

## **Tax Policy in Developing Countries**

# Tax Policy in Developing Countries

edited by  
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## FOREWORD

The 1980s witnessed a restructuring of tax systems in many industrial countries. Major elements of these tax changes included attempts at broadening the base of personal and corporate income and sales taxes by curtailing tax preferences and exemptions (or replacing the latter by tax credits), decelerating previously accelerated capital consumption allowances, reducing both the number of brackets and rates for income taxes, and, in some cases, introducing a value added tax. Developing countries also almost simultaneously adopted tax reform as a key element in their economic policy reform programs. These countries, however, understandably placed a greater emphasis on the reform of tariffs and sales taxes and increasingly sought to reduce tariffs and replace turnover type sales taxes by value added sales taxes. This volume presents a review of this experience as well as a discussion of emerging tax policy issues in developing countries. I hope tax policy officials, academics, and students of public finance in developing countries find this volume useful in their work.

LAWRENCE H. SUMMERS

VICE PRESIDENT, DEVELOPMENT ECONOMICS AND  
CHIEF ECONOMIST, WORLD BANK

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## OPENING REMARKS

Wilfried Thalwitz

As the papers in this conference make clear, taxation has become a vital component of the development effort. Indeed, without tax systems that function well, governments cannot provide even basic infrastructure and social services. The role that public finance plays in development featured prominently in public policy discussions during the turbulent 1980s—a time when many developing countries experienced significant macroeconomic imbalances and a slowdown in economic growth. These problems were in part caused by external factors, such as drastic changes in their terms of trade and high interest rates on external loans. Many countries saw their GDP drop 10 percent in the span of a few years as a result of their changing terms of trade. These severe strains have revealed the inherent brittleness of some of the structures of public finance systems and underscored the need for fundamental reforms.

In the early phases of reform, "stabilization" policy dominated the discussion. Our experience with stabilization programs was that they required financial and design assistance from international agencies to smooth the transition to a stable economic environment. But we also realized that macroeconomic stability could only be sustained when structural reforms enable a country to use its available resources efficiently. So stabilization

policy packages have had to include structural measures designed to reduce both the distortions that retard growth and the inefficiencies in resource allocation.

The World Bank took the lead in financing structural adjustment. It began by encouraging reforms in trade policy. Since then, the emphasis has gradually shifted toward fiscal issues, in response to the growing recognition that inappropriate and unsustainable expenditure and revenue policies are, in many instances, the major cause of disappointing economic performance. It is also now recognized that a flawed tax structure is often a contributing factor to economic inefficiency.

Initially, the Bank's policy dialogue on fiscal adjustment focused on public expenditure issues, that is, on the level and composition of recurrent and investment spending and the operation of public enterprises. When the external funding that had previously helped finance high levels of public expenditure dropped, countries had to cut public spending and reorder their priorities. Now, however, we have reached a stage where the belt tightening approach to fiscal reform is no longer sufficient. Populations are growing, the physical infrastructure is inadequate to support a revitalized private sector, and social services must be provided, particularly for the needy. There is indeed a limit to how far and how fast public expenditures can be cut. Therefore, adjustment programs are becoming more concerned with mobilizing revenue through improved taxation and better pricing of public services.

We must focus on tax reform for several reasons. First, structural reforms cannot pay off fully without an improved public infrastructure, which is necessary to promote the private sector as an engine of growth. But public infrastructure cannot be improved without an equitable and efficient means of mobilizing revenue. Second, reform measures often cause short-term disruptions in the economy, such as a temporary increase in unemployment. Appropriate fiscal measures would prevent these problems from alienating the population

from the reform program. Third, many countries are beginning to see that the tax system has a role to play in providing a safety net for the poor. Finally, the tax system should be providing appropriate incentives to protect the environment. Eastern Europe provides a sobering example of the careless use of resources that could have been prevented through fiscal measures for environmental protection. With appropriate pricing and taxation, it should be possible to generate additional revenues and to contain environmental damage as well. Tax systems clearly need to be reformed if governments are to pursue growth, equity, and environmental protection.

In particular, reformers need to look closely at the structure of taxation—at the level, composition, design, and implementation of taxes and charges. The total yield of the tax system in many developing countries is about a third of those of European and North American countries. Increasing this yield is justified in order to fulfill the objectives I have mentioned, but any proposal to do so should be carefully studied to ensure that it will be politically feasible. Also, if tax revenues are raised, the instruments and the rates used must be carefully devised to minimize any disincentive effects. The experiences that developing countries have had with tax reform suggest that broadening the base and eliminating the taxes that have significant distortionary effects will be vital ingredients of any tax system that is expected to boost growth and equity.

By providing an opportunity to exchange views on an important subject, this conference is fulfilling an important function of the policy and research complex of the World Bank. The subject is of great concern to the Bank and all its member countries.

## **INTRODUCTION AND OVERVIEW**

Javad Khalilzadeh-Shirazi and Anwar Shah

Recent experience with growth-oriented adjustment programs for developing countries indicates that tax reform is an essential component of any comprehensive strategy for structural adjustment and the resumption of growth (see Chhibber and Khalizadeh-Shirazi 1988). The existing tax systems of many developing countries are distortionary and contribute to a host of economic problems, including production inefficiency, capital flight, and fiscal and balance of payments disequilibria. Furthermore, there is a growing recognition that fiscal imbalances cannot be addressed simply by curtailing expenditures. In order to obtain a deeper understanding of what constitutes successful tax reform and to enhance the world Bank's ability to assist member countries in this area, the Bank's Public Economics Division has been conducting a program of research on this topic over the past few years.

One of the principal research projects of this program has been devoted to examining the experiences that developing countries have had with tax reform. The intention was to collect information on past successes and failures so as to provide guidance for countries that are facing similar sets of circumstances and are embarking on tax reform. With the completion of this project, as well as research on a number of other important tax policy issues, a conference was held in Washington, D.C., on March 28-30, 1990, to discuss, disseminate, and evaluate the findings of this research. The conference brought together a number of leading tax policy specialists from both developed and developing countries to discuss the lessons from tax reform experiences in developing countries, selected aspects of tax policy, and a future research agenda in this important policy area.

The conference was organized around two core areas: (a) the findings of a Bank research project on tax reform experience in individual developing countries and an overview of tax administration, tax reform, and the general lessons from the reform experience; and (b) a number of specific tax policy issues related to the research conducted in, or sponsored by, the Bank's Public Economics Division. The conference concluded with a round table discussion by a panel of experts on the Bank's future research agenda on tax policy and related topics. There was not enough time, however, to cover other important issues, such as municipal taxation and intergovernmental fiscal relations (see Shah 1991a, 1991b). The present volume contains the revised versions of the papers presented at the conference. This overview highlights the main themes of the papers and the conclusions of the discussions.

### **Experience with Tax Reform**

Participants discussed the experience with tax reform by examining the background to the reforms and the lessons gained from them.

#### **Background to Reform Process**

The conference devoted considerable time to a diagnosis of existing tax structures and to a review of the broad themes emerging from the tax reform movement that has swept the developing world in recent years.

**FRAMEWORK FOR ANALYSIS** . The Ramsey rule calling for a highly differentiated structure of taxation, by varying the tax rate inversely with the elasticity of demand and supply, has endured in the optimal tax literature (see

Atkinson and Stiglitz 1976; Diamond and Mirrlees 1971; Ramsey 1927; and Stern 1976, 1982, 1987). As Thirsk suggests in chapter 4, putting this rule into operation leads to an intractably large number of rates, which would be difficult to calculate and infeasible to administer effectively (see also Deaton 1987; Feldstein 1978;

and Slemrod 1990). Slemrod has argued that the optimal tax theory can serve as a guide to designing "optimal tax systems" only if one considers the technology of tax collection, that is, the feasibility of tax instruments, the cost of tax administration, and compliance. The response to these difficulties has been quite pragmatic. In recent tax reform episodes around the world, the emphasis has been on fairly uniform taxation through an explicit

recognition that gains in economic efficiency, horizontal equity, and administrative simplicity that stem from uniform taxation outweigh any vertical equity losses.

**DIAGNOSTICS** . A common theme of the review of tax reform experiences was that tax structures in most developing countries are complex (difficult to administer and comply with), inelastic (nonresponsive to growth and discretionary policy measures), inefficient (raise little revenue but introduce serious economic distortions), inequitable (treat individuals and businesses in similar circumstances differently) and, quite simply, unfair (tax administration and enforcement are selective and skewed in favor of those with the wherewithal to defeat the system). There is a heavy reliance on taxes on international trade, which undermines the long-term international competitiveness of developing countries. User charges and taxes on income, property, and wealth contribute only a small proportion of total revenues. Agricultural incomes, fringe benefits, and, in some countries, public sector wages, are not taxed. Taxes on wealth, bequests, land, and property exist in theory but have been rendered ineffective by design problems or the lack of interest in administration, or both. Personal and corporate income taxes are levied on narrow bases at high rates. Sales taxes are levied in a cascading manner, thereby imposing tax pyramiding (gross price inclusive of tax is taxed as the commodity passes through various production and distribution channels) and, in some instances, more than 100 percent full forward shifting (final sales price inclusive of the tax rises more than the amount of the tax).

The existing tax structures impose varying levels of taxation, depending on the form of income, the type of assets, the size and legal status of the businesses, and the kind of business activity. As a result, both the average effective tax rate (tax as a percentage of income) and the marginal effective tax rate (the tax wedge on the after-tax rate of return) vary substantially across assets and sectors, thereby creating an uneven playing field for economic agents. Such differential treatment distorts individual choices with respect to the form of income, the asset ownership, the business organization, the sector of investment activity, and the time profile of investment. Thus business decisions are not guided by economic considerations alone. Tax considerations may be playing a significant part in these decisions, and the resulting allocation of resources might not be consistent with least-cost output choices for the economy as a whole.

Tax expenditures (forgone revenues) are widely used to advance wide-ranging but sometimes conflicting tax policy objectives, such as promoting industrial development, savings, investment, employment, and exports (see Boadway and Shah in Shah forthcoming a). Given the limited tax bases, poor compliance, and enforcement in many developing countries, tax expenditures are often ill-suited to achieving individual policy objectives. These incentives confer windfall gains on some activities at substantial cost to the treasury without inducing commensurate behavioral responses (for empirically derived benefit-cost ratios for various tax incentives in developing countries, see Bernstein and Shah in Shah forthcoming b; and Shah and Baffes in Shah forthcoming a). Because of these poorly conceived tax preferences, along with widespread tax evasion and avoidance, many economic activities, even in the formal sectors, go untaxed while the rest are taxed at inefficiently high levels. Taxable activities are subject to a multitude of rates, some of them quite onerous, established on narrow bases. At such heavy levels of taxation, after-tax rates of return are often below the opportunity cost of funds. Furthermore, high rates encourage tax avoidance and compromise the fairness of the tax system. In view of these perverse incentives and the resulting tax evasion, the inadequate resources of tax administrations are often stretched to the limit. Poor tax compliance introduces considerable inequity into the current structure and also makes the tax system an inefficient and ineffective instrument of public policy.

**DIRECTIONS OF REFORM** . As already mentioned, a large number of developing countries have undertaken tax reform in recent years. Their successes and failures can provide guidelines for countries in similar circumstances that may now or in the future attempt to reform their tax systems. The countries that have embarked on reform differ in the nature, substance, procedure, context, and timing of their tax reform. For example, Colombia (McLure and Zodrow this volume), the Republic of Korea (Choi 1990), and Turkey (Bulutoglu and Thirsk 1991) each had a long drawn-out period of tax reform, whereas other countries such as Indonesia (Asher 1990) and Malawi (Shalizi and Thirsk this volume) carried out major changes in their tax

system in a single episode implemented over a short period of time.

Faced with mounting deficits and having cut expenditures as far as is prudently possible, particularly on public investment and social spending, a number of developing countries have decided to restructure their tax systems to seek higher revenues or to improve the revenue elasticity and buoyancy of the tax structure. The secondary goals of these reform movements have been to (a) eliminate the disincentive effects of onerous levels of taxation; (b) reduce the economic inefficiencies induced by the distortionary taxation of assets and sectors; (c) protect the poorest of the poor from the tax net; and (d) provide partial relief from the unwelcome effects of inflation. Thus revenue enhancement, economic efficiency, horizontal equity, and simplicity issues have dominated the world agenda on tax reform, and other issues such as vertical equity and international income taxation have received only scant attention. The emphasis on the redistributive role of the tax system is gradually waning—a direct consequence of the fact that tax evasion is so pervasive. Although progressivity remains high on the political agenda in theory, often the political will to enforce income tax compliance is lacking. Vertical equity is increasingly being perceived as an elusive goal and therefore is being assigned a lower order of priority in tax reform. In pursuit of revenue enhancement, many countries are relying less on narrowly based trade taxes and are emphasizing broadly based consumption (hybrid value added) taxes. To reduce the disincentive effects of taxation, some countries are bringing down the average and marginal effective tax rates by eliminating ineffective tax preferences and thereby broadening the bases, while leveling the rates. These measures, however, compromise vertical equity. As Richard Musgrave points out (see chapter 16), broadening bases may raise the threshold of taxation and have fewer and lower tax rates, but it does not pay adequate attention to the distribution of relative tax burdens across income classes. Some have attempted to protect the poor by exempting or zero rating foods under a value added tax (VAT) and by raising the threshold of taxes on personal income, urban property, and agricultural land.

Intersectoral and interasset distortions are also being reduced as countries endeavor to create a level playing field by eliminating special preferences and by replacing cascading turnover and sales taxes by more neutral value added taxes. There have also been attempts to mitigate the unwelcome effects of taxation in the highly inflationary economies of Latin America through partial indexation of the tax system. Regional and international tax competition to attract foreign investment has been intense (see Chia and Whalley in Shah forthcoming a). Countries that provide special incentives for foreign direct investment tend to overlook the implications of the tax systems of those advanced nations that tax their residents on their worldwide income but allow them to claim credit for taxes paid to foreign governments against their domestic tax liability (see Shah and Slemrod this volume; and Slemrod in Shah forthcoming a).

Although the broad directions of reform are remarkably similar, a number of unresolved and controversial issues remain. For example, all recent attempts at tax reform have curtailed tax preferences, especially for investment, but some economists would argue that certain tax incentives, such as the investment tax credit, are desirable because they lower the user cost of (new) capital and thereby encourage greater capital formation. (For a fuller discussion of this issue, see Boadway and Shah in Shah forthcoming a. The effectiveness of such incentives in the presence of market imperfections is discussed by Rajagopal and Shah in Shah forthcoming a, b).

The proper role of progressive income taxes in developing countries is another intensely debated issue, as is the question of whether the personal income tax should have fewer tax brackets and rates on account of simplicity (see Musgrave and Stern, both in chapter 16). Some would argue that the proponents of simplicity should focus on the definition of the base, not on whether there is a single income tax rate or four or five. Others would point out that there is a tradeoff between simplicity and progressivity. And on the question of replacing income taxes by broadly based consumption (expenditure) or cash–flow taxes, perplexing philosophical and transitional issues continue to dominate current discussions. Broadly based consumption taxes in their pure form would tax wage income only (see Zodrow and McLure 1988) and would exempt capital income apart from rents. The equity implications of such taxes would create considerable controversy. Cash–flow taxes would be simple in design and

are conceptually superior to the existing income taxes, especially the corporate (equity) income tax, in the setting of a closed economy. Developing countries with an open economy may find cash–flow taxes unsuitable, especially because they would not be creditable under the existing foreign tax credit regimes and cannot be used as withholding taxes. Moreover, such taxes are considered to be so difficult to implement that no country has yet adopted them (except in enclaves such as mining), although Mexico has recently indicated that it hopes to move gradually toward a cashflow taxation of business incomes.

### Lessons for Tax Reform

Tax reform experiences to date offer some important insight into useful tax policy design and institutional development.

*1. The value added tax should be an instrument of choice for most developing countries contemplating reform of their sales taxes. A value added tax can provide greater revenue, tax neutrality (economic effi–*

*ciency), and, under certain circumstances and to a limited extent, vertical equity. That the VAT increases revenue and economic efficiency is well documented. Indeed, the VAT has been an unqualified success in this regard. Vertical equity is also improved through the trade component of the VAT, which reduces rents accruing to the wealthy recipients of import or foreign exchange licenses. Furthermore, a VAT can assist in improving the collection of other taxes. This potential has yet to be exploited by a developing country. The VAT has helped raise additional revenues and reduce the efficiency costs of taxation in Indonesia, Turkey, Brazil, Colombia, Mexico, Korea, and Malawi. Of course, several difficulties arise when the VAT is implemented in developing countries. A VAT cannot cover economic activities carried out in the informal sector in a typical developing country. Also, to keep the poor out of the tax net, basic foods and necessities are usually exempted, which gives rise to administrative complexities. Interregional trade creates its own special problems for VAT administration. A value added tax is best administered by the central or federal government. And a value added tax is not necessarily superior to a well–functioning retail sales tax in small, islandtype economies.*

*2. The base of existing taxes should be broadened at the same time that tax administration reform is carried out. Base broadening is compatible with a number of economic objectives. It can increase revenues and improve the simplicity, neutrality, and equity of the tax system. Neutrality increases because base broadening usually reduces differential tax treatment among assets and sectors of economic activity by leveling the playing field. Vertical equity also increases because tax expenditures that offer disproportionate levels of benefits to the rich are curtailed. Lower and fewer tax rates also enhance neutrality but are not compatible with vertical equity objectives. Tax administration difficulties continue to stand in the way of broadening existing tax bases and having fewer and lower rates. The record to date for these measures in improving the taxation of income is not clear. The apparent lack of success in this area is attributable to several factors: selective and lax enforcement practices, ineffective tax administration in part due to political inertia, institutional and political difficulties associated with bringing agricultural incomes into the tax net, and an overall disenchantment with income taxes as revenue instruments in an evasion–pervasive environment.*

*3. The use of the tax system for special tax preferences should be carefully evaluated. Using the system to provide tax incentives (tax expenditures) usually causes a serious drain on the national treasury by conferring windfall gains on existing activities or by shifting resources to tax–preferred activities (see Shah and Baffes in Shah forthcoming a). But the use of the tax system for corrective purposes, to protect the environment, and to discourage public "bads" has welcome effects in that it discourages such activities and also raises additional revenues (see Shah and Larsen forthcoming; Shah 1990,1988; and Summers 1991). Thus in devising tax policies to meet economic and social objectives, potential gains must be weighed against the revenues and potential losses in efficiency that might be associated with these measures. Furthermore, the design of tax measures must be consistent with their objectives.*

4. *Tax reform must take into account initial conditions at home and abroad.* In reforming their tax systems, developing countries are severely constrained not only by their own institutional settings but also by the tax structure in capital-exporting countries. For example, the U.S. foreign tax credit regime discourages the adoption of a cash-flow system of taxation in developing countries. Moreover, the circumstances in such countries are usually such that they would experience serious transitional difficulties if the tax system were to be redesigned from scratch. Developing countries must take into account initial conditions at home and abroad. Otherwise, the reform effort is likely to fail. The impact of tax policy on international competitiveness has not received much attention in tax reform analysis, but it appears that developing countries often engage in wasteful tax competition and do not give adequate thought to the tax regime that a potential marginal investor faces in his home country. A marginal investor from a country with a worldwide system of taxation can be taxed by the host country at the home country tax rate without feeling any disincentive effects. Furthermore, the host country needs to adopt appropriate income attribution rules to circumvent the shifting of income to low-tax countries or to tax havens through transfer pricing.

5. *The credibility of the tax regime is the key to the success of any tax reform.* A stable tax policy environment encourages businesses to take a longer-term perspective in their finance and investment decisions. Making tax changes without giving adequate consideration to transitional arrangements can undermine the credibility of a tax regime. Therefore, transitional arrangements require much more careful analysis than they have hitherto been given in developing countries. In addition, tax changes must be presented as part of a long-term strategy to improve the public sector environment for the private sector. The tax regime would gain the confidence of business if more attention was paid to the preparation and analysis of reforms, advance consultation, providing a reasonable period of adjustment prior to implementation, grandfathering provisions, and the historical consistency of tax reform.

6. *Coordinated tax reform offers significant advantages over isolated piecemeal tinkering with the tax system.* A coordinated reform ensures that individual tax changes will be consistent with the central objectives. For example, a reduction in tariffs without a

corresponding increase in other taxes, generally of a value added type, can increase the fiscal deficit and exacerbate macroeconomic difficulties. Furthermore, to improve economic performance in general, tax reform should be closely integrated with structural adjustment measures.

### **Political Economy of Tax Reform**

Tax reform is a sensitive and difficult process. The payoff tends to be of a long-term nature and therefore it is difficult to get politicians to commit themselves to a comprehensive reform. Few developing countries are likely to give tax reform initiatives serious consideration until they are faced with a fiscal crisis. In theory, comprehensive reforms are more desirable because a tax system is better able to meet revenue, efficiency, equity, growth, and simplicity objectives in such a framework. In practice, since the gains from comprehensive reform become visible only in the medium to long term, it is a challenge to assemble a political quorum to carry through a wholesale reform. Often, the pragmatic course is to strive for incremental reforms in a consistent manner over time. Historical consistency, although desirable, is difficult to achieve. Consider the case of Colombia, where a net wealth tax was considered an important progressive element of taxation in the 1974, 1986, and 1988 reform episodes. In 1989, however, it was repealed. Also consider what might happen if the tax rates on income are reduced at the same time that the base is broadened. If tax preferences are later restored to appease special interests, the initial reform effort would have contributed to a deterioration of the tax structure for in the final analysis the lower rates would be applicable to still narrower bases (see Thirsk chapter 4). Broader bases and lower rates can erode the tax structure further wherever tax evasion is prevalent.

## Tax Policy in Developing Countries

Tax changes create winners and losers. Also, each tax change introduces some efficiency and vertical equity tradeoffs that must be recognized and appropriately addressed. Canada, for example, introduced refundable tax credits to counteract the regressivity of the VAT. Developing countries deal with regressivity through exemptions. It is important to identify gains and losses by income class, by geographic region, and by political affiliation so that the long-run viability and sustainability of reform measures can be objectively evaluated. Short-term tax expenditures designed to meet nonrevenue objectives should be avoided since they create strong political constituencies wedded to these measures. A comprehensive reform offers some possibility of balancing the gains and losses of various groups, which usually is not the case in piecemeal reform.

Country experiences suggest that tax reform proposals must consider the institutional features of the country in question. In low-to middle-income countries—such as Colombia, Malawi, Turkey, and Indonesia—broader income taxes are not likely to produce large revenue gains and therefore the VAT is expected to be the mainstay of the revenue-raising effort. In newly industrialized countries such as Korea, however, broader bases offer considerable potential for increasing revenue. In a country with a federal system of government, the powers of taxation are delegated among the levels of government in a way that typically constrains tax reform choices. In India, for example, a full-fledged union VAT would meet with state-level opposition because of a concern that a federal VAT would not leave much room for state and local sales taxes. In Pakistan, the octroi tax, which is a tax on intermunicipal trade, could not be repealed because it is a significant source of local revenue.

Tax policy advice must also give due attention to current administrative practices and what potential there may be for improvement. Experience suggests that compartmentalizing public policy in various departments (or even various branches of the same departments) limits tax reform options. None of the countries reviewed by the conference handle tax and transfer options simultaneously. The range of choices is restricted to alternative tax instruments, and direct expenditure options are excluded.

The political and civil service elite in the country must assume the "ownership" of the proposals if the reforms are to succeed. The chances for success also increase when local experts participate in the design of the reform because they are better judges of the political pulse of the country. The success of tax reform in Colombia and Malawi can be attributed in part to the trained core of local experts who worked closely with foreign advisers.

The way to increase compliance is to make sure not only that the people are consulted on the reform proposals themselves but also that they are given a clear idea about how the money will be spent. The authorities in Malawi consulted widely with taxpayers to gauge their reaction to income tax changes before finalizing their proposals. This helped to ensure that the final reforms were acceptable to a majority of the population that would be affected by them.

Whatever choices may be made on the path to reform, it helps to have a coherent plan in place before implementation begins. Also, tax reforms must remain flexible so that they can respond to changing economic and social conditions.

### **Selected Tax Policy Issues for the 1990s**

The conference debated a number of issues that are expected to dominate tax policy discussions in the 1990s. These include tax administration, the design of indirect taxes, the taxation of foreign investment, finan-

cial taxation, resource taxation, the incidence of taxes, tax policy and economic growth, and the quantitative tools for tax policy analysis.

### **Tax Administration**

As already mentioned, tax administration plays a vital role in the success or failure of any attempt to reform taxes. Unfortunately, with the notable exception of the studies by Deaton (1987) and Slemrod (1990), the existing public finance literature does not pay adequate attention to tax administration issues. From the experiences of tax reform in Latin American countries, Richard Bird (chapter 3) develops some basic rules for tax administration reform. He argues that tax structure and administration are interdependent and therefore that they must be considered together. Developing policy recommendations on administrative reform requires closer and, preferably, quantitative analysis of many aspects of administration such as the internal incentive structure and the operating costs of the tax system. In the 1980s Latin American countries moved away from progressive personal income taxes and toward VATs. Bird interprets this change as a clear recognition of the administrative dimension of tax reform. These countries appear to have recognized that progressive income taxes are difficult to administer.

Bird advocates simplicity as the fundamental rule in tax reform and proposes a tax reform package that takes into account the interdependency of tax structure and tax reform. The main measures he proposes are to eliminate unproductive taxes; keep differential rates to a minimum, whether in commodity taxes or, to reduce tax arbitrage, in the effective rates of income taxes; draft the law clearly and communicate it effectively to both administrators and tax payers; and focus on collecting revenue and not on using the tax system to achieve nonfiscal ends. Bird concludes that modest research (and action) on alternative administrative arrangements is more likely to lead to a more or less fair and efficient tax system for most developing countries than would the application of either traditional reform prescriptions, such as comprehensive income taxation, or of the latest optimal tax theorem. The discussion indicated that although the institutional aspects of tax administration are reasonably well understood, the economic dimensions based on the theoretical insights need further research. Moreover, the data problems in this area impede the development of sound economic advice. For example, the marginal administrative costs of various tax measures of inspection or compliance-inducing actions are usually not known.

### **The Design of Indirect Taxes**

In most developing countries, the design of indirect taxes affects the ability of governments to raise revenues without causing major economic distortions. Thus it is particularly important to coordinate the reform of tariffs and domestic indirect taxes and to design an appropriate value added tax.

Mitra argues in chapter 6 that tariff reform should not be carried out in isolation from the reform of other indirect taxes if the potential losses in public revenues arising from tariff reductions are to be offset and macroeconomic difficulties kept at bay. A coordinated reform of these taxes would combine reductions in tariffs with an offsetting or, preferably, revenue-enhancing upward adjustment in the sales tax or VAT, which would apply equally to both domestic production and imports. The protection function would be served by customs duties and the revenue objective by the sales tax or VAT. Not only could revenue neutrality be preserved in this scheme, but the rate structure could be raised so as to meet the demand for any assistance for trade liberalization that may become necessary.

As noted earlier, the VAT is the most pervasive feature of tax reform in many developing countries. From the lessons learned about VAT design, Cnossen in chapter 5 gleams advice for developing countries that are contemplating a VAT-type tax. First, he concludes that pre-retail VATs cause such significant distortion and administrative complexities that they are not worth adopting. He argues for the use of a scale factor (say, size of turnover), supplemented by administrative criteria relating to trader type and employment, to exclude small firms from VAT coverage. Second, all services (except health care, education, social welfare, banking, and insurance) should be included in the base. Third, rates should be differentiated as little as possible, although to protect the poor it may be necessary to reduce rates for food, essential consumer items, drugs, electricity and fuel, newspapers and books, and public transportation. If luxuries are to be taxed at a higher rate, then this should be

done by special excises rather than by a higher VAT. Fourth, the VAT is an ideal tax for large, integrated economies with sophisticated production and distribution channels. It is less suitable for small, island-type economies that have a narrow manufacturing base and that depend heavily on crossborder trade.

### **Taxation of Foreign Investment**

Attitudes toward foreign investment in developing countries have changed considerably in recent years. Such investments used to be seen as an instrument of foreign domination and control and were therefore treated with suspicion. This perception is now changing, and developing countries have come to recognize that foreign capital can provide positive economic gains, particularly through technology transfers and access to world markets. As a result, some developing countries have begun to compete in the provision of

tax incentives to attract foreign capital. In many instances, however, such incentives boil down to a transfer of resources from the host developing country to foreign treasuries without any special benefit to foreign investors. Thus the taxation of multinationals by a developing country cannot be assessed in isolation from the tax regime of the home country, from tax havens or conduit countries, or from transfer pricing practices. These factors will have bearing on the tax sensitivity of foreign direct investment (FDI).

The tax sensitivity of FDI has important policy implications. If, on one hand, FDI is not responsive to taxation, it may be an appropriate target for taxation by the host country, which can raise additional revenues without sacrificing any economic benefits that FDI produces. If, on the other hand, the volume of FDI responds negatively to taxation, then the host country must trade off the revenue gains of increased taxation against the economic costs of discouraging FDI.

The relevance of host and home country tax regimes to FDI transfers and reinvestments is the subject of considerable theoretical controversy. According to the old view, both tax regimes matter—the home country tax system is relevant even if a subsidiary finances its investment by reinvesting earnings or by raising local debt. This is because its financing and investment decisions affect tax liability at home with respect to the distribution of dividends. In the more recent view, in the case of FDI financed by local debt or reinvested earnings, the home country tax rate is irrelevant.

In chapter 7, Leechor and Mintz challenge the new view. They argue that home country taxes influence the user cost of capital even when retained earnings are used at the margin. They also find that foreign firms in a typical host country would face substantial variations in the user cost of capital because of factors such as (a) the country where capital is owned; (b) the type of organization (because branches are often subject to accrual taxation and subsidiaries subject to exemption or deferral); (c) the rate of remittance (the higher the rate, the higher the weight of home country taxes in determining the user cost of capital); (d) financial policy (since real interest rates and applicable withholding tax rates vary across countries, the debt–equity ratio and the country where the debt is raised have important implications for the user cost of capital); and (e) the net foreign tax–credit position. The authors' calculations for Thailand indicate that effective tax rates there vary with the source of funds, the type of organization, and the rate of remittance. They also argue that the policy options of the host country are usually constrained by the tax rules in capital–exporting countries and by the strategic behavior of multinationals. Leechor and Mintz conclude that, given the international mobility of capital, global tax neutrality is possible only through a comprehensive multilateral agreement on the coordination of capital income taxes.

The tax sensitivity of FDI in developing countries has not been examined empirically in past studies. Even the relevant empirical literature on advanced nations does not capture the home country tax regime. Furthermore, the disincentive to invest caused by the tax system is usually implicitly measured by an average tax rate, whereas the incentive to undertake new investment depends on the effective marginal tax rate, which can deviate substantially from an average tax rate concept. Shah and Slemrod (see chapter 8) have devised an empirical model to study the

relevance of host and home country tax regimes to FDI using data on U.S. multinational transfers and reinvestments in Mexico. The model distinguishes FDI financed by transfers from that financed by retained earnings, and it incorporates tax and nontax factors for both the host and the home country, including host country risk factors and the credit status of multinationals. Both the marginal and the average effective tax rates are incorporated into the analysis. The authors conclude that FDI in Mexico is sensitive to tax regimes in Mexico and in the United States, to the credit status of multinationals, to country credit ratings, and to the regulatory environment. They also find that developing countries in which the degree of FDI penetration is large need not worry about providing special tax incentives for foreign investment, but they should ensure instead that their tax system is competitive with the home tax regime of a marginal investor who has access to foreign tax credits against domestic tax liabilities.

### **Resource Taxation**

Many developing countries bring agricultural income into the tax net indirectly, by means of distorting taxes on agricultural exports, marketing boards, and overvalued exchange rates. The possibility of replacing these with a nondistorting land tax is discussed by Skinner in chapter 9. He examines in some detail the advantages and disadvantages of the land tax, both in theory and in practice, in selected developing countries. He concludes that a land tax is not necessarily a superior alternative to export taxes for federal government revenues, because it is too inflexible to deal with instability in agricultural incomes and with administrative and political difficulties. Progressive tax rates on landholdings are nearly impossible to administer, he argues, citing the example of Bangladesh, where the top marginal rate on the wealthiest farmer's land is nearly fifty times the minimum rate, although in reality there is little or no evidence that rich farmers pay more than three times the minimum rate.

According to Skinner, the record to date suggests that land taxes have not been effective in attaining nonrevenue goals such as (a) transferring resources from the agricultural to the nonagricultural sectors; (b) discouraging inefficient or speculative land use; (c) assisting in

land reform; and (d) promoting environmentally sound land management. A land tax, however, is a suitable instrument for local government financing because it would be seen as a benefit tax or simply as a user charge for local public services.

### **Financial Taxation**

Many economists believe that any strategy for growth must devote attention to developing financial markets. Most developing countries consider their banking, insurance, and finance sectors to be lightly taxed. Chamley argues in chapter 10, however, that the financial sector in many developing countries is heavily taxed if one looks at both explicit and implicit taxes. Implicit taxes include seigniorage, reserve requirements, lending targets at nonmarket rates (earning below-market rates), and interest ceilings combined with inflation. These taxes are never reported as tax revenues in standard national accounts but yield revenues far in excess of traditional taxes. Inflation, in particular, is often overlooked as a source of tax revenue.

Using a partial equilibrium framework, Chamley argues that most of the effective taxation of financial institutions falls on deposits. Although the revenue from the taxation of financial assets is difficult to measure because of the complexity of the instruments, their efficiency cost is very large when the rate of taxation is greater than 40 percent. At lower rates, say, less than 20 percent, the efficiency cost is smaller in relation to revenues. The removal of onerous levels of taxation stimulates financial intermediation, provided such a move is seen as a permanent policy change. The results vary depending on the initial conditions (tax rates, level of development, and inflation rate) and the credibility of the tax regime in each country. In countries that have developed financial markets to a relatively high level and in those that have experienced an annual inflation rate in excess of 100 percent, the supply of financial assets is highly responsive to tax changes, provided the policy change is seen as

credible. As countries develop a large and sophisticated menu of financial assets, such as those in Thailand and Indonesia, greater possibilities for substitution emerge and the efficiency costs of financial taxation rise. Most countries in Latin America and Southeast Asia, along with Ghana, Zaire, Uganda, and Somalia in Africa, have either high inflation or sophisticated financial systems. In these countries, the reduction in the level of financial assets in the formal sector that is associated with implicit taxes is thought to outweigh the revenue gains from such taxation. The impact of taxation is estimated to be significantly weaker in countries with inflation rates of 60 percent or lower. Tanzania, Nigeria, and Zambia are cited as examples of this weaker association between taxation and the accumulation of financial assets.

### **The Distributional Impact of Taxation**

The incidence of various taxes has been the subject of considerable debate. The importance of this issue in tax policy discussions cannot be overemphasized. The issue is addressed by Shah and Whalley in chapter 11 and by Clarete in chapter 12. Shah and Whalley argue that, despite decades of research and some obvious pitfalls, tax incidence analysis for developing countries continues to be based on the same shifting assumptions that are used for developed countries. Taxes are assumed to be shifted forward to consumers or backward onto factor incomes, in accordance with tax incidence work on developed countries ranging from that of Bowley and Stamp to that of Pechman and Okner. But the nontax policies and regulatory environments of developing countries are quite different from those of developed countries, with features such as higher protection, rationed foreign exchange, price controls, black markets, and credit rationing. According to Shah and Whalley, all these features can greatly complicate and even obscure the incidence effects of taxes in developing countries. In the case of several taxes, when such features are taken into account signs may be reversed and estimates of incidence substantially changed from those that would be produced by conventional thinking. The authors present calculations for Pakistan on the incidence of selected taxes to substantiate this newer view of tax incidence.

Clarete uses a general equilibrium framework to analyze the interactions between the institutional distortions typically found in a developing country and the incidence of selected taxes. The institutional distortions he covers are quantitative import restrictions, the Harris–Todaro effects, and foreign exchange rationing. He finds that the incidence of various taxes is sensitive to the type of institutional distortion in the model. For example, excise taxes are regressive in the presence of quantitative import restrictions and Harris–Todaro labor market distortions but are progressive in the presence of foreign exchange rationing alone. Value added taxes range from being almost proportional, if foreign exchange rationing is present, to being slightly progressive, if quantitative import restrictions or the Harris–Todaro labor market distortions are featured in the model.

### **Quantitative Tools for Tax Policy Analysis**

A quantitative evaluation of the impact of changes in tax structures is essential for both economic and political economy reasons. Along with the chapters on incidence analysis, two others present frameworks for evaluating reform proposals according to their impact on factor use by various sectors, aggregate employment, prices, government revenues, and income distribution.

In chapter 13 Dahl and Mitra draw on the work done by the World Bank to analyze taxes in Bangladesh, India, and China and illustrate that applied general equilibrium analysis has been useful in addressing a wide variety of tax policy questions. The Bangladesh model, for example, combines revenue and incidence effects in a single measure to rank various sectors with respect to the efficiency–cum–equity cost of raising revenue. The China model is used to evaluate whether it is appropriate to recommend to socialist economies that they should adopt broadly uniform tax rates over a large number of sectors, while the India model examines the coordinated reform of tariffs and indirect taxes. Dahl and Mitra also discuss the resources required for carrying out such analyses. They argue that establishing a consistent data set is the costliest aspect of modeling and that computing and software costs are small by comparison. They suggest that cost considerations must be weighed against the

substantial gains that model analyses make possible, notably, the consistency of recommendations and the sound policy decisions concerning structural reform.

Atkinson and Bourguignon (see chapter 14) present a simple spreadsheet framework, termed the "tax–benefit" model, which can handle redistributive calculations while abstracting from any behavioral responses. This framework uses microeconomic data extracted from household surveys or comparable sources. It applies to each household in the sample the official calculation rules for the various taxes and benefits to which it may be entitled and derives the resulting distribution of net incomes. The model also provides other important characteristics of the redistributive system, such as the effective marginal tax rates that households may be facing, the distribution of individual gains and losses associated with a specific reform measure, and any changes in government revenues. The disincentive effects of the system are incorporated simply by modifying the household budget constraint in an ad hoc manner. The authors summarize the features of the tax benefit models that are used in the United Kingdom and France and illustrate how they are applied. They also discuss the possible modifications of these models for use in developing countries and the main features of a potential framework for Brazil.

### **Tax Policy and Economic Growth**

There is little disagreement that in theory taxes have some impact on economic growth. Other things being equal, countries with a low tax rate are expected to grow faster than those with a high tax rate. Negative taxes (incentives and subsidies) stimulate growth. Empirical evidence to this effect is sparse, however, especially for developing countries. Korea provides an interesting opportunity to look into this question since its tax system underwent a major transformation during the early phase of its dramatic growth. In chapter 15, Trela and Whalley examine this question using an applied general equilibrium model developed earlier to assess the significance of intersectoral resource transfers for Korean economic growth. The Korean tax system, they point out, has evolved over the years from one that raised small amounts of revenue from narrow bases to a broadly based system that yields substantial revenue. The tax system has been continuously adapted to serve broader policy objectives (for example, investment and export promotion). Rebates of direct and indirect taxes on exports and investment tax credits and tax holidays have been liberally used in pursuit of specific policies. More recently, tax policy has shifted toward neutrality.

Trela and Whalley also discuss the significance of tax–induced intersectoral resource transfers for Korean growth. The modeling results indicate that tax policy contributes only modestly to Korean economic growth. It accounted for less than a tenth of the growth during 1962–82, although it did contribute to about 3 percent of export growth. The results described in chapter 15 must be treated as tentative for the model used takes only a partial view of the Korean growth process and does not explicitly take into account savings, investment, and the accumulation of human capital. The authors nevertheless expect the model, once expanded in this direction, to reconfirm the conclusion that the main factors underlying Korean growth in recent decades lie outside of tax policy.

### **Concluding Comments**

In the concluding session of the conference, a round table discussion reflected upon areas of future research into taxation and the Bank's role in such work. The Bank, it was noted, is ideally suited to fostering collaborative research among analysts from developed and developing countries. A number of topics were singled out for such research: the joint analysis and reform of tax and expenditure systems (fiscal reform as a whole); the fiscal federalism dimensions of tax reform; global issues of taxation, particularly those related to tax competition among developing countries trying to attract foreign direct investment, and to environmental protection such as carbon tax schemes for controlling emissions of greenhouse gases and their implications for developing countries; the dynamic analysis of taxation, in view of the improved techniques for constructing plausible positive models of dynamic economies that incorporate expectations, learning by doing, and imperfect competition; and the institutional and economic aspects of tax administration.

The importance of tax administration was repeatedly noted throughout the conference. It is widely recog-

nized that the success of tax policy changes depends heavily on the administrative ability (and, of course, the political will) to collect revenues through fair and efficient enforcement. All recent efforts at tax reform clearly point to simplicity of tax design and ease of administration as the fundamental criteria for choosing among alternate reform proposals. Unfortunately, no reliable framework has yet been developed for evaluating the administrative efficiency of alternate policies or for estimating the relative orders of magnitude of marginal administrative costs of various administrative measures. Tax administration reform is often contemplated without adequate knowledge of potential output (the real tax base), the nature of administrative cost functions (returns to scale, discontinuities, jointness of production, and so on), and compliance reaction curves (for example, in an environment where tax evasion is pervasive, higher penalties create increased incentives for corruption and therefore reduced compliance). Thus additional theoretical and empirical research on the efficiency of tax administration can provide better insight into the appropriate path of tax reform. In particular, such understanding could ensure that the simplicity criterion in the design of tax reform is put in proper perspective and is not overemphasized at the expense of other policy objectives, including equity.

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## **PART I— TAX REFORM EXPERIENCES**

### **1— Tax Reform in Colombia: Process and Results**

Charles E. McLure, Jr. and George R. Zodrow

This chapter analyzes the process and the results of the multitude of tax reforms that have occurred in Colombia since about 1960.<sup>1</sup> It examines the evolution of Colombian tax policy and evaluates the major reforms in terms of the criteria commonly applied to tax systems by public finance economists—economic neutrality (especially with respect to capital investment alternatives), distributional equity, administrative and compliance simplicity, and revenue performance. The chapter also examines the extent to which the tax reform process in Colombia has been influenced by the advice of foreign tax experts, especially by the recommendations of the missions headed by Milton Taylor in 1965, Richard Musgrave in 1971, and Charles McLure in 1988, and by the work of Richard Bird (1970). An underlying theme is that Colombia has heeded the advice of foreign experts; as a result, changes in the Colombian tax structure have often reflected shifts in the prevailing "conventional wisdom" among public finance economists regarding the relative importance of the criteria listed above. Thus it should be noted that this appraisal of the various episodes of Colombian tax reform is conditioned by current interpretations of the relative importance of these criteria.

The reforms enacted over this period have often been quite sweeping, and in some important cases, represented dramatic reversals of earlier policy decisions (sometimes corresponding to equally dramatic shifts in the conventional wisdom on these issues). For example, a wide range of investment incentives were introduced in 1960, but were allowed to expire ten years later. Dividends were first made subject to tax in 1953, but then were exempted in 1986. A wide variety of personal exemptions and deductions, as well as a form of income splitting, were introduced in 1960 and modified during the 1970s, but were largely eliminated in 1986. Inflation adjustment in the measurement of capital income was first rejected, but it was later gradually enacted to the point that the current system provides for virtually full indexing. Now a move to a comprehensive balance-sheet approach to inflation accounting is planned for 1992. A tax on net wealth was instituted in 1935 and was improved substantially in 1988, but it is currently scheduled for elimination in 1992.

The net result of all these changes is a tax system that is far superior to the one that prevailed in the late 1950s. The tax base is significantly broader, and thus scores high marks on both the neutrality and the horizontal equity criteria. A comprehensive system of inflation adjustment implies that real economic income is measured much more accurately than would be the case under an unindexed system. Although inflation indexing adds complexity, many of the features of recent reforms have resulted in greater simplicity, as efforts to fine tune income measurement have been scaled back in order to design a system that can be administered more easily. The vertical equity characteristics of the current system are more difficult to characterize. Although the reduction of rates, the elimination of the tax on dividends at the individual level, and the elimination of the tax on net wealth have increased incentives to work, save, and invest, they probably also made the system less progressive than it was thirty years ago. Certainly the desirability of these changes is open to debate. Finally, despite several design problems, the

current value added tax is an important revenue raiser and is clearly superior to the defective sales tax system it replaced.

The remainder of the chapter is organized as follows. The next section provides a brief chronology of the most significant features of the tax reforms that have occurred in Colombia over the past thirty years. It focuses on those changes that provide insights into the process of tax reform in that country. The chapter then evaluates several of the more recent reforms in terms of the criterion of investment neutrality. Specifically, it summarizes the results of calculations of the marginal effective tax rates on capital income under (a) the pre-1986 law, (b) the 1986 law when fully implemented, and (c) the 1988 law when fully implemented. A discussion of the distribution of income in Colombia considers the distributional effects of various reforms. The chapter then examines the effects of these reforms on tax simplification, considers the effects of various reforms on government revenues, and draws conclusions about the process and the results of tax reform in Colombia.

### Episodes of Tax Reform

Although tax reform has been an ongoing process in Colombia over the past thirty years, it is possible to identify seven major reforms or reform proposals over that period—what we might call episodes of tax reform. The principal features of these reforms or reform proposals are described in the following subsections.

#### The Tax System after the 1960 Reform

The Colombian tax structure in 1960 was typical of those found in Latin America at the time. In 1957 the United Nations Economic Commission for Latin America had called for a highly interventionist strategy to spur economic development. In line with this recommendation the Colombian tax system provided a variety of incentives for investment in favored industries, including industries deemed to be of basic importance to development such as iron and steel.

The resulting system of pervasive investment incentives caused an inefficient allocation of scarce capital resources, complicated the tax system, made the achievement of horizontal and vertical equity more difficult, and had a high cost in terms of revenue lost per additional dollar of investment obtained.<sup>2</sup> As a result, most of the incentives were allowed to expire ten years after the 1960 reform was enacted. Indeed, Colombia was one of the first of the developing countries to reject the highly interventionist approach and to reduce dramatically its reliance on investment incentives. This change was consistent with the recommendations of both the foreign advisers working in the National Planning Department at the time and the Musgrave mission.<sup>3</sup> Apart from incentive provisions, the basic structure of the Colombian tax system after 1960 consisted of the "income and complementary taxes" (the personal and company income taxes, the tax on individual net wealth, and an excess profits tax) and some relatively minor indirect taxes. The main features of this system can be summarized as follows.

**INDIVIDUAL INCOME TAXES** . Labor income was generally taxable under the individual income tax, although there were a wide variety of exemptions, including annual bonuses, vacation and sick pay, severance pay, travel allowances, gambling winnings, and the income of Catholic clergy. Capital income was generally taxed lightly, because interest on government securities and limited amounts of other interest and dividends were exempt, capital gains were treated generously, and taxes on dividends and interest were easily avoided.

Interestingly, the implicit capital income on owneroccupied housing (in excess of a small exclusion) was subject to tax; although such treatment is commonly viewed as desirable in principle, few countries attempt to tax this source of income. A somewhat unusual and complicating feature of the individual income tax was that personal deductions for medical, educational, and professional services depended on the income and number of children of the taxpayer. The taxpaying unit was the individual, but an element of income splitting was allowed because a limited amount of income could be "ceded" to the lower-earning spouse. Foreign source income, net of foreign taxes, was taxed at the individual level. The marginal tax rate structure was quite progressive by current standards, with rates ranging from 0.50 to 51 percent.

**THE NET WEALTH TAX** . The individual income tax was supplemented by a tax on net wealth. (A tax on the net wealth of corporations and similar entities was eliminated in the 1960 reform.) The base of the net wealth tax was seriously understated, however, because (a) there were many exemptions, similar to those granted under the income tax, (b) real estate was valued at the relatively low assessments used for purposes of the local property tax, and (c) depreciable assets were valued at historical cost after correcting for depreciation.

**COMPANY TAXES** . Company taxation varied according to the organizational form of the business. Corporate income was subject to company level taxation at rates of 12, 24, and 36 percent, and dividends were also taxed at the individual level.<sup>4</sup> Relatively lower company tax rates were applied to the income of limited partnerships (rates of 4, 8, and 12 percent) and the income of ordinary partnerships (3 and 6 percent).

Nonetheless, all such income—both dividends and retained earnings—was imputed to the owners of the firm and thus was also subject to taxation at the individual level. Depreciation allowances were not indexed for inflation and were calculated assuming straight line depreciation over lives that ranged from five to twenty years.

Under the 1960 reform all Colombian income of foreign-based companies was subject to tax at corporate rates. Repatriated dividends were also subject to a 12 percent withholding tax. The income of Colombian branches of foreign companies was subject to a 6 percent withholding tax; this was raised to 12 percent in 1963.

**EXCESS PROFITS TAX** . A tax on excess profits was levied at rates ranging from 20 to 56 percent on profits in excess of 12 percent of net wealth (provided wealth exceeded certain amounts).

**INDIRECT TAXES** . Indirect taxes accounted for less than 10 percent of federal revenues, with most such revenue coming from stamp taxes and stamped paper sales. Because the bases for these taxes were chosen primarily for administrative convenience and revenue stability, the impact of the taxes was capricious. There were no broadly based indirect taxes, such as a value added tax or a national retail sales tax.

**ADMINISTRATIVE PROBLEMS** . The tax system in Colombia in 1960 suffered from many administrative shortcomings. Particularly troublesome problems that were amenable to legislative solutions included (a) a complete absence of withholding, (b) an unreasonably short two-year statute of limitations that encouraged the filing of false returns since detection within two years of filing was highly unlikely, (c) sole reliance on official assessment rather than self assessment of tax liability, and (d) delays in collections, which, combined with a lack of indexing of liabilities for inflation, resulted in chronically low real revenues.

### **The Taylor and Musgrave Missions**

Tax policy in Colombia over the following twenty to twenty-five years, especially the wide-ranging changes of 1974, was profoundly influenced by the reports of the Taylor and Musgrave missions. The first of these missions occurred under the joint auspices of the Organization of American States and the Inter-American Development Bank. By comparison, the second was conducted at the request of Carlos Lleras Restrepo, the president of Colombia, and was financed with Colombian funds. Both missions produced volumes that soon became staples in the literature of tax reform in developing countries. Because the Musgrave report was more influential, the discussion here focuses on its recommendations; however, several areas of disagreement between the two reports (which were broadly similar in most of their recommendations) are also noted. In addition, it is important to note that many Colombians assisted in the preparation of the reports; the two missions thus contributed to the development of a sizable group of Colombian tax professionals who would have an impact on the evolution of tax policy in Colombia for many years thereafter.

**INDIVIDUAL INCOME TAXES** . The Taylor and Musgrave missions were in agreement in recommending full taxation of most exempt labor income, coupled with severe limits on deductions that were not clearly business related. The Musgrave mission recommended a standard deduction and argued that many exemptions and deductions should have "vanishing" provisions, so that they would gradually be eliminated with increases in taxpayer income. Besides endorsing the ceding of income from one spouse to another, the mission suggested that taxation of the imputed rental income from owner occupied housing should be eliminated, in which case deductions for home mortgage interest and property taxes should be disallowed. (In contrast, the Taylor mission recommended partial taxation of imputed rent and elimination of the income ceding provision.) Reflecting a high level of concern about distributional equity (and relatively little concern about the disincentive effects of high marginal tax rates), both missions recommended increases in the top individual tax rate to levels that are very high by current standards—62 percent in the case of the Taylor mission and 55 percent in the case of the Musgrave mission. Indeed, it seems that both missions perceived their base-broadening recommendations primarily as a way to reduce vertical inequity rather than as a way to promote efficient resource use or simplify the tax structure.

## Tax Policy in Developing Countries

Reflecting the conventional wisdom of the time, the Taylor and Musgrave missions generally did not recommend inflation adjustment either for amounts specified in nominal terms (such as bracket limits or personal exemptions) or for the measurement of capital income. The rationales for this included a desire to erode the real values of relatively high personal exemptions and the belief that inflation adjustment tended to lower the resolve of the government to reduce inflation. Neither mission commented on the adverse effects of an unindexed system on financial policy, resource allocation, or real or perceived equity. An important exception to the general advice against inflation adjustment was in the area of capital gains, where the Musgrave mission offered inflation indexing of basis as an option. The alternative proposed was full taxation of nominal gains at a rate five percentage points below the rate applied to ordinary income. Taxation of capital gains on assets

transferred at death (via constructive realization) was also proposed.

**THE NET WEALTH TAX** . The Musgrave mission endorsed the Taylor mission's earlier recommendation that a measure of presumptive income based on agricultural netwealth be included in the system of income and complementary taxes. It also recommended that many exemptions be eliminated from the base of the tax on net wealth, and that debts be deductible only to the extent that they were secured by or related to taxable assets.

**COMPANY TAXES** . Both the Taylor and Musgrave missions generally opposed the existing system of investment incentives, including those enacted in 1960, as costly and ineffective. Both reports were tolerant, however, of "well-designed" incentives, particularly those intended to increase the overall level of investment by lowering the cost of capital. They both also favored highly targeted incentives for investment in particular industries and regions.

Both missions rejected any attempts to integrate individual and company taxes to avoid the double taxation of corporate income, although they recognized explicitly the distortions and inequities caused by such double taxation. An unintegrated system was seen to increase revenues, to increase the progressivity of the overall tax system, and to be consistent with the Colombian practice of taxing capital income more heavily than labor income. The Musgrave mission also recommended taxing all companies under the rules and rates applied to corporations. Both missions were generally opposed to inflation adjustment in the measurement of capital income.

**EXCESS PROFITS TAX** . The Taylor mission supported the Colombian excess profits tax on both policy and administrative grounds. In marked contrast, the Musgrave mission strongly advocated that it should be abolished, noting its inequities, distortions, incentives for waste, and disincentives to growth and efficiency.

**Indirect taxes**. The Taylor mission recommended a broad system of moderately progressive excise taxes on semi-luxury and luxury goods, coupled with rationalization of the system of stamp taxes. In 1965, Colombia introduced a broad-based sales tax on finished goods and imports, with rates ranging from 3 to 10 percent, which was converted to a credit type VAT in 1966. An unusual feature of the Colombian VAT is that no credit is allowed for the purchase of domestically produced capital goods. Subsequently, the Musgrave mission recommended that capital goods be exempt from tax and also suggested a national retail sales tax to replace the VAT.

**ADMINISTRATION** . The Taylor mission recommended several administrative reforms designed to remedy problems identified earlier. These included (a) withholding on wage and salary income and on interest and dividends, (b) self assessment by taxpayers, (c) extension of the statute of limitations, (d) advance tax payments to accelerate the receipt of revenues by the government and thus maintain their real value, and (e) stricter enforcement of penalties. During the period between the Taylor and Musgrave missions, progress was made on all these fronts except on extending the statute of limitations. The Musgrave mission suggested various improvements for the taxation of sectors noted for high levels of tax evasion, including small businesses, independent professionals, and agriculture. These included a recommendation for a wealth-based tax on

presumptive income in the agricultural sector and a prohibition on the use of agricultural losses to offset income from other sources.

### **The 1974 Reforms**

The 1974 reforms were issued early in the term of President Alfonso Lopez Michelson under emergency powers provided by the constitution. The availability of these powers greatly facilitated the passage of a consistent reform package.<sup>5</sup> Unfortunately, the first forty–nine articles of the reform decrees, which contained many desirable administrative reforms, exceeded the authority granted under these emergency powers, and so they were deemed unconstitutional.

The remaining reforms were strongly influenced by the proposals made by the Taylor and Musgrave missions as well as by the recommendations of Richard M. Bird (1970). Nevertheless, it is equally clear that a group of Colombian tax professionals shaped the ultimate legislation. This group of technocrats modified, extended, improved (or worsened, in a few cases,) or rejected the various recommendations. Thus, the indirect effect of the Taylor and Musgrave missions—which created this group—may have been as important as the direct impact of the missions' actual policy recommendations.

**INDIVIDUAL INCOME TAXES** . The 1974 reforms eliminated many exemptions for capital income, including those for interest on government debt and those associated with various investment incentives. (The Colombian constitution effectively precluded the use of emergency powers to alter labor income exemptions.) A tax credit analogous to a standard deduction was introduced, and various personal deductions that were subject to vanishing provisions (enacted in response to the recommendations of the Musgrave mission) were converted to much simpler tax credits. Capital gains were subject to tax as "occasional gains," a classifica-

tion that also included gambling receipts, 80 percent of gifts and inheritances received, and nominal interest in excess of 8 percent on certain indexed bonds. These gains were taxed at a marginal rate ten percentage points less than the rate that would apply if 20 percent of occasional income were included in the individual income tax base.

Although both the Taylor and Musgrave missions had generally recommended against inflation adjustment, the 1974 reforms included several inflation indexing provisions. Various nominal amounts were indexed for inflation (up to a maximum inflation rate of 8 percent a year), and optional inflation adjustments were made available for capital gains.

**THE NET WEALTH TAX** . In accord with the recommendations of the Taylor and Musgrave missions, many of the exemptions under the net wealth tax were eliminated. In addition, any optional annual inflation adjustments for capital assets that were made for purposes of the income tax on occasional gains also had to be reflected in the value of the asset in the base of the net wealth tax. They could not, however, be used in calculating depreciation allowances.

**COMPANY TAXES** . Flat–rate structures were adopted for corporations and other business entities. Nonetheless, the income of corporations was taxed at a 40 percent rate, but the income of limited liability companies and partnerships was taxed at a 20 percent rate. Most of the depreciation rules were in accord with those recommended by the Musgrave mission, that is, unindexed allowances based on the double–declining balance method, coupled with a shift differential of 25 percent additional depreciation per extra shift. In addition, state enterprises (other than those offering public services) became subject to income tax.

**TAXATION BASED ON PRESUMPTIVE INCOME** . The taxation of presumptive income based on wealth (applied only to agricultural income before 1974) was extended to cover all individuals and companies. Income was presumed to be at least 8 percent of wealth, and any unexplained increases in wealth were also presumed to

be income.

**THE EXCESS PROFITS TAX** . Based on the recommendation of the Musgrave mission (but not of the Taylor mission), the excess profits tax was repealed.

**INDIRECT TAXES** . Under the 1974 reforms, the tax credit, or invoice, method replaced sales tax exemptions for businesses. The base of the sales tax was expanded to include many services. Rate differentials were increased to 6 percent for nonexempt wage goods and 35 percent for luxury goods. In addition, imported capital goods used in basic industries were exempt from tax (even though tax credits were still not allowed for domestic capital good substitutes).

**ADMINISTRATIVE ISSUES** . Most of the provisions of the 1974 reform that would have improved tax administration were ruled unconstitutional. Nevertheless, several improvements were enacted, including a prohibition on the use of agricultural losses to offset other income.

### **Tax Reforms and "Deforms" 1975-85**

A wide variety of tax changes were enacted during 1975-85. Some of these were quite appropriate, especially those providing for improved inflation adjustment. Many of these changes, however, can be characterized as tax "deforms"—undesirable reversals of previous reform measures—that presumably were made in response to pressure from powerful political groups. In addition, many administrative problems continued, and many desirable changes identified by the Taylor and Musgrave missions were not enacted, especially those that eliminated exemptions for various forms of labor income.

**INDIVIDUAL INCOME TAXES** . Inflation indexing of various amounts specified in nominal terms was gradually increased until full inflation adjustment was allowed in 1979. In addition, partial inflation indexing of interest income was allowed on certain forms of debt. The treatment of capital gains was made especially generous. In addition to a preferential rate, gains that were reinvested primarily in certain types of assets (for any length of time) were exempt. This effectively led to an optional capital gains exemption.

**COMPANY TAXES** . Partial integration of individual and business taxes was achieved with dividends—received credits that varied from 10 to 34 percent. Dividends received by low-income taxpayers and dividends paid by "open" corporations received particularly favorable treatment. Depreciation allowances were liberalized, with most assets, other than real estate, eligible for complete write-offs within two or three years. In addition, the tax rate for limited partnerships was reduced slightly to 18 percent. A measure allowing inflation adjustment for business interest income and expense was enacted in 1982, but was largely repealed shortly thereafter.

**PRESUMPTIVE INCOME TAXATION** . A second measure of presumptive income—2 percent of gross receipts—was added in an attempt to reduce evasion by wholesalers and retailers. In addition, the value of real estate used in the wealth-based calculation of presumptive income was limited to 75 percent of the cadastral value.

**INDIRECT TAXES** . Several improvements in sales taxation were made over this period. These included extending the tax to retailers, broadening the base to include more services, partially eliminating rate differentials, and eliminating exemptions for such goods as agricultural machinery and transportation equipment.

### **Administrative Issues**

If 80 percent or more of a taxpayer's income was from labor and was subject to withholding, he would be exempted from further taxation. This important simplifying measure significantly reduced the number of

taxpayers filing income tax returns.

### The 1986 Reform

The 1986 reform in Colombia reflected many of the changes in conventional wisdom among public finance economists that had occurred over roughly the previous ten years. In particular, there was an increased emphasis on (a) economic neutrality, especially with respect to capital investment decisions, (b) the horizontal equity advantages of a broadly defined tax base, (c) the tax simplification benefits of accepting approximate or "rough justice" measures of income for cases in which accurate income measurement (or the determination of an individual's "ability to pay" taxes) would make administration substantially more complicated, and (d) rate reduction. The dramatic reduction in corporate tax rates and rates for high income individuals and the elimination of taxation of dividends at the individual level showed a reduced emphasis on traditional vertical equity concerns. In addition, the Colombian reform provided for full inflation adjustment of interest income and expense. An important motivating factor behind the 1986 reforms was concern about the extent to which tax distortions might be contributing to increasing debt–equity ratios for Colombian firms and thus increasing the probability of costly bankruptcies during a recession (Chica 1984/1985; Carrizosa 1986). Such concerns played an important role in the elimination of individual dividend taxation and the introduction of inflation adjustment for interest expense.

**INDIVIDUAL INCOME TAXES** . The most striking feature of the 1986 reform was the reduction in the top individual income tax rate, which fell from 49 to 30 percent. Rate reduction was supported by the argument that high rates dampened incentives and led to complexity, because of political pressures for special exclusions, deductions, and credits intended to mitigate the effects of high rates (Nueva Reforma Tributaria 1987). Many exemptions of various forms of labor income were eliminated, including those for severance and vacation pay, various bonuses, pensions in excess of a generous floor, and some representation allowances. Nonetheless, many other exemptions were retained for political reasons, including representation allowances for high government officials, teachers, and judges, military income above a floor, and small pensions. Limits were placed on the business expenses that could be claimed by professionals.

Occasional gains were taxed separately, although they were subject to the same rate structure.

Full (rather than partial) inflation indexing was allowed for all interest income and capital gains; indexing for interest expense was phased in over a ten–year period. In this respect, the Colombian reforms did not follow the recommendations of the Taylor and Musgrave missions. The inflation adjustment mechanisms utilized were almost entirely "home grown," because foreign advisers had little, if any, influence on the details of these rather complex provisions.

**COMPANY TAXES** . Under the 1986 reform, an important source of non–neutrality and inequity was eliminated when a single rate of 30 percent was applied to the income of corporations and limited partnerships. This represented a ten (twelve) percentage point reduction (increase) in the tax rate for corporations (limited partnerships). Moreover, taxes on mixed enterprises and nonprofit institutions engaging in non–exempt activities were increased to provide for treatment closer to that in the private sector.

A partial and approximate form of integrating company and individual taxes was provided by exempting dividends received from individual taxation; distributed business income was thus taxed solely at the company rate.<sup>6</sup> Although such an approach is theoretically inaccurate if the corporate tax rate is higher than the tax rate of the individual shareholder, it is significantly easier than alternative methods that attempt to tax distributed income at the shareholder's rate. This again reflected a willingness to accept a "rough justice" approach to income measurement in the interest of achieving administrative simplicity.

Inflation indexing of interest income and expense was also phased in for companies. This provision reduces the advantage of debt finance in an inflationary environment, and thus helps address the "decapitalization" problem

discussed earlier.

Although some progress was made in reducing tax preferences for various favored industries, preferential treatment was retained for other politically powerful sectors, including cattle raising and forestry.

The level of taxation on dividends paid to foreigners was initially left virtually unchanged under the 1986

reform, because the reduction in the corporate rate was offset by a 30 percent increase in the withholding rate.

**ADMINISTRATIVE ISSUES** . Increases in the zero-bracket amount and in the levels of income and wealth at which individuals are required to file returns dramatically reduced the number of filers. In addition, the elimination of (a) various tax credits, (b) the taxation of imputed income on owner-occupied housing, and (c) the ability to cede labor income to one's spouse simplified compliance and administration. These changes can, of course, be criticized for eliminating features commonly used to adjust tax burdens to an individual's "ability to pay" tax. Although such adjustments may be desirable in principle, they are easily rendered ineffectual (or even counterproductive) if, as in Colombia, they cannot be administered effectively. Again, an administrable "rough justice" approach to measuring taxpaying ability was chosen over a theoretically superior approach that could not be administered. The movement toward taxing individual rather than family income is consistent with the recent emphasis in the public finance literature on the simplicity and neutrality benefits of such treatment.

### **The 1988 Report**

Another important feature of the 1986 reform was that it granted the president "extraordinary faculties" to change the provisions related to inflation indexing during 1987 and 1988. To assist in formulating policy options, the government of Colombia commissioned a third major tax reform study (McLure, Mutti, Thuronyi, and Zodrow 1990). This report focused on various approaches to inflation indexing but also considered a wide variety of related issues, including the possible replacement of the income tax with a direct consumption tax. The report suggested three policy options to the government: (a) a more complete system of "ad hoc" inflation-adjustment measures, (b) an integrated "balance-sheet" adjustment method of the type used in Chile, and (c) adoption of a consumption based tax (the "Simplified Alternative Tax" or SAT) that would obviate the need for inflation adjustment.

**AD HOC INFLATION ADJUSTMENTS** . The ad hoc approach would have simply extended inflation adjustments in place, or those being phased in for interest income and expense and for capital gains, to depreciation allowances and the cost of goods sold from inventories. Depreciation allowances would be based on estimates of economic depreciation and then indexed for inflation, and inflation-adjusted "first in, first out" (indexed FIFO) inventory accounting would be required. In addition, the values of assets in the base of the net wealth tax would be adjusted for inflation.

**THE INTEGRATED BALANCE-SHEET APPROACH** . The integrated balance-sheet approach calculates inflation-adjusted income using annual changes in inflation-adjusted balance sheets. As under the ad hoc approach, depreciation allowances are based on estimates of economic depreciation, and the cost of goods sold from inventories is determined using indexed FIFO accounting. The integrated balance-sheet approach is more accurate than the ad hoc method, especially in accounting for inflation-induced changes in the value of money balances. (The ad hoc adjustment of interest income and expense makes no adjustment for the loss in purchasing power experienced by holders of cash.) However, its relative complexity is problematic, especially for a country with relatively little experience in inflation adjustment.

**THE SIMPLIFIED ALTERNATIVE TAX** . A drastic alternative to inflation adjustment is to eliminate it by adopting a consumption-based rather than an income-based tax. This SAT is based on cash flow in current

period pesos, eliminating the need for inflation adjustments. The SAT has three basic features: (a) an individual tax on labor income assessed at progressive rates coupled with a business tax levied at the maximum individual rate; (b) expensing of all business-related purchases, including capital equipment; and (c) no business deductions for interest or dividends coupled with tax exemption of interest income, dividends and capital gains at the individual level. The net result of these provisions is a marginal effective tax rate of zero on income from capital. The report recommended that the tax on net wealth be retained if the SAT were adopted.

**OTHER ISSUES IN THE 1988 REPORT .** The report also discussed a wide variety of income measurement problems or "timing" issues. These arise because accurate measurement of income requires accrual accounting, which, in turn, requires a determination of the appropriate time to recognize receipts and to allow for deductions. The report proposed a number of rules to deal with such issues, including the determination of appropriate deductions for depreciation, amortization, and other capitalized expenses, and the treatment of original issue discount bonds, long-term contracts, and installment sales. Such issues disappear for the most part under the cash-flow accounting required under the SAT.

The report also paid close attention to international issues noting that one benefit of the generous treatment of capital income under the SAT would be a reduced incentive for capital flight from Colombia. In addition,

it argued that because of the 1986 reform in the United States, a large fraction of American multinational corporations are likely to be in an excess foreign tax credit position. This implies that the unsettled question of whether a consumption-based tax like the SAT could be used as a credit against U.S. tax liability may be less important than commonly believed.

### **The 1988 and 1989 Changes**

At the end of 1988 the government of Colombia exercised the extraordinary powers granted by the 1986 reform by issuing two decrees that specified a timetable for changes in the rules for inflation adjustment, which will eventually result in the adoption of the integrated balance-sheet, or "Chilean," approach. In addition, the 1988 legislation contained emergency powers allowing changes or elimination of the tax on net wealth. June 1989 legislation eliminated the wealth tax, effective in 1992. This action was justified by the unconvincing argument that improved calculation of presumptive income based on wealth—due to the revaluation of real estate and inflation adjustment of assets in the net wealth tax base—made a separate tax on wealth unnecessary.

**INFLATION ADJUSTMENT .** During 1989, ad hoc inflation adjustments are to be extended to depreciation allowances for assets acquired after 1988. The accelerated depreciation allowances of previous laws, however, are not to be adjusted to reflect economic depreciation more closely. As a result, these allowances will be quite generous in real terms. An unusual feature of the inflation-adjustment mechanism is that the adjustment factor used is based on the change in the consumer price index (CPI) over the period ending October 1 of the year prior to the tax year. Last in, first out or LIFO inventory accounting will be allowed as an ad hoc adjustment for inflation in inventory accounting until 1998, after which time replacement cost accounting will be employed. The phase-in of the disallowance of the inflationary component of interest expense has been frozen until 1991 at its 1988 level of 30 percent, after which time it will resume its previous pattern with the fraction disallowed increasing by 10 percentage points a year.

In 1992, most private companies will be required to adopt the integrated balance-sheet system of inflation adjustment, although most individuals (those who qualify for use of the simplified sales tax regime) may either continue to use the ad hoc approach or switch. Taxpayers who adopt the integrated system for tax purposes must also use it for financial accounting. In calculating balance-sheet values, the costs of fixed assets are to be adjusted for inflation, and depreciation allowances are to be based on those inflation-adjusted values, but depreciation schedules remain unchanged from earlier law. Inventories are to be valued at replacement cost rather than by

indexing the original purchase price as under an indexed FIFO accounting system. Inflation adjustment is to be applied only to indexed monetary or financial assets (and real assets), because inflation adjustment for assets fixed in nominal terms occurs automatically under the integrated balance–sheet approach. The inflation adjustment for assets and liabilities in foreign currencies is based on changes in particular exchange rates rather than on the change in the Colombian price level.

The calculation of net wealth will be based on inflation adjusted values for assets acquired after 1988. Beginning in 1992, changes in the values of inventories will gradually be reflected in net wealth (but will not be subject to tax under the income tax).

**OTHER ISSUES** . Under the 1988 reform capital gains on sales of shares in publicly held companies with a net wealth of less than \$20 million are effectively exempt from tax. (This is equal to about US\$42,500 at the May 1990 exchange rate.) In addition, the distinction between capital gains and ordinary income was eliminated for taxpayers who use the integrated balance–sheet method. The withholding rate on dividends paid to foreigners was reduced to 20 percent in response to reductions in tax rates in capital–exporting countries, notably the United States. A 20 percent tax is applied to the income of nonprofit organizations, to the extent that such income is not tax exempt. (Income for such organizations is calculated allowing immediate expensing for nonfinancial investments, and inflation adjustments are not allowed.) Several changes have been made in the tax on presumptive income. These are: (a) beginning in 1990, real estate is included at 100 percent of cadastral value; (b) the exemption of 60 percent of the value of beef and dairy cattle is repealed; (c) the implied interest rate applied to net wealth in the calculation of presumptive income is reduced from 8 to 7 percent; (d) the gross income–based measure of presumptive income will be phased out by 1990; and (e) the excess of presumptive income over income calculated under ordinary income tax rules can be carried forward for two years and deducted from gross income.

**AN APPRAISAL OF THE 1988 AND 1989 CHANGES** . The recent changes in the Colombian tax structure are, at times, at odds with the recommendations of the 1988 report. First, it is clearly inconsistent with income tax principles to allow both accelerated depreciated allowances and inflation indexing. Because the accelerated depreciation allowances under prior law provided a rough inflation adjustment at inflation rates typical of recent experience in Colombia, current law treatment

is overly generous and will bias investment decisions toward depreciable assets. In addition, such relatively large deductions for depreciation suggest that net wealth will be understated.

Second, the use of inflation–adjustment factors based on changes in the CPI in the year before the tax year is highly questionable. It will lead to inaccurate income measurement, as well as opportunities for "game playing" based on advance knowledge of future inflation adjustment factors.

Third, the use of replacement–cost inventory accounting and the calculation of exchange rate gains and losses on the basis of changes in currency values represent an interesting compromise between accurate income and wealth accounting. These changes will lead to accurate measurement of wealth (and wealth–based presumptive income). However, accurate income measurement requires indexed FIFO inventory accounting and inflation–adjustment factors based on internal inflation rates for calculating gains and losses on foreign exchange.<sup>7</sup> In light of the elimination of the wealth tax in 1989, accurate income measurement would appear to be the more pressing goal.

Fourth, the elimination of the wealth tax is somewhat questionable and is clearly at odds with the 1988 report. Although the wealth–based calculation of presumptive income will undoubtedly be more accurate because of improved measurement of net wealth, a separate wealth tax can still be justified as a way to increase the progressivity of the tax system, to offset the effects of income tax evasion, and to encourage more productive land use.

A number of the 1988 changes are quite appropriate. These include: (a) more comprehensive "conformity requirements" to improve tax and financial accounting and to help prevent both tax and non-tax abuses; (b) improvements in the calculation of the base of the net wealth tax, including full valuation of real estate and cattle; (c) reduction of the presumed rate of return on wealth, because of a more accurate measurement of the base;<sup>8</sup> (d) elimination of the gross income-based calculation of presumptive income; and (e) increased taxation of activities of nonprofit organizations that are not tax exempt.<sup>9</sup>

**THE POLITICS OF THE 1988 AND 1989 REFORMS .** Because implementation of the integrated approach to inflation adjustment was delayed, there is time for public education and discussion of a fairly radical reform. Beyond that, there was some risk that enacting such a drastic reform exceeds the emergency powers granted under the 1986 reform. Extending the ad hoc approach provides a "fall-back" position should the integrated approach ultimately be rejected, and also suggests that Colombia will gain additional experience with inflation adjustment if the integrated approach is adopted in 1992. That depreciation allowances were not scaled back when inflation adjustment for depreciable assets was introduced was probably caused by a desire to appease opponents of the 1986 reform.

It is also not surprising that the SAT was not adopted. Such a radical reform might very well have been ruled unconstitutional on the grounds that it exceeded the emergency powers granted under the 1986 law to modify inflation adjustment. In addition, it would presumably have been politically rash and indeed perhaps irresponsible to introduce such a far-ranging reform without adequate time for public discussion, especially because no other country has enacted such a plan. Finally, introduction of the SAT would have raised a number of problems, including: (a) the creditability under U.S. law of a consumption-based tax and of the associated withholding taxes on dividends paid to U.S. shareholders; (b) the fact that tax accounting would differ so greatly from financial accounting, thus eliminating an incentive for improving the latter; (c) the absence of a reasonable basis for presumptive taxation under the SAT; and (d) the political feasibility of implementing a tax that effectively exempts capital income (especially since eliminating the tax on net wealth was being seriously considered). Nevertheless, past experience suggests that the 1988 report will inform future debate as Colombia continues to grope toward a better tax system.

### **Marginal Effective Tax Rates in Colombia**

This section examines in detail the differentials in the taxation of capital that could be expected to create distortions in investment decisions in recent years. This focus on differential taxation of capital is explained by two considerations. First, differences in the taxation of labor are fairly obvious, without sophisticated analysis. Thus, for example, the exclusion of military salaries and the representation allowances for judges poses no serious analytical questions. By comparison, the evaluation of tax-induced distortions in the allocation of capital requires careful consideration of such factors as depreciation allowances, investment credits, the tax treatment of goods sold from inventories, deductions for interest expense, the taxation of interest income, the tax treatment of capital gains, the tax treatment of dividends at both the firm and the shareholder levels, the rate of inflation, and various provisions to offset the effects of inflation in the measurement of income, using a method of analysis that hardly existed before its articulation in King and Fullerton(1984).

Second, in recent years, tax neutrality with respect to capital-investment decisions has become increasingly important in the evaluation of tax policy. This reflects disenchantment with the results of government-directed investment policies and an increasing emphasis

on the relative efficiency of market allocations of investment. For example, the 1988 report stressed investment neutrality as an important goal more than the reports of either the Taylor or Musgrave missions.

The extent to which a tax structure satisfies the criterion of investment neutrality can be quantified by calculating the pattern of "marginal effective tax rates" (METRs) that the structure imposes on capital income. Such calculations offer summary estimates of the net effect of all the provisions that affect the taxation of capital income. This section briefly summarizes the results of METR calculations for three of the tax structures described earlier—the pre-1986 rules, a fully phased-in version of the 1986 structure and a fully phased-in version of the system enacted in 1988. The discussion begins with a brief description of the METR methodology and assumptions, which is based largely on King and Fullerton (1984).<sup>10</sup>

### **An Outline of the METR Methodology and Assumptions**

A METR is defined as the tax "wedge" on an investment—the difference between the gross return on a marginal investment and the return received by the "saver" or provider of funds, expressed as a percentage of the gross return.<sup>11</sup> For example, suppose that an individual invests in a firm that, in turn, makes a marginal investment in a depreciable asset. In addition, suppose that the gross return is 10 percent and the net return, after both company and individual taxes, is 7 percent. In this case, the METR is 30 percent ( $0.30 = (0.10 - 0.07)/0.10$ ). METRs are calculated for various types of assets, methods of finance, and types of savers, taking into account all relevant features of capital income taxation and the investment configuration being analyzed. Thus METRs are summary measures of the net effects of a particular tax structure on various forms of capital income, and they provide a clear indication of the relative tax burdens facing different types of investments.

Although a full discussion of the methodology used in the calculation of METRs is far beyond the scope of this chapter, it may be useful to list some of the major assumptions made in the analysis. The METR calculations are entirely prospective, in that they focus solely on the purchase of a new asset and on the present values of returns and deductions associated with that purchase. Moreover, they are static in that a given tax structure is assumed to be in effect for the life of the asset. Two assumptions are critical to understanding the results. First, the calculations assume a fixed gross return of 10 percent. Thus they provide an indication of the level of tax distortions before investment is reallocated in response to those distortions and net real returns are equalized. Second, the calculations accept the validity of the "new view" of dividend taxation, which argues that individual level taxation of dividends affects only investments financed with new-share issues and is irrelevant for retained-earnings finance.<sup>12</sup>

The METR calculations also: (a) assume that capital and other markets function perfectly; (b) ignore uncertainty; (c) ignore administrative problems; (d) assume for simplicity that assets depreciate exponentially and are held forever;<sup>13</sup> (e) assume a constant expected rate of inflation; (f) ignore highly sector-specific tax preferences; (g) involve a high degree of aggregation, as all depreciable assets are characterized as either "structures" or "equipment;" (h) ignore the taxation of presumptive income; (i) ignore local property taxes; and (j) ignore any other taxes, including import or export duties. These limitations should, of course, be kept in mind when using the METR results presented below to evaluate the evolution of the taxation of capital income in Colombia.

The METR calculations are performed for four types of assets (equipment, structures, inventories, and land), three types of savers (taxable Colombian individuals, tax-exempt institutions, and foreign investors) and three methods of investment finance (debt, new-share issues, and retained earnings). Two inflation rates are considered; results for a zero inflation rate serve as a benchmark, although most of the calculations assume a 20 percent inflation rate roughly equivalent to recent experience in Colombia. The results presented ignore the Colombian value added tax. The simulated effects of a hypothetical 10 percent VAT, however, are described briefly, taking into account that tax credits under the Colombian VAT are not allowed for capital goods purchased from domestic sellers.

Various data used in the calculations are taken from tax returns for Colombia for 1984 and 1985, and a variety of assumptions are used to calculate the relevant tax parameters. For example, when the base of the wealth tax is not indexed for inflation, the calculation of effective wealth tax rates must take into account the reduction in real asset value caused by inflation. Again, details are provided in McLure and Zodrow (forthcoming), and also in McLure,

Mutti, Thuronyi and Zodrow (1990).

### Results of the METR Calculations

Tables 1–1 through 1–7 present METRs for a variety of combinations of industries, asset types, methods of finance, and types of savers for each of the three tax structures noted above. Although a complete description of these results is beyond the scope of this chapter, the main results can be summarized qualitatively as follows.

**INFLATION SENSITIVITY: DEPRECIATION ALLOWANCES .** Not surprisingly, the METRs under the pre–1986 tax structure (denoted in the tables as "1985") and the 1986 tax structure vary considerably with inflation, regardless of the method of finance or the characteristics of the saver. This occurs primarily because depreciation allowances were not indexed for inflation and, in the case of debt finance in 1985, because of the treatment of interest income and expense. At an inflation rate of 20 percent, however, the depreciation deductions that were allowed under these two tax structures were sufficiently accelerated that they roughly offset the effects of inflation; that is, the present value of the accelerated depreciation allowances was roughly equal to the present value of real economic depreciation. As a result, all of the tables indicate that these tax structures were roughly neutral across assets and investment sectors if a constant inflation rate of 20 percent were fully anticipated. Of course, this fortuitous result does not apply to inflation rates that differ significantly from 20 percent. For example, without inflation, accelerated depreciation allowances were too generous relative to economic depreciation, and created a tax preference for investment in equipment over structures. Such tax–induced distortions cause capital misallocations and reduce overall investment productivity and output. Moreover, the sensitivity of tax burdens to inflation introduces an unnecessary element of uncertainty into investment decisions.

The 1988 tax changes provided for inflation indexing of depreciation allowances and of the base of the net wealth tax. Depreciation allowances are, however, still accelerated to the same extent as under the pre–1988 schedules. So, although METRs do not vary with inflation, they are lower for investment in equipment than for investment in structures, with METRs being highest for investment in inventories and land.

**PREFERENTIAL TREATMENT OF LAND UNDER THE NET WEALTH TAX .** The METR calculations also demonstrate that excluding 60 percent of the assessed value of land from the base of the tax on individual net wealth under the 1986 tax structure lowered the METR on investment in land when individuals were the source of funds (see tables 1–1 and 1–2). This distortion was eliminated in the 1988 reform, and elimination of the net wealth tax in 1989 maintains this neutrality.

To simplify the exposition, the remaining discussion ignores the sensitivity of depreciation allowances and the preferential treatment of land under the net wealth tax by focusing solely on investment in inventories. (The METRs on inventories are not affected by these two factors.) This approach highlights the following critical aspects of the evolution of the taxation of capital income in Colombia.

**INFLATION SENSITIVITY: INTEREST INCOME AND EXPENSE .** The calculations demonstrate that METRs on debt–financed investment were highly sensitive to the rate of inflation under the pre–1986 law (see tables 1–3 and 1–4). This result obtains because interest expense was fully deductible at the business level, although interest income was only partially taxed at the saver level for individuals or was fully exempt for tax exempt institutions and foreigners. These factors suggest highly negative METRs at a 20 percent level of inflation. Such negative METRs encourage economically unprofitable investments by making it profitable to borrow at an interest rate higher than the return on the investment. Moreover, these negative METRs encourage debt finance and almost certainly played a role in increasing the reliance of Colombian companies on debt finance over the past thirty–five years (see McLure and Zodrow forthcoming). Such a tax bias distorts the allocation of risk bearing in the economy and increases the likelihood of costly bankruptcies during a recession. In addition, if nominal interest is fully deductible, the increase in tax differentials across assets and business sectors that occurs

when the inflation rate declines is more pronounced for debt than for equity finance.

Thus one of the most beneficial aspects of the 1986 reform (unchanged in the 1988 reform) was the introduction of inflation indexing of interest deductions at the business level, coupled with full inflation indexing of interest income at the individual level. These changes eliminated negative METRs on debt-financed investment funded by individuals.

**TAXATION AND FINANCIAL POLICY** . METRs on equity-financed investments were reduced under the 1986 reform by the elimination of taxation of dividends at the individual level (which affects only new-share issues, according to the new view of dividend taxation) and by the company tax-rate reductions (see tables 1-1, 1-2, and 15). As a result, METRs on new-share issues sold to individuals fell dramatically; for example, rates on investment in inventories fell from 65.4 to 40.7 percent at a zero rate of inflation and from 56.6 to 32.7 percent at a 20 percent rate of inflation (see table 1-1). (Differences are attributable to the lack of indexation of the base of the net wealth tax.) Smaller, but still significant, reductions occurred in the METRs on investments financed with retained earnings (see table 1-2). This, in conjunction with the increase in METRs on the income from debt-financed investment, meant that the 1986 law dramatically reduced the tax bias favoring debt over equity finance that existed under the 1985 law.

Under the new view of dividend taxation, the elimination of the individual level tax on dividends under the 1986 reform also has had an important effect on the relative incentives for equity-financed investment fac-

**Table 1-1. Marginal Effective Tax Rates on New-Share Issues for Individuals, 1985, a 1986, and 1988 (percent)**

<i>Item</i>	<i>Inflation rate = 0</i>			<i>Inflation rate = 0.2</i>		
	<i>1985</i>	<i>1986</i>	<i>1988</i>	<i>1985</i>	<i>1986</i>	<i>1988</i>
<i>Asset</i>						
Inventories	65.40	40.70	40.70	56.60	32.69	40.70
	56.99			48.48		
Land	65.40	36.42	40.70	56.60	31.64	40.70
	56.99			48.48		
Equipment	44.66	19.16	19.16	59.04	32.45	19.16
	46.75			51.23		
Structures	51.53	27.08	27.08	58.59	33.76	27.08
	48.20			48.85		
<i>Sector</i>						
Agriculture	62.30	35.29	37.64	57.04	32.33	37.64
	55.06			48.59		
Mining	50.37	25.48	25.48	58.54	33.12	25.48
	48.62			49.75		
Manufacturing	57.37	32.21	32.50	57.61	32.75	32.50

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	52.68			49.28		
Construction	52.68	27.71	27.90	58.31	33.20	27.90
	49.58			49.33		
Commerce	63.32	38.42	38.58	56.86	32.69	38.58
	55.87			48.69		
Transportation	47.12	21.63	21.73	58.76	32.49	21.73
	47.91			50.86		
Finance	53.35	27.35	28.52	58.17	32.79	28.52
	50.21			49.45		
Services	54.78	30.07	30.25	58.11	33.42	30.25
	50.33			48.81		
<i>Total</i>	55.16	29.77	30.33	57.92	32.85	30.33
	51.28			49.35		

a. The second figures in the 1985 column apply to limited partnerships prior to the unification of the taxation of corporations and limited partnerships in 1986.

*Source:* Authors' calculations.

ing new firms and established enterprises. New firms commonly depend heavily on the issuance of new shares, but more established firms generally rely on retained earnings. The 1986 reform eliminated (and actually slightly reversed) the tax advantage favoring retained earnings finance over new–share issues for individuals. It thus eliminated a significant tax distortion that favored investment by established firms over investment by new enterprises.

Inflation indexing for business interest expense has also raised METRs on debt–financed investments when the source of funds is foreigners. Apart from this, the tax rate on debt–financed investments is zero, but the tax rate on investment financed with new–share issues to foreigners remained virtually unchanged between 1985 and 1986 at roughly 50 percent. It fell slightly to 44 percent in 1988 because of the reduction in the withholding rate on dividends to 20 percent (see tables 1–3, 1–6, and 1–7). The METR on investments financed with retained earnings, however, was reduced by roughly 25 percent as a result of the business tax reduction in 1986. So, the (relatively more important) tax bias favoring debt finance over retained earnings was reduced somewhat, while the tax bias favoring retained earnings over new–share issues was increased. This raised the tax bias favoring investment by established firms over new foreign enterprises. In addition, the relatively high tax rate on new shares issued to foreigners may have reduced such investment in Colombia.

The treatment of limited partnerships. The METR calculations also demonstrate the somewhat complicated effects of the changes in the treatment of investment by limited partnerships. Before the 1986 reform limited partnerships were taxed at a preferential rate, but they were also subject to "pass–through" treatment, because all annual earnings were attributed to partners. The tax code encouraged debt finance by such partnerships, although this incentive was smaller than the differential facing corporations (see tables 1–1 and 1–4). This incentive was narrowed in the 1986 reform by unifying the tax treatment of limited partnerships, corporations, and mixed public–private enterprises.

**Table 1–2. Marginal Effective Tax Rates on Retained Earnings for Individuals, 1985, 1986, and 1988** (percent)

<i>Item</i>	<i>Inflation rate = 0</i>			<i>Inflation rate = 0.2</i>		
	<i>1985</i>	<i>1986</i>	<i>1988</i>	<i>1985</i>	<i>1986</i>	<i>1988</i>
<i>Asset</i>						
Inventories	54.38	43.33	43.33	45.95	35.24	43.33
Land	54.38	39.05	43.33	45.95	34.21	43.33
Equipment	23.87	17.29	17.29	42.01	30.25	17.29
Structures	38.75	29.98	29.98	48.21	36.29	29.98
<i>Sector</i>						
Agriculture	50.79	37.91	40.26	46.36	34.82	40.26
Mining	34.60	26.44	26.44	45.48	33.76	26.44
Manufacturing	43.42	33.68	33.97	45.30	34.02	33.97
Construction	38.34	29.44	29.64	46.32	34.63	29.64
Commerce	51.54	40.75	40.91	45.79	34.91	40.91
Transportation	27.62	20.39	20.49	42.62	30.94	20.49
Finance	38.70	28.77	29.94	45.76	33.94	29.94
Services	42.25	32.79	32.97	47.51	35.85	32.97
<i>Total</i>	40.91	31.27	31.83	45.64	34.11	31.83

*Source:* Authors' calculations.

An interesting question is whether the 1985 tax structure favored equity investment in limited partnerships rather than in corporations. The METR calculations demonstrate that investment in limited partnerships financed with new issues was clearly at a tax advantage relative to new issues made by corporations. This finding is of limited relevance, however, since most new equity investment of both corporations and limited partnerships is financed with retained earnings. The 1986 reform eliminated the differential treatment of limited partnerships and corporations.

**INFLATION SENSITIVITY: THE NET WEALTH TAX .** After the 1986 reforms, the only part of the tax burden that remained sensitive to inflation was equity-financed

investments. In 1988 the base of the individual net wealth tax was indexed for inflation. Of course, the elimination of the net wealth tax in 1989 made this issue irrelevant for the purpose of calculating METRS.

**THE VALUE ADDED TAX .** In contrast to most countries that employ value added taxation, Colombia does not allow credit for tax on (domestically produced) capital goods. It is unclear whether the effects of the VAT should be included in the METR calculations, because the increase in the average cost of capital goods due to the application of VAT to domestic capital goods may simply offset the decrease in the cost of imported capital goods due to an over-valued exchange rate. Nevertheless, it may be useful to describe briefly the

**Table 1–3. Marginal Effective Tax Rates on Debt–Financed Investment for Tax Exempt Institutions and Foreigners, 1985, 1986, and 1988**  
(percent)

<i>Item</i>	<i>Inflation rate = 0</i>			<i>Inflation rate = 0.2</i>		
	<i>1985</i>	<i>1986</i>	<i>1988</i>	<i>1985</i>	<i>1986</i>	<i>1988</i>
<i>Asset</i>						
Inventories or land	0	0	0	–133.33	0	0
Equipment	–40.68	–27.50	–27.50	–140.96	–7.65	–27.50
Structures	–19.49	–13.27	–13.27	–129.69	1.35	–13.27
<i>Sector</i>						
Agriculture	–4.51	–3.07	–3.00	–132.70	0.17	–3.00
Mining	–25.72	–17.43	–17.00	–134.61	–2.39	–17.00
Manufacturing	–14.38	–9.73	–10.00	–134.73	–1.81	–10.00
Construction	–20.61	–13.99	–14.00	–133.03	–1.01	–14.00
Commerce	–3.71	–2.51	–3.00	–133.68	–0.46	–3.00
Transportation	–35.64	–24.09	–24.00	–139.81	–6.56	–24.00
Finance	–20.32	–13.78	–14.00	–134.02	–1.67	–14.00
Services	–15.18	–10.33	–10.00	–130.85	0.81	–10.00
<i>Total</i>	–17.51	–11.87	–11.87	–134.18	–1.62	–11.87

*Source:* Authors' calculations.

**Table 1–4. Effective Tax Rates on Debt–Financed Investment for Individuals, 1985, a 1986, and 1988**  
(percent)

<i>Item</i>	<i>Inflation rate = 0</i>			<i>Inflation rate = 0.2</i>		
	<i>1985</i>	<i>1986</i>	<i>1988</i>	<i>1985</i>	<i>1986</i>	<i>1988</i>
<i>Asset</i>						
Inventories or land	33.50	24.66	24.66	–51.19	24.66	24.66
	33.50			17.85		
Equipment	2.09	1.00	1.00	–57.08	18.07	–1.00
	22.10			13.73		
Structures	18.46	13.24	13.24	–48.38	25.82	13.24
	27.95			17.97		
<i>Sector</i>						
Agriculture	30.02	22.02	22.02	–50.70	24.81	22.02

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	32.22			17.82		
Mining	13.65	9.66	9.66	-52.18	22.60	9.66
	26.25			16.26		
Manufacturing	22.40	16.28	16.28	-52.27	23.10	16.28
	29.46			16.76		
Construction	17.59	12.63	12.63	-50.96	23.79	12.63
	27.67			16.96		
Commerce	30.63	22.50	22.50	-51.46	24.26	22.50
	32.45			17.57		
Transportation	5.99	3.93	3.93	-56.19	19.01	3.93
	23.51			14.30		
Finance	17.81	12.80	12.80	-51.73	23.22	12.80
	27.77			16.69		
Services	21.78	15.77	15.77	-49.28	25.36	15.77
	29.18			17.84		
<i>Total</i>	19.98	14.45	14.45	-51.85	23.27	14.45
	28.56			16.77		

a. The second figures in the 1985 column apply to limited partnerships prior to the unification of the taxation of corporations and limited partnerships in 1986.

*Source:* Authors' calculations.

effects of including the VAT. (These effects are not shown in the METR tables.)

Including a 10 percent VAT has three primary effects on the METR calculations. First, the average level of METRS increases, generally by five to thirty percentage points. Second, the VAT—when considered in isolation—introduces a tax bias toward investment in structures over equipment. This occurs because payment of

**Table 1–5. Marginal Effective Tax Rates for New–Share Issues and Retained Earnings for Tax–Exempt Institutions, 1985, 1986, and 1988**  
(percent)

<i>Item</i>	<i>Inflation rate = 0</i>			<i>Inflation rate = 0.2</i>		
	<i>1985</i>	<i>1986</i>	<i>1988</i>	<i>1985</i>	<i>1986</i>	<i>1988</i>
<i>Asset</i>						
Inventories or land	40.00	30.00	30.00	40.00	30.00	30.00
Equipment	15.59	10.75	10.75	35.42	24.64	10.75
Structures	28.31	20.71	20.71	42.18	30.95	20.71

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<i>Sector</i>						
Agriculture	37.29	27.85	27.85	40.38	30.12	27.58
Mining	24.57	17.80	17.80	39.24	28.32	17.80
Manufacturing	31.37	23.19	23.19	39.16	28.73	23.19
Construction	27.63	20.21	20.21	40.18	29.29	20.21
Commerce	37.77	28.24	28.24	39.79	29.68	28.24
Transportation	18.62	13.14	13.14	36.11	25.41	13.14
Finance	27.81	20.36	20.35	39.59	28.83	20.35
Services	30.89	22.77	22.76	41.49	30.57	22.76
<i>Total</i>	29.49	21.69	21.69	39.49	28.87	21.69

*Source:* Authors' calculations.

**Table 1–6. Marginal Effective Tax Rates on New–Share Issues for Foreigners, 1985, 1986, and 1988**  
(percent)

<i>Item</i>	<i>Inflation rate = 0</i>			<i>Inflation rate = 0.2</i>		
	1985	1986	1988	1985	1986	1988
<i>Asset</i>						
Inventories or land	52.00	51.00	44.00	52.00	51.00	44.00
Equipment	32.47	37.53	28.60	48.34	47.25	28.60
Structures	42.65	44.50	36.57	53.75	51.66	36.57
<i>Sector</i>						
Agriculture	49.83	49.50	42.28	52.30	51.08	42.28
Mining	39.66	42.46	34.24	51.39	49.83	34.24
Manufacturing	45.10	46.23	38.55	51.33	50.11	38.55
Construction	42.11	44.15	36.17	52.14	50.50	36.17
Commerce	50.22	49.77	42.59	51.83	50.77	42.59
Transportation	34.89	39.20	30.51	48.89	47.78	30.51

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Finance	42.24	44.25	36.28	51.67	50.18	36.28
Services	44.71	45.94	38.21	53.19	51.40	38.21
<i>Total</i>	43.60	45.19	37.35	51.59	50.21	37.35

*Source:* Authors' calculations.

a flat-rate VAT represents a larger fraction of the present value of total costs for assets that depreciate relatively rapidly. These two results do not vary significantly with the rate of inflation.

The third feature, however, is the most interesting. Recall that METRS (when the VAT is not included) do not vary with respect to inflation under the 1988 law but are highest on investment in inventories and land, are somewhat lower on investment in structures and are lowest on investment in equipment. So, the distortions of the VAT offset the distortions of the Colombian income and wealth taxes. In fact, the METR calculations indicate that the combined effect of the VAT and the income or wealth taxes is a roughly neutral tax structure.

The implications of this result are unclear. In one sense, the imperfections of the VAT are desirable because they offset the imperfections of the income and

wealth taxes. Such an approach, however, is clearly a hazardous way for a tax system to achieve economic neutrality in investment decisions, especially because it is unclear whether the VAT should be included in the METR calculations. A preferable approach is to achieve economic neutrality in investment decisions directly (and with greater certainty) by taxing real economic income and wealth under the income and wealth taxes and by allowing credit for tax on all capital goods.

**SUMMARY** . Before 1986 accelerated depreciation allowances based on the historical cost of assets were sensitive to inflation but were roughly equivalent in present-value terms to economic depreciation at a 20 percent inflation rate. Full deductibility of interest expense, coupled with the partial inflation indexing of interest income at the individual level, reduced METRS

**Table 1–7. Marginal Effective Tax Rates on Retained Earnings for Foreigners, 1985, 1986, and 1988**  
(percent)

<i>Item</i>	<i>Inflation rate = 0</i>			<i>Inflation rate = 0.2</i>		
	<i>1985</i>	<i>1986</i>	<i>1988</i>	<i>1985</i>	<i>1986</i>	<i>1988</i>
<i>Asset</i>						
Inventories or land	42.25	32.63	32.63	42.25	32.63	32.63
Equipment	18.67	14.10	14.10	37.84	27.47	14.10
Structures	31.00	23.69	23.69	44.35	33.54	23.69
<i>Sector</i>						
Agriculture	39.64	30.56	30.56	42.62	32.74	30.56
Mining	27.40	20.88	20.88	41.51	31.01	20.88
Manufacturing	33.95	26.07	26.07	41.44	31.40	26.07
Construction	30.35	23.20	23.20	42.42	31.94	23.20

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Commerce	40.11	30.93	30.93	42.05	32.32	30.93
Transportation	21.67	16.39	16.39	38.51	28.20	16.39
Finance	30.51	23.34	23.34	41.85	31.50	23.34
Services	33.48	25.66	25.67	43.68	33.17	25.67
<i>Total</i>	32.14	24.63	24.63	41.76	31.54	24.63

*Source:* Authors' calculations.

on debt-financed investments to very negative levels. Moreover, because dividends were taxed at the individual level, the tax system favored debt over equity finance, especially the issuance of new shares. Finally, differential taxation of corporations and limited partnerships distorted business decisions about organizational form.

Under the 1986 reform full indexing of interest income and expenses reduced the tax advantage of debt finance and reduced the extent to which tax burdens varied with inflation rates. Eliminating taxation of dividends at the individual level further reduced the tax advantage of debt finance and roughly eliminated the tax advantage of retained earnings over new-share issues. Unifying the treatment of corporations and limited partnerships eliminated distortions affecting the choice of organizational form. Finally, distortions that remained were reduced by rate reductions.

Indexing of depreciation allowances and the wealth tax base to inflation under the 1988 reforms eliminated the inflation sensitivity of the tax structure. Depreciation allowances, however, remain too generous relative to economic depreciation. Inclusion of 100 percent of the assessed value of land in the wealth tax base improved wealth measurement, but the elimination of the wealth tax in 1989 suggests that this will be relevant only for the calculation of presumptive income, a factor not considered in the METR calculations.

### The Distribution of Income and Tax Reform

Although the distribution of income in Colombia was studied extensively during the 1960s and 1970s, this topic has received fairly little attention in recent years. This perhaps reflects a general reduction of concern among public finance specialists regarding distributional issues. This section briefly reviews the earlier studies and comments on the likely distributional effects of various features of the changes described earlier.

A recent study by the United Nations (1988) surveys many studies of income distribution in Colombia. Although such studies are subject to a great number of qualifications (some of which are discussed below), it is clear that there is a basic pattern of considerable income inequality. For example, the U.N. study estimates that for the seven largest cities in Colombia in 1971, the bottom quintile (ranked by household income) received 3.1 percent of cash income while the top decile received 41.3 percent, and by 1979 this differential had widened to 2.3 percent compared with 42.3 percent. Moreover, although rural income distribution is probably less unequal than urban distribution, the national income distribution may be even more unequal, since the average income level in the rural sector is so low. However, Urrutia (1985) finds some improvement in the overall income distribution during the 1970s, and others have reported a similar improvement during the 1980s.

A natural question is whether the changes in tax policy described earlier have increased or decreased income inequality in Colombia. Any answer to this question clearly depends on a large number of controversial incidence assumptions, especially: (a) whether company taxes and property taxes are borne by capital owners (including foreigners) or are shifted to consumers, labor, or land; (b) the extent to which foreign tax credits in many capital-exporting countries mean that company taxes paid initially by foreign multinationals merely reduce the revenues of foreign treasuries; (c) whether coffee export duties are offset by benefits targeted exclusively to

coffee growers and, therefore, should be neglected in the distributional analysis; and (d) whether import duties should be allocated in proportion to consumption of the taxed commodities or attributed to exporters or importers. In addition, consumption often exceeds current income for low income households either because these households receive unrecorded income or because they are net borrowers in the period studied but net lenders in other periods. As a result, incidence estimates based on reported income probably overstate the regressivity of the tax system for those households with permanently low incomes.

Keeping in mind the importance of the incidence assumptions chosen, the results of several incidence studies can be summarized as follows. McLure (1975) and Berry and Soligo (1980) conclude that the Colombian tax system in the early 1970s was mildly to strongly progressive, depending on whether company taxes are attributed to consumers, to foreigners, or to Colombian capital owners (and whether the classifier is an estimate of permanent or annual income).

Perry and Cardenas (1986) also estimate that: (a) the 1974 rate changes, coupled with the conversion of personal exemptions and several itemized deductions to credits, essentially eliminated tax burdens for low income taxpayer's, reduced burdens slightly in the middle-income range and increased burdens modestly at very high-income levels; (b) the elimination of various capital income exemptions increased the tax burden of high-income individuals by between 25 to 50 percent; and (c) the introduction of the wealth-based measure of presumptive income increased the tax burden of high-income individuals by roughly 25 percent. In summary, Perry and Cardenas find that the 1974 changes in the individual income tax eliminated all or most of tax liability for 40 percent of those who were taxpayers under prior law. They also estimate that the 1974 reform increased the tax burden by between 29 to 93 percent for those in the very highest income

brackets, and reduced the burden in the middle-income ranges by from zero to 50 percent. In addition, changes in the net wealth tax, including a rate increase, an expansion of the base, and an increase in the exemption level, also made it more progressive.

The most important changes in company taxation in 1974 were those that eliminated preferential treatment of various industries. Presumably the brunt of these changes was borne primarily by capital owners or labor in the affected industries; thus the changes probably increased the progressivity of the tax system, possibly substantially.

The increase in the differential between the sales tax rates applied to necessities and luxury goods also increased the progressivity of the overall tax system. The same is probably true of administrative changes that curbed abuses by farmers, independent professionals, and other self-employed individuals who are likely to have high incomes.

In sum, Gillis and McLure (1978) estimate that the 1974 tax changes shifted an amount of income equal to as much as 1.5 percent of GDP from the top quintile of the income distribution to the rest of the population. This increase in progressivity, however, was probably offset to some extent by the unification of VAT rates and by the tax "deforms" of 1974-85 that restored or introduced various tax preferences that primarily benefited the higher income classes.

Finally, despite the fact that it is too early to know the magnitudes of the distributional changes caused by the 1986, 1988, and 1989 reforms, it is fairly easy to predict the directions of many these changes. For example, the reduction in individual income rates and the elimination of the taxation of dividends must have reduced the progressivity of the system substantially (unless evasion is reduced dramatically or unless increased incentives to work, save and invest lead to large tax-base increases at the highest income levels). The increase in the tax threshold, however, increased progressivity over the relevant range of the income scale. The elimination of many deductions and the conversion of personal exemptions to credits also may have increased progressivity somewhat, to the extent that such changes affect only higher income taxpayers, as lower income individuals were dropped

from the tax rolls by the increase in the tax-free threshold.

The extension of inflation adjustment to interest expense has also increased progressivity, although this effect was offset to some extent by the increase from partial to full indexing of interest income. Indexing of depreciation allowances, when combined with the accelerated depreciation deductions of the previous law, will also reduce progressivity. Not only will elimination of the net wealth tax in 1989 have a negative direct impact on overall progressivity but also the indirect effect—through reduced administrative attention to the

calculation of wealth for the purpose of presumptive income taxation—may also be important. But to the extent that net wealth is measured more accurately because of the 1986 and 1988 reforms, the taxation of presumptive income may become more important. This may increase overall progressivity.

The net effect of all of these changes is difficult to gauge. If income-tax revenues were reduced by the 1986 reform, then progressivity was also reduced as only high income individuals are subject to tax. Even if the 1986 reform was revenue neutral, as planned, the combination of rate reductions and the elimination of taxation of dividends, especially when coupled with elimination of the net wealth tax in 1989, must have reduced progressivity at the top of the income distribution.

### **Administrative Simplification**

The individual income tax system in Colombia in the 1960s was characterized by a large number of features designed to measure income accurately or to "fine tune" tax burdens to individual circumstances. An important aspect of the evolution of tax policy in Colombia has been a shift in emphasis from the use of such rules, which are desirable in principle but add significantly to complexity, to rules that achieve only "rough justice" in income measurement or the determination of the "ability to pay" taxes but are more easily administered. Several examples of this phenomenon are examined in this section.<sup>14</sup> (Inflation adjustment is an area in which complexity has been increased in the interest of improving the accuracy of real economic income measurement.)

#### **Personal Exemptions and the Ceding of Income**

In 1960 the individual income tax allowed personal exemptions and the "ceding" of labor income to a spouse in a lower marginal tax bracket. Although such provisions can, in principle, be justified as necessary for accurate income measurement, they complicate the tax structure, create opportunities for fraud, and make accurate withholding difficult. The introduction of "vanishing" provisions for personal exemptions in 1969 further complicated the calculation of individual tax liability until they were repealed in 1974. The 1986 reforms eliminated a host of problems in this area by repealing both personal exemptions and the ceding of income.

#### **Personal Expenses**

The 1960 law also allowed a wide variety of deductions for personal expenses, many of which depended on both income and family size. Following the recom-

mendation of the Musgrave mission, a standard deduction was introduced in 1974 to simplify the tax structure. The Musgrave mission also recommended the rather complex "vanishing" exemptions and deductions that were replaced with tax credits in 1974. The 1986 reform simply repealed a variety of special credits for personal expenses and eliminated both personal exemptions and the ceding of income. This made it possible to withhold taxes more accurately. Indeed, withholding is now the final tax for many taxpayers.

### Housing

In 1961 the individual tax base included an estimate of the imputed net income from owner-occupied housing. Because a limited amount of imputed income was excluded from the tax base, renters were allowed a deduction that depended on income and family size. Although the taxation of the imputed income on owner-occupied housing is desirable in principle (and indeed has commonly been advocated as a reform measure), the Colombian approach—especially since it was coupled with a rent deduction—was exceedingly complex. The 1986 reforms also made drastic changes in this area eliminating the imputed income tax and the associated rent deduction. In addition, a limit was placed on the amount of deductible mortgage interest and property taxes became nondeductible (except as a business deduction for rental housing).

### Filing Requirements

As the Taylor mission noted, the rules in Colombia in the early 1960s led to the filing of many tax returns with no tax liability. This implied that many scarce resources were being used to audit returns that generated no tax revenue. This problem was exacerbated by the lack of self assessment. Several changes were made during the years before the 1986 reform, including the introduction of withholding and self assessment, the use of shorter forms, and the curtailment of exempt income. The 1986 reform was more drastic in this regard, because the zero-bracket amount was raised, and many deductions and credits and the ceding of income were eliminated. As a result, withholding became much more accurate and, as noted above, it became the final tax for many more individuals.

### Double Taxation of Dividends

The introduction of taxation of dividends at the individual level in 1953 resulted in a tax on distributed corporate income at both the company and individual levels. The 1986 reforms provided relief from such double taxation by exempting dividends. Such an approach achieves only "rough justice" because income is taxed at the corporate rate rather than at the marginal tax rate of the taxpayer. Although more accurate alternative approaches are possible, their adoption would greatly complicate the tax system. Again, adoption of the dividend exemption option reflects a growing awareness that a simple "rough justice" approach is more desirable in Colombia than a more accurate but more complex alternative.

### Administrative Issues

Before 1988 Colombia attempted to increase tax compliance by requiring certificates of *paz y salvo*—statements that the taxpayer had paid all tax liabilities—of individuals who wished to leave the country, to transfer real estate, or to enter into any other contracts with the government. This system used a tremendous amount of scarce administrative resources and given that fraudulent certificates were readily obtainable, the system did little to increase compliance. In 1988 the *paz y salvo* system was eliminated. This simplified compliance with the tax code and freed up administrative personnel for more productive duties, especially tax audits.

Colombia has also improved its processing of tax information and its collection techniques. Because the law used to require a multitude of supporting documents to be filed with tax returns, the amount of data supplied physically overwhelmed the tax authorities. Under current law the system is simpler, requiring that supporting documents must be available on demand but need not be filed with the return. In addition, data processing has been facilitated by the requirement that large taxpayers should provide machine-readable information. Collection techniques have also been improved, and the receipt of tax returns and payments is now handled by banks rather than by government tax offices. This simplifies compliance and reduces the potential for fraud by government collecting officials. In addition, the banks process the returns and supply the tax department with machine-readable data. Finally, effective audits have been facilitated because banks must now file a variety of information returns on large transactions.

The administration of the tax system has also been improved by reducing the extent to which dishonest tax officials can extort bribes from taxpayers by such techniques as threatening to "lose" returns or payments or to delay the processing of large refunds. Regulations permitting the dismissal of employees who do not process returns expeditiously have largely eliminated this problem and thus have greatly improved taxpayer morale. In addition, the introduction of a penalty schedule that encourages the quick resolution of tax disputes has reduced incentives to delay payments (and thus reduce their present value) through protracted litigation. Compliance has also been encouraged by a provision that allows tax authorities to close

businesses that do not issue receipts to customers or that keep more than one set of accounts. Finally, the number of administrative layers in the Tax Department has been reduced, the number of local tax offices has been increased, and a career civil service has been created for tax administration. All of these changes have improved the quality of services provided to taxpayers.

### Revenue Performance

An important factor affecting the evolution of tax reform in Colombia over the past thirty years has been the overall fiscal environment. This section reviews the revenue performance of the Colombian tax system in recent years and comments on the revenue effects of various reforms. It also compares tax revenue–GDP ratios in Colombia to those in other countries.<sup>15</sup>

Immediately before the 1960 reforms the tax revenue–GDP ratio in Colombia was about 8.5 percent. By 1962 this ratio had fallen to 6.3 percent, because of: (a) provisions in the 1960 reform that led to revenue loss, including investment incentives and the rule allowing the ceding of labor income to the spouse; (b) declines in real collections due to inflation; and (c) the implementation of import controls. By this time the Colombian tax system no longer relied primarily on import and export duties; direct taxes had become a major source of revenue.

During the remainder of the 1960s and 1970s revenues as a percentage of GDP fluctuated between the low of 1962 and a high of around 11 percent. These fluctuations were, of course, related to economic performance and to the level of tax revenues obtained from import and export duties. They were also, however, affected by the various tax reforms during the period. Revenue increases were attributable to the introduction of the sales tax, administrative improvements—including the introduction of withholding and of estimated tax payments—and the 1974 reforms.

Although each of the years between 1979 and 1983 saw a decline in the revenue—GDP ratio, revenues grew considerably more rapidly than GDP from 1984 to 1987. This suggests that revenue did not suffer from the 1986 reforms, which were intended to be revenue neutral. It is too early to estimate the effect of the 1988 reforms, which contain various provisions aimed at raising revenue and others that will cause receipts to decline.

It is interesting to note that revenue fluctuations, primarily due to changes in the levels of exports and imports, have strongly influenced the nature of tax reform. For example, revenue shortfalls due to reduced import–export levies have sometimes sparked revenue–raising reforms, such as the introduction of the sales tax in the 1960s. In contrast, periods of relatively plentiful revenues sometimes led to revenue–losing tax "reforms," such as the changes enacted in 1977 and 1979. Finally, several of the more important tax changes should be viewed primarily as attempts to improve the tax structure rather than to raise revenue. These include the major reforms in 1974, which focused on broadening tax bases and on improving horizontal and vertical equity, and the 1986 reform package, which emphasized the achievement of economic neutrality, simplification, and horizontal equity.

A comparison of tax revenue–GDP ratios across nations suggests that two features characterize Colombian revenue performance. First, the tax revenue–GDP ratio has consistently been low in Colombia relative to other Latin American countries; typically, the Colombian ratio is roughly 30 percent or more below the average.

Second, the degree of reliance on direct taxation in Colombia has historically been relatively high until recent years, reflecting early heavy reliance on the income tax and the net wealth tax. Revenues from business taxation, however, have generally been low in Colombia relative to other Latin American countries.<sup>16</sup>

### Conclusion

A variety of lessons can be learned from the Colombian tax reform experience, most of which are likely to be applicable to other developing countries.<sup>17</sup> It is particularly interesting to note the relationship between the recommendations of various tax reform studies performed by outside experts and the nature of the reforms ultimately enacted. Tax changes in Colombia—and sometimes inaction—have clearly been strongly influenced by the outside studies.

This is seen clearly, for example, in the adoption of the type of tax incentives recommended by ECLA, the administrative improvements made in response to the recommendations of the Taylor mission, the basebroadening that resulted from the Musgrave proposals, and the modifications of the system of inflation adjustment based on the 1988 report. Nevertheless, the various tax reform episodes have also reflected, to a large extent, the ideas of Colombian tax professionals, as proposals made in various reports have been adapted to local conditions. Thus, for example, in the 1974 reforms the proposal for a presumptive income tax on agriculture was extended to cover all taxpayers, the vanishing provisions recommended by Musgrave were eliminated as too complicated, and inflation adjustment was begun, despite the contrary recommendations of both the Taylor and Musgrave missions. The 1986 reforms reflect even greater reliance on local expertise; they were essentially ready for enactment before being discussed with foreign advisers.

Developing a cadre of local experts committed to the reform process and knowledgeable about both local conditions and practices and the goals and design of good tax policy is an essential element in bringing about and sustaining an effective tax reform. Including

local professionals in the preparation of outside studies can play an important role in developing their expertise.

There has often been a long gestation period between the making of recommendations and their implementation. This has often been the source of frustration and disappointment to the directors of studies that have seemed to gather dust on the shelves. But it should be a source of comfort to the directors of future studies—and to their patrons in the government for whom the studies are conducted. Wide dissemination of tax reform reports can help to educate local tax professionals and the general public and pave the way for tax reform.

The discussion of Colombian tax reform in the past thirty years clearly illustrates that the recommendations of outside experts have been conditioned by the current conventional wisdom on tax policy, and that such recommendations (as well as Colombian tax policy) have changed as this wisdom has evolved. On a grand scale this can be seen in the shift in weight accorded various objectives over the course of the period examined here. Whereas considerations of income distribution and vertical equity were prominent during the 1960s and early 1970s, during the 1980s more attention was being paid to economic neutrality, administrative considerations, and horizontal equity. These large themes are manifested in differences in policy prescriptions. This suggests that developing countries should try to distinguish between sound policy advice and "fiscal fads" that might be recommended by outside advisers or utilized in other developing countries. Examples of such fads in the Colombian experience include introduction of investment incentives, the use of an unindexed tax system as a way to restrain inflationary tendencies in the economy and attempts to "fine tune" the measurement of income without adequate consideration of the administrative problems involved; all have since been reversed.

Outside studies have had much greater impacts when they were requested by the Colombian government than when they were conducted under the auspices of international agencies. For example, many of the

recommendations of the Musgrave mission and the 1988 report (which were both commissioned by the Colombian government) were passed into law relatively rapidly, while the recommendations of the Taylor mission (sponsored by the Organization of American States and the Inter-American Development Bank) have had relatively few direct effects. Advice is much more likely to be heeded when sought out by the local government rather than imposed by outside agencies except when the outside agencies can exercise "clout."

The tax system of Colombia has generally improved over time. This can be seen in a number of areas: the elimination of tax incentives; the unification of the tax treatment of corporations and partnerships; the introduction of the presumptive taxation of income; the simplification of the tax treatment of the family; the elimination of most deductions for personal expenses of taxpayers; the passage of the sales tax and its evolution into a modern VAT; increased reliance on withholding and other administrative advances; and the inflation adjustment of both nominal amounts and the measurement of income from business and capital. Yet progress has often been slow, and there have been periods of retrogression or "counter-reforms" in which strong political interests eliminated desirable tax changes. Thus the declaration that the administrative features of the 1974 reform were unconstitutional was a strong blow against tax reform, as were the subsequent "deforms." The failure to decelerate depreciation allowances when inflation adjustment was introduced and the elimination of the net wealth tax are the most striking recent examples of this phenomenon. Nevertheless, there is cause for optimism. On balance improvement has occurred, and some badly needed changes (such as the introduction of withholding, the presumptive income tax, and the 1988 reforms) have been enacted quickly.

Macroeconomic conditions have also played an important role in the tax reform process. Positive reforms have often occurred in Colombia during times of fiscal crisis while counter-reforms have generally occurred when revenues were plentiful. This pattern suggests that general tax cuts may be desirable—or at least preferable to the alternative—when revenues exceed expectations, and that local reformers should have ready a supply of well-considered revenue-raising reform proposals that can be enacted quickly whenever revenue crises occur.

Equity and administrative simplicity often conflict, especially in developing countries with scarce administrative resources. The tax structures in Colombia in the 1960s and 1970s was characterized by a number of provisions that were desirable in terms of determining economic income or ability to pay accurately, but were extremely complex and difficult to administer. Such provisions may be appropriate in theory but are much less desirable if they are enforced poorly; indeed, poorly administered provisions are also an important source of inequity. Accordingly, more recent reforms have been willing to sacrifice some theoretical equity in order to gain administrative simplicity.

This tendency is indicative of a more general trend, to be more realistic about what tax policy can achieve and about the world in which policy decisions must be made. Not only are administrative limitations considered more carefully in designing tax policy. The elimination of virtually all tax incentives suggests that there is less faith in the ability to use tax policy productively to guide economic decisions. Finally, policymakers have come to recognize that inflationary pressures are

not likely to be much affected by the failure to index the tax system, but the equity and neutrality of the system are.

Finally, the Colombian experience suggests that one cannot judge a tax system by what appears on paper. Colombia has long appeared to have—and probably does have—one of the best tax systems in the Third World; this is especially true after the 1986 reforms. But important administrative reforms were made between 1986 and 1988 that made the system even better. Ironically these are not obvious; to see them it is necessary to delve into the bowels of the tax administration to see how things actually work. This suggests two final lessons from the Colombian experience: serious tax reformers must do such delving; administrative reform is necessary in virtually all countries that aspire to a satisfactory tax system.

### Notes

1. Details of the various reforms are provided in Fiscal Survey of Colombia (1965), Brid (1970), Musgrave and Gillis (1971), Gillis and McLure (1977, 1978), McLure (1982, 1989, 1990), Perry and Cardenas (1986), Thirsk (1988), Perry and de Triana (1990), and McLure, Mutti, Thuronyi, Zodrow (1990) and McLure and Zodrow (forthcoming). The chapter draws heavily on the last item.
2. See Bilsborrow and Porter (1972). They conclude that the incentives stimulated less additional investment than the revenue loss involved.
3. Although the Taylor mission was critical of the specific investment incentives used in Colombia, its report was generally favorable toward the use of "well designed" investment incentives.
4. Dividends were exempt from individual taxation under the 1935 income tax law but were made taxable in 1953.
5. For a discussion of this episode and the importance of emergency powers in the passage of the 1974 legislation, see Urrutia (1989).
6. To prevent the exemption of dividends paid from income that has not been taxed at the company level, dividends in excess of 7/3 of company taxes are subject to tax at the shareholder level.
7. Suppose that inventory was purchased for \$100 a unit, that some inventory was sold and replaced, that some remains in stock, that the general price level has since risen by 20 percent and that replacement cost is \$150 a unit. Accurate inventory valuation requires that inventories be valued at the figure of \$150 a unit, but accurate income measurement requires that goods sold be valued at \$120 a unit.
8. Indeed, one could argue that further reductions are appropriate, as a presumed real rate of return of 7 percent seems quite high.
9. However, the income–measurement rules applied to such institutions are unusual and inaccurate, and should be replaced by ordinary income–measurement rules.
10. There are several ways to calculate METRS; the following description outlines only the approach used in the calculations presented in this section. For further details, see King and Fullerton (1984) or McLure, Mutti, Thuronyi and Zodrow (1990: chap. 4).
11. A marginal investment is one in which the cost of the asset equals the present value of after tax returns, taking into account all deductions, credits, and so on, allowed under the tax law.

12. For details of this argument, see McLure and Zodrow (forthcoming).

13. To simplify the calculation, asset lives are assumed to be infinite; the analysis would not be greatly affected if more realistic lives were used.

14. This discussion draws heavily on McLure and Pardo (1991).

15. The following is primarily descriptive; for more detailed information, see McLure and Zodrow (forthcoming).

16. Colombian reliance on indirect taxes was far below average until the introduction of the sales tax in 1965.

17. These are discussed in greater detail in McLure and Zodrow (forthcoming).

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### Tax Reform in Malawi

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Malawi embarked on a comprehensive program of tax reform with World Bank assistance in the latter half of the 1980s. At the government's request, the Bank helped analyze the weaknesses in Malawi's tax system in 1985, made recommendations for change, and assisted in financing the implementation of many reform proposals from 1987 to 1990. Consistent with its stage of economic development, the country had a limited administrative capacity and a weak data base. Together these limitations constrained the options that could be considered and the analysis that could be performed. Nonetheless, feasible improvements had to be identified. This chapter concentrates on the problems in the revenue system that provided the impetus to reform, the nature of the solutions that were offered, and the issues raised in implementing the reforms. Since many of these reforms are still being introduced into Malawi's economy, their ultimate success will have to await future analysis. The chapter begins with an overview of Malawi's economy and tax system and its evolution up to the time of the Bank's involvement in the mid-1980s. The reform agenda is outlined next and then the extent to which it has been implemented to date. The discussion concludes with a few lessons that can be learned from the Malawi experience.

### Malawi's Economy and Tax System prior to 1985

Malawi is a small and landlocked country that achieved its independence from Great Britain in 1964. It has a poor but relatively open economy that in the 1970s achieved one of the highest growth rates among the developing countries. In the early 1980s per capita income was about US\$180. In 1984 about 80 percent of Malawi's labor force was employed in agriculture, which accounted for approximately 50 percent of GDP. Agriculture had a dualistic structure consisting of numerous smallholdings along with a few large estates and commercial farms specializing in tea, tobacco, and sugar for export. The smallholders grew maize, the major subsistence crop, and some crops for export such as tobacco, cotton, and groundnuts. In 1984 exports accounted for almost one-third of GDP, and agricultural exports made up nearly half of the total exports. During the 1970s Malawi also exported a significant fraction of its labor force to neighboring countries, and workers' remittances contributed significantly to Malawi's foreign exchange earnings. By the mid-1980s, however, this flow had declined substantially.

### Tax Structure up to 1978

After independence, Malawi inherited a tax system in which personal and company income taxes provided as much as 50 percent of total tax revenue. By developing-country standards, and particularly for a nonmineral-producing one in Sub-Saharan Africa, Malawi relied heavily on *direct* taxes. The tax base, however, was very narrow. Most of the personal income tax revenue came from workers in the public sector and large companies, while the company income tax came from a few large private firms in primary processing and distribution.

The primary source of *indirect* tax revenue in the 1960s was custom duties, which contributed about 40 percent of total tax revenue. The rate structure of trade tariffs was designed to promote import substitution of consumer goods and to discourage luxury consumption. Accordingly, the highest duties were imposed on

durable and luxury consumer goods whereas the tariffs on capital goods and intermediate goods were low or nil.

To broaden its indirect tax base, Malawi introduced a sales tax in 1970. Known as the surtax, this was initially a 5 percent tax on the sales price of domestic manufacturers and the duty-paid value of imports. The rate was increased to 10 percent in 1971 and to 15 percent in 1977. In the case of imports, an additional uplift factor of 1.2 was imposed on the base rate to place imports on a more even and competitive footing with domestic manufacturers (ostensibly to offset part of the currency overvaluation). Capital goods were exempted under the new surtax, and intermediate inputs were eligible for rebates. To avoid taxing transactions between producers, the government introduced a "ring" system whereby those manufacturers who registered with the controller of customs and excise could qualify for a rebate of surtaxes paid on the purchase of intermediate inputs. The amount

of the rebate depended on the final commodity. If the intermediate product could be obtained from within Malawi, only part of the duty was recoverable.

#### Revenue Crisis of 197884

The middle to late 1970s were the halcyon days of Malawi's economic development (table 2–1). Economic growth and investment, fueled by easy access to foreign lending, were at a peak. But the early 1980s brought a serious reversal of economic fortunes. The global economic recession, the sharp decline in foreign private lending to developing countries, and the abrupt termination of Malawi's access to ports by rail through Mozambique greatly affected economic activity. Being a landlocked country, Malawi transported 80 to 90 percent of its exports and 60 to 70 percent of its imports by the rail line. The loss of this route sharply increased the cost of producing goods in Malawi and of exporting them.

This series of external shocks revealed a number of weaknesses in Malawi's fiscal system. The servicing requirement on Malawi's accumulated debt put strong upward pressure on current expenditures so that by 1981 debt servicing (inclusive of amortization) consumed about 34 percent of current expenditures,<sup>1</sup> which was more than double the rate of three to four years earlier (approximately 15 percent in 197778; see table 2–2, column 10). Although loans from the International Monetary Fund (IMF) provided some temporary financial relief, Malawi was soon forced into two consecutive debt reschedulings. At the same time, national defense spending grew as a result of the unrest in Mozambique. Despite the declining overall economic activity and serious attempts to cut unnecessary public spending, the various shocks combined to produce a strong demand for more government revenue.

**Table 2–1. Macroperformance in Malawi, 19741987**

(percent)

Year	<i>Constant 1978 prices</i>	<i>Constant 1978 prices</i>		<i>Implicit foreign savings /GDP(2)</i>	<i>Inflation rate a</i>
	<i>(1)</i> <i>Real GDP growth rate</i>	<i>(2)</i> <i>Gross domestic investment /GDP</i>	<i>(3)</i> <i>Gross domestic saving /GDP</i>		
<i>Pre–study</i>					
1973		20.4	12.4	8.0	
1974	7.2	18.9	16.4	2.5	18.2
1975	6.1	24.9	17.0	7.9	8.3
1976	5.0	22.1	17.8	4.3	10.0
1977	4.9	22.2	20.1	2.1	12.5
1978	9.7	30.9	20.5	10.3	1.0
1979	4.4	27.1	12.7	14.4	2.6
1980	0.4	22.2	10.8	11.4	15.0
1981	–5.3	15.2	11.9	3.3	17.0
1982	2.5	14.6	14.9	–0.3	9.8
1983	3.7	13.7	15.2	–1.5	10.9

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1984	5.4	13.0	15.4	-2.4	12.9
<i>Post-study</i>					
1985	4.6	13.3	13.1	0.2	8.5
1986	-0.2	11.1	9.2	1.9	12.7
1987	1.1	12.1	13.2	-1.1	24.2
1988	4.8	13.3	8.0	5.3	24.4

a. Annual change in implicit price deflator for GDP.

*Source:* Chamley and others 1985. These data are drawn from Malawi National Accounts Report, 1973-1979, and Malawi, Economic Report, 1985. Post-1985 data are drawn from Malawi Country Economic Memorandum (#1840-MAI). This source includes minor revisions to earlier data.

**Table 2-2. Central Government's Fiscal Operations (budgetary revenues and expenditures), 1974-88**  
(percentages of GDP at market prices)

Year	(1) Interest expendi- ture	(2) Non interest current expendi- ture	(3) Current expendi- tures I a	(4) Tax revenue	(5) Non tax revenue	(6) Current revenue	(7) Current deficit	(8) Overall budget deficit b	(9) Interest/ current expenditure	Debt Servicing
										(10) Interest/ current expenditure
1973	1.1	15.8	16.9	12.0	5.4	17.4	+0.5	-7.9	6.4	1.1
1974	1.1	15.9	16.0	11.7	5.4	17.1	+1.1	-7.8	7.1	1.1
1975	1.0	14.9	15.9	12.6	4.4	17.0	+1.0	-12.2	6.4	1.1
1976	1.5	13.8	15.3	11.8	3.7	15.5	+1.2	-7.7	10.0	1.1
1977	1.0	13.9	14.9	12.3	3.6	15.9	+1.1	-8.5	0.7	1.1
1978	1.9	15.6	17.5	15.2	3.3	18.5	+1.0	-12.4	10.6	1.1
1979	2.6	17.7	20.3	16.8	5.1	21.9	+1.6	-13.9	12.9	2.6
1980	3.7	17.0	20.7	16.6	3.2	19.8	-0.8	-15.8	18.0	2.6
1981	5.5	19.1	24.7	16.2	3.8	20.0	-4.7	-15.5	22.4	3.7
1982	5.1	17.2	22.4	16.7	2.9	19.6	-2.7	-12.5	22.9	5.1
1983	4.2	17.7	21.9	16.7	3.3	20.0	-1.9	-10.1	19.3	4.2
1984	7.1	17.3	24.4	17.4	3.3	20.7	-3.7	-8.8	28.9	7.1
1985	5.8	20.8	26.6	19.1	3.5	22.6	-4.0	-8.7	21.7	5.8
1986	8.2	21.8	30.0	17.8	4.6	22.4	-7.5	-13.9	27.2	8.2
1987	7.7	18.7	26.4	16.4	4.8	21.2	-5.3	-9.9	29.3	7.7

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1988    5.8            20.0            25.6            18.1            3.4            21.5            -4.1            -7.6            22.0            3

*Note:* Budget data are in fiscal years (FY) and GDP in Calendar Years (CY).

a. Current expenditure I excludes amortization.

b. Budget deficit before grants.

c. Current expenditure II includes amortization.

*Source:* Chamley and others (1985). Post-1985 data are drawn from Malawi Country Economic Memorandum (#8140-M) source includes minor revisions to earlier data.

### Initial Response to the Revenue Crisis

As a result of this fiscal pressure, Malawi resorted to the administratively expedient option and raised taxes in turn on virtually all existing bases, but particularly on foreign trade. Most of the measures were ad hoc.

**DOMESTIC TRANSACTIONS** . As early as 1978 the shift in Malawi's economic fortunes was reflected in its fiscal balances (table 2-2, column 8). The budget deficit increased by a third, moving from 8 to 9 percent of GDP in 197677 to 12 to 14 percent in 197879. The government's first response on the revenue side was to increase the domestic surtax rate by five percentage points in two steps: from 15 to 17 percent in 1979 and then to 20 percent in 1980. The import surtax rate moved up in tandem, although still subject to the 1.2 uplift factor (from 18 to 25 percent in 1979 and 30 percent in 1980). Excise rates (per unit of quantity) on domestic production were also increased. Since the domestic production base was not large enough to generate adequate additional revenue, the next round of increases focused on external trade.

**ALL CONSUMER IMPORTS** . First, tariff rates on consumer imports were increased. Then, to compensate in part for the overvaluation of the kwacha and to discourage imports in general, the government introduced a 3 percent import levy on the c.i.f. value of *all* merchandise imports in 1981.<sup>2</sup> Although this was to be a temporary measure, its rate was raised to 4 percent in 1982 and 5 percent in 1983. Already by 198182 the implicit average effective tax rates on private sector imports had nearly tripled, although implicit average effective tax rates on domestic producers (primarily manufacturing) showed a much more modest rise (table 2-3).

**INTERMEDIATE AND CAPITAL IMPORTS** . In 1983 imports were still too high for balance of payments purposes. Therefore, a foreign exchange allocation system was introduced to limit the importation of nonessential imports. This measure de facto favored public imports (in other words, imports by government, state-owned enterprises [SOEs], and projects assisted by foreign aid), which were seen as essential for growth. As a result, the share of essential imports as a proportion of total imports grew from 12 percent in 1978 to 16 percent in

**Table 2-3. Implicit Indirect Tax Rates, 1975-1982**  
(percentage)

<i>Commodity class</i>	<i>Import tax on private sector imports</i>		<i>Average compound annual growth</i>	<i>Domestic tax on large manufacturers</i>		<i>Average compound annual growth</i>
	<i>197576</i>	<i>198182</i>		<i>197576</i>	<i>198182</i>	
Consumption goods	27.5	40.6	6.6	8.2	10.6	4.23

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Mixed use (consumption or intermediate)	2.3	71.2	20.8	8.8	3.99	-12.36
Intermediate inputs	1.9	8.3	28.13	0.9	2.3	16.12
Capital goods	1.9	14.3	40.4	—	—	—
Average	11.7	32.1				

*Note:* Implicit tax rates are defined as the ratio of actual tax collections from a particular base to the size of that base.

*Source:* Chamley and others (1985).

1981 and to approximately 20 percent in 1984. Since essential imports were exempt from import duties and the consumer goods imports (particularly luxuries) with the highest duty rates were being curtailed, the foreign exchange allocation system had negative consequences for public revenue. As a result, the government introduced new duties or increased existing duties on imported intermediate and capital goods.<sup>3</sup> In addition, in 1984 the surtax was extended to cover intermediate and capital goods that had previously been exempt. These were now taxed at 5 percent. For those intermediate and capital goods imports that were already subject to the tax, the rate was increased from 20 to 25 percent. In addition, in 1984 the basic surtax rates on domestic output and consumer imports were both increased from 25 to 30 percent.

**EXPORTS** . With the traditional tax bases subject to increasingly high tax rates (for example, 30 percent on imports on average), totally new bases had to be activated. Thus in 1985 exports also became subject to explicit taxation. After the 10 percent devaluation of the kwacha in 1985, the government introduced taxes on tea and tobacco, its principal exports, ostensibly to absorb the windfall gains due to the devaluation and to ensure that agriculture would share the increasing rates of taxation with manufacturing.

**INCOME** . Eventually income taxes also had to be increased. In 1984 the rate for firms was raised from 45 to 50 percent and, to broaden the personal income base, personal exemptions, dependency allowances, and a select set of other allowances were eliminated.

### **Tax Study of 1985 and Reform Proposals**

The tax and tariff changes of the early 1980s were in no way part of any long-run plan for the development of Malawi's revenue system. Perhaps as a result, these changes evolved into a revenue system with a number of worrying features that could be ignored only as long as they were not binding. In 1984 and 1985, however, both the IMF and the World Bank recommended that the government create a more liberal economic environment by dismantling the foreign exchange allocation system and the prevailing system of administered prices, and in particular that it restructure the state-owned enterprises (SOEs). But once the obstacles to a freely functioning price system were removed, it was clear that the currently nonbinding distortions of the new ad hoc revenue measures would become binding.

In the spring of 1984 a World Bank mission outlined some of the difficulties that the existing tax structure could pose for the future growth of trade and investment. In the same year, another mission from the World Bank, this time dealing with a structural adjustment loan, expressed some concern about the impact of existing taxes on production incentives in both agriculture and manufacturing.

By 1985 it had become increasingly obvious to government officials—following the Bank studies that had identified the preliminary problems—that the recent revenue measures were not desirable in the long run and that

the tax system itself needed to be reformed. The stage had been set for a restructuring of the Malawian tax system.

In January 1985 the government of Malawi asked the World Bank for assistance in reviewing its entire tax system (not just selected issues) and suggesting recommendations for reform. In response, the Bank sent a study team to Malawi, which, after intensive investigation and discussions with all the major government agencies and the private sector, issued a two-volume report in November 1985 (see Chamley and others 1985).

### **Problems Arising from the Ad Hoc Measures**

The tax study identified a number of problems.

1. Most tax instruments were serving multiple objectives. The surtax, primarily a revenue tax, had a number of built-in protective features not normally part of a sales tax, particularly a higher rate on imports (30 percent) relative to its domestic counterpart (25 percent) owing to the 1.2 uplift factor (which was less justified after the kwacha had been devalued) and the partial rebating of taxes on competitive imports of intermediates. At the same time, import duties, in addition to serving a protective function for the prevailing industrialization strategy, were a means of generating substantial revenue and of influencing the pattern of consumption.
2. The import levy, introduced as a proxy for devaluation, was retained even after the devaluation. Even as a proxy, it was not appropriate since nonmerchandise imports were not subject to the import levy and exports were not subsidized by an equivalent rate. In addition, since imports of intermediate and capital goods were subject to the import levy, with no relief provided for exports, this levy was increasing the cost of exports (a distortion in resource allocation that does not occur under a devaluation) at a time when both traditional and nontraditional export expansion needed to be encouraged.
3. Although the extension of import duties to purchases of capital and intermediate goods reduced the effective rates of protection for many competitive imports, it also (a) distorted incentives against exports, again at a time when there was a premium on expanding exports; (b) created negative protection for the production of essential final goods whose imports were exempted from import taxes; and (c) to the extent that the tariff measures existed for revenue raising rather than for protective reasons, transformed the indirect tax system into a set of production taxes that closely resembled a network of turnover taxes.
4. Even though a duty drawback system existed, it was not an effective mechanism for compensating exporters. Malawi did make an effort to rebate duties paid by exports, but the drawback system was narrow in scope. It provided tax relief for only about 30 exported products and then only in the case of inputs that were considered to be physically incorporated into the final product<sup>4</sup>. Moreover, producers could not claim a rebate unless they exported their entire product, since there was no mechanism to allow inputs to be prorated between domestic and export sales. Finally, if an exporter marketed his product through a distributor, he was ineligible for the drawback since he did not physically export the product and the distributor was not the entity that had paid the input taxes. Consequently, exports were being harmed by the growing trend toward taxation of inputs used in production. Exports were also adversely affected when the surtax was extended to intermediate and capital goods, despite the ring or suspension system that was in place for manufacturers (although this mechanism was considerably more effective than the duty drawback).
5. Explicit taxes on agricultural exports were making it more difficult for Malawi to compete in international markets. In fact, agricultural producers were caught in a fiscal squeeze because the new tax measures were not only pushing down the prices they received for their output but were also raising the cost of their purchased inputs. As an attempt to capture the windfall arising from devaluation, the export tax was inappropriate since it drove a wedge between international and domestic prices and altered the long-term signal to producers, who were

basically price-takers in the international market. As an attempt to proxy for income taxes on agricultural activities, the export tax was inappropriate since it overlooked the fact that (a) smallholders were already paying an implicit tax through the price differential levied by the agricultural marketing board, ADMARC (which did not show up in revenue accounts because it was not transferred to the Treasury) and (b) large agricultural estates were already subject to formal personal and company income taxes.

6. The ad hoc changes in trade and commodity taxes as well as in personal income taxes did little to introduce equity into the tax system.

7. The increased taxes on capital imports and on companies were both likely to have an adverse impact on investment.

8. The tax rates on taxable incomes and activities were now at relatively high levels because of the rather narrow tax base—which consisted of public sector employees; employees of large firms; the income of formal sector private firms, both domestic and foreign (but not SOEs); and traditional excisable products plus imports. Incomes and transactions subject to explicit taxation in Malawi accounted for only a third of GDP. Consequently, the tax-to-GDP ratio of roughly 17 percent in 1983 and 1984 translated into a tax of approximately 50 percent on the value added of the modern sectors of the economy.<sup>5</sup>

### Framework of the Tax Reform

The goals of the reform exercise were fourfold: (a) to reduce tax-induced inefficiencies by creating a system of taxation that would interfere less with the efficient allocation of resources in production, trade, and investment; (b) to reduce inequities by shifting a larger fraction of the overall tax burden from the poor to the rich; (c) to identify instruments and promote institutional changes that would improve the quality of the tax administration; and (d) to lay a stronger foundation for any future increases in total revenue, should this be necessary.

**CONSTRAINTS** . The tax study recognized four constraints in its wide-ranging package of recommended reforms for Malawi. First, changing the level of revenue could not be a prime objective. From 1978 to 1984

Malawi had increased its tax-to-GDP ratio from 12 to 17 percent—an unprecedented jump of five percentage points, or almost 50 percent of tax revenue in 1978. Since any increase in the tax-to-GDP ratio in excess of three percentage points in a couple of years is normally difficult to sustain, it seemed more important to consolidate and rationalize this already impressive increase rather than increase the tax-to-GDP ratio further. On the other hand, even though lowering the tax-to-GDP ratio might reduce the tax-induced inefficiencies in the economic allocation of resources, it was deemed necessary that the new recommendations as a whole should generate at least as much revenue as the existing system did. Failure to do so might generate pressures to introduce ad hoc revenue measures that might run counter to the study's major recommendations for reform. Thus, if a particular reform measure was expected to produce a loss in revenue, this loss would have to be recouped through other features of the reformed system. Second, the proposals were constrained from reducing the de facto equity features of the tax structure, even though the focus of the reform was to reduce tax-induced distortions in production, trade, and investment. Third, the reform proposal could not overwhelm the capacity of the existing tax administration. From the outset a commitment was made to build on and, where desirable, modify existing tax instruments, rather than to introduce new ones. Fourth, given the severe shortage of empirically estimated data, the reform recommendations would have to be based on the best available data combined with informed judgments arising from extensive interviews, rather than the quantitative conclusions arising from formalized partial or general equilibrium models of the Malawian economy.

**APPROACH** . In practice, it is the interaction of various tax instruments that determines whether objectives are attained. It is almost impossible to assign a single instrument to each objective. In Malawi, however, an attempt

was made to *use different instruments for different objectives as much as possible*. This was done by clearly delineating the principal role of each instrument, and limiting the overlap with other instruments. For example, whereas import duties can be used to influence consumption, provide protection, and generate revenue, in the Malawi exercise import duties were to play a primarily protective role (that is, implicitly subsidizing domestic production at the expense of competing imports) rather than to also serve as a major source of revenue. One suggestion was to limit the aggregate size of these producer subsidies and to provide them in the form of short-term import duty protection for a selected set of goods that would change as industrial priorities changed. Such an approach would create a very narrow tax base. Alternately, a broader import base could be set up, but with lower tariff rates. In either case, even though import duties would clearly continue to generate revenue, the amount would be marginal relative to the *revenue generated from domestic taxes on the import base*. By subjecting all competing as well as noncompeting imports to an "embryonic" consumption tax (see sections on surtax reform), *revenue would continue to be collected at the point of import*, to take advantage of the administrative convenience of this arrangement, but through domestic indirect taxes rather than import duties. This would remove much of the revenue function of import duties and shift the revenue function to an instrument that is equally convenient to collect but would not create unnecessary distortions between imported and domestically produced goods. By also shifting luxury tariff rates to domestic indirect taxes, the import tariffs would no longer be used to influence the pattern of consumption. Thus, after a suitable rearrangement, the trade tariff system would be more or less focused on a single objective—that of providing protection as deemed necessary by trade and industrial policy. Similarly, the surtax could be made the primary revenue raiser within the system of indirect taxes by removing the protective features that were built into it.

Thus, even though in general the interaction of instruments is crucial in evaluating the effects of the tax system on objectives, the number of instruments in use in Malawi were few and their effects were potentially separable. Hence, existing instruments could be redesigned to address specific objectives such as generating revenue, providing equity, and providing protection. Whatever other effects they might have as by-products would be minor compared to their principal roles.

It is interesting to see how these reform principles were applied in the framing of specific proposals to improve the performance of the major tax instruments in Malawi. At no point in the exercise did the tax study team take the position that there was only one correct answer to a problem. This made it possible to explore ideas that initially were not considered feasible. To reiterate, the emphasis was on reforming the existing tax system rather than on designing a new one from scratch. In other words, every attempt was to be made to *build on existing instruments* and to take advantage of the fact that tax administrators were already familiar with them. The instruments retained in the reformed system were those that had many, but not all, of the desirable characteristics of the best tax for a given objective, *provided* there was evidence that the retained instruments had generated an increasing amount of revenue over time. If a sophisticated instrument with desirable characteristics was generating increasing amounts of revenue, it was assumed to be an *administrable* instrument. Such instruments were then modified (to expand the range of their desirable characteristics) in preference to introducing new instru-

ments whose administrative feasibility was not known. This can be illustrated by the way in which the surtax was reformed.

### **Taxes on Goods and Services**

Four basic steps were recommended to reform the taxes on goods and services: shift from a ring to a credit surtax system, realign trade and domestic taxes, expand the surtax base, and strive for greater equity through the rate structure of the reformed surtax.

**SHIFTING FROM A RING TO A CREDIT SYSTEM** . The Study team initially recommended that Malawi introduce a value added tax (VAT), but this recommendation met tremendous resistance from both the Department of Income Taxes and the Department of Customs and Excise Duties, on the grounds that it was too complicated to administer. Therefore, the idea was shelved at the time the study team began its fieldwork. But when the team did a detailed assessment of the existing surtax procedures, it found that the paperwork involved in the prevailing ring system was the same as would be required in the case of a VAT, but in a reverse flow. Malawi had adopted the ring (or suspension) method of commodity taxation in an effort to control the degree of tax cascading arising from the taxation of business inputs. Under the ring system, the surtax was applied only to sales outside the ring. Transactions among registered manufacturers were exempt. Thus, in order to qualify for an exemption, the seller had to request documentation proving that the buyer was registered. If the procedure was reversed, and the vendor had to indicate to the purchaser the amount of taxes he was being assessed, the existing surtax would be transformed into a tax similar to the VAT with more or less the same amount of paperwork.

In addition, introducing a crediting system within the surtax framework in lieu of the existing system of exemptions could actually make the surtax less complicated to administer. Although the ring system was sound in principle, in practice it was plagued by a number of problems. First, it could only imperfectly remove the tax on business inputs since it could not prevent the reentry of taxed products into the ring when a registered manufacturer purchased an item at either the wholesale or retail level. Second, to avoid revenue leakages and diversions of goods to nontaxed uses, considerable administrative resources were required to keep track of the goods purchased by exempted producers. Audits of inventories and bonded warehouses were necessary to ensure that purchasers who were exempt from the surtax did not sell to parties whose sales were not taxed (for example, to the services or the informal sectors). There was growing evidence of substantial leakages around the ring despite an all-out effort to police its boundaries. Out of a total of 226 registered firms, only 10—those also subject to excise taxation—accounted for well over 80 percent of the revenues from the surtax, which was way out of proportion to their representation in the value added produced by the 226 firms.

It was in this setting that the study team recommended that Malawi replace the exemption approach with a tax-crediting mechanism. Although it was not called a VAT, it made use of the principle of a consumption-based VAT. All sales would become taxable, with the exception of export sales, and all sellers could claim credit for taxes paid on the purchase of inputs. This would ensure that production distortions due to the taxation of inputs would be minimized. The administrative advantage was that there would no longer be any need to distinguish between final and intermediate goods or between tax-exempt and tax-paying producers. On the revenue side, taxes on final sales would be collected in increments at earlier stages, rather than in total at the end, as in the ring system.

Thus, although the government initially balked at introducing a VAT on the grounds that it was administratively too complicated, the study team was able to demonstrate the feasibility of a tax similar to the VAT. Not only would the paperwork required for a VAT remain much the same as for the current ring system, but the self-enforcement aspects of the crediting system were superior to those of the ring system.

**REALIGNING TRADE AND DOMESTIC TAXES** . The next step was to map as much as possible of the revenue function of the trade taxes into domestic taxes. This was to be accomplished by realigning the coverage and rate structure of the import surtax with the domestic surtax so that the former could also be incorporated in the crediting network. The uplift factor of the import surtax would be eliminated, and the basic surtax rate would be reset to compensate for this elimination. All formal domestic production, as well as competing and noncompeting imports, would be subject to the *same basic surtax rate and crediting system*. By this device, a protoconsumption tax would be created, at least through the manufacturing and import stage. Exports were to be zero-rated and refunds made on the presentation of documentary evidence arising from the crediting process. This would ensure that, because the inputs used in exports would not be taxed, the tax structure would not interfere with export competitiveness.

Other efficiency-enhancing measures included merging the import levy with import duties and the high tariff rates on luxury imports into a second (luxury) rate for the surtax. The latter change would ensure that the consumption of luxuries would be taxed without providing protection for their production. The protective structure of import duties could then be

rationalized gradually. Because of the foreign exchange allocation system, however, this could not be an immediate priority. In addition, it was recommended that a better and smoother system of duty drawbacks for exports be established and that the export duties imposed in 1985 be removed.

**EXPANDING THE SURTAX BASE .** As already mentioned, the high surtax rate in Malawi was a reflection of the narrow tax base, even inclusive of imports. It was also a strong inducement for evasion. The study team therefore proposed that the size of the surtax base be expanded so the tax rate could eventually be reduced. One recommendation was to include in the base the large establishments in Malawi's wholesale and retail sectors. It was anticipated that such a move would increase the share of total consumption subject to the surtax from 30 to 46 percent. Another recommendation was to include marginal manufacturing—in the form of packaging, bottling, and assembly of components—in the definition of formal manufacturing activity. Moreover, the sales value of manufacturing goods was to include the sales of any ancillary services, such as warranties, transportation, and the provision of finance. This broader definition would discourage manufacturers from undervaluing the sale of goods and overvaluing the sale of services. Finally, in the case of manufacturers who operated their own wholesale and retail activities, manufacturing would be defined to include them and thus to remove any temptation to engage in tax-minimizing transfer pricing.

The government was also urged to adopt a tax-inclusive budget that would add equally to both government expenditures and revenues but would eliminate any tax-induced bias in purchases made by government agencies and bureaus. In the absence of a tax-inclusive budget, the government and many public entities were exempted from paying import duties and other taxes with protective features, such as the surtax. This exemption encouraged the public entities to purchase imports rather than domestic goods. This preference was not desirable. A tax-inclusive budget would also remove the emerging tendency on the part of some public agencies to engage in arbitrage by purchasing goods duty- and tax-free and reselling them to the private sector.

Equity and the rate structure of the reformed surtax. The incidence of commodity taxes (that is, the taxes on goods and services) in 1983 was more or less proportional, except among the lowest income group (table 2–4), which also appeared to be hardest hit by the commodity tax rate increases after 1983. This was in sharp contrast to the progressivity of income taxes. High-income households paid nearly as much in income taxes as they did in commodity taxes. Low-income households, however, paid very little in income taxes. Thus income taxes rather than indirect taxes had been responsible for making the total tax burden of the former nearly three times as large as that imposed on the latter.<sup>6</sup>

To address the lack of progressivity in indirect taxes, the study recommended that equity features be added to the embryonic consumption tax. To this end, existing excises could be redesigned to complement the restructured surtax in four respects. First, the excise (and import) duty rates were to be shifted from a specific (per unit of quantity) to an ad valorem (per unit of value) basis of valuation. Between 1978 and 1984 the ad valorem equivalent rates on excisable products had dropped by half, with a commensurate decline in potential revenue. This drop had occurred despite low rates of inflation and repeated increases in the specific rates. If ad valorem rates had been in force, the revenue from excises would have grown without recourse to rate changes. The ad hoc increases in specific rates gave the appearance of increasing tax burdens, which antagonized domestic producers without maintaining revenue yields. The shift to ad valorem rates on excisable products was judged to be feasible since the same products were already subject to the ad valorem domestic surtax. Second, all ad valorem excises were to be collapsed into two or three rates that could be merged into the surtax structure as additional rates. These rates would be higher than the basic surtax rate. Since they would apply primarily to final goods, the

presence of differential rates would not complicate compliance with the surtax crediting system.<sup>7</sup> Com-

**Table 2–4. The Incidence of Taxes in Malawi, 1983**  
(percentage of household expenditures)

<i>Income Group (kwachas)</i>	<i>Commodity taxes a</i>		<i>Income taxes</i>	<i>Total taxes</i>
High (> K 4,800)	13.8	(17.9)	14.4	28.2
Medium (K 1,2004,799)	14.3	(17.5)	4.5	18.8
Low (K 4801,199)	13.1	(12.8)	1.0	14.1
Lowest (< K 480)	9.1	(8.8)	1.0	10.1

a. The column in parentheses under commodity taxes indicates the anticipated pattern of tax burdens under the proposed commodity tax reforms.

*Source.* Chamley and others (1985).

modities would then be classified into three or four groups according to their income elasticity. Those commodities consumed primarily by the poor would be exempted whereas those with the highest income elasticities would be subject to the higher surtax rates. Third, traditional excisable products (such as alcohol and tobacco) would also be reclassified, and the lowest-quality products would be subject to the basic surtax rate, while the higher- and highest-quality products would be subject to the two progressive rates, respectively. Fourth, the luxury import tariff rates would be replaced by the new higher surtax rates. If this proposal were to be adopted, the incidence of the new regime of commodity taxation would be more progressive, as indicated in table 2–4 (in parentheses). The higher surtax rates (or ad valorem excises) would play the primary role in providing greater tax equity within the indirect tax system.<sup>8</sup>

In summary, the proposed reforms would shift more of the indirect taxes from a production and trade base to a consumption base. A crediting mechanism would be introduced into the operation of the surtax to remove the tax on business inputs and to eliminate tax cascading. Exports would be zero-rated. Imports and domestic output would both be taxed at a common rate under the surtax. The issue of equity would be dealt with by adding one or two luxury rates to the surtax. There would be much less reliance on tariffs for revenue purposes. By lowering tariff rates on imported final goods rather than raising tariffs on imported intermediate and capital goods, the government would reduce the levels of both nominal and effective protection.<sup>9</sup> This overall approach in Malawi would realign the nonprotective components of existing trade and production taxes to function as a rudimentary consumption tax and merge the revenue function of the newly instituted taxes on trade with the reformed domestic tax.

### Company Income Taxes

In the early 1980s company taxes generated a quarter of total tax revenues. The company tax in Malawi sensibly did not draw a distinction between corporations and other forms of business organization, thus avoiding a distortion that is found in many other countries, both developed and developing. Table 25 presents some of the main features of the company tax in Malawi before 1985. The statutory company tax rate was increased from 40 to 45 percent in 1975 and to 50 percent in 1981. Average effective tax rates (AETRs), which reflect the revenue consequences of the tax structure, were significantly lower, although they, too, rose from 24 percent in 1975 to about 39 percent in 1984. Marginal effective tax rates (METRs), which reflect the incentives for allocating

investment, were also lower than the nominal or statutory tax rate but higher than the average effective tax rate. The relationship between the average and marginal effective tax rates was opposite that normally desired. In general, it is preferable for the marginal effective tax rate to be lower than the average effective tax rate since the objective is not to lower the level of investment but to ensure that revenue is collected from economic profits (that is, profits above the opportunity cost of capital or the level required to induce the marginal investor to invest).

The marginal effective tax rates were lower than the nominal rates in part because companies had been allowed to pay taxes with a lag of at least one year. Most of the disparity between the nominal and the marginal effective rates, however, was due to a generous set of investment incentives, which also varied by sector. Manufacturing, unlike other sectors, was entitled to a 10 percent investment credit, which did not reduce the depreciable basis. Manufacturers could also claim a 10 to 20 percent initial investment allowance, which acted as a form of accelerated depreciation. The uneven sectoral impact of the company tax provisions is indicated in table 2–5 by the wide differences in marginal effective rates of taxation between the manufacturing and nonmanufacturing sectors in Malawi.<sup>10</sup> New investors in manufacturing faced an effective tax rate of 31 percent in 1974 and 43 percent in 1984, in comparison with rates of 44 percent and 58 percent in the nonmanufacturing sectors for the comparable periods.<sup>11</sup> In other words, an investor would prefer for tax reasons a 10 percent return in manufacturing activities over a 15 percent return in nonmanufacturing activities.

In its appraisal of the company taxes in Malawi, the study team was particularly concerned about the intersectoral and interasset biases in this part of the tax

**Table 2–5. Company Tax Rates, 1975 and 1984**  
(percent)

<i>Rate</i>	<i>1975</i>	<i>1984</i>	<i>Proposed</i>
Statutory tax rate	45	50	50
Average effective tax rate	24	39	—
Marginal effective tax rate			
Manufacturing (long-lived assets)	31	43	39
Non manufacturing (long-lived assets)	44	58	39

*Source.* Chamley and others (1985).

system. To remove these nonneutralities, the study initially recommended a move to a cash-flow tax with no allowance for interest deductions. Such a tax would result in a zero marginal effective tax rate (no distortion against investments earning the opportunity cost of capital or the going interest rate) and a positive average effective tax rate (from investments earning above the opportunity cost of capital). Since revenue losses from shifting to a tax on cash flow (rather than on income) would be too high in the initial post-reform period, the proposal was shelved, even though it would have simplified income tax administration. Instead, the focus shifted to reducing the level and dispersion of marginal effective taxes. Malawi was not encouraged to follow the trend in some developed economies toward reducing statutory tax rates, for this would lower not only the marginal effective tax rate but also the average effective tax rates. Revenue could be lost under the latter reduction (and there could be a windfall to existing capital) even if no new investment materialized. This loss of revenue would be too high to be offset by tax increases elsewhere in the system. Instead, since the intention of tax relief was to

trade off revenue for new investment, it was recommended that the marginal effective tax rate be lowered by amalgamating existing investment credits and allowances into a single initial allowance at a higher rate (40 percent) to benefit new investments and that this initial allowance be available to investments in all sectors.<sup>12</sup> It was also recommended that the average effective tax rate remain high for revenue reasons. Although the final proposal fell short of complete expensing, it would have the desirable effect of encouraging aggregate investment by reducing the marginal effective tax rate without losing substantial amounts of revenue.

As a further step to avoid tax-induced inefficiencies in resource allocation, the study urged the government to subject state-owned enterprises to the company tax. It also recommended that company income tax payments be moved forward to a current year to conform with the treatment of personal income taxes.

Finally, the study argued that small businesses required special measures. Because of inadequate record keeping, many small businesses were able to shift a number of personal expenses into the category of business income deductions. As a result, businesses with significant amounts of turnover were able to report trivial amounts of taxable business income. To curb evasion on the part of small businesses, the study recommended that Malawi consider applying some form of presumptive tax to this group based on objective and publicly known criteria. Those subject to presumptive taxation would be given the option of belonging to the regular tax system that applied to personal and company incomes.

### **Personal Income Taxes**

Before 1983 Malawi had a two-tiered system for taxing personal incomes. Under the taxable income method, neither deductions nor exemptions were allowed, whereas under the chargeable income method both were permitted. Taxpayers were required to calculate their liabilities under both approaches and then asked to pay the larger of the two taxes. After 1983 only the chargeable income method was allowed, and personal exemptions were eliminated. Marginal personal income tax rates were progressive and ranged from 3 to 50 percent. Only full-time workers employed in the formal sector of the economy and some self-employed businessmen and professionals were subject to the personal income tax. For most workers, including government workers, the tax was withheld at the source through the pay-as-you-earn (PAYE) system, a familiar withholding mechanism in many former British colonies. This withholding arrangement reduced the cost of collection and ensured that taxes on current income were paid without a lag. A year-end reconciliation of tax obligations was required only from those workers who also had nonwage income.

Two other kinds of personal taxes were also assessed. Low-wage workers in the urban economy were subject to a two-tier graduated tax, and males over the age of eighteen who were not subject to any other type of income tax had to pay a nominal poll tax. These two taxes combined contributed only about 12 percent of total personal income tax collections, which, in turn, constituted only 16 or 17 percent of total tax collections. As a result, it was estimated that as few as 10 percent of urban households were responsible for as much as 80 percent of the revenues collected through all types of personal income taxes.

The tax study therefore recommended that the tax base be broadened by closing loopholes and that the personal income tax be made fairer. To remove the burden of the tax from low-income households, the study recommended that the absence of personal exemptions be compensated for by introducing a zero-rate income bracket or that the personal exemptions be reinstated. To broaden the base, the government could repeal the interest deduction on housing mortgage loans, since housing did not generate any taxable income. It could also repeal the exemption on interest income earned at Post Office Savings Banks, even though in inflationary conditions taxing interest income is equivalent to taxing capital. The rationale for this recommendation was that the interest exemption was originally intended to encourage greater savings on the part of low-income households but was increasingly being used by corporations for purposes of tax arbitrage. It was also recommended that greater use be

made of creditable taxes on repatriated earnings from Malawi. Thus, a 10 percent withholding tax on all forms of remittances to foreigners—including interest, dividends, rents, and royalties—was suggested to replace the prevailing noncreditable sop–up tax on dividends paid to foreigners.

Inasmuch as the valuation of fringe benefits for personal income tax purposes was obviously tricky and their nontaxation was leading to abuse, as was evident in the proliferation of nontaxed fringe benefits, the study team recommended that fringe benefits be excluded from the personal income tax base and instead have them taxed indirectly by disallowing them as a company tax deduction. This was to be made more effective by aligning the nominal company tax rate with the top bracket rate under the personal income tax.<sup>13</sup>

For a low–income economy, Malawi had a surprisingly sophisticated method of integrating the taxation of company and personal incomes. It used an imputation or dividend gross–up system based on the nominal company tax rate. The problem was that it allowed individuals to claim a rebate on dividends earned even if the company distributing the dividend had not paid tax or if the tax paid was lower than the nominal company tax rate. The tax study therefore recommended that the procedure for grossing up dividend income be modified so that any personal income tax refund would be based *only* on the amount of company taxes that had *actually* been paid. In addition, although no capital gains tax existed, the tax study team suggested that a follow–up study be made of how such a tax might be made to work satisfactorily in the context of Malawi's economy.

In summary, in the area of direct taxation the study suggested that the company income tax be reformed to reduce tax disincentives to new investment and to reduce the dispersion of marginal effective tax rates across different sectors in the economy. It also suggested that nonneutralities in the personal income tax that arise from asset acquisition should be reduced by repealing the incentives for investing in housing over investing in other types of assets. Finally, a few changes in the personal income tax were recommended to broaden the base and ensure greater fairness.

### **Tax Administration**

On the whole, tax administration in Malawi, as exercised by the Department of Customs and Excises and the Department of Income Tax, was highly regarded by the tax study team. Substantial weaknesses were identified, however, in the way information on taxpayers and their tax payments was generated and used. To overcome these deficiencies and thus improve management, the study recommended, first, that the information system should be redesigned. It suggested that a document control system be introduced and that data be organized in a way that would allow tax experts to identify trends and patterns in, for example, receipts, arrears, and the settlement of delinquencies. This would enable management to analyze changing conditions faster and more readily and to react appropriately.

Toward this end, it was recommended that a master tax file be created with unique taxpayer identification numbers (that is, numbers that unambiguously identified all individual *and* company taxpayers). Such a file would facilitate the cross–checking of sales and income tax records (subject to confidentiality rules) and would provide an up– to–date account of any taxpayer and of the performance of the entire tax system. The coverage of the tax system could also be expanded if taxpayers were required to have an identification number in order to receive government contracts or obtain employment or access to credit.

To help the Malawian government analyze the interaction of the tax system with the rest of the economy, the study team also recommended that a special tax analysis unit be established in the Ministry of Finance. This unit would not make tax policy but would provide policymakers with professional advice on how changes in other policy areas might affect the tax system, and vice versa. It could also be used to monitor the performance of the current tax system and to evaluate proposals to change the system.

### Revenue Impact

Despite the continuing need for more revenue, a decision was made early in the process not to strive for immediate increases in revenue. Instead, the emphasis was on generating at least as much revenue as the existing system by consolidating the earlier revenue increases and, if possible, creating greater tax-to-GDP elasticity in the long run. The reform proposals attempted to balance any revenue losses with offsetting revenue gains. Some measures, such as the more generous provision of initial allowances and the removal of taxes from business inputs, would result in significant reductions in total revenue. Offsetting these declines would be the higher revenues resulting from the broadening of the surtax and income tax bases, from the adoption of ad valorem excise taxes (instead of per unit levies), and from the conversion of the company income tax to an estimated or current year payment basis. Moreover, although the revenues previously collected from imports of capital and intermediate goods would drop for sectors whose output was taxed, this would be offset by a gain in revenue from the sectors whose output was not taxed, where the average tax rate

on many inputs would rise from about 14 percent to the basic surtax rate of 30 percent.<sup>14</sup> The long-run elasticity of the revenue system was also expected to increase with the shift to ad valorem excise and import duties and with the greater progressivity of the indirect tax system. Finally, once the surtax base was purged of many of its distortionary features, the surtax rate could be used as the principal means for addressing revenue requirements. In fact, the surtax has already begun to play this important revenue role.

### Implementation of the Tax Reform Proposals

To ensure support for the reforms, the Ministry of Finance had invited reactions from interested parties (both public and private) from the inception of the study. This was undertaken with a view to incorporating their concerns into the design of the new tax instruments. A preliminary report was presented to the Ministry of Finance in October 1985 and discussed with the Treasury and the two tax departments. A revised draft of the report was circulated more widely to other ministries and departments in November 1985. In January 1986, after extensive internal discussions, the government agreed in principle to most of the recommendations in the study.

### Handover from Study Team to Technical Assistance Team

Over time, the study team had managed to establish a solid working relationship with senior government officials. This partnership contributed to the reforms being treated as homegrown rather than foisted on reluctant government officials. Indeed, the fact that the government had initiated and participated fully in the exercise contributed to its ultimate success. Confidence grew to the point where the government wanted the study team to help implement the reforms instead of having to forge a new relationship with an unknown group. This was not feasible since a different set of technical skills (legal, accounting, and administrative) were required to implement the proposals.

In the end a compromise solution was found. A member of the study team was appointed to direct the project because he was familiar with every detail of the intent and content of the proposals. The Harvard Institute of International Development won the contract to provide the institutional support for implementing the reform program. The implementation phase was to be financed jointly by the Bank, the UNDP, and the government of Malawi. The entire exercise was assisted by the continuity of key officials and by the establishment of a high-level tax-coordinating committee in the Ministry of Finance to oversee the implementation of the reforms. The strong support of senior officials has played an invaluable role in putting the reforms into operation. Perhaps the most crucial was the involvement and support of the permanent secretary of the Ministry of Finance, who initiated the review and provided guidance and support through two-thirds of the implementation phase.

Many of the central proposals for reform have already been implemented (World Bank 1987/90). Other proposals are either still under discussion or are in the process of being implemented. As in the study phase, the government of Malawi has actively participated in working out the details for implementing the proposals. For the reform program to be implemented in full and given a chance to work, supporters will have to stay the course and not give in to pressure to undermine the reforms.

### **Reform of Taxes on Goods and Services**

The reform of the surtax is the linchpin of the program for indirect taxes. Introducing the crediting mechanism was expected to be the most difficult part of this reform. Because the administrative features of the prevailing surtax had been analyzed so thoroughly during the study phase, however, it was possible to revise forms and procedures and to train staff in a relatively short period, with the assistance of former officials of the United Kingdom's VAT administration. Within the first year of the implementation phase, it was possible, in the April 1988 budget, to announce the introduction of an operational surtax crediting mechanism. To cushion its adverse revenue effect, the government planned to phase in gradually the crediting of the tax on purchases of capital goods and spare parts. The crediting mechanism has performed well above expectations. Penalties and interest charges on late payments are being enforced. A danger has appeared on the horizon, however, with the courts overturning on appeal some of the decisions of the surtax office. If upheld, these judicial rulings could in time undermine taxpayers' willingness to pay their surtax obligations on time.

Other elements of the indirect tax reform that have been successfully completed are (a) the merging of the nonprotective aspects of the import duty and the import levy into the import surtax; (b) the transfer of luxury import duties to a second rate for the surtax; (c) the conversion of specific rates for import and excise duties to ad valorem rates; and (d) the elimination of export taxes.

Some changes have not yet been completed (although approved in principle). These include (a) eliminating the uplift factor to create a single surtax rate; (b) expanding the surtax base to cover the consumption of telephone and electricity services, as well as purchases made in restaurants and hotels; and (c) the development of a feasible and effective duty drawback scheme.

### **Reform of Taxes on Income**

The reform of company income taxes has been implemented with the assistance of the Technical Assistance Advisory Service of the U.S. Internal Revenue Service. The base of the company tax has been expanded in two ways. In 1986 the government introduced a withholding tax on sales made by firms in the tobacco and transportation sector, and in 1987 it incorporated state-owned enterprises in the company tax framework. In 1988 it put all firms on a current estimated payment system so that taxes become due immediately after income is earned rather than after one or two years, as in the past.

The collapsing of all investment-related allowances and credits into an initial allowance of 40 percent began in April 1988. The new provision applies to those assets previously eligible for the smaller initial allowance. It is to be extended in stages to other assets. A problem on the horizon is the possibility that a new investment code will be adopted with extensive provisions for fiscal incentives. There will be little justification for additional fiscal incentives to encourage investment or export once the surtax crediting system is expanded to all imports and domestic products, the reformed duty drawback system is implemented, and the 40 percent initial allowance is extended to other assets.

Some changes remain to be made: (a) legislation is needed to allow small businesses to be taxed on a presumptive basis; (b) more appropriate depreciation rates are yet to be adopted; and (c) the imputation system is yet to be revised.

The proposals for personal income tax reform are being implemented more slowly. So far, all that has been achieved in full is that the base has been expanded by including in the withholding system the interest paid on government bonds, as well as dividends and certain other kinds of interest income.

Most of the reforms are still being worked out, including (a) the restoration of the personal exemption or, alternatively, the use of a zero bracket; (b) the repeal of both the interest exemption on Post Office Savings Accounts *and* the interest deduction for home purchase loans, especially since the latter is used primarily by upper-income households; (c) the estimation of dividend gross-ups to reflect actual taxes paid; (d) higher imputation values for fringe benefits; and (e) the conversion of the graduated tax into a flat 3 percent income levy.

### Reform of Tax Administration

Many of the administrative components of the reform package have already found their way into the tax system. The most important of these were the issuing of taxpayer identification numbers in December 1988, the construction of a master tax file (to be completed in 1990), computerization, staff training, the redesign of forms and documents, and the introduction of a document control system (also to be completed in 1990). There are signs, however, that an important proposal—the adoption of a *tax-inclusive* budget—may be shelved by the government because of the numerous objections received from several government departments.

### New Issues

After the sharp rise in the tax-to-GDP ratio in 1978 to 1984, it was unrealistic to expect taxes to increase revenue further in the immediate post-reform period. Nevertheless, tax revenue in this period has risen (on average by one and a half to two percentage points), in part because of inflation. But this has not been enough to prevent the budget deficit from worsening. Current expenditures are at least four percentage points of GDP higher than before the study. As a result, with external flows still low, inflation rates have doubled to 25 percent per year. This has the potential of undermining several of the earlier reforms. In the case of the company tax, inflation is causing the effective tax rate to rise because the real value of depreciation allowances is being eroded and nominal capital gains from inventories are being included in the measurement of taxable company income.<sup>15</sup> For the moment, the absence of indexation has been partly offset by provisions that are already in place for revaluing assets upon devaluation of the kwacha. In the case of personal income taxes, inflation has contributed to significant bracket creep under the PAYE system. Bracket amounts remained fixed in nominal terms between 1985 and 1988, while the consumer price index rose well over 50 percent in the same period. Pressures to index the rate brackets and other nominal amounts in the personal income tax are growing steadily but have been resisted so far for revenue reasons. The Technical Assistance team recently proposed that the statutory company income tax rate be returned to its earlier level of 45 percent and that the top marginal personal income tax rate be lowered to 45 percent to avoid income shifting.<sup>16</sup> Unfortunately, these proposals are being implemented without simultaneously expanding the tax base. As a result, the revenue from the explicit tax system is being traded off against the inflation tax, which may have an adverse effect on the efficiency and equity features of the tax system.

### Some Lessons from Tax Reform in Malawi

Although the experiment with tax reform in Malawi is recent and unfinished, it offers some general guidelines.

1. Reforms can sometimes be introduced more easily in a quasi-crisis situation because structural

weaknesses tend to be more evident. In Malawi, for example, the existing tax system did not prove to be a good foundation for raising more revenue. The need for revenue thus acted as an impetus for the rationalization of tax bases and rates despite the political and administrative costs that had to be incurred to bring about change.

2. Successful tax reforms require a high level of government commitment and continuity. In Malawi, the reform program has succeeded so far in large part because the government was supportive of the project from the start. Senior officials and key departments have been deeply involved in the selection and implementation of reform options. Clearly, this consultative approach can be time-consuming and a drain on resources, but in the long run it is more effective. It fosters commitment to the program and creates the political will to overcome obstacles as the reform unfolds. The participation of high-level government officials may well be an indispensable element in carrying out a reform of the tax system, for they provide the continuity and thus stability such a program cannot do without. By the same token, the departure of key officials can sometimes stall the whole process of reform.
3. Tax structures can be rationalized even where data are limited. Making different tax instruments serve distinct and separate functions helped clarify the intention of the reform process in a way that made it easier to redesign the instruments in current use and to defend the proposed changes. In Malawi, the restructuring of the surtax to become the revenue workhorse in the tax system, the redesign of excise taxes to enhance the equity characteristics of taxation, and assigning tariffs to serve the goal of protection were, and remain, important guiding principles of the tax reform process.
4. It is feasible to introduce tax reform in poor countries with limited administrative capacity and a limited tax base, even though the limitations can severely constrain reform options. Tax reforms may be easier to implement if they build on existing instruments rather than create entirely new ones. If an instrument has many desirable characteristics and has generated significant amounts of revenue in the past, it should be treated as the core of a reformed instrument, since it has proven to be administrable. In Malawi, it was much easier to fashion a surtax that embodied many features of the VAT than to scrap the surtax and replace it with a brand new VAT. This strategy takes advantage of the tax administrators' familiarity with the current system and encourages a smoother transition from the existing tax system to a reformed one.
5. Implicit or hidden taxes may be just as important, if not more so, as the overt features of the formal tax system. In Malawi, for instance, taxes on certain agricultural exports had been justified on the grounds that they equalize the burden of taxation between agriculture and other sectors. But focusing on explicit taxes only overlooked the fact that agricultural pricing policies, particularly those administered through a marketing board, already imposed an implicitly high tax burden on agricultural producers.
6. It is possible to link trade and domestic tax reform successfully. The overall approach adopted in Malawi realigned the nonprotective components of existing trade and production taxes so they could function as a rudimentary consumption tax. Although difficult to implement, these changes have either been completed or are nearly completed.
7. The exemption of low-income earners from the personal income tax contributes significantly to the progressivity of the overall tax system (since only a small percentage of households in a developing country are subject to the income tax). It is still necessary, nonetheless, to ensure some additional progressivity in the design of indirect tax rates because these are the taxes that affect the poor. Progressivity in indirect taxes is also desirable to the extent that there are wealthy individuals who evade the income tax.
8. Malawi's new tax system is now yielding more revenue than its old system (approximately two percentage points of GDP), in part because of the effect of inflation on tax payments, even though increasing revenue was not explicitly the goal of the reform program. But since the budget deficit remains high and inflation continues to be a problem, bases must be expanded further if the currently high statutory company tax rates and basic surtax rate are to be reduced. The expansion of tax bases and improved administration are more important than rate restructuring. Both processes take time. Hence, in the short run tax reform is not a panacea for deficit reduction without substantial cutting and restructuring of expenditures.

### Notes

1. See table 2–2, footnote C.
2. Cost, insurance, and freight.
3. These had been introduced at very low rates in 1981. As a result, effective tax rates on imported and domestically produced capital and intermediate goods rose faster than effective tax rates on consumer goods, as shown in table 23.
4. To restrict abuse and unwarranted claims, for example, duties paid on an imported saw blade used to fashion furniture for export would not be eligible for rebate because it was not incorporated in the product.
5. Where taxed sectors (such as the modern sector) interact with untaxed sectors (such as the informal or subsistence sectors), working out the ultimate incidence of taxation—to determine who carries the actual burden—is problematic. Even if through this interaction tax burdens were diffused throughout the economy, important distortions in resource allocations would remain, as measured by differences in effective tax rates. Thus approximating the average tax rate on the taxed component of GDP, rather than on all of GDP, is potentially a useful measure. It suggests that if the average rates are very high there might be barriers to the further expansion of (a) formal activities and transactions (since the latter are much more heavily taxed than the informal sectors), and (b) revenue (unless base expansion is feasible).
6. Within income taxes, it was the exemption from taxation rather than the progressivity of the rate structure that contributed most to the progressivity of the incidence of the tax burdens.
7. If experience showed this not to be feasible, the higher surtax rates would be eliminated and replaced by equivalent ad valorem excises. This would remove goods taxed at a higher rate from the crediting system.
8. Separately, the study also recommended the reinstatement of personal exemptions (or a zero–rate threshold) and the removal of some loopholes in the personal income tax to address equity concerns in the direct tax system.
9. In the short run, the administered foreign exchange allocation system determined the domestic price of imports in the economy. As a result, neither the level nor the structure of tariff rates was binding and the prevailing tariffs only served to soak up the economic rents created by the rationing of foreign exchange.
10. The calculations are based on the assumption of a debt–equity ratio of 5 percent, an inflation rate of 8 percent, and a nominal interest rate of 15 percent

11. What is not shown in the table is the tendency of the investment allowance to reduce even further the marginal effective tax rate on assets with a shorter life.

12. Over time, agitation from investors in other sectors had already led authorities to broaden the definition of "manufacturing" to include hotels and agricultural processing, but in an ad hoc manner. For example, buildings, such as warehouses and offices, were not eligible for tax allowances in any sector, even in manufacturing.

13. The equivalence between taxing fringe benefits at the personal level and disallowing a deduction at the company level breaks down if effective marginal company tax rates are less than the nominal rate, or if the company is tax-exempt.

14. Even though in principle the taxing of inputs is no more desirable for the informal sector than for the formal sector, in practice it could not be avoided given the existing administrative constraints. There was a silver lining, however. The higher tax rate imposed on inputs of the informal sector would not only expand the tax base immediately, by incorporating a group not previously subject to tax, but also in the long run if it encouraged more producers to enter the crediting network. The crediting would benefit them if they were in competition with other firms whose sales were credited in the reformed surtax, yet the tax on their output would generate more revenue than the tax on their inputs. For this to happen, barriers to registering and entering the crediting system would have to be removed or at least reduced.

15. Given the relatively unleveraged capital structure of most companies in Malawi.

16. Technical Assistance Team, Memoranda, November 1989 (World Bank 198790).

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### 3—

## Tax Administration and Tax Reform: Reflections on Experience

Richard M. Bird

Recent experience with the administrative aspects of tax reform provides some useful lessons for would-be tax reformers in developing countries. To appreciate these lessons, one needs to examine the relation between tax structure reform and tax administration, along with some critical aspects of "tax technology" in developing countries, as this chapter demonstrates. But it is also important to look at specific cases. Therefore the central part of the chapter is devoted to reviewing the administrative dimension of the recent Bolivian tax reform, with briefer references to experience in a few other Latin American countries.

### Approaches to Tax Administration and Tax Reform

The most naive approach to the relation between tax administration and tax reform is simply to ignore administration.<sup>1</sup> That is what happens in optimal tax theory, for instance, which gives administration little attention except in the choice of taxes. As Slemrod (1990) argues, if optimal tax theory is to become relevant to the formulation of tax policy, it must incorporate "tax technology" (administrability, for example, with respect to monitoring, measurement, and agency and enforcement costs) more explicitly. The size of the chasm now existing between optimal tax theorists and practitioners of the equally arcane, but quite different, art of tax policy is illustrated by the almost universal rejection by the latter of the clearest policy conclusion of the former, namely, that sales tax rates should be nonuniform.<sup>2</sup>

Tax reforms even in countries as sophisticated as Israel have at times fallen far short of expectations at least in part because of inadequate attention to the administrative dimension. Indeed, Israel may have made the same mistake twice. The fundamental administrative deficiencies of the 1975 Israeli reform are recounted in convincing detail in Radian and Sharkansky (1979), whose subtitle—"Partial Implementation of Ambitious Goals"—tells the story. Earlier, the principal economist authors of this reform had titled their own paper "The Political Economy of a Tax Reform" and had emphasized the pragmatic and compromised nature (from the point of view of pure theory) of what they felt they had been able to accomplish (Ben-Porath and Bruno 1977). Their outraged reaction (Ben-Porath and Bruno 1979) to a subsequent critical comment by Radian (1979) is thus perhaps understandable. Having gone along with all kinds of politically necessary compromises, they were now being attacked for administrative unrealism! It is impossible to read this exchange, however, without feeling that this response completely misses Radian's central point, namely, that reforms that do not take administrative limits adequately into account are likely to turn out in practice to be quite different from the way they look on paper.

Given this history, it is rather ironic to read the following assessment by Jenkins (1989: 23) of Israel's latest tax reform exercise: "The 1987 tax reform commission in Israel is a classic example of people with good intentions proposing complex tax policies in order to ensure economic efficiency and fairness. Many of the proposals would be impossible to administer and were rightly resisted by the tax administration." Eco-

conomic expertise alone, it appears, cannot produce workable reforms even in a country like Israel, which for decades has been fortunate enough to possess an administration that, although not perfect, is well above the usual standard found in developing countries (Wilkenfeld 1973).

Knowledgeable tax policy advisers are of course well aware of the importance of administration. The question is, what do they do about it? At one extreme, as already noted, they may either ignore it or, equally naively, assume that any administrative deficiencies can and will be quickly remedied once the right tax policy is put into place.<sup>3</sup> At the other extreme, they may take the quite different view that administrative feasibility dominates tax structure decisions. This dominant view is perhaps most clearly epitomized in the "tax handles" literature (for example, Musgrave 1969), which in effect argues that the tax structure of developing countries is dominated by their limited ability to administer taxes. Ports and breweries are few in number and easily visible: import and excise duties are therefore prime sources of revenue in most developing countries. In contrast, capital gains and income from wealth are difficult to locate, measure, and tax; such taxes are therefore of minuscule importance.

The result of this administration-dominated approach to tax policy may be a tax structure that burdens foreign trade and the organized modern industrial sector heavily and hardly impinges at all on most domestic consumption or such hard-to-tax groups as the liberal professions, small traders, and farmers and the nonmonetary sector in general. Traditional excise taxes, for example, score highly in administrative terms: the tax base is relatively easy to measure and monitor, and it is relatively simple to enforce and collect taxes on this base with little leakage into unauthorized pockets. Such taxes, levied as a rule on products for which demand is relatively inelastic and with which adverse external effects may be associated, may also look good in terms of the standard efficiency calculus.<sup>4</sup>

At the same time, heavy taxes levied on a narrow base may affect the organization and production of the taxed goods in unexpected and undesirable ways.<sup>5</sup> Moreover, as a rule the distributional effects of the traditional excise taxes on alcohol and tobacco are considered undesirable (McLure and Thirsk 1978). This concern may be overdone, however. In the context of many developing countries import and excise taxes may not be shifted forward, as is conventionally assumed.<sup>6</sup> To the extent such taxes are paid out of rents, their incidence may even be progressive. Where there is a large nonmonetary sector, taxes impinging only on the monetary sector will also be progressive.<sup>7</sup>

Whatever the facts, if politically significant groups are dissatisfied with the outcome of the tax system for any reason and consider it unfair, the result may be decreased compliance where taxpayers can get away with it. Decreased taxpayer morale owing to perceived unfairness may thus lead to increased shirking (evasion).<sup>8</sup> At the extreme, a sort of Gresham's law of taxation may operate, with the combination of bad taxes imposed on administrative grounds and the (in part consequent) evasion of good taxes leading to the virtual destruction of the tax system.

A related approach to the role of tax administration in tax reform may be illustrated by Tanzi (in Newbery and Stern 1987), who distinguishes between the statutory and the real (or effective) tax system. Tax reform thus conceived has two stages: changing what is said (the law) and changing what is done (the administration of the law). Policy change without administrative change is nothing. The converse is not true, however: in the memorable words of Casanegra (1990: 179), "tax administration *is* tax policy." The implication is that changing tax administration dominates changing tax structure as a means to achieving effective tax reform. Or, as Tanzi (in Newbery and Stern 1987: 238) put it, "The basic truth to remember is that control over the statutory system (over the tax laws) may at times be accompanied by very little control over the effective system. If such is the case, changing the laws may mean far less than we believe."

Two quite different approaches to the administrative dimension of tax reform have been sketched—and perhaps caricatured—above. The first approach suggests that tax reformers should concentrate on getting the tax structure right and worry about fixing up administration, if at all, only after tax law has been tuned to the desired specifications. There is no point in administering bad taxes better. In contrast, the second approach suggests that what really matters is administration. If policy outcomes are to be altered, administrative changes (which may also require legal changes) must come first. In reality, most authors who may appear to take one or the other of these views would likely say that this is a false choice: structure and administration are interdependent and tax

reform must take both aspects into account.

In a recent study of tax reform in Jamaica, for example, Roy Bahl (in Gillis 1989: 169), argues that "a first principle for successful tax reform is to get the policy right and *then* deal with the administrative problems." This declaration suggests his tent is clearly pitched in the first camp noted above. The main substantive argument Bahl (in Gillis 1989) gives for this conclusion, however, is that the tax structure may be so complex and unfair that it simply cannot be administered effectively.<sup>9</sup> This is an undeniably true statement, and not just for Jamaica.

Complaints about the compliance and enforcement problems caused by poor drafting abound in the literature in developing and developed countries alike.<sup>10</sup>

An especially dramatic instance occurred in the Philippines, where the nominally global and progressive income tax became so complex, hard to understand, and difficult to administer that a general sigh of relief went up when it was replaced a few years ago by a set of schedular taxes (Asher and Kintanar in Asher 1989b).<sup>11</sup> This explicit reversion to schedular taxation is noteworthy both because it appears to have been motivated largely by administrative considerations and because it is so contrary to the conventional wisdom on the virtues of global as compared to schedular taxation (see, for example, Shoup and others 1959). As noted later in the chapter, however, the Philippines may prove at least in this respect to be on the cutting edge of the new wave of tax reform in developing countries.<sup>12</sup>

Whatever one thinks of the Philippine reform, Bahl (in Gillis 1989) is quite right that it generally makes no sense to attempt to improve the administration of a badly designed tax. It does not follow, however, that attention should not be paid to improving tax administration as well as to tax design. Indeed, in his own work on Jamaica, Bahl (1988, 1991) has paid a great deal of attention to such critical aspects of tax administration as staffing, training, administrative procedures, and the collection and use of information. Like all good tax reformers, he is thus well aware of the interdependence of tax reform and tax administration.

At first glance, Bird (in Gillis 1989) may appear to be taking exactly the opposite line to Bahl's "first policy, then administration" argument. My central point in that paper, however, was simply that the key to successful tax reform in developing countries is to design reforms that will work properly, assuming that the tax administration in place at the time of the reform will remain much as it is. The argument is not that administrative improvements along the traditional (and correct) lines set out by Surrey (1958) are not desirable and necessary. It is rather that experience in many countries in recent years has demonstrated that such improvements are so difficult and time-consuming to accomplish that would-be tax reformers must as a rule work with what now exists, since that is all there is likely to be for years to come.

But this is really the same message, with a different emphasis, as in Bahl (in Gillis 1989). There is no point in administering more efficiently an inherently bad tax structure (Bahl). Nor is there any point in designing a good tax structure that cannot, and will not, be administered effectively (Bird). In short, the key to successful tax reform is to design a tax structure that can be administered adequately with the available resources while at the same time making the best possible use of those resources from a long-term perspective. A tax system comprises both structure and administration, and structural and administrative reform must be considered together if tax reform is to accomplish the goals usually attributed to it.

### Three Aspects of Tax Technology

In addition to simply recognizing the interdependence of the structural and administrative aspects of taxation, more research in the area of tax technology is needed to improve the success ratio of tax reform efforts.<sup>13</sup> This section reviews three aspects of this technology and suggests some possible lines for future research.

### The Importance of Administrative Incentives

Not one tax authority in the more than twenty developing countries in all parts of the world in which I have worked on tax reform has had available the sort of basic information on the characteristics of the taxpaying population that is needed to enforce taxes adequately and fairly. In many cases, the only current information available to the head of the tax administration has consisted of collection data, with no indication of who paid the tax, how it was paid, or whether it was paid on time. An obvious way to improve tax administration in most developing countries is thus simply to design and install better management information systems. Unfortunately, although much ingenuity has gone into designing and implementing better computer-based information systems (Lane 1990), little attention has been paid to the second, and critical, part of the problem: designing organizational and individual incentives to ensure that the information is used. An early paper by Haberstroh (1965) on managing a tax department has not, it appears, generated any subsequent general analysis or any publicly available case studies. Nor has there been any systematic analysis of the optimal way to reward tax officials, although this subject cries out for study owing to the universality of the problems arising from the low salaries paid to tax officials.

In Indonesia, for example, revenue targets or quotas were for many years the principal way in which the income tax administration was managed and tax officials rewarded. This system was almost universally condemned by visiting experts as arbitrary, inequitable, and discouraging to good administrative practices.<sup>14</sup> Analysis of the targeting system suggested, however, that the targets were set to support rather than discourage administrative effort. Even the apparent arbitrariness and inequity with which they were sometimes applied accorded with prevalent political and cultural norms. Rather than an archaic anachronism, targeting in the Indonesian context possessed the

important virtue of providing a predictable flow of revenue while permitting the central authorities to oversee the (as it were) "official tax farmers" who actually ran the system.

The designers of the Indonesian tax reform of 1985 were aware of this entrenched system and of the potential problems it posed. Gillis (1985), for example, explicitly noted that the success of the reform depended critically upon the readiness of tax officials to change their ways.<sup>15</sup> In fact, as Gillis (1990) later noted, not only did the tax administration not support the income tax reform but even five years after the reform there was little evidence of any significant change for the better in administration. There have of course been some changes, and some improvements, in Indonesia's tax administration in recent years (Nasution in Asher 1989b). Nonetheless, the consensus appears to be that the important reforms in the income tax law have had less impact on taxpayers than expected largely because of the failure of the tax administration to mend its ways (Asher 1989a; Gillis 1989, 1990; Jenkins 1989). How any other outcome could have been expected, given that the same people were still responding to the same incentives in the same ways, is unclear.

Similar problems are likely to arise in implementing any tax reform unless close attention is paid to the internal incentive structure of the tax administration. In Egypt, for example, tax officials currently receive much of their (legal) compensation in the form of (untaxed) incentive payments based on a sort of targeting system.<sup>16</sup> In Senegal (and many other countries) tax officials receive much of their compensation from the additional tax and fines they collect—a system obviously fraught with the possibility of abuse. In Jamaica, at least prior to the recent tax reform, many tax officials relied heavily on (nontaxable) travel allowances to make a living wage—a system that encouraged unproductive travel around the island. Such aspects of the reward systems (compensation and performance appraisal) prevailing in different tax administrations are not minor matters. As the Indonesian example illustrates, these details may determine the outcome of major reforms in tax structure.<sup>17</sup>

### The Costs of Taxation and Other Quantitative Questions

The cost of levying taxes is obviously a relevant consideration in shaping the tax structure in any country.<sup>18</sup> A recent study in the United Kingdom of the operating costs—public (administrative) and private (compliance)—of the tax system found that this cost came to about 4 percent of revenues, or 1.5 percent of GDP (Sandford and others 1989).<sup>19</sup> The real resource cost of running the tax system is probably at least as large in developing countries and deserves more attention than it has received.<sup>20</sup>

Although there are obvious difficulties in carrying out cost studies (Bird 1982a), particularly in developing countries, a worthwhile research task would be to estimate the administrative and compliance costs of both existing taxes and, especially, of proposed tax reforms.<sup>21</sup> Tax changes create such transitional costs as increased uncertainties, start-up costs, and learning costs. These costs, too, need closer study to ensure that the gains from change exceed its costs sufficiently to make the investment worthwhile.<sup>22</sup> Frequent changes in tax structure (like large differentials in taxes that depend on minute differentiations in real circumstances) are likely to result in regressively distributed real social costs exceeding any benefits resulting from the change (or differential).

Economists may have neglected unduly the operating costs of tax systems. The same cannot be said of the efficiency costs (excess burden or deadweight loss) that are the main focus of much economic analysis of taxes.<sup>23</sup> Changes in economic behavior induced by taxation reduce the real level of well-being every bit as much as does the using up of real resources in collecting the taxes in the first place. Although estimates of efficiency costs are considerably more speculative than those of operating costs, their conceptual appeal is such that many more such estimates may be found in the literature, at least for developed countries.

Although such estimates are subject to wide variation, most economists today would probably agree that efficiency costs are likely to be at least 20-30 percent of revenues collected (and, some would say, perhaps much higher). Indeed, if one adds to such costs—as Usher (1986, also in Bird 1991) has persuasively argued we should—an allowance for the real cost of concealing income or sales from the tax authorities (the cost of tax evasion), the overall cost of collecting taxes would look even higher.<sup>24</sup>

Unfortunately, the amount of quantitative evidence available on such questions is risible. Malcolm Gillis (in Bird 1991), for example, reports two unpublished studies, in Colombia and Indonesia, which suggested that for every \$1 in bribes received by tax officials, governments lose \$20 in tax revenues. The cost to taxpayers of evading direct taxes in those countries was thus probably as low as 5 percent of the tax evaded for those caught in the rather porous tax net—and much lower for those who slipped through unnoticed.<sup>25</sup>

Such estimates ignore the expected value of being caught and penalized. Despite the prominence of such calculations in the extensive economic literature on tax evasion (following on Allingham and Sandmo 1972), however, this omission is not significant. Tax evaders in most developing countries can realistically assign an

expected value of zero to the likelihood of being detected and penalized. The utility of extending the now conventional formal analysis of noncooperative games to developing countries thus seems dubious.<sup>26</sup> Demonstrations of the dependence (or nondependence) of evasion on the height of tax rates and the precise design of the penalty structure are unlikely to provide much information of interest to tax authorities.<sup>27</sup> Moreover, scattered evidence in different countries suggests that the more severe the penalty the less likely it is to be applied. As Levi (1988), Lewis (1982), and others have stressed, good taxpayer–government relations require attention not only to the control mechanisms (sanctions, audit probabilities) stressed in the economic literature but also to the important mechanisms of social cooperation that constitute part of the "institutional constraints" (Mansfield 1987) that enable tax systems to collect significant amounts of revenue.<sup>28</sup>

Similar casual empiricism (for example, in Paraguay, where smuggling constitutes a major economic activity) suggests that, as a rule of thumb, the cost of smuggling (bribes, additional transport costs, and the like) is probably on average no more than 10 percent of the value of the smuggled goods. Although I am aware of no systematic study of this point, it is interesting to note that a uniform 10 percent tariff rate appears to be a relatively common recommendation in reform packages, such as that adopted in Bolivia recently (Thirsk 1989a).<sup>29</sup>

An even more casual observation (reported by Joel Slemrod in Bird, 1991) is that for every additional \$1 spent on tax enforcement in Mexico, an additional \$25 in revenues is collected.<sup>30</sup> Gillis (1990) reports an even more startling figure from Indonesia, where a special "strike force" of auditors, focusing on a limited number of large firms reporting losses for 1985, produced a direct revenue return equal to 340 times the investment. The ripple or indirect effect—that is, the resulting improvement in "quasi-voluntary compliance" (Levi 1988) as a result of the increased perceived probability of detection—would presumably have made these results even more impressive. As Gillis (1990) says, "This special team clearly demonstrated not only the presence of great 'slack' in tax administration, but also the tremendous potential returns available from investments in targeted audits. Unaccountably, however, the group was disbanded at the end of 1987."

This interesting story suggests two lessons that merit further consideration. The first is that no government, no matter how authoritarian it may be, can with impunity enforce taxes too harshly on politically influential groups.<sup>31</sup> More generally, as Shoup (1969: chap. 17) and Goode (1981) observed, no government anywhere pushes enforcement to the point at which marginal administrative cost is equated to the marginal revenue collected. Nor, as these authors properly stress, should any do so. Nonetheless, it would clearly be useful to understand this relationship better, both empirically and analytically.

The second lesson from the Indonesian story concerns the appropriate strategy for deploying auditing resources. In terms of direct returns, there seems little question that targeting big taxpayers is likely to prove most rewarding. As Muten (1981) has stressed, it often makes sense to concentrate scarce administrative resources on those few taxpayers, generally large firms, from whom taxes can actually be collected rather than dissipating them to little avail across the vast array of small and medium taxpayers. It may thus be sensible to create special administrative sections to exert tight control over large taxpayers, as has been done in Bolivia and Argentina. The large literature on how to deploy auditing resources optimally (see, for example, Balachandran and Schaefer 1980) usually similarly favors a selective, targeted, approach.

At the same time, there are at least three reasons for spreading auditing talent more thinly. The first is to encourage greater compliance by small taxpayers by making it clear that they are not immune to enforcement efforts (Casanegra 1990). A second reason, equally obvious, is in the name of those eternal verities of developmental tax policy, equity and economic growth. Enforcing taxes most rigorously on the largest companies may maximize revenue, but it is both unfair and may tend to encourage the expansion of less efficient, and less taxed, sectors of the economy.<sup>32</sup> Finally, as Cowell and Gordon (1989) have demonstrated, random audits may be most efficient even in terms of the conventional economic analysis of evasion when the possibility of total noncompliance is taken into account.<sup>33</sup>

### **The Link between Expenditures and Tax Administration**

The efficiency and effectiveness of any tax administration reflects many factors. The importance of an adequate legal framework both for the tax structure and such procedural aspects of administration as assessment, collection, review, appeal, and penalties is clear (Yudkin 1973). So is the need for adequate internal management and effective deployment of resources by the administration itself. In addition, however, it is critical both that the political authorities support effective tax administration and that taxpayers themselves are neither implacably antagonistic to the administration nor excessively tolerant of evasion. When a tax administration lacks political support and is badly run, it will lose credibility with the public, and thus further erode its political (and probably resource) base. Argentina's recent experience affords a clear demonstration of this vicious circle at work.<sup>34</sup>

How people feel about taxes and tax administration at least to some extent reflects how they feel about expenditures.<sup>35</sup> When people are antagonistic to government, when they feel that it is wasting their money and not acting in their best interests, taxes and tax officials are likely to be even more unpopular than usual.<sup>36</sup>

This line of argument should not be misunderstood. I am not arguing that a good tax system is one in which there is a high degree of voluntary compliance. Such voluntary compliance is largely a myth. Even if every individual citizen fully supports all government actions and willingly accepts a resulting high tax level in principle, it is still in his individual interest to reduce his share of the total tax burden. Tax systems depend more upon taking money away from people before it gets into their hands—and scaring them into paying the balance—than they do on goodwill. Nonetheless, the boundaries of what is considered reasonable tax evasion in any society are elastic, and how far these boundaries are stretched depends at least in part upon how the government is perceived by its citizens. People seem to be more willing to pay taxes if they think the funds are well used—particularly for their own benefit—and if they feel fairly treated relative to the individuals and groups with whom they compare themselves. As Bates (in Gillis 1989) has stressed, one can understand the politics of tax reform only if one considers both the costs of taxes and the benefits of expenditures for specific political actors.

The principal functions of government are to deliver services and to manage conflict. Traditionally, economists have considered only the first of these objectives. Even the best-intentioned government can live up to its good intentions only if it is in power, however, and it can stay in power only if it can muster sufficient support, including tax revenues. Some critical support generally comes from groups to whom, so to speak, government delivers the goods, whether as formal or informal tax concessions or as public expenditures favoring their interests. Governments reward those whose support and cooperation is needed to accomplish particular policy goals.<sup>37</sup>

In some instances, one key to tax reform may be to link expenditures and revenues more explicitly than has usually been done in practice or advocated in the tax reform literature.<sup>38</sup> The principle of benefit taxation—of levying taxes in accordance with the benefits received from the expenditures they finance—is an old one, with a rationale well-grounded in both equity and efficiency (Bird 1978). Few seem to realize, however, the extent to which this approach can usefully be applied in developing countries that find it difficult to raise taxes and to spend the proceeds efficiently.

The precise outcome of benefit taxes and user charges depends on the details of the particular expenditures and financing methods in question. Although generalizations are as suspect in this as in most areas of economic policy, the more effective use that can be made of expenditure-revenue links, the more acceptable any given tax system (or proposed reform) may be. It may also be easier to administer, although this is far from certain since the cost of administering benefit-related systems can be high and it is by no means clear that greater acceptance implies greater compliance. As in the case of administrative incentives and the costs of taxation, much more careful study of particular cases is needed before any firm conclusions can be drawn with respect to the costs and benefits of particular types of expenditure-revenue links in different contexts.

### **Tax Administration and Tax Reform In Latin America**

Two types of tax reforms have taken place recently in Latin America.<sup>39</sup> The first type, of which Bolivia affords the most dramatic example, is a drastic overhaul of the tax system in a short time. The second, of which Colombia is perhaps the best example, is a more gradual evolution through a series of reforms over a longer period of time. The results of both processes are similar, however—and very different from the direction of reform favored in such well-known reports as those by Musgrave (1981) and Musgrave and Gillis (1971) and Shoup (1965) and Shoup and his colleagues (1959). This section considers briefly a few of the apparent lessons in tax administration and tax reform suggested by this recent experience, particularly in the much-publicized Bolivian case.

### Bolivia

As Thirsk (1989a) has shown, the export boom of the 1970s that masked the fundamental weakness of Bolivia's revenue structure encouraged an unsustainable expansion of government expenditure. When world recession hit early in the 1980s—exacerbated by adverse weather conditions in the agricultural sector—both current revenues and Bolivia's access to foreign capital fell sharply. The only way out was through recourse to the Central Bank, with the consequences of rising inflation, still further declines in revenue, and still more inflation.

Lagged collections of income taxes together with poor penalty and enforcement systems diminished real collections from direct taxes—a phenomenon earlier documented for Argentina by Tanzi (1977). Heavy reliance on specific rather than ad valorem excise tax rates, as well as the effects on trade taxes of the overvalued exchange rate and the consequent increased incentive to smuggling, similarly reduced real indirect tax collections. The results were catastrophic: central

government tax revenue fell from an average of about 11 percent of GDP in the 1970s to less than 3 percent in 1984 (Mann 1990). At the same time, inflation was roaring ahead at an annual rate of close to 12,000 percent by 1985, and per capita income and consumption were declining sharply (Thirsk 1989a).

This crisis clearly demanded drastic changes in policies. The newly elected government of Paz Estenssoro, with surprisingly broad political support, carried through in a short time a series of substantial economic reforms that deregulated and liberalized a wide range of economic policies. An important element in this new economic policy was a complete reform of the tax system in May 1986. The immediate effect of this package of reforms was to halt inflation dead—by 1987, the annual rate of inflation was reduced to 14 percent—and to reduce the fiscal deficit (which had reached a peak of more than 30 percent of GDP in 1984) to less than 2 percent of GDP (Thirsk 1989a).

The remarkable achievement of increasing taxation to 13 percent of GDP by 1986 and 17 percent by 1987, from a low of 3 percent in 1984, reflects three facts. First, and most important, the situation in Bolivia had become so desperate that the characteristic Latin American *modus vivendi* under which inflation is more politically acceptable than taxation was no longer viable. All major political groups were, at least for a time, prepared to swallow the bitter medicine of tax reform. Second, the government acted decisively and quickly with the explicit objective of restoring revenues and creating a more stable tax system. Third, most of the measures it took to this end proved efficacious, thus restoring the necessary degree of confidence without which no economy can function effectively.

The key to reforming domestic consumption taxes in Bolivia, as in many other countries, was the imposition of a 10 percent value added tax (VAT) on an extremely broad base, excluding only housing, financial services, and (of course) transactions in informal markets. The new VAT was supplemented by taxes on specific consumption items at rates of 30 percent (on alcoholic beverages and, more questionably given enforcement problems, perfumes and cosmetics) and 50 percent (on tobacco and, also questionably for the same reason, jewelry).<sup>40</sup> In addition, and more surprisingly, the VAT was also supplemented by a new 1 percent transactions tax. This tax is really a cumulative turnover tax subject to precisely the defects of cascading, taxation of (inputs to) exports, and so on that the value added form of sales taxation is designed to eliminate. The introduction of this archaic form of sales tax was apparently intended to provide a little additional revenue, as well as information that might be useful in enforcing the value added tax.

The aspect of the Bolivian tax reform that seems to have attracted most attention abroad, however, is the introduction of a "complementary" tax, under which all income (wages, salaries, rentals, interest, royalties, and so on) is subject to a 10 percent withholding tax. The base of this flat tax is not really gross income, however, because individuals can offset against this tax four "minimum national salaries" (approximately US\$80) per

month and the value added taxes they have paid, as verified by invoices. The aim of this levy is thus not so much to generate revenue as to encourage people to acquire VAT receipts. Moreover, since in principle the government can add up the information received from individuals, firms should presumably be encouraged to remit the VAT they collect to the government.

The stimulus to tax enforcement provided by this device may not be important, however. The incentive to collect receipts seems weak given the obvious alternative of making a deal with the merchant not to pay the VAT in the first place and splitting the difference. Moreover, the government seems unlikely to be in a position to do much with any information it receives as a result of this provision. Related schemes to encourage consumers to demand VAT receipts have long been used in other countries (for example, Chile) and at best have proved to be of marginal use in enforcing the VAT (Casanegra 1990). Even the much more advanced Republic of Korea, which set out initially to check all invoices claimed for credit by purchasers against those reported by sellers, soon gave up the attempt as costineffective (Choi 1984, 1989). Apart perhaps from some initial effect of scaring taxpayers into compliance, this particular tax gimmick seems unlikely to have played a large role in the revival of the Bolivian tax system.

Perhaps the most startling aspect of the Bolivian reform was that income taxes were simply eliminated.<sup>41</sup> In their place, a trio of new taxes was created. Owners of real estate and vehicles were subjected to a progressive tax (the proceeds of which are shared with municipalities) at rates ranging from 1.5 to 5 percent on vehicles and from 1.5 to 3 percent on urban real estate, the rate varying with value. These rates would be high if the values were adequately assessed, but obviously the efficacy of such taxes, like that of their predecessors (vehicle and urban property taxes) depends entirely on the effectiveness of the automobile registration system and on how up to date cadastral values are. The similar tax later established on rural property, based on the potential yield of the land and the nature of farming in the region, seems likely to prove too complex to amount to much in the circumstances of Bolivia.<sup>42</sup>

The enterprise income tax was replaced (except for cooperatives and natural resource companies) by a 2 percent tax (later increased to 2.5 percent) on the net worth of enterprises. The taxes on vehicles and real estate owned by enterprises are creditable against this tax. An important consequence of the abolition of the enterprise income tax is that the array of investment incentives that had proliferated in Bolivia in the early 1980s have all vanished (although established firms

benefiting from such incentives are still exempted from the new assets tax).<sup>43</sup> The efficacy and effects of the new business net worth tax depend entirely upon how well it is administered, for example, with respect to detecting fraudulent debts used to reduce net worth. A similar tax has been used with considerable success in Colombia for many years (McLure and others 1989), but with the important difference that it serves not as *the* tax on business income but as a *minimum* tax.<sup>44</sup> Similar minimum corporate taxes, in various forms, exist in Mexico (Gil Diaz 1989), Turkey (Bulutoglu and Thirsk 1989), and a number of other countries (Muten 1982).

The final component of the new set of direct taxes is the only one that shows any influence from the well-known Musgrave (1981) report. A "simplified" tax was imposed on very small enterprises (as measured by both capital and sales) to replace not only the enterprise net worth tax but also all other taxes (such as the VAT) payable by such enterprises. Basically, the simplified tax on any business is a fixed (lump-sum) amount determined on the basis of (self-declared) gross sales revenue. Clearly, the effects of this tax will again depend entirely on the success of the administration in ensuring that these declarations are at least roughly in accordance with reality and especially in preventing larger firms from fraudulently sheltering themselves (through artificial fragmentation) within the haven of the simplified tax.

All the new direct taxes thus depend on precisely the sort of good tax administration Bolivia has long lacked. The changes in tax administration that formed an integral part of the reform are therefore at least as important as these

changes in tax structure. Five significant administrative changes go some way toward explaining the relative success of the Bolivian reform.

The first such change, perhaps more important in symbolic than in real terms, was the creation of a new Ministry of Tax Collections, essentially taking the tax collection function out of the Ministry of Finance and giving it new status by raising it to ministerial level. After the crisis subsided, this office was later reincorporated into Finance.

A second notable administrative reform was to eliminate a number of small taxes and, as already described, to simplify considerably the administration of direct taxes, essentially by redesigning the tax structure to eliminate such difficult tasks as the need to assess business profits or to apply a progressive personal income tax on a comprehensive base.<sup>45</sup> An important consequence of these changes was to reduce the direct negotiation between taxpayers and officials that too often characterized the old system.

Third, the government launched a surprisingly successful registration campaign for new taxpayers, something that had really never been tried before in Bolivia. The result was to double the number of registered taxpayers, although it is not clear what the revenue effects of this increase were or whether the new information is being effectively used.<sup>46</sup>

The final two administrative changes were undoubtedly the most significant from a revenue point of view. One change was to strengthen tax enforcement, especially in La Paz, the capital and largest city. In particular, a special office was created to keep a close check on the few dozen largest and most important taxpayers, penalties (and interest penalties for late payment) were strengthened,<sup>47</sup> more use was made of computers to monitor taxpayers, and—most striking of all, given Bolivia's previous dismal record of enforcement—some establishments were actually closed for failing to issue proper VAT receipts. That the tax administration not only has some idea of what is going on, at least in this important part of the economy, but is able and willing to penalize noncompliers is something totally new in Bolivia and appears to have had a healthy effect in stimulating compliance.<sup>48</sup>

The final change was to turn tax collection over to the commercial banks. The banks not only receive tax payments but also the returns from taxpayers and are responsible both for sending the taxes collected to the Treasury (or, in the case of the municipal share, to the local authorities) and for supplying data to the tax data center. In exchange, the banks are allowed to keep 0.8 percent of the revenues they collect.<sup>49</sup> Although there continue to be some delays in processing, this system ensures better control over both revenue and data than the former system. Equally important, the new system minimizes direct contacts between tax officials and taxpayers, thus substantially reducing the opportunity for corruption.

Apart from the critical importance of both widespread political acceptance of the need for drastic change and taking tax administration seriously, two other ingredients may be identified in Bolivia's successful tax reform. The first was the strong emphasis on simplification: on the adoption of a uniform tariff and the elimination of minor taxes, investment incentives and other exemptions, and, most striking, any attempt to tax either personal or corporate income. Second, the emphasis on administering effectively a uniform, broadly based value added tax was clearly the key to revenue success. Apart from the abolition of income taxes, such recommendations have been standard in tax studies for decades. The main novelty is that Bolivia actually did it.

What is less clear is how important the more novel parts of the Bolivian reform package, especially the transactions tax and the complementary tax, were in making the value added tax a relative success. These devices may have helped to some extent in making it more credible that the VAT was going to be enforced effectively, but their usefulness in this respect probably diminished fairly rapidly. On the whole, there seems little reason either to have introduced the archaic trans-

actions tax or to keep it. The future of the complementary tax is more difficult to discern, even if the skepticism expressed above with respect to its effectiveness in improving the administration of the VAT is accepted, because this tax must be considered in the context of the drastic changes in direct taxes that formed an important part of the Bolivian reform. Indeed, apart from the extent to which the complementary tax is really a tax on income (or savings) there are now no income taxes in Bolivia.

In practice, as noted earlier, the yield of the taxes that have replaced the income tax depends on the extent to which the tax administration is successful in maintaining current market-value assessments of real property. As has often been argued in the context of developing countries, real property taxes are, on the whole, good taxes (Bahl and Linn, forthcoming) but they are by no means easy to administer, especially in the face of inflation (which had crept back up to an annual rate of 20 percent in Bolivia by 1988). It is not clear that sufficient resources are being devoted to tax administration to maintain the relatively high standards reached shortly after the reform. It remains to be seen whether the apparent inequity of not subjecting high-income recipients to any form of direct personal tax will prove to be politically sustainable in Bolivia. Both the net worth tax on enterprises (especially, perhaps, if it became a minimum tax on Colombian lines; see McLure and others 1989) and the simplified regime for small businesses, however, seem likely to become permanent, and generally desirable, features of the tax system in Bolivia.

### Argentina

Bolivia and Argentina are at opposite ends of the development spectrum in Latin America, however that rather nebulous concept may be measured. Nonetheless, at least some aspects of Bolivian experience may perhaps be emulated in Argentina. The explanation is simple: by 1989 the Argentine economy was in almost as bad a mess as Bolivia's was in 1985. Inflation was out of control, the economy was virtually "dollarized," and government economic policy in all spheres had lost credibility. Just as in Bolivia, the tax system had been heavily eroded by exemptions and incentives, ravaged by inflation, and administered in an increasingly ineffective manner. These factors made Argentina at least as ready for a "tax revolution" in 1989 as Bolivia had been in 1985.<sup>50</sup> It is therefore not surprising that the newly elected Menem government soon had under consideration, and to some extent adopted, a tax reform that in some ways is similar to the Bolivian package described above.

One set of proposals considered by the new government in late 1989 (Dadone 1989) bore a particularly close resemblance to those enacted earlier in Bolivia. As in Bolivia—and fifteen years earlier in Uruguay and Chile (Harberger in Gillis 1989)—one element of this proposed reform was to simplify the system by abolishing a number of taxes that either yielded very little or (as in the case of the stamp tax) imposed significant inefficiencies on the economy. In addition, a number of payroll taxes earmarked to different funds were to be consolidated into a simpler levy. The most important changes proposed, however, were to introduce (a) a broadly based value added tax at a uniform rate, (b) a flat-rate income tax, at a rate of 20 percent, and (c) a considerably simplified, though still far from uniform, set of foreign trade taxes. Unlike Bolivia, however, not only were no new taxes proposed on assets but the existing taxes on net wealth of both individuals and corporations were to be abolished.

The resemblance of these proposals to those adopted earlier in Bolivia was particularly strong since up to half (10 percent) of the proposed 20 percent income tax—which, as in Bolivia, was to be collected by withholding on all forms of income payments—could, like the Bolivian complementary tax, be paid by producing VAT receipts. Moreover, in a striking example of what might be called the "Chinese menu" approach to tax reform—select one item from list A, and one from list B—this system was to be supplemented by adopting a device from Chile and holding a lottery that distributed prizes for tax receipts. As was noted above with respect to Bolivia, however, the effect of such devices in improving tax administration seems unlikely to be important. Unless the public perception of a significantly improved administration that will actually use such information and enforce taxes is soon reinforced by action, any initial illusory effect seems likely to erode quickly, leaving the administration buried in a sea of unused (and probably often falsified) VAT receipts.

In any case, the tax reform actually proposed to Congress in October 1989 did not adopt this particular gimmick. It did, however, emphasize broadening the base of the VAT and in addition introduced a 1 percent tax on corporate assets to replace the net worth tax. As finally approved at the end of 1989, this new tax was applied on gross assets (that is, without allowing for offsetting liabilities) for a period of three years, with the tax paid being creditable against corporate income tax. At the same time, the corporate income tax rate was cut from 33 percent to 20 percent and dividends (now subjected to a 10 percent withholding tax at source) were exempted from personal income tax.

No matter how clever the design of a tax reform, however, it will amount to little unless a credible tax administration exists to enforce it. Despite some promising signs—such as the adoption early in 1990 of a law imposing criminal penalties on tax evaders—it is as yet

unclear that Argentina is prepared to face up to the hard, and invariably unpopular, steps required to restore faith in its tax administration.

### **Colombia**

Tax reforms in other countries such as Mexico and Colombia in recent years have by no means been as dramatic as those in Bolivia or Argentina. Nonetheless, their cumulative impact has been significant. In contrast to the two cases discussed above, reform in these countries generally represents not a sharp break with past experience under the stimulus of external pressure but rather a process of more or less gradual adaptation to changing circumstances.

In Colombia, for example, where there had been some partial inflation adjustments in the years following the substantial tax reform of 1974, a later major reform in 1986 went considerably further in this direction, moving the taxation (and deduction) of interest to a real rather than nominal basis. Then reforms in 1988 began a gradual process of moving to a fully indexed tax base for business and capital income (similar to that adopted in the much more inflationary economy of Chile a decade earlier [Casanegra 1985]).

In addition, a number of other changes were introduced in 1986 to simplify the direct tax system. For example, by abolishing personal exemptions, income splitting, and (most) itemized deductions, the need for most taxpayers to file returns was eliminated. The distorting effect of the tax system on economic decisions was further reduced by such measures as unifying the treatment of corporations and limited liability countries, lowering the top rate of the personal income tax to 30 percent (equal to the new unified business tax), and exempting dividends from taxation at the individual level. Some of these changes, like the abolition of the net wealth tax in 1989, seem more dubious in (theoretical, if not necessarily real) equity terms than in efficiency terms. For the most part, however, they all score fairly well in terms of improving the administrability of the system.

Indeed, perhaps the most outstanding feature of Colombia's tax reform experience is the marked contrast between the earlier (1974) and the later (1986) reforms. The 1974 reform, which followed the pattern laid out in Musgrave (1971), ambitiously tried to achieve at least to some extent the textbook virtues of comprehensive income taxation. But it ignored the realities of inflation and (owing in part to judicial invalidation of the relevant legislation) administrative limitations. The later reform, while clearly influenced by the new textbook model of an efficient tax system as one with lower rates and broader bases, both faced the reality that inflation is likely to be around for a long time and, partly in recognition of the constraints imposed on policy by administrative feasibility, was much more modest in what it attempted to do in terms of achieving equity through tax policy.

The Colombian tax system, like that in Mexico, may still be at best "roughly just." In both cases, however, recognition of the inevitable roughness (approximate nature) of the distributional objectives that can be attained in an open economy with severely limited administrative capability has led to a much more restrained approach to

redistribution through the fiscal system than was common in earlier years.<sup>51</sup> Similarly, Colombia, although never as far down the fiscal incentive road as Argentina (where tax incentives gave away at least 10 percent of tax revenue in 1988; see World Bank 1990), has clearly, like the other countries discussed here, retreated a long way from the days of the earlier view of tax incentives as an essential tool of interventionist development policy (Bird 1970).

Unfortunately, although administrative realism has obviously influenced the formulation of recent tax policy in Colombia, it is not clear that sufficient attention has been paid to the essential task of improving tax administration itself, rather than redesigning the system around its imperfections. A great deal has been done to improve tax administration in Colombia through the introduction of bank collection, the elimination of procedures that were both burdensome and ineffective, and so on (McLure and Pardo 1991). Nonetheless, Colombia has not been able to overcome the fundamental problem bedeviling direct tax administration in most of Latin America, namely, the political impossibility of enforcing taxes on rich and powerful taxpayers (Urrutia and others 1989). Perhaps, however, it takes something like a Bolivian-style crisis before governments can face the unpleasant reality that at some point they must search out and penalize tax evaders, even their friends, if they are to establish a stable tax base.

### **An Overview of Latin American Experience**

In general, experience with recent tax reforms in Latin America may perhaps be summed up, with some trepidation, as follows:<sup>52</sup>

The objectives and nature of tax reform appear to have changed substantially since the 1960s.<sup>53</sup>

The value added tax now plays a central role in most large-scale tax reforms.

There is much greater awareness than before of the important constraints imposed by the administrative dimension of tax reform.

Nonetheless, some reformers in Latin America still seem to be overly tempted by tax "gimmicks" that promise reform without the need to undergo the slow and painful process of creating an adequate public administration.

The move to lower marginal rates of income taxation, particularly in the top brackets, is widespread: in recent years Colombia has lowered its top rate from 49 to 30 percent, Bolivia from 40 to 10 percent, Argentina from 45 to 35 percent, Guatemala from 42 to 34 percent, El Salvador from 60 to 35 percent (Jenkins 1989), and so on. Indeed, Bolivia has gone further than these figures suggest and has effectively abolished the income tax for most people, while Colombia has moved to a gross income basis for most taxpayers.<sup>54</sup> There has clearly been a turn away from the use of the tax system to redistribute income. The day when one could consider the tax system to be "the supreme equalizer" of the economic system (Organizacion de Estados Americanos 1973), the main means of correcting inequalities in income and wealth, is gone.<sup>55</sup>

One reason for the apparent reversal in attitude toward direct taxes since the earlier wave of tax reform—for example, both the Taylor and others (1965) and Musgrave and Gillis (1971) reports in Colombia recommended *increases* in the top income tax rate—is undoubtedly greater recognition of the severe constraint imposed on redistributive taxation by administrative factors.<sup>56</sup>

In Latin America, as in the rest of the world (Tait 1988), the value added tax has come to play a critical role in all attempts to modernize the tax system.<sup>57</sup> In particular, reforms engendered by fiscal crisis, which invariably call for increases in revenues, can often attain their revenue goals only by relying on the value added tax. An effective value added tax requires a fairly competent tax administration; a VAT is in no sense a "self-enforcing" tax

(Casanegra 1990). The deterioration of the VAT in both Bolivia and Argentina in the early 1980s demonstrates the truth of this proposition.[58](#)

Tax reformers have, in recent years, become increasingly aware of the constraints imposed not only by the obvious political opposition that reform almost invariably engenders but also by the limits of administrative feasibility (Bird, in Gillis 1989). The Bolivian and Argentinean episodes discussed above bear particular witness to the truth of this claim, but its importance is also evident in every other country in Latin America that has undergone significant reform, such as Chile and Uruguay (Harberger in Gillis 1989).

Much that is positive can be said about the Bolivian tax reform, for example. Unfortunately, it appears that in this case, as with the prior experience of Chile, some analysts have confused, as it were, the frosting and the cake and considered the essence of the Bolivian (or Chilean) reforms to be the introduction of such outwardly clever structural devices as crediting VAT receipts against income taxes or holding lotteries based on such receipts.[59](#) The real secret of success lies not in such gimmicks, however, but in the more mundane task of establishing a more credible and effective tax administration. Such devices may perhaps help change public perceptions of the probability of being caught, but unless the administration is in fact made more credible and effective, this impression is likely soon to wear out.

If tax administration is improved—utilizing (as in Bolivia) such proven techniques as extensive reliance on withholding, the replacement of complex taxes by simple taxes, improved use of available information, and visible enforcement activity—gimmicks intended primarily to increase the flow of information to the administration may provide some extra benefit. In no circumstances, however, can such gimmicks *replace* improved administrative effort.

In any case, the kind of tax reform that can be successfully administered in even the most sophisticated countries of Latin America now appears to be quite different from the nominally progressive income tax that has traditionally existed (on paper) in most countries and has long been advocated by would-be reformers.[60](#) Since an effective general sales tax has come increasingly to constitute the cornerstone of successful revenue systems in developing countries, the first concern of serious tax reformers should almost certainly be to put such a tax (probably a VAT in most countries in Latin America) in place.[61](#) Accompanying the rise of the VAT, however, has been a move away from progressive income taxation. In part, this move may reflect the lesser attention now being paid to redistribution through the fiscal system as a policy objective. In addition, however, the lesser emphasis on direct and progressive personal taxes appears also to reflect the realization that such taxes have not been, and probably cannot be, effectively administered in the context of most Latin American countries.[62](#) The necessity, like the desirability, of this marked shift in tax policy emphasis may certainly be questioned. But what cannot be questioned is that, for better or for worse, the highly progressive global income tax that once constituted a key instrument in every tax reformer's tool kit is no longer considered feasible even in the most sophisticated countries of the continent.

### **Some Possible Lessons for Tax Reform–Mongers**

In almost every developing country in which taxes have increased significantly, the increased revenues have come not from the direct taxes on income, expenditure, and wealth that have customarily been stressed by tax reformers but rather from a variety of indirect taxes on consumption—taxes that have equally conventionally been condemned as regressive and (in the forms they have generally taken in developing countries) inefficient.[63](#) What the preponderance of indirect taxation demonstrates clearly is the severe constraint imposed on the nature of tax reform in developing countries by administrative limitations.

Perhaps the most important conclusion emerging from the modern positive analysis of public policy (Mueller 1989) is that the process by which policies are made bears almost no resemblance to the model that still seems to

be implicit in much development literature, namely, that decisions are made by a rationally calculating, benevolent, all-powerful dictator whose sole object in life is to improve the economic welfare of his citizens and who possesses sufficiently detailed knowledge to do so. The problem is not simply that the dictator is seldom that benevolent. The problem is that both the knowledge available to any government and its span of authority is limited. Even the most absolute dictator's power is limited by the need to balance the interests of the conflicting groups that keep him in power. Such balancing acts are even more obvious in a democracy. No government can pursue tax noncompliance to the full extent of the law and still stay in power. How far to go, and in which direction, is a matter of delicate political judgment.

Taxes in developing countries must be designed both to be politically acceptable and to work with a poor administration. Tax reforms must not aim at producing a finely tuned masterpiece that will work wonders if properly implemented, but will fall apart or produce poor or perverse results if, as is all too likely, they are poorly administered. It is critical to design taxes that are, so to speak, *robust* to poor administration (Bird 1977). Highly progressive income taxes, refined taxes on personal expenditure and wealth, European-style value added taxes, elaborate taxes on the potential income of agricultural land—such clever ideas tend to come crashing to earth when put into place with the usual inadequate administration in poor countries. Moreover, since this is not only the way things are but how they are going to remain for some time, reform proposals that simply presume, implicitly or explicitly, that administration will be improved are likely to prove ineffective. Too often, proposals for such reforms have been seized upon as a sort of magic elixir enabling governments to solve this or that problem without tackling the hard task of introducing the sort of technically competent, honest, and dedicated administration that such proposals usually assume already exists, or can readily be brought into being.

Those who would succeed in tax reform must understand thoroughly the existing administration and assess realistically the possibility of rapid improvement. As emphasized in Bird (in Gillis 1989), the aim of reformers should be to design a tax reform that will work, that is, that will produce better results than the present system with an administration of the caliber of that which now exists, and is likely to continue to persist in most developing countries. Complex proposals such as interlocking income expenditure and wealth taxes (Kaldor 1956) or taxes on the presumptive income of agricultural land (Wald 1959) should be shunned. Such schemes have not worked and will not work in the conditions prevailing in most developing countries. Too often tax designers have let themselves be led astray by the futile search for the perfect fiscal instrument, not realizing that the perfect is often the enemy of the good, in the sense of a roughly acceptable tax system—one that can be administered roughly and still produce acceptable results.

A good basic rule for tax reformers is the well-known management principle: keep it simple. Eliminate unproductive taxes (Harberger in Gillis 1989). Eliminate unproductive tax incentives (Gillis 1985). Keep differential rates to a minimum whether in commodity taxes (Cnossen 1982) or, to reduce "tax arbitrage," in terms of the effective rates of income taxes (McLure 1982). Draft the law clearly and communicate it effectively to both administrators and taxpayers (everyone who has ever written on the subject!). Focus on collecting revenue and do not try to fine-tune the tax system to achieve nonfiscal ends, whether with property taxes (Bird 1974) or income and sales taxes (McLure and Zodrow, chapter 1, this volume).<sup>64</sup>

More specifically, the key to success with income taxes is a good withholding system supplemented by some sort of legally based presumptive assessment on hard-to-tax groups (Bird 1983).<sup>65</sup> Both these approaches work best if rates are not too high or steeply progressive. Both also have the virtue of reducing the opportunity for face-to-face negotiation between taxpayers and tax officials, and hence the ease of bribery and corruption.

With respect to sales taxes, the best that can be done for some countries may be a physically controlled excise system (Cnossen 1978). Most consumption tax revenues in most developing countries come from imports and high-rate taxes on alcohol, tobacco, and fuel in any case, and continued tight control in these areas is needed to protect the revenue. Obviously, as experience everywhere shows (Tait 1988), use of the value added principle is both feasible and desirable within limits in many developing countries once the tax base is sufficiently developed

to make the substantial administrative investment needed to launch a general sales tax worthwhile.<sup>66</sup> Of course, as the experience of Mexico (Gil Diaz 1989), Morocco (Thirsk 1989b), and Guatemala (Bird 1985) illustrates, the mere adoption of a value added tax hardly resolves the basic problems of sales tax administration. Moreover, small, open countries with little domestic production and relatively low tariffs on most items may achieve much the same results by levying a uniform tariff on imports, while exercising due care to avoid fostering inefficient industrial development (Bird 1989).

As for wealth taxes, simple flat-rate taxes on urban and rural property, coupled with special assessments to finance urban public works, are probably about all that can be hoped for in all but the most advanced

developing countries (Bird 1974). In many cases, such taxes can probably be best administered (if not assessed) by local governments. Local finance could also undoubtedly make more use of benefit taxes, user charges, and other ways of increasing taxpayer compliance (Bahl and others 1984).

The kinds of administratively constrained tax reforms outlined above may not appear to be either innovative or drastic enough to cure the fiscal ills afflicting many developing countries today. Nonetheless, modest structural changes in such directions, like the increased research (and action) on such key administrative features as the internal incentive structure of tax administrations and the operating costs of tax systems urged earlier, offer a better prospect of attaining a roughly fair and efficient tax system in the circumstances of most developing countries than does the application of either such traditional reform prescriptions as comprehensive income taxation or the latest optimal tax theorem. In short, Harberger's (in Gillis 1989: 27) dictum that the lessons of tax reform are "not exciting—more like 'how to be a good public accountant' than 'how to be a star in the movies or in the opera or on the football field'" seems amply confirmed by this brief and partial review of some recent experience with the administrative aspects of tax reform.

### Notes

1. A much more detailed account of the literature summarized in this section may be found in Bird (in Gillis 1989).
2. Essentially the same point is made by McLure (1990), one of the leading practitioners of the tax policy art, in his review of the new "bible" of the optimal tax reformer, Newbery and Stern (1987).
3. Perhaps the clearest example of the latter approach is Kaldor (1980), who appears to assume throughout his discussion of tax reform in various developing countries that administrative deficiencies can and must be rectified to permit desirable policy changes. Unfortunately, good theorists seem particularly prone to this Kaldorian vice of assuming away administrative realities.
4. Such taxes may even be considered equitable if assessed in terms of the subjective (psychic) costs of taxation emphasized in Buchanan (1969) and the (relatively few) authors who have followed this "Austrian-London" approach.
5. For instances, see Sandford and others (1989) on the effects of the U.K. tobacco excise on the structure of the industry and the various examples of "transformation" cited by Seligman (1927).

6. For early recognition of this point, see Radhu (1965); see also Shah and Whalley (chapter 11, this volume).
7. For an example of a country in which beer taxes are clearly progressive, see Bird (1989). Of course, all incidence studies are subject to criticism; see Bird and DeWulf (1973), DeWulf (1975), Bird (1980), and McLure (in Gillis and others 1990). As Bird and Miller (1989, and in Bird and Horton 1989) argue, with the growing availability of microdata sets in developing countries, it should be possible to improve conventional incidence analyses substantially (see also Ahmad and Stern, 1983, 1984, 1986). Nonetheless, we are still a long way from being able to take systematically into account the effects of taxation on such fundamental determinants of the distribution of well-being as sectoral shifts in employment (see Bird 1982b).
8. The conventional game-theoretic analysis of "rational" tax evasion (see Allingham and Sandmo 1982; and the subsequent literature summarized in Cowell 1990) generally neglects the problem of taxpayer morale and the role of the perceived fairness of the tax system and its administration (and of the expenditures it finances) in affecting that morale.
9. Bahl (in Gillis 1989) actually gives three arguments for his position, but the other two, which essentially reduce to the view that concentrating on administration may divert the government from the essential exercise of rethinking tax policy, in effect assume what is being argued, namely, the primacy of policy over administration.
10. See, for example, the following papers: on Colombia, McLure (1982); on Morocco, Thirsk (1989b); on Australia, Krever (1987); and on the United States, Calkins (1989).
11. The income tax in the Philippines now consists of four components: (a) a modestly progressive tax—maximum rate 35 percent—on gross wages and salaries, with deductions only for dependents; (b) a uniform final withholding tax of 20 percent on various types of capital income; (c) a progressive tax on net business income, also with a maximum rate of 35 percent; and (d) a 35 percent tax on net corporate income (Sicat 1990).
12. Earlier doubts about the desirability and viability of global income taxes in countries with poor administrations include Forte (1964), Rezende (1976), and—admittedly much more cautiously—Oldman and Bird (1977).
13. Carl Shoup (1991) has recently distinguished "tax architecture," "tax engineering," and "tax management." This distinction between (roughly) broad system design, detailed tax design, and tax administration is useful for many purposes. As used here, however, "tax technology" encompasses elements of all three of Shoup's categories because the focus is less on the different stages of tax policy development and implementation than on the interdependence of the different stages.
14. For a similar condemnation of the "targeting" system prevalent in Japan 40 years ago, see Shoup (in Gillis 1989: 193). Since the account in the text of the Indonesian system is based on several visits to that country in the early 1980s and on Lerche (1980), it may no longer apply: similar systems continue to exist in a number of developing countries, however.

15. Gillis (1990) also noted in passing that administrative opposition had blocked an earlier attempt at computerization.

16. The existence of this system is clear, but the precise nature of its workings and effects remains to be investigated.

17. See Bird (in Gillis 1989), n. 35, 339, for reference to a "performance bonus" system—developed by Gordon Cox for Ghana though not, it appears, applied there—that seems to merit further examination.

18. Another common problem is the derailment of improved information systems as a result of the reluctance of official agencies, even within the same department, to provide information to each other as, for example, in Turkey (Bulutoglu and Thirsk 1989a) and Egypt.

19. See also Sandford (1973) and Sandford and others (1981). For similar, more limited, studies in Canada and the United States, see Vaillancourt (1989) and Slemrod and Sorum (1984), respectively.

20. Moreover, as a rule tax systems impose higher costs on small than on large firms owing to the importance of fixed costs in total operating costs (Sandford and others 1989). The special rates, exemptions, and payment and filing periods for small firms often found in value added and income taxes may to some extent compensate for this state-created disadvantage for small businesses, as well as recognize the administrative impossibility of subjecting such firms to the "normal" regime.

21. The few administrative cost studies I have seen (for example, in Bolivia and the Philippines) are unpublished and focus on such particular points as, for example, the administrative cost of processing an additional income tax return. One of the few published works related to this question is Lerche (1980). There appear to be no studies of compliance costs in developing countries.

22. In fact, administrative costs per se constitute efficiency costs only to the extent that they are higher than the costs of collecting the same revenue in a different way. See also n. 24 below.

23. See, for example, the following series of papers on the U.S. tax system: Stuart (1984), Ballard and others (1985), and Browning (1987), as well as the useful summary and overview of earlier work on the United States and Canada in St. Hilaire and Whalley (1982).

24. Note that, although compliance costs may impose significant additional marginal excess burdens (Collard in Sandford and others 1989), total evasion costs are directly additive to standard "efficiency" costs and, like them, are in large part a function of the tax rate.

25. Such "leakage cost" (Shaw 1981)—the difference between what is collected from taxpayers and what reaches the government—is not a real cost of taxation but simply a transfer from one private person (the taxpayer) to another (the tax official).

26. The recent survey and extension of this literature in Cowell (1990) recognizes some of the special characteristics of the problem in developing countries (such as corrupt officials) but does not formally incorporate them into the analysis. See also Virmani (1987) for relevant discussion.

27. It is difficult, for example, to believe that extensive formal analysis—such as that by Chu and Chu (1990) of the penalty structure of tax evasion in Taiwan—has much to tell either tax policymakers or tax administrators.

28. For a discussion of both mechanisms in the United States, see Smith and Kinsey (1985). In contrast, see the different situation reported for a number of developing countries in Radian (1980), chapter 5—tellingly titled "Catch Me If You Can: Audit and Assessment."

29. Incidentally, some thirty years earlier, a similar proposal was reportedly rejected in Bolivia because of the strong protests from the many smugglers whose livelihood would have been adversely affected! I owe this information to a conversation at the time with George Eder, who had recently returned from a stint as tax adviser to the government of Bolivia. As this anecdote suggests, some of these rules of thumb have been around for a long time. Unfortunately, their antiquity does not appear to have strengthened their empirical foundations.

30. Slemrod mentions that the comparable ratio in the United States is usually taken to be 10 to 1—a figure close to what can be inferred from the 1989 Canadian budget (which notes that each additional auditor produces \$400,000 in additional revenue).

31. This point is developed in an interesting fashion in Levi (1988). As n. 29 above suggests, "politically influential" groups may include such unlikely candidates as smugglers.

32. Perceived inequity may also, as mentioned above (at n. 8) contribute to the disintegration of the tax system.

33. Due (1985) had earlier come to much the same conclusion on the basis of an examination of state sales tax audit practices in the United States.

34. "DGI [the tax administration] was one of the most respected public agencies in Argentina 20 years ago. It was known for the high caliber of its technical personnel as well as high morale. The degradation of DGI as an institution has paralleled that of the erosion of the tax system. This degradation has simultaneously been cause and effect of the vicious circle of poor legislation and poor administration that has brought about the collapse of the tax system" (World Bank 1990: 53).

35. The following argument is developed at more length in Bird (1990).

36. For a similar argument linking the (mild) "tax revolt" in Canada in the early 1980s to changing perceptions of expenditure benefits, see Bird (1982c).

37. As pointed out in Bird and Horton (1989), the poor are not likely to constitute the most powerful interest group in this process.

38. Indeed, that literature (for example, Surrey 1958) has often argued against such links as distorting budgetary allocations. As Breton (1989) demonstrates, however, linking expenditures and taxes will reduce the deadweight cost of taxes. For further discussion of this question, see Bird (1984).

39. For a more extended treatment of the Latin American experience, see Bird (forthcoming), from which this section

is largely drawn. Particularly useful recent country studies are those by McLure and Zodrow (see chapter 1, this volume), McLure (1991, and in Gillis 1989), McLure and Pardo (1991), Gil Diaz (1987, 1989), Perry and Cardenas (1986), Thirsk (1989a), Mann (1990), Cabezas (1990), and World Bank (1990). Detailed references to these and other sources may be found in Bird (forthcoming).

40. In 1988, these taxes were altered in a number of ways: the tax on jewelry was reduced to 10 percent; the tax on beer was raised to 45 percent; a new 20 percent tax was imposed on soft drinks; and various electrical goods, pottery and china, and automobiles were also subjected to special excise taxes. The original simplicity of the new consumption tax system is thus disappearing, as the political pressures that produced the original complexity once more rise to the surface. (Incidentally, as noted earlier, another important tax policy change was the adoption of a uniform tariff, at first at a rate of 20 percent, later lowered to 10 percent. In addition, much of the increase in revenue resulted from important changes in petroleum taxes not discussed here; see Mann, 1990.)

41. Uruguay had eliminated its personal income tax much earlier—in 1975—but that tax was both more recently established and less important in revenue terms than in the case of Bolivia. Moreover, Uruguay retained substantial income taxes on business and (at least in principle) agricultural income, as well as heavy payroll taxes on wages and salaries (Harberger in Gillis 1989).

42. Again, Uruguay may appear to afford a precedent in view of its innovative presumptive tax on agricultural income based on the potential productivity of the soil. In fact, however, as Harberger (in Gillis 1989) notes, this tax, which is in any case a fairly crude device, is now optional for smaller farmers and for larger farmers is supplemented by a tax on actual income from agriculture. Moreover, even if Uruguay could perhaps implement such a tax, it seems unlikely that Bolivia could. As Bird (1974) emphasizes, if a poor country wants to tax its agricultural land, it is well advised to do so in as simple a fashion as possible. The proposed Bolivian rural land tax does not appear to satisfy this criterion and would likely prove as much a failure in practice as the many similar complex schemes in other countries described in Bird (1974) and Strasma and others (1987).

43. Bolivia has thus joined Indonesia (Gillis 1985) as one of the few countries to have made a clean sweep of tax incentives.

44. As in Bolivia, the (municipal) real property tax was creditable against the net wealth tax in Colombia. Unfortunately, the Colombian net wealth tax, after more than fifty years of relatively successful existence, was abolished in 1989, largely, it appears, as a result of strong protests aroused by attempts to revalue real property in

Bogota.

45. Perhaps the most notable Latin American experience along these lines was the 1975 elimination of some 130 small taxes in Uruguay—and the somewhat similar change in Chile in the same year (Harberger in Gillis 1989).

46. Earlier crude studies in Bolivia (Musgrave 1981) had suggested that the major gap in the tax system was not so much that potential taxpayers completely escaped the tax system as the failure of many in the system to report their incomes at all fully, especially with respect to income from capital. In contrast, a much more detailed study of Jamaica by Alm and others (1989) found the major source of evasion to be nonfilers. The efficacy of a registration drive in improving tax collections clearly depends in part upon whether the bulk of the tax gap is accounted for by nonfilers or nonreporters: it is surprising there does not appear to have not been more research on this point.

47. This is an obvious area for change in many countries. In Paraguay in 1989, for example, the penalty interest rate was only 1 percent a month, with a maximum of 18 percent—a rate that made the state the cheapest source of funds in the country. It is surprising that there does not appear to be a systematic examination of the appropriate structure and monetary amount of penalties in the literature apart from the early study by Oldman (1965). (Gordon 1988 updates this study but unfortunately does not add anything to the discussion of penalty structures.)

48. Again, there are precedents in Latin America for such actions, and such success. The most notable is the case of Chile (Harberger in Gillis 1989) which similarly—and a decade earlier—simplified its tax structure, improved the flow of information to the tax administration, broke the easily corruptible link between taxpayers and officials, strengthened penalty structures, and, most important, applied the penalties in a generally even-handed manner (even to the president's brother!). Bolivia has not, however, gone nearly as far as Chile in the direction of collecting information systematically. For some discussion of the kind of information that needs to be collected, see Bird (1983) and, with respect to computerization, Lane (1990).

49. The appropriate level of compensation to third-party agents of the tax administration, whether banks or employers, is yet another matter where there appears to be no systematic exploration of either the principles or the wide variety of experience throughout the world; see, however, Sandford and others (1981, 1989) for some useful discussion.

50. A "tax revolution," or a drastic reform imposed from above, may be contrasted with a "tax revolt," in which taxpayers refuse to comply to such an extent that they force a change in the tax system. Of course, in both the Argentine and Bolivian cases, one could argue that the reason a revolution was needed is the revolt (noncompliance) had been so successful that the previous system had, for all intents and purposes, ceased to function.

51. No attempt is made here to analyze the distributive effects of the various tax reforms described because the data needed to do so are lacking and because there is substantial doubt as to whether the usual measures of fiscal incidence mean much anyway. See Bird and DeWulf (1973) for an earlier review. Perry and Cardenas (1986) say what can be said about this issue in Colombia up to the early 1980s.

52. The trepidation arises because, as Bates (in Gillis 1989) correctly observed with respect to, among others, Bird (in Gillis 1989), one cannot confidently base generalizations on such partial case studies as those reported here.

53. For a review of the earlier experience, see Bird and Oldman (1968).

54. Outside of Latin America, that most Latin of Asian countries, the Philippines, has gone considerably further in the direction of gross (rather than net) income taxation, with no allowance for personal circumstances. See n. 11 above.

55. This turn away from progressive income taxes is by no means confined to Latin America. For an overview of recent income tax reforms in the OECD countries, see Cnossen and Bird (1990), and for an assessment of the changing role of the income tax in historical perspective, see Bird (1988).

56. An additional important constraint on redistributive taxation is imposed by the openness of many Latin American economies (see Bird and McLure, in Cnossen and Bird 1990), but this aspect cannot be developed further in the present chapter.

57. This point is especially stressed by Gillis (in Gillis 1989).

58. See also the account in Bird (1985) of the initially poor results of the value added tax introduced in Guatemala in 1983.

59. Another superficially attractive but fundamentally unsatisfactory tax gimmick all too frequently found in Latin America is the tax amnesty (Bird in Gillis 1989). For a recent detailed analysis, see Stella (1989).

60. For an interesting Brazilian exception to the enthusiasm for global progressive income taxes prevalent in earlier years, see Rezende (1976).

61. A possible exception is Paraguay (and perhaps a few other smaller economies in Central America), where a simpler form of sales tax than a full-fledged VAT would seem an advisable interim step. For a related analysis of a simple economy in another part of the world, see Bird (1989) on Papua New Guinea. See also Shalizi and Squire (1990) for a somewhat similar approach to tax reform in sub-Saharan Africa, although their analysis pays insufficient attention to the administrative implications of the nonuniform rate structure they favor.

62. This does not mean that a flat-rate tax is preferable: for one instance where this is clearly not the case, see Bird (1989), and for a more general discussion of the issues, see Head (1991).

63. The phrase "reform-monger" is taken from Hirschman (1963). That most of this concluding section bears more than a passing resemblance to passages in Bird (in Gillis 1989) is not a coincidence.

64. See Bird (in Gillis 1989) for further discussion of this particular folly.

65. In this respect, it is crucial to distinguish a presumptive system (such as that proposed in Bird 1983) from the superficially similar *forfait* system found in many countries of Francophone Africa. The essence of the *forfait* system, and its irremediable defect, is that it depends on face-to-face negotiations with taxpayers to determine the tax due. In contrast, the presumptive approach separates the determination of the tax into two parts. First, a small group of experts appraises for each line of activity the relationship between factors that may be objectively determined (for example, size and location of premises) and taxable income. The result of this process is a series of tables relating the objective indicators to taxable income. Second, the tax official visits the premises, records the indicators required, and then returns to the office and applies the income factors shown in the tables. At no time is the taxable income, or tax due, discussed directly with the taxpayer. This process has its own problems, but it is likely to be less susceptible to corruption than the *forfait* system.

66. As Shalizi and Squire (1990) correctly argue, use of the value added principle does not necessarily mean the adoption of a full-fledged European-type value added tax. Incidentally, it is unfortunate that no one seems to have followed up the pioneering work of Levin (1968) on the question of just when a country's potential domestic tax base might be considered sufficient to warrant adopting a general sales tax of any variety.

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#### 4— Lessons from Tax Reform: An Overview

Wayne Thirsk

The World Bank's Tax Reform Project is an attempt to document and analyze the experience with tax reform in ten developing countries. The purpose of this project has been to assess how developing countries might improve the performance of their tax systems. Toward this end, each country study has delved into the questions of what motivated these tax reforms, what they were intended to accomplish, how they were implemented, and how successful they have been in achieving their objectives. This chapter investigates empirical regularities in the tax systems in these countries and extracts some general lessons from a comparison of their experience with tax reform.

The countries encompassed by this project are Turkey, Indonesia, the Republic of Korea, Bolivia, Colombia, Mexico, Jamaica, Morocco, Malawi, and Zimbabwe. All have undertaken significant tax reform within the past two decades. Colombia, Indonesia, Mexico, Jamaica, Korea, and Turkey are distinguished from the others by the fact that they have completed at least one fairly recent major reform whose effects can be observed and analyzed. More resources have been committed to studying the effects of tax reform in this group than in Morocco, Malawi, Zimbabwe, and Bolivia, which are currently in the process of reforming their tax systems. In the latter group, Bolivia has made the most progress in laying the foundations of a new tax system, but important administrative reforms remain unfinished. Because the tax reforms in these countries are so recent, the results are not yet fully known and therefore can only be given a preliminary evaluation.

Each country study considers the motivations for tax reform, describes the way reforms were implemented, and offers an assessment of their success. In appraising the outcome of the various reforms, each study has adopted the traditional public finance criteria of revenue adequacy, allocative neutrality, taxpayer equity, and administrative capability. Almost all the reforms were judged according to their ability to improve economic

performance along these four dimensions. The collection of reform experiences in this project reveals striking similarities in the tax problems and in the response to them in these ten countries. This makes it possible to draw up some general lessons about the process and the substance of tax reform in developing countries. The chapter opens with a brief review of the literature on tax reform in developing countries and of the major fiscal issues in the countries under consideration. The rest of the chapter is concerned with country responses and the lessons that can be drawn therefrom.

### Introduction

Only a relatively modest literature exists on the subject of tax reform in developing countries. Much of the work is descriptive and refrains from asking whether alternative policy measures might have been more successful than the ones that were actually chosen. As Gillis (1988) has noted, even the measurement criteria used to judge the success or failure the reforms are not well established. Gillis himself evaluates the merits of a reform according to whether or not the announced goals of the reform have been met.

Newbery and Stern (1987), in contrast, have analyzed tax reform in the normative framework provided by the theory of optimal taxation. This theory attempts to account for the impact of tax reform on tax-induced losses in the efficiency of resource allocation and on vertical equity norms. The former dimension of a re-

form is captured by the responsiveness of taxpayers to tax-induced relative price changes, and the latter relies on particular specifications of a social welfare function. Optimal tax reforms in this context tend to be those that minimize the efficiency costs (excess burden) of taxation and pay some heed to income inequality. An interesting feature of these reforms is that they seldom endorse a uniform pattern of tax rates.

Although the reforms suggested by optimal taxation are based upon rigorous economic theory, they are difficult to put into operation. As Deaton (in Newbery and Stern 1987) and McLure (1989) have emphasized, the information requirements of optimal tax reform are almost overwhelming. In no country, but least of all in developing countries, is it possible to obtain robust price-elasticity estimates for a complete system of consumer demands. Moreover, little is known about the exact nature of the social welfare function—even its existence has been called into doubt by public choice theorists—and the suspicion lingers that specific optimal tax proposals may be highly sensitive to the particular choice of that function's key parameters.<sup>1</sup>

A further limitation of the optimal tax approach, as pointed out recently by Slemrod (1990), is that it neglects entirely the administration component of tax reform by assuming perfect tax administration, analogous to the physicist's simplifying assumptions of a frictionless world. Once the task of implementing a tax reform and enforcing the collection of taxes is recognized, the appeal of a highly differentiated structure of tax rates, one that would seriously complicate the ability to administer taxes effectively, is considerably diminished. In a more realistic policy framework, in which the resource costs of implementing tax measures are admitted, the proper focus of attention, as urged by Slemrod (1990), is not optimal taxes but optimal tax systems.<sup>2</sup>

Despite the flirtation with the undeniable logic of optimal tax theory, many recent tax reforms have focused on achieving broader-based taxation at more uniform rates, which is in direct violation of the dictates of optimal taxation. In a sense, however, the clash between theory and practice is more apparent than real. Unlike earlier pleas for broader-based taxation, which called for greater progressivity, the current appeals are for lower marginal tax rates and reductions in the level of tax-induced distortions that are prompted by high rates. In this manner, the lessons of optimal tax theory have infused recent tax reform efforts with a new respect for economic efficiency. Perhaps the main difference between optimal and uniform taxation lies not in their choice of objectives—both are concerned with achieving economic efficiency in taxation—but rather in their method of realizing this goal. Proponents of optimal taxation aspire to attain the most efficient tax structure, whereas advocates of uniform taxation have embraced the more limited objective of improving the efficiency of taxation.

Looking at the situation from a political economy perspective, Aaron (1989) has recently spelled out two basic requirements for sound tax reform proposals. Analogous to the physician's creed of "do no harm," it is imperative for tax reformers to be sure that they "have got their signs right." On this ground alone, uniform taxation is a more attractive principle than the uncertain and computationally difficult dictates of optimal tax theory. Uniform taxation usually promises to deliver efficiency gains even though it may fall short, in some unknown way, of the goal of minimizing tax-induced efficiency losses. Also, it is equally important to advance tax reform proposals that are politically robust and that will not become badly warped when they are refracted through the political prism. On this ground as well, uniform taxation that is directly opposed to preferential tax treatments seems likely to deliver a better outcome than the highly differentiated approach favored by optimal tax theory.

If there is now a growing consensus on the desirability of uniform taxation as the appropriate tax reform target, there is also an increasing recognition of the high degree of complementarity that exists between the efficiency payoff of uniform taxation and the other tax reform goals of horizontal equity and greater simplicity. If tax bases are broader and tax rates are lower and more uniform, there is a greater likelihood that households in the same economic circumstances before the application of taxes will continue to resemble each other after taxes have been applied. Lower tax rates also reduce the rewards for rent seeking, evasion, and tax incentive relief, thereby improving the odds that equals are treated equally. Moreover, if differential tax treatment is ruled out and various distinctions among taxpayers and different sources of income are swept aside, it is possible to simplify and streamline the operation of the tax system. Thus tax reform proposals in a number of countries stress the basic harmony that exists among the objectives of economic neutrality, horizontal equity, and tax simplification.

### **The Main Concerns of Tax Policy**

Although tax reforms in the countries under consideration have typically dealt with a diverse set of issues, there is still a universal core of fiscal problems that runs through the entire collection of tax reform experiences. A brief discussion of these problems helps to make clear what successful tax reforms must accomplish.

#### **The Quest for Better Indirect Taxes**

With the single exception of Zimbabwe, all the countries included in the tax reform project have recently

adopted the value added form of sales tax (VAT). Behind this development has been an increasing disenchantment with the haphazard effects of turnover taxes on the treatment of investment and tradable goods, as well as some dissatisfaction with the random incidence pattern associated with these taxes. Adoption of the VAT has been viewed as a reasonably reliable method of promoting both exports and investment while achieving a more predictable, and often more equitable, distribution of tax burdens.<sup>3</sup>

Often the VAT has been seen as a panacea for a wide variety of fiscal ills, including the need for higher revenue. The large revenue potential of the VAT has made it the marginal source of funds in many countries and has shifted the mix of taxation away from income toward consumer expenditure. Experience in a couple of countries, however, has tempered this enthusiasm by illustrating what can happen if a VAT is poorly designed. If the preparation for the VAT is inadequate and enforcement is weak (as it was in Bolivia when the tax was first attempted there in 1975) or if the VAT has numerous rates and is riddled with extensive exemptions (as in Morocco), it may operate with the same defects and, indeed, may be even worse than the indirect taxes that it replaced.

In undertaking a reform of their indirect taxes, most countries have attempted to coordinate the operation of their trade taxes with their domestic indirect taxes.<sup>4</sup> Nonetheless, few countries have tackled tariff reform simultaneously with indirect tax reform. In large part, this is because it often proved impossible to get trade taxes on the table during the fiscal reform discussions. Perhaps because of its close relationship with the World Bank,

Malawi alone has managed to overcome this restriction on the scope of indirect tax reform. From the beginning of the reform initiative in Malawi, concerted efforts were made to adjust both indirect taxes and tariffs and to apply them with less discrimination in favor of domestic over foreign sources of supply. It is true that Bolivia reformed its tariffs at the same time as its tax system, but these activities were separate parts of a general policy restructuring rather than a deliberate attempt to integrate trade and domestic taxation.

In this area, however, as in all other areas of tax policy, it is important to have a broad perspective on the impact of tax reform proposals, as recent experience in Zaire indicates. Although it was not a part of the tax reform sample, the case of indirect tax reform in Zaire illustrates the dangers of relying on a narrow trade focus for achieving indirect tax reform. Before the reform activity, Zaire operated a sales tax that effectively and wisely rebated the tax imposed on the purchase of business inputs. At the same time, tariffs were significantly higher on final consumer goods than on intermediate inputs and capital goods. In order to eliminate large variations in effective rates of protection, it was recommended that Zaire move toward a uniform tariff structure by imposing substantially higher tariff rates on both intermediate inputs and capital goods. To forestall undesirable import substitution in these latter two activities, it was also recommended that import-competing production of intermediate inputs and capital goods be taxed at equivalent rates. The net effect of this series of recommendations would have been to introduce a turnover tax and all of its undesirable consequences into Zaire through the back door. Fortunately, none of these compromising measures was ever adopted in Zaire.

### **The Relatively Small Size of the Income Tax Base**

It is difficult to broaden the bases of the personal and corporate income taxes in developing countries for several reasons. In addition to the intractable measurement problems posed by capital gains, imputed housing rents, and fringe benefits, political preference is accorded to certain sectors (such as agriculture in Colombia, Turkey, and Morocco) and tax administration has widely recognized weaknesses. The presence of a large number of workers employed in small businesses, in urban professional occupations, and in the agricultural sector poses a serious challenge to the capability of tax administrations properly to assess and collect income taxes in most developing countries.

A number of countries—including Turkey, Bolivia, Colombia, Mexico, and Korea—have attempted to apply various forms of presumptive taxation in an effort to include these groups in the income tax base. In principle, these measures should expand the size of the tax base, raise total revenues, improve both horizontal and vertical equity, and produce gains in economic neutrality. In practice, however, efforts at introducing presumptive taxation may take the form of special tax regimes that have just the opposite effect. Although special tax regimes may incorporate additional taxpayers into the tax base, they may also create new tax–evasion opportunities for other taxpayers who may be induced to seek reclassification as members of the hard-to-tax group or who may try to shelter their taxable income in more lightly taxed activities. Mexico offers some interesting examples of these revenue–reducing tendencies. To include trucking services in the overall tax base, Mexico used to tax this activity on a per–unit basis. As a result, many companies used transfer pricing techniques to channel their taxable income into this fixed tax category. Mexico also tried to encompass construction activity in the overall tax base by levying a 3 percent tax on gross construction receipts. Many companies responded to the disparity between this tax treatment and the standard treatment under the corporate income tax by issuing false invoices to cor–

porations and facilitating significant reductions in their taxable income and corporate tax liabilities.

### **Capital Income: Slipping through the Tax Net**

Just as some activities are not easily brought into the tax net, some sources of income are much harder to tax than others. In a number of countries, the personal income tax is little more than a burden on labor incomes earned in the modern sectors of the economy. Reaching a significant share of capital incomes through either the personal or

the corporate income tax poses a serious problem for most developing countries. In Korea, for example, slightly less than a third of the economy's capital income is included in the base of the personal income tax, compared with an inclusion rate of about 75 percent for labor income. Similar kinds of differential coverage were also found in Bolivia before its tax reform and in Morocco.

Part of the problem springs from the global mobility of capital, financial capital in particular. The fear of capital flight and the inability to tax residents' worldwide income have persuaded a number of countries to exempt interest income from the personal income tax and to tolerate, as in the case of Colombia and Korea, the existence of no-name bearer shares. Indonesia, for instance, made no serious effort until recently to include interest income in the personal income tax because such income goes untaxed in nearby Singapore. More generally, foreign tax systems seriously constrain the tax options of developing countries. Nowhere is this better illustrated than in the recent decision by the United States not to tax the interest income foreigners earned on their U.S. investments.

As the study of Mexico suggests, attempts to tax interest income may only result in higher interest rates in the economy, which will reduce the size of the corporate income tax base and add to the cost of servicing public debt on the expenditure side of the budget.<sup>5</sup> Yet, countries that fail to tax interest income while letting companies deduct interest expense offer significant opportunities for tax arbitrage. So-called back-to-back loans or the practice of "round tripping," as it is referred to in Indonesia—in which companies obtain interest-deductible bank loans in exchange for making bank deposits and which was found to be fairly common in Indonesia, Mexico and Jamaica—demonstrate the ease with which tax exemptions can swing open the door for widespread tax evasion.

In countries that allow zero or low taxation of interest income at the personal level that tax only equity income at the corporate level, sizable financial distortions have been created because companies have been encouraged to rely excessively on debt. Many countries have attempted to offset this debt bias either by imposing thin capitalization rules, as in Korea and Indonesia, or, as also in Korea, by reducing the rate of taxation on dividend income. Perhaps only Zimbabwe has managed to tax most interest incomes successfully, but Zimbabwe's situation is special in that its capital markets are tightly controlled. Other countries, such as Turkey and Korea, have turned to a schedular approach in taxing interest income, which means a modest amount of tax is withheld at the source.

### **Nonrevenue Objectives: The Problematic Impact of Tax Incentives**

Further undermining the revenue potential of taxes on capital income has been the propensity of many, if not most, developing countries to offer generous savings and investment incentives. In the 1960s, a complex and detailed system of tax incentives was part of the overall planning process in countries as diverse as Colombia, Korea, and Turkey. More recently there has been a wavering of faith in the ability of tax incentives to perform a useful role in promoting economic development. Some countries, such as Indonesia and Bolivia, have abandoned them altogether, whereas other countries, such as Mexico and Colombia, have substantially pruned them. A residue of countries, such as Turkey, Korea, and Morocco, continue to rely upon them and offer tax holidays and investment tax credits to a wide variety of activities in an effort to influence both the total volume of investment and its allocation. In very few countries has the impact of tax incentives on total revenues and tax equity been ascertained, let alone their effectiveness in redirecting resources.<sup>6</sup> In many countries, however, there is a growing appreciation of the ability of tax-incentive firms to shelter the income of nonincentive firms from taxation through transfer pricing and other income-shifting devices.<sup>7</sup>

### **Achieving Greater Vertical Equity in Taxation**

In light of the limited capacity of income taxes to generate revenue, most developing countries have been forced to rely on a variety of indirect taxes as their revenue workhorses. Typically, sales and excise taxes, along with taxes on international trade, constitute at least two-thirds of the total amount of revenue collected. Only in Zimbabwe and Malawi have income taxes approached anywhere close to one-half of total revenue. Many countries have therefore tried to structure their indirect taxes to either reduce or remove the burden of these taxes

on low-income groups. Exemptions of basic necessities from the value added or other form of sales tax, plus the imposition of differentially higher tax rates on items of luxury consumption have been the instruments most frequently used to achieve this goal. Few studies have carefully examined the effects of these kinds of policies on horizontal equity.

Some countries, such as Zimbabwe, have discovered that certain kinds of indirect tax may be highly progressive. For example, raising import duties in the presence of quantitative restrictions may be an effective way of raising taxes from wealthy holders of import licenses. Nevertheless, almost all the incidence studies that are cited in the tax reform project indicate that the bottom 20 percent of taxpayers in these countries typically spend 10 percent or more of their income in satisfying various tax obligations. None of the reforms have achieved notable success in significantly reducing tax burdens on the poor.

### **The Specter of Fiscal Deficits and Inflation**

A majority of the countries in the tax reform project have been plagued by large and persistent fiscal deficits. Such deficits have frequently signaled the need for fundamental tax reform, and the aura of growing fiscal crises has served to relax many of the political barriers standing in its way. This was clearly the case in Bolivia, Jamaica, Turkey, Morocco, Mexico, Malawi, and Zimbabwe. Many of these countries had relied on a combination of easy access to foreign lending and substantial revenues from trade taxes to finance their expenditures. With the onset of the international recession in the early 1980s and the ensuing debt problem in many developing countries, private foreign lending evaporated and revenues from trade taxes declined precipitately, leaving a legacy of fiscal deficits that could not be adequately financed from domestic revenue sources.

In three other countries—Indonesia, Korea, and Colombia—comprehensive tax reforms were fashioned without the underlying threat of an immediate fiscal crisis. What distinguishes this group of countries from the rest is their relatively stable political structure and, in Korea and Indonesia, a lack of political opposition, a situation that allows these governments the luxury of anticipating future fiscal needs. In Indonesia, for instance, the government was able to take the long view and introduce tax measures that promised to compensate for the expected decline in petroleum revenues. In Colombia, during the 1970s, the government invoked its constitutional powers in order to secure passage of its tax reform legislation. For the most part, however, fiscal deficits, whether current or projected, have been the primary impetus behind tax reforms. Consequently, tax reforms that pay insufficient attention to current and future revenue adequacy are unlikely to meet the fiscal needs of developing countries.

In a number of the countries studied, fiscal deficits have supplied the macroeconomic spark igniting an inflationary fire that eventually produced severe distortions in relative prices, particularly in the value of the economy's real exchange rate and real interest rates. In Bolivia, for example, the inflationary flame spread quickly out of control as the effects of inflation ate away at the foundations of the revenue system and created ever larger deficits and higher rates of inflation. Eventually, severe hyperinflation led to the virtual collapse of the fiscal system. Although less severe in their consequences, inflationary impulses in Turkey and in Mexico have also been fueled by large fiscal deficits. However, not all countries that have experienced significant fiscal deficits have financed them in an inflationary manner. Morocco, for instance, relied on implicit taxation during the 1970s in financing its deficits by running up substantial arrears in its accounts with the private sector. Zimbabwe has also been successful in imposing implicit taxes on consumption, through the device of quantitative trade restrictions. By reducing the supply of imported consumer goods, and in the absence of domestically produced substitutes, Zimbabwe's private savings rates have risen to offset the negative amount of public saving.

### **Simplifying the Tax System and Making It Work as Intended**

Weak tax administration is a characteristic shared by most developing countries. The inability to collect accurate and timely information on taxpayers' circumstances, to determine who has paid tax and who has not, to check the accuracy of taxpayers' declarations, to detect the presence of fraud, and to collect taxes already assessed are typical administrative shortcomings. What is needed to overcome many of these problems is not only more administrative resources but also better utilization of existing resources, including improved training of staff. If both direct and indirect tax laws were significantly simplified, administrative resources could be concentrated on auditing and collection functions, with likely gains in both total revenue and equity. Stiffer sanctions for nonpayment, more frequent audits to compel better compliance, shorter lags in the collection process, the computerization of tax information (to determine who has filed a tax return and paid their taxes), and streamlined legislation may all be required to achieve true tax reform.

Experience with tax reform in a number of countries gives ample evidence of the gap between the way the tax system works in practice and the way it is spelled out in the tax laws. In Korea, for example, when the Office of National Tax Administration was created in 1966, total revenues increased by 50 percent because of its vigorous efforts at improving administration. In Morocco, auditing revealed massive fraud since, on average, audits in that country raised taxable income by approximately a factor of three. As is discussed in greater detail in the next section, one result of weak tax administration has been a disturbing discrepancy be-

tween the nominal and effective tax rates on different activities and sources of income in the economy.

### **Widespread Tax Evasion as a Way of Life**

Because of weak tax administration, tax evasion has become prevalent in most developing countries. In many of the countries studied, it was estimated that as much as one-half of all income tax is evaded and that the greatest opportunities for evading taxes were available to richer rather than poorer taxpayers. In Bolivia, for example, only about 20 percent of capital income ended up in the personal income tax net compared with 75 percent of labor income.

Tax evasion occurs through a myriad of channels. Failure to file a tax return, the temptation to misrepresent income and expenses, the use of fraudulent invoices, and transfer pricing practices involving exempted or preferentially taxed activities are among the most frequently used methods of evading taxes. In Jamaica, for instance, only about one in ten of the self-employed bothered to file a tax return. The situation with doctors in Zimbabwe was similar. Evasion occurs just as frequently with sales taxes as it does with income taxes. Issuing no invoice and thereby underreporting sales for tax purposes or resorting to fake invoices in order to claim higher input tax credits have been serious problems with the VAT in several countries, as has the practice of collecting sales tax revenue and failing to turn over the proceeds to the tax authorities. With rampant tax evasion, tax systems in many countries are neither efficient nor equitable.

### **Trends in Tax Reform**

In response to the issues outlined above, the developing countries in the sample have all recently reformed their tax systems in ways that suggest that there is a considerable convergence of opinion on how best to deal with these problems. Although there are some notable exceptions, the tax reforms examined in this study reveal some clearly discernible trends in taxation:

**VALUE ADDED TAX** . In most of the countries that have initiated tax reform, the value added tax has become the mainstay of the revenue system. The VAT typically accounts for a third or more of total national tax revenue in the countries studied. Although most countries have chosen the consumption type of VAT levied on a

destination basis, a few countries, such as Colombia and Turkey, have moved closer toward the GNP type of VAT under their policy of only partly refunding taxes paid on capital goods. Indonesia recently moved the VAT from the manufacturer's to the wholesaler's level of application. The VAT still operates at the manufacturer's level in Malawi, as it will in Jamaica if the plans for a VAT materialize in that country. In the rest of the countries that have adopted a VAT, it applies at the retail level. Countries with the retail SVAT have put in place special tax regimes for small retailers to simplify their bookkeeping procedures, which are desirable on administrative grounds. Most countries have operated with VATs that have a single rate and allow exemptions for basic necessities and certain hard-to-tax sectors. Exports are invariably zero-rated, although in some countries the poor timeliness of VAT refunds implies that exports are subject to some unknown tax burden. Multiple rate structures, such as those found in Mexico, Malawi, and Turkey, appear to have been the political price that was paid for raising the basic VAT rate significantly above 10 percent.

**BROADER PERSONAL AND CORPORATE INCOME TAX BASES .** A number of countries have turned to a wide assortment of measures to create broader personal and corporate income tax bases. These measures include reduced reliance on tax incentives, the granting of fewer exclusions and exemptions, greater use of presumptive methods of taxation, increased withholding under both sales and income taxes, the introduction of minimum taxes on assets, and generally tighter tax administration. Korea, Colombia, Mexico, Turkey, and Bolivia, for instance, have all given greater priority to presumptive methods of taxation in recent reforms, while Jamaica, Malawi, and Turkey have incorporated a variety of fringe benefits into the tax base. In other countries—notably Malawi, Zimbabwe, Colombia, and Bolivia—public enterprises have been successfully incorporated into the corporate income tax base.

**CAPITAL INCOME TAXES .** Many countries have found that the corporate income tax may be the only effective way of reaching capital incomes in equitably and that some schedularization in taxing nonequity capital income may be necessary to compensate for weaknesses in tax administration. A few countries, such as Bolivia and Mexico, have concluded that it is administratively easier to tax either the net worth of companies or the expenditures made by the recipients of capital income rather than the income arising from capital ownership.

There is considerable diversity in the way countries treat the taxation of interest income. Whereas some countries (such as Jamaica, Malawi, and Zimbabwe) tax nominal interest incomes fully, other countries, (such as Colombia and Mexico) tax only real interest income. Until recently Indonesia exempted interest income, whereas Bolivia, Morocco, Korea, and Turkey, have taken an intermediate path by imposing low withholding taxes on interest income. Only Colombia has made any serious effort to tax capital gains from the stock market. A few countries make a half-hearted attempt to tax the capital gains arising from real estate transactions.

**TAXATION OF DIVIDENDS .** In recent years, the double taxation of dividends has become considerably less onerous, because of the development of imputation schemes or, more commonly, the exclusion of dividends at the personal level. Dividend exclusions currently apply in Colombia, Bolivia, Mexico, Indonesia, and Korea, while imputation schemes can be found in Malawi and Zimbabwe. Only Jamaica and Turkey continue to tax dividends at both the corporate and personal levels. Korea has also recently abandoned its presumptive dividend tax that had been applied to retained earnings. In many countries, therefore, there is less incentive for corporations to rely heavily on debt finance, although the common practice of either excluding or lightly taxing interest income at the personal level still contributes to the debt bias, if only in an attenuated form.<sup>8</sup>

**RATE STRUCTURE .** Complementing the effort to broaden the income tax base are reforms in the rate structure that flatten the amount of nominal tax progressivity and align the nominal corporate income tax rate with the top bracket rate of the personal income tax. Only Zimbabwe and Korea now have top-bracket personal income tax rates in excess of 50 percent. And Jamaica now has a single personal income tax rate, which has been set equal to the corporate rate of 33.3 percent. Countries began to move toward less nominal progressivity in the rate schedule after finding that almost no taxpayer ever paid tax at the highest rate; rather, considerable taxpayer resources were

devoted to avoiding that outcome. Consequently, any loss in vertical equity is significantly less than a comparison of nominal rate schedules would suggest. In countries such as Colombia and Mexico, the top–bracket rate has been halved in comparison with its value only a few years ago. The merging of the corporate and topbracket personal rates in countries as diverse as Indonesia, Jamaica, Malawi, and Mexico has made it easier to tax small businesses by reducing the temptation to convert capital income into labor income and vice versa, while at the same time achieving closer parity of tax treatment between firms located in the corporate and unincorporated sectors. The alignment of these two rates, moreover, enhances the effective integration of these two income taxes through the technique of the dividend exclusion.<sup>9</sup>

This simplification and unification of the rate structures reduces opportunities for tax avoidance, and the lower personal rates may also weaken the incentive to evade personal tax.<sup>10</sup> Whatever loss of vertical equity may have occurred as a result of these developments, there may be offsetting gains in administrative simplicity and the attainment of greater horizontal equity. Similarly, the introduction of a single deduction under the personal income tax in Colombia, Mexico, and Jamaica may also improve horizontal equity at the expense of some unknown cost to vertical equity. Flatter rate structures also contribute to more accurate withholding and easier tax administration.

**INDEXATION** . Some countries have indexed the income tax system in response to persistent inflation and the problems of capital flight. Colombia and Mexico, for example, have progressed from ad hoc inflation adjustments and partial indexation measures to more satisfactory and virtually complete indexation of the tax system. Colombia and Mexico are unique among the countries in tax reform sample in trying to tax only real interest income and in allowing only the deductibility of real interest expense. Depreciation allowances are also fully indexed in these two countries. A number of countries that had failed to index brackets of the personal income tax—particularly Bolivia, Turkey, and Mexico—found themselves facing a profusion of untaxed fringe benefits. There has also been a shift in commodity taxation toward the use of ad valorem rather than specific tax rates. During the inflationary 1970s, many countries discovered that specific tax rates were quickly eroded by the effects of inflation, which contributed to declining real tax yields.

**EXCISE TAXES** . Most countries have shown an interest in designing excise taxes that extract larger tax payments from nonpoor households. To some extent, this tendency reflects the growing specialization of tax instruments rather than having a multiple rate value added tax that serves a variety of purposes and renders the administration of that tax much more difficult. The VAT has typically been assigned the role of raising revenues, while excise taxes have been given the task of imparting greater progressivity to the system as a whole.<sup>11</sup> By the same token, there is increasing acceptance of the notion that tariffs should be used for protective purposes rather than for raising revenues.

**TAX ADMINISTRATION** . The majority of tax–reforming countries have recognized that all facets of tax administration need to be improved. To obtain better compliance, all the countries under consideration have made efforts to create a unique taxpayer identification numbering system. This, along with the computerized processing of tax returns, has enabled governments to maintain a much better check on nonfilers and stopfilers. They have also improved collection efficiency by relying more and more on banks to receive, and to some extent process, tax payments and by concentrating audit resources on the country's largest taxpayers. Some countries, for example Colombia, have made greater use of withholding as a form of final tax payment, thus freeing up administrative resources for the tasks of collection and auditing.

There is also a growing awareness of important complementarities that may exist in tax administration.

A number of countries now seem to recognize that if the administration of the VAT is weak, it will be much harder to obtain satisfactory compliance with the personal and corporate income taxes. Conversely, a well administered VAT may generate improvements in documentation that will make it significantly easier to

administer both income taxes. A few countries have turned to innovative approaches in their efforts to secure greater compliance with the VAT. Turkey's expenditure rebate system and Bolivia's complementary tax both offer limited income tax credits to households for their collection of tax-paid invoices and are examples of how to use the fiscal carrot rather than the fiscal stick to obtain better tax compliance. Both schemes offer some resistance to the temptation to accept a seller's offer of a lower price and no purchase invoice.

**TAX EVASION** . Taken together, most of the major elements of recent tax reforms have the potential to reduce tax evasion significantly. Fewer tax incentives; the development of broader tax bases and lower tax rates; administrative improvements in the area of information, auditing, and collection; greater reliance on indirect taxes; the exemption or schedular treatment of many forms of capital income; and the experimentation with special compliance measures—all can help make tax evasion both less feasible and less desirable.

### **Some Lessons from Tax Reform**

The lessons of tax reform can be usefully separated into those that throw some light on the process of tax reform and those that have something to say about the substance of tax reform.

#### **The Process of Tax Reform**

Tax reforms are more likely to be introduced when the need for them is clear to politicians, policy makers and the population alike. Fiscal crises typically signaled by persistent and growing deficits create a sympathetic political environment in which governments are seriously prepared to contemplate reform. The tax reforms of Mexico, Colombia, Bolivia, Malawi, Morocco, Jamaica, Turkey, and Zimbabwe all fit into this mould. Conversely, and perhaps more controversially, fiscal surpluses may give governments the latitude to engage in various kinds of tax reform (a "reform" that authorizes additional distorting tax preferences). Although few countries have enjoyed the luxury of sustained fiscal surpluses, the periodic coincidence of these surpluses and tax reform in a few countries lend some support to this view.

Strong and stable governments that enjoy continuity in office may be in a position to take a long view of the economy's future course of development and to adopt preemptive tax reforms that may avert the threat of potential fiscal crises. The tax reform experiences of Korea and Indonesia seem to fit this pattern fairly well. In both of these countries, political longevity has enabled governments to refashion their tax systems in ways that were consistent with the economy's longterm economic objectives and plans. Conversely, as the experience of Bolivia and Turkey's nonmilitary regimes suggests, weak and internally divided governments may be unable to cope adequately with fiscal crises and may suffer from continuous fiscal deficits as a result of this debility.

It is extremely important to have the appropriate policy measures "on the shelf" before a fiscal crisis occurs in order to forestall the adoption of ad hoc and ill-advised tax reforms. For example, the governments of Jamaica, Morocco, and Malawi, had no clear, wellthought-out plans on how to deal with the fiscal crises that beset them in the early 1980s. Consequently all of them attempted to stem their revenue shortfall by raising tax rates on badly distorted tax bases. Fortunately, none of these countries saw this response as a sustainable policy option and all subsequently undertook fundamental tax reforms, with varying degrees of success. One implication of this is that desirable tax reforms may have a long gestation period before they are finally adopted, as was the case in Colombia. Moreover, economic planning has a greater chance of success if local people and officials are consulted about the options for reform before a fiscal emergency arises.

Influential and well-informed advisers have often played a critical role in bringing about satisfactory tax reforms. The imprint of tax policy experts in setting the broad agenda for reform, in guiding the discussion of reform possibilities, and in supporting particular tax measures while rejecting others is clearly evident in the reforms that have been carried out in Jamaica, Indonesia, Malawi, Zimbabwe, Colombia, Korea and, to a lesser extent, Turkey. Mexico and Bolivia have shown a greater propensity than the rest to develop home grown tax reforms. Large

amounts of foreign aid on the other hand, as illustrated by the experience of Turkey, may have delayed the adoption of desirable tax reforms by relaxing the balance of payments pressures created by sustained fiscal deficits.

From a historical vantage point, tax reform is best seen as a continuous process in which there is substantial learning by doing, continual adjustment and refinement of the tax system, and a gradual groping toward the achievement of a better tax system. The experiences of Korea, Mexico, Colombia, and Turkey all suggest that the process of tax reform is never finished. As new ideas and fashions take hold, as the technology of tax collection changes, and as a country's economic circumstances are altered, new opportunities will arise for improving a country's tax system. This is not to deny that countries may occasionally stray from the path of true tax reform, as Colombia did in the late 1970s when

it partly reversed some of the reforms introduced earlier in the decade.

Undue haste and inadequate preparation in introducing tax reforms may create substantial waste and eventually doom them to failure. Bolivia's ill-fated effort to introduce a value added tax in 1976 provides the best illustration of this lesson. Few resources were committed to educating the public on how a VAT operates, to creating an administrative apparatus to deal effectively with its implementation, or to a careful designing of the tax forms. Not surprisingly, the new sales tax failed to live up to its promise. The much more successful reforms introduced in Jamaica, Indonesia, and, more recently, in Malawi all benefited from detailed and careful planning and preparation plus close monitoring after their implementation.

Good data and a reliable empirical analysis of the effects of the pre and postreform systems are the best way to convince doubters of the soundness of proposed tax changes. Successful tax reform measures ordinarily require a detailed knowledge of the defects of the current system, particularly a sense of who pays taxes at the industry, firm, and household level. They also require a feeling for how the distribution of tax burdens will be affected by tax measures that are supposed to make matters better. The recent tax reform efforts in Jamaica, Colombia, Malawi, and Indonesia all display this attribute. The marginal effective tax rate methodology is also increasingly being applied to measure the allocative impact of different tax policies.

Reforms are more likely to be adopted if local policymakers are actively involved in their design and implementation and if the reforms result in the formation of a cadre of local tax experts. Recent reforms in Colombia, Malawi, Indonesia, and Jamaica have proved the importance of securing a strong commitment to the reform process and to the measures themselves. Without active local engagement, the reforms are not woven into the country's institutional structure and important opportunities for institution building are missed.

Comprehensive tax reform, insofar as it creates winners as well as losers, may meet with less political resistance than piecemeal tax reform. The recent reforms in Colombia, Mexico, and Jamaica seem to suggest that if everyone has both a little to gain and a little to lose from a tax reform package, political opposition to the reform will be unable to coalesce around a particular issue. Alternatively, if the number of winners from a reform is large enough, they may be able to inflict a political defeat on any coalition of losers. If, however, a reform takes aim at a particular tax distortion, the political outcry from those who benefit by its existence might be sufficient to destroy the initiative.

Potential simplification and greater horizontal equity are strong selling points in favor of a tax reform. Gains in economic efficiency and vertical equity, on the other hand, are much harder to sell. Support for the recent reforms in Indonesia, Colombia, Mexico, and Jamaica seems to spring in large part from the public expectation that the reforms would produce a more uniform distribution of tax burdens across different firms and industries in the economy and across different households at the same income level. Similarly, complex tax rules were seen as invitations to avoid and evade them, and thus they undermined the ability of the tax system to achieve horizontal

equity. At the same time, efficiency arguments are not well understood by the public and vertical equity is very much a matter of personal judgment.

An unstable macroenvironment may threaten and even eclipse tax reforms that are popularly perceived to be a source of the instability. Although the experience of Jamaica and a few other countries demonstrates that recession is not a barrier to introducing reforms, Colombia, Turkey, and, perhaps to some extent, Mexico have found that if some macroeconomic difficulty occurs after the reforms are put in place, the reforms may be blamed for the coincident distress. In some cases the weight of this accusation may be sufficient to force the repeal of the tax reforms.

In general, there seems to be a logical sequence to fiscal reform, although the empirical evidence in favor of this proposition is embarrassingly thin. Implicit in much of what has been said thus far is the assumption that the expenditure policies of developing countries are selected and executed in an efficient manner. Stories of white elephants abound to cast great doubt on this supposition. It clearly makes no sense to make tax policies more efficient and effective if the revenues they produce are used to finance an inefficient set of public expenditures. In this sense, if expenditure reform does not accompany tax reform, it should precede it. Moreover, structural tax policy should ideally undergo reform before tax administration does since there is not much merit in making a bad tax system work somewhat better; that is, improved tax administration can never compensate for bad tax design. At the same time, improved tax policies will never work properly unless they can be effectively administered. In this sense, improved tax administration is frequently the key element in a successful tax reform. And as the experience of Morocco makes clear, tax reform should logically come before tariff reform. If tariffs constitute a significant fraction of total revenues, as they did in Morocco, tariff reductions will bring fiscal deficits in their wake unless, or until, the tax system can be effectively revamped to replace the foregone tariff revenue.

### **The Substance of Tax Reform: Major Themes**

The reforms introduced by the ten countries have addressed a host of technical issues concerning the

choice and application of various tax instruments. Several important themes emerge from these efforts. These lessons, or bits of practical advice, constitute a core of basic tax reform principles on "what to do."

#### **1. Tax reform measures need to conform to existing administrative capacities.**

Exceeding administrative limits almost always results in poor compliance and widespread evasion, which will compromise the goals of revenue, equity, and efficiency. Administrative feasibility can be met in several ways, in particular by keeping the tax system simple and avoiding fine tuning, by broadening tax bases and reducing both average and marginal tax rates, by relying primarily on indirect sources of revenue, by devising workable presumptive income taxes (or minimum taxes), by looking to the expenditure side of the budget for redistribution, by aligning the corporate and top-bracket personal tax rates, and last, but not least, by investing in improved administrative capability.

High tax rates on narrow bases are arguably more inefficient because they distort decisionmaking to a greater degree by encouraging savings, investment, consumption, and the earning of income in tax-preferred forms. They are also more prone to perpetuating horizontal inequities (although inefficiency may eliminate some apparent horizontal inequities), and they are certainly more difficult to administer because they invite greater tax evasion and raise compliance costs. Broader and simpler tax bases have been chosen by Jamaica, Korea, Malawi, Colombia, Mexico, Bolivia, and Indonesia. The undesirable features of narrow and administratively complex tax bases have been amply demonstrated by the experience of Morocco, which has functioned with a narrow and highly differentiated tax system for a number of years.

Although in principle special tax regimes should broaden the tax base, in practice many of them may narrow the base by inducing ordinary taxpayers to take advantage of the disparate tax treatments accorded under the special regime and the normal tax system. Consequently, at least some special tax regimes may result in a loss of total revenue and may impair the tax system's ability to generate equitable and efficient outcomes.

As a result of the unification of corporate and topbracket personal rates, there is a much smaller payoff to the conversion of labor income into more lightly taxed capital income on the part of corporations and small businesses. Also, in conjunction with the exclusion of dividend income at the personal level rate, this unification has provided a reasonably effective method of integrating the tax treatment of dividend income. In every country it has proven much easier to tax the flow of dividend income at the corporate rather than the personal level.

A number of countries also recognize that different parts of the tax system can provide support for one another. Thus, for example, a well-functioning value added tax can assist in the administration of both corporate and personal income taxes by providing detailed information on important items such as gross receipts and deductions. In Colombia, a well-administered net-wealth tax was indispensable for the effective operation of both the presumptive income tax and the tax on capital gains.<sup>12</sup> Other countries besides Colombia either have not tried net-wealth taxes or have had only limited success in applying them.

In reforming taxes, is it better to build on existing tax instruments or to replace them with fresh ones? As the contrasting experiences of Malawi and Bolivia indicate, both approaches may be required if tax reform measures are forced to conform with current administrative capacity. Malawi felt it was easier to refashion existing tax instruments, whereas Bolivia replaced its unwieldy orthodox income tax system with a set of simpler taxes that promise to be easier to implement.

Future tax reforms, like those in recent years, are unlikely to be driven by vertical equity considerations. Because of the interplay of weak tax administration and political preferences, the effective progressivity of both personal and corporate income taxes has been found to be substantially less than that implied by legislative rates. Nominal progressivity has accordingly been tailored to suit administrative realities in most countries. Top marginal rates under the personal income tax have been substantially reduced in several countries, while the nominal corporate tax rate has been significantly lowered as well. Concern over triggering capital flight and increased recognition of the distorting effects of high marginal tax rates have reinforced this tendency to adopt lower rates.

### **2. It is important to design tax and expenditure systems that will minimize current deficits and the prospects of future fiscal deficits.**

Small, open economies such as Bolivia, Malawi, and Morocco, which have relied heavily on export taxes as a source of revenue, have been particularly prone to fiscal deficits as a result of any downturn in the international economy. These countries cannot easily cultivate more stable revenue sources and require either flexible expenditure systems or some kind of stabilization fund if they are to contain the size of future fiscal deficits. Revenue-elastic tax systems also help to prevent the emergence of fiscal deficits during periods of stable economic growth.

Because they are more often than not financed through central banks, fiscal deficits may be more pernicious in their inflationary impact in developing countries than in developed countries. Of all of the methods of taxation available to governments, the inflation tax has been shown to be among the least desirable of tax instruments. It is both highly inequitable and highly distorting, particularly in an unindexed tax system. Either by levying higher tax rates or by

administrative or statutory efforts to expand the size of the tax base, explicit taxation is almost always preferable to the implicit inflation tax. In choosing between these two explicit tax options, one must compare the efficiency

costs of higher rates against the resource costs of greater administrative effort. If rates are already high, there is a presumption in favor of more diligent administration. If a high rate inflation is viewed as unavoidable, it is important to index both direct and indirect taxes in order to maintain real tax revenues and avoid inflation-induced inequities and distortions in the tax treatment of both capital and labor incomes.

Contrary to conventional wisdom, the absence of indexing measures may frequently be destabilizing and may make inflation more rather than less likely. As the experience of Bolivia graphically illustrates, unindexed commodity tax bases are especially vulnerable to inflationary erosion and can contribute to explosive macroeconomic instability as accelerating rates of inflation create ever larger fiscal deficits.

As was particularly evident in the case of Turkey, inflation in an unindexed tax system will often raise effective tax rates on labor incomes while reducing them on capital incomes. This effect occurred because more workers were elevated into higher tax brackets and nominal interest deductibility reduced the size of the corporation income tax base. Inflationary episodes in Turkey, Bolivia, and Mexico, and also to some extent in Colombia, suggested that an unindexed personal income tax that results in bracket creep is an important stimulant to the growth of untaxed fringe benefits. But these fringe benefits arose unevenly across different groups in the labor force, with consequent damage to both vertical and horizontal equity.

In the absence of indexation, inflation also produces substantial inequities and distortions in the tax treatment of capital income. Debt finance is artificially encouraged, and taxes on nominal interest income are transformed into covert wealth taxes. Explicit and comprehensive indexing is preferable to a variety of ad hoc measures intended to provide partial relief from inflationary tax effects on capital income. Under the indexing schemes recently introduced in Colombia and Mexico, only real interest income is taxable and real interest expense is deductible. Both of these countries have also adopted inflation-proof methods of measuring depreciation, and Colombia also provides for indexed treatment of capital gains.

### **3. Despite the desirability of having broader income tax bases, a comprehensive and global income tax is difficult to achieve for a variety of structural and economic reasons.**

The substantial size of the informal sector in most developing countries severely limits the reach of the income tax. The scope of the income tax is also restricted by measurement difficulties, the provision of tax incentives, and the power of special interests to obtain exemptions and exclusions. No example could be found of a personal income tax that included more than a third of the economy's capital income in its tax base. The corporation income tax, moreover, cannot adequately compensate for this skimpy coverage because it is a tax on only one form of capital income, the part received in the form of equity. Large portions of labor income in the form of fringe benefits are also excluded from the personal tax base in many countries.

The increasing integration of the world's capital markets and the dismantling of capital market controls in most countries have exerted considerable pressure on developing countries to either reduce or even eliminate their taxes on interest income. At the same time, the reluctance to tax interest income, when combined with the deductibility of interest expense, opens up significant opportunities for both tax arbitrage and tax evasion. Highly levered financial structures are another by-product of this unequal tax treatment of debt and equity.

It is not entirely clear what the appropriate policy for treating interest income should be. If the fear of capital flight and inability to enforce the residence principle causes interest income on domestic deposits to be exempt from tax, this exemption will probably create pressures to reduce tax burdens on other forms of capital income, especially dividend income and capital gains, if for no other reason than to mitigate the financial distortions that would otherwise occur. On the one hand, if a country attempts to include interest income in the tax base, the effect is likely to be higher domestic interest rates as the effective tax burden is shifted forward to domestic consumers in general and to owners of immobile land and labor in particular. If this were the case, it might be argued that reliance on an income tax excluding interest income and other components of capital income (an expenditure tax),

or on a general sales tax, would be preferable since, with either of these taxes, the distribution of tax burdens could be more easily predicted and a tax-induced distortion in the capital market would be avoided. If, on the other hand, interest income were excluded from the tax base, there is an argument for making interest expense nondeductible in order to curb tax arbitrage. Such an approach, however, could easily jeopardize the availability of foreign tax credits and raise the economy's cost of capital from foreign sources. There seem to be no easy answers. What is clearer, however, is that a global capital market exerts powerful pressures on developing countries to replace conventional income taxes on individuals with either direct or indirect taxes based on consumption.

Given these weaknesses in the personal taxation of capital income, a pivotal role for the corporate income tax is to see that the equity component of capital income is taxed at least once. The other role for this instrument is to tax the domestic source income of

foreign corporations and any economic rents received by both domestic and foreign companies.

An important design feature in the reform of the corporate income tax is the tradeoff between low nominal rates and no investment incentives as against nominal corporate rates and liberal investment incentives.<sup>13</sup> Most of the countries examined have favored the former policy. Malawi, however, has recently introduced a relatively high corporate tax rate combined with a partial first-year write-off for investment in the manufacturing sector. Zimbabwe remains the only country in which complete expensing of investment is allowed, but it also unwisely permits interest deductibility, thereby subsidizing investment.

#### **4. Tax measures and instruments need to be closely targeted to the objective they are intended to achieve and the number of nonrevenue objectives should be kept to a minimum.**

Indirect or poorly targeted tax measures almost always create new problems and often generate undesirable side effects. For example, for a number of years Colombia adopted an accelerated depreciation scheme in an attempt to compensate for the impact of inflation upon corporate income taxation. Such measures are crude at best and can only offset inflation for a particular rate of price increase. At the same time, however, such a scheme injects significant nonneutralities into the tax system by influencing the choice of investment among different sectors and assets. As a further example, many countries grant an outright exemption for all food purchases under the value added tax in an effort to reduce or even eliminate the regressive features of that tax. By exempting all food purchases rather than only the items purchased by low income households, however, the exemption may confer larger absolute benefits on the rich than on the poor. Protective excise taxes and revenue-raising tariff policies provide further examples of poor targeting.

In many developing countries, there is now considerably more doubt about the ability of tax incentives to achieve their intended objectives. Many, though not all, of the tax reform countries have restricted the scope and application of tax incentives as part of a growing awareness that the costs of such incentives may be substantially higher and their benefits significantly lower than was previously thought to be true.

#### **5. Most tax reform measures will ordinarily entail tradeoffs among the normal criteria that are used to evaluate tax changes. Although the goals of simplicity, neutrality, and horizontal equity frequently complement one another, all three clash with the pursuit of vertical equity.**

For instance, attempts to obtain greater vertical equity typically invoke the use of differentiated tax rates and tax treatments that clash with the policy requirements for simplicity, neutrality, and horizontal equity. In an inflationary environment, indexation may be required for greater tax neutrality and equitable treatment among investment choices, but it almost always adds to administrative complexity. Further conflict may occur between growth and equity since the former objectives stress reliance on consumption taxes, whereas the latter goal calls

for the elimination of taxes on the consumption of the poor. Korea provides an example of a country that, at least until recently, placed more priority on achieving higher rates of economic growth than on attaining greater equity in taxation. There may also be some tension between the size of total revenue and the pursuit of an equitable distribution of tax burdens. Zimbabwe, for instance, has already exhausted the use of tax instruments that fall primarily on the rich and has forced the government to turn to marginal revenue sources that impinge heavily on the poor. On balance, most of the recent reforms have stressed the importance of achieving greater simplicity, neutrality, and horizontal equity and have pursued these goals at the expense of vertical equity.

Despite the prevalence of policy tradeoffs, opportunities may exist in many countries for simultaneous improvements in many dimensions of tax policy performance. For example, presumptive taxes, such as those levied on net wealth in Colombia and on indicators of the standard of living in Turkey, may usefully compensate for weaknesses in tax administration and produce unambiguous gains in neutrality, as well as both horizontal and vertical equity. Minimum taxes along the lines of those recently enacted for Turkish and Mexican corporations may do likewise.<sup>14</sup> The replacement in several countries of numerous cascaded commodity taxes by a value added tax has also contributed to unambiguous gains in efficiency, equity, and ease of administration.

The goals of tax reform are now more modest and perhaps also more realistic than they were previously. Many tax experts would argue that rough justice is the best target to aim for rather than some ideal, but administratively hopeless, notion of perfect justice. From this standpoint, for instance, the policy of excluding dividends from the personal income tax is preferable to the more conceptually accurate but administratively more complex imputation approach as a method of integrating corporate and personal taxes. By the same token, a single VAT rate accompanied by an exemption for food is considered to be better than a multiplicity of VAT rates. Similarly, many would argue that a single-rate personal income tax combined with a generous personal exemption is better than a system that has sharply progressive tax rates and a variety of deductions and credits. Colombia, Mexico, and Jamaica have all recently eliminated a variety of tax deductions and replaced them with a single deduction that more or less approximates the minimum wage in each country.

Streamlining deductions, disallowing deductions for losses against unrelated income, and the imposition of thin capitalization rules for domestic and foreign companies are all examples of attempts to tailor the tax system to fit existing administrative capabilities. Although these measures and others like them inevitably create some inequity by ruling out finer distinctions among taxpayers, they may also curb larger inequities arising from tax evasion and avoidance and are considered to be the lesser of two evils. These simpler measures may succeed where more sophisticated measures would fail.

In keeping with the more modest aims of recent tax policy, avoiding tax-induced resource misallocation and administratively complicated measures have assumed more importance than using the tax system either to spur economic development or to redistribute income. These latter tasks are now thought to be handled much better on the expenditure side of the budget. Attempts to use the tax system for these purposes may fail if for no other reason than that they impair effective tax administration and encourage tax evasion.

### **6. The VAT has worked well in most countries, having succeeded in raising substantial amounts of revenue and in removing the burden of indirect taxation from exports and investment expenditures.**

Experience has shown, however, that it is possible to design bad VATs and to impair their effectiveness by adopting multiple rates and adding numerous exemptions. Like any other tax, the VAT must be carefully crafted and implemented if it is to work well. Experience seems to suggest that as the general rate of the VAT increases, the political process in many developing countries will extract concessions in the form of a multiple rate structure. For example, concern over the regressive impact of a higher value added tax in both Mexico and Turkey compelled policymakers to accept a VAT with numerous rates, which compounded the administrative complexities.<sup>15</sup>

In choosing a destination-based VAT to replace an odd assortment of taxes on imports and domestic inputs, many developing countries have significantly enhanced the coordination of their trade and domestic indirect taxes. Nevertheless, there are a few instances in which commercial and tax policies were reformed simultaneously, and the danger remains that efforts to reform tariff policies may inadvertently distort a country's indirect tax system. For example, tariffs on imported inputs may produce greater uniformity in effective rates of protection but, by making accurate border tax adjustments more difficult, the configuration of indirect tax burdens will become more distorted.

Besides contributing to total revenue, luxury-based excise taxes have the important role in most developing countries of making the burden of indirect taxation more equitable. In order to accomplish this objective, developing countries need to produce reliable income and expenditure data, since what is deemed to be a luxury in one country may be otherwise for other countries.

Given the relative importance of indirect taxes in the revenue systems of developing countries, the central equity concern under a tax reform is to design and apply both sales and excise taxes that do little harm to the low-income groups in the economy. Almost all the incidence calculations included in the tax reform sample, however, indicate that the bottom quintile of households bears a significant tax burden, on occasion reaching as high as 10 percent or more of household income.<sup>16</sup>

### Conclusion

Successful tax reforms have a number of common elements: they stem from a well-thought-out program of action and a clear perception of the problems of the pre-reform tax system; they are staunchly supported by leading policymakers and local technocrats; they are carefully and systematically implemented and monitored; they use tax incentives only sparingly and instead aim for broader and simpler tax bases on which lower marginal rates are imposed; they not only avoid raising taxes on the poor but make some effort to reduce tax burdens on this group; they refrain from making procedural demands that overwhelm administrative capability while investing more resources in training and in upgrading the level of administrative performance; they pay attention to interactions among different components of the tax system and do not neglect the importance of revenue adequacy; they rely primarily, if not exclusively, on tax measures that are directly targeted to the objectives they are intended to achieve; they emphasize the importance of horizontal equity, neutrality, and simplicity; and they accept a state of crude justice in taxation rather than striving for the unattainable goal of complete justice.

The preceding guidelines for reforming taxes are, however, of an extremely general nature. Extreme caution should be exercised in transferring solutions to particular tax problems across different countries. Intercountry variations in administrative capability, in initial economic conditions, and in behavior all suggest the need to prescribe tax remedies that are appropriate to the patient's ills. For example, sophisticated indexation may work in Colombia but not in Morocco, where administrative complexity is already difficult to contend with. Regressive indirect taxes may be of greater concern in Bolivia than in Korea, where household income disparities are less marked. It may be feasible to tax interest income in Zimbabwe where capital markets are highly regulated but not in Mexico. What is

considered a luxury in one country and therefore is highly eligible for excise taxation may not be perceived as a luxury in another country. Despite reservations of this kind, the broad lessons outlined above suggest that several important facets of tax reform experience can indeed be generalized and that countries can learn a great deal from each other's successes and failures.

### Notes

1. Yitzhaki and Thirsk (1990) use the concept of welfare dominance to illustrate how it may be possible to identify welfare-improving tax reforms that are virtually free of value judgments concerning interpersonal equity.
2. Once the resource costs of collecting taxes are recognized, the optimal use of a tax instrument is determined by equating the marginal administrative cost of raising another dollar of revenue from better enforcement with the marginal excess burden per dollar of revenue that results from raising the rates of existing taxes.
3. Some countries (for example, Turkey), restrict crediting for the purchases of capital goods under the VAT, whereas others (such as Colombia) deny a credit except for imported capital goods. The rationale for this practice rests partly on revenue grounds but also in the awkward attempts of these countries to offset the impact of subsidies to capital use found elsewhere, either in the tax or in foreign exchange rate systems. This is also a further example of poor tax policy targeting discussed later in the chapter.
4. Before Indonesia adopted its VAT, it taxed imports at differentially higher rates under its sales and excise taxes. Colombia, in contrast, granted a VAT exemption to purchasers of foreign, but not domestic, capital goods after it adopted the VAT.
5. The situation is further complicated by the provision of foreign tax credits. If foreigners are able to credit host country tax liabilities against their obligations to their own tax authorities, interest rates in the capital-receiving country may not increase when taxes are imposed on interest income.
6. To some extent, this issue of effectiveness depends on the negotiation of tax treaties that permit tax sparing. Unless developed countries allow foreign tax credits for taxes that are "spared" by the host country, tax incentives for foreign firms may simply transfer revenues to foreign treasuries. Tax sparing is not an issue, however, if the home country either exempts foreign source income from tax or, under a credit system, gives firms excess foreign tax credits.
7. The opportunity for evading taxes may be influenced by the form in which the tax incentive is provided. Tax holidays, for example, may be much more susceptible to transfer-pricing abuses than other kinds of tax incentive.
8. Indexation measures in a number of countries have also helped to mitigate the debt distortion.
9. In part, the universal decline in corporate tax rates reflects the effects of international tax competition as developing countries have responded to the lower rates recently introduced by a number of developed countries. The diminished availability of foreign tax credits has also contributed to this phenomenon.
10. The presumption in this instance is that lower tax rates will make it worthwhile for the taxpayers to devote fewer resources to concealing their true income from the tax authorities. Unfortunately, none of the tax reform studies could shed any empirical light on this issue.

11. This statement does not apply to the traditional excises on alcoholic beverages, gasoline, and tobacco products, which have quite different rationales as revenue instruments.

12. The presumptive income tax in Colombia served a number of beneficial purposes. In addition to curbing evasion and improving progressivity, it was a useful instrument for reducing lock-in-effects, taxing imputed income from real estate, and generally correcting for a number of "timing" problems inherent in the application of income taxes. Approximately one-third of all companies and individual taxpayers were taxed on this basis before the tax was repealed in 1989.

13. Here the tax design issue is that of striking a balance between the desire to tax economic rents on previous corporate investment and establishing an attractive tax environment for new investment.

14. In the case of both Turkey and Mexico, these taxes are creditable against corporate tax obligations so they imply no extra burden for profitable companies that comply with the law.

15. At the same time, Colombia unified its VAT rate structure for administrative reasons when the tax was extended to more retailing outlets in 1983.

16. The tax reform studies suggest that it is important to avoid blindly adopting the rules of thumb that often dictate the calculation of tax incidence in developed countries. That is, the incidence of a tax must be examined within the specific context of a particular developing country and there is no reason to believe that an incidence rule that is appropriate in one developing country would also be appropriate in another. For example, some indirect taxes, such as tariffs that are levied in the presence of quantitative restrictions may be significantly more progressive than any direct tax. Moreover, the rules of thumb appropriate for a closed economy may be wholly unsuitable when applied to an open economy.

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## **PART II— DESIGN OF INDIRECT TAXES**

### **5— Design of the Value Added Tax: Lessons from Experience**

Sjibren Cnossen

The widespread introduction of the value added tax (VAT) should be considered the most significant event in the evolution of tax structure in the last half of this century. Since the 1960s, fifty–five industrial and developing countries have embraced the VAT. The VAT has become the main consumption tax in nearly all industrial countries, except in the United States, and it is a condition of membership in the European Communities (EC). Nearly all Latin American countries and several countries in Asia and Africa levy a VAT. In the past three years, such diverse economies as Canada, Iceland, Japan, Kenya, and Malawi have introduced the VAT. Currently, VAT legislation is pending in Bangladesh, Bulgaria, Cyprus, Egypt, Pakistan, Paraguay, Poland, and Thailand.

Although the specific reasons for adopting the VAT differ from one country to another, the main argument is that a properly designed VAT raises more revenue with less administrative and economic costs than other broadly based taxes. A VAT with few exemptions can generate revenues of some 0.4 percent of GDP for every percentage point of the rate. Furthermore, a VAT does not influence the methods of doing business. The tax bill is the same for a product made in the corporate or noncorporate sector with capital–intensive or labor–intensive technology or for one made by integrated or specialized firms. The VAT also ensures neutrality in international trade by freeing exports of tax and by treating imports and domestic goods the same; this is an important attribute in an interdependent, high–tax world. As a transactions tax, which must be shown on invoices, the VAT is harder to evade than an income tax.

The Organisation for Economic Co-operation and Development (OECD), the International Monetary Fund (IMF), and the World Bank have recently published important studies on the economic, technical, and distributional aspects of the VAT.<sup>1</sup> None of these studies, however, has systematically evaluated such essential design features of the existing VATS as the most appropriate coverage or the tax base or rate structure. In short, the questions, "who should be taxed, on what, and to what extent?" deserve further exploration. This is particularly true for developing countries, which, because of limited administrative capability, often find it difficult to implement desired policy objectives.

The chapter has been organized as follows. First is an overview of VATS in the world describing their basic characteristics. Second is an examination of the coverage of VAT. Should the tax extend through the retail stage or should it be confined to the manufacturing or wholesale level? How should an appropriate small-firm exemption be designed and how should the agricultural sector be treated? The chapter then addresses tax-base issues. Should services be taxed comprehensively or should a selective approach be adopted? What is the best treatment of real estate? What about capital goods? What follows is a review of rate issues. Is rate differentiation desired and, if so, should essential commodities be exempted, zero rated or taxed at a lower-than-standard, but positive, rate? Is there a case for imposing a higher rate on luxury commodities, or should these perhaps be liable to separate excises?

After these structural issues have been discussed, the chapter sums up the lessons from the experience with

the VAT in developing countries. The conclusions of this paper differ from those of the world Bank study mentioned above. Although the latter leaves room for preretail VATS, diverse treatment of services, and substantial rate differentiation,<sup>2</sup> this chapter argues that retailers should always be included in the coverage of the VAT (subject to a small-firm exemption); that services should be taxed comprehensively (subject to selective exemptions); and that the case for extreme forms of rate differentiation—such as a zero rate on food products—is weak.

### **The Characteristics of Value Added Taxes**

This section dwells briefly on some definitions and the major characteristics of various VATs found around the world.

#### **Classification Issues**

The ideal VAT is a transactions tax on all goods and services collected on sales at all stages of production and distribution. Tax neutrality can be ensured by confining the tax to the value added at each stage. (Value added is defined as the difference between the value of sales and the value of purchases at that stage.) Tax neutrality is achieved by giving registered firms a credit for the tax paid on all taxable purchases from registered suppliers (including capital goods) against the tax payable on sales. As a result, the same value added is never taxed twice; that is, there are no cumulative effects, as would be inherent to a gross turnover tax. Similarly, tax neutrality in international trade is achieved by applying a zero rate to exports (which results in a refund of any tax paid in earlier stages) and by taxing imports on a par with domestically produced commodities.

Not all VATs are neat, broadly based, tax-credit, net consumption taxes that extend through the retail stage and that are imposed on the destination principle. Some VATs stop at the manufacturing or wholesale stage, which makes it unlikely that services would be included in the base. Furthermore, these and other VATs may not allow a full or immediate credit for the tax on capital goods. In this chapter all tax-credit types of sales tax, regardless of the stage at which they are imposed, are defined as VATs, provided that the tax is levied on goods (but not necessarily services) comprehensively and that there is a credit for the tax on raw materials and intermediate goods (but not necessarily capital equipment. By this definition, production taxes that permit a deduction of

purchases from sales and tax credit types of excise systems are not considered to be VATs.<sup>3</sup> The production taxes are not levied on transactions; administratively, they are more akin to a business income tax.

Table 5–1 lists the fifty–five countries in the world that have some form of VAT. The tax is found on all continents, but it is particularly prevalent in Europe and Latin America. Apart from the incomplete tax–credit manufacturers' tax in Algeria and Côte d'Ivoire, which was inherited from the French, the VAT was first adopted by the Brazilian states and Denmark.<sup>4</sup> The table also shows the coverage, base, and rate structure of the tax in each country. Because the interaction between a general and a selective tax on goods and services is important, the nature of each country's excise system is highlighted.<sup>5</sup>

As table 5–1 shows, the coverage of a VAT may extend through the retail stage (R), the wholesale stage (W), or the manufacturing stage (M). Furthermore, the base may comprise all consumer goods and services, unless specifically exempted (G + S); goods and selected services (G + ST); goods only G; consumer goods and capital goods (G + CG); or consumer goods, selected services, and capital goods (G + ST + CG). The rates for each VAT are tax–exclusive, in accordance with the practice in most countries. A distinction is made between standard rates, lower–than–standard rates (including exemptions, denoted by the letter "x"), and higher–than–standard rates.

The nature of the excise system is defined as limited (it comprises mainly duties on tobacco, alcohol, and petroleum products), intermediate (duties are levied on traditional excise goods as well as luxury products), or extended (all the foregoing are in effect along with duties on various producer goods). CT means that a consumption tax separate from the (traditional) excises is imposed, mainly on luxury products.<sup>6</sup>

#### Coverage, Base, and Rate Structure

Most economies extend the VAT through the retail stage (R–VAT), although the small–firm exemption (to be discussed below) may exclude most retailers (but not necessarily most retail sales) from coverage (see table 5–1). Three countries (Indonesia, Mauritius, and Morocco) have cut the tax off at the wholesale stage (W–VAT), and four countries (Algeria, Côte d'Ivoire, Kenya, and Malawi) restrict it to the manufacturing (and importing) level (M–VAT). Once they gain experience with a pre–retail VAT, countries tend to push the tax through the retail stage, as Peru, Senegal, and Tunisia have done in recent years. Indonesia and Morocco, which started with an M–VAT, recently extended the tax to the wholesale stage.

The VAT is the first sales tax that has successfully integrated the taxation of services with the taxation of goods. Not surprisingly, thirty–seven countries tax services and goods comprehensively, often defining services as any commodity that is not a good. Five countries, however, confine the tax to goods (G or G +

**Table 5–1. Value Added Taxes: Basic Characteristics, by Economy**

Area and Economy	Year introduced	Scope		Rates (percent) c			Excise system	
		Coverage a	Tax base b	Standard	Lower d	Higher	Nature e	Luxury products f
<i>European Communities</i>								
Belgium	1971	R	G+S	19	6,17*	25,33	Limited	—
Denmark	1967	R	G+S	22	—*	—	Intermediate*	—
France	1968	R	G+S	18.6	5.5,7	22	Limited*	—
Germany	1968	R	G+S	14	7	—	Limited	—

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Greece	1987	R	G+S	18	8*	36	Limited	—
Ireland	1972	R	G+S	23	0,10*	—	Limited	—
Italy	1973	R	G+S	19	4,9*	38	Intermediate	—
Luxembourg	1970	R	G+S	12	3,6	—	Limited	—
Netherlands	1969	R	G+S	18.5	6	—	Limited	—
Portugal	1986	R	G+S	17	0,8	30	Limited	—
Spain	1986	R	G+S	12	6	33	Limited	—
United Kingdom	1973	R	G+S	15	0	—	Limited	—
<i>Other Western Economies</i>								
Austria	1973	R	G+S	20	10	32	Limited	—
Canada	1991	R	G+S	7	0	—	Limited	—
Finland	1976	R	G+ST+CGg	21.2	—	—	Limited*	—
Hungary	1988	R	G+S	25	0,15	—	Intermediate	CT*
Iceland	1989	R	G+S	25	—	—	Limited	—
Norway	1970	R	G+ST	20	—*	—	Limited* h	—
Sweden	1969	R	G+S	25	—*	—	Limited	—
<i>Asia</i>								
Indonesia	1985	W	G+ST	10	X	—	Intermediate	CT
Israel	1976	R	G+S	16	—*	—	Extended	CT
Japan	1989	R	G+S	3	—	—*	Limited	—
Korea	1977	R	G+S	10	X	—	Intermediate	CT
New Zealand	1986	R	G+S	12.5	—	—	Limited	—
Philippines	1988	R	G+S	10	X	—	Intermediate	—
Taiwan	1986	R	G+S	5	X	—	Intermediate	CT
Turkey	1985	R	G+S	12	8*	20	Limited	—
<i>South America</i>								
Argentinai	1975	R	G+ST	13	X	—	Extended	CT*
Boliviaj	1987	R	G+S	11	—	—	Intermediate	CT*
Brazil (states)	1967	R	G+CGk	20.5	—1	—	Extendedm	CT*
Chile	1975	R	G+S	18	—	—	Intermediate	—
Colombia	1974	R	G+ST	10	0*	35*	Limited	—
Ecuador	1970	R	G+ST	10	X	—	Limited	—
Perun	1982	R	G+STo	14	X	—	Extended	CT*
Uruguay	1973	R	G+S	22	X,12	—	Limited	—

## Tax Policy in Developing Countries

### *Central America and Caribbean*

Costa Rica	1975	R	G+ST	10	0	—	Extended	CT*
Dominican Republic	1983	R	G+ST+CG	6	X	—	Extended	CT
Grenadap	1986	R	G+S	20	0,8*	—	Limited	—
Guatemala	1983	R	G+S	7	0	—	Extended	CT
Haiti	1982	R	G+S+CG	10	X	—	Limited	—
Honduras	1976	R	G+ST	7	X	—*	Intermediate	CT
Mexico	1980	R	G+S	15	0,6	20	Limited	—*
Nicaraguaq	1975	R	G+ST	10	X*	15*	Limited	—
Panama	1977	R	G+S	5	X	—*	Limited	—

### *Africa*

Algeria	1960	M	G+CGr	25	7,5,11.1	42.9,66.7*	Limited	—
Côte d'Ivoire	1960	M	G+CGg	25	11.1*	35.1	Limited	—

*(table continued on next page)*

CG). Brazil does so because its constitution relegates the taxation of services to the country's municipalities. Mauritius, a small island economy, apparently considered it difficult to tax services at the wholesale level or did not want the VAT to interfere with tourism and related services. Malawi may have had similar reasons for excluding services from its M-VAT. Algeria and Côte d'Ivoire retained the old French manufacturers' tax and

*(table continued form previous page)*

<i>Area and Economy</i>	<i>Year introduced</i>	<i>Scope</i>		<i>Rates (percent) c</i>			<i>Excise system</i>	
		<i>Coverage a</i>	<i>Tax base b</i>	<i>Standard</i>	<i>Lower d</i>	<i>Higher</i>	<i>Nature e</i>	<i>Luxury products f</i>
Kenya	1990	M	G+ST	18	X	35,50,100	Limited	—
Madagascar	1969	R	G+S	15	X	—	Extended	CT
Malawi	1989	M	G	35	X	var.	Limited	—
Mauritius	1983	W	G	5	X	—	Limited	—
Morocco	1986	W	G+S	19	X,7,12,14*	30	Limited	—
Niger	1986	R	G+S	17	X,10	25	Limited	—
Senegal	1990	R	G+S	20	7	50*	Limited	—
Togo	1984	R	G+S	14	3t	—	Limited	—
Tunisia	1988	R	G+S	17	X,6	29	Limited	—

a. R = value added tax extending through the retail stage; W = value added tax extending through the wholesale

stage; and M = value added tax extending through the manufacturing stage.

b. G = goods; S = services; ST = services taxed selectively; and CG = capital goods.

c. Rates are expressed as a percentage of the tax-exclusive value of taxable commodities, which is the practice in most countries. Algeria, Bolivia, Brazil, Côte d'Ivoire, Finland, Guinea, and Sweden have tax-inclusive rates. Tax-inclusive rates ( $t_i$ ) can be converted into tax-exclusive rates ( $t_e$ ) by dividing them by  $(1-t_i)$ . An asterisk denotes the existence of other special lower or higher rates, often technical in nature, which apply to only one or two commodities.

d. The letter "X" means that essential products are exempted rather than taxed at a lower or zero rate.

e. Three types of excise system are distinguished: limited, intermediate, and extended excise systems. *Limited* excise systems tax at least the traditional excise goods: tobacco products, alcoholic beverages, and petroleum products, as well as various forms of road use and entertainment. Some food products (such as sugar, confectionary, and salt), various beverages (such as coffee, tea, and cocoa), and some services (such as insurance) may also be included in the base. In addition to the items covered under a limited system, an *intermediate* excise system covers a large number of luxury products such as cosmetics, furs, precious stones, audiovisual equipment, and household appliances. Obviously, the taxes on these products serve the same function as a higher VAT rate. An *extended* excise system would include in its base the commodities covered by a limited system and an intermediate system, but also a large number of producer goods. An asterisk means that a large number of low-rate special-purpose excises are imposed to earmark their revenues or to achieve various regulatory objectives, for example, pollution abatement. These levels are left out of consideration in defining the nature of the excise system.

f. CT denotes that a separate consumption tax is imposed in addition to the (traditional) excises. CT\* means that the consumption tax, usually levied at the manufacturing level, has a tax credit feature akin to the VAT.

g. The coverage of services is confined to telecommunications and waiting services in hotels and restaurants. Capital goods are not taxed as such, but using the direct subtraction method, 80 percent of investments in machinery and equipment and 75 percent of investments in factory buildings are deductible from taxable sales.

h. Not including a separate tax on investment goods, which reportedly is used to influence the business cycle.

i. In Argentina, the provinces and the federal district levy gross receipts taxes at rates ranging from 1 to 8 percent, depending on the jurisdiction and the nature of the taxable transaction.

j. Bolivia also has a 2 percent gross receipts tax.

k. Under the Brazilian constitution, the right to tax services is reserved to the municipalities, which tax nearly all services except interjurisdictional transportation and communications (reserved to the federal government) and banking. The taxes on services are turnover type levies without a tax credit for tax paid in previous stages.

l. Lower rates of 7.5 percent and 13.6 percent are imposed on interstate sales between registered taxpayers, whereas sales at retail across state borders are taxed at a rate of at most 20.5 percent.

m. The federal government in Brazil levies a highly rate-differentiated, tax-credit type of industrial products tax. Unlike the VAT at the state level, the tax credit is available for a wide range of capital goods. A zero rate applies to almost 4,000 items including chemicals, medicines, papers, and common metals. The rates are highly product-specific.

n. Peru also levies a 2 percent gross receipts tax for municipal development purposes, which is added (without tax credit) to the VAT.

o. The tax credit on capital goods purchases is allowed in two annual installments. If inflation is high as it is in Peru, the real value of the tax credit is eroded and provision would in effect be a tax on capital goods.

p. Grenada also has a 2 percent gross receipts tax.

q. Nicaragua also has a 2 percent gross receipts tax levied by the municipalities and social welfare boards. Under the VAT, the minister of finance can fully or partly disallow the tax credit attached to the acquisition of capital goods or fixed assets or prescribe that the credit should be taken in annual installments.

r. Algeria has a separate turnover tax on services levied at differentiated rates. Construction is subject to the VAT.

s. Côte d'Ivoire has a separate turnover tax on services levied at differentiated rates. However, building contractors and hire purchase companies are subject to the VAT.

t. In Togo, the lower rate of 3 percent applies to all first sales that have not been subject to the 14 percent rate. This contrasts with the usual situation in which the lower rate is reserved for essential commodities.

*Source:* Country legislation and reports. Some information may be incomplete or out of date.

therefore tax services (except construction) separately under a turnover tax.

Twelve countries tax services selectively by enumerating them in the law. At one extreme, Norway lists nearly all services, and the result is almost the same as under the integrated approach. At the other extreme, Finland taxes only telecommunications and waiting services in hotels and restaurants. The number of tax-

able services is also limited in Indonesia, Kenya, Colombia, and the Dominican Republic, but large in most other Latin American countries. The integrated versus the selective approach warrants further examination, as does the practice in six countries (Finland, the Brazilian states, the Dominican Republic, Haiti, Algeria, Côte d'Ivoire) of taxing capital goods, which discriminates against capital-intensive production.

High VAT rates are a typical phenomenon in Europe, where everything and everyone is taxed higher (and receives more benefits) than anywhere else.<sup>7</sup> Rate differentiation is found mainly in southern Europe and in Africa, in the French practice of taxing traditions. Interestingly, twenty countries exempt essential commodities in the household basket of lower-income groups. Exemptions are frowned upon in the literature because they cause cascading effects. Nine other countries (notably the United Kingdom, Hungary, and Mexico) zero-rate commodities regarded as essential. Outside Africa and the European Communities, few countries have higher-than-standard VAT rates.

If a country levies a broadly based consumption tax such as the VAT, it may be expected to have a limited excise system confined mainly to the traditional excise goods. By and large, this is the situation in Europe and Africa, but not in Asia and Latin America, where fourteen of the twenty-five countries with a VAT have an intermediate or extended excise system. There are three explanations for this somewhat paradoxical phenomenon. First, most countries with an intermediate or extended excise system use this system, instead of a higher VAT rate, to discriminate against luxury items. Second, many Latin American countries also use their excise system to discriminate against imports, perhaps because their membership in a free-trade area prevents them from using the import tariff for this purpose. And third, some countries simply did not clean their Augean stable of commodity taxes when they introduced the VAT, but just added another tax.

### **Tax Coverage**

Two important issues related to the coverage of a VAT are what stage of production and distribution should be taxed, and how should small traders and farmers be treated.

### Pre-retail Value Added Taxes

In the literature, pre-retail VATS are often given the benefit of the doubt. At the manufacturing level, it is argued, business units are typically larger (and, hence, taxpayers are fewer) and accounts are better maintained than at subsequent trading levels. In practice, as indicated above, most countries have opted for the R-VAT. Pre-retail VATS, seven in all, are only found in various countries of Africa and in Indonesia.<sup>8</sup> The scale on which these taxes have been abandoned in the past fifteen years<sup>9</sup> and the well-documented discouraging experience with the M-VAT in Canada<sup>10</sup> provide evidence that a VAT short of the retail stage should not be contemplated. Some of the shortcomings are listed below.

An M-VAT may be suitable at the early stages of economic development to succeed the excise taxes imposed previously on products other than alcohol, tobacco, and petroleum. As an economy matures, however, such a tax becomes beset by valuation and trade organization problems, which draw valuable administrative resources away from audit and compliance control. It becomes difficult not only to define "manufacturing," but also to determine how to treat sales at different trade levels, transfers between related parties, sole distributors, and various other issues.

If sales are made by manufacturers to retailers or consumers, the actual sales price causes unintended differences between and within industries, depending on whether wholesale or retail channels are used. As a result, countries are forced to develop elaborate and complex extrajudicial systems of discounts to exclude wholesale and retail margins from the manufacturers' sales price. Such a system complicates administration, is arbitrary, and is subject to abuse and litigation. Furthermore, businesses are likely to want to extend the discount system to all wholesale and retail sales. Such pressure may be especially hard to resist in developing countries with a high degree of interlocking economic interests.

Another problem under an M-VAT concerns sales between registered firms and nonregistered firms that are related. If the sale of a registered firm is not made at arm's length (a fact that is often difficult to determine), the understatement of its value results in a permanent saving of tax. A related problem is that of sole distributors who buy from manufacturers at lower prices than those charged to other wholesalers and retailers. In return, sole distributors take on market promotion costs, which usually are not taxed under an M-VAT if incurred by traders other than manufacturers. In developing countries, sole distributors are particularly prevalent in the import trade. To the extent that domestic manufacturers do bear marketing costs, they often do, this means that the M-VAT exerts a tax bias against domestically produced goods. Uplifts may correct for the differences, but they are a highly arbitrary device that does not achieve complete equal treatment.

The differences between an M-VAT, and a W-VAT are minimal, although domestic and imported goods are treated more evenly under a W-VAT, in that marketing costs (for example, warranty, advertising, and packaging) included in the value of manufactured goods but not in the value of imports are also taxed<sup>11</sup> Otherwise,

the two taxes have many of the same disadvantages. A W-VAT induces large retailers to integrate their operations backward by assuming wholesale functions. The only solution to this problem is to register such retailers, but then a discount should be permitted in respect of the value for tax of their sales. Furthermore, a large number of wholesalers would also sell at retail, that is, to consumers. Some arbitrary line has to be drawn to exclude those whose wholesale sales during the previous year did not exceed, say, 50 percent of their total sales; perhaps they would not have to register for tax purposes. Whatever is done, the line would be difficult to establish and apply to individual cases.

In conclusion, a VAT extending through the retail stage clearly is the preferred choice. The usual argument against including the retail stage is that it comprises numerous small firms whose records are so poor that it would be wasteful of administrative resources to try to levy the tax on them. But this observation suggests that the

coverage of a VAT is not a "stage" problem, but rather a small-firm issue. There is no reason why middle-size and large retailers, which may be assumed to keep adequate accounts, should not be registered. Moreover, the appropriate VAT treatment of small firms is an issue that concerns those at all levels of production and distribution: producers, wholesalers, and retailers. In other words, the small-firm issue is not resolved by excluding the retail stage. The best VAT covers the whole production-distribution process. The sole criterion for tax coverage should be the size of the firm, regardless of the stage at which it is situated. In other words, attention should be focusing on the design of an appropriate small-firm exemption.

### **Small Traders and Craftsmen**

Almost all VAT employ some method of excluding small traders, craftsmen, and farmers from the coverage of the tax.<sup>12</sup> High compliance and administrative costs, in relation to revenue, are the rationale for the smallfirm exemption. The definition of "small firm" differs from one country to another, depending on such factors as the level of economic development, the organization of the trading sector, and the bookkeeping skills of small traders. Generally, the exemption implies that the VAT burden of small firms is limited to the tax they pay on their taxable purchases. Usually, small firms are not permitted to state any tax on sales invoices and they do not have to keep records for VAT purposes.

Thirty-nine of the fifty-five countries with a VAT exclude small firms on the basis of turnover. Of this number, at least six countries (Greece, Haiti, Indonesia, Ireland, Niger, and Portugal) have a lower exemption for services, because the value added of establishments rendering services is usually larger, in relation to sales, than that of shops selling goods. A drawback of this refinement is that services have to be defined. Four countries (France, Luxembourg, Japan, and the Netherlands) waive or reduce the VAT liability of small firms in the form of a vanishing rebate. To qualify for this concession, firms must compute their net VAT liability; hence, it can be applied only if small firms maintain accounts. Four countries (Belgium, Ecuador, Finland, and Turkey) exclude small firms on the basis of the type of trade they carry on (these include low-margin outlets, stores that sell second-hand goods, peddlers, and hawkers).

More than half of all the countries with a VAT employ various forms of presumptive assessment (forfait system) to collect some tax from firms that are too small to be treated as regular taxpayers, yet too large to be entirely exempted.<sup>13</sup> The French forfait system, which is also found in most Francophone countries of Africa, is the most widely known. Under this system, individual assessments are raised for a period of two to three years and payments are made in monthly or quarterly installments. In other countries, trade-specific percentages (that take the average input tax into account) are applied to the total volume of sales or purchases. A number of countries use presumptive techniques to ascertain the VAT liability of specified traders, such as hotels, restaurants, and truckers. Examples are Bolivia, the Dominican Republic, and the Philippines.

Most countries prefer a straightforward small-firm exemption based on turnover. Additional criteria relating to, say, the type of trader and the number of employees may be useful in establishing a prima facie case for exempting a particular firm. Apparently, presumptive assessment techniques are helpful in collecting some revenue from firms just above the exemption limit, especially if they are not subject to income tax. The volume of purchases seems the best proxy for estimating the presumptive tax liability. The idea is to approximate the VAT liability as closely as possible without spending too much time on the exercise and without giving the tax office too much discretion.

### **Farmers**

Many of the arguments used to justify the exemption or presumptive taxation of small traders and craftsmen apply equally to small farmers. Records of transactions are often inadequate and compliance is difficult to enforce. In contrast to small traders, however, farmers are situated at the beginning rather than the end of the production-distribution process. This implies that if the tax credit attached to agricultural inputs cannot be passed

on, it generates uneven tax-to-consumer price ratios at the end of the process. Such effects should be avoided, particularly since the products of primary sectors usually are essential foodstuffs that weigh heavily in the household basket of lower-income groups.

In some highly developed countries, where farming resembles an industrial activity, farmers are simply taxed and are subject only to the small-firm exemption. Other industrial countries exempt the agricultural sector and use various techniques to eliminate the tax incurred by farmers on their purchases of taxable inputs, such as seed, feed, fertilizer, and machinery. One method is to provide a presumptive tax credit to processors of agricultural products equal to the average tax on farmers' inputs. Another method, which has the same effect, permits farmers to charge a VAT on their sales at an effective rate equal to the average tax on inputs of their sector. In effect, then, they do not incur any VAT liability.

In most developing countries, small farmers and their products are simply exempted. The element of tax in the price of farm produce at the consumer level may be small if various inputs are exempted as well. Whereas seed, feed, and fertilizer are often given concessionary treatment in the form of a lower or zero VAT rate, agricultural machinery and equipment are usually taxed because these goods can also be used for nonfarming purposes. Most countries allow farmers the option of registering and paying VAT. This eliminates any potentially adverse effect an exemption might otherwise have on large production units that use substantial volumes of taxable inputs.

### **Tax Base**

Ideally, a VAT should apply to all consumption items: goods as well as services. Taxing one commodity but not another distorts consumer choices and reduces the tax intake at a given rate. Nonetheless, some concessions must be made for social policy considerations or on administrative grounds. Thus, it would be difficult to defend the taxation of health, education, social, and religious services. Feasibility considerations argue against the taxation of current housing services, financial transactions, and insurance. As these examples show, exemptions are found mainly in the area of services.

### **Treatment of Services**

Services can be taxed in two ways. First, the law may stipulate that all services are taxable, except those specifically exempted. This "integrated" approach is found in the European Communities and most Asian countries. Second, the law may exempt all services, except those that are explicitly enumerated as being taxable. This "selective" system is favored by many other countries. In theory, the base may be the same under either approach; in practice, it usually is not.

**INTEGRATED APPROACH** . Generally, the integrated approach is found in countries that had a broadly based turnover tax before they introduced the VAT, or in Africa a French tax-credit type of manufacturers' tax along with a turnover tax on services. In both instances, goods and services were taxed before the VAT took over. With a few exceptions, nearly all countries that follow the integrated approach exempt social services relating to health care, education, welfare, and cultural activities, as well as other services in the fields of finance, insurance, and gambling.

Exemption means that no credit is given for the VAT on purchases. It might be argued, of course, that social services should be zero-rated. Zero-rating the institutions rendering such services, on the one hand, would require registration, returns, and refunds. Zero-rating their purchases, on the other hand, would involve suppliers in the application of end-use exemptions, which are notoriously difficult to monitor. Therefore, the exemption approach seems best for social services. Since many of these services are rendered free of charge or at administered prices, do not involve significant taxable inputs, and are made available directly to consumers, tax-induced price variations and cumulative effects should be small or irrelevant.

The exemption of other services—such as financial transactions, insurance, and gambling—is more difficult to rationalize. The exemption of banking, for instance, means that an element of tax (that is, the tax the bank has paid on its purchases) enters into the price the bank charges business firms (which cannot credit it against the VAT on sales) for its services. Zero-rating banks would remove all tax but would have the same administrative repercussions as the zero-rating of nonprofit institutions. Taxing banks, the solution indicated by the philosophy of the VAT, raises conceptual difficulties (should the tax be imposed on the interest or on the gross margin of the intermediary?), as well as practical problems (how are inputs and outputs to be measured?)<sup>14</sup> Similar issues arise in the field of insurance (how should the savings element of life insurance be excluded and how should indemnity payments be treated?)<sup>15</sup> Other more appropriate levies on admissions and payouts are available to tax gambling. In all these cases, therefore, the exemption approach, although not ideal, is the best that can be done.

**SELECTIVE APPROACH** . The selective approach is prevalent in countries that still have a pre-retail VAT or that changed over to the R-VAT after having had a singlestage or tax-credit type of manufacturers' tax. But there are conceptual and practical problems in taxing services under a pre-retail sales tax, as demonstrated by the Nordic countries with a history of retail sales taxes. Since they were largely left out of the base, services proved difficult to tax comprehensively when the VAT was adopted.<sup>16</sup>

Services that may be singled out under a selective approach are laundry, dry cleaning, and dyeing ser-

VICES, as well as various personal care services provided by hairdressers and beauty shops; hotels, restaurants, and similar establishments providing food, drink, and shelter; amusement and entertainment services (excluding betting), rendered by theaters, performances, amusement parks, circuses, bowling alleys, night clubs, and discotheques; telecommunications, such as telephone, cable, and telex services; repair and maintenance services of movable goods provided by garages and repair shops, as well as maintenance services for immovable property; the leasing and letting of movable property, such as cars, boats, appliances, and other goods; freight transport and storage of goods; publicity, advertising, marketing, and various administrative and office services, including data processing; and legal services, accountancy, consulting, and other similar professional services.

Among individual services, washing, drying, dyeing, hairdressing, and beauty salons are widely taxed. The small size of the establishments does not seem to be an obstacle. Rather, the fact that they are specialized outlets may be a helpful feature from an administrative point of view. In view of the high income elasticity of demand for most of these services, it would seem appropriate to include them in the VAT base.

More variety is encountered in the VAT treatment of hotels and restaurants, and for good reason. If food was liable to the zero rate or a lower rate, the hotel and restaurant trade would feel discriminated against if it was taxed at the standard rate. Yet, some countries distinguish between food and drink consumed on the premises (taxed at the standard rate) and food and drink (other than alcohol) bought for home consumption (taxed at the lower rate or not at all). The exception is canteen meals, which are taxed at lower rates. Hungary zero-rates cheap food services, and Morocco and Tunisia apply a lower rate in this category.

There is much diversity in the treatment of amusement and entertainment services. Entertainment is one of the few areas in which arguments regarding income elasticity tend to be overridden by cultural considerations. Concerts and theater performances, usually heavily subsidized anyway, are often exempted, whereas "ordinary" forms of amusement provided by zoos and circuses, for example, are taxed at the lower rate. Many amusement and entertainment services are liable to separate excises. Interestingly, Portugal zero-rates movies, but France and Spain apply a higher rate to pornographic films.

Telecommunication services are generally exempt if they are rendered by the government (the post office) or taxed at the standard rate (and sometimes liable to excise) if supplied by privately owned companies. Since these services are easy to define and control, many countries tax them. Since they are considered public utility services,

they are treated like the provision of gas and electricity (see below).

A large number of countries tax repair and maintenance services connected with movable (and immovable) property. Apparently, revenue considerations and administrative savings (not having to distinguish the value of goods from that of services) outweigh the hassle of taxing many small firms. To block an obvious avenue of tax avoidance, the leasing and letting of movable property is widely taxed. Taxation is feasible with fixed places of business, but troublesome with, say, owner-operated taxis, which should probably be exempted or, better still, taxed on a presumptive basis. Similarly, freight and storage services are widely taxed, although if a country has a large number of owner-operated truckers (and many countries do) or if small-firm transport is a readily available substitute, taxation of these services would be difficult to monitor effectively. But presumptive assessment combined with optional taxation is a feasible alternative.

The taxation of various administrative services requires lime comment. To the extent that these and other services are performed for registered firms, the tax on sales would be washed out by the tax-credit mechanism. That is also true for various professional services. The taxation of legal services may be thought to interfere with the administration of justice. For this reason, many countries exempt all or specified legal activities, for example, those relating to family affairs. Often, lawyers and accountants are given favorable treatment.

As for the practice in individual countries, the base of the selective approach in Norway closely resembles the integrated approach in the European Communities. A large number of services are also taxed in Ecuador, Peru, Costa Rica, Honduras, and Nicaragua. In contrast, Colombia and the Dominican Republic have a narrow services base, confined to the types of services widely taxed in the United States: telecommunications, photography, parking lots, clubs, car rentals, and air fares. A narrow base is also found in Indonesia, reflecting its previous experience with a manufacturers' tax.

**EVALUATION** . Although in theory services can be taxed widely under both the selective and the integrated approach, experience shows that more services are likely to be taxed under the latter. Politically, it is probably more difficult to obtain an exemption when all services are taxed in principle than to see to it that one's services are left out of the base when the taxable services are enumerated in the law. The selective approach establishes a precedence that is less likely to emerge under the integrated approach. Moreover, it may be easier to define what is not taxable than what is liable to a VAT.

Two lessons may be drawn from the treatment of services under the VAT. First, the background and history of sales taxation in a country, as well as the choice of the approach itself, go further in explaining why services are not taxed comprehensively rather than

administrative feasibility. Second, if a country levies or introduces an M-VAT, it is advisable to impose a turnover tax on services as well, in order to facilitate the future extension of the VAT through the retail stage.

### **Construction and Buildings**

The treatment of immovable property (real estate) is one of the more complicated issues under the VAT. It is not feasible to tax rents and imputed rental values, but goods and services supplied for maintaining the existing stock of buildings, new buildings, and the lease and sale of commercial buildings can be taxed. It appears difficult to improve on the approach found in the Sixth Directive of the European Communities and followed by nearly all industrial countries. Basically, the Sixth Directive exempts the sale and lease of land and used buildings. In conjunction with optional registration, this is in effect a roundabout way of taxing all new residential property (after all, the value of the property represents the capitalized value of future housing services) and, if desired, a way of providing a credit for the tax on the construction and lease of industrial and commercial real estate.

In the category of construction, nearly all countries tax building materials. Costa Rica, however, zero-rates building materials used for low-cost housing, an enduse exemption that is no doubt difficult to monitor effectively. Côte d'Ivoire and Senegal tax specified local building materials at the lower rate. Most countries treat repair and maintenance services as they do building materials. In the case of mixed firms that trade in and use their own building materials, this obviates the need to distinguish between the goods and the services in a transaction. Administrative problems arise in many Latin American countries that tax building materials but exclude construction services from the base.

Logically, building materials and repair and maintenance services, broadly interpreted, add up to a new building. Most countries recognize this and tax newly created buildings at the same rate as materials and labor. This is the only way to avoid serious distortions and administrative difficulties. Some countries (for instance, Haiti, Guatemala, and Mexico) tax materials and services supplied for the maintenance and repair of the existing stock of buildings but exempt new buildings. Special-purpose exemptions for low-cost housing (unless, say, constructed of bamboo) should be avoided. Turkey limits the exemption to units of 150 square meters but must have difficulty monitoring families who buy two units and then join them.

Like materials and labor, the lease and sale of (commercial) buildings are twin branches of the same tree. If one activity is exempted or taxed, the other activity should be given the same treatment to the extent possible, or the situation will breed tax avoidance schemes. The best approach may be a general exemption in combination with a tightly controlled option of registering and paying VAT for commercial lessors. Otherwise, commercial buildings on which the tax has been credited at the time of purchase may be transferred to the exempt circuit. Nicaragua taxes commercial rents, but confines the tax on residential accommodation to furnished dwellings (and thus treats them the same as hotel rooms). Also, various Francophone countries of Africa tax rents.

The sale of commercial buildings, like residential property, is widely exempted, although many countries levy a transfer tax. Some Asian countries, however, tax such sales on a gross basis. In other words, the VAT is akin to a registration tax or a stamp duty.<sup>17</sup> In most Latin American countries, the VAT liability is restricted to the sale of movable corporeal property (and specified services); hence, an exemption for the sale of immovable property does not have to be provided. Hardly any country taxes the sale of land.

### **Capital Goods**

A few countries tax capital goods under their VATs (see table 5-1) and thereby discriminate against capital-intensive methods of production. The rationale is that the taxation of capital goods with labor-displacing effects promotes employment. The employment argument, however, applies only to imported capital goods for the simple reason that domestic capital goods are produced with domestic labor. Efficiency in production seems best served by having neutral taxes on domestic production and consumption. Taxing capital goods and then allowing a full and immediate credit for the tax thereon also has an important administrative advantage: the tax office does not have to try to define capital goods. Furthermore, a full credit for the tax on capital goods facilitates the auditing process. If the objective is nonetheless to influence investment in capital goods, the income tax, not the VAT, would seem the appropriate instrument.

### **Rate Structure**

Since consumption as a share of income falls as income rises, a VAT levied at a uniform rate falls more heavily on the poor than on the rich.<sup>18</sup> In most countries, this violates prevailing equity norms. These countries therefore attempt to mitigate the regressive burden of the VAT by taxing essential consumer goods that are disproportionately consumed by the poor at lower-than-standard rates. Conversely, a number of countries tax luxury commodities at a higher-than-standard rate.

### Essential Consumer Items

Although the precise definition of the term "essential" differs from one country to another, the items that may be labeled as such usually comprise foodstuffs, medicines, fuel, electricity, newspapers, and public transportation. How are these items taxed and how should they be taxed?

**COUNTRY PRACTICES** . Eleven countries apply the standard rate to basic foodstuffs.<sup>19</sup> Forty-four other countries use one of three methods to mitigate the regressivity of the VAT: zero-rating, exempting, or applying a lower-than-standard rate to basic foodstuffs. Ten countries eliminate all tax on basic foodstuffs by applying a zero rate. No doubt, this is the neatest and most equitable (but also the most costly) way of ensuring that the poor (as well as the rich who eat, and all do) do not pay any tax on their daily bread. The United Kingdom and Ireland go further than any other country: all food products, except when supplied by hotels and restaurants are subject to the zero rate. Portugal confines the zero rate to such items as meat, fish, dairy products, cereals, edible oils, fruits, and vegetables. This approach is also found in Colombia, Costa Rica, Guatemala, and Mexico. Some countries limit the reach of the zero rate by adding the qualification that the zero-rated foodstuffs must be "unprocessed."

Twelve countries tax basic foodstuffs at a lower, but positive, rate. Spain does this most comprehensively (and efficiently) by subjecting all foods for human or animal consumption (except soft drinks and alcoholic beverages) to a 6 percent rate, which is half the standard rate. Following some unsatisfactory experience with trying to distinguish between essential and nonessential food items, in 1988 the Netherlands put all of them in the lower rate category. Basically, Germany takes a similar broad view in taxing foods. Most other countries, conscious of the revenue involved, try to limit the scope of the lower rate in the way they do the zero rate, as described earlier.

Instead of levying a lower or zero rate, which requires registration, returns, and payments or refunds of VAT, twenty countries (mostly developing countries) simply exempt basic foodstuffs.<sup>20</sup> In defining the exempt foodstuffs, most countries refer to the "original" or "natural" state of the product (as does the Philippines) or employ the adjective "fresh" (as does Côte d'Ivoire). Threshing, drying, salting, or smoking usually does not affect the natural state of foodstuffs, but, with few exceptions, industrially processed foods are taxed. Other foods tend to be taxed at the standard rate, except in most member states of the European Communities that apply a lower rate to these items (and therefore do not need to distinguish them from basic foodstuffs). Generally, coffee, tea, and cocoa are treated like other foods.

Many countries accord special treatment to drugs and medicines. A few countries zero-rate these products, which makes sense for registered medicines dispensed in hospitals or through separate outlets, but not for ordinary pharmaceuticals (weight-reducing pills, cough syrups). Many countries exempt medicines. Generally, this helps reduce their cost only if the medicines are imported and the prior-stage tax has been rebated in the exporting country.

The treatment of electricity and household fuel varies, although most countries outside the Nordic group (where it is very dark and cold), Ireland, and the United Kingdom (countries that do not believe in a broadly based consumption tax) apply the standard rate. Some countries exempt kerosene or even zero-rate it (Grenada, Guatemala). Printed matter, especially newspapers, receives favorable treatment nearly everywhere. Similarly, most countries exempt public transportation, either outright or by not listing it under the services that are taxed.

**EVALUATION** . If there are no major constraints on administrative capacity, rate-differentiated VATs are an illtargeted and administratively cumbersome way of reducing the tax burden on the poor. Although the poor spend relatively more of their income on food than the rich, household budget expenditure surveys indicate that, in absolute amounts, the rich spend twice as much as the poor on food because they buy more expensive varieties of various products. In absolute amounts, the rich are given twice as much VAT relief. Obviously, this concession is not an effective way of assisting the poor. In contrast, the income tax can be much more sensitive than the VAT to the economic position and the personal circumstances of individual taxpayers. For those too poor to be able to pay

income tax, income maintenance programs can financially assist them.<sup>21</sup>

Differentiated VAT rates also increase administration and compliance costs and stir up controversy regarding the rate that should be applied. If basic foodstuffs include chicken and pork, but not expensive varieties of fowl and meat, how are the latter to be distinguished from the former? Even with careful design, anomalies cannot be avoided, as demonstrated by the VAT–rate schedules in various countries. Traders, moreover, are seldom able to keep separate accounts for differentially rated products. This means that presumptive methods must be used to determine the tax liability. Compliance control then becomes more complicated, because the physical flow of goods must be audited in addition to the financial flow of goods. Otherwise, firms can issue invoices that show the correct financial amounts, but the wrong kind of goods and rate.

These arguments have less force in developing countries with a limited administrative capacity. In the absence of an effective income tax or adequate income support mechanisms, the taxation of basic foodstuffs would reduce the disposable income of the poor and might undermine their productivity, because they would have less to spend on high–protein foods and consequently not be able to work as hard.<sup>22</sup> Given the dualistic nature of such economies, moreover, unprocessed food products would be difficult to tax, because they would be sold at the farmgate or in local markets without going through specialized distribution channels. Which rate structure, in these circumstances, would be most effective in eliminating the VAT burden on food at acceptable administrative costs?

Experience in the developing countries suggests that the best approach is to exempt the original products of agriculture, animal husbandry, horticulture, fishing and forestry. If the inputs for these products were also given preferential treatment, the hidden tax in the price of food would be minimal. Zero–rating, as in Colombia, Mexico, and some other Latin American countries, may be appealing to the expert but it unduly increases the administrative complexity of the VAT. For revenue purposes, processed foods and, in particular, homogeneous products such as coffee, tea, and cocoa should then be taxed at the standard rate.

Newspapers, books, and public transportation should probably be exempted from VAT. A VAT on public transportation would largely be a bookkeeping exercise if the service were provided by the government. On revenue grounds, it would be advisable to apply the standard rate to electricity and household fuel, as well as clothing and footwear. Although prescription medicines might be exempted, the standard rate should apply to other drugs.

This approach assumes that the preferred solution would be a (low) standard rate for most foods and other products, combined with an exemption for basic foodstuffs. At some middle level of economic development, however, a good case can be made for subjecting all food products, nonalcoholic beverages, drugs, and medicines to a lower, but positive, rate, as Spain has done. Clothing, footwear, electricity, and fuel should then be taxed at the standard rate. What should be avoided is the use of exemptions, zero rates, lower rates, lower rates, higher rates, and higher–higher rates to boot, within categories of products with close substitutes. Colombia is an example of a country with one of the most costly VAT–rate structures to administer.

### **Luxury Products**

Luxury goods are commodities for which the crosssectional income elasticity of demand exceeds unity. In other words, expenditures on these commodities rise proportionately faster than income and hence VAT payments are an increasing percentage of income when moving up the scale. The elasticities will differ from country to country and over time within the same country. Nonetheless, there is wide agreement that luxury goods comprise cosmetics and perfumery; jewelry and precious stones; furs (as well as special skin, leather, and silk products); clocks and watches; radios, television sets, and videos; electrical household appliances; cameras and musical equipment; weapons and ammunition; and cars and pleasure boats. These products may be taxed at the standard

VAT rate or the higher-than-standard rate. Alternatively, luxury products may be subjected to (supplementary) excise duties.

**COUNTRY PRACTICES** . Half of the EC member states and all Nordic countries do not have a higher-than-standard VAT rate, nor do they levy supplementary excises on luxury goods. These countries recognize that a higher VAT rate or a luxury excise system would do little to promote progressivity in taxation, if only because such a system seldom reaches beyond 5 percent of total consumption expenditures. In the six other EC member states, the higher VAT rates are rapidly becoming an anachronism. The European Commission has proposed to abolish them by the end of 1992.

Outside Europe, two trends are of particular interest. First, only four of the countries with a VAT in Asia and Latin America—namely, Turkey, Colombia, Mexico, and Nicaragua—have a higher-than-standard rate. In contrast, the majority of the countries in Africa with a VAT, following the French tradition of commodity taxation, have a higher rate (Guinea, Madagascar, and Mauritius are the exceptions). Second, most countries without a higher rate use their excise system to promote progressivity in commodity taxation. Similarly, some countries with a single rate, such as Grenada, Haiti, and Panama use their import tariff to discriminate against items of luxury consumption.

**EVALUATION** . The arguments against higher VAT rates on luxury goods in industrial countries are by and large the same as the arguments in favor of applying the standard rate to essential consumer items. Differential product taxation (excises) may be a useful instrument for internalizing external costs (effluency levies) or charging users for the cost of government-provided services (road-user charges), but it is not an effective way of promoting progressivity in taxation. Many items merely constitute a small portion of total consumer expenditures or can be smuggled in easily from abroad and thus escape the tax.

Some industrial countries with a VAT impose higher rates on cars, yachts, and private airplanes. These products appear to be particularly suitable for increased VAT

rates but in reality they are not. Instead, selective excises and a properly designed system of user charges, reflecting the cost of government-provided road, waterway, and air services, as well as the cost of congestion and pollution, can do a better job than a higher VAT rate in identifying consumer preferences and reducing excessive use of public facilities.

In developing countries, the case for levying higher VAT rates or excises on luxury goods is also weak. The limited base of luxury consumption and the incentive nature of many products are arguments against differential taxation, however appealing. Thus, for a large number of people in the middle-income ranges in developing countries—people who play a crucial role in economic development—the opportunity to purchase luxury products may act as a powerful incentive to work harder and save more.<sup>23</sup> Toilet preparations, transistor radios, and musical instruments have been cited as incentive goods. If high excises on these goods have a substitution effect in favor of leisure that would outweigh the income effect, the potentially favorable influence on productive effort would be reversed. There is one area, however, in which differential commodity taxation seems to make sense, and that is the motoring field. The demand for passenger cars and gasoline is usually highly income elastic, expenditures make up a sizable part of household budgets, and related levies are easy to administer.

Moderation in the higher taxation of luxury goods, therefore, seems to be good advice.<sup>24</sup> Certainly, the extended, highly rate-differentiated excise systems prevalent in Latin America should be rejected. The resources employed in administering these systems would be better directed at improving the administration of the income tax. Nonetheless, if countries insist on taxing luxury products differentially higher, one must then ask whether a higher-than-standard VAT rate or a set of supplementary ad valorem excises would be the better tool. Although both methods exist, supplementary excises would better protect the integrity of the VAT. Classification problems

would be fewer, and, since the excise component of a luxury item would not be creditable, this would reduce the inevitable problem of monitoring the illegitimate claiming of credits on business purchases diverted to personal use. Accounting for VAT would also be simpler for most taxpayers.

### Lessons

The first lesson of this review is that pre-retail VATs cause so many distortions and administrative complexities that they should hardly ever be contemplated. (If they are introduced, pre-retail VATs should be accompanied by a turnover tax on services.) In general, VATs should (and do) extend through the retail stage. An appropriate small-firm exemption can be used to exclude most small traders, if not most retail sales, from the tax. Very small firms should be excluded from coverage by reference to turnover, possibly supplemented by (administrative) criteria relating to trader type and employment. A presumptive assessment system, based mainly on turnover, could be operated for other small traders and artisan producers. Small production units in primary sectors should also be excluded from coverage, initially by exempting their products (agricultural products, meat, fish) and at a later stage by waiving their liability to tax. To minimize the tax burden on the products of primary producers, their inputs (feed, seed, fertilizer) should be taxed preferentially or not at all. To avoid discriminatory treatment, farmers and small traders should have the option of becoming registered for VAT purposes.

The second lesson is that an effort should be made to include all services (except health care, education, social welfare, banking, and insurance) in the base. The integrated approach (all services taxed, unless specifically exempted) is preferable to the selective approach (all services exempted, unless specifically taxed). It is easier to define what is not liable than what is liable to the VAT. Administrative feasibility seems to be less the real reason for leaving various services out of the base than is often thought. If the selective approach is followed, consideration should be given to taxing laundry services and beauty shops; hotels and restaurants; amusement and entertainment; telecommunications; repair, maintenance, and the letting and leasing of movable property; freight and storage; advertising and administrative services; lawyers and accountants.

Construction activities and buildings are one of the most problematic areas under a VAT, primarily because it is hardly feasible to tax rents and imputed rental values or the sale of second-hand buildings. The best approach is to tax new buildings, building materials, and repair and maintenance services, at the same rate. The letting and leasing of buildings should be exempted from the tax, but commercial lessors might be given the option of becoming registered taxpayers. Financial services and insurance should not be included in the tax base. Special-purpose exemptions for worthy causes should be avoided; end-use exemptions are notoriously difficult to monitor effectively.

The third lesson is that rate differentiation should be kept to a minimum. Yet, administrative capacity may be so limited in developing countries that other instruments are not readily available for financially assisting the poor. If so, a case can be made for the favorable treatment of essential consumer items, primarily unprocessed foodstuffs. In the early stages of economic development and administrative sophistication, such foodstuffs should be exempted; later, a reduced rate of VAT might be applied to all food products. Other products and services eligible for the reduced rate are drugs

and medicines; electricity and fuel; newspapers and books; and public transportation.

Even in developing countries, the case for levying higher-than-standard rates of VAT or supplementary excises on luxury goods (apart from gasoline and motor vehicles) is not strong. Expenditures on luxury items are relatively minor and many luxury goods motivate people to work harder and save more. If luxury goods are to be taxed higher, separate excises rather than a higher VAT-rate would be appropriate. Luxury items that are widely taxed include cosmetics and perfumery; jewelry and precious stones; furs and fancy textiles; clocks and watches; radios, TVs, and videos; electric appliances; cameras and musical instruments; weapons and ammunition; and

cars and pleasure boats.

The fourth lesson is that the VAT can be administered at most levels of economic development, but as a broadly based transactions tax it is particularly suitable for large, integrated economies with sophisticated production and distribution processes. It is less than ideal for small, island-like economies that have a narrow manufacturing base and that depend heavily on cross-border trade. The VAT is not as simple to operate as, say, an excise system. It requires literate taxpayers who are willing to maintain basic accounts and a tradition of voluntary compliance. Otherwise, a country would be better off with a set of well-chosen excises. It is important to view the VAT in relation to other commodity taxes. Many countries have a simple VAT but jeopardize the administrative feasibility of their indirect tax system by an extended, highly rate-differentiated, protectionist set of excises.

The fifth lesson is that tax reform efforts should be just as concerned with assessing existing VATs as with introducing such a tax in countries that do not yet have it. In particular, the VATs that have an incomplete base and that are levied in conjunction with complex excise systems should be reexamined in the light of widely accepted criteria relating to tax neutrality and administrative feasibility. Recently, Nicaragua has done so.

### Notes

I am grateful to the editors and anonymous referees for their useful comments. Of course, whatever faults remain are entirely my responsibility.

1. See Organisation for Economic Co-operation and Development (1988), Tait (1989), and Gillis and others (1990).
2. See Gillis and others (1990: 22331). In some cases, this study calls these issues "largely unexplored."
3. See table 5-1 for the countries that have tax-credit type of excise systems. Production taxes are found in Cameroon, Central African Republic, Chad, Congo, and Gabon. In the usual terminology, these countries employ the direct subtraction technique or accounts method of computing value added. Japan permits the use of the accounts method as an alternative to the tax-credit or invoice technique. For more on the various forms of VAT and methods of calculating the tax liability, see Carl S. Shoup (cited in Gillis and others 1990).
4. It should be noted, however, that the VAT was pioneered in France, which introduced a value added type of consumption tax on goods in 1954, levied at the production stage. In 1968, this tax was combined with the existing turnover tax on services and a local tax on retail sales to produce a single, comprehensive levy extending through the retail stage. In recent years, Niger, Senegal, Togo, and Tunisia have followed the same route.
5. Full details of each country's VAT and excise system will be published in a forthcoming World Bank monograph, which will also analyze the structural aspects of various VATs in greater detail than is possible in this chapter.
6. For more on the nature (and effects) of excise systems, see Cnossen (1977).

## Tax Policy in Developing Countries

7. Note that many African countries also have high VAT rates (see table 5–1), but these rates are imposed mainly at pre–retail stages; therefore, the effective rate on consumer sales may be only half of the statutory rate.

8. The tax–credit type of excise systems (consumption taxes) in various Latin American countries have features akin to M–VATs.

9. Nine of the thirty–two countries with a manufacturers' or wholesale sales tax in 1977 listed in Cossen (1977:1821) adopted a R–VAT.

10. See especially Gillis (1985).

11. For this reason, in 1989 Indonesia extended the coverage of its 1986 M–VAT to wholesalers. Currently, it is considering a further extension to the retail stage.

12. For a fuller treatment, see John F. Due (in Gillis and others 1990).

13. Nine countries do not exempt small firms at all, but tax all small firms on a presumptive basis.

14. Argentina and Israel, however, tax banking services by way of the addition method. That is, the value of these services is measured as the sum of the payments to the factors of production: labor and capital. For a useful discussion of the VAT treatment of banking services, see Hoffman and others (1987).

15. New Zealand and Chile tax fire, general, and accident insurance, but not life insurance. To confine the tax to the gross margin, insurers are allowed a credit for the tax fraction of any indemnity payments. A number of countries subject nonlife insurance premiums to a separate tax. For more on this issue, see Barham and others (1987).

16. Of course, all countries with an R–VAT tax services performed in connection with the direct production or distribution of goods, including assembling, packing, blending, and mixing. Obviously, the value added by distributional activities as such would also be included in the taxable value.<sup>a</sup>

17. In analogy to the sales tax terminology, registration taxes and stamp duties on the sale or purchase of immovable property may be called the (cumulative) turnover taxes in the

field of property taxation. They have the same pernicious effects.

18. That is, if the VAT burden is measured against income, as is commonly done. The burden distribution would be proportional, or largely proportional, if consumption or lifetime income were taken as the denominator.

19. As shown in table 5–1, the standard rate is applied in the Nordic countries, Israel, Japan, New Zealand, Bolivia, Brazil, and Chili. In the last three countries, the small–firm exemption may keep the trade in some food sales outside the ambit of the VAT. Interestingly, food products are rarely subject to higher–than–standard rates. Some EC countries, Mexico, and Turkey apply higher rates to caviar or, more generally, seafood. Obviously, this makes as little sense as imposing an extraordinarily high excise on, say, champagne.

20. The Republic of Korea, a newly industrialized country, uses the exemption approach as well.

21. For further details, see Cnossen (1989).

22. As Shoup (1965: 59293) has pointed out, regressive product taxes may reduce gainful consumption, defined as "consumption of a type such that, in the event that it decreases, the output of the economy will decrease, either now or later, by more than the decrement in consumption."

23. See Cnossen (1978: 822) and the literature cited there.

24. If it is necessary for revenue purposes to tax certain widely consumed items, such as sugar and soft drinks, differentially higher excises should be used. Under the VAT, these items can then be taxed at the same rate as other foods and nonalcoholic beverages.

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## 6—

# The Coordinated Reform of Tariffs and Indirect Taxes

Pradeep Mitra

Many economists now recognize the value of adopting an outward-oriented development strategy and therefore recommend that developing countries reduce the bias against exports caused by the extensive use of tariffs and quantitative restrictions on imports.<sup>1</sup> That bias has been pronounced in several countries. The Philippines, Nigeria, and Colombia, for example, allowed effective rates of protection to manufacturing to reach 44,55, and 82 percent, respectively, in the late 1970s. Furthermore, these rates have been lower for exports than for domestic sales everywhere except in the Republic of Korea and Singapore (see World Bank 1987).

In the absence of appropriate macroeconomic policies, however, trade liberalization tends to be delayed or aborted.<sup>2</sup> But with public sector deficits averaging 7 percent of GDP, developing countries can ill afford to sustain the revenue losses arising from tariff reductions. It is therefore important for them to identify alternative and administratively collectible sources of revenue if they are to avoid sinking deeper into macroeconomic difficulties.<sup>3</sup> That these could be significant emerges from the fact that the contribution of import taxes to tax revenue in 1985 was 14 percent in Latin America, 21 percent in Asia, 22 percent in the Middle East and North Africa, and 26 percent in Sub-Saharan Africa, in comparison with 2 percent in industrial countries (see World Bank 1988). The tradeoff between moves toward outward orientation and fiscal imperatives is thus frequently central to policy reform.

The central argument of this chapter is that tariff reform must be seen as part of a broader program of tax reform. Advice that is typically given on tariff and tax reform fails at times to coordinate the two. It is therefore important to (a) examine the instruments used by developing countries to further protection and revenue objectives and (b) determine what administratively feasible tax and tariff design would better serve efficiency and equity objectives in those countries.

## Tariff and Tax Policy

Discussions of structural adjustment in developing countries have given tariff and tax reform a good deal of attention but on the whole have treated these topics separately.

### Tariff Reform

Although details vary from country to country, a standard set of recommendations on the reform of import policy consists of (a) converting quantitative restrictions and other forms of nontariff licensing into tariffs and (b) reducing the level and dispersion of tariffs.<sup>4</sup> It is recognized that such a reformed system necessarily discriminates against exports: the bias is offset in part through a variety of schemes that exempt from tariffs imported inputs entering into export production.

The revenue implications of tariff reform, however, have not been addressed systematically. To give a few examples, a 1984 move to eliminate the special import tax in Morocco miscalculated the revenue impact, which, together with the poor initial performance of

the value added tax, led to a subsequent tariff increase. A similar situation came about in Thailand in 1981 because proposals for alternative sources of revenue focused on one-time increases rather than elasticity-enhancing tax reform. The revenue effect also appeared to have been underestimated in the Philippines, where the government then introduced an across-the-board import tax and a domestic turnover tax to raise revenue—although this is ascribed more to the deterioration of the economy in 1983<sup>86</sup> than to tariff reform. The program of import liberalization was, however, stalled by those developments (see Rajaram 1990).

### Tax Reform

Tax reform in developing countries is designed to further revenue, efficiency, and equity objectives (see World Bank 1991). Indirect taxes account for the bulk of tax revenue, and the instrument of choice is a value added tax (VAT) on consumption or a single-stage sales tax, with symmetric treatment of domestic production and imports.<sup>5</sup> Proposed reforms tend to favor using a VAT to replace a wide range of existing indirect taxes and to allow its coverage to expand as more and more taxpayers find it advantageous to register in order to benefit from the crediting of taxes paid on inputs.

Tariff and tax reform studies, as already mentioned, are to a large extent conducted separately. As a result, tariff studies, on the one hand, tend to overlook the protective role of domestic tax-subsidy instruments that, in addition to tariffs, extend favorable treatment to local producers. Tax studies, on the other hand, may recommend symmetric treatment of domestically produced and imported goods, but they leave the analysis of the structure and level of protective customs duties to tariff studies. Such a separation has, admittedly, an obvious practical advantage from the point of view of the management of tasks. It also has the apparent virtue of not straining the absorptive capacity of policymakers—

**Table 6–1. Composition of Indirect Tax Revenue in Bangladesh, 1987<sup>88</sup>**

(percentage of total tax revenue)

<i>Tax type</i>	<i>Tax base</i>		<i>Total</i>
	<i>Imported goods</i>	<i>Domestic goods</i>	
Customs duty <sup>a</sup>	37.8	—	37.8
Sales tax	12.4	—	12.4
Excise duty <sup>b</sup>	—	26.8	26.8
Total	50.2	26.8	77.0

— Not available.

a. The customs duty is levied on the c.i.f. value of imports. The sales tax, which applies only to imports, is levied on the customs duty-inclusive value.

b. The excise duty is levied on the ex factory price of domestically produced goods.

*Source:* World Bank estimates.

ers. However, the policy reversals noted earlier that have occurred as a result of not addressing budgetary concerns have often compromised the credibility of reform and argue for the adoption of a coordinated trade-cum-public finance perspective on these issues.<sup>6</sup> Thus, the main concern of this chapter is the interaction

of tariffs and indirect taxes with respect to protection and revenue. This is not to deny the importance of other policy instruments in trade liberalization, as the broad overview in Thomas and Nash (1991) makes clear. The focus is narrowed because of the evident lack of systematic attention to revenue issues in tariff reform and the consequent need to develop in depth principles that should guide the coordinated reform of tariffs and indirect taxes.<sup>7</sup>

### Tax and Tariff Instruments

The taxation of imports usually consists of (a) a customs duty that applies to the c.i.f. price and (b) a sales tax/V

AT that is levied on the customs duty-inclusive price. Tables 6-1 through 6-5 report the use of those (and other) instruments in Bangladesh, Malawi, Nepal, Tanzania, and Uganda which, with per capita incomes of \$160, \$160, \$160, \$180, and \$260, respectively, in 1987, are among the poorest low-income countries (World Bank 1989a). It may be noted that the sales tax on imports is a significant revenue source even in the three Sub-Saharan African countries where import taxes do not loom as large as in the two South Asian countries.

The following points can be made from the data in tables 6-1 to 6-5. First, even the poorest countries use (at least) two different policy instruments to tax imports. The significance of this point may be illustrated by a simple example. Suppose that the c.i.f. price of an imported good in local currency is 100. The customs duty is 20 percent, and the sales tax that is levied on the

**Table 6-2. Composition of Indirect Tax Revenue in Malawi, 1988**

(percentage of total tax revenue)

<i>Tax type</i>	<i>Tax base</i>		<i>Total</i>
	<i>Imported goods</i>	<i>Domestic goods</i>	
Import duty <sup>a</sup>	17.8	—	17.8
Surtax <sup>b</sup>	13.7	20.2	33.9
Excise duty <sup>c</sup>	—	3.5	3.5
Total	31.5	23.7	55.2

— Not available.

- a. The import duty is levied on the c.i.f. value of imports.
- b. The surtax is levied on the import duty-inclusive price of imports and the excise duty-inclusive ex factory price of domestically produced goods.
- c. The excise duty is levied on the ex factory price of domestically produced goods.

*Source:* World Bank estimates.

**Table 6–3. Composition of Indirect Tax Revenue in Nepal, 198889**

(percentage of total tax revenue)

Tax type	Tax base		Total
	Imported goods	Domestic goods	
Import dutya	35.7	—	35.7
Excise taxb	0.7	13.6	14.3
Sales taxc	11.0	11.8	22.8
Total	47.4	25.4	72.8

—Not available.

a. The import duty is levied on the c.i.f. value of imports. There is a two-tiered structure with only the first slab applying to imports from India and both the first and second slabs applying to imports from other countries.

b. The excise duty is levied on the ex factory price for domestic goods. It applies to imports and domestic goods at the same rate.

c. The sales tax is levied on the excise and import duty inclusive c.i.f. value for imports and the excise tax–inclusive ex factory price for domestic goods. It applies to imports and domestic goods at the same rate. Sales tax revenue collected from imported inputs is reported as revenue from domestic goods, so that the 11 percent share reported above is an underestimate of sales tax collected from imports.

Source: World Bank estimates.

customs duty–inclusive price and on domestic production of the good is 10 percent. Assuming the absence of nontariff import licensing, the price that domestic producers can charge for the good is the c.i.f. price plus customs duty, or 120. In this example, the customs duty is a measure of the *subsidy* extended by the incentive system to producers. The customs duty also raises the price of the good to the user above its international price (from 100 to 120), providing the basis for the standard observation that a tariff is a subsidy to a domestic producer financed by a tax on the user. Since the tax component of the customs duty raises the price to users of domestic production as well as imports,

**Table 6–4. Composition of Indirect Tax Revenue in Tanzania, 198889**

(percentage of total tax revenue)

Tax type	Tax base		Total
	Imported goods	Domestic goods	

## Tax Policy in Developing Countries

Import duty <sup>a</sup>	18.6	—	18.67
Excise tax <sup>b</sup>	—	—	—
Sales tax <sup>c</sup>	17.2	55.6	72.8
Total	35.8	25.4	91.4

— Not available.

a. The import duty is levied on the c.i.f. value of imports.

b. An excise tax that applied to both domestic and imported goods was introduced in 1989/90. Revenue figures are not yet available for that year.

c. The sales tax is levied on the import–duty inclusive value of imports and the ex factory price of domestically produced goods. It treats imports and domestically produced goods in a symmetric way.

*Source:* World Bank estimates.

while its subsidy component applies only to domestic production, the tax revenue from users exceeds the outlay on the subsidy to producers; for this reason, the tariff is revenue–raising. The customs duty, however, is not the only tax on users of the good. That is given by the customs duty plus the sales tax, which together raise the price from 100 to 132 (the latter figure being arrived at by adding 10 percent to the customs duty–inclusive price). Hence, the *tax* on the user of the good is 32.

The example suggests that the two instruments could be used to further the two objectives of providing protection and raising revenue. Provided, as in the example and in fact in Nepal and Tanzania (see tables 6–3 and 6–4), that the sales tax/VAT applies at an equal rate to imports and domestic production, the customs duty may be seen as playing a primarily protective role, with revenue objectives being met by the customs duty together with the sales tax/VAT. Thus, the level and structure of customs duties should be set with reference to whatever protection objectives are deemed to be appropriate. The sales tax/VAT can then be set at a level that, together with the customs duty, satisfies the government's revenue requirements.

Second, although the excise tax features separately in all the countries, it may be thought of as a combination of the customs duty and the sales tax because it has both revenue–raising and protective aspects. The first is obvious. In Nepal (see table 6–3), for example, it has a purely revenue–raising function. The second may be seen from its operation in Malawi and Uganda (see tables 6–2 and 6–5), where the excise duty, by applying to domestic production only, subtracts from the protection afforded by import duties. This effect

**Table 6–5. Composition of Indirect Tax Revenue in Uganda, 1988/89**  
(percentage of tax revenue)

	<i>Tax base</i>		
<i>Tax type</i>	<i>Imported goods</i>	<i>Domestic goods</i>	<i>Total</i>

## Tax Policy in Developing Countries

Import duty <sup>a</sup>	17.7	—	17.7
Excise duty <sup>b</sup>	—	10.9	10.9
Sales tax <sup>c</sup>	12.0	27.9	39.9
Total	29.7	38.8	68.5

— Not available.

a. The import duty is levied on the c.i.f. value of imports.

b. The excise duty is levied on the ex factory price of domestic goods.

c. The sales tax is levied on the import–duty inclusive c.i.f. value of imports and the excise–duty inclusive ex factory price of domestic goods. There were a number of items for which the sales tax rate on imports exceeded that on the corresponding domestic product. It appears, however, that a recent change has led to symmetric treatment of domestically produced and imported goods. Imports were subject to a higher rate of sales tax.

*Source:* World Bank estimates.

could be reproduced by adjusting import duties and by offsetting the revenue impact through an adjustment to the surtax/sales tax.

Third, it is sometimes tempting to recommend that an existing array of taxes and surcharges on imports be consolidated into a single levy for administrative simplicity. The above analysis shows that this would be a mistake. Customs duties that apply to imports alone fulfill a different role from sales taxes that apply to imports as well as domestic production. As mentioned earlier, the two instruments are aimed at two objectives, namely, protection and revenue raising. Since both instruments are in use in the poorest countries and even more widely elsewhere, consolidation would mean giving up one instrument and would reduce the possibility of treating tariffs and taxes in a consistent way.

### The Design of Taxes cum Tariffs

The simple example presented earlier showed that (a) the difference between the producer price and the world price of a good is the subsidy to producers, and (b) the difference between the consumer price and the world price of a good is the tax on consumers. This allows us to identify the customs duty with the producer subsidy and the customs duty–plus–sales tax with the consumer tax.<sup>8</sup>

This section develops some basic principles of coordinated tax and tariff design with a view to clarifying ideas as well as providing a point of reference toward which reforms may be directed. Consideration is first given to the wedge between producer prices and world prices introduced by customs duties and then to the wedge between consumer prices and world prices caused by the combined operation of customs duties and sales taxes/VAT.

### **Producer Prices and World Prices**

Wedges between producer prices and world prices are supported by the classic infant industry argument (for details, see Corden 1974). A variant of this runs as follows. The volume of gross output confers "learning-by-doing" benefits; these eventually lower the costs of production and allow the industry to become competitive in the future. The argument is therefore intertemporal: the economy incurs the costs of industrial promotion today in return for higher productivity tomorrow.

This does not necessarily translate, however, into an argument for government intervention. Thus, if private firms can invest in high-cost production in the early years and appropriate the benefits of higher productivity in later years, no intervention is necessary. Institutional restrictions on appropriability and capital market imperfections may, however, preclude such arrangements. Economic theory would then argue for intervention in labor and capital markets to correct those distortions, without restricting trade in any way.<sup>9</sup> But the administrative capacity to identify and extend subsidies in factor markets may be lacking in developing countries. Although this might suggest a welfare-inferior policy of production subsidies extending to all production, whether for domestic sales or exports, in practice developing countries find it easier to assist their producers via an even worse policy. This of course is tariff protection, which encourages only domestic production and discriminates against exports. Its widespread use may be explained by its revenue-raising feature and the relatively inconspicuous way it extends assistance to favored constituencies.<sup>10</sup>

The infant industry argument has also been seen to encounter certain difficulties in practice. A recent report on trade policy reform observed,

Experience with protection policies and their general outcome in the majority of developing countries suggests that infant industry arguments are generally used as a rationale by politically powerful protection-seeking industries, without any serious consideration of whether and under what conditions the economic benefits of the protection will exceed its economic costs. Thus the policies seldom recognize that if the initial economic costs are to be offset, the learning-by-doing benefits (weighted for risks and discounted for the opportunity cost of the capital invested) must appear in a period of, say, five to seven years. (World Bank 1989b)

These and associated reasons have made it difficult to recommend that protection be given to support industries.

### **Structure of Protection**

In practice, advisers on tariff design are usually faced with import tariffs that are justified by a combination of learning-by-doing arguments that cannot be handled by policies superior to tariffs, effective lobbying by special interest groups with no particular claim to "infancy," and political imperatives to keep subsidies hidden (as is the case with tariffs) rather than transparent.<sup>11</sup> Since evidence on learning by doing and related externalities across sectors is notoriously elusive, governments experience considerable difficulty in identifying potentially successful sectors and products for special encouragement. Economists have then recommended that assistance be made uniform, on the grounds either that, in the absence of compelling evidence to the contrary, learning effects might as well be assumed to be roughly the same across sectors or that a uniform structure of assistance is less vulnerable to special

pleading.<sup>12</sup> Higher time-bound assistance may be provided for a few selected sectors where there are demonstrable learning externalities.

### Level of Protection

The above arguments on the *structure* of protection would also be relevant to the question of the appropriate *level* of assistance. Some economists see the need for special assistance to manufacturing as deriving from the excess of the market wage over the real cost of labor because of labor market distortions and savings constraints on the economy (Little, Scitovsky, and Scott 1970). Thus, if wage costs as a proportion of gross value added were on average 15 percent and the real cost of labor 50 percent of the market wage (which is likely to be a generous allowance), the extent to which value added should be assisted is on the order of 5 to 10 percent. In the least-developed countries, if the wages of unskilled labor were as high as 40 percent of value added, the justifiable level of assistance to value added could be 20 percent. Although these estimates should be regarded as no more than illustrative, given the considerable variation in country circumstances governing the relationship between market wages and the real cost of labor, they provide a rough range in which, in the absence of welfare-superior production subsidies, the average level of protective tariffs might lie.

### Summary of Tariff Recommendations

The discussion on protective tariffs may be summarized in the observation that a uniform tariff at a level not exceeding 10 to 15 percent could be adopted as an acceptable rule of thumb in countries where administrative and revenue constraints preclude the extensive use of factor- or production-based subsidies. Although such a structure of incentives discriminates against exports, the 10 to 15 percent range is low enough to limit the extent of discrimination. The discrimination may be partly offset by granting exporters duty-free access to intermediate inputs. Both common sense and experience suggest that practical schemes that give effect to such proposals with regard to imported inputs (duty drawbacks, exemptions, bonded warehouses, duty free zones, and the like) are easier to administer when tariffs are set at low levels. This has two significant implications.

### The Treatment of Intermediate Inputs

The first point to note is that if exports were to gain access to duty-free imported inputs, domestic producers of such inputs would not be able to compete with imports if they were to charge duty-inclusive prices. Thus, for example, if garment exporters were allowed to import fabrics free of customs duties, they would have no incentive to purchase locally produced fabrics at duty-inclusive prices. Hence, countries have attempted to allow an indirect exporter such as the local producer of fabrics to import part of his input requirements free of customs duty. Although this is helpful to domestic fabric producers, it does not fully offset the lack of protection resulting from the need to compete with imported fabrics on that portion of their sales going to garment exporters. If successful, however, the policy could help develop backward linkages and deepen the benefits flowing from outward orientation.

Second, the difficulty of granting duty-free access at high tariff levels implies that attempts to unify tariffs at levels higher than the 10 to 15 percent range cannot be part of the recommended design. This has generated the following problem to which some recent work has been addressed. Consider a situation in which tariffs on final goods are 30 percent, possibly (although this is not necessary to the argument) as a result of previous reform. Tariffs on intermediate goods entering into the production of such final goods are low and, for purposes of this argument, may be taken to be zero. Effective protection to import-substituting final goods is therefore much higher than may be justified on learning-by-doing or other grounds. It is assumed that, for reasons not usually specified, the tariff may not be reduced any further. Attention must therefore turn to indirect ways of reducing protection. Broadly speaking, two kinds of solutions have been offered. The first, proposed by Harberger (1988), is to increase the tariff on intermediate goods.<sup>13</sup> If in fact an intermediate good accounts for  $x$  percent of the value of the final good under free trade, a tariff on the intermediate good at a level  $(100/x)$  times 30 percent would drive

the effective protection on final goods to zero. Since  $x < 100$ , this level of tariff on the intermediate good would be *higher* than that on the final good. Harberger does not recommend that intermediate good tariffs be set at that level. Instead, he suggests, without further argument, that a uniform tariff on intermediate and final good imports is likely to be a satisfactory compromise. The second solution, offered by Shalizi and Squire (1989), is to impose an additional domestic tax on the production of final goods without raising the tariff on intermediate goods.

Both solutions are revenue-raising and therefore do not have adverse budgetary consequences. Moreover, although this is not mentioned by either Harberger or Shalizi and Squire, the extra revenue could be used to assist the producers of final goods who have been adversely affected by the reduction of protection. This point is discussed later in the chapter. The first solution, by unifying the tariff structure at the "unalterable" level of 30 percent, runs the considerable risk of making it difficult for developing country administrators to im-

plement schemes allowing exporters duty-free access to intermediate inputs: the inducements to "leakage" from bonded warehouses and the likelihood of fraudulent claims for duty drawback are too great. It also offers considerable protection to domestic producers of intermediate goods. In contrast, the second solution, by not raising intermediate good tariffs, does not complicate duty-exemption procedures for exports. However, it offers no protection to intermediate goods and does not unify tariffs at a common level. Under this scheme, there are two sets of tariffs: a higher uniform rate for final goods and a lower uniform rate (possibly zero) for intermediate goods, complemented by an additional levy on domestic production of final goods.<sup>14</sup>

The protection of intermediate goods does not seem to be an issue in either solution. Harberger sees the tariff on intermediates principally as an instrument to adjust the effective protection to final goods, while Shalizi and Squire imply that it is not important to protect intermediates in the Sub-Saharan African countries they are discussing. If there are no particular grounds for protecting intermediate goods and the only constraint is the presence of minimum unalterable tariffs on final goods, how is tariff design to be modified? It has been pointed out that the uniformity argument is based on the absence of compelling empirical evidence on sectorally differentiated learning-by-doing or externality arguments. If protection of intermediates is not relevant, it is preferable to have low protection for final goods and no protection for intermediates. If this cannot be achieved by lowering the tariffs on final goods (but see the next paragraph), then, faced with the real possibility of injury to exporters and a consequent threat to outward orientation, it would be desirable to have an additional domestic tax to offset the high effective protection to final goods that would otherwise result. If intermediates are deserving of protection, however, their tariff rates should be increased to levels of 10 to 15 percent and an excise tax imposed, if necessary, on the domestic production of final goods as well. The answer to whether intermediate tariffs should be raised from zero to 10 to 15 percent therefore turns on whether intermediates are to be protected in their own right.

Even if the reduction of final good tariffs is ruled out, the authors think it is possible to increase intermediate good tariffs (Harberger) or to levy additional domestic taxes on final goods (Shalizi and Squire). Before endorsing those solutions, it is important to determine the basis for the unalterability of the final good tariff. If, for example, it may not be reduced because domestic producers of final goods wish to maintain a minimum level of protection, those producers may be equally successful in blocking either of the above proposals, which adopt indirect methods to reduction of that level of protection. In that case, it may be no more difficult to press directly for the reduction of nominal tariffs on final goods.

### **Consumer Prices and World Prices**

In the absence of the lump-sum taxes of classical economic analysis, the motivation for the wedge between consumer prices and world prices, given by the customs duty plus sales tax, is to raise revenue. As a consequence, the government's revenue needs determine the average level of this wedge, while standard considerations of efficiency and equity guide its structure.

In a one–consumer economy with an assumed absence of lump–sum tax instruments, it is desirable to raise revenue by taxing more (less) heavily goods that are relatively complementary (substitutable) with leisure, where leisure is understood to represent an untaxed time endowment.<sup>15</sup> Thus, if all goods were equally substitutable for leisure, a uniform tax structure would be desirable. In the more realistic many–consumer economy, the desired structure of taxation depends on two factors: (a) substitution possibilities with leisure, as before, and (b) variations in consumption patterns among different consumers and income groups. This second factor introduces distributional considerations into the analysis in an essential way. Thus, uniform taxation would be desirable if all goods were equally substitutable for leisure and if there were no variation in consumption patterns across different households. These conditions are implausibly stringent. But they can be relaxed if other instruments are available to the government. If there is a well–functioning income support scheme and income taxation that can appropriately target the basis of differences among households, it may be shown that, under certain circumstances, uniform taxation continues to be desirable even in a many–consumer economy (Deaton and Stern 1986).

Literally interpreted, these prescriptions would call for a complicated structure of tax rates that could not be administered effectively. A comparison of optimal and uniform tax structures and country experience, however, suggest that broadly acceptable outcomes may be obtained by implementing the following set of recommendations.<sup>16</sup>

### **Structure of Consumption Taxes**

First, it would be desirable to tax consumption over as large a part of the economy as administrative constraints permit and to do so at a uniform rate. This does not discriminate on the basis of complementarity and substitutability relationships with leisure endowments, but since such information is extremely difficult to

obtain, it is not uncommon to assume in effect that all goods are equally substitutable with leisure. The situation is somewhat analogous to the earlier one in which, in the absence of evidence on differentiated learning effects across infant industries, it was assumed that they are equally strong. Given the limited reach of taxation in developing countries, however, the uniform tax will not in practice apply to all sectors at the same rate. Agriculture will be exempt from taxation except for its purchase of taxed inputs, as will be enterprises in the informal sector and many services. Once again, the situation varies across developing countries. The middle–income countries of Latin America generally administer a value added tax on consumption that extends through the retail level to the point of final consumption. In contrast, the Asian countries—with the exception of Korea and the Philippines—and the low–income countries of Sub–Saharan Africa administer a VAT that extends only to the manufacturers' level.

Second, given the absence of well–functioning income support mechanisms and the undeveloped nature of the income tax, especially in the lower–income countries, it is necessary to allow exemptions and some differentiation in the rate structure of indirect taxes in order to accommodate distributional goals. Thus, the exemption of nonmarketed food in particular ensures that the tax system has distributionally acceptable consequences. If the indirect tax system is to guard against serving too many objectives and administrative capacity is an important consideration, however, a proliferation of rates must be avoided.

Reference has already been made to the desirability of taxing consumption. This is done under the VAT by allowing firms credit for taxes paid not only on raw materials but also on capital goods.<sup>17</sup> This form of tax also allows exporters refunds on taxes paid on capital goods and thereby enhances competitiveness and allows the benefits of outward orientation to be more fully reaped.

The ensuing discussion makes a distinction between exemption and zero rating and requires a brief explanation. Exempted sectors, by not being part of a VAT, do not pay taxes on their output. By the same token, they cannot

claim credit for taxes paid on their inputs. Hence exempted sectors are taxed on their inputs rather than on their outputs, whereas sectors under the VAT are taxed on their output rather than on their inputs. In contrast, zero-rated sectors are exempted from taxation on both their inputs as well as on their outputs. Zero rating therefore offers a precise way of according relief from taxation.

The VAT used by most economies has either a zero rate or an exemption applying to necessities, a standard rate for the majority of sectors, and a higher rate for luxury items and those goods whose consumption the authorities wish to discourage. Table 6–6 provides some examples. It shows the main rates of VAT and additional rates applying to a subset of goods in the countries of the European Community (which have the longest experience of using VAT), other European countries, selected Latin American countries, and in New Zealand, Taiwan (China), Indonesia, and Korea. The rates shown are those that apply to domestic sales;

virtually all of the economies zero-rate exports. The largest number of rates is seven (in Belgium), but two or three rates are more common. In Asia, Indonesia has a single rate, whereas Korea and Taiwan, which began with single rates, now have three rates.

All the economies listed in table 6–6 have additional taxes on particular commodities. These are separate from the VAT and are therefore not subject to refund. In the European Community, these additional taxes are mainly in the form of excise taxes on tobacco, alcohol, gasoline, and diesel oil. The rates vary widely from one economy to another but are often higher than the 10 or 20 percent VAT levied on goods regarded as luxuries. Korea levies a special excise tax that ranges from 5 to 100 percent on selected goods.

Thus, distributional objectives may be accommodated through a second or luxury rate within the value added tax or by imposing excises on luxuries entering final consumption, together with items such as cigarettes, alcohol, and petroleum products.<sup>18</sup> Once again, the extent of differentiation in the rate structure should depend on international experience with the VAT and the country's administrative capabilities. At the same time, the standard and luxury rates must

**Table 6–6. The Rate Structure of VAT in Selected Economies**

<i>Economies</i>	<i>Main rate</i>	<i>Other VAT rates</i>
Argentina	18	9
Austria	20	10, 32
Belgium	19	1, 6, 17, 25, 33
Denmark	22	—
France	18.6	2.1, 4.5, 5.7, 33.3
Germany	14	7, 2
Greece	18	3, 6, 36
Hungary	25	15
Indonesia	10	—
Ireland	25	2.2, 10

## Tax Policy in Developing Countries

Israel	15	6.5
Italy	18	2, 9, 38
Korea	10	2, 3.5
Luxembourg	12	3, 6
Netherlands	20	6
New Zealand	10	—
Norway	20	11.11
Portugal	16	8, 30
Spain	12	6, 33
Sweden	23.46	3.95, 12.87
Taiwan, China	5	15, 25
United Kingdom	15	—

*Note:* Most countries use a zero rate for a few goods.

*Source:* Tait (1988).

apply symmetrically to domestic production and to imports, to ensure that the task of protection is left to customs duties.

### Summary of Tax Recommendations

The wedge between consumer prices and world prices should be set (a) at a single rate for all transactions that the tax administration is able to reach, with exemptions for items such as nonmarketed food consumed by the poorest and (b) at higher rates for luxuries and other goods whose consumption the government wishes to discourage, with the extent of differentiation being dictated by administrative capacity.

As already mentioned, the wedge between consumer prices and world prices to which the above discussion refers is brought about through the operation of the customs duty plus the sales tax/VAT. Recall the earlier example in which the c.i.f. price of an import in local currency is 100, the customs duty is 20 percent, and the sales tax 10 percent. Since the sales tax is levied on the customs duty–inclusive price (120) rather than the world price, consumer prices could be raised by a uniform proportion over world prices only through a uniform customs duty (which raises producer prices by an equal proportion over world prices) and a uniform sales tax/VAT (which raises consumer prices by an equal proportion over world prices). That proportion would be given in this example by  $(1.2 \times 1.1) - 1 = 0.32$ . Luxury rates or sumptuary excises would apply on top of this for selected commodities. This consideration further underlines the importance of adopting an integrated perspective in determining a desirable structure of customs duty and sales tax/VAT.

### Exports

Thus far, little has been said about the tax treatment of exports, except to suggest that inputs entering export production should not be liable for customs duty or value added tax. There are circumstances, outlined below, when the taxation of exports is justified. To the extent that exports are already implicitly taxed through import tariffs, however, arguments for export taxation should be used with considerable care.

First, a classic argument is provided by less than perfect elasticity in world demand for a country's exports. As the above formulation makes clear, however, the relevant elasticity is not that of world demand as a whole, but the demand for the country's exports. Competition among countries ensures that the latter will usually be considerably more elastic than the former, weakening the argument for significant export taxation. It is also necessary to remember that long-run demand elasticities substantially exceed short-run demand elasticities.<sup>19</sup>

A second argument for export taxation can be made when there is a quota on a country's exports or "voluntary" export restraints. Here the purpose is to tax quota profits and the level should be set to make exports equal the quota in question. Examples are provided by the Multifiber Arrangement and various commodity agreements.

A third argument for export taxation arises from restrictions on domestic tax possibilities. Thus, constraints on the possibilities of taxing agricultural land or income can justify the taxation of agricultural exports.<sup>20</sup> These can either be explicit taxes or indirect taxes implemented via agricultural marketing boards that set prices received by farmers below international prices.

Export taxes were used in at least fifty-three of the seventy-four countries singled out for a recent study of such taxes (World Bank 1988). The evidence also suggests that they are set at levels considerably in excess of those justified by demand inelasticity or the need to substitute for unavailable land or agricultural income taxes. It is important in such cases to replace export taxes by more trade-neutral tax instruments.

### Optimal Policies as Opposed to Rules of Thumb

The prescriptions outlined in this chapter are to be seen, not as optimal policies, but as rules of thumb that yield broadly acceptable policy outcomes with regard to efficiency, equity, and protection, and that can also be implemented with the administrative resources available to developing countries.<sup>21</sup> In contrast, Harberger (1988) has attempted to justify the optimality of uniform tariffs—on the grounds that this guarantees efficiency. This argument is somewhat difficult to assess since, notwithstanding frequent references to "the protectionist motive," the paper nowhere makes clear whether protection is to be considered an objective or a constraint.

The desirability of the uniform tariff is said to follow from "the absurdity (from an economic point of view) of paying a domestic resource cost (DRC) of 22 pesos per dollar in one place, of 16 pesos per dollar in another, and of 10 pesos per dollar in a third place—all being cases of import substitution. A country gains by moving towards equalization of the domestic resource costs of different import substitute activities" (Harberger 1988). Since the measure of the DRC used here—factor use in each activity evaluated at market prices compared with value added at international prices—is equal, in a standard trade model, to one plus the effective rate of protection (ERP), the above is equivalent to arguing that unequal ERPS are undesirable, from which the optimality of uniform ERPS follows directly.

The difficulty with this line of reasoning is the following. DRCS evaluated at *market* prices of factors have no welfare significance in a distorted economy (see, for

example, Srinivasan and Bhagwati 1978). The argument is straightforward. With distortions, the real opportunity cost to the economy of employing or withdrawing a factor from a particular activity is given by its marginal product in that activity, evaluated, in the case of tradables, at their world prices and not their market prices. To make statements on welfare in such an economy it is therefore necessary to use the real opportunity costs of factors in calculating the DRCS. Since only DRCS calculated using the real opportunity costs of factors have any welfare significance, and since this is not the case for DRCS calculated at market prices, the latter of which equal one plus the ERP, "it is best therefore to drop the terminology and concept of ERPS altogether from cost-benefit analysis" (Srinivasan and Bhagwati 1978). This establishes that unequal DRCS at market prices in different import substitution activities cannot be used as evidence of economic inefficiency.

A rehabilitation of uniform ERPS may, however, be attempted using a different line of argument that makes the protection constraint on economic policymaking explicit. If the objective is (a) to extend special treatment to a subset of sectors (for example, manufacturing) compared to the rest of the economy and (b) to preserve uniformity of treatment within that targeted subset, a form of protection constraint discussed by Bertrand (1972), it is clear that policy interventions would discriminate in favor of the subset compared with those outside but not within it. *If there were no economic cost to providing subsidies*—that is, if subsidies could be raised at no cost through lump-sum taxation—the above objective would be achieved by a uniform subsidy to producers within the targeted sector. Furthermore, this uniformity would lead to uniform effective rates of protection if the aim were to encourage value added (that is, gross output net of intermediate inputs) in the targeted sectors. The argument refers not to distortionary tariffs at all, however, but to production subsidies financed by lump-sum taxation. In contrast, if subsidies may not be raised except via distortionary taxation, the economic costs of the latter would have to be taken into account, thus undermining the uniformity argument altogether (see Mitra 1987). Since revenue and administrative constraints preclude most developing countries from assisting local production via subsidies and since most tax administrators do not have access to lump-sum instruments to finance those subsidies, it must be concluded that the special circumstances constructed here to make the most favorable analytical case for uniformity are of virtually no interest for policy. At the same time, as this chapter points out, uniform tariffs, together with uniform indirect taxes, if combined with exemption of nonmarketed food and supplementary trade-neutral taxes on luxuries, although enjoying no theoretical claim to optimality, are likely to be reasonably good rules of thumb in a wider class of situations.<sup>22</sup>

It is now generally known that uniformity is not optimal except in special cases. The above discussion implies that the value of analytical tax-cum-tariff studies for policymaking would be considerably enhanced if more attention was paid to identifying circumstances under which the pursuit of uniformity of taxes cum tariffs, supplemented by higher taxes on domestically produced and imported luxuries, would be seriously inappropriate, rather than constructing empirically implausible special cases where they hold exactly. Thus, as already mentioned, weaknesses in income-support mechanisms and income taxation would be one important reason for introducing distributionally oriented differentiation in the value added tax. Recent research suggests that uniform VAT structures may also be seriously inappropriate in economies where the public sector is characterized by extensive price controls (Heady and Mitra 1991). The pursuit of appropriate rules of thumb has thus made more progress in the design of tax structures than in simultaneous tariffs cum taxes.<sup>23</sup>

### **The Reform of Taxes cum Tariffs**

Policy advisers are rarely called upon to design a country's tax-cum-tariff structure de novo. The more typical situation is one in which the antiexport bias of the trade regime is high on account of import tariffs and quantitative restrictions and must be reduced. At the same time, revenue constraints are typically acute, so that accompanying fiscal adjustments are necessary to preserve macroeconomic stability.<sup>24</sup> How might the ideas on desirable structures developed in this chapter be used to guide the reform?

#### **Nontariff Import Restrictions**

The relaxation and ultimate removal of quantitative restrictions and import licenses is a standard component of trade liberalization. Countries have tried different schemes in this regard, ranging from replacing a positive list of permitted importables by a negative list that allows imports of all items not appearing on it, through auctioning quotas or licenses, to substituting nontariff restrictions with tariffs (for further details, see World Bank 1989b). The last two alternatives are revenue-enhancing. Two points deserve mention here. First, since quantitative restrictions are protective in intent, their replacement by tariffs should be reflected in the customs duty and not in the sales tax/VAT on imports. Second, this change increases the dependence of public revenue on tariffs until such time that the country reduces protection and switches from tariffs to

more trade-neutral sources of revenue such as the sales tax/VAT.

### Tariff Reduction

An easy stage of "reform" may be achieved by lowering tariffs that are set so high as to be ineffective, so that collection rates are significantly lower than statutory rates. A reduction of those tariffs would increase revenue and raise protection for domestic import-competing producers while reducing protection, in the case of intermediate goods, for domestic users of the product. Similar effects would follow from a removal of the numerous exemptions that frequently characterize tariff codes in many developing countries.

### Matching Sales Tax/VAT

The integrated approach to tax-cum-tariff analysis suggests that protection and revenue issues connected with tariff reduction subsequent to the easy stage of reform mentioned above be handled as follows. It is desirable to transfer the role of protection to customs duties. To that end, the sales tax/VAT on imports and domestic transactions should be matched, so that both are taxed at the same rate. Customs duties that are levied on commodities for which there is no domestic production and that are therefore purely revenue-raising should be brought under the sales tax/VAT.<sup>25</sup>

The matching of the sales tax/VAT with respect to rates does not necessarily imply that the effective rate, defined as the revenue collection divided by the base, will be the same for imports and domestic production. This is because collection costs are usually higher for domestic taxes than for trade taxes. The *World Development Report 1988* reports that the administrative costs of trade and excise taxes range from 1 to 3 percent of revenue collected, whereas the corresponding figure for VATS can be as high as 5 percent<sup>26</sup> what is relevant in switching from protective customs duties to a VAT, however, is not the average administrative cost reported above, but the marginal administrative cost of collection; no evidence is available to indicate the extent to which these differ across taxes. In practice, nevertheless, the satisfactory matching of the sales tax/VAT will require a concomitant strengthening of the domestic tax administration.

### Adjusting Trade-Neutral Taxes and the Exchange Rate

To illustrate the kinds of adjustments that are necessitated by tariff reform, recall again the numerical example in which the c.i.f. price of the imported good is 100, the customs duty 20 percent, and the sales tax 10 percent, so that the producer price is 120 and the consumer price 132. A lowering of the customs duty by, say, 50 percent, reduces the producer price to 110. Since sales taxes are levied on the customs duty-inclusive price, however, this also reduces the consumer price to 121 [=  $110(1 + 0.1)$ ], so that the reduction of the customs duty lowers not only the relative producer prices of importable goods but also their relative consumer prices. This can be expected to lead to excess demand for those goods and to a worsening of the current account deficit in the balance of payments if not offset by a policy of cutting absorption, that is, the sum of consumption and investment.<sup>27</sup> Although this will typically be achieved through a combination of expenditure restraint and revenue increases, the latter is of primary interest here. This should take the form of raising the sales tax/VAT, applying it symmetrically to domestic production and imports, a policy that goes in the direction of restoring the tax wedge between consumer prices and world prices. Such a policy of disabsorption, while helpful in redressing a potential supply-demand imbalance in the market for tractable goods, will also reduce the demand for nontradables. If the prices of the nontradables are (realistically) assumed to be rigid downward, a situation of equilibrium in the market for nontradables prevailing before the tariff reform will have been replaced by one of excess supply. This can be corrected by a depreciation of the exchange rate, which will raise the domestic prices of tradables relative to nontradables and thus reduce the excess supply of the latter. The new equilibrium will be characterized by the pre-reform current account deficit (external balance) and equilibrium in the market for nontradables (internal balance) brought about by two instruments, namely, (a) a trade-neutral sales tax/VAT and (b) the exchange rate.<sup>28</sup> Although the former may be thought of as being directed mainly toward the restoration of the external

balance and the latter toward the restoration of the internal balance, each of the two instruments contributes to both policy objectives. This implies that the new sales tax/VAT rate and the exchange rate must be set at levels that recognize their effects on those objectives.<sup>29</sup>

The reformed equilibrium resulting from the above changes will generally be characterized by a higher dependence on a nondiscriminatory sales tax/VAT, a more depreciated exchange rate, and a lower relative price of traded to nontraded goods.

The estimate of revenue expected from increasing the sales tax/VAT rate structure must be adjusted downward by the increased cost of collecting the extra sales tax/VAT revenue, net of the cost saving arising on the customs side. Although these savings cannot be quantified without data on marginal collection costs, it should be remembered that successful reform will also require a reallocation of resources across the units entrusted with the administration of the different taxes.

### **Revenue and Protection Constraints on Reform**

The extent to which revenue as opposed to protection considerations limit the reduction of protective tariffs depends ultimately on administrative constraints to the expansion of the domestic tax base.<sup>30</sup> This will necessarily vary from country to country, but the following general point may be made. The evidence cited earlier indicates that the importance of trade taxes in public revenue declines with per capita income, which implies that administrative constraints to identifying other revenue sources besides trade taxes will probably be most acute in the low-income countries. This suggests that a reduction of protective tariffs might rapidly encounter revenue constraints in such countries. Against that, however, must be set the observation that the low-income countries do not have a diversified manufacturing sector and therefore that many of their import taxes are mainly revenue-raising rather than protective. Since trade liberalization should pertain to the reduction of protective rather than purely revenue-raising tariffs, with the latter being absorbed within the sales tax/VAT, the extent of revenue loss arising from this reduction will in fact be considerably smaller than would otherwise have been the case. Thus it would require a more modest offsetting adjustment in domestic tax structures.

The extent to which protection considerations themselves limit the reduction of protective tariffs depends both on the ability of import-competing producers to preserve the tariff-induced implicit subsidy they enjoy as well as on the other instruments available to the government. Since existing tariff levels in many countries are well in excess of the recommended range of 10 to 15 percent, the move to an outward-oriented development strategy clearly involves a significant reduction in protection to import-substituting sectors. Producers will need time to adjust to such changes. The transition could be facilitated by extending other timebound forms of assistance, as explained below.

The literature on international trade discusses two paths to tariff reform (see Corden 1974). One, the "concertina" method, collapses the structure by reducing the top rate at each step of the transition to the next highest level, while leaving other rates the same. The other, the "radial" method, reduces all tariffs at each stage to a fraction of their previous levels. In both cases, however, the conditions under which reform can improve matters are stringent. Under the concertina method, welfare can only be improved if there is substitutability among commodities, a property that almost certainly fails to hold when intermediates and capital goods, as well as final goods, are imported. Under the radial method, welfare improves (a) if there are no domestic taxes or (b) more generally, if those taxes are also reduced radially. In either of those cases, the country's revenue base would suffer significant erosion. Furthermore, the government would have to be able to offset the revenue gains and losses at each stage through lump-sum taxes and subsidies, a feature that greatly limits their relevance for policy. As a practical matter, it would be preferable at the outset to preannounce the desired tariff structure developed in accordance with the principles set out earlier in this chapter and to establish a realistic timetable for attaining it that takes into account the problems of adjustment in the sectors most heavily affected by the reform.

### Toward Explicit Assistance

Another important question many countries face is whether to provide adjustment assistance to producers adversely affected by tariff reduction. Sometimes a tariff might be imposed on a key intermediate good such as steel to protect one or two large and visible high-cost local producers, possibly but not necessarily in the public sector. Reduction of the tariff on steel is recommended in order to make downstream producers, say producers of light engineering goods, more competitive in export markets. Although the government may support this objective, it may also be concerned that the reform would make local producers of steel uneconomic, and thus might threaten jobs and lead to other negative consequences. In such a situation, the affected producers are few and visible and almost certainly registered with the domestic tax authorities. It would therefore be administratively feasible to extend assistance to those producers via subsidies, with the required revenue coming from a further upward adjustment in the sales tax/VAT. Such a policy, in contrast with tariff protection, would have the advantage of being explicit and therefore subject to periodic budgetary scrutiny. There is therefore some likelihood that such assistance would be more time-bound and less "permanent" than assistance via tariffs. Hence such a policy change should be suggested in such cases.<sup>31</sup>

### Conclusions

Since it is generally accepted that the lack of supportive macroeconomic policies has helped delay or even reverse trade liberalization programs, policymakers must make every effort to offset the potential losses in public revenue arising from tariff reductions if they hope to avoid further macroeconomic difficulties. They should also reconsider the common practice of pursuing tariff and tax studies independently, since the lack of simultaneous attention to the revenue implications of tariff reform and to the implications for protection of tax reform can have negative consequences for the credibility of policy change.

A comprehensive public finance perspective on policy reform becomes easier to adopt when it is recognized that even the poorest countries have essentially

two sets of instruments for the taxation of imports: (a) customs duties and (b) sales taxes/value added taxes, which are usually levied on the customs duty-inclusive value of imports and on domestic transactions as well. Since the customs duty raises the import price above the world price, it is a subsidy to domestic producers. Since the sales tax/value added tax, together with the customs duty, raises the import price users face above the world price, it constitutes a tax on domestic users. The customs duty can then serve protection objectives, while the two together can be designed to meet revenue requirements.

The following integrated structure of taxes cum tariffs provides a point of reference toward which reforms may be directed. This comprises (a) a basic customs duty at a uniform rate of no more than 10 to 15 percent, (b) a basic value added tax on consumption, applying at a uniform rate—depending on revenue requirements—to domestic production and imports, and exempting agriculture, in particular nonmarketed food consumed by the poorest, (c) luxury excises applying at a common rate to domestic production and imports of selected items, (d) zero rating of exports under the value added tax, (e) exemption of imported inputs entering export production from customs duty, and (f) taxes on selected exports either where world demand for the country's exports is expected to remain less than perfectly elastic or where the country is subject to export quotas or where there are significant constraints on land or income taxes. It is important to view the above elements as part of an interrelated package so that, for example, attempts to unify customs duties at levels higher than the recommended range, as in (a), do not create administrative problems in implementing duty exemptions on inputs entering export production, as in (e).

The above prescriptions must be regarded as rules of thumb that can generate broadly acceptable outcomes in terms of efficiency, equity, and protection and that should be flexibly applied in the light of country circumstances

and administrative capability. They are not properties of optimal tariff and tax structures. Thus, the value to policy advisers of analytically oriented studies of taxes and tariffs would be enhanced if such studies were to identify circumstances in which the pursuit of such rules is likely to be inappropriate, rather than construct empirically implausible special cases where they hold exactly.

The coordinated reform of an existing distorted structure of tariffs and indirect taxes in accordance with the above principles will include the following components:

Tariffs that are set so high as to be ineffective, so that collection rates are significantly lower than statutory rates, should be lowered. The numerous exemptions that frequently characterize tariff codes should be eliminated.

The sales tax/VAT rates on domestic production and imports should be matched, to transfer the function of protection to customs duties. Customs duties on items for which there is no domestic production and that are therefore purely revenue-raising should be brought under the rubric of the sales tax/VAT; that is, they should apply at the same rate to imports and possible future domestic production.

The desired tariff structure should be preannounced and a realistic timetable for attaining it developed that takes into account the problems of adjustment in sectors most heavily affected by the reform.

A lowering of customs duties to reduce the excess of producer prices over world prices (the element of protection) would require (a) an upward adjustment to the sales tax/VAT structure and, if nontradable goods prices are inflexible downward, (b) a depreciation of the exchange rate, in order to maintain external and internal balance in the economy.

Export taxes in excess of levels justified by (a) less than perfect elasticity of world demand for the country's exports or (b) quotas on the country's exports or voluntary export restraints or (c) restrictions on more targeted instruments such as taxation of land or income in the sector from which exports originate should be replaced by trade-neutral taxes.

Demands for adjustment assistance arising from sectors adversely affected by tariff reductions may be met by generating revenues through an additional upward adjustment in the sales tax/VAT rate. Such assistance, if extended via the budgetary process, would have the advantage of being explicit and thus subject to periodic scrutiny.

### Notes

1. For an authoritative account, see Balassa (1989a).
2. The relevant literature is cited in Halevi (1988).
3. Based on a sample of thirty-three countries in 1986, as reported in Chhibber and Shirazi (1988).
4. A recent review (World Bank 1989b) notes that trade policy reform has accounted for 30 percent of the conditions in adjustment lending: "a practical first-phase goal for reforms is to reduce tariffs to reasonably low levels, say to a range of 15 to 30 percent over the medium term." Another review of policy recommendations regarding tariff reform in eleven countries (Rajaram 1990) found that a long-term uniform/maximum effective rate of protection of about 20% was favored in certain cases.

5. The proportion of indirect taxes ranges from 43 percent for the Middle East and North Africa to 61 percent for Sub-Saharan Africa. See World Bank (1988).
6. The need to integrate trade taxes with domestic taxes in a common framework has also been argued in Shalizi and Squire (1989) and Linn and Wetzel (1989).
7. An agenda for the simultaneous reform of tariffs, quantitative restrictions, exchange rates, indirect taxes, and government expenditure is developed for a particular country in Mitra and Go (1991).
8. It will be recalled that the shadow price, or social opportunity cost, of a traded good for a small economy is the world price, adjusted for trade and transport margins. Hence the above statement has the appealing property of measuring the producer and consumer distortions introduced by the tax-cum-tariff system with respect to social opportunity costs. Although traded goods are the primary focus of tariff reform analysis, changes in taxes and tariffs consequent on policy reform will clearly affect nontraded goods as well. It may therefore be noted, paralleling the description for traded goods, that the wedge introduced between producer prices and shadow prices of nontraded goods corresponds to a subsidy, whereas that between consumer prices and shadow prices of nontraded goods corresponds to a tax.
9. For a careful statement of the appropriate qualifications, see Baldwin (1969).
10. It is recognized that the administrative capacity to extend domestic subsidies as part of an industrial promotion policy, as opposed to export-discouraging tariff policies, will vary across countries.
11. We ignore here the departures from free trade that may be justified by the "new" trade theory. Their relevance for developing countries remains to be established. See, for example, Srinivasan (1989).
12. For a derivation of the relationship between learning-by-doing and production subsidies, see Mitra (1991). The relationship between structures of incentives and lobbying remains to be demonstrated, however. For some possible formulations, see Mitra (1989).
13. The selective review by Rajaram (1990) suggests that tariff increases on intermediate goods have been recommended in certain countries.
14. This would be an excise tax that has the intended effect of reducing protection for final goods.
15. The result follows from a desire to tax the consumer's endowment. It is common to choose leisure as the endowment good. It could equally be interpreted as nonmarket time. For a careful statement of these conditions, see Stern (1987).

16. See, for example, the calculations reported in Ebrahimi and Heady (1988), Dahl and Mitra (1991), and Mitra (1991).

17. VAT systems that do not allow credit for taxes paid on capital goods—the so-called income-type VATS—are generally not used. Exceptions among the developing economies are Argentina and Peru and, to some extent, Turkey. By definition, income-type VATS credit taxes paid on capital goods purchases only when the latter depreciate: their implementation therefore requires maintaining depreciation accounts. In practice, however, the depreciation provisions used in Argentina and Peru are very generous. In contrast, VATS of the gross-product type, as practiced in Finland and Morocco, do not allow tax credit on depreciation.

18. International opinion is somewhat divided as to what framework is appropriate for the tax treatment of luxuries and other goods whose consumption the government wishes to discourage. One option is to incorporate luxury rates on income-elastic goods within the VAT, with additional sumptuary excises on selected items. A second option is to use a single-rate VAT with sumptuary excises outside the VAT.

19. These observations are confirmed by Imran and Duncan (1988), who present the relevant information for cocoa, tea, coffee, and natural rubber.

20. For a review of the comparison between export taxes and land taxes, see Skinner (this volume).

21. This subsection relates the present chapter to some earlier literature and is somewhat more demanding. Readers prepared to accept its conclusions might proceed to the section entitled "The Reform of Taxes cum Tariffs" without disadvantage.

22. This is also the position taken in Balassa (1989b) in a paper that synthesizes disparate literatures into a consistent package for policymakers.

23. An attempt in this direction is contained in Mitra (1991).

24. The raising of tariffs that are currently lower than the 10-15 percent range but are called for on grounds of protection will of course usually alleviate conflicts with revenue goals.

25. Since there is no domestic production of these items, there will be no revenue collected under those items from the domestic sales tax; however, this does not affect the principle that the rate applying to these items under the sales tax should be the same irrespective of whether the source of supply is imports or possible future domestic production.

26. The corresponding figure for personal income taxes is reported to be 10 percent.

27. This statement would need qualification if the government, which loses tariff revenue, has a pattern of consumption which, compared to that of the private sector, is more heavily oriented toward traded goods. That qualification does not, however, affect the conclusion of the paragraph, namely, that two instruments are needed to achieve internal and external balance.

28. For a particularly lucid exposition of the basic balance of payments model, see Corden (1980), who does not, however, use that model to discuss tariff reform.

29. For a detailed application of this approach to one country, see Mitra and Go (1991).

30. Mexico offers an example in which the introduction of a VAT three years before the 1983 trade reform allowed revenue losses to be offset through increases in indirect taxes.

31. A review of the Bank's approach to subsidies, Myers and Brondolo (1986) took the view that explicit subsidies are preferable to implicit subsidies and that it is undesirable to finance subsidies through nonbudgetary instruments.

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## **PART III— TAXATION OF FOREIGN INVESTMENT**

### **7— Taxation of International Income by a Capital-Importing Country: The Perspective of Thailand**

Chad Leechor and Jack Mintz

The international dimensions of tax policy are of concern to industrial and developing countries alike. Industrial countries have grappled with the issues for some time, however, and are considerably more familiar with them than are less developed countries. Only recently have tax authorities in some developing countries begun to incorporate external factors—including foreign tax rules and the tax planning of multinational firms—in their policymaking. But even those who have done so find it difficult to devise appropriate policies because they lack a guiding framework and the requisite information.

This chapter reviews the analytical and policy questions pertinent to the taxation of international income by developing countries. It concentrates on two broad topics: incentives and tax policy issues.

#### **Incentives**

Taxation has an impact on the investment and financing decisions of a multinational company. International flows of income are subject to host country taxation of the income generated by a subsidiary operating in the host

country's jurisdiction. When the parent company receives foreign-source income from the subsidiary, the home country may assess another layer of tax and thereby allow host country taxes to be credited or deducted from foreign-source income as defined by the home country. A home country is able to tax foreign-source income in three principal ways:

*Accrual taxation* of foreign-source income by the home country, which applies to branches or to subsidiaries operating in tax-haven countries.

*Deferral taxation*, which refers to the taxation of remitted income from foreign sources and generally applies to subsidiaries.

*Exemption* of foreign-source income either on a partial or full basis (usually equity income is exempt, with other sources of income being taxable).

Of the three regimes, the most important is deferral taxation, which is currently used by the largest capitalexporting countries, including the United States, the United Kingdom, and Japan. Previous economic analysis of deferral taxation has suggested that subsidiary investment decisions are independent of home country's tax system when retained earnings are used (Hartman 1985). Our analysis, however, shows that this result is incorrect. In fact, the user cost of capital for a subsidiary that is using retained earnings (retentions) to finance investment depends on both the host and home country's taxes.<sup>1</sup> Only if the home country exempts foreign-source income is the user cost of capital exclusively determined by the host country's tax system.

The taxation of investment income also depends on a series of bilateral treaties. These treaties determine the rates of withholding tax and other provisions, such as "nondiscrimination" between domestic and foreign-owned capital and the definition of "permanent estab-

lishment," which determines the right of the host country to tax a business. As a result, the effect of taxation on financing and investment decisions can be quite complicated to determine. In large part, it depends on how companies try to minimize taxes, given the costs incurred by relying on particular forms of finance, such as bankruptcy costs and political risks that are important to the investor. The analysis in this chapter draws on various models, each with a different set of assumptions concerning the financial choices made by firms.

### Tax Policy Issues

The second part of the chapter deals with the level and structure of company and withholding taxes. It asks what taxation policies are appropriate when the capital importer attempts to maximize the benefits associated with international flows of capital. It is also concerned with the extent to which company tax policies are constrained by the tax regimes of capital exporters and other capital-importing countries.

Two aspects of international tax policy merit close attention. First, the appropriate level of taxation set by the host country depends on the price elasticity of foreign capital. One determinant of the elasticity is the method of taxation used by the home country. For example, if the host country's taxes are fully credited against the home country's tax, then a reduction in taxes on foreign capital by the capital importer leads to a transfer of revenue from the host to the home government's treasury without affecting investment. From the point of view of the host country, lowering taxes on foreign capital under this tax regime reduces the country's welfare.

Second, taxation may encourage capital to flee to a country with a more favorable tax regime. As a result, countries that are concerned about the "competitiveness" of their tax regimes choose tax policies that mitigate tax competition. The chapter examines the extent to which tax competition affects tax policy and the types of strategies that could be undertaken to reduce the impact of tax competition. These strategies include treaties that

may eliminate tax competition.

The incentive and policy issues are examined more closely in the framework of the system in Thailand. Thailand's economy has been growing at the rapid rate of about 10 percent a year in real terms since the late 1980s. In 1988 it experienced a substantial, if not unparalleled, increase in foreign savings of more than 250 percent. Thailand has now reached a stage of development in which it faces some decisions concerning the taxation of international income:

To encourage foreign investment, Thailand has granted exemptions and reductions for company income tax and dividend withholding tax. The government is now questioning whether these incentives are too generous since other factors, such as political stability and low unit costs of production, may be sufficient to attract foreign investment.

Thailand wants to be able to attract foreign investment to the same extent that adjacent countries such as Malaysia, Indonesia, Singapore, and the Philippines do. Tax incentives provided by other countries include tax holidays, accelerated depreciation, and investment allowances. Thailand must decide whether to match the incentives provided by other competing capital-importing countries.

Multinational investment is difficult to tax because transfer prices can be manipulated by multinational firms. To ensure adequate taxation, the Thai government must rely on unsatisfactory ad hoc methods, including high import duties to discourage overinvoicing of imported inputs. These measures create distortions of their own, however, and their effectiveness is limited in any case. Thus, new ways must be found to tax international investment income.

Thailand has provided exemptions of import duties and business tax for capital goods imported by promoted firms. The proposed introduction of a value added tax (VAT) and the restructuring of import duties will erode the tax advantages now enjoyed by promoted firms, many of which are foreign owned or controlled. Given these proposed changes, one of the natural questions to ask is: How should the company tax be modified with respect to foreign investment?

The chapter opens with a description of the current tax regimes of Thailand and of capital-exporting countries and then explains the way taxes influence the financing and investment decisions of companies operating in Thailand. This is followed by an analysis of the policy issues facing Thailand, particularly with respect to the treatment of foreign companies and the taxes imposed on income remitted abroad. Attention is also given to the implications of national taxation on worldwide resource allocation and to the successes and limitations of the current bilateral approach to tax coordination. The theoretical model on which the analysis is based is presented in the appendix to this chapter.

### **Tax Regimes of Thailand and Capital-Exporting Countries**

This section examines tax regimes in relation to Thai taxation of foreign affiliates, taxation by countries of residence, and tax treaties.

#### **Thai Taxation of Foreign Affiliates**

Foreign affiliates operating in Thailand pay two types of taxes: internal taxes and nonresidentwithholding taxes.

**INTERNAL TAXES** . Internal taxes consist of company taxes and indirect taxes. The standard rate of company taxation is currently 35 percent and is applicable to branches of foreign companies, both locally incorporated subsidiaries and wholly Thai entities.<sup>2</sup> Lower tax rates are available under two major incentive programs:

investment promotion, administered by the Board of Investment (BOI); and stock market development, supervised by the Security Exchange of Thailand (SET). The BOI grants temporary tax holidays or substantial tax reductions for projects that fulfill its specified eligibility conditions. The SET provides guidelines on ownership patterns and on standards of financial reporting. Companies that are registered on the stock exchange (SET) are entitled to a preferential tax rate of 30 percent, as well as additional benefits with respect to withholding taxes.

Company income is defined in a comprehensive manner. Active business income, portfolio income, and realized capital gains are aggregated to arrive at the total. Interest and rental income is therefore fully taxable. Intercompany dividends are entitled to more favorable treatment in recognition of the potential double taxation of income flows from one company to another.<sup>3</sup> Half of the dividends received from a local company may be excluded. If paid by a registered (SET company), the dividends are fully tax-exempt. Capital gains are fully taxable upon realization if they arise from the shares of other companies, but are exempt if they come from the company's own shares. Immovable properties, whether or not connected to an active business, give rise to taxable capital gains upon realization.

Active business income is determined by treating each company in a corporate group as an individual taxable entity. Pricing among related companies is expected to follow the arm's-length standard. A fair market value or a reasonable value that might prevail among unrelated parties may be used. At present, no formula for apportioning international income has been contemplated. Apart from current operating expenses, such as labor and leasing expenditures, the following deductions are allowed:

*Capital cost allowance.* Tax depreciation is based on historical cost with no inflation adjustments. Maximum rates of allowable depreciation are 20 percent for machinery and 5 percent for structures, both under the straight-line method. Companies are required to ensure that tax and book depreciation allowances are in accord.<sup>4</sup>

*Interest expenses.* Actual interest costs of financing are fully deductible, except for loans extended by a foreign parent company to a local branch. This restriction does not apply, however, to loans extended by a foreign company to a controlled local subsidiary. Unlike many of its capital exporters, Thailand has no rules for curbing thin capitalization. This makes it possible for highly leveraged foreign affiliates to reduce taxes in Thailand and pay more taxes or use up the foreign tax credit at home.

*Loss carryover.* Business losses may be carried for five years with no interest and inflation adjustments.

Indirect taxes can be subdivided into two main categories:

*Import duties.* Most imports fall within the range of 5 to 50 percent tax rates, the average being about 20 percent. The rates are therefore relatively high by the standards of industrial countries, but the authorities see them as an instrument for providing necessary protection for local industries. They also provide safeguards against overinvoicing, which would reduce the domestic income tax base. The BOI provides temporary duty exemptions or reductions for selected projects.

*Business tax.* The business tax is a turnover tax collected on intermediate goods and final products with no credit given for taxes on inputs. It covers imports and domestic goods at the same rates. After years of hearing manufacturers and exporters complain, the government decided to replace the business tax with a value added tax (VAT). The new VAT will be levied on consumption and will allow a credit equal to the taxes paid on intermediate and capital goods. It will have comprehensive coverage, excluding only the financial sector, and a high threshold for registration, which will leave out small firms in all sectors.

**NONRESIDENT WITHHOLDING TAX .** A nonresident withholding tax is imposed on investment income repatriated out of the country. This tax serves several purposes. First, it generates revenue with little economic cost if the tax is fully credited against foreign taxes. (In many home countries, NWTS above stipulated ceilings

are not creditable.) Second, it is a bargaining device in treaty negotiations. But the NWT can also work against the interests of the host country. If, for instance, the NWT raises the host country's total tax rate (company and withholding taxes taken together) beyond that of a capital-exporting country and if the resulting excess foreign tax credit is not applicable against other taxes levied by the home country, then the host

country's investment becomes less attractive to the foreign investor.

The NWT rates in Thailand are highly uneven. First, they vary across types of income, and the items deductible at the company stage, such as interest expenses, are taxed somewhat more heavily. Second, the rates are reduced on all types of income for treaty partners. Third, the rates also depend on the recipient of the income being remitted, with distinctions made between individuals and companies, between financial institutions and other companies. Fourth, the degree of ownership in the Thai operations can also affect the NWT rates. Often, 25 percent control of the voting stocks in a manufacturing company qualifies the foreign investor for a lower NWT tax rate.

Normally, the host country can apply a different NWT rate to each capital-exporting country. This practice is well accepted and not regarded as discriminatory, since company tax rates in the home countries are generally unequal. The NWT is currently applied to branch profits, dividends, capital gains, interest, and royalties, management fees, and technical service fees.

Branches of foreign companies are taxed in Thailand at the standard company tax rate (35 percent), with no deduction for the interest on loans extended by parent firms. The home country of the parents, however, may allow a consolidation of any losses a foreign branch incurs with the income of the parent. When the profits are transferred abroad, an additional remittance tax of 20 percent applies to "net-of-tax" profits. Because this is a tax-exclusive rate, the actual tax liability is only 16.7 percent of the gross-of-tax profits submitted for repatriation.

Ordinarily, the NWT on dividends is 20 percent. But some treaty partners, particularly those exempting foreign-source income, have received preferential rates. The Netherlands, for instance, has a reduced rate of 10 percent if the affiliate in Thailand engages in manufacturing and if the parent holds at least 25 percent of the voting shares. For France, the rate is 15 percent when the same conditions are met. For dividends paid by companies under a company-tax holiday, no NWT is collected.

The standard NWT is 25 percent on capital gains being remitted abroad. The rate may be reduced to 12.5 percent or even to zero for treaty partners. Of Thailand's current twenty-two treaty partners, only five countries pay this tax at the full 25 percent, and most of the rest are given exemptions.

The standard NWT is 25 percent on interest. The rate remains unchanged for most treaty partners, but certain concessions are made. First, the interest paid to a financial institution abroad is subject to a 10 percent withholding tax. Second, interest accruing to a government agency abroad is exempt from tax.

The NWT rate of 25 percent also applies to royalties, management and technical service fees. Some deductions are also allowed for the actual expenses incurred in providing the service. Treaty provisions may lower the NWT rates to 5 or 15 percent for some narrowly defined activities.

### **Taxation by Country of Residence**

The host country seldom has exclusive tax jurisdiction over the income earned by a foreign affiliate. The home country of the parent also plays an important role: although the source country has the first opportunity to tax, the residence country determines the ultimate tax burden. For instance, a tax collected at the source may or may not be recognized at home. An incentive granted by the source country may be reduced or canceled by an increase in

the residence country's tax. To achieve its own policy objectives, the capital–importing country cannot ignore the tax rules prevailing in the capital–exporting countries.

The rules governing foreign–source income are generally complex and vary from one capital–exporting country to another, but a few basic and strategic principles cut across national practices, as summarized below.

**THE SOURCE AND THE RESIDENCE PRINCIPLE .** When the source principle is followed, only the income originating from domestic sources is taxed, whereas foreign-source income is exempt. The residence principle, by contrast, calls for the taxation of a resident's income on a global basis. When this principle is used, a mechanism is needed to relieve foreign–source income from double taxation. A common method of relief is to grant a foreign tax credit, which reduces the home country's tax by the amount of eligible taxes paid abroad. Another method is to allow foreign taxes to be deducted from the home country's taxable income.

Few countries follow any one principle strictly. Hong Kong is one of the few. It applies the source rule consistently and thus avoids the double taxation of foreign–source income without resorting to any relief procedures. The United States is another example. It follows the residence rule to a large extent and uses the foreign tax credit. It does tax nonresidents on their U.S. source income, however, and thus departs from a strict application of the residence principle. Most countries specify the taxpayer's circumstances and the types of income under which each of the principles applies. In general, and apart from the case of Hong Kong, it is not possible to identify a country that follows either the source or the residence principle exclusively.

**DEFERRAL AND ACCRUAL TAXATION .** Foreign–source income may be taxed when received by the resident (the

deferral method) or when earned abroad (the accrual method). This distinction is particularly important when the tax rates differ significantly between the host and the home countries. The deferral method is more attractive to the taxpayer when the source–country tax is relatively low. The advantage of deferral arises from the taxpayer's opportunity to make use of the deferred tax, which is essentially an interest–free loan.

The foreign–source income of subsidiaries is normally taxed on a deferral basis. Accrual taxation applies under more limited circumstances, notably, on the income of foreign branches. This option is favored by many financial companies, since a foreign branch is often set up for the first few years of commercial operations when losses are expected. Accrual taxation of branches allows the parent company to write off the current losses abroad against local income. When its operations subsequently become profitable, the branch may be incorporated as a subsidiary. Accrual taxation may also be applied to the income of a controlled foreign affiliate in a tax haven. This type of income is the main concern of the well–known Subpart F regulations in the United States.

**ACTIVE AND PASSIVE INCOME .** Many countries distinguish between active and passive forms of income. Active income refers to the return on entrepreneurial activity, as with direct foreign investment. Passive income is the return on portfolio investment or property income. The distinction is not always clear–cut. At times an arbitrary line is drawn. For example, when the ownership of a subsidiary operating in a foreign country is greater than a minimum level (that is, 10 or 25 percent), depending on the home country's law, the income from it is considered active. When ownership falls below the specified level, the resulting income is considered passive.

Active business income is normally given preferential treatment. Most European nations, for instance, exempt active business income arising from foreign sources but tax passive income on a deferral basis with a foreign tax credit. Some countries only allow active business income to receive a foreign tax credit and apply the deduction method to other forms of income. Preferential treatment is a relative concept; in the case of active income, it refers to the comparison of tax rules across different forms of income in one country.

Each country of residence has its own mix of these various rules. No two countries are exactly alike. An interesting mix can be found in Germany. The German government taxes foreign–source income according to the residence principle when the source country is not a treaty partner. When a treaty exists, active business income may be tax–exempt, according to the source principle, but passive income remains subject to tax. The deferral method is applied to the passive income arising from a treaty partner when ownership is equal to or less than 10 percent (ordinary foreign affiliates), but accrual taxation is applied when ownership exceeds 25 percent (controlled foreign affiliates).

### Tax Treaties

As a net importer of capital, Thailand regards tax treaties primarily as an instrument for attracting foreign investment. Through tax treaties, the Thai government conveys to potential investors a clear set of tax rules, as well as a sense of stability, in that any changes in treaty provisions can only be accomplished by a bilateral agreement arrived at through established procedures. Through its tax treaties, the Thai government also seeks to ensure that the incentive measures it implements are not nullified or substantially weakened by actions of the home countries.

Various kinds of income are eligible for tax incentives in Thailand, including active business profits and passive and portfolio earnings. Each kind is subject to a different method of relief from double taxation when remitted to the home country. Many countries employ the credit method as the principal tax relief procedure. The credit method often implies that a reduction or exemption received in Thailand gives rise to an equal tax increase in the home country. (This observation is based on two features of Thai taxes: nearly all Thai taxes are consistent with international practices and are therefore creditable; and Thai tax rates are relatively low, which means that a deficient credit position likely arises.) Thus, a tax holiday in Thailand could mean a transfer of revenue from Thailand to the home country. Moreover, the benefits intended for the investors would not materialize.

Thailand has attempted to prevent revenue from being transferred out of the country without giving up its incentive programs. When the home country uses the exemption method to avoid double taxation, as do most Western European countries, no particular problem arises. But where the credit method is used, Thailand requires a tax–sparing provision to be included in the treaty. Tax sparing means that any taxes spared or exempted in Thailand are given full credit in the home country. Most of the countries that export capital to Thailand have agreed to the tax–sparing condition, with the exception of the United States, the second largest capital exporter to Thailand. Therefore the United States, which has not ratified any treaty with a tax–sparing clause since 1963, does not currently have a double–taxation agreement with Thailand (see table 7–1).

Thailand is also concerned about the potential revenue losses arising from other treaty provisions. Under the United Nation's Model of Double Taxation Convention, the concept of a taxable entity (called permanent establishment) is somewhat narrower than provided by

**Table 7–1. Thailand's Treaty Partners, Tax Relief Methods, and Tax Sparing**

<i>Treaty partner</i>	<i>Principle method of relief for double taxation</i>	<i>Tax–sparing clause</i>
Austria	OCa	Yes

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Belgium	EPb	Yes
Canada	OC, EP	Yes
China	OC	Yes
Denmark	EPb	No
Finland	OC	Yes
France	EP	No
Germany	OC, EP	No
India	OC	Yes
Indonesia	OC	Yes
Italy	OC	Yes
Japan	OC	Yes <sup>d</sup>
Korea, Rep. of	OC	No
Malaysia	OC	Yes
Netherlands	EP	No
Norway	EP	No
Pakistan	OC	Yes
Philippines	OC	Yes
Poland	OC	No
Romania	n.a.	n.a.
Singapore	OC	Yes
Sweden	EP	No <sup>e</sup>
United Kingdom	OC	Yes

n.a. Not applicable

a. OC = Ordinary Credit

b. EP = Exemption with progression

c. Active business income from foreign sources may be exempted in Canada.

d. Tax sparing applied only to a 1962 Incentive Act, but not the subsequent and current one. The treaty is being renegotiated.

e. Sweden applies the tax credit method only to royalty income and tax sparing is provided in the treaty.

*Source:* Various double taxation treaties.

the Thai tax code. If Thailand were to adopt the definition used by the United Nations (UN), some of its existing taxpayers would no longer be subject to tax. Furthermore, tax deductions are more liberal under the UN

convention than under the Thai tax code, and many of the withholding taxes for treaty partners are set lower than Thailand's standard rates. For instance, the dividend NWT is reduced from 20 to 15 percent (or 10 percent) in some cases, interest from 25 to 20 percent, and the royalty tax from 20 to 15 percent. These potential sources of revenue loss are weighed against the improvement in investment climate made possible by tax treaties. Thus, Thailand has successfully concluded treaty negotiations with all the leading capital exporters, with the notable exception of the United States.

### **Impact of Taxation on the Financing and Investment Decisions of Multinationals**

The empirical analysis in this section is based on a theoretical model developed in Leechor and Mintz (1990), which is also presented in the appendix to this chapter. The model describes a multinational firm that maximizes the value of its equity investment in a Thai subsidiary. The subsidiary finances investment only by means of retentions or debt so there is a one-to-one relationship between the ratio of dividend to interest remittances and the debt-equity ratio of the subsidiary.<sup>5</sup> Firms that rely on debt finance remit more interest and fewer dividends. Debt may be raised in Thailand or in the home countries. (The main analytical relationships of the model are given in the appendix.)

As already mentioned, subsidiaries pay company and withholding taxes. We do not include the Thai business tax (an indirect tax of the turnover variety) in the model since the expected reform measures (consumption-based VAT) will eliminate the tax imposed on capital goods. In principle, import duties on capital goods should be included in the measure of the user cost of capital. Since we have no data on imports by company or by country of origin, however, a single measure of the import duty tax rate on capital goods does not allow for much variation in the user cost of capital across firms with different ownership.

The Thai company income tax provisions included in our calculations are as follows. First, we examine foreign companies operating as non-SET firms (up to 100 percent ownership) facing a company tax rate of 35 percent and SET firms (less than 50 percent ownership) facing a company tax rate of 30 percent. We do not include tax-holiday firms owned by foreign companies.<sup>6</sup> Withholding tax rates also vary since SET companies can remit dividends and capital gains abroad without paying Thai withholding taxes. Second, we assume that companies use tax depreciation allowances that conform with book depreciation. As mentioned in the preceding section, companies may try to use higher book depreciation figures to maximize their tax allowances even though true economic depreciation is much lower. Third, interest costs associated with either offshore or local debt are deductible from Thai corporate taxable income, although interest on offshore debt is subject to Thai withholding taxes.

The capital-exporting economies selected for this study provided the bulk of direct foreign investment for Thailand. Of these economies, Hong Kong fully exempts foreign-source income. The Netherlands, Switzerland, France, and, for qualifying ownership of 10 percent, Germany exempt remitted dividends and retained profits of subsidiaries in Thailand. And Japan, Singapore, Taiwan, the United Kingdom, and the United States tax the remitted earnings of subsidiaries and provide a tax credit for the underlying corporate income and withholding taxes. Almost all these countries tax branch profits on an accrual basis, except for the Netherlands, Switzerland, and Hong Kong, which exempt them.

We examine several cases of home country taxation. Those countries that exempt the foreign-source equity income of subsidiaries and branches are assumed to be exempt cases only. Countries that exempt the equity income of subsidiaries but not of branches are assumed to be employing exempt or accrual taxation only. Countries that tax the remitted earnings of the subsidiary and accrual earnings of branches are assumed to be either "exempt," "deferral," or "accrual" cases. Also included in the exempt category are companies resident in countries that tax foreign-source income on a deferral basis if these companies have excess foreign tax credits that cannot be used against other tax liabilities.<sup>7</sup>

Table 7–2 provides the data used later to measure the user cost of capital and the marginal effective tax rate.

The model presented in the appendix also takes into account the varying impact of interest rates and inflation on the investment and financing costs of multinationals of different origins. The exchange rate between Thailand and other countries must be determined before the effect of taxes on the multinational's decisions can be modeled. The model uses purchasing power parity for this purpose. The value of a home country's currency relative to the Thai currency, the baht, is determined by the ratio of the home country's consumer price index to the Thai consumer price index. Several studies have suggested that currency valuation, at least in the short term, is not accurately predicted by "purchasing power parity." The model in the appendix is based on long–term considerations since investment is inherently a long–term decision. Purchasing power parity is an appropriate characterization of currency valuation in such circumstances.

This section is divided into two parts. The first deals with the impact of taxes on the financing decisions of multinationals. This analysis depends on the model assumed for the determination of financial equilibrium, a point discussed in more detail below. The second part deals with the impact of taxes on the multinational's investment decisions. We first measure the user cost of capital, which is the tax–adjusted cost of financing and depreciation a firm faces when choosing its capital stock. We then measure the effective tax, which is the difference between the gross–of–tax marginal rate of return on capital (user cost of capital net of depreciation) and the net–of–tax marginal rate of return earned by owners of capital. The marginal effective tax rate is then measured as the effective tax divided by the gross–of–tax marginal rate of return on capital.<sup>8</sup> Since we will be allowing for three kinds of financial arbitrage, we measure the user cost of capital and the effective tax rate for each case.

**Financing Decisions**

A primary factor to consider in assessing the impact of taxation on multinational decisions is financial arbitrage. Differences in tax rates across countries and sources of income make it difficult to model accurately a financial equilibrium whereby savers earn the same net–of–tax rates of return on assets and firms face the same gross–of–tax costs on all sources of finance. In a multinational context, a model of financial equilibrium

**Table 7–2. Values of Parameters Used to Measure User Costs of Capital and Effective Tax Rates for Companies Operating in Thailand, Domestic and Foreign Ownership**  
(percent)

<i>Economy</i>	<i>Corporate tax rate</i>		<i>Capital cost allowance rate balance equivalent</i>	<i>Accrual–equivalent capital gains tax, rate on parent</i>	<i>Dividend pay–out ratio</i>	<i>Subsidiary debt–asset ratio</i>	<i>Interest rate</i>	<i>Inflation rate a</i>
	<i>Domestic income</i>	<i>Foreign income</i>						
Thailand	30, 35	35	10	15			12.5	3.9
Hong Kong	18	0	10	8	53.9	34.0	10.0	7.4
Taiwan	25	25	10	8	47.8	57.4	10.5	4.5
Unites States	38	38	13.6	13	48.0	42.5	9.3	4.0

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United Kingdom	35	25	15.5	12	43.5	43.1	10.3	4.9
Germany	56	0, 50, 56b	10	6	70.5	95.5	8.3	1.2
Japan	58	53c	10	19	39.6	66.1	4.9	0.7
Singapore	33	33	12.6	4	43.5	28.2	6.0	1.5
Netherlands	42	0	10	4	36.8	38.8	7.8	0.7
Switzerland	30	30	18.6	4	48.0	50.7	5.2	1.9
France	42	0	10	4	48.0	50.7	9.5	2.7

*Source:* Somchal Richupan and International Bureau of fiscal Documentation, 1989.

a. Based on 1988 consumer price index.

b. 0 percent applies to dividends for qualifying ownership in subsidiary, 50 percent for branches, 56 percent otherwise.

c. Corporate income plus enterprise tax.

would need to take into account differences in treaty shopping, financial policy, and timing.

Treaty shopping refers to the repatriation strategy multinationals employ to minimize their taxes. Because countries have different withholding and corporate tax provisions, multinationals route their income through the countries with the lowest levels of taxation on particular sources of income. The Netherlands, for example, has obtained low withholding tax rates under treaty agreements with host countries, including Thailand. The Netherlands allows interest and dividend remittances to flow tax-free through a Dutch subsidiary. If the multinational does not want to repatriate the income back to the resident country, it can distribute the funds as interest to a Swiss branch of the Dutch subsidiary. The branch in Switzerland is taxed at a minimal rate.<sup>9</sup> In this manner, a foreign company can defer taxes owing to the home country and at the same time repatriate funds out of Thailand to a desired destination. Arbitrage under treaty shopping is particularly difficult to model in detail since many tax-planning opportunities are available to multinational companies.

The analyst must also pay close attention to financial policy because a multinational can minimize taxes by choosing an appropriate financial structure for its subsidiary. For example, if the parent has excess foreign tax credits, it can restructure the subsidiary's liabilities in favor of debt since interest is tax-deductible. This lowers the tax paid to the host country and thereby reduces the excess foreign tax credits. If the subsidiary's interest also accrues to the parent, the parent will generate more home country tax liability on interest income (to the extent that the home country's corporate tax on income is more than the withholding tax imposed on remittances by the host country), and this liability can be used to absorb more of the excess foreign tax credits. The same consideration applies to technical and management assistance fees, royalties, and lease payments, all of which are deductible expenses in calculating the host country's corporate tax.

Timing differences are another important factor to consider because a multinational can reduce tax liabilities over time by manipulating the payment of corporate taxes to the host and home governments. The "rhythm" method is a term coined for strategies companies employ to take advantage of the deferral method used by many countries to tax foreign-source income. A company can try to avoid paying taxes to the home country by reinvesting profits in the subsidiary. No tax has to be paid to the home country because it only taxes remitted income. If the multinational wishes to repatriate earnings, either for financing or for tax reasons, it then generates the highest possible tax in the host country in the year of repatriation to minimize the amount of tax due to the home

country.<sup>10</sup> It can do this by having the subsidiary sell off assets (and generate taxes paid to the host country) or, if some deductions under the host country's tax law are discretionary, by choosing not to use all of the company tax write-offs (delaying them for future years when repatriation is not planned). The host country's taxes are thereby increased in years of repatriation and reduced in years of profit reinvestment. Recent U.S. tax reforms that require earnings to be pooled over time in calculating the foreign tax credit are specifically aimed at the use of the "rhythm" method, although the incentive to defer taxes by reinvesting profits still remains.

Various biases in financing are induced by the tax system. We can demonstrate these biases by calculating the cost of debt finance raised locally in Thailand, the opportunity cost of equity invested in the subsidiary, and the cost of debt finance raised by the multinational at home.<sup>11</sup>

Table 7–3 presents the real costs of finance for each home country and tax regime (exemption, deferral, and accrual) under consideration here. These numbers provide some insight into the effects of international taxes on the incentive to issue finance in different countries. In each case, we consider the possibilities of treaty shopping, restructuring, and timing differences.

**THE EXEMPTION CASE.** Equity and debt finance costs the least in Hong Kong, followed by Switzerland. There are several reasons for this but the primary one is that inflation rates, relative to interest rates, are highest in Hong Kong and Switzerland compared with the rates in other countries. As a result of the deductibility of interest (unadjusted for inflation) from company taxable income, the costs of debt finance are lowest in Hong Kong and Switzerland, even though they tax company income at a relatively low rate. In contrast, Thailand's finance costs are rather high, primarily because of its restrictive monetary policy, which implies low inflation, high nominal interest rates, and high real interest rates.

With respect to the incentive to restructure financing, note that the real cost of debt finance issued in Thailand is generally higher than the real cost of equity in the exemption case—even though the tax deductibility of interest from Thai corporate taxes lowers the cost of Thai debt finance. Only in the case of French, German, and Thai ownership is the cost of equity finance higher than debt finance. The reason is that most countries have lower real interest rates than Thailand.

Similarly, the cost of debt finance raised in the home country is higher than debt finance in Thailand for the exemption regime. This reflects not only the differences in real interest rates but also a higher company tax rate in most other countries, with the exception of Hong Kong. Since interest write-offs are more valuable in other countries, there is an incentive to issue debt in those countries.

**Table 7–3. Real Cost of Thai Debt, Home Country Equity and Debt**

	<i>Debt—issued in Thailand</i>	<i>Opportunity cost of equity finance (parent)</i>			<i>Cost of debt finance issued at home</i>
		<i>Non— SET</i>	<i>SET</i>	<i>Non— SET</i>	
<i>Economy</i>	SET				
Thailand	4.85	4.23	6.73	8.17	..
<i>Hong Kong</i>					
Exemption	4.85	4.23		0.84	0.80
<i>Taiwan</i>					

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Exemption	4.85		4.23		4.15		
Deferral	4.94		4.05	5.02		4.35	4.06
Accrual		5.48			4.90		
<i>United States</i>							
Exemption	4.85		4.23		3.66		
Deferral	4.98		4.00	4.43		4.83	2.63
Accrual		3.85			4.80		
<i>United Kingdom</i>							
Exemption	4.85		4.23	3.58			2.71
Deferral	3.59		2.36	5.36		5.86	
Accrual		4.32			4.74		
<i>Germany</i>							
Exemption	4.85		4.23		6.66		
Accrual		1.60			5.07		2.69
<i>Japan</i>							
Exemption	4.85		4.23		2.34		
Deferral	4.68		3.43	2.56		4.09	1.84
Accrual		1.35			4.28		
<i>Singapore</i>							
Exemption	4.85		4.23		3.44		
Deferral	4.48		3.32	3.75		4.12	2.69
Accrual		4.48			3.65		
<i>Netherlands</i>							
Exemption	4.85		4.23		5.72		3.83
<i>Switzerland</i>							
Exemption	4.85		4.23		2.38		1.74
<i>France</i>							
Exemption	4.85		4.23		5.20		6.73
Accrual		3.35			6.5		
.. Negligible.							

*Source:* Author's calculations.

As stressed above, these results are contingent on anticipated rates of inflation. If real interest rates are the same across countries, multinational companies from exemption countries such as Hong Kong and the Netherlands would prefer to issue debt in Thailand and reduce corporate tax payments to the Thai government. The companies might then remit income in the form of interest from Thailand that would only be subject to the Thai withholding

tax rate, which is generally lower than the Thai company tax rate. As a result, a multinational company from an exemption country would tend to remit earnings in the form of deductible payments, rather than dividend income. Such is the case of Hong Kong, where almost 90 percent of the income repatriated from Thailand is in the form of tax-deductible interest or fee payments (see table 7-4).

**DEFERRAL TAXATION** . The countries among Thailand's trading partners that use deferral taxation are the United States, United Kingdom, Japan, and Singapore.

In comparison with the exemption case, the costs of equity finance are generally higher (lower) for firms in an excess (deficient) tax-credit position. The reason is as follows. When the firm is in a deficient tax-credit position with respect to its dividends, retaining dividends in Thailand saves the parent company from paying the home country taxes on remitted dividends. But when the firm is in an excess foreign tax-credit position, the retained earnings used to finance investment reduce the value of the excess foreign tax credits that can be used to offset taxes on other sources of income.

Similarly, the cost under deferral can be higher or lower than that under exemption, depending on whether the subsidiary is in an excess or deficient tax-credit position. When the firm is in an excess foreign tax-credit position, the cost of debt finance tends to be higher under deferral since interest deductions not only reduce taxes paid to Thailand but reduce excess foreign tax credits and increase the amount of

**Table 7-4. Remittances of Profits, Dividends, Interest and Other Fees from Thailand to Home Country, 1983-87**

<i>Economy</i>	<i>Profits</i>	<i>Dividends</i>	<i>Interest</i>	<i>Fees</i>	<i>Total</i>
United States	1,873.7	5,374.0	5,850.3	2,360.4	15,458.4
Percentage of total	12.1	34.8	37.8	15.3	100
Japan	436.9	1,805.0	2,144.4	4,063.4	8,449.7
Percentage of total	5.2	21.4	25.4	48.0	100
United Kingdom	562.2	439.2	2,995.6	707.7	4,704.7
Percentage of total	11.9	9.4	63.6	15.1	100
Germany, Federal					
Republic of	25.6	240.9	904.7	449.6	1,620.8
Percentage of total	1.6	14.9	55.8	27.7	100
Hong Kong	246.1	1,198.1	11,077.1	464.8	12,986.1
Percentage of total	1.9	9.2	85.3	3.6	100
France	..	13.8	190.8	..	204.6
Percentage of total		6.7	93.3		100
Singapore	36.5	155.9	10,023.3	..	10,215.7
Percentage of total	0.4	1.5	98.1		100

..Negligible.

*Source:* Bank of Thailand.

taxes paid on remitted earnings received by the parent. If the firm is in a deficient tax–credit position (as a Japanese firm would be), debt financing is less costly under deferral since interest deductions save taxes owing to both the host country and to the home country to the extent that profits are remitted.

With respect to treaty shopping and deferral taxation, multinational companies, regardless of their legal residency and location of management, would still prefer to use Hong Kong, and to a lesser extent, Switzerland as sources of financial capital. In general, capital–exporting countries using deferral taxation are less favorable locations for multinationals.

As for the restructuring of finance, deferral taxation generally increases the incentive for multinational subsidiaries to issue debt in Thailand rather than to use equity. Equity finance is less favorable since the tax on remitted earnings is negative. Paying out dividends at the margin increases foreign tax credits and reduces taxes paid on other sources of income. (In other words, the multinational subsidiary is in an excess foreign tax–credit position.) The cost of debt finance raised in the home country remains the most preferable source of finance, however, given the relatively high real rates of interest in Thailand.

**ACCRUAL TAXATION** With accrual taxation, the home country taxes both the remitted and reinvested profits of the multinationals operating in Thailand. Accrual taxation generally applies to branches of multinationals, and deferral taxation applies to subsidiaries. Thus, a comparison of costs of finance for accrual and deferral can suggest what incentives there may be to form branches rather than subsidiaries.

For most countries, the cost of equity finance is highest where accrual taxation applies rather than either exemption or deferral taxation. Compared with the exemption case, the higher accrual tax reflects the additional capital gains tax on the equity invested in branches (capital gains are only taxed by the home country). As for debt finance issued in Thailand, the interest deductions are permitted in the home country, not in Thailand. This implies that the cost of debt finance issued in Thailand is generally lower for branches than it would be under the exemption case, since most capital exporters impose higher company tax rates than Thailand does.

When it comes to treaty shopping, Hong Kong remains the favorite source of equity and debt finance, although the cost of debt issued in Thailand by German and Japanese branches is quite low owing to their countries' high company tax rates and the fact that interest costs in Thailand are deductible from company taxes. Thus, branches that are primarily debt financed would find Japan and Germany to be good locations from which to take advantage of the high company tax rates in those countries. Note that the cost of issuing debt in Thailand is very high for Taiwanese branches, since the Taiwanese company tax rate is much lower than the Thai tax rate.

As for restructuring, the taxation of accrual income discourages the use of retentions by branches operating in Thailand and encourages the use of debt financing relative to the exemption and deferral cases. The only exceptions are Taiwanese companies and, in the case of deferral only, U.K. companies. This can be explained by the substantial subsidy afforded to debt financing owing to the excess foreign tax–credit position of the multinational. (More debt finance reduces taxes paid to the home country on remitted earnings.)

Whether branches are preferable to subsidiaries is less clear, since accrual taxation lowers the cost of debt

finance and increases the cost of equity finance for a number of countries. If the debt–equity ratio of the multinational firm operating in Thailand is sufficiently high, branch operations may be more desirable than subsidiary operations. Thus, for tax reasons alone, leveraged firms such as financial intermediaries may prefer operating as a branch in Thailand. To assess this issue properly, one has to examine effective tax rates on capital.

### Investment Decisions

In this section, we assess the impact of taxation on investment in long-lived assets held by multinationals operating in Thailand. We do so by measuring the user cost of capital and the marginal effective tax rate on capital as defined earlier. The formulas used for estimating these variables are derived in the appendix.

An important and difficult step in measuring the user cost of capital is to establish how multinational companies determine their financing costs. Since the user cost of capital depends in part on the source of finance, each taxed at a different rate, a model must be developed to show how the real cost of finance is determined. We consider three models of financial equilibrium.

The first is known as the tradeoff model. Here, the cost of finance depends not only on taxes but also on transaction costs. Debt is a favored source of finance from a tax point of view since interest is deductible from the company's taxable income; however, debt finance entails other costs, such as higher bankruptcy and agency costs (for a detailed discussion of these issues, see Bartholdy and others 1987). In the international framework, there is a choice between the debt and equity used by the subsidiary, as well as by the parent company.

In the tradeoff model, we assume that each source of finance entails its own tax or transaction costs. The multinational firm chooses a financial policy that minimizes tax and transaction costs, whatever the capital stock of the firm. The cost of finance used by the multinational is a weighted average of individual sources of finance (equity, debt issued in Thailand, and debt issued in the home country). The weights used are those observed for the subsidiary and the parent.

Consider, now, the tax-planning model, which assumes that the financing carries no transaction costs and therefore the object of the multinational is to minimize the cost of finance. In this model, the multinational uses the cheapest source of finance to acquire assets, either in Thailand or in the home country. The firm is constrained from selling assets short so that arbitrage is not unlimited.

The third model—the pecking-order model—takes into account that firms may prefer to finance investment with retentions first and then to use external financing if retentions are not adequate (see Myers 1985). The pecking-order motive for financing arises from models in which external finance must be obtained from outside investors who believe that only poor-quality firms are seeking funds from the market. The pecking-order model is more difficult to apply to multinational subsidiaries since the parent has knowledge about the subsidiary or branch. Retentions may still be desirable, however, if they incur the least transaction costs. In our model below, retentions are assumed adequate to finance the investment undertaken by the multinational subsidiary or branch.

These three models of financial equilibrium are easily applied in each of the three tax regimes. Note, however, that deferral taxation can lead to a tax-minimizing model without imposing constraints on short sales (in contrast to other possible models). In equilibrium, debt financing by the subsidiary lowers the taxes paid to the host country but may increase taxes paid to the home country on remitted dividends and other earnings. When evaluating the cost of capital for countries that use deferral taxation, we assume that the cost of finance on Thai debt is equal to that on equity rather than follow the method employed in table 7-3. This also applies to the calculations for the tradeoff model.

Two important aspects of financial policy are ignored in our calculations. First, we assume that companies operating in Thailand are domestic- or foreign-owned firms with marginal sources of finance coming from the primary owners. Yet, many companies in Thailand have both Thai and foreign owners. (This may be important insofar as it allows foreign firms to enjoy certain benefits, such as owning land and bringing in expatriates as managers.) Since tax rates on the foreign parent company, particularly in the deferral and accrual taxation cases, are different from those for domestic owners, the measure of the cost of finance would differ for the two owners.

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Second, our calculations are based on actual interest rates observed for host and home country. Financial arbitrage across countries is assumed to be incomplete in that interest rate differentials are not completely eliminated.

In table 7–5, we present the user cost of capital for companies operating in Thailand. The user cost of capital is based on an exponential economic depreciation rate of 10 percent, averaged over machinery and building assets. For companies of different ownership, the debt–asset ratio is calculated on the basis of financial statements as reported in table 7–5. (Companies with negative values of equity are excluded from the sample.) We assumed that parent companies finance their capital with 30 percent debt in the home country. Thus, we did not try to calculate a country–specific debt–asset ratio for each parent.

The calculations in table 7–5 allow for variations in financial policy under various models and different tax regimes. We prefer the tradeoff model in which a

**Table 7–5. User Cost of Capital for Foreign Firms Investing in Thailand by Type of Ownership and Home Country Tax Regime for Various Financial Models, 1989**

<i>Economy</i>	<i>Tax regime</i>	<i>Trade off model</i>		<i>Tax–planning</i>		<i>Pecking–order</i>	
		SET	Non–SET	SET	Non–SET	SET	Non–SET
Thailand	Exemption	19.7	21.3	17.8	17.7	20.4	23.5
Hong Kong	Exemption	12.6	13.3	12.3	12.6	12.3	13.7
Taiwan	Exemption	16.8	17.4	15.8	16.8	17.9	18.7
	Deferral	16.4	18.1	16.5	17.2	17.6	18.2
	Accrual	16.0	17.0	15.3	16.2	16.3	17.3
United States	Exemption	16.4	17.5	13.6	15.3	16.2	18.5
	Deferral	15.3	17.5	14.5	15.2	17.6	18.5
	Accrual	15.8	17.4	13.9	15.2	16.7	18.4
United Kingdom	Exemption	15.8	16.9	13.6	15.4	16.1	18.4
	Deferral	15.3	17.5	14.7	15.4	17.2	18.0
	Accrual	14.5	15.9	13.0	14.1	15.2	16.6
Germany	Exemption	21.4	21.5	14.5	15.4	18.9	20.4
	Accrual	20.1	20.8	15.8	16.2	22.0	22.8
Japan	Exemption	19.8	20.5	13.0	14.2	15.7	17.7
	Deferral	15.0	17.0	13.5	14.2	17.3	18.3
	Accrual	16.4	18.1	13.5	14.5	17.7	19.6
Singapore	Exemption	17.1	17.7	14.6	15.4	15.9	16.8
	Deferral	15.3	16.2	14.6	15.1	15.9	16.4
	Accrual	14.9	15.2	14.0	14.3	15.3	15.6
Netherlands	Exemption	19.8	20.6	16.4	17.3	19.0	20.3

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Switzerland	Exemption	17.4	17.8	13.6	14.2	14.4	15.2
France	Exemption	18.4	18.9	15.0	15.9	18.2	19.5
	Accrual	18.8	19.3	16.1	16.5	19.9	20.5

*Note:* User cost of capital is estimated as  $F' = (\delta + r)(1 - A)/(1 - u)$ ;  $F' = (\delta + r)(1 - A)/(1 - u) = \text{combined host and home country company tax rate}$ ,  $A$  = present value of capital cost allowances, and  $\delta$  = economic depreciation rate,  $r$  = real cost of finance.

*Source:* Author's calculations.

weighted average of costs on debt raised in Thailand and equity or debt raised in the home country is taken as the firm's discount rate. (In the deferral case, however, the real cost of debt finance in Thailand is assumed to be equal to the multinational's weighted average cost of debt and equity finance.) For the taxplanning model, our calculations for the deferral case assume the same value for tax on remitted earnings imposed by the home country. In principle, the tax rate on remitted earnings would be higher if the parent relied primarily on home country debt rather than on Thai debt. In the pecking-order model, it is assumed that the multinational parent only uses equity to finance capital abroad. Thai debt is used by the subsidiary in the case of deferral taxation only. (The cost of Thai debt is assumed to be equal to the cost of equity finance for the parent and so does not enter the calculations directly.) Under the pecking-order model, no home country debt is used in any tax regime and no Thai debt finance is included, except for deferral taxation which requires the cost of Thai debt and retentions to be equal. Other data used to estimate the user cost of capital are provided in table 7-2.

In table 7-6, we present marginal effective tax rates on capital. These rates are calculated by measuring the difference between the gross-of-tax and net-of-tax marginal rate of return. The marginal rate of return on capital is calculated by taking the user cost of capital and subtracting the rate of economic depreciation. The net-of-tax rate of return is the marginal rate of return on capital received by the owners. This would be the rate of return, adjusted for inflation, that, under purchasing power parity, leads to two different cases.

In the first case, the net-of-corporate-tax rates of return on assets differ across countries. This situation can arise when there are impediments to arbitrage or when taxes for capital gains on currency appreciation differ from the taxes on regular income. In the second case, net-of-tax real rates of return are the same across assets. This situation can arise if there are no impediments to arbitrage and there is equal taxation of income and of capital gains on currency appreciation received by the lender to the firm. The second set of calculations were made by assuming that all countries have real interest rates equivalent to that of Thailand's, although in reality Thailand's rate is usually higher than the rates elsewhere. These calculations are only done for the tradeoff model.

The calculations presented in tables 7-5 and 7-6 lead us to several conclusions concerning the taxation of international income in Thailand.

Taxation of Thai firms relative to foreign companies. Domestically owned companies in Thailand face a relatively high user cost of capital (table 7-5); only those of French and German companies are higher.

**Table 7-6. Effective Tax Rate for Foreign Firms Investing in Thailand by Type of Ownership and Home Country Tax Regime for Tradeoff Model, 1989 (percent)**

Economy	Tax regime	Equal real interest rate		Actual real interest rate	
		SET	Non-SET	SET	Non-SET

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Thailand	Exemption	31.0	40.7	31.0	40.7
Hong Kong	Exemption	57.7	65.1	92.4	94.2
United States	Exemption	42.7	52.1	45.6	54.1
	Deferral	46.1	59.7	13.5	38.3
	Accrual	50.3	59.4	20.8	37.5
United Kingdom	Exemption	45.2	54.3	48.8	57.2
	Deferral	52.0	64.2	41.3	58.4
	Accrual	45.0	55.4	31.0	46.8
Germany	Exemption	34.8	35.7	34.8	35.7
	Accrual	38.8	42.9	26.7	31.6
Japan	Exemption	35.0	41.1	36.0	40.2
	Deferral	25.4	46.1	-18.3	15.2
	Accrual	44.5	55.6	7.6	26.8
Singapore	Exemption	41.0	46.4	43.8	48.5
	Deferral	38.5	46.3	25.1	35.4
	Accrual	36.1	39.1	19.1	23.4
Netherlands	Exemption	37.9	42.6	38.4	42.8
Switzerland	Exemption	39.9	43.8	41.5	44.5
France	Exemption	39.4	43.4	40.1	43.8
	Accrual	49.4	51.9	44.4	47.4

*Source:* Author's calculations.

The user cost of capital in Thailand reflects the high real interest rates faced by companies raising capital domestically. The user cost of capital is lowest for Hong Kong companies, mainly because of the low cost of finance in Hong Kong.

Calculations of effective tax rates (table 7-6) suggest that Thai domestic firms tend to be taxed at a lower rate than most foreign companies, whether the equal real interest rate or the actual real interest rate is used. The exceptions are German (exemption only) and Japanese (deferral with actual real interest rate) companies. Hong Kong's effective tax rates are quite high, primarily as a result of the low gross-of-tax rates of return on capital used in computing effective tax rates.

These results assume accurate reporting of income. If Thai-owned companies were to report low revenues or high costs to avoid company taxes, the user cost of capital as estimated in table 7-5 would have to be adjusted downward. In fact, accounting data suggest that Thai-owned companies tend to pay proportionately fewer taxes

than do foreign companies. The user cost of capital for Thai firms may, therefore, be overestimated.

**EXEMPTION AS AGAINST DEFERRAL TAXATION .** The user

cost of capital for a company of a specific country is often lower under deferral taxation than under exemption (table 7–5). This is due in large part to the advantages afforded to foreign–owned companies to finance investment in Thailand at low real rates of interest in their own country. Under deferral, multinationals benefit from a lower cost of finance much more than they do under exemption, especially when substantial dividends are remitted to the parent, for they increase the value of deductions for capital cost. Thus, for foreign companies the main advantage of investing in Thailand is that it costs them less to obtain funds than it does Thai companies.

To gain a better understanding of the effect of deferral, we use the effective tax calculations in table 7–6. For the tradeoff model, when real interest rates are assumed to be the same, tax rates based on a deferral regime are generally higher than those on an exemption regime. This is not surprising since the effective statutory tax rate, which includes the impact of capital income on the repatriation tax rate imposed by the home country, is higher than the Thai statutory tax rate. Moreover, the capital cost allowances are partly based on the home country tax write–offs for foreign investments of multinationals. In general, home countries tend to provide less liberal write–offs, and so capital cost allowances are less valuable on a present value basis, to the extent that dividends are remitted.

These results change somewhat when actual real interest rates are used. In Japan, Singapore, and the United States, deferral effective tax rates are now lower than those in the exemption case. The reason is that these countries have higher inflation rates and lower real interest rates than Thailand does. Thus, the cost of finance in the home country is lower. This makes

capital cost allowances more valuable since the discount rate for computing the present value of the capital cost allowance write–off is lower. In addition, the tax subsidy associated with debt finance raised in the home country is more valuable to the parent, especially if inflation rates are high relative to the nominal interest rate in the home country. Both of these factors are particularly important for Japanese companies that face low real interest rates and tend to have more leverage.

**ACCRUAL TAXATION .** Under the accrual regime (the tradeoff model), the effective tax rate for each country is higher than it is in the exemption case when real interest rates are the same, except in the United Kingdom and Singapore. When real interest rates differ, the accrual taxation leads to lower effective tax rates on capital for Japanese firms as well, because the tax subsidy on debt favors Japanese companies when they remit income to Japan.

This is a surprising and unconventional result. The relatively low cost of capital in the accrual case can arise for two reasons. First, under accrual taxation, the effective statutory tax rates that apply to interest and depreciation deductions are based on the home country rather than Thai company tax rates. When the rate of company tax is higher in the home country, these tax deductions are more valuable. Second, the capital cost allowances given by the home country for multinational foreign investments are sometimes higher than those provided by the host country (for example, the United Kingdom). As a result, the effective tax rate may be lower under accrual taxation than under the other tax regimes.

**FINANCIAL MODELS .** In general, the tax–planning model yields the lowest user costs of capital but not the lowest effective tax rates. This is due to the fact that different models imply different rates of return. As already mentioned, the source of finance that carries the lowest cost is debt issued at home, the reason being in part that statutory tax rates and lower real interest rates are higher in home countries than in Thailand. In the tax–planning model, home country debt costs the least and, surprisingly, has higher effective tax rates.

COMPANIES ON AND OFF THE STOCK EXCHANGE OF THAILAND . Companies registered on the Stock Exchange of Thailand are taxed at the preferential rate of 30 percent instead of the standard 35 percent. Withholding taxes imposed by Thailand on dividends and capital gains are also lower for these companies. It is not obvious, however, that a lower statutory tax rate leads to a lower user cost of capital. As is well known, if tax depreciation and interest write-offs are generous enough, a lower statutory tax rate may penalize rather than subsidize investment. In an international context, there is another dimension. A lower statutory tax rate may reduce tax payments in Thailand and, if the firm is in a deficient foreign tax-credit position, it may increase tax payments to home countries that are using deferral taxation. Except in Japan and the United States, home country taxes on remitted dividends of SET companies are negative, so a lower statutory company or withholding tax rate imposed by Thailand does not necessarily benefit the foreign company. The calculations do suggest, however, that effective tax rates are lower for SET firms in general.

### **Policy Options from the Perspective of Thailand**

As we have found, effective tax rates on foreign capital vary by country of ownership and type of tax regime. Using this finding, we now address policy issues related to the taxation of foreign capital from the perspective of the capital-importing country. We first review the objectives of company tax policies and the constraints surrounding policy measures and then see how these apply to the situation in Thailand. Devising company tax policy in an international context is quite difficult given the complexities of tax systems and the strategic behavior of the parties concerned.

#### **Economic Objectives of Tax Policy**

Countries might tax capital to attain the following objectives: raise revenue, increase allocative efficiency, promote investment, and achieve a more equitable distribution.

RAISING REVENUE . The main rationale for taxation is to raise revenue. It is conceivable that governments could rely on taxes on individuals, such as personal income and withholding taxes, without imposing taxes on firms. So what is the role of the company income tax?

A company income tax serves two purposes (see Mintz and Seade 1989). The first is to "withhold" taxes on income, primarily on accrued capital gains, that is difficult to tax at the individual level. The company tax ensures that individuals cannot evade the individual income tax by reinvesting income to avoid withdrawing it as dividends or other forms of income that are fully taxed.

Second, if a country imports capital, especially foreign-controlled capital (through direct investment), the company tax acts as a withholding tax on the income accruing to foreigners. From the perspective of a capital importer such as Thailand, the taxation of income accruing to foreigners has little effect on foreign investment if the tax falls on rents accruing to foreigners or,

under foreign tax-crediting arrangements, on foreign governments. This makes the company income tax, along with nonresident withholding taxes, an efficient source of revenue as economic costs for the capital-importing country are low.

As we have seen, however, this depends on the tax regime of the home country. If the exemption tax system is used, the company income tax falls on investors, not on governments. The company tax lowers the return on capital, with the result that foreign capital flows are distorted, except when foreign investors earn rents (in other words, there is a difference between the revenues and the economic costs of using capital and labor).

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Under the accrual tax system, which applies primarily to branches of foreign companies, another result is obtained. Since the host country's company and withholding taxes are fully credited against foreign taxes, the host country's company tax has no distortionary effect on investment. The tax serves as a *revenue-sharing* device in the sense that each unit of company tax raised in the host country reduces a corresponding amount of revenue accruing to the home country.

Under the "deferral" tax system, the tax system of the host country withholds the subsidiary's income accruing to both investors and governments. To the extent that the underlying company tax is associated with remitted dividends and is creditable against foreign taxes under the deferral system the home country loses revenue in favor of the host government. But the host's company tax also falls on foreign investors and may discourage capital inflows. In part this depends on the degree to which investments are financed by the retentions of the subsidiary. It also depends on how the host country's taxes affect home country taxes on remitted income.

The company tax can also encourage foreign capital investment under the deferral regime. If a subsidiary is in an excess foreign tax-credit position on dividends, the credits can be used to reduce home country taxation of other forms of incomes. In this case, deferral taxation leads the home country to subsidize investments by subsidiaries in the host country.

**ALLOCATIVE EFFICIENCY** . Two efficiency issues are relevant to the taxation of foreign capital.

First, company taxes affect the allocation of capital by taxing assets unevenly. (We will refer to this as static inefficiency.) In the international context, taxes on assets vary across firms according to the country of ownership. Also, taxes on capital may vary depending on the relationship between economic depreciation and the capital cost allowances of host and home countries. Since neither Thailand nor its major capital exporters implement indexation, differences in inflation also contribute to the variation in effective tax rates.

Second, capital income taxes distort the allocation of resources over time (dynamic inefficiency). In the presence of company taxation, firms are deterred from investing in capital, and the economy responds by shifting resources from future to current production.

In a closed economy, it is often argued, cutting or removing the company income tax reduces the static and dynamic efficiency associated with the taxation of capital income. In an open economy, however, such efforts may fail to improve allocative efficiency and may leave the capital importer with a loss in national income. This situation arises when capital-exporting countries tax multinational investment under the accrual or deferral tax system. If the accrual system is used, reducing the company income tax in the host country does not undo the company tax imposed by the capital exporter. It leads to a transfer of revenue from the host to home country public treasury. Under the deferral tax system, the company tax levied by the host country does affect investment, but eliminating it would not undo the impact of home country taxes on the multinational's capital decisions. As discussed above, it is also possible that eliminating the host country tax might deter investment, especially if the host tax rate is more than the home company tax rate.

This suggests that the capital importer's company tax should be high on foreign capital when subject to accrual taxation and low on capital when under exemption taxation, with the deferral system generally lying somewhere between the two. In practice, however, company taxation cannot be structured in this way. Bilateral tax treaties normally contain a provision disallowing discrimination on the basis of country of residence. A limited degree of discrimination may nonetheless be feasible through differentiated nonresident withholding taxes, with relatively low rates applied to exemption countries.

**PROMOTION OF INVESTMENT** . Tax incentives are often used to encourage selected investment activities. For example, tax holidays in Thailand have been used to promote local participation and to enhance growth through import substitution or export promotion. They have also been used to encourage industries to relocate to

less congested regions.

The use of company tax incentives for investment purposes can fail because, under accrual taxation, the elimination of a host country tax may simply lead to a transfer of revenue from the host to the home country without affecting investment. Thus, lower company taxes on branch income or lower withholding taxes on remitted income from the host country may be ineffective if these taxes are credited abroad. Under the exemption system, tax incentives can be more effective since host country taxes are not credited abroad.

Under deferral taxation, the impact of tax incentives is less clear. A lower tax in the host country will not

always encourage company investment if the multinational is remitting dividends, since the tax incentive will be partly undone by higher taxes paid to the home country on remitted dividends. This suggests that, under the deferral system, tax incentives, such as tax holidays, should be restricted to foreign capital from those capital exporters who use the exemption system rather than the accrual or deferral tax regimes.

These conclusions would have to be modified wherever a tax-sparing provision exists. Such a provision is sometimes granted by capital-exporting countries to a less-developed host country, and it enables the multinational to receive a foreign tax credit at home for the taxes exempted in the host country. Under tax sparing, the host country's incentives remain effective and may be more attractive than under the exemption system.

**DISTRIBUTIVE ISSUES** . If a capital-importing country is not concerned with the welfare of foreigners, the distributive implications of company taxes on the income of foreigners are immaterial. Company taxes in an open economy can, however, affect the wages paid to nationals working for foreign companies. In particular, in a small open economy like Thailand's, the effect of a capital income tax may be to lower the income of labor. Since the rate of return on the net of company tax paid to shareholders is determined by international markets and is unaffected by the tax policy of the local economy, the burden of company taxation may be shifted to labor. Thus, tax relief for foreign companies may be appropriate if this impact of wages is considered acceptable.

Again, these issues depend on the tax regimes implemented in the home countries. The most important distributive impact of the company taxes of host countries arises in the exemption case since the host country tax is not credited abroad. In other cases, tax incentives adopted for distributive reasons are partly undone by increases in taxes paid to home countries.

### **Tax Planning and Tax Competition**

Before we examine Thai tax policy in the light of the objectives above, we need to give some attention to tax planning (or tax arbitrage) and tax competition, since they affect some of the conclusions just reached.

**TAX PLANNING** . Tax planning is what multinationals do to minimize their tax liability. This can consist of shifting the tax base from high-to low-tax jurisdictions. Some strategies are transfer pricing, debt restructuring, and allocating overhead costs so that expenses are deducted in high tax jurisdictions but income is reported in low-tax jurisdictions. Tax planning therefore reduces the amount of tax revenue accruing to the high-tax country. As a result, host countries use other taxes, such as withholding taxes on individuals and companies, to protect revenue.

What is less well known is that a multinational can use tax planning to turn company tax in a high-tax country to its advantage. A multinational can deduct expenses at a higher statutory tax rate in one jurisdiction and report income in a low-tax jurisdiction. In effect, capital can be subsidized with careful tax planning.

The effect of tax planning on government revenue and multinational investment in the host country is ameliorated by the deferral and accrual taxation adopted by some capital exporters. With accrual taxation, and to a lesser extent deferral taxation, it is more difficult for companies to shift income from high-tax to low-tax countries in that the transaction itself is subject to more home country taxes. Therefore, the gains from tax planning vary across multinational companies, depending on where they are based.

**TAX COMPETITION .** Tax competition refers to the policies countries choose in order to compete with each other in attracting foreign capital.<sup>12</sup> Assuming that the host country is "small" in both capital and product markets, company taxes levied on foreign capital have no impact on the world price of traded goods and services.

As we have seen, it may be in the interest of a host country to "export taxes" by taxing the income accruing to foreign investors or, with tax crediting, that accruing to foreign governments. With respect to foreign investors, it is important to distinguish between industries that earn rents generated in the host country and industries that do not earn rents at all. Rents are defined here as revenues net of the opportunity costs of using labor and capital or revenues net of wages, economic depreciation, interest on borrowed money, and the imputed cost of equity finance. If foreign investors do not earn rents in the host country, a company tax on foreign capital may do more harm than good. The reason is that the tax on capital lowers the income earned by domestic factors of production by more than the domestic resource costs of importing capital. Thus, for a small open economy, taxing foreign investors who earn no rents may not be in the best interest of the host country.

Often, foreign investors do earn rents generated in a host country. In this case, a rent tax would be appropriate. One type of tax, often discussed in the literature, is a cash-flow tax that allows capital to be expensed rather than allowing economic depreciation and financing costs to be deducted from the tax base. (This type of tax base is implicitly used in many value added tax systems.) A cash-flow tax is equivalent to a rent tax since the expensing of capital is equal to the present value of depreciation and financing deductions. Because no capital-exporting countries use cash-flow taxes, however, a capital importer may find it necessary

to use the company income tax to capture parts of the rent. The company income tax is an imperfect mechanism for this purpose since, unlike the cash-flow tax, it falls on both rents and the return to capital, thereby distorting investment decisions.

These remarks apply primarily to the tax treatment of foreign investment income under the exemption system. If home governments use the deferral or accrual tax regime, the host country is often motivated to use company income tax to take advantage of the crediting system. The critical question then becomes, Which instruments to use? Clearly, withholding taxes on remitted income, which are creditable against foreign taxes under the deferral or accrual systems, help the host country acquire tax revenue with little or no deterrent effects on investment. A company tax on rents, if fully credited, could also serve as a useful tax to withhold income accruing to foreign governments. The host government, however, may fail to collect sufficient revenue since the tax base, which allows the imputed cost of equity to be deducted, is smaller than the foreign government income tax bases, which only allow the cost of debt to be deducted. Moreover, as noted earlier, a rent tax imposed by the host country is not neutral in an international context.

Each country also worries about closely related jurisdictions that are either capital exporters or are adjacent capital importers and that compete for foreign capital and managerial resources. An important question is whether countries must offer a company tax similar to that in other jurisdictions. When a capital importer is competing with adjacent countries for foreign capital, it is often argued, its company tax must be similar to that of its neighbors. This argument is of limited validity. Tax competition among capital importers is irrelevant if world prices of imported services are unaffected by the tax policies of small countries and if a crediting system is used in the home country.<sup>13</sup>

A company tax imposed by a capital importer may be used by multinationals to take advantage of tax-crediting arrangements. For this reason, a capital importer may wish to use withholding taxes or a similar company tax to maximize tax revenues credited against foreign taxes. If capital exporters, using the accrual or deferral tax systems, lower company taxes on multinational foreign-source income, a capital importer may be forced to reduce its own tax as less tax revenue may be credited abroad and may thereby affect its investment. Under deferral, the capital importer may also need to lower its tax rates if it wishes to protect its revenue base. As illustrated by the worldwide company tax reform in the 1980s, when statutory tax rates were lowered in capital exporter countries, many capital importers reduced their statutory rates to guard against the possibility that multinationals might shift deductible expenses to their own jurisdictions but report income abroad. Also, under the deferral tax system, if a company found itself in an excess foreign tax-credit position because of a lower tax rate imposed by the home country, it would take action—for example, it might restructure the debt of the subsidiary—to use up any excess foreign tax credits.

Tax competition becomes a concern under two conditions: (a) if the host's concessions do not reduce foreign tax credits in the home country, because the home country either exempts foreign income or gives tax sparing; and (b) if the adjacent countries are "large" in relation to each other. Under these circumstances, one country's incentives increase the cost of acquiring resources for its competing capital importer. The competing capital importer would wish to lower taxes on foreign capital since its tax base is more elastic, and thus it will have more difficulty withholding income accruing to foreign investors. Tax competition would then cause adjacent countries to rely less on company tax revenues.

### **Thai Company Income and Withholding Taxes**

As already established, Thai company taxes on foreign capital are composed of (a) withholding taxes on remitted dividends, branch profits, interest, and fees; and (b) company income taxes. Special tax concessions in the form of company income and withholding tax holidays are given to attract foreign capital in competition with adjacent countries, particularly Malaysia, the Philippines, Singapore, and Indonesia.

In general, withholding taxes in Thailand are lowest on interest remitted to financial institutions and on dividends remitted to countries using the exemption system. The rates are highest on remitted income that is deductible for Thai company tax purposes (interest paid to nonfinancial firms, rent and lease payments, and technical and management fees). In addition, income from foreign-owned mutual funds holding SET shares can be remitted abroad tax-free.

In Thailand, withholding taxes on income that is remitted to home countries using the exemption tax system tend to be low in recognition of the fact that the tax is not creditable. In some cases, however, tax relief is provided even though the withholding tax may be credited abroad and there is no tax sparing (such as exemptions on dividend withholding taxes for tax-holiday companies).

As for the company tax, Thailand has an "average" tax regime, except in those cases where foreign companies qualify for tax holidays or where they understate profitability for tax purposes. The Thai statutory tax rate is not out of line with that of major capital exporters, except for Hong Kong. Thailand also provides tax deductions similar to those of exporting countries, except when compared with the United Kingdom and

Singapore, which grant relatively fast write-offs for multinational foreign investments. This suggests that the Thai company tax, at least in principle, is set at an appropriate level.

A few features of these taxes are of concern, however. To begin with, the differences between withholding tax rates among countries with similar tax regimes can create opportunities for tax planning. For example, several foreign companies have their Thai subsidiaries remit dividends to another subsidiary in the Netherlands rather

than to other countries using the exemption system.

Withholding tax relief should not be given to countries with deferral or accrual taxation and without tax sparing. This applies particularly to withholding tax concessions that are given under tax-holiday provisions. These concessions are unnecessary since only the foreign government stands to gain from them.

The Thai definition of "permanent establishment" becomes a problem for international tax law since the Thai authorities often want to ensure that foreign activities that generate income are fully taxable. Many companies have voiced concern about the application of Section 76bis of the Thai tax code, which allows the Thai authorities to tax foreign companies that may only be exporting goods to Thailand, not "carrying on business in Thailand." These concerns stem by and large from the fact that no clear application of the law exists in this area. This issue, however, is confined to nontreaty countries, including the United States.

Many countries, such as Canada and recently the United States, limit the amount of interest that multinational subsidiaries can deduct from taxes owing to the host country. Thailand currently has no such rules. Given the low withholding taxes on certain forms of remitted income, it is desirable that new rules be introduced to reduce interest deductions.

The Thai government could consider a special tax or adjustments in withholding taxes that would reduce the incentive for multinationals to use transfer pricing. One justification given import duties in Thailand has been that they reduce the incentive for companies to overstate imported prices, but they are not an appropriate instrument for eliminating transfer pricing. Instead, the Thai government could impose special provisions to bring Thai company tax rates in line with those of its trading partners.

Data on the accounting statements of Thai and foreign companies include details of the company taxes paid to the Thai government. Interestingly, a large number of companies do not pay any company taxes, particularly those that are not registered on the Stock Exchange of Thailand. Given that the Thai company tax regime has few fast write-offs for capital, this is surprising. There may be a case for a minimum tax that would be creditable against normal company taxes paid by the firm. Such a minimum tax would add complexity to the tax system but it would also level the playing field so that all companies would bear some tax. The two minimum taxes that could work in Thailand are either a tax on distributed profits (dividends, possibly interest) or a tax on the capital assets of the subsidiary (such as the Canada's Large-Corporation Tax). If structured correctly, either tax could be creditable against home country taxes on remitted dividends from Thailand.

The company income tax incentive system in Thailand uses a company and withholding tax holiday lasting from three to eight years to attract foreign investment. The Thai tax holiday is biased against long-lived capital in that the assets are written down during the holiday (see Mintz 1990). The remaining depreciation allowance after the holiday may be too low relative to true economic depreciation and thus may produce higher effective tax rates than the statutory rates. Since the Revenue Department does not review the income statements of tax-holiday firms, it is not clear to what extent depreciation deductions are taken. Furthermore, the tax holiday allows for considerable abuse in that income from related companies can be shifted into tax-holiday companies.

Internationally, the incentive may be partly counteracted by taxes imposed by capital-exporting countries that use the deferral or accrual tax system.<sup>14</sup> Also, the reason given by the authorities for adopting tax holidays is that adjacent countries also provide tax holidays. But it should be noted that a tax incentive need not always be in the form of a tax holiday. Indonesia, for instance, attracts considerable foreign capital with accelerated depreciation that is biased in favor of longlived assets.

## Appendix: The Derivation of the Technical Results

We consider a model of a subsidiary owned entirely by a parent resident of a foreign country that uses the deferral method. The model assumes that the subsidiary finances capital by retentions or local debt. The multinational parent finances its capital by raising debt at home or using retentions generated by other operations. No equity transfers are made by the parent to the subsidiary. [15](#)

Let nominal dividends earned by the subsidiary in period  $t$  be  $D_t$  before remittance to the parent and denominated in local currency of the host country. Dividends earned are equal to revenues net of gross investment expenditures financed by retentions, borrowed financing costs, and corporate taxes. The subsidiary's nominal revenues are  $e^{xt} F[K_t]$  where  $\pi$  is the local rate of inflation and  $F[\cdot]$  is a strictly concave function defined over the capital stock,  $K_t$  Nominal

investment expenditure is equal to  $e^{xt} (\dot{K}_t + \delta K_t)$ . The subsidiary finances capital with new issues of nominal bonds equal to  $\dot{B}_t$  and pays out interest on its stock of bonds equal to  $iB_t$  ( $i$  is the nominal interest rate of local debt). Letting  $T_t$  denote corporate taxes paid by the subsidiary, its nominal dividends are thus the following:

$$(7-1) \quad D_t = e^{xt} F[K_t] - e^{xt} (\dot{K}_t + \delta K_t) + \dot{B}_t - iB_t - T_t$$

Corporate taxes paid to the host country in local currency are levied at the rate  $u$  on nominal revenue net of capital costs allowances and interest costs:

$$(7-2) \quad T_t = u \{ e^{xt} F[K_t] - \alpha \hat{K}_t - iB_t \}$$

whereby  $\alpha$  is the capital cost allowance rate on an exponential basis and  $\hat{K}_t$  is the undepreciated capital cost allowance base. This is the base used for tax purposes and is equal to the remaining amount of undepreciated investment expenditures accumulated since the start-up time  $\tau$  to the current period:

$$(7-3) \quad \hat{K}_t = \int_{\tau}^t (\dot{K}_s + \delta K_s) e^{\pi s} e^{-\alpha(t-s)} ds.$$

The above values denoted in local currency can be converted into the home country's currency by using the exchange rate  $x_t$ , expressed as units of home currency per unit of host currency, such as U.S. dollar per Baht. We assume that the exchange rate in every period is determined by purchasing power parity. Letting the initial value of the exchange rate be equal to unity,

$x_t = \frac{e^{\pi^* t}}{e^{\pi t}}$  with  $\pi^*$  denoting the inflation rate in the home country. Thus, if the anticipated inflation rate, in the home

country is higher than the local inflation rate, the local currency appreciates in value, increasing the value of dividends remitted to the home country. Multiplying the value of dividends in local currency by the exchange rate and substituting equation (7-2) into (7-1), we obtain the following expression for dividends denoted in the home country's currency:

$$(7-4) \quad D_t^* = x_t D_t = e^{x^* t} F[K_t] (1 - u) - (\delta K_t + \dot{K}_t) e^{x^* t} + e^{(x^* - \pi)t} (u \alpha \hat{K}_t + \dot{B}_t - iB_t (1 - u))$$

THE DETERMINATION OF TAXES ON REMITTED INCOME . When a multinational remits dividends, it pays a withholding tax to the local government equal to  $\theta D_t$  in local currency, or, in home country currency  $D_t^*$ . This withholding tax, in the case of deferral taxation, is credited against the corporate income tax levied on

foreign-source income by the home country. Also, corporate income taxes deemed to be paid on dividends in the host country are credited against home country corporate taxes, if there is sufficient ownership by the parent. (In the United States, the level of ownership required for an indirect corporate tax credit is 10 percent and in some countries as low as 5 percent.)

The credit for corporate income taxes under deferral is quite complicated; it is based on the dividend pay-out ratio of the subsidiary as defined by the home country tax authorities. The exact calculation of the credit for deemed corporate taxes is as follows. The amount of foreign corporate income taxes credited by the home country is deemed to be a proportion of local corporate taxes denoted in the home country's currency. The proportion used is dividends remitted (in home country currency) divided by net-of-foreign tax earnings of the subsidiary as defined by the home country: taxable profits of the subsidiary less foreign taxes, all denoted in the home country's currency. The foreign tax credit given by a country using the deferral method for corporate income and withholding taxes paid in the host country is equal to

$$(7-5) \quad FTC_i = \left[ \frac{T_i x_i D_i^*}{(\Pi_i^* - x_i T_i)} \right] + \theta D_i^*$$

with  $\Pi_i^*$  denoting taxable profits of the subsidiary as defined by the home country. (An expression for taxable profits is explicitly derived below.)

The amount of corporate income tax paid to the home country is also complicated since dividends, gross of withholding and corporate taxes in the host country, are taxable as foreign-source income. The taxable value of gross dividends is calculated as the proportion of profits attributed to the dividend pay-out. This proportion is the same as that calculated for the foreign tax credit. The corporate tax paid to the home country is thus equal to the rate, of tax,  $u^*$ , multiplied by the taxable earnings attributed as remitted to the parent, net of the foreign tax credit:<sup>16</sup>

$$(7-6) \quad T_i^* = \frac{u^* \Pi_i^* D_i^*}{(\Pi_i^* - x_i T_i)} - FTC_i \\ = D_i^* \left[ \frac{u^* \Pi_i^* - T_i x_i}{\Pi_i^* - T_i x_i} \right] - \theta D_i^*$$

The value of the subsidiary's taxable income as defined by the home country is equal to revenues net of depreciation (measured according to the capital cost allowance rate used by the home country's tax authorities) and interest costs denoted in the home country's currency:<sup>17</sup>

$$(7-7) \quad \Pi_i^* = e^{r^* t} F(K_i) - \alpha^* \hat{K}_i - i B_i x_i$$

Similar to equation (7-3), the value of the undepreciated capital cost allowance base,  $\hat{K}_i$ , is the sum of undepreciated gross investment expenditures of the subsidiaries, denoted in the home country's currency:

$$(7-8) \quad \hat{K}_i = \int_{\tau}^t \dot{K}_s e^{r^* s} (\dot{K}_s + \delta K_s) e^{-\alpha^* (t-s)} ds \\ = \int_{\tau}^t e^{r^* s} (\dot{K}_s + \delta K_s) e^{-\alpha^* (t-s)} ds$$

We may note that the terms in equation (7-6) can be combined to obtain the following:

$$(7-9) \quad X_t = u^* \Pi_t^* - x_t T_t = (u^* - u) e^{\sigma t} F[\cdot] - (u^* - u) i B_t x_t - \{ u^* \alpha \hat{K}_t^* - u x_t \hat{K}_t \alpha \}$$

$$(7-10) \quad Y_t = \Pi_t^* - x_t T_t = e^{\sigma t} F[\cdot] (1 - u) - (\alpha \hat{K}_t^* - u x_t \alpha \hat{K}_t) - (1 - u) x_t i B_t$$

THE VALUE OF THE MULTINATIONAL'S INVESTMENT IN THE HOST COUNTRY . We are now in position to describe the value of the multinational's investment in the host country, taking into account both the host and home country's tax systems. Denoting  $D_t^b$  as the net-of-tax dividend received by the parent from the subsidiary in period  $t$ , it can be shown to be equal to the value of remitted dividends net of the "repatriation" tax,  $\sigma_t$ , as shown in Bruce (1989):

$$(7-11) \quad D_t^b = D_t^*(1 - \theta) - T_t^* = D_t^* (1 - \sigma_t)$$

with the repatriation tax equal  $\sigma_t = \frac{u^* \Pi_t^* - x_t T_t}{\Pi_t^* - x_t T_t} = \frac{\chi_t}{Y_t}$  whereby the numerator, excess home country taxes on foreign source profits, is defined by equation (79) and the denominator, "adjusted net-of-foreign tax profits" is defined by equation (710). The withholding tax imposed by the host country on dividend remittances is eliminated by the tax credit given by the home country. Thus, the repatriation tax only depends on differences between host and home country taxes on subsidiary profits.

Income received by the multinational parent is equal to net-of-tax dividends less any accrued capital gains taxes paid by the parent on equity holdings in the subsidiary,  $c \dot{E}_t$ . The effective accrued capital gains tax is a fiction in that, at most, a parent pays capital gains taxes (usually to the home country) only at the time that assets are sold in a foreign country. For purposes of the model, we include an "accrual-equivalent" capital gains tax rate to complete the model.

The present value of the income accruing to the parent is equal to nominal flows of income, discounted by the nominal discount rate of the parent,  $\rho$ , which is defined more precisely later:

$$(7-12) \quad E_0 = \int_0^{\infty} e^{-\rho t} \{ D_t^b - c \dot{E}_t \} dt = \int_0^{\infty} e^{\frac{-\rho t}{1-c}} \left\{ \frac{D_t^*(1-\sigma_t)}{(1-c)} \right\} dt$$

As shown by Boadway (1987), the right-hand side of expression (712) is obtained by differentiating the middle expression with respect to  $t$ , dividing the differential equation by  $(1-c)$  and solving for the expression on the right-hand side, using the definition of  $D_t^b$ . An important property to note with respect to the above expression is that the repatriation tax is not necessarily independent of time, depending on decisions made by the subsidiary.

Before solving the model, we should make two points to delineate the above expressions for taxes paid on foreign-source income (equations (7-6), (7-4), (79), and (710)) from earlier work in the literature. First, the rate of corporate taxes levied by the home country on foreign-source income is independent of financing and investment decisions only under very restrictive conditions, as established by the following lemma:

**Lemma:** *Condition for the Exogeneity of the Home Country's Tax Rate Under Deferral Taxation:*

Let the following two conditions hold:

(a) Host and home country tax depreciation rates are the same ( $\alpha = \alpha^*$ ).

(b) Inflation rates are the same ( $\pi^* = \pi$ ).

$$\sigma_t = \frac{(u^* - u)}{(1 - u)}$$

**Proof:** If  $\infty^* = \infty$  and  $\pi^* = \pi$ ,  $x_t \hat{K}_t = \hat{K}_t$  for all  $t$  using equations (7-3) and (78). From equations (79) and (710)  $u^* \Pi_t^* - x_t t T_t = (u^* - u) \Pi_t^*$  and  $\Pi_t^* - x_t t T_t = (1 - u) \Pi_t^*$ . This implies  $\sigma_t = \frac{(u^* - u)}{(1 - u)}$

The home country tax,  $\sigma_t$ , is independent of capital stock and financing decisions of the subsidiary if the tax bases of the host and home countries are equivalent. It is clear this requires capital cost allowances to be equivalent. It also requires inflation rates to be identical. The reason for this latter result is that the capital cost allowance base used for tax purposes by the host country is based on investment expenditures that rise in nominal terms by the inflation rate of the host country. The home country calculates the capital cost allowance base in a different way. First, it converts nominal investment expenditures denominated in the host currency into home currency. Then, it adds up the undepreciated amount of past investment expenditures to arrive at the capital cost allowance base,  $\hat{K}_t$ .

When the repatriation tax is exogenous, the value of the tax on dividends is equal to the difference between

host and home country statutory tax rates on the grossed up value of dividends. The withholding tax rate disappears because it is fully credited. This treatment of the tax on foreign-source income is the "textbook" version used for descriptive purposes (see, for example, Brean 1982; and Alworth 1988). Moreover, since the tax rate on each dollar of dividends received is independent of subsidiary investment and financing decisions, the above conditions lead to the Hartman result that investment decisions, financed by retentions, are independent of the home country's tax system. In general, however, this determination of the tax rate on foreign-source income and the impact on investment is too simplistic.

The second point is that we assume that in every period the firm is able to use its foreign tax credits owing on dividend repatriations. In particular, the tax paid to the home country in equation (7-6) may be positive (deficient foreign tax credits) or negative (excess foreign tax credits). The latter case applies only when the multinational is able to use excess foreign tax credits on dividends against taxes owing on other remittances of foreign-source income. In our model,  $\tau^* \leq 0$  implying that any excess foreign tax credits on dividends are applied to taxes on other foreign-source income. Otherwise, if the multinational is in an excess foreign tax-credit position for all forms of income, it pays no tax on any income to the home country, implying that  $\sigma_t = 0$ .<sup>18</sup> (This case is described below when we turn to the full and partial exemption treatment of foreign-source income.)

**SOLUTIONS TO THE MODEL.** The problem for the multinational is to maximize the value of its equity (equation (712)) subject to two constraints, which are the equations of motion for the evolution of the undepreciated capital cost allowance used by the host and home countries:

$$(7-13.1) \quad \hat{K}_t = -\alpha \hat{K}_t + e^{\pi t} (K_t + \delta K_t)$$

$$(7-13.2) \quad \hat{K}_t^* = -\alpha^* \hat{K}_t^* + e^{\pi^* t} (K_t^* + \delta K_t^*)$$

The control variables for the multinational are thus  $K_t, K_t^*, K_t^*$  and  $B_t$  which maximize  $E_0$  subject to the constraints (713.1) and (713.2) for each period of time. Denoting the Lagrange multipliers for each of these constraints, respectively, as  $\lambda_1(t)$  and  $\lambda_2(t)$ , the Euler conditions for the above problem are derived (for solutions, see Leechor and Mintz 1990).

These optimality conditions for the investment and financing decisions of the subsidiary are obtained for the capital stock and debt policy of the subsidiary. The steady state conditions turn out to be rather simple. With capital stock constant, the real value of depreciation allowances in home country currency and the stock of bonds being constant over time, the repatriation tax,  $\sigma$ , on remitted earnings is constant.<sup>19</sup> The following formulas are derived:

$$(7-14) \quad F' = \left\{ \frac{\delta + \frac{\rho}{(1-c)} - \pi^*}{(1-\bar{u})} \right\} (1-A)$$

$$\bar{u} = u + d[u^* - u - \sigma(1-u)]$$

$$A = \frac{u\alpha(1-d(1-\sigma))}{\frac{\rho}{(1-c)} + \alpha + \pi - \pi^*} + \frac{d(u^* - \sigma)\alpha^*}{\frac{\rho}{(1-c)} + \alpha^*}$$

and  $d = \frac{D_i^*}{[Y_i(1-\sigma)]}$  (the "tax adjusted" pay-out ratio)

The cost of capital for the multinational subsidiary is somewhat different from the usual formulation obtained for domestically controlled firms. The main differences lie with the adjustments made for the impact of investment decisions on the repatriation tax faced by the parent on remitted earnings. With the holding of capital, the parent incurs depreciation costs ( $\delta$ ) and real financing costs, the opportunity cost of equity financing adjusted for the home country's inflation rate:

$\frac{\rho}{(1-c)} - \pi^*$ . The net revenues earned by the subsidiary ( $F'$  at the margin) are taxed at the host country's corporate tax rate ( $u$ ) plus the additional repatriation tax imposed on net revenues by the home country when dividends are remitted (this is reflected in the "tax-adjusted" dividend pay-out ratio). This additional repatriation tax results from two sources. First, when more capital investment is undertaken by the subsidiary, additional taxes equal to the difference between home and host country statutory tax rates are levied. (This is the "taxable income" effect obtained by differentiating the numerator of the repatriation tax,  $\chi$ , in expression [79]). Second, with more investment, the tax base used to calculate the repatriation tax is broadened ( $Y$  in equation (710)). This base-broadening effect causes the repatriation tax to fall by  $\sigma(1-u)$ .

The present value of depreciation allowances also depends on the repatriation tax. When the subsidiary claims capital cost allowances due to investment in the host country, it lowers both host country corporate and home country repatriation taxes each year. With increased tax depreciation allowances claimed in the host country, the host country tax and repatriation tax (via the foreign tax credit) are affected (first term of the expression for  $A$ ) as well as the home country tax on gross-of-creditforeign-source income (the second term

of the expression for  $A$ ). Again, two impacts can be distinguished: deduction and base-broadening effects. With more tax depreciation claimed for the host country tax, foreign tax credits are reduced when income is remitted, thereby increasing the repatriation tax by  $du \propto$ . The tax depreciation, however, is claimed for the host country tax; the repatriation tax base is narrowed reducing the value of tax depreciation deduction by  $du \propto \sigma$ . Similar reasoning is applied to the second term for  $A$ . More investment leads to additional tax depreciation claims valued by  $u \propto$ . Tax depreciation narrows the repatriation tax base, however, lowering home country tax depreciation claims by  $\sigma u \propto$ .

The specification of the discount rate of the multinational has not been made clear yet. Essentially, the discount rate,  $\rho$ , depends on the source of finance used by the parent. If equity is used, the  $\rho = \rho^*$  whereby  $\rho^*$  is the opportunity cost of equity finance for the parent in the home country (this cost of equity finance is gross of personal taxes paid by individual investors). If debt finance is used by the parent, the  $\rho = i^*(1-u^*)$ , the

net-of-corporate tax cost of debt finance in the home country.<sup>20</sup> Like other models, this model does not give an explicit analysis of optimal financing decisions of the multinational. We would need to rely on some additional assumptions such as bankruptcy costs or tax losses to derive a unique financial policy for the parent firm.

#### Exemption of Foreign-Source Income by the Home Country

If a home country exempts the foreign-source income of the resident parent company, the above analysis can be easily amended as follows. The value of dividends earned by the subsidiary in the host country prior to payment of withholding taxes to the host country (equations (7-1) through (7-4)) remains the same. The amount of taxes imposed on remitted income is the withholding tax assessed by the host country,  $\theta D_t^h$ , as denoted in home country currency. Since the foreign-source income is exempt from the point of view of the home country, the value of dividends received by the parent is:

$$(7-12') \quad D_t^h = D_t^f(1 - \theta)$$

The parent maximizes the discounted value of net-of withholding tax dividends as in equation (713) (where  $\sigma = t = \theta$ ). The control variables are  $K_t$ ,  $K_t^*$  and  $B_t$ . Financial policy must be constrained in this problem to prohibit the multinational from issuing unlimited amounts of debt. It is assumed that debt finance can be no more than the value of the firm and no less than zero. This problem yields two results: one pertains to the user cost of capital, the other to the cost of finance.

USER COST OF CAPITAL . The user cost of capital obtained for the case of exemption is the following:

$$(7-14') \quad F' = \frac{(\delta + R - \pi^*)}{(1 - u)} [1 - A]$$

$$R = \text{Min} \left\{ i(1 - u) - \pi + \pi^*, \frac{\rho}{(1 - c)} \right\}$$

$$A = \frac{u\alpha}{\alpha + R - (\pi^* - \pi)}$$

For investments made by multinationals resident in countries that exempt foreign-source income, the user cost of capital is much less complicated than that obtained for the deferral case. It is also more familiar since it is quite similar to the usual formulation found in the literature. There are, however, two adjustments to the user cost of capital in this context that are not well known. The first is that the discount rate of the multinational is the nominal financial cost of finance adjusted for the home country's inflation rate. The second adjustment is that the present value of tax depreciation allowances for the multinational is discounted by the nominal cost of finance net of capital gains earned by holding wealth in the host country's currency. With respect to the real capital gains due to currency appreciation, note that under purchasing power parity, capital gains on securities are equal to  $(\pi^* - \pi)$  for each unit of the host country's currency. This term is used in discounting tax depreciation allowances since appreciation in the value of the host country's currency increases the value of the tax depreciation allowances in the home country's currency.

THE COST OF FINANCE . As indicated above in expression (714'), the cost of finance,  $R$ , is the minimum of the cost of debt finance raised in the host country ( $i(1 - u) - \pi + \pi^*$ ) or the cost of equity finance for the multinational  $\left( \frac{\rho}{(1 - c)} \right)$  with  $c$  the capital gains tax, if there is one, imposed by host or home country). In principle,

the multinational uses the least-cost form of finance. If the multinational parent finances its capital with debt raised in the home country, then  $R = \tau^*(1 - u^*)$ . This implies that debt finance is raised in the host country only if  $i(1 - u) - \pi + \pi^* < i^*(1 - u^*)$  or vice versa. If the multinational parent's cost of equity finance at home,  $\pi^*$ , then the optimal choice of finance depends on minimum cost of  $\pi^*$ ,  $i^*(1 - u)^*$  and  $i(1 - u) - \pi + \pi^*$ .

The artificial bounds imposed on financing decisions ensures that the multinational prefers one form of finance or another. Unlike the case of deferral, which leads to an optimal debt policy, the financial decision in this model leads to corner solution when taxes imposed on equity and debt income are different. Imposing artificial constraints, however, is not satisfactory. One would like a model to explain financial choices without imposing artificial constraints on financing. As discussed earlier, in an alternative model that incorporates bankruptcy costs or tax losses, a more satisfactory determination of financial policy can be obtained. In particular, in the presence of bankruptcy cost, the discount rate may be a weighted average of the cost debt and equity finance, the weights being the proportion of capital financed by debt for equity.

**Full Taxation of Foreign-Source Income by the Home Country**

The final case to be examined here arises with respect to the full taxation of foreign-source income of a parent's operation in another country. This case applies particularly to branches of a parent in that most countries allow a parent to credit foreign corporate income taxes against the taxes levied by the home country on foreign-source profits. In contrast to the case of deferral, all income, as measured by the home country, is taxed whether or not the income is remitted. Host countries also apply a withholding tax on the branch profits regardless of whether the profits are remitted.

The model for full taxation of foreign-source income requires the expressions presented earlier to be amended as follows. First, the foreign tax-credit expression of equation (7-6) no longer depends on the dividend payment of the subsidiary to the parent. Instead, the foreign tax credit is equal to corporate income and withholding taxes paid to the host country on branch profits as defined by the host country:

$$(7-6'') \quad FTC_t = T_t \pi_t + \theta \Pi_t \pi_t$$

with  $\theta'$  denoting the withholding tax on branch profits and  $\pi_t$  denoting taxable income of the branch profits as defined by the host country (the expression in the parenthesis of equation (7-2)).

The home country allows the taxes to be credited against taxes assessed on branch profits. Taxes on foreign-source branch profits levied by the home country, net of the foreign tax credit, are equal to the following:

$$(7-7'') \quad T_t^* = u^* \Pi_t^* \\ = u^* (e^{r^* t} F[K_t^*] - \alpha^* \hat{K}_t^* - i B_t \pi_t) - FTC_t$$

whereby  $\hat{K}_t^*$  is the base for capital cost allowance defined in equation (79).

The parent maximizes the present value of dividends received over time. Dividends are equal to the net-of-withholding tax income received from the branch operating in the host country,  $D_t^*(1 - \theta')$  ( $1 - \theta'$ ), net of taxes paid to the home country (expression 77''). The value of equity in this case is equal to the following:

$$E_0 = \int_0^{\infty} e^{-\rho t} \{ D_t^*(1 - \theta') - T_t^* - c \dot{E}_t \} dt$$

Since the corporate and withholding taxes paid to the host country are credited against home country tax all terms associated with  $\theta'$  and  $\hat{K}_t^*$  drop out. The only control variables are  $K_t$ ,  $\hat{K}_t^*$  and  $B_t$ . The first-order conditions obtained for this problem are rearranged and reported below.

FULL TAXATION TO FOREIGN-SOURCE INCOME . The user cost of capital for the case of full taxation of foreignsource income is the following:

$$F' = \frac{(\delta + \rho - \pi^*)}{(1 - u^*)} (1 - A^*)$$

$$\text{with } A^* = \frac{u^* \alpha^*}{(\alpha^* + \rho)}$$

The user cost of capital in this case depends only on tax parameters relevant to the home country, not the host country. We note that tax depreciation allowances are not discounted by a rate inclusive of real capital gains earned by holding wealth in the host country. The reason for this is that the tax depreciation allowance base,  $K^*$ , is denominated in home country currency.

As a final point, the cost of finance for the parent,  $\pi$ , depends on the sources of finance, debt or equity, raised in the home country. The cost of finance is either the minimum of  $r(1 - u^*)$  or  $\frac{\rho^*}{(1 - c)}$  or the weighted average of these two net-of-corporate tax costs of finance. As discussed above, the appropriate discount rate depends on the type of equilibrium attained in financial markets.

## Notes

1. The cost of capital depends on the home country's tax on remitted income as long as tax provisions, such as the capital cost allowance, used by the home country's authority differs from that used by the host country. The appendix derives this result in detail.

2. Companies engaged in international transport as well as petroleum exploration and production are subject to different tax treatments. In transport, an income tax of 3 percent of gross receipts originating in Thailand is collected. If the carrier's country of residence is a treaty partner, the rate is

reduced to 1.5 percent. Petroleum companies are covered by a separate tax law which takes granted concessions and royalties into account. At present the income tax rate is 60 percent.

3. The special treatment for intercompany dividends is not applicable when they constitute 15 percent or more of the company's pre-tax income.

4. The effectiveness of this provision depends on the standards used by the accounting profession to ensure such conformity. A cap on depreciation deductions is used to limit the ability of companies to avoid company taxation by setting book depreciation rates too high.

5. We do not model equity transfers made by the parent to the subsidiary although the model can be easily extended to allow for this form of financing. With transfers, the Thai withholding tax on dividends is more relevant to measuring the cost of finance for the subsidiary than the capital gains tax, which affects the cost of finance associated with retentions.

6. Tax holidays have been analyzed by Mintz (1990) for five countries including Thailand. The model used in the analysis is applicable to domestic firms or foreign affiliates where the home countries exempt foreign source

income. The regimes of deferral and accrual taxation have not been incorporated.

7. Hines and Hubbard (1989) found that a number of U.S. corporations in 1984 were in an excess foreign tax credit position although they had no evidence to suggest that such a position would be permanent. Moreover, from a tax planning point of view, a parent corporation with excess foreign tax credits would want to restructure its relationship with the subsidiary so that the subsidiary pays less company tax to Thailand and the parent pays more corporate tax to the home country so foreign tax credits can be used up.

8. There are alternative measures such as the effective tax divided by the net of tax rate of return on capital. We choose the former since it is comparable with the original studies such as King and Fullerton (1984) and Boadway, Bruce, and Mintz (1984).

9. Some countries, like the United States, might tax this passive income earned by the Dutch subsidiary on an accrual basis. However, if the U.S. multinational structures the transaction carefully, the income may not trigger a U.S. tax.

10. For example, repatriation can occur simply because the parent wishes to generate excess foreign tax credits on dividend remittances in order to cancel out the home country taxes it owes on other remittance income.

11. We do not attempt to model the U.S. tax reform rules that limit the use by the parent of interest deductions when financing investments in the subsidiary. We assume that any debt finance raised in the United States is deductible from domestic source income.

12. Much of this discussion is borrowed from Mintz and Tulkens (1989).

13. Tax competition is relevant when countries try to maintain their tax revenue base.

14. Under a new treaty between Thailand and Japan negotiated in 1989, a tax-sparing provision is included so that the Thai tax holidays do not lead to more tax revenue for the Japanese government. There was, however, a period of more than ten years (1977-89) when the tax-sparing provision contained in an earlier treaty was suspended.

15. It would not be difficult to include equity transfers from the parent to the subsidiary for empirical work. However, to emphasize the points obtained by the theoretical model, we ignore such transfers to keep the model simple.

16. Another way of calculating the tax owing to the home government is by measuring the foreign source income of the parent as dividends received (gross of withholding taxes paid to the host country) plus corporate taxes paid to the host country attributed to the dividends. This implies that  $T_i^* = u^* [D_i^* \times x_i T_i] \frac{D^*}{(\Pi_i^* - T_i x_i)} FTC$ . Note that we would obtain the same expression for equation (7-7) using this interpretation.

17. In this formulation, it is assumed that there are no interest costs incurred in the home country that are allocated to the subsidiary's taxable profits generated in the host country. Recent changes to U.S. tax law requires that interest costs be apportioned between subsidiary and parent taxable income according to the proportion of assets held in each country. This could be modeled as well using the techniques presented in this section.

18. We also do not try to model the new U.S. rules applying to the calculation of taxes on foreign source income based on accumulated dividends and profits over time to define the dividend pay-out ratio.

19. More formally, these steady state conditions are the following:

$$(i) \quad \dot{K}_t = 0 \text{ and } B_t = \pi B_t$$

$$(ii) \quad \dot{\lambda}_1 = -(\pi - \pi^*)\lambda_1 \text{ and } \dot{\lambda}_2 = 0$$

$$(iii) \quad \dot{K}_t = \delta K_t e^{-\alpha t} \int_t^\infty e^{-(\alpha + \pi)s} ds = \delta K_t \frac{e^{-\pi t}}{(\alpha + \pi)} \text{ for } \tau = -\infty$$

$$\text{and } \dot{K}_t^* = \delta K_t^* \frac{e^{-\pi^* t}}{(\alpha^* + \pi^*)} \text{ for } \tau = -\infty.$$

Using these conditions one can show that  $\dot{\sigma}_t = 0$  by substituting (i) to (iii) into equations shown in expression (14.1) after obtaining the values for  $K_t$  and  $K_t^*$

20. As mentioned above, some countries, like the United States, may disallow interest costs, incurred by the parent to finance investments by the subsidiary, to be deducted from the home country's corporate tax. Instead, the interest costs may be attributed to the subsidiary implying that the parent's discount rate cannot be equal to the net-of-home country tax interest rate.

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## 8—

### Taxation and Foreign Direct Investment

Anwar Shah and Joel Slemrod

The 1980s witnessed a remarkable growth in foreign direct investment (FDI). Since then, some economists have become concerned about the effect of this growth on economic performance (of both the host and the home country) and about the need for an appropriate government policy toward FDI. Not surprisingly, this concern has been fueled by the responsiveness of FDI to attempts to tax the income that it produces. If FDI is not responsive to taxation, then it may be an appropriate target for taxation by the host country, which can raise revenue without sacrificing any of the economic benefits that FDI produces. For some countries in which the degree of FDI penetration is large, the revenue raised from taxing FDI can represent a significant fraction of total tax revenues. In Trinidad and Tobago, Nigeria, Peru, Indonesia, Ecuador, and Egypt, for example, tax payments by U.S. corporations alone exceed 10 percent of host country corporate tax revenues (Alworth 1988: 33). If the volume of FDI responds negatively to taxation, then the host country must trade off the revenue gains of increased taxation (if any) against the economic costs of discouraging FDI.

Most of the recent empirical literature on the tax sensitivity of FDI has focused on investment to and from the United States, in part because these flows are well documented. In this chapter we examine the effect of taxation on FDI in Mexico. We conclude that FDI in Mexico is sensitive to Mexico's tax regime and to the regimes of the investing countries. The regulatory framework and overall economic and political climate in the country also exercise important influences on FDI transfers and reinvestments in Mexico. These conclusions emerge from our review of the recent empirical literature on FDI in the United States and our own empirical study of the tax regime for foreign investment in Mexico.

### Review of the Empirical Literature

As already mentioned, FDI in the United States has been the main focus of recent investigations, particularly since the extraordinary increase of FDI into the United States in the late 1980s. As Slemrod (1989) has pointed out, that increase may be related in part to the tax changes in the Tax Reform Act of 1986. In any case, the literature on the U.S. situation is relevant to this discussion and provides some lessons on how an empirical treatment of FDI into Mexico should be carried out.

Empirical study of the effect of taxation on the time series of FDI in the United States was pioneered by Hartman (1984). Using annual data from 1965 to 1979, he estimated the response of FDI, both for investment financed by retained earnings and for transfers from abroad, to three variables: the after-tax rate of return realized by foreign investors in the United States, the overall after-tax rate of return on capital in the United States, and the tax rate on U.S. capital owned by foreigners compared with that on U.S. capital owned by U.S. investors. The first two terms are proxies for the prospective return to new FDI, the first term being more appropriate for firms that are considering expanding their current operations and the second being more applicable to the acquisition of existing assets that are; not expected to earn extraordinary returns based on production of differentiated products or on the possession of superior technology. The relative tax term is

designed to capture the possibility that tax changes that apply only to U.S. investors will, by affecting the valuation of assets, alter the foreign investor's cost and therefore the return from acquiring the asset.<sup>1</sup>

Hartman did not attempt to measure either an effective withholding tax rate or the foreign income tax rate applied to the aggregate of foreign direct investment, arguing that the average values of these tax rates are likely to be relatively constant over time. Nor did he attempt to measure the alternative rate of return available abroad to foreign investors.

Hartman's regression results reveal a positive association between both after-tax rate of return variables and the ratio to U.S. gross national product GNP of FDI financed by retained earnings; and they show a negative association between the FDI/GNP ratio and the relative tax rate on foreigners compared with domestic residents. Hartman's model does not explain transfers from abroad or retained earnings, although coefficients of all three

variables have the expected sign and are significantly different from zero. Hartman concluded from this research that the effect of taxes on FDI—both that implied by reinvestment of earnings and that accomplished by explicit transfer of funds—is quite strong.

Boskin and Gale (1986) reestimated Hartman's equation using the updated tax rate and rate of return series from Feldstein and Jun (1986). Although their estimated elasticities of FDI to the rates of return are somewhat lower, none of the point estimates change by more than one standard deviation. They also extended the sample forward to 1984 (and in some cases backward to 1956) and experimented with a variety of alternative explanatory variables and functional forms. They concluded that although the results are somewhat sensitive to sample period and specification, the qualitative conclusions of Hartman are fairly robust.

Young (1988) used revised data on investment, GNP, and rates of return earned by foreigners to estimate similar equations: These changes increase the estimated elasticities with respect to the rate of return realized by foreigners and the relative rate of return. The equations for new transfers of funds estimated using the years 1956-84 yielded poor results, which suggested to Young that the simple Hartman model is inadequate for studying foreign direct investment through new funds when applied to the expanded sample period. Relaxing Hartman's assumption of a unitary income elasticity and including the lagged dependent variable as a right-hand side variable does not substantially alter the conclusions for retained earnings (although the estimated responsiveness is significantly lower), but the tax responsiveness of transfer of new funds is still not supported.

Newlon (1987) reexamined the results of Hartman as well as those of Boskin and Gale. During his attempt at replication, he discovered that the series measuring the rate of return on foreign direct investment, used in all earlier studies, had been miscalculated from the original Bureau of Economic Analysis data for the years 1965 to 1973. The equation that uses the corrected series to explain retained earnings does not fit as well, although the equation explaining transfers fits better. In explaining retained earnings, the estimated coefficients on the return to FDI and the tax ratio are slightly larger in absolute value and remain statistically significant, although the estimated coefficient on the net return in the United States is lower and is no longer statistically significant. For transfers of funds, the estimated coefficient on the return to FDI is much larger and becomes significant, although the estimated coefficient on the net return in the United States becomes smaller and insignificant. When the sample period is extended to range from 1956 to 1984, Newlon's results also differ from those of Hartman and those of Boskin and Gale. In particular, the equation explaining the transfer of funds fits poorly, and no estimated coefficient is significant.<sup>2</sup>

None of these studies has deviated very far from the approach taken by Hartman in 1984. Although Young (1988) refers to Feldstein's (1982) dictum that, in the absence of a perfectly specified model, many alternative models should be investigated, the empirical research has all been on only one track. This is a sufficient reason to explore alternative methodologies. Furthermore, there are several problems with the standard approach that bear further study.

In previous studies, the disincentive to investment caused by the tax system is implicitly measured by an average tax rate, computed as total taxes paid divided by a measure of profits. The incentive to undertake new investment depends, however, on the effective marginal tax rate, which, as is well known, can deviate substantially from an average tax rate concept.

None of the existing studies attempts to estimate the effect of the home country's tax system on FDI in the United States. Of course, collecting the appropriate data is difficult and perhaps, as Hartman argued, these tax rates have not in fact varied a great deal. But the observed stability applies to statutory tax rates and not necessarily to the more appropriate effective marginal tax rates. There is also a theoretical reason to focus attention on the host country tax rate. Hartman (1985) has argued that only the host country's tax system matters for investment coming from subsidiaries' earnings, even when the home country taxes its residents on the basis of worldwide income. This is because the home country's tax reduces equally the parent's return to an investment and the opportunity cost

of making an investment (remitting a dividend to the parent).<sup>3</sup> Thus, for any subsidiary whose desired investment exceeds earnings, the tax due upon repatriation of earnings does matter. This situation is likely to arise for newly formed subsidiaries. In any event, it is important

to investigate the impact of both the home country's rate of taxation and its system of taxing foreign-source income.

The interpretation of the estimated coefficient on the rate of return to FDI variable is also problematic, as stressed by Newlon. This rate of return is defined as the after-tax income from direct investment divided by the stock of direct investment. When the home country has a foreign tax credit with deferral, it is often more advantageous for the subsidiary to finance investment by first using retained earnings, and only when these earnings are exhausted to use funds transferred from the parent firm. This hierarchy of financing implies that, whenever a subsidiary's investment exceeds its retained earnings, its retained earnings will exactly equal its income. Thus, for these firms we would expect a direct association between the calculated rate of return (in which after-tax income is the numerator) on FDI and retained earnings, regardless of whether the average rate of return influences decisions concerning new FDI. As Newlon notes, if subsidiaries were following a fixed dividend pay-out rule (for example, it pays out a fixed fraction of income), a direct association between income and retained earnings would also be observed. This argument may also apply to the subsidiaries of firms residing in countries that employ territorial systems of taxation, thus making problematic any observed empirical association between FDI out of retained earnings and realized rate of return.

Slemrod (in Razin and Slemrod 1991) has tried to remedy some of the empirical problems discussed above. He has extended and updated a Hartman-style model of aggregate FDI in the United States, in part replacing a measure of the average rate of tax by a measure of the marginal effective tax rate on new investment. This analysis is supportive of a negative impact of U.S. effective rates of taxation on total FDI and on new transfers of funds, but not on retained earnings.

### **Unique Problems and Advantages of Studying FDI in Mexico**

Although an analysis of FDI to Mexico poses some difficult problems, it also offers some analytical advantages. Here we review each in turn.

#### **Unique Problems**

Historically, Mexico's policy strategy has been to regulate foreign investment rather than encourage or promote it. Until recently, foreign investment was viewed as a vehicle for the political and economic domination of Mexico and was therefore suspect. The policy toward foreign investment became even more restrictive between 1948 and 1982. First, certain important industries such as telecommunications, electric power, timber, and film distribution were nationalized. Second, foreign investment in most industries was restricted to minority participation subject to prior authorization from the Government of Mexico. The regulatory environment worked to discourage foreign participation, and as a result the net FDI flows averaged less than 1 percent of GDP between 1950 and 1985. A dramatic reversal of these past policies has been taking place in recent years. It began with the initiation of a debt-to-equity conversion scheme (the scheme was later suspended in 1987 and reinstated again in 1990) and the exemption of small to medium levels of investment from prior authorization for majority participation in 1986. In 1987 majority FDI participation in specified sectors was permitted on a case-by-case basis. On May 19, 1989, President Carlos Salinas De Gortari announced a major shift in Mexican policy toward foreign investment: "We are a mature country with the judicial, intellectual and economic capacity to assimilate the largest flow of foreign investment. On behalf of all Mexicans, we will institute new regulations to encourage the types of foreign investment that support our economic policy objectives without compromising our sovereignty and freedom of action" (Press Release, Monterey, N.L.).

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This presidential pronouncement was followed by major changes in the foreign investment regulations. Under the new regulations, majority investment in nonrestricted sectors meeting all of the following six criteria will be eligible to receive automatic approval:

1. The investment is less than 250 billion pesos (about US\$100 million).
2. The capital originates from outside Mexico.
3. The project is located outside the country's three major industrial cities (Mexico City, Monterey, and Guadalajara).
4. The foreign exchange cost is spread evenly over a period of three years.
5. The investment provides permanent jobs and training.
6. The project uses "adequate" technologies that satisfy existing environmental regulations.

The regulations also permit limited access to the Mexican stock market through special trust funds. Temporary access to some sectors normally reserved for Mexicans will be allowed under twenty-year trusts for investment in Mexican companies with high export potential or in financial distress. Thirty-year trust funds will provide access to otherwise restricted geographical zones such as coastal and border areas. New regulations stipulate automatic approval of an application on which the National Foreign Investment Commission fails to reach a decision within forty-five days of the time it was submitted.

Whatever the demand for FDI in Mexico, in most of the postwar years the supply of available opportunities for such investment has clearly been limited by regulations. Thus, it will be important to control for this factor

in the analysis. If demand was always limited by these regulations in a binding way, there would be no interesting story to tell about taxation. But the data on FDI flows suggest that these limitations were not always binding, and that tax influences on demand did play a role in the volume of FDI into Mexico.

The instability of the Mexican economy also poses analytical problems. The high inflation rates (114 percent in 1987) and nominal interest rates (92 percent in 1987) have dramatic consequences for the calculations of the effective tax rate on new investment. The standard assumptions used in their calculation—that current values for inflation, interest rates, tax rates, and tax depreciation rates will persist in the future—are unlikely to be accurate, but reasonable alternative assumptions about expectations are not obvious. This problem suggests that some measure of the average rate of taxation (taxes paid divided by a measure of economic income) may be a more accurate measure of the tax system's disincentives than an analytically constructed marginal tax rate.

### **Unique Advantages**

Most of FDI in Mexico originates in the United States. This fact offers two analytical advantages. First, because the United States independently compiles country-by-country data on outward FDI, it is possible to check the Mexican data on inward FDI from the United States against the U.S. data on outward FDI to Mexico. Second, it facilitates the investigation of the effect of the investing country's tax system on FDI.

### **Taxation of Foreign Investment Income in Mexico**

Mexico taxes nonresidents under the territorial rule and therefore taxes only the income originating from Mexican sources. Mexico is a member of the Latin America Integration Association, whose primary function is to provide

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preferential treatment to member countries in matters of trade and taxation. Mexico has not yet concluded any comprehensive treaty on the avoidance of double taxation or tax sparing with any other country. It has concluded agreements with the United States, Canada, and the Netherlands on the avoidance of the double taxation of income from international shipping and air transport and with France on the prevention and investigation of customs fraud.

Until 1989 the retained earnings of a Mexican subsidiary of a foreign corporation were exempt from taxation, but dividends were taxed upon distribution to a parent. All income of a branch was taxed upon accrual. Thus, from a Mexican tax standpoint, establishing a subsidiary rather than a branch office was a tax-preferred alternative. (Home country tax rules also generally favor the subsidiary form, because tax liability is deferred until earnings are repatriated). As a result of various tax changes introduced in 1989, Mexico eliminated the differential treatment of subsidiary income over branch income. The principal features of the taxation of income earned in Mexico by foreigners as announced in 1989 are summarized in the following paragraphs.

**TAXATION OF CORPORATE INCOME** . The corporate income tax base is now indexed. Taxable profits (defined as gross receipts minus costs, business expenses, dividends corresponding to previous periods of earnings, and net losses carried forward from other periods) are taxed at a rate of 35 percent (a rate of 42 percent prevailed before 1987). Depreciation deductions are indexed, or, as an alternative, the present value of depreciation calculated at a discount rate of 7.5 percent may be deducted fully in all regions except large metropolitan areas and in all sectors except the automobile industry. In metropolitan areas, only 60 percent of such value can be deducted in the first year and the remaining 40 percent subjected to capital consumption allowances.

**ASSETS TAX** . An assets tax at a rate of 2 percent of the average value of total assets of business enterprises and creditable against their income tax liability in Mexico, is levied effective in 1989.

**DIVIDEND INCOME** . Starting in 1989, dividends were no longer deductible by the corporation distributing them nor could they be included in the gross income of the recipient. The withholding tax on dividend distributions varies with the source (whether or not paid from accumulated earnings already taxed—the net tax profit account—or paid from untaxed other sources) and with the tax regime faced by the recipient, as follows:

<i>Recipient</i>	<i>Withholding Tax Rate on Dividends Paid (%)</i>	
	<i>From the net tax profit account</i>	<i>From other sources</i>
Individuals or nonprofit organizations, resident or nonresident in Mexico	10	40
Resident corporations	None	35
Foreign corporations:		
Home tax rate on foreign dividend income at 30 percent or more	None	35
Home tax rate on foreign dividend income at less	10	40

then 30 percent

**INTEREST INCOME AND ROYALTIES** . Beginning in 1991, the withholding tax rate on interest income will be 35 percent and the rate on payments for technical assistance, know-how, the transfer of technology, and fees paid to nonresidents (including royalties for patents when licensed in connection with the rendering of technical assistance) will be 21 percent . Payments for the use of other royalties such as for the licensing of trade marks or trade names, or patents without the rendering of technical assistance, will be taxed at 40 percent.

**GOODS IN BONDED WAREHOUSES** . These goods are subject to a 3 percent tax either on the value on which import duties are assessed or on the declared value, whichever is greater.

**PROFIT SHARING** . All businesses in Mexico are obliged to share 10 percent of their profits with employees.

**SOCIAL SECURITY AND PAYROLL TAXES** . Employers are obliged to contribute to social security coverage for workers (11 percent of workers' weekly wages), children's nurseries (1 percent of wages), and an occupational risk fund (from 5 to 167 percent of wages). In addition, employers contribute 5 percent of wages to the National Housing Fund and 1 percent of wages in support of education.

**VALUE ADDED TAX** . The general 15 percent rate of the value added tax (VAT) is applicable to all transactions concluded in the border and free zones.

**INVESTMENT INCENTIVES** . Effective in 1991, immediate full expensing of the present value of capital consumption allowances calculated using a 7.5 percent discount rate will be available to all investors in nonmetropolitan areas only, regardless of their resident status. Incentives in the form of investments and employment tax credit certificates (CEPROFIS) for priority industries and special regions are available to Mexican residents only. The inbond assembly industries established in border areas may be completely owned and operated by foreigners provided Mexicans are hired to process the imported raw materials using imported equipment and the processed goods are exported back to the country of origin. Table 8–1 compares the taxation of business income in Mexico and the main source countries for foreign investment. It shows that the Mexican tax system is fully competitive with the tax regime in the home

**Table 8–1. Taxation of Business Income, A Comparative Perspective**  
(percent)

<i>Tax regime</i>	<i>Mexico (1991)</i>	<i>United States (1990)</i>	<i>Canada (1990)</i>
Corporate income tax rate: generala	35 + 3.9 = 38.9	34 + 6 = 40	28 + 15 = 43
<i>Withholding tax rates</i>			
Interest	35	30	28
Dividends	040	30	25
Technology transfer fees	21	30	25
Royalties	40	30	25
Indexation of deductions	Full	No	No
Loss carry forward	5	15	7

## Tax Policy in Developing Countries

Loss carry backward	0	3	3
Minimum/alternative Minimum tax	2% assets tax	20% on taxable income inclusive of tax preferences	0.175% on capital in excess of \$10 million creditable against 3% surtax on corporate profits
<i>Capital gains taxation</i>			
Coverage	Full	Full	Two-thirds
Indexation	Full	No	No
Rate	35	34	28
Dividends deduction	No	Yes	Yes
Full expensing of investment	No	No	No
Investment tax credits	Regional and priority sectors	Energy investment, rehabilitation of real estate, targeted job credit	Regional and R&D

a. In Mexico the profit-sharing rate and, in the United States and Canada, the average provincial or state tax rates are added to the basic federal rate.

*Source:* Ugarte (1988), Price Waterhouse (1988, 1989), Mancera Hermanos (1989), International Bureau of Fiscal Documentation (1988), and Gil-Diaz (1989).

countries of foreign investors. Mexico has also moved some distance toward adopting a full cash-flow taxation in a future year.

### Some Theory and the Empirical Model

For the most part, recent investigations have concluded that the demand for FDI is primarily an issue of industrial organization. Dunning (1985: 67) has argued that FDI by firms of country A in country B is more likely if A's firms: (a) possess ownership-specific advantages relative to B's firms in sourcing markets; (b) find it profitable to use these advantages themselves rather than to lease them to B's firms; and (c) find it profitable to use their ownership-specific advantages in B rather than A.

#### Some Theory

A large body of empirical literature has been concerned with testing this theory of international production, usually referred to as the "eclectic" theory. Much of this research has been cross-sectional, relating the extent of foreign investment in a given sector to characteristics of that sector that represent ownership-specific and location-specific comparative advantages. Several examples of this kind of analysis are contained in Dunning (1985).

Studies of the effects of taxation on FDI have generally taken the view that whatever the benefits to firms, they must be balanced against the tax consequences of carrying out FDI. We can hypothesize that the tax systems of both Mexico and the firm's home country affect the incentives to attract FDI and the best way to finance a given pattern of FDI.<sup>4</sup>

Mexico, like all countries of the world, asserts the right to tax the income originating within its borders, including the income generated by multinationals. The effective tax rate on this income depends in a complicated way on the statutory tax rate on corporate income, on the extent of tax credits granted, and on the definition of the tax base, including the system of depreciation and how gross income and deductions are allocated between the Mexican source and the foreign source.

There are two approaches to measuring the effective tax rate on new investment. In the analytical approach pioneered by Hall and Jorgenson, the level of pre-tax return required for a stylized investment is calculated to yield a given return after tax. The wedge between the pre-tax rate of return and the after-tax rate is a measure of the tax-related disincentive to invest. This procedure requires details on the tax code, rate of inflation, economic depreciation rates, the proportion of debt and equity finance, and the costs of debt and equity finance. Thus, the effective tax rate on equity transfers and retained earnings on FDI in Mexico would be different.

The alternative approach is to calculate the ratio of taxes paid in a given year by a measure of income that is independent of the definition of taxable income. This approach may capture some of the features of the tax law that are left out of the analytical approach and also may more accurately capture some features that are present in the analytical models but are inadequately represented by the stylized assumptions that must be made to calculate marginal effective tax rates. As we argued above, because of the extreme volatility of the Mexican inflation rate (from 2 to 132 percent on an annual basis), an average tax rate may be more appropriate.

The multinational's country of residence may also assert the right to tax the income that is generated in Mexico. This is not, however, true of all countries. Some countries, notably France and the Netherlands, operate a territorial system for active (in other words, nonportfolio) income earned abroad. Under a territorial system, the home country levies no tax of its own on the foreign-source income. Under the system of taxation used by the United States, Canada, United Kingdom, and Japan, among other countries, the multinational's home country asserts the right to tax its income regardless of where it is generated. In order to avoid two tiers of taxation, these countries offer their multinationals a limited credit against domestic tax liability for certain taxes paid to foreign governments. The credit is generally limited to what tax liability the foreign-source income would incur if home country tax rules were applied. In most cases, the tax liability (and credit) attendant to subsidiaries' foreign-source income is deferred until dividends are repatriated to the parent company. The foreign-source income of branch operations is not deferred but instead is taxable upon accrual.

Let  $\tau m$  be the effective rate of tax on new investment imposed by the Mexican tax system. For a multinational from a country using the territorial system,  $\tau m$  is also the total tax burden imposed. For a multinational from a country with a worldwide system of taxation, there is another level of taxation to consider, that of the home country. The "old" view of this extra level of taxation is given by  $\max(\alpha(\tau u - \tau m), 0)$  where  $\tau u$  is the tax rate of the home country and  $\alpha$  is a value between zero and one that reflects the benefits of being able to defer the tax liability on subsidiaries' foreign-source income until the earnings are repatriated. In the cases where earnings are never repatriated ( $\alpha$  is equal to zero) or when the firm is in an excess credit position ( $\tau m > \tau u$ ), the home country tax is irrelevant. An opposite extreme case occurs when  $\alpha$  is equal to one, implying that the host country tax liability of the multinational can be fully offset by the home country tax credits. Note that  $\tau u$  is generally closer to a statutory rate concept than an

effective tax rate on investment, since the home country tax base for foreign-source income generally does not take into account such things as accelerated depreciation and investment tax credits that affect the taxable income owing to domestic operations. Note that  $\alpha(\tau u - \tau m)$  can be negative if  $\tau u$  is less than  $\tau m$ . In this case, the tax paid to the host country generates foreign tax credits that may be used to offset the tax that could otherwise be due on repatriations from the low-tax country whose effective tax rate is less than  $\tau u$ .

The "new" view of the total tax burden on FDI, expounded by Hartman(1984), holds that if investment is financed by the retained earnings of the foreign subsidiary, then the home country tax rate is irrelevant, so that the total tax burden remains at  $\tau_m$ . The reasoning is that any taxes due upon repatriation to the home country equally reduce the opportunity cost of investment (a repatriated dividend) and the after-tax return to investment. Thus it is irrelevant for the incentive to invest. Even under the new view, however, the home country tax rate would be relevant for home country multinationals that are contemplating a transfer of funds to a foreign subsidiary. It is difficult, however, to reconcile the simultaneous occurrence of transfers of funds and remittance of dividends from subsidiaries, since these activities incur an avoidable tax liability (see Hines and Hubbard, forthcoming).

Thus, under the "new" view, the total tax burden on FDI financed by retained earnings is  $\tau_m$  but is  $\tau_m + \alpha(t_u - \tau_m)$  for investment financed by the transfer of funds. The old view did not distinguish debt and equity financing, using the latter expression for both cases.

The value of  $\alpha$  will depend on the excess credit or limit position of the potential investor. If the multinational is in an excess credit position (because the average rate of tax paid to foreign governments exceeds  $t_u$ ), then at the margin there is no extra tax due to the home country government upon repatriation. (If the multinational is in an excess limit position where the average rate of foreign taxes paid is less than  $t_u$ , then the repatriation tax may be binding at the margin.) Note that this depends on the average rate of tax paid to *all* foreign governments, not just Mexico. Thus even if  $\tau_m$  is less than  $t_u$ , if the overall foreign tax rate exceeds  $t_u$ , then the Mexican tax rate is the marginal rate ( $\alpha$  is close to zero).

A recent study by Scholes and Wolfson (1989) has suggested that the ownership of a given stock of domestic capital will depend on the relative tax rate paid by alternative owners. Therefore, in the contest for ownership of Mexican capital, foreign owners are likely to be successful the lower is the ratio  $\frac{[\tau_m + \alpha(t_u - \tau_m)]}{\tau_m}$ . (This, of course, only applies if the home country operates a worldwide system of taxation). The surprising implication of this analysis is that, as long as  $\alpha$  is greater than zero and  $t_u$  exceeds  $\tau_m$ , an increase in  $\tau_m$  will *increase* foreign ownership of Mexican capital. The idea is that although an increase in  $\tau_m$  applies fully to potential Mexican owners (or owners from countries with a territorial tax system), its effect on foreign owners is partly offset by credits taken against domestic tax liability. Thus it reduces the relative tax burden on foreign owners from countries with worldwide tax systems. Of course, to the extent that  $\tau_m$  reduces the incentive to undertake investment in Mexico, both domestically and foreign-owned investment will decline. The total impact on FDI thus depends on the relative strength of the Scholes-Wolfson ownership effect and the volume effect. Furthermore, the ownership effect applies only to investment from countries with a world wide tax system and only to the extent that the multinationals are in an excess limitation position, so that additional taxes paid to the Mexican government do in fact generate additional foreign tax credits.

### The Empirical Model

The foregoing discussion suggests that a general empirical model of the impact of taxation on FDI in Mexico has the following form:

$$(8-1) \quad FDI_t = f_t(\tau_m; L(t_u - \tau_m), X)$$

where  $X$  is a vector of nontax factors that affect FDI and  $L$  is an (inverse) index of the excess credit status of the investing countries. The presumption is that the greater the extent of excess credit status, the lower the effect of the home country's tax rate. The subscript on FDI suggests that the impact of taxes may depend on the source of financing.

In order to see the implications of the competing theories of FDI, we specify (8-1) as follows:

$$(8-2a) \quad FDI_T = a_0 + a_1 \tau_m + a_2 (t_u - \tau_m) \\ + a_3 \cdot L \cdot (t_u - \tau_m) + a_4 X + u_T$$

$$(8-2b) \quad FDI_R = b_0 + b_1 \tau_m + b_2 (t_u - \tau_m) \\ + b_3 \cdot L \cdot (t_u - \tau_m) + b_4 X + u_R$$

where a subscript *T* denotes FDI financed by transfers of funds and a subscript *R* denotes FDI financed by retained earnings.

## The Data

Aggregate data on stocks and flows of FDI and other relevant variables for the period 1965-87 have been

assembled from a variety of sources. Details of these sources are given in the appendix to this chapter. A few key variables used in the study are described in the following paragraphs.

**FOREIGN DIRECT INVESTMENT.** Data on FDI flows is derived from the Banco de Mexico's published and unpublished sources for various years. Substantial details on the financial flows of firms with foreign capital are available from these sources, including transfers and reinvested earnings. A breakdown of FDI by economic sector and the country of origin is also available. Alternate but less complete sources of FDI data include the U.S. Commerce Department (U.S. investments only) and the Director General of Foreign Investment, Mexico (new approvals only). Figure 8-1 shows FDI from 1965 to 1987. It indicates that from 1965 to 1977 FDI was slowly but steadily rising. The beginning of the oil boom in the late 1970s led to dramatic increases in FDI, which in 1981 reached a peak of US\$2.8 billion. Later, the end of the oil boom in 1982 coincided with a sharp curtailment of FDI. This trend was reversed again in 1986 and accelerated with the initiation of debt-equity conversion schemes and the exemption of small and medium FDI from government control and approval process. The debt-equity conversion scheme was subsequently suspended in 1987 and a process to relax foreign investment regulations was initiated the same year, and, for the first time, majority foreign participation in key sectors was permitted on a case-by-case basis. This decontrol process was further strengthened by the new foreign investment regulations unveiled in 1989.

Figure 8-2 provides details on net transfers to Mexico during the period 1965 to 1987. These transfers show a fairly flat trend during 1965 to 1977, alternating boom

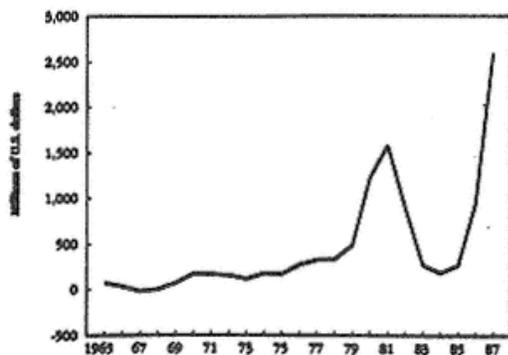


Figure 8-1.  
Foreign Direct Investment in Mexico, 1965-87  
Source, Banco de Mexico (various issues).

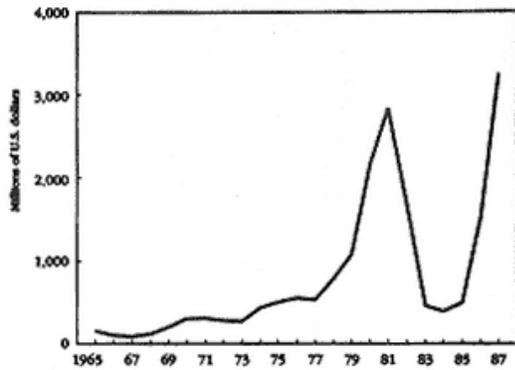


Figure 8-2.  
Transfer of Funds to Mexico, 1965-87  
Source. Banco de Mexico (various issues).

and bust cycles from 1978 to 1982, and a sharply rising trend since 1983. Figure 8-3 graphs retained earnings by multinationals in Mexico during the period 1965 to 1987. These reinvestments rise slightly from 1967 to 1975, decline during 1975 to 1977, and undergo alternating boom and bust cycles in the next decade coinciding with cycles in general economic activity.

**STATUTORY TAX RATES** . Mexican ( $t_m$ ) and the U.S. ( $t_u$ ) statutory tax rates serve as simple but highly useful measures of tax disincentives.

**EFFECTIVE TAX RATES** . Four alternate measures of the tax disincentive to new investment in Mexico—three marginal (one each for aggregate investment, transfers, and retained earnings) and the fourth an average measure—are developed in this chapter. First, a historical

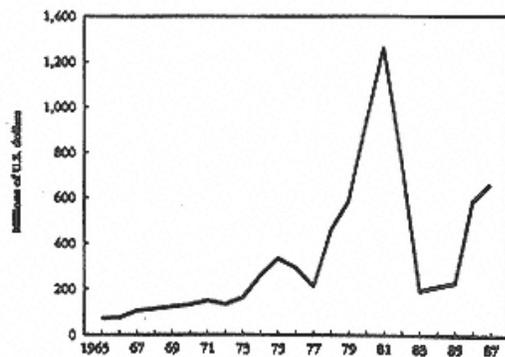


Figure 8-3.  
Retained Earnings of Multinationals, 1965-87  
Source. Banco de Mexico (various issues).

series on the marginal effective tax rate on new aggregate investment in Mexico  $\tau_m$  is developed using the standard Auerbach-Hall-Jorgenson methodology (see the appendix). A comparable series for the United States is obtained from Auerbach and Hines (1988). Then we develop marginal effective tax rate for transfers by calculating the weighted average cost of capital by taking into account such factors as the Mexican and U.S. corporate tax rate, U.S. personal tax rate, U.S. interest rate, U.S. and Mexican inflation rate, and the rate of Mexican pesos depreciation against the dollar (see Auerbach 1990). A third marginal effective tax rate calculation

was done for retained earnings. Finally, an average effective tax rate ( $T$ ) measure based on corporate tax liability per dollar of value added is calculated for both Mexico ( $T_m$ ) and the United States ( $T_u$ ). The choice of this particular formulation of the average effective tax rate was based primarily on the completeness of data series for this measure. Several alternate measures of average effective tax rates are also available. These include the average effective rate on gross profits, revenues, and assets. Although complete data series for these variables are available for the United States, data for Mexico are missing for all years beyond 1981. For this reason, these series were not used in further analyses. The marginal effective tax rate measure is conceptually attractive but, as discussed earlier in the chapter, a highly inflationary environment with financing constraints diminishes its usefulness. Therefore, the average effective tax rate is also explored as an alternate measure of the tax system's disincentive.

**INDEX OF EXCESS FOREIGN TAX CREDIT STATUS OF INVESTING MULTINATIONAL ( $L$ ).** This index is calculated as the ratio of aggregate foreign tax credit claimed to foreign tax credits available to U.S. multinationals investing in Mexico. Because U.S. investment has accounted for about two-thirds of Mexican FDI in the period studied, it is a reasonable indicator of the excess credit status of investing countries in general. The closer this index is to zero, the more likely the typical U.S. multinational is to be in an excess credit position. At the extreme where this value is one, all available foreign tax credits are immediately claimed, which implies that the multinationals are in an excess limitation (deficit of credit) position. A major limitation of this measure is that data were available for only five years; values for the remaining years were interpolated. Longer time-series data are available on an alternate but conceptually less satisfactory measure—the credit status of U.S. multinationals investing worldwide ( $L_w$ ), which includes all U.S. multinationals, whether investing in Mexico or not. Because of the presence of some firms with no Mexican investment in this sample, use of this latter measure in the analyses of reinvested earnings would be subject to caveats.

**COUNTRY CREDIT RATING.** The Business International Corporation (BIC) and the Institutional Investor (II) publish annual credit ratings of various countries (CRS) based on a composite index of political, commercial, and monetary factors (see the appendix for details). To develop consistent time-series data on the credit rating of Mexico, the BIC index for 1965 to 1979 was spliced with the (II) index for 1979–87. The resulting index is a useful measure of the country risk factors.

**INDEX OF REGULATIONS.** Black market exchange rate premiums are used as an index of regulation (REGU) in Mexico. Exchange rate premiums in Mexico correlate well with the past history of regulation and therefore serve as a reasonable proxy of regulatory environment. This is not a fully satisfactory measure of regulations, however, as it may simply be capturing effects of import restrictions.

**EFFECTIVE TARIFF RATE.** Data on import duties and the value of imports from various Mexican government publications are used to calculate these historical series. These data series could be useful in investigating the effects of protective trade barriers on inward investment.

### Empirical Estimation and Results

A wide array of variables are available to implement the empirical models specified in Equations (8–2a) and (8–2b). Choices include alternate measures of tax disincentives such as marginal ( $\tau$ ), average ( $T$ ), or statutory ( $t$ ) tax rates; two alternate measures of multinationals' excess credit status; and a host of nontax factors, including quantitative restrictions, unemployment rates in the host and home countries, and exchange rate and price movements.

Mexican data show a great deal of variability during the period 1977 to 1987 owing to cycles of oil boom and bust. To examine differential behavior during this as opposed to earlier periods in the sample, an intercept dummy variable with a value of one for the oil boom and bust period and zero otherwise was used in various regressions. This variable was found to be insignificant and was therefore dropped from further analysis. Note that the

economic environment associated with oil boom and bust cycles is well captured by credit ratings, and therefore it is possible to isolate tax effects from the effects associated with a general deterioration and amelioration of economic activity. Furthermore, the marginal effective tax rate incorporates the rate of return to FDI and therefore captures the variability of profits over time. The data show that the gross rate of return on investment in Mexico is positively correlated with FDI transfers and retained earnings. The biggest dilemma in model estimation was

presented by the choices available for the tax rate variable. Theory did not provide much guidance in this respect and so variables were selected primarily on the basis of model selection tests. It should be noted that in various formulations of the models, the marginal effective tax variable showed a great deal of consistency as a determinant of transfers and retained earnings. In contrast, the estimated coefficients of the average tax rate and statutory tax rates variables showed a great deal of sensitivity to model specification. This instability of coefficients was partly attributable to a degree of collinearity among a subset of variables. The fact that the coefficient estimates for regressions on retained earnings showed a greater degree of instability than did those for transfers remained unexplained. Thus the conclusions reached in the following sections merely represent our best judgments based on available imperfect data. It is conceivable that a better set of data may or may not support some of the conclusions reached here.

As a first step, the Lagrange multiplier test is used here to screen regressors to be included in model specification. Subsequently, several alternate models are formulated and model selection tests are conducted to select "the best" model.<sup>5</sup> These tests take the form of the residual sum of squares multiplied by a penalty factor. The penalty factor varies directly with the number of estimated parameters. An increase in model complexity would reduce the residual sum of squares (RSS) while raising the penalty. A better model thus would have lower values on most of these tests than an alternate model. Two better regressions based on these criteria are presented in tables 8–2 and 8–3. Only regressions incorporating the aggregate marginal effective tax rate are presented here, as this formulation allows us to test the two alternative views on tax sensitivity of FDI in a simple and transparent manner. Results from regressions incorporating the marginal effective tax rate on transfers and retained earnings are close to this simple formulation.

Table 8–2 presents the estimation results for FDI transfers from 1965–87. FDI transfers to Mexico show a great deal of sensitivity to the Mexican marginal effective tax rate ( $\tau m$ ). The estimated coefficient of  $\tau m$  implies a startlingly high elasticity of 6.25 of FDI transfers with respect to the marginal effective tax rate when evaluated at the mean values over the period, although a more reasonable elasticity of 0.79 when evaluated at 1987 values. As the elasticity of marginal effective tax rate with respect to Mexican statutory tax rate is only 0.2, this translates into FDI elasticities of –1.24 at mean values and –0.16 at 1987 values with respect to changes in Mexican statutory tax rates. The large difference in elasticities brings out how large the change in the order of magnitude of FDI has been in Mexico in recent years; what would have been a very large change in FDI in previous years represents a much smaller change in relative magnitude in recent years. This same fact means that the behavior of FDI in recent years is also critical to the estimation results. As an example, if the equation of table 8–2 is estimated excluding the years 1985 through 1987, the large negative coefficient on  $\tau m$  disappears. This suggests that future research should focus on whether the recent surge in FDI transfers and decline in  $\tau m$  were in fact causally related or coincidental.

The tax differential variable and the composite variable on the credit status of multinationals had signs consistent with a priori expectations, but were not significant. It is, however, interesting to note that the coefficients imply that for the extreme excess limit case ( $L = 1$ ), it is approximately true that the  $\tau u$  but not  $\tau m$ , provides a disincentive to investment; in general, though, both home and host country tax rates mattered. The estimated coefficient of the tax differential variable suggests that Mexican tax differentials over the U.S. statutory rates did not matter much for FDI transfers to Mexico. Furthermore, the excess credit position of the multinationals had a small and insignificant effect on FDI transfers to Mexico. Empirical results further suggest that the regulatory environment in Mexico discourages foreign investment but that protective trade barriers had a positive effect on

FDI. In general, the specified equation fitted the data well, explaining 89 percent of the variation in FDI.

Equation (8–2b) (see table 8–3) indicates that reinvested earnings are quite sensitive to the Mexican marginal effective tax rate, Mexican–U.S. tax differentials, the credit position of the multinationals, and Mexico's credit ratings and regulations. Protective trade barriers, in contrast, did not play a significant role in the reinvestment decisions of multinationals. Reinvested earnings showed negative but elastic responses to changes in the Mexican marginal effective tax rate (elasticity of  $-1.5$  at 1987 values with respect to marginal effective tax rate, but only  $-0.56$  with respect to the Mexican

**Table 8–2. Regression Explaining FDI Transfers to Mexico, 1965–87**

<i>Independent variable</i>	<i>Coefficient</i>	<i>t–statistic</i>
$\tau m$	–6766.7	–2.4
$tu - \tau m$	–3994.5	–0.8
$L (tu - \tau m$	–3012.1	–0.6
CRM	34.6	3.8
REGU	–394.6	–1.6
MDM	2507.9	1.1
CONSTANT	2341.1	1.7

*Note:* Based on equation 9–2a. Dependent variable: FDIT.

$R^2 = 0.89 = 0.89$ ; log of the Likelihood function =  $-157.7$ .

**Table 8–3. Regression Explaining Reinvested Profits in Mexico, 1965–87**

<i>Independent variable</i>	<i>Coefficient</i>	<i>t–statistic</i>
$\tau m$	–2593.7	–2.9
$tu - \tau m$	–6687.5	–2.7
$L \cdot (tu - \tau m$	5166.0	2.5
CRM	17.1	3.0
REGU	–340.0	–1.9
MDM	–1573.9	–0.9
CONSTANT	3415.6	5.1

*Note:* Based on equation (9–2b). Dependent variable: FDI  $R$ .

$\bar{R} = 0.69 = 0.69$ ; log of Likelihood function =  
-146.9.

statutory tax rate) and Mexican–U.S. tax differences (elasticity of –2.8 at 1987 values). A change in the credit status of multinationals toward excess limit positively influenced their decisions to reinvest rather than to repatriate their earnings. This influence is estimated to be quite strong (elasticity of 1.9 at 1987 values). These results are qualitatively robust even if the 1985–87 period is eliminated.

The results are by and large consistent with the "old" view regarding the tax sensitivity of FDI and suggest that both the host and home tax regimes matter for FDI in Mexico. As attested by the difficulty in accurately measuring effective tax rates and the sensitivity of the results to alternate forms of the tax rate variables, however, these results concerning tax sensitivity must be interpreted with caution. In addition to taxation, the regulatory framework and the economic and political climate in the country appear to be dominant influences on FDI transfers and reinvestments in Mexico.

### Policy Implications

FDI in Mexico appears to show a great deal of sensitivity to the Mexican tax regime. If this conclusion stands up in further investigations, it implies that Mexico must aim for tax rates closer to, but neither higher nor lower than, the U.S. rates. Higher rates would provide tax–induced disincentives for investment. Lower rates would allow a transfer of revenue from Mexico to the U.S. Treasury through the operation of U.S. foreign tax–credit provisions. But note that the U.S. Tax Reform Act of 1986 has pushed more U.S. multinationals into excess credit status, thus increasing the likely disincentive effects of Mexican taxation of FDI and reducing the possibility that reductions in Mexican tax will simply transfer revenues to the United States. This implies that, for U.S. multinationals that operate globally, a tax rate below that of the United States may be appropriate (see Slemrod 1991).

Mexico has already implemented tax reforms that make the tax regime there competitive with the regimes of the United States and Canada. Furthermore, effective taxation of reinvestments in Mexico is lower than that of repatriations, which provides incentives for retained earnings. However, the new 2 percent assets tax may, because of its partial noncredibility against U.S. tax liability, cause concern to a potential investor. This tax could be replaced by an alternative minimum tax with an adjusted base that would include tax preferences as part of taxable income. Such a tax could achieve the same functions as the 2 percent assets tax but would be fully creditable against U.S. tax liabilities. Because with the tax changes introduced in 1989 the Mexican tax system does not provide any special disincentives for foreign investment, perhaps public policy attention should be focused on accelerating the process of deregulation of FDI that has already been initiated in Mexico.

### Appendix: The Data

VARIOUS SERIES ON FOREIGN DIRECT INVESTMENT . These data are obtained from Banco de Mexico, Subdireccion de Investigacion Economica.

Index of excess credit status ( $L$ ). These data are obtained from the U.S. Commerce Department. The index is calculated as follows:

$$L = \frac{A}{B + C - D + E}$$

where A = foreign tax credit claimed, B = foreign taxes paid or accrued, C = foreign taxes deemed paid, D = deductions for certain foreign taxes, and E = taxes carried over.

MARGINAL EFFECTIVE TAX RATES . The following formulation developed by Auerbach (1990) is used in the calculation of marginal effective tax rates.

$$\tau = \frac{\left[ \frac{(r+\delta)(1-\Gamma)}{(1-t)-\delta} \right] - s}{\frac{(r+\delta)(1-\Gamma)}{(1-t)-\delta}}$$

where  $\tau$  = effective corporate tax rate,  $r$  = weighted average cost of capital,  $\delta$  = capital depreciation rate (assumed value),  $\Gamma$  = present value of investment credits and depreciation deductions (based on a sample of twenty-three firms reported in Schwartzman 1987),  $t$  = corporate tax rate (Mexico), and  $s$  = rate of return to supplier of funds (calculated on the basis of data from the International Monetary Fund, *International Finance Statistics*, various issues). *Marginal effective tax*

rate for transfers ( $\tau t$ ) utilizes the following expression for the weighted average cost of capital ( $r$ ).

$$r = b \frac{[t_u(1-t_u^p) - (\pi_u - \pi_m - XRRC)]}{1-t_{\max}} + (1-b) \left[ \frac{\mu}{1-\phi} \right] \left[ 1 - \frac{t_{\min}}{1-t_u} \right]$$

where  $b$  = fraction financed by debt,  $\mu$  = real discount rate for equity, and  $t_m$  = Mexico corporate tax rate.

$t_u^p$  = U.S. personal tax rate  
 $t_u$  = U.S. nominal interest rate  
 $\pi_u$  = U.S. inflation rate  
 $\pi_m$  = Mexico inflation rate

XRRC = rate of Mexican pesos depreciation against the dollar

$t_{\max}$  = higher of U.S. personal income tax rate and the Mexican withholding tax on interest payments

$t_{\min}$  = smaller of Mexican and U.S. corporate tax rates

$\phi$  = effective tax rate on real equity return

For retained earnings:  $r = \frac{\mu}{1-\phi}$  is utilized in the effective tax rate formula.

REGULATIONS . Exchange rate premiums are used as a proxy for regulation (REGU). They are defined as

$$REGU = \frac{XRM - XRN}{XRN}$$

where XRM = the market exchange rate and XRN = the official exchange rate. For unemployment rates. U.S. data are from *the Economic Report of the President to the Congress* (various issues), whereas the Mexican data are from INEGI unpublished statistics on the unemployment rate in Mexico City.

COUNTRY CREDIT RATINGS. Country credit ratings is a composite index of the following factors:

*Political Factors*

Political stability

Nationalization problems

Restrict capital movements

Desire foreign investment

Limits: foreign equity

Limits: foreign expansion

Government interventions

Internal disorders

Red tape: delays

Cultural interaction

*Commercial Factors*

GDP market size history

Real GDP growth history

Real GDP growth forecast

Income per capita

Trade restrictions

Capital availability

Labor availability

Corporate tax level

Infrastructure quality

*Monetary Ratings*

Inflation history

Inflation forecast

Devaluations past ten years

Percent devaluation

Currency forecast

External debt forecast

Policy Implications

Import coverage history

Import coverage forecast

Convertibility forecast

## Notes

1. Hartman argues that the variable measuring the rate of return to domestic capital, because it is based on replacement costs, will not capture these valuation effects.

2. Newlon also estimates variants of Hartman's original model with several additional variables, including a quadratic time trend and dummy variables for the years in which data revisions were made and with a definition of the return to direct investment that includes the fees and royalties that accrue to the parent from its foreign subsidiary. Most of these changes do not alter the qualitative results reported earlier.

3. If, however, the home country's tax system is expected to change, then there is an incentive to time repatriations appropriately.

4. On the credibility of the tax regime for FDI, see Bond and Samuelson (1989).

5. Formulas for model selection tests are

Akaike information criterion (AIC):  $\frac{RSS}{(N-k)}$ ;

Schwarz criterion (SC):  $\left(\frac{RSS}{N}\right)N^{\frac{k}{N}}$ ;

Akaike finite prediction error (FPE):  $\left(\frac{RSS}{N}\right)\frac{(N+K)}{(N-k)}$ ;

Hannan and Quinn criterion (HQ):  $\left(\frac{RSS}{N}\right)(\ln N)^{\frac{2k}{N}}$ ;

Shibata criterion (SHIBATA):  $\left(\frac{RSS}{N}\right)\frac{(N+2k)}{N}$ ;

Craven and Wabba Generalized Cross Validation method

$$(GCV): \left(\frac{RSS}{N}\right) \left[1 - \frac{k}{N}\right]^{-2}; \text{ and}$$

$$\text{Rice criterion: } \left(\frac{RSS}{N}\right) \left[1 - \left(\frac{2k}{N}\right)\right]^{-1}.$$

RSS = residual sum of squares, N = Number of observations, and k = number of estimated parameters. See Ramanathan (1986) and Judge and others (1985: 24263, 85491).

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## **PART IV— TAXATION OF AGRICULTURE LAND AND FINANCIAL INSTITUTIONS**

### **9— Prospects for Agricultural Land Taxation in Developing Countries**

Jonathan Skinner

Many developing countries use export taxes, marketing boards, and overvalued domestic currencies to raise revenue from the agricultural sector. For example, the rates of effective discrimination against exported products during 1980–84 were 50 percent for wheat in Argentina, 34 percent for rice in Thailand, and 36 percent for cotton in Egypt (Krueger and others 1988). Although these policies are highly inefficient, they do provide a substantial amount of government revenue. In 1977 agriculture accounted for 15 percent of GDP in Argentina, but 40 percent of the total taxes collected (Trapido 1988). Despite the demonstrated benefits of easing these distortions, most countries facing financial pressures are unwilling to forgo the tax revenue.

One solution to this problem might appear to be a tax on agricultural land. Such a tax does not distort farm produce prices, yet it can raise significant revenue. In the eighteenth century, India's land tax drew in more than two-thirds of all government revenue; by the first part of the twentieth century, it was still raising more than one-third (Bird 1974: 35). Similarly, farmers in Japan during the Meiji period in the latter part of the nineteenth

century experienced productivity growth while laboring under a heavy land tax. Progressive land taxes, in which rates rise with total landholdings, can in theory ensure that wealthier farmers with extensive landholdings will bear most of the tax burden. Given the great potential for both an efficient *and* equitable land tax, should central governments facing budgetary pressures and agricultural distortions not be encouraged to adopt one?

The presumed theoretical superiority of land taxation over other forms of taxation has been discussed in recent papers by Hoff (1991) and Skinner (1991). This chapter provides a broader perspective on the prospects for agricultural land taxation by examining the historical record, the theoretical literature, and recent experiences with land taxation in Bangladesh, Argentina, and Uruguay.

The historical evidence suggests that countries have turned away from land taxation at the first opportunity. Except in Chile and Uruguay, few central governments now rely on land taxation for more than 3 or 4 percent of total revenue. The theoretical supremacy of land taxation over other types of taxes has been challenged in recent years. Although land taxation does not distort prices faced by farmers, neither does it pool income risk; the farmer must pay the fixed assessment in bad harvests as well as good harvests. In contrast, export or commodity taxes cushion the variance of income since taxes are lower in years when crop yield or market prices are low. To the extent that farmers face incomplete credit markets and the government can better pool risk, the land tax may be less efficient than the export or commodity tax (Hoff 1991).

The administrative costs of collecting the tax are often ignored in theoretical studies of land taxation. But administrative costs are a drain on the economy just as are traditionally measured efficiency costs. A perfectly nondistortionary land tax that is costly to administer can cause a larger welfare cost to society than an "inefficient" tax that is inexpensive to administer (Skinner 1991).

Proponents have emphasized that the land tax not only raises revenue, but also encourages socially beneficial economic behavior. This chapter examines its effectiveness in encouraging farmers to increase productivity and in reducing the incentive to speculate in "unproductive" land, in promoting land reform by placing a greater tax burden on larger farms, and in encouraging environmentally beneficial uses of land. There is little evidence that the land tax is effective at these goals.

The value of a land tax in promoting development is ultimately an empirical question. This chapter examines agricultural land taxation in Bangladesh, Argentina, and Uruguay. The three countries differ in both the type of tax scheme used and the environment in which it is used. Bangladesh is a poor country with very small plot sizes, but with extensive cadastral mapping and a centuries-old tradition of land taxation. Argentina has great (relative) wealth, very large farms, and little experience or success with the land tax at the federal level. Argentina has lost money with its federal land tax. Despite roughly US\$6 million invested in its proposed land tax, not a single austral has yet been collected. Uruguay, in contrast, is one of the few countries that has enjoyed some success with land taxation.

The chapter discusses the feasibility of replacing revenue from export, income, or commodity taxes with land taxation. Although agricultural land taxation shows considerable potential for collecting revenue for the local government, it is unlikely to be a significant source of revenue for the central government.

### **Historical Patterns of Land Tax Use**

Agricultural land taxation has a long history matched only by the resentment of the farmers who have paid it. Most governments have shifted tax instruments to less contentious sources of revenue, such as indirect taxes on domestic and international trade, at the earliest opportunity.<sup>1</sup>

Figure 9–1 shows the general trend of agricultural land taxation, expressed as a percentage of central government revenues, for selected countries.<sup>2</sup> The sharpest declines in the role of land taxation can be seen in Nepal (where the land tax accounted for 55 percent of central government revenue following World War II), Egypt, and India, with similar patterns for Pakistan and Bangladesh. Other countries not depicted in figure 9–1 have had little more success in raising land tax revenue, and it is rare when more than 3 or 4 percent of total revenue is raised through such taxes.

It is useful to consider in more detail the history of the tax in India, Pakistan, and Bangladesh, if only because at one time authorities in the region relied almost exclusively on land tax revenue. The British

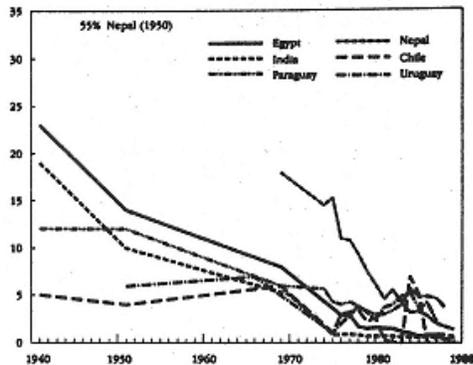


Figure 9–1.  
Land Tax Revenue as a Percentage of  
Total Tax Revenue in Six Countries, 1940–88

Note: Land taxes are defined as property taxes less corporate property taxes on financial and capital transactions. This classification includes urban taxes.

Source: Pre–1970 data, Bird (1974) pp. 3435. Post–1970 data, IMF (1984, 1989).

adopted the traditional Indian land tax, but modified it to assess the Ricardian rent or profit from the land. They established zamindars (tax farmers) to collect the revenue from individual tenants. The taxes were often oppressive, reaching in some areas a levy of more than half the net produce. Over time, the government assessment remained constant in nominal terms but the zamindars' rents kept pace with inflation, making them de facto landlords who retained an ever-increasing fraction of rent. In 1900, the demand for government revenue was Rs 39 million, but zamindars collected Rs 165 million (Hossain and others 1985).

The decline of the land tax in India during the twentieth century has continued a trend begun in the nineteenth century; land tax revenue as a fraction of total revenue fell from 69 percent in 1793–94 and 36 percent in 1891–92 to 16 percent in 1938–39 (Bird 1974: 133) and currently is less than 1 percent. Local land tax revenues for Indian states also declined from 13 percent of total state tax revenue in 1951–52 to only 2 percent in 1978–79 (Titus 1984: 5354).

Other economies have had similar experiences with land tax revenue. The agricultural land tax in Taiwan fell from 2.7 percent of central government revenue in 1975 to 0.3 percent in 1984 (Riew 1987). The land tax in Turkey was hobbled by lagging tax assessments in the middle part of the twentieth century so that the market value of land increased fiftyfold between 1936 and 1960, but land tax revenue rose less than threefold (Bird 1974: 68). Indonesia has recently been improving its assessment and collection methods, but the effective rate on land value is only 0.1 percent. Although Chile and Uruguay have enjoyed some success with a federally administered land tax, these countries are excep-

tions to the overall trend. And even Chile has turned over its land tax revenue to local governments.

Some part of the land tax decline depicted in figure 9–1 could be due to factors other than a lessening role of land taxation. If the share of agricultural GDP is declining over time (as one might expect in a developing economy), then a fall in the share of land taxes to total taxes should be expected. But the ratio falls even after adjusting for the decline in the share of agricultural production. The fact that land tax revenue is so small as a fraction of total revenue illustrates a somewhat different point: a doubling or tripling of land tax rates would have little impact on central tax revenue. To expect land tax revenue to ever account for a significant fraction of total central revenue would require a radical restructuring of current land tax systems.

### Theoretical Aspects of Land Taxation

Nearly all taxes cause a loss in efficiency. For example, export taxes provide both revenue to the government as well as lower prices to domestic consumers, but at a cost of discouraged production, attenuated foreign exchange earnings, and domestic overconsumption of the product. The income tax also raises revenue, but at a cost of reduced labor supply and a decline in the incentive to save and invest. The question that needs to be reexamined, then, is whether land taxation is more or less efficient than alternative tax instruments.

Income taxes are often used in developed countries because they are capable of raising large sums of money in an equitable way. But a genuine agricultural income tax is difficult to administer in developing countries because their farm records are not too reliable. Presumptive income taxes based on an objective measure of farm output is often land quality, the presumptive income tax becomes a de facto land tax (Bird 1974). The most commonly used means of taxing farmers has been to implicitly or explicitly tax marketed commodities or exports. For this reason, the theoretical section below compares land taxation with traditional export taxation.

The effect of an export tax on domestic production and consumption of the agricultural good is shown in figure 92. Suppose that the world price of the commodity is fixed, so the country enjoys no monopoly power in world markets. In the absence of the tax, the price faced by producers is  $P_0$ , and the quantity produced is  $Q_0$ . The domestic demand curve, including both rural and urban consumers, is given by  $DD'$ , and the quantity demanded is  $Q_1$ , so exports are  $Q_0 - Q_1$ . Suppose an export tax is imposed. Because the world price remains fixed, the domestic price will decline by the full amount of the tax  $t$ . Suppliers will reduce output to  $Q_2$ , and exports will shrink to  $Q_2 - Q_3$ . The gain to

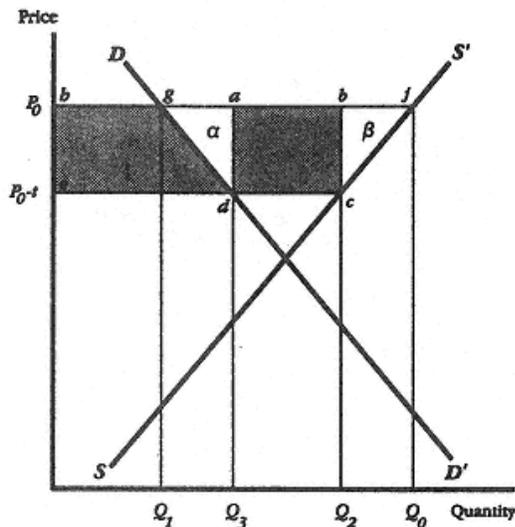


Figure 9–2.

### Economic Effects of an Export Tax

the government is shown by the shaded area  $abcd$ , and the gain to domestic consumers (through lower prices) is the shaded area  $edgh$ . The loss to producers is the entire area  $bjce$ . The difference between the loss to producers and the gain to society is the area of the two triangles labeled  $\alpha$  and  $\beta$ . The triangle  $\beta$  is the traditional efficiency cost to producers; the price they face is below the world price and as a consequence they produce less. By producing less, farmers are worse off and the government loses revenue on the forgone output. In the case of  $\alpha$ , the efficiency cost is caused by the subsidization of the commodity for domestic consumption. Individuals value the good (at the margin) at  $P_0 - t$ , but in world markets the good could be sold for  $P_0$ , so the marginal inefficiency is just  $t$ .

In contrast, a land tax assessed on the site value of the land, or its intrinsic economic value excluding improvements, causes no distortion at all. Farmers produce at  $Q_0$ , domestic demand is equal to  $Q_1$ , and exports rise back to  $Q_0 - Q_1$ . The excess burden triangles  $\alpha$  and  $\beta$  are avoided, and an increase in efficiency (and foreign currency) is gained. It is on this basis that the land tax enjoys its distinguished theoretical pedigree dating back to Henry George and David Ricardo.

Some proponents of the land tax claim that the land tax will cause a rightward shift in the supply curve as the landowners, burdened with cash tax payments, are forced to use their land more efficiently. A shift of the supply curve to the right would increase the nation's output and spur exports further.

Replacing an export tax with a land tax affects more than farmers' incentives. As shown in figure 9–2, export taxes depress domestic as well as export prices of agricultural commodities. Export taxes are an efficient

means of transferring income from the rural to the urban sector (see Trapido 1988). Note that the revenue actually raised by the export tax,  $abcd$ , is only a small fraction of the total burden placed on farmers,  $hjce$ . Replacing an export tax with a land tax will benefit farmers by more than just the efficiency cost triangle  $\beta$ . The implications of this analysis are that despite the efficiency gains associated with the introduction of a land tax, urban consumers of the tradable good will be worse off as a consequence of its increased domestic price. To this point, the analysis has assumed perfect certainty. The next section examines differences in the two types of taxes when farm income is uncertain.

### The Land Tax and Uncertainty

Suppose that farmers face uncertainty in the yield of the commodity. Then, as Hoff (1991) has carefully shown, the land tax may yield the farmer fewer benefits than an export tax because the land tax introduces greater uncertainty in net income. To simplify the model, assume that the farmer sells all the crop for export and owns land outright. Two taxes will affect the farmer's profits, a proportional commodity tax  $\tau$ , and a fixed land tax  $T$ . Depending on the soil quality and acreage, net profits can be written

$$\pi = p[1 - \tau]\theta(p[1 - \tau], \varepsilon) - C - T$$

where  $p$  is the world price of the commodity,  $C$  is the cost of the inputs (such as wages, seed, and fertilizer), and output depends on the net price of the commodity  $p[1 - \tau]$  and a random element  $\varepsilon$  such as rainfall. Profits  $\pi$  are uncertain because output  $\theta$  is uncertain, although costs  $C$  and the land tax  $T$  are certain. Note that the choices of inputs have been solved for implicitly in this formulation. By the standard arguments, a higher net price  $p[1 - \tau]$  will raise expected output  $E(\theta)$ , expected profits  $E(\pi)$ , and (certain) costs  $C$ .

Suppose that the utility of the farmer depends positively on average profits but negatively on the variance of profits  $U = U(E(\pi), \sigma^2)$  where  $\sigma^2 = p^2[1 - \tau]^2 \text{Var}(\theta)$  is the net-of-tax variance. It is then possible that an

export tax could be preferred to a land tax. Consider an extreme case of a farmer with a perfectly inelastic supply curve; output  $\theta$  is independent of the net price  $p_n$ . Then shifting from an export tax to an equal revenue land tax will not affect average net profits, since average gross profits remain unchanged, as does the government's revenue. But the variance of net income will rise under the land tax, leaving the farmer worse off.

Although farmers do not have completely inelastic supply curves, the example above suggests that the theoretical supremacy of the land tax is in doubt when the government is better able to pool risk than farmers are. Furthermore, the additional risk of the land tax is likely to have a greater impact on subsistence farmers than on large, well-diversified corporate farmers. If governments have better access to credit markets than farmers, the export tax can at least partly fill a risk-pooling function (see Newbery and Stiglitz 1981).

The empirical importance of risk pooling through taxation in developing countries is not well established. But for a number of reasons, land taxes may still dominate export taxes even in a model of uncertainty. First, numerical calculations suggest that the degree of output uncertainty must be high for even risk-averse farmers to prefer export taxes over land taxes (Skinner 1991).<sup>4</sup> Second, Deaton (1990) has argued persuasively that in a more realistic model, farmers are able to partly insure against bad harvests by precautionary saving. And Hoff (1991) has shown that combining land taxation and commodity taxation dominates either tax in isolation. Evidence from Uruguay suggests that *both* a land tax and a variable export tax are used in tandem, with appropriate adjustments in each when world beef prices are low (Jarvis and Medero 1988).

### The Land Tax and Administrative Capability

A more serious problem with land taxation is its administration. For most land tax systems, information on the quality, the market value, area, and owner(s) must be determined before the tax can be paid. Owners are understandably reticent about reporting the true value of their land or revealing what land they own, so land tax administration must be sufficiently vigorous to prevent either a secular decline in tax revenue as inflation erodes outdated assessment or grossly unequal tax liabilities among similar landowners.

A simple model developed by Skinner (1991) illustrates why administrative costs are so important in assessing the land tax. Suppose there are two export oriented farmers with equal acreage, but farmer A owns productive land and farmer B owns average land. Assume they are equally productive as farmers, so A's output will always exceed B's output for any net-of-tax output price. Therefore the export tax revenue collected from A will always exceed that collected from B. With export taxes difficult to evade, farmer A will always reveal himself as a more productive farmer, and hence pay more in taxes, than farmer B.

Under a land tax, farmer A with productive land is supposed to pay  $T_A$ , whereas farmer B with the average land is assessed  $T_B$ . Now farmer A has a strong incentive to produce a larger output, but to misrepresent himself to the tax authorities as an average farmer, thereby saving  $T_A - T_B$  in tax liability. The cost of collecting an equitable tax is that the government must spend real resources to prevent the productive farmer from misrepresenting himself as owning average land (or from

neglecting to pay the tax at all). Because the resource cost of administering the tax does not generally provide a directly productive service, it is an efficiency cost—the inevitable social cost of transferring resources from the taxpayer to the government. Hence the land tax may be less efficient than the export tax once the administrative costs are factored in.<sup>5</sup>

No one wants to pay taxes, so what is so different about enforcing a land tax as opposed to an export tax? An export tax is often easier to administer because of the small number of shipping centers or airports. Smuggling can be punished by strict penalties and fines because it is quite obvious whether an individual is evading export duties. In contrast, there is no "true" value of land, and reasonable people may differ over its value or inherent

productivity, particularly when agricultural land markets are thin, or when inflation is rampant. Assessing large penalties on taxpayers who incorrectly report low market land values, or low levels of land quality, could be viewed as confiscatory and patently unfair. To ensure compliance, tax administrators must evaluate nearly every plot of land. But even plot-by-plot surveying can lead to massive appeals by landowners, given the minimal penalties from under-assessment and the large potential gains. Strasma and others (1987) suggest that a 5 percent appeals rate can in effect shut down most land tax administration systems.

If administering the land tax is so difficult, why was it widely favored in the nineteenth century? One reason is that the growth in trade and manufacturing since that time has given rise to alternatives such as income or trade taxes that are easier to administer and are capable of raising large sums of money. And second, a greater concern about horizontal and vertical equity in tax collection may have prompted authorities to rely less on land taxes. The problem with the land tax is not so much its ability to collect revenue—the rates can be tripled, if necessary—but its ability to collect revenue in an equitable way.

Up to this point, I have assumed that the land tax is a pure site-value tax on the implicit value of the land, excluding all improvements. But as all tax administrators learn, one must give up "the quest for the Holy Grail of the 'true' value of land; there is no such thing" (Bird 1974: 238). In practice, tax authorities typically choose one of three methods to assess the tax: (a) an in rem tax based on land area, (b) a tax based on net income or market value, and (c) a tax that relies on objective measures of soil quality, distance from market, and other factors to proxy for presumptive income or productivity.

**A PROPERTY TAX BASED ON LAND AREA .** A tax based solely on land area is the easiest to administer. There is no need to assess land quality, so the cadastral requirements are minimal and tax authorities need not establish detailed ownership records. If cadastral records are incomplete and rates are low, farmers often choose to pay the land tax to assist in ownership or title disputes.

The disadvantage of the tax based on land area is that the tax burden as a fraction of land value is largest on the least productive land and is lowest on the most productive land. If poorer farmers own the less productive land, then the property tax is regressive. In contrast, the export or commodity tax tends to be progressive to the extent that poorer farmers consume more of their own output. Furthermore, the revenue potential of such a tax is limited by the maximum acceptable burden on the least productive land. The tax must, by necessity, remain a limited method for raising central government revenue.

**A TAX BASED ON NET INCOME OR MARKET VALUE .** This kind of tax is closest in spirit to the theoretical Ricardian tax on net land profits, which, as noted above, causes no tax distortion. Since few tax assessment procedures can distinguish between the Ricardian site value of the land and its market value (inclusive of improvements), the net income or market value tax is usually imposed on capital improvements. Hence such a tax will entail some distortion by discouraging capital improvements and may be partly shifted to owners of capital.<sup>6</sup> I ignore these efficiency considerations here and focus instead on the administrative difficulties of assigning tax liabilities based on either net income or on the market value of land.

In theory, market value is simply the present value of net income from the land, so the two measures should differ only by a factor of proportionality.<sup>7</sup> But in practice, the market value of farmland may be higher than the present value of the current net income because of speculative or income-sheltering reasons (Strasma and others 1987). Whichever method is used, assessing either market value or net income can be quite difficult.

One approach to taxing land on the basis of wealth or net income is to allow self-assessment. Such a technique rarely yields much revenue, since all farmers will have an incentive to understate the value of their land. Furthermore, the assessments will rarely be upgraded, so that inflation will further erode already low declared market values. As one official commented on the selfassessment program in Columbia, "property owners' statements were—and are—highly undependable. Their memories are notoriously bad, both as to what they own

and how much of it they own. And their modesty with respect to the value—for tax purposes—of their own property is simply incredible."<sup>8</sup>

The problem with self-assessment is that there is currently little or no penalty for "modesty." One proposal to enforce self-assessment is to allow the govern-

ment, or private individuals, to bid on the disputed land; the taxpayer has the choice of either selling the land for the bid price, or paying the tax on the bid price (see Strasma and others 1987). In equilibrium, all taxpayers should be motivated to report the market value of their land truthfully. The disadvantage of such a technique is the potential for abuse or extortion (Bird 1974). For example, larger farmers can either buy out smaller farmers or force them to pay higher land taxes by increasing their bid prices. This might create particular problems for smallholders who value their land well above the market price. A different problem would arise for larger farms with multiple plots. One particular plot may provide river or road access to the other plots, so its value to the particular farmer is above the market value, once again leading to potential extortion. Such an assessment system, while ensuring generally honest disclosure of property values, can also become a means of actual (or threatened) economic warfare among landowning individuals.

The other option to enforce market value taxation is to hire tax officials to assess each plot of land, first using a cadastral survey and later using periodic reassessments. This method has two shortcomings. The first is the often substantial costs—before any revenue is collected—of cadastral surveys; in Brazil, the average cost per parcel may be as high as US\$220, or about US\$7 per hectare (in 1985 U.S. dollars; Strasma and others 1987). Official estimates of the extra cost of a five-year cadastral revision cycle in Bangladesh suggest that the cost of the survey would probably exceed the additional revenue collected (Skinner 1987).

The second shortcoming is that tax revenue is particularly vulnerable to inflation. If the inflation rate is 25 percent, the tax assessment after five years will be only 41 percent of the real value. In late 1986 the tax assessment for some plots of land in Bangladesh was fixed at their 1922 nominal rate! In theory, it should be straightforward to index the tax rate to inflation to avoid the problem entirely. But in practice, few tax authorities make use of indexing for land taxation. Perhaps tax authorities are loath to use indexing because inflation often reflects real shocks, such as oil price increases, as well as general price level changes.

**LAND TAX BASED ON OBJECTIVE MEASURES** . The third approach eschews farm records or market valuation and relies on objective features of the land, such as distance from the market, soil quality, irrigation facilities, and so forth. This approach provides a crude measure of the potential income arising from the land. It is not a pure site-value tax, because improvements in irrigation, for instance, increase tax assessment.

In many respects, this kind of tax holds the greatest promise for future tax revenue. There is no need to rely on market assessments, and the tax can be updated for inflation by simply adjusting the tax rate on the (constant) quality index of the land. Furthermore, this tax can distinguish between as many or as few types of land as can be handled by tax administrators. For example, one could assess the land tax only on the basis of the distance from the market, or on objective measures of soil quality.

These objective measures can still be open to dispute, since measured soil quality may depend on where in the plot the measurement is taken. Furthermore, no account can be taken of individual differences in presumptive net income across plots without running into the subjective nature of "true" land quality (see Bird 1974: 23436). To the extent that the government is concerned with horizontal equity—that landowners with equal net income should pay equal tax—such crude measures of land quality may imperfectly tax true net income. Such differences in assessments across land value would be most pronounced at higher tax rates. Still, the administrative prospects for such objective grading of land are brighter than market-based measures where developing countries are concerned.

### Nonrevenue Objectives for the Land Tax

Land taxation has often been viewed as an efficient and equitable means to encourage a number of development objectives. This section considers the historical effectiveness of land taxation in promoting such goals and recent proposals for using land taxes to encourage environmentally sound land use.

One nonrevenue goal of the land tax proposed during the 1950s and 1960s was to shift resources from agriculture to industry to launch the "takeoff" phase of industrial development (Bird 1974: 67). The historical model for this view of land taxation and development was Meiji Japan during the latter half of the nineteenth century, when a heavy agricultural land tax was used to finance (military) industrial expenditures (Bird 1974: 11222). Few development economies currently support the view that agricultural income transferred to the industrial sector would ensure an industrial "takeoff."

A second nonrevenue objective is to encourage productive efficiency. That is, given existing prices of outputs and inputs, it is thought that the land tax would encourage farmers to seek the most productive use of their land, perhaps by the sale of "unproductive" land by large absentee landlords to small farmers. It is not clear at a theoretical level why a land tax should encourage more productive use of land, unless the tax is tied to a reduction in export taxation. If it was not profitable to plant crops before the land tax, it still would not be profitable after the land tax was imposed. This is precisely the definition of an efficient tax. It is possible, however, that a sufficiently large land tax

could spur landowners to work harder (an income effect) or to stop relying on traditional methods of production and seek new and more efficient methods (for example, Leibenstein 1978).

The Meiji period has been used as one illustration of how land taxation has improved agricultural productivity. A number of researchers have suggested that farmers sought to invest in agricultural investments and to market their produce following the imposition of a 25 percent tax on gross income during the latter part of the nineteenth century (Yamamura 1986). That is, despite the "strenuous resistance and even uprisings" during the first three years of the land tax (Yamamura 1986: 391), the necessary cash payments to the government motivated farmers to work harder and more efficiently.

One shortcoming of this explanation is that other factors, such as improved regional markets and land reform, could have provided the incentive for improved agricultural investment. Furthermore, the income effect of land taxation can theoretically decrease or increase productivity. Lindauer and Singh (1979) suggested that the heavy land tax in India at the turn of the century may have either reduced farmers' nutrition and productivity by cutting into consumption or forced peasants to borrow money from lenders during bad harvests. Subsequent defaults by smaller farmers to the moneylenders increased the landless population and concentrated holdings among large landowners.

Land taxes are also sometimes believed to encourage efficient land use by discouraging speculation in idle land. Again, the theory behind why taxes should dampen speculation is weak. Imposing the tax will reduce the market price of land. But once the price of land has fallen, it can be expected to grow at the same rate as before.<sup>9</sup> Although speculators suffer a one-time loss after the imposition of a land tax, their incentive to hold land for speculative purposes after the land tax is imposed will remain unchanged. Of course, a land tax might bring down prices by bursting a speculative bubble in land prices. The problem with testing such a theory is that, in practice, land taxation has at most a trivial impact on land use. In one study in Colombia, L. Harian Davis concluded that "because of low rates, the tax burden is a relatively small percentage of income and this fact means that there is little opportunity for the non-fiscal effects to operate particularly among the larger farmers, where the tax burden is lightest" (quoted in Strasma 1987: 41).

A third nonrevenue objective of land taxation is to encourage land reform. Taxing large farmholdings at progressive rates could force their owners to break them up into large numbers of small farms. Such efforts to encourage land reform in Colombia and other countries have generally been unsuccessful, for two reasons. First, commonly administered land tax rates have not been important enough to have an effect on land use. Second, land taxation suffers politically because neither large nor small farmers like increased tax rates. At least the benefits of direct land reform are obvious to the landless peasants.<sup>10</sup>

Land taxation is more likely to be a complement to, rather than a substitute for, land reform (Bird 1974: 265). Land taxation encourages people to keep land records and to conduct cadastral surveys useful to land reform. A strong land tax would also reduce the cost of land, thereby scaling back the cost to the government of compensating landowners for redistribution.

More recently, land taxation has been proposed to promote the environmentally sound use of land. For example, land taxes resembling a Pigouvian tax on the external effects of environmental degradation could be assessed on environmentally harmful conversions of Amazon rain forests to cattle ranches. Binswanger (1989) presents evidence that the existing land tax in Brazil is actually working to *encourage* the destruction of the Brazilian rain forest because forestland is considered to be "unused" and as a consequence is subject to a higher tax rate.

Even if a land tax were designed to encourage the preservation of rain forests, the importance of the incentive—relative to corporate or individual taxes—is likely to be minimal. Binswanger reports that for land plots above a minimum size, the statutory land tax rate in Brazil is 3.5 percent of the unimproved value of the land, with a reduction of up to 90 percent in tax liability, depending on land use. What is more likely to be the important factor in encouraging deforestation is that the corporate and individual tax in Brazil exempts most profits from agricultural concerns, leading to substantial incentives for investing in frontier lands.

In sum, land taxes have been less than successful in the past at attaining nonrevenue goals. As long as the effective tax rates are low and administration and collection efforts remain weak, the land tax is unlikely to affect all but the most marginal land–use decisions.

This is not to say that a land tax is incapable of affecting environmental quality. The tax has traditionally been effective at raising a limited amount of revenue to fund local government projects. Tying the proceeds of the tax to a particular expenditure program (which is known as "valorization" or earmarked taxes) may provide the most effective means for local selffinancing of projects that combat deforestation, pollution, and the erosion of waterways. Since local landowners often benefit from environmental improvements, they may be viewed as the natural beneficiaries of the earmarked expenditures. A land tax by itself is unlikely to encourage sound environmental choices, but the (limited) revenue thus raised can be an effective tool in improving adjacent land quality or in preserving wild areas.

### **Case Studies: Bangladesh, Argentina, and Uruguay**

This section departs from the broad view of land taxation and focuses on particular countries. The problems of administering a progressive land tax are highlighted in Bangladesh, while the risks of political opposition (and the benefit of political support) are emphasized in the study of Argentina and Uruguay.

#### **Agricultural Taxation in Bangladesh**

As recently as 195960, agricultural direct taxes on land in Bangladesh (East Pakistan) made up 66.2 percent of all direct taxes and 19.8 percent of total central tax revenue.<sup>11</sup> Following independence, the government implemented a new tax, called the land–development tax (LDT), which was based on land area and not land quality. It consisted of a flat rate on commercial and residential areas, with a two–slab rate system for agricultural

land: Tk 3 (US\$.40) per acre for holdings smaller than 8.25 acres, and Tk 15 (US\$1.94) per acre above 8.25 acres.<sup>12</sup>

The commercial and residential rates were adjusted upward in 1980 and 1982. Also in 1982, the agricultural rates were revised by specifying a sharply progressive schedule for agricultural land ranging from Tk 3 per acre to a marginal rate of Tk 145 (\$7.67) per acre for landholdings larger than 25 acres. The specific rates are described in table 9–1, which also tabulates the 1976 marginal tax rates in constant 1985 taka. Marginal (and average) tax rates have declined in real terms for smaller plots but have increased for larger holdings.

The land–development tax is not just assessed on agricultural areas. The industrial and commercial rates imposed on land near police stations (located in the cities of Dhaka, Khulna, and Chittagong) were sixty nine times higher than the maximum rate on agricultural land. Table 9–1 shows a sharp real increase in the tax assessment on commercial and residential property, but with generally stagnant rates on commercial property.

The total revenue collected, adjusted by the GDP implicit price deflator to 198485 prices, is shown in table 9–2 and figure 9–3. Despite substantial rate increases in the 1980s, it was only in the 198586 budget that real tax collections regained the levels collected during 197677. The LDT has assumed a smaller relative role in aggregate tax revenue of the central government, and by 1987 it accounted for only 0.2 percent of agricultural value added.<sup>13</sup>

The difficulty of maintaining land tax revenue in the face of inflation contrasts with the ease of revenue collections for the Bangladesh nonjudicial stamp tax. In 1986 the stamp tax was assessed on any property transfer at a progressive rate, from 6 percent of the declared value to a top marginal rate of 18 percent. Figure 9–3 compares the growth of the stamp tax revenue with the revenue from the land–development tax. In 197677, revenue collection from the two taxes were nearly identical, but by 1986 the stamp tax collected more than twice as much revenue. Property transfer taxes may be inefficient in that they discourage property transfer, but in Bangladesh they have been highly buoyant with respect to inflation and are easy to administer since the property cannot be transferred legally until the tax is paid.<sup>14</sup>

Recall that the 1982 revisions to the land–development tax increased the progressivity of the tax substantially, with the ratio of the highest to the lowest

**Table 9–1. Land Development Tax Rates in Bangladesh, 1976 and 1985**

<i>Size of Plot</i>	<i>Marginal tax rate 1976</i>	<i>1976 tax rate (in 1985 taka)</i>	<i>Marginal tax rate 1985</i>
<i>Agricultural land</i>			
Less than 2 acres	3	10.7	3
25 acres	3	10.7	15
58.25 acres	3	10.7	36
8.2610 acres	15	18.2	36
1015 acres	15	30.1	60
1525 acres	15	39.4	95
More than 25 acres	15	39.4	145

*Nonagricultural land (near police stations)*

Commercial and industrial	600	2,145	10,000
Residential	3,000	1,073	2,000

*Nonindustrial land (other areas)*

Commercial and industrial	300	1,073	1,500
Residential	150	536	500

*Note:* Areas close to police stations are primarily in Dhaka, Chittagong, and Khulna.

*Source:* Land Development Tax Ordinance, 1976; notification in the *Bangladesh Gazette*, June 26, 1982 and January 25, 1986.

**Table 9–2. Fragmentation of Landholdings in Bangladesh, 1977**

<i>Size of farm</i>	<i>Reported number of plots</i>					
	<i>1</i>	<i>23</i>	<i>45</i>	<i>69</i>	<i>1019</i>	<i>20</i>
Small farm (< 1 ha)	3.7	25.2	28.4	28.0	13.5	1.2
Medium farm (1–3 ha)	1.5	5.6	11.9	26.0	42.9	12.1
Large farm (> 3 ha)	1.1	2.4	5.8	11.9	34.7	44.1
All farms	2.6	15.1	19.5	25.7	27.2	9.9

*Note:* Reported figures are distribution (or percentage) of farmers with the given number of total plots.

*Source:* Bangladesh Agricultural Development Strategy Working Paper, Bangladesh Agricultural Census, 1977.

marginal rate rising from 5 (15/3) to nearly 50 (145/3). Given the substantial concentration of wealth in landholdings (Rahman 1982), the theoretical assessment on the wealthiest 1 percent of the population was calculated to be 55 percent of the total (projected) tax revenue of Tk 453 million, or US\$24 million (Booth 1985). The *actual* tax collections in 1985 of Tk 485 million might suggest that the land–development tax is a highly progressive and effective tax. But aggregate tax revenue includes commercial and residential sectors, which, as noted above, are taxed at much higher rates. To measure the independent contribution of agricultural land to LDT revenue, a survey of tax records was conducted in the Tangail and (rural) Dhaka districts.<sup>15</sup>

In both tax offices, the records of plot ownership and location dated from the early 1960s; these in turn were based on cadastral surveys from 1914. The striking characteristic of the sampled records was the small size of each plot and the high fraction of plots subject only to the Tk 3 rate per acre (or the minimum Tk 1 tax payment). Figure 9–4 shows both the average tax rate

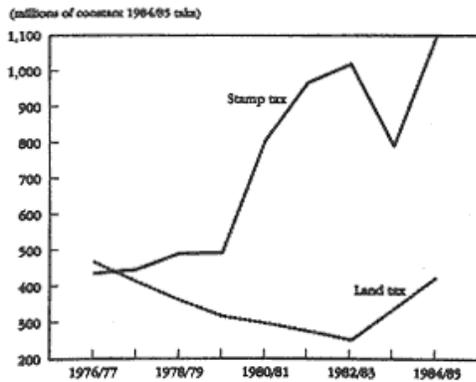


Figure 9-3.  
Revenue from Land and Stamp Taxes in Bangladesh,  
1976/77-1984/85  
Source: World Bank data.

by plot size and the corresponding number of plots. Note that 68 percent of the sampled plots were smaller in area than 0.4 acre, and only two out of 111 were larger than 2 acres.

The average tax rates compiled in this sample suggest that some effort was made to assess progressive tax rates above the basic rate of Tk 3 per acre. Yet the theoretical degree of progressivity is not borne out by actual tax collections. In fact, average tax rates are highest for the very small plots of land subject to the minimum Tk 1 payment.<sup>16</sup> There is a slight degree of progressivity for the larger plots, but not a significant increase.

The small size of each plot is consistent with findings from the land-use survey. In the 1977 Agricultural Census, 44 percent of large farmers reported owning twenty or more separate plots (table 9-2). Even among small farmers owning less than 1 hectare (2.47 acres) of land, 43 percent reported more than six plots. So figure 9-4 may not accurately measure the degree of progressivity in tax rates if wealthy landowners hold many small plots. But aside from the smallest plots of

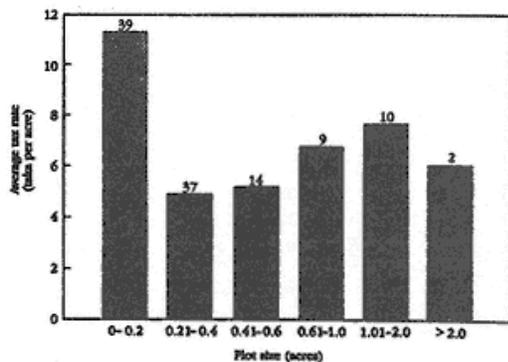


Figure 9-4.  
Land Tax Rates per Acre by Plot Size in  
Rural Bangladesh, 1986 Note Numbers above the  
bars denote the number of plots in each size category.  
Source: World Bank data.

land subject to the Tk 1 minimum, there was no agricultural plot of land in the sample subject to a tax rate of more than Tk 28 per acre.

There appeared to be substantial difficulty in crossreferencing the plots of land with the individual owners. The tax collector (or Tahsildar) may have local knowledge about land ownership, but, given the large size of his district and ownership outside his district, he may find it difficult to match owners with each plot of land. To complicate matters further, many plots are registered to long-dead owners (because authorities are slow to update their records) or to four or six siblings or cousins who have shared in a common inheritance.

A fundamental administrative difficulty is caused by basing the tax rate on total personal holdings but assessing the tax against the plot of land. If a farmer owns ten 1-acre plots, for example, should the total 10-acre tax liability be averaged across plots, or should the progressive rates be assigned to each plot randomly? In practice, many of the actual tax assessments appeared to be based on "discussion and imagination."

If this sample of plots is representative of the rural sector in general, then agriculture cannot have provided more than Tk 188 million (US\$6.4 million) in 1986. Even after adjusting for possible regional differences in the distribution of plot sizes (Miller and Wozny 1985), agriculture cannot have accounted for more than 64 percent of the total collections. It seems likely that much of the reemerging LDT revenue collection in the mid-1980s was a consequence of strong collections in urban and commercial districts, and not in agricultural areas.<sup>17</sup>

The cost of administration must be subtracted from revenue to determine the net revenue available for government expenditures. In 1985/86, the fraction of tax collections accounted for by administration costs was 66 percent, implying only 34 percent for central government use. The local tax office does provide valuable service such as maintaining land records, and receipts of land taxes paid are often viewed as informal land titles. Still, the average administrative cost of per taka of revenue for the LDT exceeds the comparable ratio for other taxes in Bangladesh by a factor of seven. In sum, the LDT on agricultural land is best thought of as a filing fee for annual ownership records, but one that provides little revenue for central government operations.

### Land Taxation in Argentina

Whereas the land tax in Bangladesh is a dim memory of what it once was, the federal land tax in Argentina remains a dream of what it might be.<sup>18</sup> The intellectual basis for the land tax came from the early 1960s, when the land tax was viewed as a publicly palatable step toward land reform. The first federal government land tax, implemented in 1969 under the regime of General Juan Onganía, imposed a flat 1.6 percent tax on the value of agricultural land.<sup>19</sup> Despite public opposition, the land tax collected an average of 24 percent of total agricultural taxes (or two-thirds of export tax revenue) during the few remaining years of the regime (Trapido 1988: 52).

During the second Peron administration, the flat tax was replaced with a progressive tax (rates ranged from 0.75 to 2.68 percent) combined with an exemption for small farms. Before a cadastral survey necessary to administer the tax could be completed, Peron died, and this progressive tax was replaced with an agricultural income tax in 1976. Because of the problems in measuring income, tax revenue lagged. Beginning in 1983, the World Bank and the secretary of agriculture, Lucio Reca, led efforts to develop a new land tax. This tax was preferred to an export tax because it was expected to increase farmer output prices and ensure a more stable supply of revenue to the government.<sup>20</sup> A new land tax was proposed in 1986 to replace the agricultural income tax. Although the bill referred to the desirability of cutting back the export tax, it was not explicitly linked to export tax reductions. Furthermore, the land tax revenue was designed not simply to raise the same amount of revenue as the export tax (area *abcd* in figure 9-2), but to mop up the entire surplus from farmers, leaving them without surplus gains (area *hjce* in figure 9-2).<sup>21</sup> The bill did not meet with overwhelming support from farmers. They believed the land tax would be added to an already heavy export tax, and farming organizations helped bottle up the bill in the legislature.

To understand the vehement protests against the tax, one must look at the historical tax bias against agriculture, particularly the large share of tax revenue garnered from agriculture (Sturzenegger 1988; Trapido 1988). Furthermore, the proposed land tax came on top of already quite heavy provincial land taxes. One study estimated local tax rates on net income from land at 10 percent for farmers in the Pergamino region (Trapido 1988: 45). A local land tax of this magnitude provides little slack for farmers facing a second layer of taxation imposed by the federal government.

What are the lessons from the experience with the land tax in Argentina? The first is that for a land tax to enjoy political support, it should not be viewed as another hook in the financial hide of the agricultural sector. As long as new land tax revenue is offset by reduced export taxes, land taxes should benefit farmers by shifting the urban–rural terms of trade in favor of agriculture. But given the history of systematic bias against agriculture by past federal administrations, the new government proposals from Buenos Aires were met with some suspicion.

The second lesson to be learned from Argentina is that imposing a new land tax is a risky investment. The

administrative apparatus of land taxation, including cadastral surveys and assessor training, must be put in place before a single austral can be collected. The tax can be thought of as a project with an up–front cost (in the case of Argentina, perhaps US\$6 million) and with a risky future return. Thus far, the investment has not been successful for Argentina; no revenue has yet been raised under the 1986 land tax proposal.

### Land Taxation in Uruguay

Uruguay has enjoyed a more positive experience with land taxation.<sup>22</sup> Its land tax was first proposed during the 1960s by a group of cattle ranchers who understood that since only one–third of beef was exported, an equal–revenue land tax to replace the export tax would result in a favorable shift in the terms of trade back toward producers.<sup>23</sup> With the support of the World Bank, Uruguay implemented the tax in 1967 and at the same time cut back the export tax.

The land tax was originally a presumptive gross income tax (IMPROME) based on an index of land quality measured by its potential to produce beef and wool. The tax liability was the product of the land productivity index times an annual adjustment reflecting the output and prices of the baseline land yield. Costs of implementing cadastral and land record surveys were likely eased by the fact that more than half of the agricultural land in Uruguay is contained in farms of 1,000 hectares or more (Jarvis 1986).

The first serious crisis occurred in 1974 when beef prices fell dramatically, just as land tax rates based on 1973 productivity were falling due. The total direct tax bill for 1973 (including a capital levy and social security taxes) was 43 percent of gross agricultural income in 1974, the year in which the tax was collected. Since net income (even before direct taxes) was negative during 1974, the land tax contributed to an already serious liquidity crisis for cattle ranchers. The ranchers argued successfully that the land tax should be based on net rather than gross income, with the result that the government introduced a new tax assessed on net imputed income (IMAGRO). Neither IMPROME nor IMAGRO relied directly on individual farmer's records of costs. During the 1980s, the government attempted to move toward a tax based closely on the accounting records of individual ranchers, but this effort was not entirely successful at stepping up revenue. As Jarvis (1987: 21) notes,

The primary problem with the IRA (net income) tax is that it requires a reasonably sophisticated set of records, especially regarding inputs costs, which most Uruguayan farms and ranches cannot currently meet. It seems that such record keeping might be feasible over a period of years, but that the shift to IRA could not be applied on most farms without a significant decline in government revenue. Tax evasion is already a substantial problem in Uruguay.

Nevertheless, the land tax regularly contributes a substantial fraction of total taxes collected from the agricultural sector. Between 1977 and 1981, the land tax raised 31 percent of total agricultural taxes, and although that ratio fell during the early 1980s, it was back up to 27 percent in 1986 (Jarvis 1987).

The government did not give up its use of the export tax entirely. Instead, the export tax was often used to cushion the domestic price of beef during periods of high international beef prices (Jarvis 1986). The export tax was used most heavily during the price boom of the early 1970s and later in 1977 and 1984, following the real appreciation of export prices. During downturns in beef prices, the export tax was reduced, or even removed. In contrast, the land tax collected a relatively stable fraction of agricultural production in the 1970s (and for earlier years for which there are fewer data), but even this tax was removed during years of very poor beef prices (1982-84).

In summary, the land tax has provided a steady source of revenue from agriculture, except during the mid-1980s when beef prices were low and revenue was lagging because of efforts to administer the net income tax (IRA). Although Uruguay has stated its intention to phase out the export tax in the future, it represents a likely candidate to stabilize domestic prices and raise revenue should world beef prices rise in the future.

### **What are the Lessons for Tax Reform?**

Although one must be careful about drawing strict conclusions about the feasibility of land taxation from the historical experiences of a limited number of countries, a few lessons suggest themselves.

*The land tax is not necessarily more efficient—broadly defined—than other types of taxes.* At a theoretical level, the land tax suffers from two general drawbacks. The first is that it provides little pooling of risk; the farmer is required to pay a given tax liability in each year. In contrast, the export tax reduces the variance of annual income (Hoff 1991). I am not sure that this is a fatal shortcoming. Skinner (1991) has shown that the farmers' degree of risk aversion must be quite large (or the farmers' supply curve inelastic) in order to find the export or commodity tax superior to the land tax. And Trapido (1988) generally found that the price elasticity of farm output in Argentina was quite low. Furthermore, as Hoff (1991) has pointed out, the land tax can be used in conjunction with an export tax to raise revenue and reduce overall risk.

The second shortcoming of the land tax is that it may be costly to administer. On pure efficiency grounds, it doesn't matter whether \$1 is lost to society because of traditional inefficiency triangles or because an extra \$1

is spent on administrative expenses. So the higher cost of enforcing the land tax—in some cases, as much as 60 percent of revenue—must be taken into account in comparing the efficiency of both tax systems. The question of which tax is preferred is ultimately an empirical one that has not been entirely resolved.

*The Achilles heel of land taxation is administration.* The theoretical tax base for land taxation is the net income or intrinsic value of the land. The problem is how to determine land value. Self-assessment is not particularly effective, since farmers have a strong incentive to underassess their land. Even if each plot is assessed by trained officials, appeals by the landowners and the inflationary erosion of the assessment after a few years can quickly attenuate any revenue potential of a land tax.

There is an incentive to evade or avoid any kind of tax. What makes the land tax different is that reasonable people may differ over the correct or true value of land. Hence it is difficult to distinguish between a landowner who is evading the tax through gross undervaluation or appeals and a landowner who is more knowledgeable about his land than the outside assessor. The government is constrained from imposing heavy penalties on misassessed property because it is never clear whether the landowner had criminal intent. In contrast, a smuggler is easily identified and is subject to heavy penalties. As long as the police catch at least some smugglers, the expected cost of detection is sufficient to yield voluntary compliance with export taxes.

The other option is to impose a tax that is based on objective measures such as land area. Although this is the simplest tax to administer, it has the disadvantage of being limited by the maximum feasible tax burden on the poorest-quality land. Furthermore, if wealthier farmers own higher-quality land, the tax could be regressive. Some countries have attempted to use progressive tax rates based on landholdings, but these have not been successful (see below).

A compromise between a tax based only on land area and one based on income is a presumptive income tax based on objective measures of quality. Land taxes using crude measures of quality have been more satisfactory than taxes based on market valuations, and these represent the most promising avenue for the collection of tax revenue.

*Progressive tax rates based on the holdings of land are difficult to administer.* Most cadastral surveys are good at identifying land area, soil quality, and the owner(s) of record. But linking land records up to trace ownership across records (and across regional districts) is much harder. Supposing that the tax administration could link up land ownership records, taxpayers could still avoid the progressive rates by dividing land among family or business associates, or by creating a twisted paper trail of ownership records. The large size of the farms in Latin American countries makes the prospects of progressive taxes more favorable than in other areas of the world where landholdings are smaller and more fragmented.

A small amount of tax evasion can lose a large amount of revenue under a progressive tax system. In Bangladesh, for example, splitting a 24-acre lot into three parts reduces land tax revenue by two-thirds. Evasion or incomplete land records often lead to quite disappointing revenue collection under a progressive tax systems.

*Land taxes have not proved effective at attaining nonrevenue goals.* Development experts in the past held out great hope of achieving desirable nonrevenue goals through land taxation. It was viewed as a way to transfer resources from the agricultural to the "modern" industrial sector, encouraging more effective and productive use of land, and assisting in land reform. It has not reached any of these objectives. First, the theoretical basis for why the land tax should promote such objectives is weak. Second, and more important, land taxes rarely have had sharp enough teeth to affect land-use decisions.

Recently, land taxation has been proposed to encourage environmentally sound land management. Although it seems clear that the World Bank should discourage taxes that encourage environmentally *unsound* land management, land taxation at its current low rates is unlikely to have anything more than a marginal effect on land use. The revenue from land taxation for environmental purposes would be put to better use if it were channeled into local environmental expenditures.

*Political support for the land tax is a necessary precondition for its success.* This may appear to be a tautology, but its fundamental truth is still overlooked. The contrast between the success of the land tax in Uruguay and its failure in Argentina is instructive. The land tax in Uruguay, at least in part, replaced export taxes in response to political pressure from the ranchers themselves. They understood that a land tax raising equal revenue as an export tax would tip the urban-rural terms of trade in their favor. In contrast, Argentine farmers view the land tax as yet another attempt by the urban-dominated political powers to extract more resources from the agricultural sector. The 1986 Argentine tax reform might have enjoyed more success had farmers believed a reduction in export taxes would be matched with a land tax increase.

*The best potential for land taxation is in financing local governments or valorization (or betterment) projects.* Although the land tax may never raise more than a few percentage points of total central government revenue, this does not mean that it should be scrapped entirely. The revenue requirements of the local government are typically less than those of the

central government, so that a land tax based on land area or on crude productivity measures that raise a modest amount of revenue may be an appropriate use for local land taxation. Furthermore, the resentment felt toward land tax revenue paid to faraway central government offices (for projects in distant cities) may not be as pronounced as for local taxation.<sup>24</sup>

More to the point, the land tax appears to be a successful source of revenue for local governments, particularly those in Latin America. Unfortunately, detailed information on local land taxation is sparse. But the potential use for land taxation in financing valorization or betterment programs (for example, irrigation projects) is excellent because the benefits of the tax are readily available, and because the owners of the land are most likely to benefit economically from the improvements. Agricultural land taxation is unlikely to succeed at raising a large fraction of the central government budget. Still, a simple and easily administered tax based either on land area or on crude indicators of land quality may provide a resilient form of financing for local government expenditures.

### Notes

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1. See chapter 6 in Bird (1974) for an excellent review of the history of agricultural land taxation.
2. Data for years before 1970 are from Bird (1974). For years after 1970, IMF Statistics of Government Finance (1984 and 1989 editions) were used. Land taxes were defined as property taxes (classification 4) less corporate property tax (4.2.2) less taxes on financial and capital transactions (4.4). It is likely that this classification sweeps rather more than agricultural land taxes (such as urban taxes) into the net. For example, although the Uruguay agricultural land tax was removed in the early 1960s, the IMF statistics show positive revenue.
3. By assuming all of the good is exported, one avoids the issue raised above that land taxation shifts the urban–rural terms of trade in favor of farmers.
4. The comparisons focused only on consumption risk and not on production risk. Farmers were more likely to prefer the export tax over the land tax when the export tax rate was low.
5. As Slemrod (1990) has noted, optimal taxation may imply different policies from optimal tax *systems* that account for administrative and compliance costs.
6. For a recent debate on the neutrality of site value taxation, see Bentick (1979), Mills (1981), Tideman (1982), and Turnball (1987). For a good theoretical discussion of land taxation and shifting, see Bruekner (1986).
7. Suppose that net income in real terms is given by  $X$ , and that net income is expected to persist at that level indefinitely. With a real interest rate  $r$ , the theoretical market value (or present value) of the land is given by  $X/r$ . It is irrelevant whether one taxes  $X/r$  or  $X$ , since they will yield the same tax (with an appropriate adjustment to the tax rate).

8. Cecil Morgan, "Property Taxation in Central America," USAID (November 1967), quoted in Bird (1974: 84).
9. Suppose that the land tax reduces land prices by 20 percent . Suppose further that land today is held in expectation that land prices will be higher next year. Because the tax reduces the land price today and the price next year by 20 percent, the *rate of change* in land prices is independent of whether the land tax is imposed. See also Tideman (1990).
10. See Bird (1974: 26267) and Strasma (1987).
11. This section draws on Skinner (1987), World Bank (1989), and Alm and Schroeder (1985).
12. Conversions are in constant 1989 U.S. dollars. Exchange rates are taken from the World Bank (1986b) and adjusted to current dollars by the U.S. GNP implicit price deflator.
13. Some countries have simply replaced their land taxes with indirect taxes such as overvalued domestic currencies and marketing boards. But the evidence is that during the mid–1980s, the Bangladesh government did not place such implicit taxes on farmers (Hossain and others 1985; World Bank 1989).
14. As Ricardo declared more than 200 years ago, "For the general prosperity, there cannot be too much facility given to the conveyance and exchange of all kinds of property, as it is by such means that capital of every species is likely to find its way into the hands of those who will best employ it in increasing the production of the economy." *The Principles of Political Economy and Taxation*, quoted in Bird (1974: 74).
15. The survey was a part of the December 1986 World Bank Tax Mission to Bangladesh.
16. For example, the average tax rate for a 0.05–acre plot is Tk 20 per acre.
17. As noted in table 9–1, real tax rates for urban and commercial areas have risen in real terms between 1976 and 1986. Although Dhaka paid 5 percent of total LDT revenue in 198485, it accounted for 17 percent of the increase between 198485 and 198687. And a shift of 1 percent of agricultural land (with an average rate of Tk 6) to commercial land outside of the major cities (with an average rate of Tk 1,500) would have nearly doubled total LDT revenue.
18. Much of this section is based on the excellent survey in Trapido (1988).
19. A provision in the current Argentinean constitution makes a federal land tax illegal, so all proposed land taxes are under the guise of a presumptive income tax on farmers.

20. This latter argument turns the risk–pooling argument on its head. Rather than the government shielding farmers from risk, the farmers would shield the government from risk.

21. I am grateful to Lovell Jarvis for pointing this out to me.

22. Much of this section is based on the insightful series of papers by Jarvis (1986, 1987) and Jarvis and Medero (1988).

23. Beef is a staple in urban diets, and the per capita consumption of beef in Uruguay is among the highest in the world.

24. For example, in some regions of Indonesia as much as 70 percent of local government revenue is provided by land taxes (personal communication, Jay Rosengard).

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## 10—

### Taxation of Financial Assets in Developing Countries

Christophe Chamley

The role of financial institutions and credit markets has been recognized since the well-known studies of Shaw (1973) and McKinnon (1973). Most financial assets in the formal markets of developing countries are deposits at financial institutions. These deposits offer a potentially important tax base that could be taxed at low administrative cost. When revenues of financial taxes are significant, implicit taxes dwarf explicit taxes. As this chapter shows, financial assets may be implicitly taxed through seigniorage, reserve requirements, lending targets, and interest ceilings combined with inflation. The last instrument has often been overlooked, but in some cases (Nigeria) it has generated more than a third of implicit revenues by lowering the cost of government borrowing.

The effect of financial taxation depends on the stage of a country's development. The same general economic principles will be at work everywhere, but the emphasis will depend on the context. Financial liberalization will be different in the Republic of Korea and Ghana, for example. The empirical material in this chapter is drawn mainly from Sub-Saharan countries and some countries in Southeast Asia, which have been chosen for their experience in financial liberalization. In Sub-Saharan countries, the broad definition of money encompasses most financial assets. This region has attracted less attention than Latin America or some Asian countries. Yet it offers simple and interesting case studies.<sup>1</sup>

The chapter opens with a discussion of the tax base and the fiscal instruments used in the countries of this region and then focuses on implicit taxes. These taxes are given close attention because they dwarf explicit taxes (for example, taxes on interest incomes of financial institutions) and have much greater variance, which is useful for empirical analysis. Furthermore, the impact of financial taxation is evident only when the tax rates are high. The results of the analysis are applicable, however, to explicit taxes on financial assets.

The impact on the rate of return and the level of financial assets is discussed next, both through comparisons across countries and through time series. This is followed by an analysis of revenue measurement (including the measurement of seigniorage). Contrary to common opinion, this is not a simple task. The proper base of computation is often better approximated by M2 than by the monetary base. Once the tax base is established, there are still other problems to contend with. The level of revenues is significant for many developing countries and in some cases exceeds 10 percent of GDP. It is not always clear whether governments are deliberately using seigniorage or inflation as a revenue-raising device. Poterba and Rotemberg (1990) cast doubt on this hypothesis for a set of developed countries, but these countries have low inflation rates and good administrative structures for explicit taxes. In developing countries, the small size of the formal sector (with a labor force that may be less than 5 percent of the population), the weak administration, and the magnitude of revenues from the taxation of

financial assets make this taxation an operational instrument.

Using the standard tools developed by Harberger and others, the analysis then turns to the efficiency cost

of taxation on financial assets. The estimates provide a lower bound of the costs. Other inefficiencies such as those associated with intertemporal allocations of resources and growth cannot be evaluated at this stage.

The excess-burden of taxation is found to be low when inflation is low (less than 25 percent), and very high when the inflation rate is moderate (between 60 and 100 percent). These costs are higher than those that can be derived from other studies, which have followed Cagan (1956), for similar average values of the inflation rate.

### **Fiscal Instruments**

The structure of financial markets in many developing countries is still not well diversified and their financial assets are by and large restricted to money as broadly defined (M2).

#### **The Base**

The menu of financial assets in many developing economies includes currency, demand and time deposits, and in some cases deposits at specialized institutions such as merchant banks or saving institutions. Stock markets are embryonic in the best of cases, as in Nigeria, where trading is thin and price quotes on some of the main stocks remain unchanged for weeks. Government bonds, which could provide the best risk guarantee and liquidity, are not owned by individuals. For all practical purposes, financial institutions are the main holders of the government debt (outside the central bank). Therefore, in many countries of low to middle income, and especially in Sub-Saharan Africa, the main base for financial taxation is the extended definition of money (M2).<sup>2</sup>

#### **Instruments**

The fiscal instruments are divided in two groups, explicit and implicit taxes.

**EXPLICIT TAXES** . This group includes taxes on loans, interest income, and in some rare cases value added taxes. They are defined by statutory rates that are stable; these rates are subject to revisions, but not more frequently than other items in the tax code. The statutory rates are different from the effective rates, mainly because of a lack of indexation for inflation. Even without an adjustment for inflation, the average values of the effective rates are in general small and their variations are dwarfed by those of the implicit taxes.

In Africa, explicit taxes are found mainly in countries whose tax structure has been left over from France—namely, Morocco, Tunisia, and the countries of the two Communauté Financière Africaine (CFA) zones. Such taxes are also found in the Philippines. They are insignificant in the other African countries and in Latin America.

**IMPLICIT TAXES** . Implicit taxes are the main tools that provide a ready source of revenue, especially in times of crisis. By definition, these taxes do not appear in standard national accounts as tax revenues. Their effective rates are difficult to compute, are highly variable, and often cannot be predicted. At times, implicit taxes can be very large. Their revenues have exceeded 100 percent of the tax base (per year) in some cases. As mentioned at the outset, this chapter deals exclusively with the implicit instruments. They include (a) the issuance of currency (seigniorage), (b) reserve requirements (earning below market rates), (c) lending targets at nonmarket rates, and (d) a combination of interest ceilings and inflation.

*Creation of new currency.* The introduction of new currency debases the money that is already in circulation, and the resulting inflation is a tax on the currency. This tax cannot be separated from the taxes on the institutions of financial intermediation because these institutions provide assets that are close substitutes for the currency. An essential characteristic of this tax is that it operates through a capital loss on the existing currency. Since cash revenues to the government and capital loss to the private sector are not identical, measuring tax revenues becomes a complex matter, as explained in detail later in the chapter.

*Reserve requirements.* Reserve requirements are equivalent to a tax on deposits when reserves earn a rate below that offered by the market. It is sometimes argued that they crowd funds out of the markets for private credits. This is incorrect, but the government could invest the proceeds of the reserves into investment projects that earn a return and pay depositors. Required reserves are therefore to be viewed as an implicit tax with a rate that is equal to the difference between the market rate and the rate paid on the forced borrowings.<sup>3</sup>

*Lending targets for preferred sectors.* These instruments apply typically to agricultural loans and are similar to earmarked reserve requirements. In this way, they are equivalent to a tax on deposits, which subsidize the borrowers with a preferential rate.

*Interest ceilings with inflation.* This instrument has been often overlooked although it has been one of the most important taxes on financial institutions. An example is provided by the case of Nigeria before 1986, when all loans were subject to interest ceilings at less than 12 percent (Some requirements for specific sectors with lower rates also had to be met). Given the ceilings on the private loans and their inherent riskiness, government bonds providing a nominal rate of 9 or 10 percent were very competitive. It is therefore not

surprising that their fraction in bank portfolios was well in excess of the liquidity requirements (in some cases more than 60 percent).

Consider the stylized case of a regime with zero values for interest rates on loans and deposits and a high rate of inflation.<sup>4</sup> In this regime financial institutions will happily buy government bonds that pay a rate of return equal to zero since their risk is less than that of private bonds. The banks are not forced to hold government bonds, and the government is thus able to borrow "competitively" at no interest all the resources of the financial system, if necessary. The policy is equivalent to a 100 percent reserve requirement. This example illustrates how the different economic effects of various fiscal instruments may overlap and thus complicate the analysis and measurement of revenues.

Note that ceilings on interest rates may be caused more by inertia than policy design. In the regular course of events, ceilings are in place because of a general concern about credit markets (as in Sub-Saharan Africa), usury laws (as in Thailand), and other factors. In normal times, the ceilings may be binding, but their effect is relatively small, when a fiscal crisis occurs, inflation rises, the ceilings are left in place, and their impact becomes significant. The ceilings are then useful for government finances. Unfortunately, they also subsidize private loans, thus creating many opportunities for rent seeking. In general they impose a greater burden on depositors per unit of revenue to the government than do taxes on deposits or reserve requirements.

### **Impact of Taxation on Financial Deepening**

Financial institutions are by definition extremely highly leveraged: deposits represent more than 90 percent of their liabilities. Some of the incidence of taxes and regulations obviously falls on the equity of the banks and affects its rate of return.<sup>5</sup> But most of the incidence of the effective taxation on financial institutions falls on deposits.

In some countries, the effect of interest ceilings, reserve or lending requirements, and inflation have had a large impact on the real rate of return of financial assets. In Sub-Saharan countries, most of the financial assets are included in currency and demand and time deposits. Since they form a set that is somewhat homogeneous (with respect to other countries), it is interesting to compare them in cross-sectional data.

**Cross-Sectional Data from Sub-Saharan Africa**

The cross-sectional data are expected to show how financial deepening, as measured by the ratio of M2 to GDP, is affected by the inflationary environment. The degree of financial deepening depends on the expected real rate of return of financial assets, which is affected by financial taxation. The data do not allow for a model that would yield reliable estimates of the real rate of return for all countries. We have instead computed the average inflation rate or the real rate of return on deposits. These values are not very different because nominal rates were fixed for most of the sample, as shown in figure 10-1 for almost all the Sub-Saharan countries.<sup>6</sup>

Figure 10-1 presents a striking pattern: countries can be divided in two groups, non-CFA and CFA, respectively.<sup>7</sup> All non-CFA countries approach a schedule that shows an inverse relation between inflation and financial deepening. The only exceptions are Rwanda, Burundi, and Malawi, which have low inflation and low financial deepening. This apparent anomaly may be explained by differences in urbanization ratios, whereas the urbanization ratios for all the other countries fall between 17 and 30 percent (except for Uganda, with 7 percent), those for these three countries are 2, 2, and 5 percent, respectively (World Bank 1988).

The second group formed by the CFA countries has experienced low inflation on average (because of the institutional restraints on the creation of money), but their level of financial deepening is lower than it is in the non-CFA countries with low inflation.<sup>8</sup> Their urbanization ratios are about the same as those in non-CFA countries. It is possible that under the special regime of the CFA zone, agents use other institutions in France and European countries for intermediation. Quite remarkably, the low level of deposits in CFA countries is compensated by large loans from the central bank to commercial banks, and the level of loans by commercial banks to the private sector is not much lower than

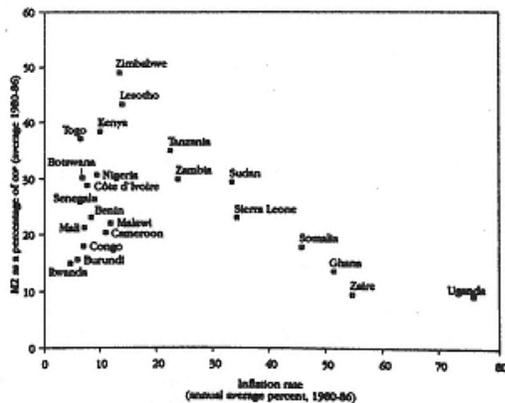


Figure 10-1.  
Financial Deepening and Inflation In 23 Countries  
in Sub-Saharan Africa, 1980-86 Averages  
Source: World Bank data.

in many non-CFA countries. A careful examination of this issue is beyond the scope of the present study.<sup>9</sup>

The data are repeated in figure 10–2 for the subsample of non–CFA countries.<sup>10</sup> The figure shows that the effect of inflation on the level of financial assets is weak when this inflation rate is moderate, that is, less than 20 percent on average (in Botswana, Nigeria, Kenya, Lesotho, and Zimbabwe).

The inverse relation between inflation and assets is strong when the inflation rate is in the range of 30 to 60 percent (on average). The ratios between quasi money (M2–M1) and money(M1) are also reported for each country in the diagram. In this range of inflation rates, the taxation of financial assets has a strong impact on the level of quasi money, which is used as a means of savings. The ratio of time deposits to money (demand deposits plus currency outside banks) is relatively high for countries with low inflation (ratios in Kenya and Zimbabwe are nearly 100 percent) and low in the countries with high inflation (such as Ghana, Zaire, and Uganda, where it is less than 30 percent).

An increase in taxation from a moderate to a high level may not generate a significant increase of revenues (figure 10–2). The measurement of these revenues is a complex issue that will be addressed in the next section, but we can suggest an approximation here that multiplies the base by the inflation rate minus a correction for the handling of the accounts (which is fixed arbitrarily at 5 percent).<sup>11</sup> The locus of points at which where revenues are equal to 6 percent of GDP is repre–

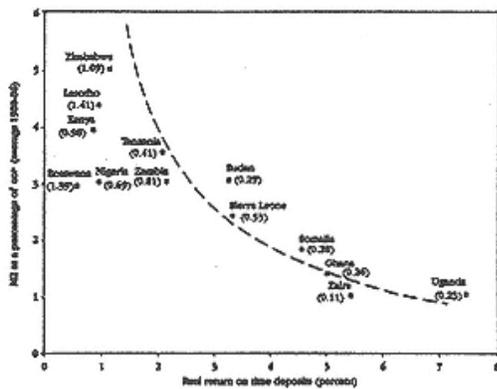


Figure 10–2.  
Financial Deepening and Inflation in 13 Non–CFA Countries In Sub–Saharan Africa, 1980–86 Averages  
Note: The numbers in parentheses are average ratios (M2–M1)/M1 for 1980–86. The dashed line is the locus of combinations of inflation and M2 yielding tax revenue equal to 6 percent of GDP. The real return on time deposits (X axis) is the difference between the nominal rate and the inflation rate.  
Source: World Bank data.

sented by the dotted curve. One can verify that it fits the data for the countries with high inflation rather well. This fit is not strong proof that high inflation does not bring more revenues, but it does indicate that the increase in revenue is not large. On average, an increase in the inflation rate of 30 to 60 percent does not generate much higher levels of revenues. It is quite possible, however, that very high inflation rates generate large revenues for short periods.

**Time Series**

The cross-sectional data show that in Sub-Saharan countries the relation between inflation and financial deepening is weak when the inflation rate is less than 30 percent. This conclusion also appears to be verified in the time-series data. Consider, first, the countries that have experienced higher levels of taxation on financial assets in Sub-Saharan Africa: Somalia and Zaire. These are the countries in which one can expect the most significant impact of taxation on financial intermediation and on financial deepening.

Countries with high inflation in sub-saharan africa. The demand for financial assets is estimated with an error correction model.<sup>12</sup> It is composed of the two equations:

$$(10-1) \quad Lm = C_1 + \alpha\pi + \beta Y_1 + \varepsilon$$

$$(10-2) \quad DLm = C_2 + aDY + b_0D\pi + b_1D\pi_{-1} + cDLm_{-1} + \delta\varepsilon + \varepsilon$$

where  $M$  is the financial assets,  $Lm = \text{Log}\left(\frac{M}{P}\right)$ ,  $P$  is a

price index (CPI),  $Y = \text{Log}(y)$ ,  $y =$  real GDP,  $\pi$  is the inflation rate.  $DLm = Lm - Lm_{-1}$ ,  $\varepsilon$  is the residual of the estimation of (10-1), and  $\delta\varepsilon$  is the residual of the estimation of equation (10-2).

The financial asset  $M$ , was chosen to be M2. Table 10-1 presents the results of the estimation for Somalia and Zaire.<sup>13</sup> Interest rates on time deposits were more or less constant for the periods of estimation. The inflation rate is therefore a good proxy for the tax rate on financial assets after the fact All equations show a significant inverse relation between the level of M2 and inflation.

The first equation determines the long-run relation between money and the inflation rate. The parameter  $\alpha$  is equal to the long-run elasticity of the demand for money and will be used later in the analysis of the efficiency cost of taxation. The second equation determines the adjustment of money demand in the short run. For example, in the case of Somalia, half of the gap between the long-run demand and the actual value is closed in a period (one year), and the inflation rate has

**Table 10-1. Demands for Financial Assets**

	Somalia	Zaire
<i>Level equation</i>	-0.52	-0.53
	(1.85)	(1.68)
<i>Adjustment equation</i>		
$a$	0.66	
	(2.09)	
$b_0$	-0.47	-0.46
	(2.34)	(2.6)

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$b_1$	0.54	
	(2.28)	
$c$	0.88	0.23
	(3.2)	(0.83)
$\delta$	-0.49	-0.35
	(2.6)	(1.84)
$R^2$	0.62	0.58

*Source:* International Financial Statistics.

a short-run effect that operates through the average  $\frac{(\pi_t + \pi_{t-2})}{2}$

Ghana is another country that experienced very high taxes on financial assets (more than 100 percent per year). But time-series estimations of the demand for money turned out to be unstable. This may be explained by the dramatic changes in policy (and political) regimes and by two episodes of demonetization that had an additional impact on the demand for money. Such an impact cannot easily be captured by standard equations. A more in-depth analysis is presented by Tsikata (1990).

**COUNTRIES WITH MODERATE INFLATION IN SUB-SAHARAN AFRICA .** The Sub-Saharan countries that experienced moderate inflation rates on average include Kenya, Nigeria, Tanzania, and Zambia. The results of the estimation of the demand for financial assets with the time-series data were not convincing. The case of Nigeria is perhaps the most interesting since it is one of the most developed countries in Sub-Saharan Africa, and the menu of financial assets there extends beyond M2 to include deposits at merchant banks and an embryonic stock market. The real rate of return on deposits was subject to large fluctuations in the period 1980 to 1985 and reached values on the order of minus 50 percent per year. Although these values would be significant in many other countries, they did not have a measurable impact on the level of deposits.

The time-series and the cross-sectional data for the Sub-Saharan countries lead to similar conclusions. Moderate inflation rates have an impact on the level of deposits that is difficult to detect. This effect is clearly identifiable when inflation rates exceed an average value of 50 percent for an extended period. The low interest elasticities may be due to limited possibilities of substitution between assets. The main assets for substitution are durable goods and foreign exchange. Trading in these assets may imply fixed costs, which limit the extent of substitution when the inflation rate is moderate. Later in the chapter we will see an important case in which financial taxation may lead to an increase in the level of deposits.

### Measurements of Revenues

The revenues from taxation of financial assets are difficult to measure because of the complexity of the instruments. Revenues should be the product of the assets by the tax wedge. Such a simple computation is just not feasible when the main instruments of taxation are interest ceilings and inflation. In the case considered here, the tax base corresponds roughly to the sum of currency and deposits at commercial banks. The taxation of the currency is included in the definition of seigniorage. We will see that, for many countries with regulations on financial institutions, the definition of seigniorage extends beyond the issuance of new currency.

### Methodology

Four problems arise in measuring the revenues of implicit financial taxation (the first three of which appear in economies with or without financial intermediation): (a) to define the position of "no taxation," (b) to reconcile the cash flows to the government and the burden on individuals, (c) to determine the impact of expectations on inflation, and (d) to account for the revenues in economies in which financial institutions absorb some of the government debt. These problems are first discussed briefly. Two measurement methods are then proposed and compared.

The issues can be introduced by looking at the simple case of an economy without financial intermediation and with a constant inflation rate. Assume first that the price level is stable and that the economy is growing. Seigniorage, as defined by the revenues from money creation, is positive because currency is issued at the same rate as the real growth rate. Are these revenues taxes? It seems that the answer is no since there is no "tax" on money. Friedman (1969) has argued, however, that money should pay an interest as capital, if the government could finance this policy (through lump-sum taxation).<sup>14</sup> If we follow this definition of the "no tax" position, the tax wedge on money should be defined by the sum of the inflation rate and of the real rate of return on capital. When the growth rate of the economy is lower than the real rate of return, which is required in the long-run for efficiency, this tax wedge is smaller than the rate of money creation. This definition implies therefore that the implicit tax on

money is greater than the level of seigniorage.

In this chapter, such issues are not of quantitative <sup>15</sup> importance. The difference between the growth rate and the real rate of return on capital is small, on the order of a few percentage points per year. It is negligible in comparison with the inflation rates that are observed in many developing countries. We therefore assume here that the tax wedge on the currency is equal to the sum of the inflation rate and of the real growth rate. In a steady state, the tax revenues are equal to the seigniorage revenues, that is, the revenues generated by the creation of money.

Unfortunately, the assumption of a steady state is almost always irrelevant, and when it is relaxed, serious difficulties arise. The main problem here is that the revenues are generated by the flow of the creation of money, whereas the tax burden is induced by a capital loss on the existing assets. In a stationary world, both would be identical, but the capability of the tax administration would probably be sufficient to avoid financial taxation. Revenue flows and capital losses are also roughly identical on average when the economy fluctuates around a steady state. But this identity does not provide information on the amount of revenues that can be generated in a given year. Furthermore, expectations about future policies have an impact on the current value of the inflation rate. As Sargent and Wallace (1985) have shown, a reduction in the rate of growth of money can induce an acceleration of the inflation rate.

Two methods can be used to measure seigniorage and can be extended to the taxation of financial assets. The first is based on the tax wedge and uses implicit rates of return. The second is based on the nominal increase of assets.

**METHOD 1 (rate of return).** In this method, the tax on financial assets is computed by multiplying the implicit tax wedges on the assets by the stocks. Consider first the case of currency (seigniorage). The wedge between the imputed and the actual rate of return defines the effective tax rate after the fact, and revenues are defined by the product of this rate and the level of the asset. There are two problems with this method.

First, as the previous discussion showed, because of anticipation effects, this measure does not give an accurate evaluation of effective government revenues in a given year. Moreover, some of the variations in the price of assets may be exogenous to government policies. Second, the data are often available only on an annual basis. Fluctuations in the inflation rate during the year introduce additional errors.

For these reasons, this method is not used to compute seigniorage revenues (Fischer 1982). The same problems arise when the method is used to measure the taxes on other financial assets, such as deposits at commercial banks.

Method 2 (cash flow). The procedure used to measure seigniorage revenues is to compute the cash flow generated by the expansion of the monetary base. The method is then used to measure the revenues from the financial taxation of other assets. Consider first the case of seigniorage.

The cash-flow that is generated by an expansion of the monetary base  $dM$  is equal to

$$(10-3) \quad R = \frac{dM}{P}$$

If the data on  $dM$  and  $P$  were available at every instant, the computation of revenues would be easy. But the values of  $dM$  and  $P$  are reported only at discrete times. Moreover, the price index (often the CPI) may not reflect the composition of government expenditures.

For this reason, most people use a measure such as the one in Fischer (1982), where the amount of revenues is estimated by the formula:

$$(10-4) \quad R' = \frac{\Delta M}{Y}$$

The term  $\Delta M$  is the increment over a discrete period, and  $Y$  is the value of nominal GDP over the same period. The value of  $R'$  measures the ratio of real income from money creation over the real value of GDP for the period. For most developing countries, the minimum period for the computation of GDP is one year. This formula uses standard national income data with no price index or deflator to produce a measure of real income and is thus convenient. It gives an exact measure of real income when the velocity of money is constant, and the rate of growth of money is constant during the period (one year).

When one of these two conditions is not satisfied, the formula is subject to errors. When the inflation rate increases, the first method leads to gross overestimates. This is illustrated in synthetic examples in Chamley (1991) and will be verified later in historical examples.

We have seen that reserve requirements are equivalent to a tax on demand and time deposits. These are included in the base for the seigniorage revenues in equations (10-3) and (10-4). The combination of low ceilings on nominal interest rates, high inflation, and government borrowings (at the so-called market rate) has the same effect on government revenues (with an additional rationing on private credit markets). Should one then include the expansion of the government debt in the term  $\delta M$ ? This correction is not even sufficient when credits to the private sector finance the arrears of the government (as occurred in Nigeria). Is the expansion of M2 a better measure of revenues? This would probably be a good procedure when interest ceilings are near zero and inflation is high, but it is inappropriate when inflation is low, interest rates are slightly

below zero, and financial assets are growing because of a surge of the saving rate or financial deepening.

The computations are even more complicated when the debt pays a positive but below-market interest. These issues are ignored in most studies that compute seigniorage revenues. For some countries that rely only on reserve requirements and market interest rates, the standard measure is appropriate (subject to the errors mentioned above). In the countries of Sub-Saharan Africa, and in others whose interest rates have been regulated in an inflationary environment, these measurement problems cannot be ignored.

### Examples

The evaluation of computation procedures depends on the policy background of the countries. In table 10–2 the two previously described methods are applied to the cases of Ghana, Somalia, Zaire, and Zambia. The results illustrate some of the remarks in the methodological discussion.

Consider the case of Ghana. The first period of high financial taxation occurred in 1976 and 1977, with inflation rates of 56 and 116 percent, respectively (table 10–2). The revenue from the tax, according to method 1, is equal to 10.7 and 16.9 percent of GDP for the same years. Now the cash–flow method (method 2), and include the entire expansion of M2 in the cash flow (which is an upper bound of the revenues). This yields revenues of 7.3 and 9.7 percent of GDP. Furthermore, these numbers may already be overestimates since the velocity of money increased in that period. The results of the two procedures can also be compared for the entire period 1971 to 1987: method 1 yields an average amount of 7.6 percent of GDP, which is almost double the second estimate of 4.2 percent.<sup>15</sup> This is not surprising in view of the large fluctuations in the inflation rate and the increased velocity of money.

The case of Somalia (table 10–2) is somewhat similar. Inflation began to increase in 1979 (22 percent), peaked in 1980 (47 percent), and was still high in 1981 (37 percent). The loss of income on financial assets as computed with method 1 was equal to 5.2, 12.8, and 6.3 percent of GDP, respectively. For the same years, method 2 yields the values of 7.6, 4.8, and 4.5 percent. In both cases, we see that the first method overstates the variations in revenues. For 1971–87 in Somalia, the two methods yield averages of 4.9 and 4.3 percent of GDP, respectively. Note however, that method 2, which includes all of M2, may be an overestimate of the true revenue. This overestimation is especially relevant before 1980, which was a period of financial deepening with relatively low taxation. For those years the result of the first procedure is lower than that of the second, sometimes by four percentage points.

These results can also be obtained in other cases (for example, Zaire in 1976). They indicate that in years of high inflation the first method, which is based on tax rates, seriously overestimates the actual amount of revenue that accrues to the government. When the revenues of financial taxes are large, the cash–flow method is more reliable.

### Efficiency Cost of Taxation

The most important distortions caused by taxation and regulations on financial institutions concern the level of deposits and the allocation of the available funds in credit markets. Although regulations do affect the efficiency of the operations of financial institutions, the variations in the banks' margins of operating costs (less than 5 percent of the deposits) are negligible with respect to the impact of taxation on the rate of return of deposits.

A comprehensive discussion of the efficiency cost of financial taxation should consider four types of distortions: (a) the reduction of the level of financial assets in the formal sector and the substitution toward other markets (informal, foreign), (b) distortions in the allocation of the available assets because of regulations such as interest ceilings, (c) interactions between taxes and existing imperfections in the credit markets, and (d) the impact on the level of saving and the intertemporal allocation of resources.

The first three kinds of distortion can be analyzed in a static framework with a level of capital that is exogenous and either constant or increasing at a given rate. In many cases, the first source of distortion is sufficient to show that the efficiency cost of financial taxation is high compared with the revenues collected, and probably higher than the cost of standard taxes for many countries. The second and the third types of distortion can also generate high efficiency costs, even when the first distortion is relatively small.

The fourth type of distortion is quite different because it operates through the impact on capital accumulation and the effect of capital accumulation on growth. The magnitude of this distortion is more controversial as it depends on the interest elasticity of saving and the properties of the growth model. Its analysis deserves separate

consideration and is beyond the scope of the present discussion.

### Measurement of the Efficiency Cost

In the simple model of analysis, the demand for loans from the financial sector depends on the marginal productivity of capital. The supply of funds to the financial sector depends on the rate of return of deposits and on the opportunity cost of the use of funds. Alternative uses may include consumption or informal capital markets. The impact of taxation on saving will not be discussed here. The analysis will instead focus on the impact on the allocation of savings. The inclu-

**Table 10-2. Measurements of Tax Revenues**

Variables	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
<i>Ghana</i>																
m <sup>2</sup> /GDP	0.180	0.202	0.208	0.192	0.226	0.251	0.221	0.194	0.196	0.162	0.137	0.155	0.097	0.097	0.114	0.113
Inflation	0.095	0.100	0.176	0.181	0.298	0.560	1.164	0.731	0.544	0.500	1.164	0.222	1.228	0.396	0.103	0.245
Tax rate	0.064	0.067	0.136	0.140	0.236	0.426	0.764	0.531	0.414	0.383	0.759	0.175	0.790	0.310	0.071	0.187
Mes2	0.014	0.062	0.030	0.040	0.066	0.073	0.097	0.094	0.024	0.042	0.052	0.028	0.030	0.038	0.039	0.040
Mes1	0.011	0.013	0.028	0.027	0.053	0.107	0.169	0.103	0.081	0.062	0.104	0.027	0.076	0.030	0.008	0.021
Inflation (six years moving average)						0.235	0.413	0.518	0.580	0.633	0.777	0.721	0.732	0.676	0.602	0.560
Mes2 (six years average)						0.047	0.061	0.067	0.066	0.066	0.064	0.056	0.045	0.036	0.038	0.038
Mes1 (six years average)						0.040	0.066	0.081	0.090	0.096	0.104	0.091	0.075	0.063	0.051	0.044
<i>Somalia</i>																
m <sup>2</sup> /GDP	0.189	0.165	0.222	0.235	0.198	0.221	0.222	0.228	0.247	0.278	0.176	0.163	0.151	0.099	0.111	0.123
Inflation	-0.00	-0.02	0.065	0.182	0.193	0.141	0.105	0.099	0.242	0.588	0.444	0.236	0.359	0.911	0.377	0.357
Mes2	-0.03	0.045	0.034	0.058	0.047	0.037	0.054	0.062	0.076	0.048	0.045	0.021	0.008	0.021	0.060	0.031
Tax rate	-0.00	-0.03	0.059	0.163	0.170	0.125	0.094	0.089	0.211	0.459	0.360	0.198	0.290	0.637	0.291	0.268
Mes1	-0.00	-0.00	0.013	0.038	0.033	0.027	0.021	0.020	0.052	0.128	0.063	0.032	0.043	0.063	0.032	0.033
Inflation (average)						0.091	0.109	0.131	0.160	0.228	0.270	0.286	0.328	0.463	0.486	0.447
Mes2 (average)						0.031	0.046	0.049	0.056	0.054	0.054	0.051	0.043	0.036	0.034	0.031
Mes1 (average)						0.017	0.021	0.025	0.032	0.047	0.052	0.053	0.056	0.064	0.060	0.044
<i>Zaire</i>																
m <sup>2</sup> /GDP	0.209	0.220	0.215	0.238	0.273	0.228	0.248	0.280	0.171	0.149	0.168	0.209	0.184	0.162	0.146	0.154
Inflation	0.057	0.157	0.156	0.274	0.290	0.806	0.690	0.484	1.086	0.420	0.349	0.362	0.771	0.522	0.238	0.444
Mes2	0.014	0.041	0.066	0.064	0.023	0.071	0.111	0.117	0.006	0.070	0.068	0.106	0.088	0.051	0.036	0.068
Tax rate	0.049	0.139	0.136	0.232	0.246	0.591	0.523	0.391	0.738	0.345	0.294	0.302	0.568	0.415	0.203	0.359
Mes1	0.010	0.030	0.029	0.055	0.067	0.135	0.130	0.109	0.126	0.051	0.049	0.063	0.104	0.067	0.029	0.055
Inflation (average)						0.290	0.395	0.450	0.605	0.629	0.639	0.565	0.579	0.585	0.444	0.447
Mes2 (average)						0.046	0.063	0.075	0.065	0.066	0.074	0.080	0.076	0.065	0.070	0.069
Mes1 (average)						0.054	0.074	0.087	0.104	0.103	0.100	0.088	0.084	0.077	0.061	0.061
<i>Zambia</i>																
m <sup>2</sup> /GDP	0.285	0.244	0.236	0.225	0.295	0.294	0.332	0.297	0.276	0.283	0.270	0.318	0.330	0.320	0.269	0.237
Inflation	0.060	0.050	0.064	0.080	0.101	0.187	0.197	0.163	0.096	0.117	0.139	0.124	0.196	0.200	0.374	0.516
Mes2	-0.03	0.013	0.040	0.012	0.029	0.063	0.029	-0.03	0.065	0.016	0.013	0.083	0.023	0.038	0.037	0.133
Tax rate	0.043	0.034	0.047	0.062	0.082	0.154	0.156	0.126	0.066	0.082	0.105	0.090	0.147	0.146	0.251	0.344
Mes1	0.012	0.008	0.011	0.014	0.024	0.045	0.051	0.037	0.018	0.023	0.028	0.028	0.048	0.046	0.067	0.081
Inflation (average)						0.090	0.113	0.132	0.138	0.144	0.150	0.140	0.139	0.145	0.192	0.258
Mes2 (average)						0.020	0.031	0.023	0.027	0.028	0.025	0.029	0.028	0.040	0.035	0.055
Mes1 (average)						0.019	0.025	0.030	0.031	0.033	0.034	0.031	0.030	0.032	0.040	0.050
Seigniorage	-0.04	0.012	0.020	-0.00	0.034	0.025	-0.00	0.005	0.004	0.011	0.013	0.014	0.012	0.015	0.016	0.083
Seigniorage (average)						0.007	0.014	0.013	0.010	0.013	0.009	0.007	0.010	0.012	0.014	0.026

n.a. Not applicable.

Source: International Financial Statistics.

sion of saving effects would introduce additional efficiency costs.<sup>16</sup> The rate of return on deposits is equal to the rate of return of the loans of financial institutions, net of the operating cost. Assuming as a first approximation that the operating costs per unit of funds are constant, both schedules can be represented on the same diagram (figure 10-3). Note that there may be some interaction between the demand and the supply schedule: if funds are reallocated from banks to the informal market, the demand for loans in the formal market may decrease.

Taxes on financial assets introduce a wedge between the lending and the deposit rate. This wedge creates an efficiency cost that is measured by the area of the Harberger triangle. A nice property of the model is that it requires only information on the elasticities of the demand and the supply of funds. This point should be stressed: no description of the alternative uses of funds (informal market, consumption, or others) is necessary, provided that there are no distortions in these markets.<sup>17</sup> Note that informal markets may present some inefficiencies when compared with intermediation in the formal market. But informal markets coexist with formal financial markets and present possibilities for economic substitution, because some of their inefficiencies are compensated for by strengths. As an example, informal credit markets may offer less diversification of risk, but they do provide some special relation between lender and borrower that improves the monitoring capability.

This application of the concept of excess burden in figure 10–3 also allows for interactions between the schedules of demand and supply: all things being equal, these schedules do not depend only on the rate of return. As the tax reduces the rate of return on deposits in the formal market, the substitution toward the informal sector increases the supply of funds in the informal sector, reduces the equilibrium rate in that sector, and thus reduces the demand for loans in the

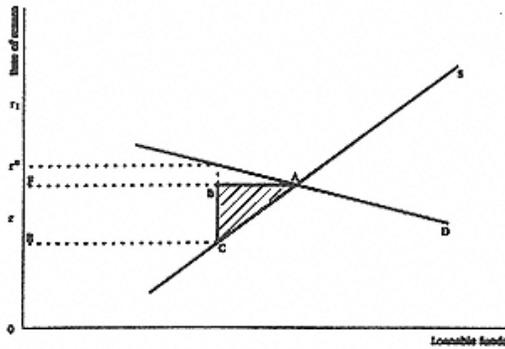


Figure 10–3.  
The Demand and Supply Schedules for Loanable Funds

informal sector. Such an interaction decreases the slope of the demand schedule for loans in figure 10–3. The efficiency cost of the tax is measured by the observed changes of demand and supply that are induced by the tax.

A lower bound of the efficiency cost is approximated by the area of the triangle ABC, which is equal to

$$(10-5) \quad E = \frac{(r^* - r) \Delta D}{2}$$

where  $r^*$  and  $r$  are the real rates of return with no tax and with a tax, respectively, and  $\Delta D$  is the reduction of the level of deposit induced by the tax. This expression is useful for two reasons. First, there is often little information on the interest elasticity of the demand for loans. Second, in some important cases, this expression is likely to capture most of the efficiency cost. The amount of the underestimation is equal to

$$(10-6) \quad A = \frac{(r_1 - r^*) \Delta D}{2}$$

where  $r_1$  is the marginal productivity of investment when the tax is in place. When the effective tax wedge is large, the value of the real net rate  $r$  is negative, large in absolute terms, and the interest gap  $r^* - r$  is probably much larger than the difference  $r_1 - r^*$ .

Marginal efficiency cost. It is well known that the measurement of the excess burden through the Harberger formula is of the second order with respect to the tax rate, and therefore with respect to the amount of tax revenue. Since the average efficiency cost increases linearly with the tax rate, however, the value of the marginal cost increases with the tax wedge and may reach significant levels. Consider a small change of the net rate of return of financial assets, which has an impact  $dS$  on the level. The marginal efficiency cost is equal to

$$(10-7) \quad MEB = (r^* - r) dS$$

Revenues (implicit or explicit) are equal to  $(r^* - r)S$ , and the marginal change of revenues is equal to

$$(10-8) \quad dR = (r^* - r) dS - S dr$$

The marginal efficiency cost per unit of revenue is obtained by taking the ratio between these two expressions:

$$(10-9) \quad MEC = \left\{ \frac{(r^* - r) \left[ \frac{-S'(r)}{S(r)} \right]}{1 - (r^* - r) \left[ \frac{S'(r)}{S(r)} \right]} \right\}$$

The sign  $S'$  is positive. As expected, the marginal efficiency cost increases with the interest gap  $r^* - r$ , and with the response  $-S'$ . [18](#)

When the demand for financial assets is of the form (10-1), the expression (10-9) becomes

$$(10-10) \quad MEC = \frac{\alpha}{1 - \alpha}$$

**EMPIRICAL ESTIMATES** . The discussion earlier showed that when the level of taxation is low, it is difficult to observe an impact on the level of financial assets. Any effect, if it exists, is weak and is dwarfed by other determinants of financial deepening. When the tax rate is high, however, we have seen that the effect is strong and measurable. Using the empirical results of the previous section and equation (1010), the marginal excess burden can be computed. The values obtained for Somalia and Zaire are presented in table 10-3. These numbers are complemented with others from a previous study on financial liberalization in Southeast Asia (Chamley and Hussain 1989).

The values of the efficiency cost depend on the assumption about the inflation rate (in the first column). They are higher than those obtained by estimating the demand for money in industrialized economies with high inflation (Cagan 1956). This property was discussed earlier.

**COMPARISON WITH THE CROSS-SECTIONAL EVIDENCE** . From the cross-sectional data, it appears that there was hardly any revenue gain when the inflation rate was between 50 and 100 percent, which is the relevant interval for Somalia and Zaire. Indeed, there is good reason to believe that the time-series results underestimate the true elasticities in developing economies where a process of financial deepening is stopped by high inflation.

In the Sub-Saharan countries with moderate and low inflation (see figure 10-2), financial deepening (as measured by the ratio of financial assets to GDP) has progressed gradually since the early 1970s. The development of the financial sector entails fixed costs that can be paid back only in a stable environment. In an environment of high taxes, there is no growth of financial assets for a saving purpose, and the money in circulation is used mainly for transactions. This motive is less sensitive to the rate of return on money (currency-to-GDP ratios are typically not very sensitive to inflation in the range of 40 to 60 percent). One can

therefore expect that time–series estimates will show relatively low interest elasticities of the demand for money. The problem here is that models of linear equations such as (10–1) may be somewhat deficient for economies that undergo the structural changes associated with economic development.

This discussion implies that the values of table 10–3 should thus be regarded as conservative estimates.

### **Interest Ceilings and Allocations in Credit Markets**

Interest ceilings have two effects on credit markets: they discriminate against risky investment projects, and they induce rationing. The first effect occurs as soon as the interest ceiling is gradually lowered from the market equilibrium rate. The second effect does not occur until the ceilings have dropped to some critical level.

Risky projects are discriminated against because the ceilings apply uniformly to loans in all projects and do not make an allowance for the risk premium and different probabilities of default. The effect is similar to that of the corporate tax in the standard Harberger model, where a fixed amount of capital is allocated between two sectors. When this effect occurs, lenders allocate funds on the margin to the less risky risk sector (where the rate of return is equal to the ceiling). There is no general rationing, although some of the more risky sectors may be excluded because they are beyond the margin. The implication of the Harberger model is that for small tax rates the efficiency cost is only of the second order with respect to the implicit tax rate.

When the ceiling is sufficiently low, or all projects are identical, rationing may occur. This rationing creates rents and may lead to an inappropriate allocation of the available funds. If the demand schedule,  $D$ , is very elastic, the maximum efficiency cost of the rationing is thus represented by the area ACEFA in figure 10–3. In general, information is inadequate to evaluate this cost more precisely. Note, however, that it is of the first order with respect to the implicit tax wedge. Therefore, for small wedges, the efficiency cost of rationing is higher than the efficiency cost measured in table 10–3.

### **Imperfect Markets**

The preceding analysis was applied to an economy in which the alternative to money holding is to invest in activities without distortions, that is, activities in which the private rate of return is equal to the social rate of return. This assumption may not be valid in many cases, but a policy that addresses this issue must rest on a clear evaluation of the distortion. In many instances it will be difficult to arrive at an objective evaluation, but one important case provides additional insight into the empirical estimates of the efficiency cost of financial taxation. We have already noted that, for various reasons, capital markets in developing countries are subject to imperfections. As Shaw pointed out a long time ago, a consequence of these imperfections is that investment goods (or any bulky item such

as durable goods) cannot be purchased until cash balances have accumulated. This is especially true in an economy without credit, but even when credit is available, the bank may finance only a fraction of the investment, and the rest will be financed by cash balances (see also Fry 1988).

Consider the problem of an investor who has no access to credit and has a positive cash flow that is saved in money for the purchase of a durable good. The real value of this flow is assumed to be constant. Assume for simplicity that in an initial environment there is no inflation and that the rate of return on the deposit is nil. Now the inflation rate takes a positive value. Inflation acts like a tax on the durable good and increases its effective cost. If the demand for durable goods is relatively inelastic, positive inflation will push the average level of the cash balance up at every moment before the purchase.<sup>19</sup>

This argument has two implications. First, it may explain some of the behavior of deposits in SubSaharan countries. We have seen that in countries with temporary episodes of significant inflation (such as Nigeria or Zambia before 1986) there is no clear relation between the level of money holdings and inflation. Second, it shows that the values in table 10–3 probably underestimate the efficiency cost of financial taxation: the tax introduces other distortions in the allocation of durable or even investment goods that cannot be measured by the Harberger triangle of figure 10–3. This is particularly clear when the inflation tax causes the demand for durables to fall while the demand for deposit balances remains constant: although the reduction of the demand for durables is a distortion, the analysis does not measure any efficiency cost.

**Conclusion: Financial Taxation and Development**

This chapter has shown that the measuring the revenues from financial taxation is not a simple task. The efficiency cost of financial taxation is unambiguously large with respect to revenue collected when the

**Table 10–3. The Efficiency Cost of Taxation**  
(percentage points)

<i>Country</i>	<i>Tax Rate</i>	<i>MEC</i>
Somalia	60	0.43
Zaire	60	0.43
	100	1.0
	200	
Thailand	5a	0.58
Indonesia	13a	1.19

a. This value is the difference between the average real rates before and after the liberalization (see Chamley and Hussain 1989).

rate of taxation is more than 30 to 40 percent Tax rates of less than 20 percent seem to have, in proportion to revenues, a much smaller effect on assets and efficiency costs. Similar conclusions have been obtained in another context by Dornbusch and Reynoso (1989)

rate of taxation is more than 30 to 40 percent Tax rates of less than 20 percent seem to have, in proportion to revenues, a much smaller effect on assets and efficiency costs. Similar conclusions have been obtained in another context by Dornbusch and Reynoso (1989).

Although it is difficult to detect the impact of small tax rates on the level of deposits at commercial banks, there may be other significant distortions even when the observed interest elasticity of financial asset is equal to zero.

Financial taxation has an adverse impact on future expectations about taxation and thus affects the development of the financial system. These long–terms effects are difficult to measure by standard time–series estimates. A comparison of financial taxation in the Sub–Saharan countries indicates that the long–term effect may be significant.

This chapter is based primarily on data from countries that do not have a sophisticated financial system. As countries develop a larger menu of assets, the possibilities for substitution increase and the efficiency cost of

financial taxation rises. This can be seen in the effect of financial liberalization in Thailand and Indonesia (Chamley and Hussain 1989), where an increase in the deposit rate by a few percentage points led to a huge growth of deposits (by more than 20 to 50 percent). The efficiency cost of financial taxation thus depends on the stage of development.

This analysis of the efficiency costs was limited to a partial equilibrium framework. The extension to general equilibrium models with endogenous capital (physical or human) is an important topic for future research (see, for example, Bencivenga and Smith 1991; and Greenwood and Jovanovic 1989).

### Notes

Stimulating comments by Sheetal Chand, Javad Khalilzadeh–Shirazi, and Bela Balassa are gratefully acknowledged.

1. The taxation of financial assets in Sub–Saharan countries has also been analyzed in Chamley and Honohan (1990). The contents of the two papers are somewhat different.
2. The stock market plays an important role in a number of developing countries, especially in Asia. Also, private individuals own government bonds in these countries.
3. The only (possibly minor) difference, is that by altering requirements on forced borrowings, the government can generate a cash flow, for a temporary period, which exceeds substantially the implicit tax that is due to the interest rate differential. Such a policy does not affect the present value of (implicit) tax revenues, however.
4. The loan and deposit rate are assumed to be equal, for the sake of simplicity. In this stylized example there is no operating cost of the financial institutions.
5. In Nigeria, banks were heavily subsidized between 1984 and September 1986, when they collected interest–free deposits toward import licenses, which they were allowed to invest in T–bills earning between 9 and 10 percent.
6. The missing countries (among the reporting members) are Ethiopia, Madagascar, Liberia, and some of the countries in the CFA zones that would be redundant with the data in figure 10–1 (Burkina Faso, Chad, Niger).
7. The CFA countries belong to one of the two currency zones with a fixed parity with the French franc (a constant nominal exchange rate since 1953) and specific constraints on monetary policy (see Honohan 1990).
8. The exception is Togo, with an index of financial deepening of 10 points more than in the all the other CFA countries; the difference is probably due to the inflow of funds from neighboring Ghana, where inflation exceeded 100 percent at the same time.

9. Note that in the cases of relatively low financial deepening, the shortfall of deposits is compensated by loans from the central bank to the commercial banks, such that the ratio of credit to GDP<sup>21</sup> in a country such as Côte d'Ivoire is not much different from that in, say, Kenya. The relatively high deposits in Togo can be explained by a substitution from the highly taxed Ghana.
10. An adjustment is made here for the interest that is paid on time deposits. This adjustment is negligible because most interest rates were fixed during the period. This is confirmed by a comparison with figure 10–1.
11. Such choice is not critical.
12. Ordinary least–squares equations with lagged dependent variables generate estimates of the long–term interest elasticity that are much overstated. For the error correction model, see Engle and Granger (1987).
13. Instrumental variables are variables lagged at least twice, and statistics are presented in parentheses.
14. The proposition can be extended in an economy with distortionary taxation (Chamley 1985).
15. An accurate accounting would add to both results the revenues from the outright demonetizations that occurred in this period.
16. Giovannini (1985) did not find any effect of the net rate of return on saving. It is well known, however, that a zero interest effect does not imply that the intertemporal efficiency cost of interest taxation is equal to zero.
17. The existence of distortion may call for some policy intervention. The determination of a corrective policy, however, should follow from the analysis of the distortion and its impact on the allocation of funds. This is not the topic considered here.
18. This formula is an approximation since it is derived by a simplified partial equilibrium analysis. For small tax rates, this formula may be a good approximation of the efficiency cost of inflation in general equilibrium (Chamley 1985).
19. This can be seen by a recursive argument: assume that time is divided into periods and that the cash flow accrues at the end of the period. In the last period of the saving process, the purchase is made and its value is equal to the sum of the cash flow in that period and the deposit balance at the end of the period. Inflation erodes the deposit balances and thus requires a higher level of the balance at the beginning of the last period (in order to have the same real balance at the end of the period when the purchase is made). A recursive argument is then applied to all periods during the accumulation process, the length of which may depend on the inflation rate.

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## **PART V— TAX INCIDENCE ANALYSIS**

### **11— The Redistributive Impact of Taxation in Developing Countries**

Anwar Shah and John Whalley

This chapter examines the incidence (redistributive impact) of taxes in developing countries. Although this topic has received considerable analytical attention (see Bird 1987; Bird and de Wulf 1973; de Wulf 1975; and McLure 1977), earlier work has consisted mainly of replicating the conventional studies done for developed countries.<sup>1</sup> This tradition continues to be followed even though the results for developed countries have been challenged in a number of important ways in recent years. The results of such analyses also need to be questioned in the context of developing countries, particularly when evaluating incidence effects that accompany structural reforms in the tax systems of these countries.

Many problems can arise in applying the incidence techniques used in developed countries to developing countries. Those considered here stem from the interaction between tax policies and other common features of the policy and regulatory environment in developing countries such as protection, rationed foreign exchange, price controls, black markets, and credit rationing.

As this chapter illustrates, misleading conclusions can be drawn from studies that ignore these developing country features. Indeed, incidence patterns are often quite the reverse of what is taken to be conventional wisdom, and even where this does not occur, actual patterns and analytical results exhibit considerable quantitative differences from conventional studies.

#### **Tax Incidence Analysis for Developed Countries**

As already mentioned, most previous studies of the redistributive effects of taxation in developing countries have been patterned after studies of taxation in developed countries, all of which contain numerical calculations of annual tax incidence.<sup>2</sup> They make various assumptions as to how components of the tax system are shifted onto consumers, producers, factor owners, and other groups. The components of primary interest are usually income, corporate, sales and excise, property, and social security taxes. Each is treated as having effects on the sources or uses side of income that reflect the extent to which any given tax is borne partly or fully by either of these aspects of income—that is to say, capital income, labor income, and transfers on the sources side, and by household savings and expenditure patterns on the uses side. In the literature, the terms "shifting assumptions," "incidence assumptions," and "sources and uses side effects" all refer to assumptions about the allocation of tax burdens. These terms are used interchangeably here, although we mainly use the term "shifting assumption."

Earlier studies assume that three main sources of income bear the burden of taxes: capital income, labor income, and transfers. Transfers are found to be heavily concentrated at the lower end of income distribution, capital income is concentrated in both the upper and lower tiers (because of presence of retirees), and labor income is closest of the three series to being proportional to income. Thus, depending on whether a tax is allocated to capital

income, labor income, transfers, or income in general, it can have either a progressive or regressive effect. On the uses side, the key feature is differential savings rates by range of income. Since about 40 percent of household savings are concentrated in the top 10 percent of income distribution, taxes that are assumed to be borne by consumers of taxed products produce a regressive effect.<sup>3</sup>

The effects of taxes on the sources and uses of income that appear in earlier incidence calculations reflect their allocation to the various components of annual household budget constraints, written for simplicity as

$$(11-1) \quad C + S = K + L + Tr - PT$$

where  $C$  and  $S$  denote consumption and savings, respectively, and  $K$ ,  $L$ ,  $Tr$ , and  $PT$  are capital and labor income, transfers, and personal taxes. The side effects of taxes on uses across households arise because consumption-to-savings ratios differ by household. Sources side effects arise because the composition of income (such as wages, interest payments, and social security) varies from one income group to another.

Incidence estimates for whole tax systems reflect separate incidence calculations by income range for each tax, which are then summed across taxes. Combined, they yield an average total tax rate for each income range. The extent of redistribution through the tax system is evaluated by examining the pattern of average tax rates by income range. It is widely agreed that net redistribution involving expenditures and taxes may be more significant than tax incidence alone and that lifetime rather than annual incidence calculations should form the basis for evaluating tax reform initiatives. Data limitations are frequently cited as reasons why these calculations are not made.<sup>4</sup>

The principal finding from earlier studies is that the tax system does little to redistribute income. One widely cited set of incidence calculations was done for the United States (Pechman and Okner 1974). These calculations were based on approximately 87,000 income tax returns and 30,000 households from a 1966 U.S. Survey of Economic Opportunity file. Other incidence calculations were made for different shifting assumptions. The conclusion from this study was that regressive and progressive taxes in the United States roughly offset each other and that this finding was little affected by the choice of shifting assumption used in the calculation. This conclusion, often referred to as the proportionality hypothesis, has been at the center of tax reform debates in the United States and elsewhere. The same theme emerges from other incidence studies for developed countries.

In work on Canada's tax system, for example, Gillespie (1980:170) concludes that the system is "regressive over the upper income classes." He stresses net fiscal incidence (the value of benefits from government expenditures, less the taxes borne by the income range) rather than simply tax incidence. His analysis is limited to a single set of shifting assumptions but uses a different income concept from that proposed by Pechman and Okner: he excludes transfers in income.

In contrast, Browning (1978, 1984) and Browning and Johnson (1979) have argued that the proportionality hypothesis should be viewed as progressive. The main difference between their work and that of Pechman and Okner lies in their treatment of sales and excise taxes and in their income concept.<sup>5</sup> Browning and Johnson argue that uses side effects due to differential savings rates by income range by and large disappear when lifetime savings rather than annual income are considered. They therefore only consider sources side effects of indirect taxes. Furthermore, they point out that, since transfers are largely indexed for changes in the price level, only factor incomes can bear the burden of indirect taxes passed forward as higher prices. The fact that transfers are concentrated at the lower end of income distribution and savings at the upper end means that sales taxes and excises are regressive in the incidence calculations of Pechman and Okner but progressive in the work of Browning and Johnson.

## Tax Policy in Developing Countries

Table 11–1 presents the main shifting assumptions used in these calculations and indicates which ones produce progressive or regressive incidence results. As can be seen, the principal areas of disagreement are the corporate, property, sales, and excise taxes.<sup>6</sup> The income tax is uniformly treated as being paid by income recipients and is considered progressive because of increasing average tax rates. Social security and related contributions are treated as payroll taxes on labor and, outside of the lower end of income distribution, are considered regressive because of the ceilings on contributions. Corporate and property taxes are regressive if treated as having shifted forward to consumers but progressive if assumed to have shifted backward to the recipients of capital income.<sup>7</sup> Corporate taxes are even more progressive if assumed to be borne by capital income specific to taxed industries rather than by capital income in general, because of the light tax treatment of widely held housing capital. In some of the literature, this is a reason for using dividends rather than all capital income (which includes dividends) as a more progressive distributor series for allocating corporate taxes. Sales and excise taxes are regressive if borne by consumers and progressive if borne by recipients of factor incomes.<sup>8</sup>

The point that incident results are sensitive to the choice of shifting assumptions in the tax incidence calculations of developed countries is also developed by Whalley (1984). He reports a series of incidence calculations for Canada, all based on the same 1972 microconsistent demand, production, and tax data originally compiled for general equilibrium tax policy modeling (see St–Hilaire and Whalley 1983).

Whalley reported a number of variations on a set of central case assumptions and calculations that showed how the tax system could be made to appear either sharply progressive or sharply regressive. The assumptions used in this central case variant were deliberately kept simple. The individual income tax was assumed

**Table 11–1. Assumptions Used in Developed Country Tax Incidence Calculations and Their Effects on Tax Incidence**

<i>Incidence pattern</i>	<i>Most progressive</i>	<i>Most regressive</i>	<i>Shifting assumptions by tax</i>	<i>P–O most redistributive case a</i>	<i>P–O least redistributive basic case a</i>	<i>Gillespie's basic case b</i>	<i>B–J comp case</i>
P			Individual income tax (not shifted): allocated to taxpayers according to income taxes paid.	X	X	X	X
			Corporation income tax				
P			To capital income in general				X
P	X		Half to capital income in general; half to dividends (stockholders)			X	
A		X	Half to capital income in general; half to total consumption		X		
P			Half to capital income in general; half to factor incomes				X
A			Half to dividend income; half to total consumption				
			Property taxes				
			On land				
P			To capital income in general			X	X
P			To landowners	X	X		

## Tax Policy in Developing Countries

P	X		To capital owners					
P		X	Half to capital income in general; half to factor income					
			On structures and improvements					
P	X		To capital income in general	X				X
R		X	To shelter and consumption		X		X	
P			Half to capital income in general; half to factor income					
			Sales and excises					
R		X	To consumers of taxed goods	X	X		X	
P	X		To factor incomes					X
			Social security					
			On employees					
A			To employee compensation	X	X		X	X
			On employers					
A			To employee compensation	X			X	X
A		X	Half to employee compensation; half to consumption		X			
P	X		Half to employee compensation; half to factor income					

*Note:* The first column indicates whether a particular shifting assumption results in a progressive (P), regressive (R), or ambiguous pattern, ambiguous being when two opposite patterns occur across income classes.

a. P–O refers to Pechman and Okner (1974).

b. Gillespie refers to Gillespie (1980).

c. B–J refers to Browning and Johnson (1979).

*Source:* Whalley (1984).

to be borne by income recipients, with no uses side effects from the tax. Capital income was assumed to bear corporate and property taxes, regardless of the type of industries in which the capital was used—an assumption of a long–run equilibrium situation with intersectorally mobile capital. Sales and excise taxes were assumed to be borne on the uses side in proportion to taxed consumption. Social security taxes were borne by labor income, with the ceiling on contributions yielding a regressive pattern.

The incidence results implied by these assumptions are reported in table 11–2. When central case incidence assumptions were used, total tax rates increased from 27.5 percent to 43 percent, moving from the lowest to the highest income brackets, showing a mild degree of progression intermediate to the Pechman–Okner and Browning calculations discussed earlier. Income tax rates reflected average tax rates by income range and were progressive. The incidence of the corporate and property taxes reflected the capital income distribution. Increasing savings rates by income range produced a regressive pattern of sales and excise tax rates. Because of ceilings on annual contributions for social security taxes, tax rates beyond the lower income ranges were regressive.

Whalley then showed how a number of changes in incidence assumptions could make the tax system appear substantially more progressive. The central case assumptions yielded three progressive and two regressive taxes. To make the tax system more progressive, one has to find justifications for increasing the progressivity of existing progressive taxes and for curtailing the regressivity of other taxes. Whalley reported a sequence of modifications to the central variant whose combined effect was sharp progressivity in the incidence calculation for the whole tax system. These changed the range of average tax rates from 27.5 to 43 percent (the central variant) to 11 to 70 percent (see column 9 of table 11–2), implying such sharp progressivity that one might easily conclude that the tax system was significantly redistributive.

This result was obtained by treating savings as the purchase of an annuity yielding both a future consumption stream and future tax liabilities. Browning's indexation adjustment for sales taxes introduced further progression, from the sources side. Incorporating an inflation tax on savers further increases tax rate progression, and treating social security contributions as a benefit–related charge, with contributions offsetting benefits received over the lifetime removed an element of regressivity from incidence calculations. While deliberately constructed so as to produce marked progression in the incidence calculation, column 9 of table 11–2 obviously provides a different perception of the redistributive impact of the tax system compared with either the Pechman–Okner or Browning–Johnson calculations.

Whalley also showed how to change shifting assumptions so that the tax system would instead appear sharply regressive. One of his supporting arguments is that under international mobility, capital does not bear the burden of any taxes, including personal taxes on capital income. He also discussed the treatment of human capital. If capital cannot bear the burden of taxes due to international mobility considerations and human and nonhuman capital are substitutes in production, incidence analysis can produce tax rate profiles that are highly regressive. Column 10 of table 11–2 shows results from the most extreme of the regressive incidence variants reported by Whalley, with tax rates falling from 99 percent for the poorest group to 15 percent for the richest.<sup>9</sup>

These calculations therefore emphasize the wide confidence ranges that need to be used in interpreting tax incidence calculations in developed countries (see Piggott and Whalley 1987). Many theoretical issues need to be settled before further incidence calculations can be meaningfully interpreted. To begin with, the implicit models that underlie most incidence studies should perhaps be replaced by numerical general equilibrium models in which production, demand, and elasticity parameters are explicitly represented (this is the applied general equilibrium approach set out in Shoven and Whalley 1984). Such a model makes it possible to replace the arbitrariness of shifting assumptions with an explicit choice of elasticities and model. The virtue of general equilibrium models is that they explicitly specify both the model and the parameter values and also take into account the deadweight loss of the tax system when calculating incidence. The problem, however, is that many forms of the equilibrium model are available, and the literature does not provide an adequate base of parameter estimates on which to draw. The arbitrariness of shifting assumptions is thus to some degree replaced by the arbitrariness of both model form and parameter values.

Only one of the general equilibrium tax models constructed thus far has been used to make an incidence calculation for the whole tax system. Using their model of the U.K. economy and the tax subsidy system, Piggott and Whalley (1985: table 7.6) reported a central case calculation in which the gain to the top decile from replacing the 1973 U.K. tax and subsidy system by a yield–preserving neutral tax was in the range of 2025 percent of disposable income, with a similar loss to the bottom decile. While there were many features of their model that could be queried, their results also suggested qualifications to the proposition that, using annual data, the incidence of taxes is proportional. These results, therefore, tend to support the proposition that, beyond concerns over incidence assumptions, work on tax incidence in developing countries should also explore the use of numerical general equilibrium techniques.

**Table 11–2. Whalley's (1984) Tax Incidence Calculations for Canada***A. Using central case assumptions and income concept a*

1972 household income classes (\$)	<i>A. Using central case assumptions and income concept a</i>						Total tax rate (all taxes)	<i>B. Total tax rate, most progressive incidence treatment b</i>	<i>C. Total tax rate, most regressive incidence treatment c</i>
	Personal income tax	Corporate income tax	Property tax	Sales and excise taxes	Social security	Production tax			
Less than 6,500	1.6	3.3	3.3	16.3	2.6	0.3	27.5	11.6	99.0
6,5007,500	4.5	4.2	4.2	15.0	4.6	0.2	32.7	19.6	70.0
7,5008,500	7.0	3.6	3.6	14.8	6.1	0.2	35.4	23.0	62.0
8,50010,000	9.5	2.8	2.8	14.2	5.6	0.2	35.0	25.5	51.0
10,00011,500	10.8	3.2	3.2	13.9	4.7	0.3	36.1	27.5	44.0
11,50013,000	12.3	2.7	2.7	12.8	4.5	0.3	35.3	30.3	42.0
13,00014,500	13.5	2.6	2.6	12.5	4.2	0.2	35.6	32.0	38.0
14,50016,000	14.7	2.5	2.5	11.9	3.9	0.2	35.7	35.0	38.0
16,00018,500	15.2	3.6	3.7	11.5	3.6	0.2	37.8	38.3	35.0
18,50021,000	14.9	3.4	3.5	11.9	3.2	0.2	37.1	37.4	34.0
21,00025,000	16.9	3.4	3.5	10.4	2.9	0.2	37.4	44.4	31.0
25,000 and over	16.5	8.4	8.4	7.4	2.2	0.1	43.0	70.6	15.0

a. Income is gross of income tax, gross of transfers, with a further adjustment for the tax treatment of imputed housing income.

b. Adds future capital and income taxes to the central variant with Browning's adjustment for current period sales and excise taxes. Furthermore, inflation taxes on savers are included; allocation of corporate taxes are based on dividends rather than capital gains; capital incomes and social security taxes are treated as benefit taxes and excluded from incidence calculations.

c. Human capital case: unimproved labor income is assumed equal for each wage earner, capital income does not bear the burden of capital taxes, and the portion of income tax allocated to capital.

d. This extreme tax rate is a special feature of the most regressive incidence treatment involving assumptions on human capital mobility and is more fully discussed in Whalley (1984).

Source: Whalley (1984).

## Previous Tax Incidence Studies of Developing Countries

Concerns over equity issues have motivated a number of studies of tax incidence on developing countries over the years, usually on a tax by tax basis rather than on systems as a whole. By and large, these studies followed the same shifting assumptions approach as used in the conventional Pechman–Okner type of developed country incidence analyses, and did so in a relatively uncritical way. As a result, they tended to reach similar conclusions regarding the incidence of several of the taxes that make up the wider tax system to those found in the more standard developed country analyses. A small number of recent studies have examined tax incidence using general equilibrium techniques (see Habito 1984; Bovenburg 1987; and Chowdhury 1990), although the important nontax institutional features of developing countries do not receive significant attention in this work. Several incidence themes emerge from this literature.

### Value Added Taxes

In general, all studies find a uniform rate of value added taxes (VAT) to be a regressive tax, although this regressivity could be reduced by having differential rates for different commodities and a supplementary system of excise taxes on "luxury goods." These incidence analyses of the VAT have generally been based on the assumption of full forward shifting.<sup>10</sup> The tax is usually simply allocated among income brackets using data on consumption expenditures. Some recent studies have used an input–output framework to take into account differential rates and exempt commodities (see Ahmad and Stem 1988; Ahmad and Ludlow 1989; and Bird and Miller 1989a, 1989b) while continuing to (implicitly) assume full forward shifting.

### Other Sales Taxes

Conclusions reached on the incidence effects of manufacturer and wholesale level sales taxes are similar to those for the VAT. In other words, such taxes appear to be regressive. Full forward shifting is again generally assumed. Despite the widespread use of forward shifting, it is claimed in many developing countries that producers and wholesalers typically apply a fixed percentage mark up to prices, and, therefore, that full forward shifting does not occur. Econometric studies tend to support this point of view. For example, Jeetun's (1978b) study of Pakistan finds only 35 percent forward shifting from increases in the manufacturers level sales tax.

### Excise Taxes

Incidence analyses of excise taxes are once again typically based on an assumption of full forward shifting. A progressive incidence pattern is usually obtained for excises in aggregate. A notable exception is taxes on tobacco and cheap liquor, which usually have a regressive incidence pattern similar to the patterns in developed countries because of relatively heavier consumption by the poor. The tobacco tax was found to be regressive in Colombia (McLure and Thirsk 1978; Cnossen 1977) and in Argentina, Guatemala, and Greece (see Cnossen 1977; Bird and Miller 1989b), but progressive in Lebanon (Cnossen 1977). Cnossen (1977) finds a regressive incidence and Asher and Booth (1983) a progressive impact for this tax in the Philippines. Some excises, such as motor fuel taxes, combine different aspects of luxury consumption taxation, such as ability to pay and taxes on the use of public services (benefit taxes or user charges). To the extent that these taxes serve as user charges, their distributional consequences as captured by conventional tax incidence analysis may be of little consequence for policy.

Available econometric evidence once again departs from the full forward shifting assumption. For example, Naqvi (1975) and Jeetun (1978b) estimated forward shifting of excise taxes in Pakistan to be 48 percent and 31 percent, respectively.

### Import Duties

Import duties are usually assumed to be fully forward shifted to consumers of imported goods, with a regressive or proportional incidence outcome being the standard result (see Jeetun 1978a). Most developing country incidence studies ignore the implications of quotas and import licensing for the shifting assumptions used.

### General Indirect Taxes

When considered as a group, indirect taxes (general sales, excise, and trade and import taxes) are almost universally assumed to be shifted forward to consumers of taxed commodities. With a few exceptions (see Radhu 1965), backward shifting and incomplete forward shifting have not received much attention. These taxes are found to have a U-shaped incidence pattern, with some regressivity in the lower income ranges for the urban and rural poor (because of general sales taxes, taxes on tobacco and cheap liquor), progressivity in the top income brackets (because of taxes on motor fuels, liquor, and other luxuries) and a flat inci–

dence profile for the remaining groups (see Foxley and others 1979 for Chile; and Jeetun 1978 and Malik and Saqib 1989 for Pakistan; see also Due 1970).

### **Export Taxes**

Primary products dominate exports from many developing countries. If no single country or a small group of countries dominates the world market, little forward shifting of the tax to foreign buyers should occur. Most incidence studies, therefore, assume that the incidence of export taxes falls on the producer exporter group, and, correspondingly, derive a progressive incidence pattern since these are in the higher income ranges. One recent study for Sri Lanka (Jayasundera 1986) that considered implicit subsidies to domestic consumers associated with export taxes on tea and rubber found these implicit subsidies were distributed in a pro-poor fashion. The pro-poor incidence effects of taxes can thus be reinforced by the pro-poor incidence effects of implicit subsidies.

### **Personal Income Taxes**

Personal income taxes are assumed to fall on individuals who pay these taxes. All developing country incidence studies thus show personal income taxes to be progressive. All these studies, as far as we can ascertain, ignore any complications stemming from tax evasion.

### **Corporate Income Taxes**

The shifting assumption commonly used in developing country incidence work for the corporate tax is that 50 percent of the tax is shifted forward to consumers and 50 percent is borne by owners of capital in the economy. Under these assumptions, the usual finding is a regressive incidence profile for the lowest income brackets, a near flat incidence profile for the middle groups, and a progressive incidence profile for the higher income groups.

### **Urban Property Taxes**

The overall incidence of the property tax is found to be progressive in most developing country studies (see McLure 1971, 1972, 1977, 1979, 1987; Linn 1980; Bahl and Linn 1985; Holland and Follain 1985). For owneroccupied residential, commercial, and industrial properties, the usual shifting assumption is that the tax falls on capital owners with no forward shifting. For rental properties, varying degrees of forward shifting are assumed. In general, property taxes on owner-occupied property are found to have a progressive incidence pattern, whereas the rented properties component of the tax is regressive. All available studies ignore the effect of tax capitalization in which the imposition of a property tax leads to a fall in the market value of the asset (see Chaudry-Shah 1988, 1989). With tax capitalization effects included, a properly administered property tax is likely to be somewhat more progressive than it appears under traditional assumptions.

### **Agricultural Land Taxes**

With agricultural land taxes, the usual incidence assumption is that taxes on large farms fall on land owners and taxes on subsistence farmers cause such increased marketable surpluses, resulting in a decline in agricultural product prices. Accordingly, some studies (Qureshi 1987) suggest that landowners bear more than the burden of the tax. As land ownership is generally concentrated in a few hands in most developing countries, a progressive incidence of such a tax is obtained under these assumptions.

### **Sectoral Incidence of Taxes**

Although not emphasized in developed country studies, the sectoral incidence of taxes is frequently analyzed in developing country work, either for rural and urban or agricultural and nonagricultural groupings. Such studies usually make assumptions as to the fraction of tax passed between different sectors.

For example, a recent study for Pakistan (Qureshi 1987) assumes that land taxes are borne solely by the agricultural sector, personal and corporate income taxes by the nonagricultural sector, and export taxes on agricultural commodities by the agricultural sector and on manufactured goods by the nonagricultural sector. Import duties are allocated to consumption patterns of dutiable imports; and other indirect taxes by relative weights in consumption. Under these assumptions, the agricultural sector emerges as being overtaxed relative to the nonagricultural sector.

The same conclusion is also reached by Kazi (1984) for Pakistan, Lipton (see Toye 1978) for India, and Jayasundera (1986) for Sri Lanka. Opposite conclusions are reached in several studies on India (see Mitra 1963; and Gandhi 1966). Jayasundera (1986) examines the relative tax burdens by income class in the modern (nonagricultural) and primary (agricultural) sectors in Sri Lanka, and concludes that low- to lower-middle income individuals are relatively heavily taxed in the primary sector compared with the modern sector.

### **The General Tax System**

Developing country tax incidence studies generally find the tax system to be broadly progressive (pro-poor), showing either a U-shape (see Malik and Saqib

1989 for Pakistan and McLure 1971 for Columbia) or progressive (see Jayasundera 1986 for Sri Lanka; Lovejoy 1963 for Jamaica; and Sahota 1969 for Brazil) incidence pattern. Exceptions to this include Wasylenko (1985) for Jamaica, who finds an inverted U-shaped incidence pattern for the overall tax system, implying that the tax system redistributes from the middle-income groups to the poor and the rich.

### **Nontax Policy Elements in Developing Countries and Tax Incidence Analysis**

Thus shifting assumptions similar to those used in developed country incidence work are widely employed in tax incidence work on developing countries. Remarkably, almost none of the available studies takes into account important features of developing country economies such as price controls, protection, rationed foreign exchange, credit rationing, and urban-rural migration. This is the case even though these may radically change the incidence analyses and the implied policy conclusions for the countries studied.

One of the central points of this chapter is that applying tax incidence approaches appropriate for developed countries to developing countries can have pitfalls. A wider network of policies surrounds the tax systems in these countries, and these have to be taken into account in some way in making incidence determinations. What might seem to be reasonable assumptions for developed countries can be unreasonable for developing countries. The issue, then, is what kinds of assumptions and analyses should be used and for which kind of country.

Because the characteristics of individual developing countries are so varied, no single tax incidence approach is applicable to all of them. Nonetheless, countries can be organized in broad groups for discussing developing country tax systems and their implications for tax incidence analysis. Table 11-3 presents a classification of types of developing countries and summarizes some of the main differences between them that need to be considered in tax incidence work.

### **Agrarian Economies with Import Duties and Excise Taxes as Primary Source of Revenue**

Some agrarian economies rely on trade and excise taxes, including export taxes, for as much as 60 percent of central government revenues, and in one extreme case (Gambia), trade taxes constitute 78 percent of central government revenues. Since most of these countries have a small export base, tax revenues primarily accrue from import duties. Thus in analyzing tax incidence, one needs to focus largely on tariffs and on the import licensing and exchange control regimes.

In addition, in many of these countries a small number of traders exercise significant control over the entire import trade and earn monopoly profits. Import duties are likely to be borne out of these profits because of quantity constraints on imports through import licensing. Black market activity and smuggling may further complicate the analysis. Income taxes in such countries

**Table 11–3. Developing Country Features Important in Tax Incidence Analysis**

<i>Significant features for tax incidence analyses</i>	<i>Country Type</i>			
	<i>A. Low–income agrarian</i>	<i>B. Lower middle–income</i>	<i>C. Higher middle–income semi–industrialized</i>	<i>D. Newly industrialized countries</i>
International trade taxes large, if not dominant	X	X	X	
Limited coverage of income tax	X	X		
Social security or payroll taxes important			X	
Sales taxes important		X	X	X
Public enterprises imply significant government ownership of the corporate sector	X	X	X	
Foreign ownership important			X	X
Reasonably broad tax system, good compliance				X
Widespread tax evasion		X	X	
Quantity and price interventions	X	X	X	
Black markets widespread	X	X	X	

are primarily paid by salaried employees but play only a small or insignificant part in the tax system.

A large number of African countries and a few Asian countries (for example Bangladesh, Sri Lanka, Myanmar, and Nepal) fit this category. In these countries, the informal sector almost completely escapes taxes. Substantial economic activity is carried out in owner–operated enterprises, cottage industries, and small farms outside of the formal tax system.

**Lower Middle–Income Countries with a Narrow but Slightly More Expansive Tax System**

Some countries have a small manufacturing base and specific excises are relatively more important sources of revenue than are trade taxes. These countries have value added taxes at the manufacturing level plus income and payroll taxes, although with only limited coverage. Smaller agrarian and commodity–exporting countries in Central America, the Caribbean, and Latin America (excluding Brazil, Argentina, and Venezuela) fit this characterization. Tax incidence analyses for these countries also depend on the industry and product market

structure for excisable commodities.

### **Higher–Income, Semi–Industrialized Countries with a Broader Tax System but Considerable Evasion**

Some countries have a significant manufacturing tax base and a fairly sophisticated overall tax structure. Tax evasion is widespread, however, and the informal sector and the black economy are large. In addition, public enterprises provide a significant source of government revenues (and expenditures through subsidies). Larger, lower middle–income economies in Asia (for example, India, Pakistan, Indonesia, and the members of the Association of Southeast Asian Nations excluding Singapore) and South America (for example, Brazil, Argentina, and Mexico) fit this category to varying degrees.

### **Newly Industrialized Countries with Mature and Advanced Tax Systems**

Some countries have a sophisticated structure of income and sales taxes, which are much more effectively administered than is the case elsewhere. Tax evasion is not as serious a problem as in the countries in the semi–industrialized countries. As a result, the techniques used to calculate incidence for developed countries can be applied here with less modification than is required in the other country groups. Economies that have a higher income and high growth and that are export oriented fit this category. Examples are the Republic of Korea, Taiwan, Singapore, and Hong Kong.

### **Pitfalls in Applying Developed Country Incidence Analyses to Developing Countries**

Because the tax systems in developing countries vary greatly, the analysis of tax incidence will differ substantially from one country to the next. In particular, it is crucial to recognize and deal with any important institutional features elsewhere in the economy—such as informal or black markets, urban–rural migration, credit rationing, industrial concentration, product market competition, price controls, import–licensing regulations, exchange controls, and quantitative restrictions—that may affect the redistributive impact of the tax system. Until now, these considerations have, for the most part, been ignored in incidence calculations for developing countries.

Thus, in many developing countries, whether it is appropriate to assume full forward shifting depends on whether quotas are present and, in turn, whether they are binding. Since tariffs are a significant source of revenue in lower–income developing countries, the question of whether they are treated as lump–sum taxes borne by recipients of rents from quotas or are passed forward to consumers in higher prices can greatly affect the conclusion of any incidence analysis.<sup>11</sup> Rationed foreign exchange, prior import deposit schemes, and other forms of quantity constraints on imports can also affect the conclusion of incidence analyses. An assumption of forward shifting implies that tariffs (or other trade distortions) are treated much the same as sales taxes in developed countries and, hence, tend to be viewed as regressive. An assumption that tariffs are borne by the recipients of quota rents because of import quantity constraints tends to make such taxes appear progressive, since rights to quota are usually allocated to higher–income groups.

The sales tax can also have different incidence effects in many developing countries since a significant number of taxed commodities in these nations are affected by price controls. If a seller of taxed products is legally permitted to pass such taxes forward, then the tax is fully shifted to the consumers of taxed products, independently of any elasticity assumptions on the demand or supply side. Conversely, if the seller is not allowed to pass taxes forward, the tax is fully borne by the seller of the product. In addition, if there are black markets, either a forward–shifted or backward–shifted sales tax will have effects both on black market prices and on the quantity of activity on these markets. The effect of a forward–shifted tax (by raising white market prices) may be to divert more expenditures onto the black market, drive up black market prices, and shorten the length of queues on white markets. Since the rich are frequently alleged to transact more heavily on black markets, these second–round effects will shift proportionately more of the burden of such taxes onto

the rich.<sup>12</sup> These effects are also typically not considered in existing developing country incidence analyses.

Incidence analysis of the corporate tax can also be affected by special developing country considerations. If there is a foreign tax credit and the corporate tax applies to a foreign-owned corporation operating in a developing country, then the tax will largely be paid by the foreign treasury and, as such, has no direct domestic incidence effects. In addition, many manufacturing and distribution corporations in developing countries are wholly or heavily government owned, which complicates the usual backward-shifting assumption that capital fully bears the burden of the tax. Also, if there is credit rationing, as is common in many developing countries, this can further affect the perceived incidence of the tax because, with credit rationing, the corporate tax will primarily take rents away from those who qualify for rationed credit.

Thus, the degree to which a wide variety of policies interact with the tax system seem a priori so important in most developing countries that they have to be taken into account when analyzing their incidence effects. Many of these policy elements do not operate in developed countries and so are neglected in developed country analyses. Because the tax system absorbs such a large share of national income in developed countries, the direct effects of taxes often dominate whatever additional effects may come into play from other policy interventions of governments. In developing countries, the opposite is usually true. Taxes account for a smaller share of national income so other factors are more important and become correspondingly more relevant for incidence analysis.

The way that these interactions with other policies can affect tax incidence analyses of developing countries is illustrated in table 11-4, which shows the developed country shifting assumptions that are conventionally used for each tax and the range of complications that can result from their application to developing countries, from effects on recipients of rents to effects on urban-rural migration patterns. These change both the shifting assumptions and the incidence conclusions relative to conventional developed country incidence analyses. The implication seems to be, therefore, that conventional shifting assumptions need to be approached with some care when used in tax incidence analysis for developing countries.

### **Import Licensing, Foreign Exchange Rationing, Quotas, and Incidence Analysis of Trade Taxes (Tariffs)**

As noted above, many developing countries raise a significant portion of revenues from trade taxes. Developing country tax incidence analyses usually treat trade taxes as synonymous with sales taxes and, therefore, assume that they are fully passed forward to consumers of imported products. Thus, as with sales taxes in developed countries, trade taxes in developing countries are assumed to be proportional or regressive.<sup>13</sup>

In most developing countries, trade taxes on the import side operate alongside import licences, which in turn act as quantity constraints on trade. Foreign exchange rationing may also be in effect and acting as a binding restriction on trade.<sup>14</sup> In addition, advance deposit schemes may be operating, under which importers are required to deposit foreign exchange for a specified period of time with the central bank before they are given permission to import.<sup>15</sup>

The binding restriction on imports is thus frequently a quantity constraint, with product prices in the domestic market determined by its severity. In such cases, tariffs have no effect on prices in the domestic market. Their effect is to transfer to the government rents that would otherwise accrue to the owners of the rights of access to restricted imports. In most cases, these are the recipients of import licences or rationed foreign exchange. In such a regime, trade taxes largely become lump-sum taxes, and have no flow-through effect to consumers in the form of higher prices.<sup>16</sup>

So it is clear that the incidence effects of trade taxes can be quite different from those portrayed by conventional analysis if the taxes are borne by recipients of quotas or licences. If, as would seem plausible, these recipients are predominantly the wealthy, then it can reasonably be argued that trade taxes in developing countries have

progressive incidence effects, rather than the regressive or proportional effects that are usually reported in the incidence studies that are currently available.

The differences between using conventional shifting assumptions and alternative assumptions are explored in table 11–5, which reports incidence calculations for trade taxes using taxation and household income and expenditure data for Pakistan from 1984 to 1985. Using traditional assumptions, trade taxes are allocated to consumption expenditures in general. This results in a regressive (pro-rich) incidence pattern similar to those in available studies. Malik and Saqib (1989), for instance, use input and output data to refine such calculations by estimating the import content of various consumption goods and applying these estimates in their calculation of forward-shifting incidence. They also derive regressive (pro-rich) incidence effects of trade taxes (import duties) by using 1978/79 data for Pakistan.

So it seems that under a quota trade regime or one that is constrained by foreign exchange controls, trade taxes will simply reduce the rents accruing to recipients of import licenses and will have little or no effect on domestic prices. In column B of table 11–5, trade taxes (import duties and export taxes) are allocated to own–

**Table 11–4. Some Developing Country Characteristics and Their Implications for Shifting Assumptions and Tax Incidence Analyses**

<i>Tax</i>	<i>Conventional developed country incidence assumptions</i>	<i>Differences from effects on rents</i>	<i>Differences from effects on black markets and tax evasion</i>	<i>Differences from effects on rural–urban migration</i>	<i>Differences from external sector complications</i>
Income tax	Paid by recipients.	None	Increased evasion from rate increases; effective progressivity of tax is reduced or offset.	If expected wage equalized across modern and traditional sectors and if tax only paid in modern sector, some of the burden is shifted to the traditional sector through intersectoral wage effects.	None
Corporate tax	Shifted backward to owners of capital or shifted forward to consumers of taxed items.	With credit rationing, tax will be wholly or fully borne by recipients of rationed credit.	Production is diverted to black market, raising white market queuing costs and hence black market prices; tax can be borne by consumer and producers supplying to both markets; outcome depends on model form and elasticities.	None.	If large degree of foreign ownership and taxes are creditable abroad, corporate tax may be fully borne by Treasury of source (developed) countries.
Sales tax					

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	Paid by purchasers of taxed commodities.	If price controls apply and legal pass-forward of tax disallowed, tax is fully borne by fixed factors in taxed sectors.	Taxes divert more production onto black markets, raising white market queuing costs and hence black market prices; tax can be borne both by consumers and producers supplying to both markets; outcome depends on elasticity values and other parameters.	If tax is paid only on sales of manufactures, and if these are more heavily consumed by urban residents, tax will affect rural-urban migration and intersectoral wage differentials; tax will partly be borne by residents in urban sector.	Tax component of imports reduces rents accruing to recipients of import or foreign exchange licenses.
Trade taxes	Paid by purchasers of taxed products for imports (via tariffs); borne by sellers of tax exported products (via export tax).	With binding import quotas or rationed foreign exchange, tariffs reduce rents received by quota recipients rather than affect prices paid by consumers.	With smuggling, higher tariffs increase smuggling with higher rationing premiums for foreign exchange, and higher prices for consumers on both black and white markets.	Protection (through tariffs and quotas) tends to increase urban production, urban wages and affects rural-urban wage differentials through induced migration.	
Payroll tax	Employer contribution borne by employer; employee contribution by employee, or both contributions borne by employee.	None.	Limited evasion of payroll taxes.	If tax paid on payroll in urban sector, induced effects on rural-urban migration, and rural labor bears some of tax burden.	None.

ers of capital income in general, reflecting an assumption that import licenses are received proportionally to capital income. This results in a progressive (pro-poor) incidence of trade taxes.

In Pakistan, access to the import and export trade is concentrated even more specifically in only a few individuals belonging to the top income brackets, so an alternative incidence calculation assumes that rents from licences accrue only to the top five income brackets in proportion to their share of capital income. The resulting incidence pattern for trade taxes (column C) is dramatically progressive (pro-poor).

### **Price Controls, Black Market Premiums, White Market Queuing Costs, and the Analysis of Sales and Excise Taxes**

The widespread use in developing countries of price controls for many items subject to sales and excise taxes is another reason why it is ill-advised to apply the traditional developed country incidence assumption—that such taxes are borne by consumers of taxed products.

If such a tax applies to a price-controlled item, a legal issue arises about whether or not the supplier of the price-controlled item is allowed to pass the tax forward, for there may or may not be a legal provision allowing

him to do so. Thus, in the presence of price controls, such taxes are either fully passed forward to consumers or fully shifted backward to recipients of factor incomes, depending upon how the law is written. The incidence outcome does not depend on demand and supply elasticities in markets for taxed products, as it would in a typical developed country situation.

In most developing countries, however, price controls also spawn black or parallel markets, in part to avoid price controls, but also because of tax evasion. An important effect of a sales or excise tax, therefore, may be to change the relative size of black and white market activity, and this can also have important implications for any incidence analysis of its effects.

An indication of how these black market interactions can come into play can be seen in two recent studies by Mohammed and Whalley (1985) and Nguyen and Whalley (1989). These studies highlight the equilibrium conditions linking black and white markets and show how price changes in white markets, owing to, say, a tax, reverberate onto black markets.

Thus, if there are penalties for those caught transacting on black markets and endogenously determined search costs involved in transacting on white markets at the controlled prices (the larger the excess demand, the larger the search costs), buyers and sellers (assuming risk-neutral behavior) on both black and white markets must face the same effective prices in equilibrium (gross of search costs, or net of expected penalties) on the two markets.<sup>17</sup>

For simplicity, we assume black market penalties are only imposed on sellers. Thus, for buyers,

**Table 11–5. Incidence of Trade Taxes in Pakistan under Alternative Assumptions**  
(tax as a percentage of total income)

198485 household income classes (Rs)	Percentage of household	Traditional analysis (A)	The New Viewb (B)	+ (C)
Less than 7,200	3.1	7.8	4.0	0.0
7,2008,400	2.1	7.1	3.6	0.0
8,4009,600	3.3	7.0	3.6	0.0
9,60012,000	9.4	6.9	4.4	0.0
12,00018,000	23.7	6.8	5.1	0.0
18,00023,000	18.2	6.5	5.9	0.0
24,00030,000	12.7	6.3	5.9	0.0
30,00036,000	7.5	6.2	6.1	12.2
36,00042,000	5.1	6.1	6.1	12.3
42,00048,000	3.6	6.1	6.2	12.6
48,00054,000	2.3	5.8	6.3	12.8
54,000 plus	8.9	5.1	7.0	14.0
Total incidence pattern		Regressive (pro-rich)	Progressive (pro-poor)	Highly progressive (pro-poor)

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a. *Traditional Analysis (A)*: This reflects the traditional view that the burden of trade taxes falls on consumers of traded products. Calculations are based on trade taxes (import duties and export taxes) allocated to consumption expenditures.

b. *The New View (B)*: This reflects the view that the burden of trade taxes falls on import and export license holders. Column B calculations are based on attribution to capital income in general. *The New View (C)*: This reflects the same view as in column B that trade taxes simply reduce rents accruing to individuals holding import and export licenses. Rents are allocated only to the five capital income classes.

*Source*: Calculations are based on allocative series derived from Pakistan Household Income and Expenditure Survey 1984-1985 (HHIES) and taxation data from Government of Pakistan, Public Finance Statistics 1987-88.

$$(11-2) \quad P^B = \bar{P} + S$$

where  $P^B$  is the black market price,  $\bar{P}$  is the controlled price on official (white) markets and  $S$  is the endogenously determined search costs faced by buyers on white (or official) markets. And for sellers,

$$(11-3) \quad P^B - \gamma K = \bar{P}$$

where  $\gamma$  is the endogenously determined probability per unit sale of being detected selling on black markets and  $K$  is the penalty or fine rate per unit sold. Mohammed and Whalley and Nguyen and Whalley both assume  $\gamma$  is an increasing function of the ratio of black market to official market sales. In this framework, changes in price controls change black market prices, the length of queues on white markets, and the risk of detection for black-market traders. Lowering price controls increases the ratio of  $P^B$  to  $P$  and increases queuing costs on white markets. Stronger enforcement designed to curtail black markets (higher  $\gamma$ ) increases search costs on white markets and can therefore decrease overall social welfare.

A sales or excise tax in this framework that is allowed to be passed forward will divert more activity to black markets, increase effective consumer prices (gross of queuing costs), and increase the penalties paid by black market traders. The tax will thus be borne by both the production and the consumer side of the economy and in ways that are quite different from those deduced from conventional analysis. The incidence of the tax will also depend upon whether buyers or sellers are liable for the tax, which is again different from conventional developed country analysis in which legal liability for taxes is considered to be of no economic consequence.

Thus, if sellers on official markets are liable for the tax at rate  $t$ , the equilibrium conditions above change, so that for sellers across black and white markets

$$(11-4) \quad P^B - \gamma K = \bar{P} (1 - t)$$

while condition (11-2) for buyers is unchanged. The effect of the tax is to divert sales to black markets, lowering black market prices and increasing the probability of detection. The lower black market prices from (11-2) reduce queuing and search costs on white markets. Consumers (buyers) thus benefit from the tax through lowered black market prices and reduced white market search costs. This implies that producers (sellers) must more than bear the burden of the tax, reflecting the reduction in effective seller prices on black markets as well as on white markets.

If buyers on white markets are liable for the tax, however, the equilibrium condition (11-2) is changed to (11-5):

$$(11-5) \quad P^B = \bar{P} (1 + t) + S$$

while condition (11-3) remains unchanged. In this case,  $P^B$  will rise, which from (11-3) must produce an offsetting change in  $\gamma$  (the probability of detection). Sellers are no better off under the tax, while buyers (consumers) more than fully bear the burden of the tax through increased black as well as white market prices.

Thus, for sales and excise taxes in this case, with black market penalties borne fully by sellers, appropriate incidence assumptions depend upon whether and how changes in black market activity are taken into account as taxes change. If taxes increase the amount of activity taking place on black markets, their effect will be to increase queuing costs on white markets and, through the equilibrium conditions linking black and white markets, also raise black market prices. The incidence of taxes will, therefore, fall on consumers who purchase on both black and white markets in the form of higher price, as well as on producers.

Because data are not readily available that allow a link to be made between black market activity and the personal distribution of income, it is not easy to take these effects into account in incidence calculations. Anecdotal evidence, however, indicates that the coverage of price controls and the size of black market activity in many countries is surprisingly large.<sup>18</sup>

### Tax Evasion and the Incidence of Income Taxes

A further common feature facing tax policy makers in developing countries that is neglected in incidence studies is tax evasion.<sup>19</sup> In developed country analysis, the conventional assumption when looking at the income tax is to assume that the tax is fully borne by the payer of the tax. But the degree of evasion found in many developing countries changes the picture.

Thus in a simple model in which evasion involves bribery of officials, the bribe,  $B$ , is related to taxes owing,  $T$ , through the bribe rate  $\tau$ . In practice, as Gang and others (1989) suggest, the bribe rate will be endogenously determined, although for simplicity here we assume it to be fixed:

$$(11-6) \quad B = \tau \cdot T$$

In this world, the effect of increasing tax rates will be to increase  $T$  but also to increase  $B$ . If the bribe rate is high and tax compliance is low, the redistributive impact of the bribe system will dominate the direct redis-

tributive effects of the income tax. The relevant issue then is who receives the bribes.

One scenario is that, through a seniority system in public service, high officials with higher income and wealth receive a large portion (or the majority) of the bribes, along with professionals (accountants) who often act as "middlemen" in this process. Increasing the income tax can thus trigger a reverse distributional process from middle-class businessmen and others to wealthy elites, an entirely opposite conclusion to that obtaining from applying conventional developed country incidence analysis to the income tax in developing countries.

The extent of evasion and its links to rent transfers in particular countries is difficult to determine. As yet, to our knowledge, no tax incidence work has taken these effects into account. Anecdotal evidence referred to above (see note 18) once again suggests that this is an extensive problem in a number of countries.

## Rural–Urban Migration Effects and the Incidence of Income and Payroll Taxes

Important differences between developed country incidence assumptions and those of key developing countries can also arise in income and payroll taxes. A prominent feature of many developing countries over recent decades has been a rapid increase in rural–urban migration during the developmental phase, which has led to concern over the rural–urban migration effects of policy changes. In a Harris–Todaro (1970) model, for instance, a rural–urban wage differential via urban unemployment yields an equilibrium condition with equal expected wages across the two sectors.<sup>20</sup>

Thus,

$$(11-7) \quad W^R = \rho \bar{W}^U$$

where  $W^R$  is the rural wage rate,  $\rho$  is the probability of being employed in the urban sector and  $\bar{W}^U$  is the downward rigid urban wage.

In many developing countries, income and payroll taxes apply de facto only to the modern sector which, in turn, can be equated with the urban sector. If the income tax operates as a tax on the urban sector only, increases in income taxes will affect urban–rural migration patterns. Taxes, in turn, affect the number of workers who remain in the rural sector and their wages. The traditional developed country incidence assumption about the income tax, namely that taxpayers fully bear the burden of the tax out of the income they receive, is inappropriate in this framework (Imam and Whalley 1985). Part of the burden is shifted to rural workers who legally pay none of the tax. Similar issues arise with the incidence analysis of payroll taxes.<sup>21</sup>

The potential importance of this effect can also be illustrated by using data for Pakistan for 1984–85. In Pakistan, only the urban sector is subject to personal income tax. A graduated gross revenue surcharge is imposed on the rural sector and acts as a pseudo income tax but with few revenue consequences. The traditional approach to the incidence of income taxes, which assumes that the burden of the tax falls fully on individuals with liability to pay such taxes, is reflected in column A of table 11–6. From this, personal income taxes appear to be a progressive element in the overall tax structure in Pakistan.

The Harris–Todaro effect in incidence calculations is captured in two alternative calculations. Column B of table 11–6 reports calculations based on the assumption that a significant proportion of the income tax is shifted from the urban to the rural sector in the form of reduced wages for rural households earning less than Rs 24,000 per annum (most potential migrants come from these income classes). The discrepancy between the taxation statistics and income tax payments data, as reported in the Households Income and Expenditure Survey, 1984–85, serves as a proxy for the total income tax burden borne by the rural sector. Under these assumptions, a regressive incidence pattern of the tax for the rural sector and an ambiguous pattern of tax incidence for Pakistan as a whole are obtained. The progressivity of the tax for the urban sector is maintained.

A variation on this theme is where part of the tax falls on all rural wages, as reported in column C of table 11–6. This variant echoes the same theme as reflected in the results reported in column B.

## Credit Rationing, Foreign and State Ownership, and the Incidence of the Corporate Income Tax

The presence of credit rationing and foreign and state ownership provide yet further examples of how developed country tax incidence assumptions can be misleading in developing country tax incidence analysis, in this case of the corporate income tax. Credit rationing, for instance, is a common element in the policy regime of many developing countries. If firms are subject to credit rationing, the corporate income tax will operate as if it were a tax on pure rent, much as trade taxes fall on holders of licences if there are binding quotas. This differs from the trade tax case in that the tax will be borne from rents accruing to stockholders of firms as a result of their access to

rationed credit. The traditional cost of capital analysis as widely used in a developed country setting, as well as traditional incidence assumptions, will also not apply in the same way.<sup>22</sup>

A recent study (World Bank 1989) suggests that 70 percent of the new lending by commercial banks in

**Table 11–6. Sensitivity of Personal Income Tax Incidence Calculations in Pakistan to Alternative Approaches**  
(tax as a percentage of total income)

198485 household income classes (rupees)	A. Traditional view a			B. The new view I b			C. The new view II c		
	Urban	Rural	Pakistan	Urban	Rural	Pakistan	Urban	Rural	Pakis
Less than 7,200	0.00	0.0000	0.00	0.00	0.74	0.58	0.00	0.54	0.42
7,2008,400	0.00	0.0000	0.00	0.00	0.83	0.63	0.00	0.60	0.45
8,4009,600	0.00	0.0000	0.00	0.00	0.88	0.63	0.00	0.64	0.46
9,60012,000	0.00	0.0000	0.00	0.00	0.73	0.46	0.00	0.52	0.34
12,00018,000	0.02	0.0000	0.01	0.01	0.57	0.35	0.01	0.41	0.25
18,00024,000	0.04	0.0000	0.02	0.02	0.70	0.38	0.02	0.32	0.18
24,00030,000	0.02	0.00019	0.02	0.01	0.01	0.01	0.01	0.29	0.13
30,00036,000	0.20	0.00038	0.13	0.09	0.02	0.06	0.09	0.26	0.16
36,00042,000	0.22	0.00036	0.16	0.10	0.02	0.07	0.10	0.31	0.17
42,00048,000	0.40	0.00074	0.29	0.18	0.03	0.13	0.18	0.19	0.18
48,00054,000	0.77	0.00017	0.50	0.35	0.01	0.23	0.35	0.18	0.29
54,000 plus	1.33	0.00270	1.04	0.61	0.11	0.47	0.61	0.13	0.48
Total incidence pattern	P	P	P	P	R	A	P	R	A

Note: P, progressive; R, regressive; and A, ambiguous.

a. *Traditional view*: The burden of tax falls on whom it is levied. Calculations are based on actual tax collections by income class as reported in the Household Income and Expenditure Survey 198485. All figures from this survey are adjusted to bring the total in line with the Public Finance Statistics data. Note that the income tax collections reported for the rural sector are either due to tax originating from urban source income of rural households and/or from the graduated land revenue surcharge imposed on the rural sector.

b. *The new view I*: A tax on urban income through its impact on urban–rural migration depresses wages in the rural sector; in this case the impact falls on the wage incomes in the rural sector in the range of incomes up to Rs 24,000 per annum. The shortfall in reported tax collections by income class in the Pakistan Household Income and Expenditure Survey 198485 and total income tax collections for 198485 stated in Public Finance Statistics 198788 is attributed to wage incomes in the rural sector in the income range of up to Rs 24,000 and less.

c. *The new view II*: Same as the New View I, except that the tax shortfall is borne by wages in general in the rural sector.

1986 in Pakistan was directed by the government.<sup>23</sup> In India in 1986, 50 percent of the bank assets were to be placed in reserve requirements or government bonds, and 40 percent of the remainder were to be lent to priority

sectors at interest rates dictated by the government. In Brazil in 1987 and in Turkey in the early 1980s more than two-thirds of the credit was advanced either at government directive or at preferential rates. In Malaysia, on average 30 percent of the bank credit is directed by the government. Many other developing countries have also adopted complicated credit regimes and credit guarantees.

A further complication in many countries is that a significant portion of the manufacturing sector is either foreign-owned or has substantial foreign involvement (see table 11-7). If a foreign tax credit applies under the domestic law of the source country (as in the United States), when investing in a developing country a portion of the corporate tax may be borne by the treasury of the foreign country in which the investment originated. In such circumstances, it may be inappropriate to agonize over whether the corporate tax is fully shifted back onto capital or forward onto consumers. This affects the level of the corporate tax burden, and hence the distribution of the total tax burden.

State ownership of the corporate sector introduces further complications for the incidence analysis of the corporate tax. Table 11-8 shows the state ownership and control of industrial undertakings in a number of developing countries. The part of corporate tax revenues that is raised from state-owned enterprises represents an internal transfer of funds for the government, with no direct incidence effects.

Table 11-9 presents incidence analyses of the corporate tax in Pakistan for 1984-85 under alternative assumptions. The first three columns report incidence

**Table 11-7. Importance of Foreign Ownership of Capital in Various Developing Economies**

<i>Economy</i>	<i>Capital of foreign affiliates</i>	
	<i>Year</i>	<i>Percentage of GNP</i>
Mexico	1982	7.0
Argentina	1983	23.9
Brazil	1982	11.1
Colombia	1984	15.8
Venezuela	1982	10.0
Hong Kong	1981	15.2
Indonesia	1982	10.9
South Korea	1983	1.9
Malaysia	1984	26.6
Singapore	1983	65.3
Taiwan	1981	2.0
South Africa	1982	22.8
Turkey	1983	0.5
Pakistan	1982	11.2a

a. Of total corporate capital stock.

*Source:* Mexico and Pakistan: World Bank staff estimates.

All other countries: Dunning and Cantwell (1987).

calculations using variants of traditional developed country approaches. These calculations ignore such features of Pakistan's economy as credit rationing and the fact that the industrial sector is owned both by the government and by foreign enterprises.

Under traditional assumptions, the corporate tax has a progressive incidence pattern if it is allocated to capital income, but a proportional incidence pattern if a significant portion of the tax is allocated to either consumption or labor income. Column D reports calculations that take into account some of the details of the corporate sector in Pakistan: 22 percent of total corporate tax collections in Pakistan are derived from state-owned enterprises and, therefore, this portion of the tax is removed in the incidence calculation. Another 5 percent of the tax take comes from foreign enterprises having access to some form of foreign tax credit against Pakistan tax liabilities, so this portion is omitted from the incidence calculation. The remaining taxes are allocated to capital income in general. A progressive incidence of the corporate tax, but with lower effective tax rates is thereby obtained.

### Some Policy Implications

It should be clear from this discussion that our criticisms of existing developing country tax incidence analyses are wide ranging. Nontax policies relevant to developing country tax systems have not been taken into account in such work. Indeed, the underlying

**Table 11–8. *Nonfinancial State–Owned Enterprise Shares of Investment for Selected Developing Countries***

<i>Country</i>	<i>Year</i>	<i>Percentage share of manufacturing investment</i>
Zambia	1984	77.5
Burma (Myanmar)	1984	69.8
Venezuela	1984	52.2
Guyana	1984	41.9
Tunisia	1984	38.7
Algeria	1985	37.7
Morocco	1985	33.1
Turkey	1985	30.5
Congo	1983	39.8
Tanzania	1984	28.0
Chile	1985	27.5
Bangladesh	1985	22.1

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Mexico	1984	21.8
Portugal	1984	20.4
Brazil	1985	17.5
Pakistan	1987	17.3
Philippines	1984	15.3
Nepal	1984	14.1
Costa Rica	1985	13.2

*Source:* Pakistan (1988:111). Other countries: Nair and Filippides (1988).

**Table 11–9. Corporate Tax Incidence in Pakistan under Alternative Approaches**  
(tax as a percentage of total income)

<i>198485 household income classes (Rs)</i>	<i>Traditional analysis a</i>			<i>The New View</i>
	<i>(A)</i>	<i>(B)</i>	<i>(C)</i>	<i>b</i>
Less than 7,200	1.18	1.71	1.56	0.85
7,2008,400	1.06	1.55	1.64	0.77
8,4009,600	1.04	1.53	1.70	0.76
9,60012,000	1.26	1.62	1.69	0.91
12,00018,000	1.46	1.70	1.69	1.06
18,00023,000	1.70	1.79	1.68	1.24
24,00030,000	1.68	1.76	1.69	1.22
30,00036,000	1.75	1.78	1.68	1.28
36,00042,000	1.77	1.78	1.66	1.29
42,00048,000	1.81	1.79	1.65	1.32
48,00054,000	1.89	1.76	1.63	1.34
54,000 plus	2.01	1.74	1.64	1.46
Total incidence pattern	Progressive	Proportional	Proportional	Progressive

a. A: The burden of tax falls on capital in general. B: Corporate tax burden is allocated one-half to capital income and one-half to consumption expenditures. C: Corporate tax is allocated one-half to capital income and one-half to labor income.

b. D: The taxes paid by state-owned enterprises (22 percent of total corporate tax collections) have no distributional implications; similarly, the taxes paid by foreign companies (5 percent of total) are assumed to be paid by foreign treasuries and have no incidence implications and; the remaining taxes (73 percent of total) are allocated to capital income in general.

*Source:* See table 11–5.

incidence literature on developed countries, on which so much developing country work is based is itself increasingly coming under challenge. Our belief is that existing incidence views are likely to be reversed and quantitative orders of magnitude substantially changed if more appropriate approaches are followed. In short, existing developing country tax incidence studies probably contain little useful information.

At the same time, implementing new approaches of the form we suggest is not easy. New models of developing country economies are needed that accurately capture the way control regimes work. But the lack of data is a serious (and in some areas possibly an insurmountable) problem, and no single uniform approach for all countries makes sense. Although this may well seem negative, there are nonetheless more positive implications of our discussion that are worth emphasizing.

First, it seems clear, to us at least, that in this area more explicit rather than implicit modeling would be helpful in future research. Agonizing over forward or backward shifting for this or that tax may be less helpful than writing down an explicit model in which the full implications of assumptions can be traced through. We see this as eventually moving toward numerical general equilibrium tax modeling, similar to that now being done for developed countries but with central features relevant to the developing country in question included.

Second, even without new quantitative analysis, our discussion challenges the strategy used to analyze tax incidence questions relevant to World Bank operations, and, hence, to questions that may need to be taken into account in lending decisions. Even though we argue that there are pitfalls in the incidence analyses for developing countries and that it may be impossible to state accurately what the incidence of a particular tax is, our analysis does shed new light on a whole series of developing country tax incidence questions (see table 11–10). We would suggest that it is the challenge to conventional thinking that our analysis implies rather than the precise answers from particular incidence calculations that may prove more important for tax policy evaluation for developing countries in the longer run.

For instance, the taxation of agricultural incomes (which is a politically sensitive subject in many developing countries) needs to take into account the extent to which tax burdens can be spread to nonagricultural sectors through interactions with price controls and the black market activities that we emphasized earlier in the paper. Also, the incidence effects of the value added tax are clearly affected by price and quantity controls through the trade component. The traditional analysis of incidence effects of the VAT treats it as equivalent to a sales tax. The sales tax, in turn, is conventionally thought of as a regressive tax in developing countries, because this has been the consensus view in developed countries for so many years (even though this is now changing for the reasons already discussed). Once the presence of quantity controls through import licensing is taken into account, then one effect of a VAT may simply be to take away rents from recipients of quota through the trade component

**Table 11–10. Alternative Views of the Incidence of Taxes in Developing Countries**

	<i>Implications of traditional developed country analysis</i>	<i>Implications of the "new" view, capturing developing country nontax policy features</i>
<i>Tax measures</i>		
Income tax	Progressive	Ambiguous
Corporate tax		Progressive

## Tax Policy in Developing Countries

	Progressive or proportional	
Broadly based sales tax (VAT)	Regressive	Progressive
Trade taxes	Regressive	Progressive
Payroll tax	Ambiguous	Ambiguous/ progressive
Urban property tax	Regressive/ progressive	Progressive

of the VAT. And if these are wealthier individuals, then this can have a significantly progressive incidence impact.

Similar issues arise with discussions of the tax mix in various countries. For instance, there is an continuing debate in Brazil as to the appropriate balance between the payroll tax and the value added tax. Payroll taxes in Brazil consist of a series of individual contributions, such as social security and pension plan, whose combined effect is substantial, perhaps on the order of 25 to 30 percent in the manufacturing sector. There has been discussion in Brazil as to whether this form of tax erodes international competitiveness and, therefore, whether heavier reliance on the VAT would be better. If evaluated within a developing country context, payroll taxes and VAT will each have different incidence effects than when evaluated using traditional developed country approaches. Thus, if the payroll tax largely applies to the manufacturing sector, some of the tax will be borne by labor in the agricultural sector as well as in the manufacturing sector, through the impact on the migration process. If the VAT is collected on products consumed in both the rural and urban areas, this will tend to weaken these effects. These considerations would be missing if a conventional developed country incidence approach was taken to the incidence analysis of tax mix issues.

The differences between tax incidence analyses that capture developing country features and those based on conventional developed country assumptions can also be seen by considering what one might term a stylized Bank–Fund package of tax reforms. Such reforms would comprise four main components. The first is a general move toward the reduction of trade taxes and trade liberalization in general. The second is an emphasis on production or consumption taxes, particularly through the value added tax. The third is a movement toward reducing personal tax rates and consolidating the number of brackets. The fourth is a move to encourage reductions in corporate tax rates and also to grant tax incentives to inward foreign investment (see World Bank 1988).

A traditional analysis of the incidence effects of such a package would be along the following lines. Reductions in personal tax rates would tend to be somewhat regressive. If the corporate tax is borne by capital and capital is more heavily owned by higher income groups, reductions in corporate taxes would also tend to be regressive. Value added taxes are indirect taxes of a consumption type, and increasing them also tends to be regressive. This whole package, therefore, could be seen as a move toward a more regressive tax regime, that could lead to substantial agonizing in policymaking.

It seems to be equally defensible to suggest that the value added tax is a progressive rather than a regressive tax, that significant portions of the corporate tax in various countries are borne by foreign treasuries rather than by domestic capital, and that reductions in personal taxes can have substantial incidence effects in the opposite direction because of less evasion and improved administration, ultimately reducing transfers to high–income groups through bribery and corruption. Thus, the incidence effects of each one of these taxes could well be quite opposite to those that conventional wisdom would predict. Table 11–10 sets out the differences between conventional developed country incidence analysis and the views that have emerged here.

In conclusion, our discussion has emphasized the difficulties associated with the implementation of alternative models and approaches and the inconclusiveness of current tax incidence calculations for developing countries. This view may appear negative but we also emphasize that our discussion challenges the existing perceptions that permeate policy in this area. Taking these challenges further in more refined model-based empirical calculations would seem to be the next task for future work.[24](#)

### Notes

1. Most of the tax incidence literature on developing countries follows this tradition. Examples of recent studies include Malik and Saqib (1989) and Jayasundera (1986). For surveys of this literature see, for instance, Bird and de Wulf (1973), de Wulf (1975), and McLure (1977).
2. See, for instance, Gillespie (1980), Pechman and Okner (1974), Musgrave and others (1974), and Browning (1978).
3. This is the case with the conventional treatment of sales and excise taxes. A number of quantitatively less important uses side effects also occur, as with excise taxes on alcohol and tobacco.
4. See Davies and others (1984).
5. The main difference in the income concept relative to Pechman and Okner is what is included in transfers. This is discussed in more detail in Meerman (1980).
6. A set of lifetime tax incidence calculations for Canada has recently been produced by Davies, St.-Hilaire, and Whalley (DSW; 1984), which, although not without problems, is nonetheless relevant to the discussions here. These calculations use a simulation model of life cycle saving and bequest behavior for a representative sample of Canadian households to generate some of the distributive series required in an incidence calculation. As in the annual incidence calculations, each component of the tax system is allocated to households, now grouped by lifetime rather than by annual income, and different distributive series are used relative to annual incidence calculations. The main implications from the DSW calculations is that there may be a stronger basis than from annual incidence calculations for the conclusion that the incidence of the overall tax system is mildly progressive. Since inequality over the lifetime appears to be considerably smaller than in annual data, however, there seems to be less cause for concern that the tax system does not do more to redistribute income, especially if the social costs of redistribution through induced inefficiencies are high.
7. Chaudry-Shah (1989) advocates empirical analysis of capitalized burdens of the local property tax as an alternate approach to study property tax incidence. This (capitalization) approach represents a departure from the traditional reasonable assumptions approaches to the study of the fiscal incidence of the local public sector.
8. However, an argument by Ballentine (1981) complicates the implication that forward shifting produces regressive incidence impacts, as in the Pechman-Okner and Gillespie calculations. Since forward-shifted taxes fall on capital goods as well as on consumption goods, savers bear some of the burden of forward-shifted taxes. In Ballentine's study, about 26 percent of forward-shifted taxes are borne by savers, which significantly reduces

the regressivity of the tax system calculated under forward–shifting assumptions.

9. This tax rate is calculated on a net–of–tax basis; in other words, a 100 percent tax rate on net–of–tax income equal to a 50 percent tax rate on a gross basis.

10. For the popular incidence hypothesis (that prices are raised exactly by the amount of the tax) to be true, the supply of all commodities must be infinitely elastic. However, the condition of infinitely elastic supply for all commodities could not possibly be satisfied in any real world economy in the short run and possibly in the long run. This is because resource constraints would become binding prior to the satisfaction of this condition. Most incidence studies also assume that factors of production are in fixed supply in the short run without recognizing its inconsistency with the "infinite elasticity of supply" assumption. In most developing countries, both the domestic and foreign–produced goods are almost always in limited supply. This scarcity is often the direct result of price controls, the rationing of foreign exchange, import licensing, and quantitative restrictions on imported raw materials and finished goods. The limited supply and rationing of some of these commodities create strong incentives for black market activities. Under such conditions, abnormal profits are earned by importers and local producers of relatively scarce commodities and, therefore, any increase in indirect taxes could be borne out of these profits (see Prest 1985).

11. See the discussion of the tax–like effects of these elements of developing country trade regimes in Whalley (1989).

12. See the modeling of black markets in Nguyen and Whalley (1985).

13. See the calculations for Pakistan by Jeetun (1978a), for instance.

14. See the discussion of trade effects of foreign exchange rationing in Clarete and Whalley (1986).

15. Such schemes are still common in Africa, and can also be found in Latin American countries currently experiencing import compression, such as Argentina.

16. See the analysis of the situation in the Philippines by clarete and Whalley (1988), whose model results clearly demonstrate this point.

17. A referee has argued that rather than black and white markets facing the same effective price in equilibrium, there may be rents in the latter that accrue to the privileged consumers.

18. Several official and academic publications report anecdotal evidence on the extent of black markets and price controls in developing countries. For example, the government of Pakistan estimates "black wealth" at Rs 180 billion or 41 percent of GDP in 1984 (see Pakistan 1987:104). Official estimates of black income in India range from 14.4 percent to 48.8 percent of GNP for various years. See Government of India, Ministry of Finance (1985); see also Chugh and Uppal (1986) and Chopra (1985). Mohammad and Whalley (1984, 1985) estimate the

economic loss due to rent seeking to India to be on the order of 30 to 45 percent of GNP. Black–white market differentials in the foreign exchange market can also be substantial. For example, in Brazil and in Uganda, in December 1989, the black market premiums in the exchange market were over 200 percent (see also Pinto, 1988).

19. There is substantial anecdotal evidence on the extent of tax evasion and bureaucratic corruption in developing countries (see for example Gould and Amaro–Reyes 1983; Carino 1986; Klitgaard 1988). A few examples are reported here. For example, a confidential survey of chartered accountants carried out in India reported that 76 percent of the income tax officers accepted bribes. Furthermore, 68 percent of their clients paid an average bribe of 20 percent of the extra tax demanded (see Gang and others 1989: 2). The government of India (1985: 363) reports that fewer than 30 convictions were made from about 4.5 million tax returns filed. Similarly, in Malaysia only 2 percent of the more than 20,000 corruption cases investigated were convicted (see Gould and Amaro–Reyes 1983). The Pakistan National Tax Reform Commissioner (1987: 103–4) estimates that 72.4 percent of the

income liable to tax escaped taxation in 1984/85. It is estimated that in Thailand 47 percent of revenues are lost through corruption and tax evasion (Carino 1986: 53).

20. See the extensive discussion of these issues in Grosh (1986). Heady (1987) and Heady and Mitra (1987) also consider rural–urban migration in optimal tax models.

21. See Whalley and Ziderman (1989), where this same point is made, and Imam and Whalley (1985), where incidence analyses of minimum wages in a two–sector Harris–Todaro framework are presented. Current reform debates on payroll taxes in Brazil within the World Bank have also confronted the issue of how far tax burdens are dispersed through the effects to the rural sector.

22. Auerbach (1990) discusses these issues in detail.

23. See the World Bank (1989: 5557) for details.

24. In chapter 14, Clarete and Whalley have gone a considerable distance to meet this challenge. They develop an applied general equilibrium model for the Philippines featuring tax and institutional distortions. The institutional distortions include quantitative import restrictions, Harris–Todaro labor market effects, and foreign exchange rationing. Their model results confirm conclusions reached here.

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## 12—

### **A General Equilibrium Analysis of the Tax Burden and Institutional Distortions in the Philippines**

Ramon L. Clarete

The literature on tax incidence points to the need for an explicit general equilibrium model to capture the links between various economic agents (Whalley 1984). The conventional method of analyzing tax incidence is to assume that taxes are shifted forward or backward from the point of collection and then to compute the tax burden distributed among the ultimate taxpayers. The problem is that the shifting assumption may turn out to be unrealistic because the tax measures may have indirect effects on the rest of the economy that alter the real incomes of consumers and thus their tax burdens. Explicit computable general equilibrium (CGE) models have been developed to address this concern (see, for example, Habito 1984; Chowdhury 1990; Whalley 1984).

But the nature of the general equilibrium models applied to developing countries can significantly influence the results of the analysis (see chapter 13). Conventional general equilibrium models tend to have fully flexible prices and may not reflect the actual conditions in which institutional distortions occur in developing countries. Such distortions include quantitative import restrictions, Harris–Todaro labor market distortions (Harris and Todaro 1970), and the foreign exchange rationing. These distortions can affect the way tax burdens are shifted from the point of collection to the taxpayers. The applied general equilibrium models used to analyze tax incidence in developing countries should therefore capture the stylized distortions in such countries (see chapter 13).

The tax incidence results obtained with such models are the subject of this chapter. The discussion focuses on the Philippine economy and its system of taxes. Four variants of the model are employed in the analysis: the conventional CGE model, a model with quantitative import restrictions, a Harris–Todaro dual–economy model,

and a model with foreign exchange rationing. The analysis did not take into consideration any interactions among institutional distortions. The taxes examined are the excise, import, value added, and corporate and personal income taxes. The four model variants were used to compare the tax burdens of eleven consumer groups classified by income levels in the Philippines.

The structure of the analytical model is described in the next section. In subsequent sections, the discussion takes up the economic data used to calibrate the model variants, the structure of the Philippine tax system, and the estimated tax burdens of various consumer groups.

### Structure of the Model

Consider first the structure of the basic model.<sup>1</sup>

#### Basic Model

The model has several components:  $N$  production sectors,  $K$  variable factors,  $N$  sector-specific factors,  $H$  consumers, and a government. Each  $N$  production sectors has the following production function:

$$(12-1) \quad X_j = \min [V_j, A_j] \quad \forall j$$

where  $V_j$  is the value added in sector  $j$ . Value added in each sector is computed as

$$(12-2) \quad V_j = B_j \prod_{i=1}^K F_{ij}^{\alpha_j} \bar{Z}_j^{(1-\theta_j)} \quad \forall j$$

where  $F_{ij}$  is the demand for the variable factor  $i$  and  $\bar{Z}_j$  is the amount of the fixed factor used in sector  $j$ ;  $\theta_j$  and  $\alpha_j$  are Cobb–Douglas exponents, and  $B_j$  is a unit parameter.

Intermediate inputs are used in fixed proportions to the amount of output produced.

$$(12-3) \quad A_j = \min \left( \frac{X_j}{a_{ij}}, i=1, 2, \dots, N \right) \quad \forall j$$

where  $a_{ij}$  ( $i, j=1, 2, \dots, N$ ) is a fixed coefficient showing the amount of good  $i$  required to produce one unit of good  $j$ .

The compensation for the fixed factor in sector  $j$ ,  $\pi_j$ , is computed as the difference between sales and production costs of variable inputs. That is,

$$(12-4) \quad \pi_j = p_j X_j - \sum_{i=1}^K w_i F_{ij} - \sum_{i=1}^N p_i a_{ij} X_j \quad \forall j$$

where  $w_i$  and  $p_j$  are the price of the variable factor  $i$  and the producer price of good  $j$ , respectively. Zero profit conditions are thus introduced into the model by imputing this residual income for the fixed factor.

The Philippine economy is regarded as a price taker in all world markets. Since the world prices of all traded goods are fixed, we aggregate the traded goods to form one composite traded good at world prices. The domestic demand,  $C_f$ , and supply,  $X_f$ , of the composite traded good are

$$(12-5) \quad C_j = \sum_{j \in T} \bar{p}_j (C_j + ID_j) \text{ and};$$

$$X_j = \sum_{j \in T} \bar{p}_j X_j$$

where the vector  $\bar{p}$  denotes world prices of traded goods,  $ID_j$  is the domestic intermediate demand for good  $j$ , and  $T$  is the set of traded goods. Clearing the market of this composite traded good implies trade balance in the model.

Rather than differentiate goods by place of origin (Armington 1969), we assume that imports are perfect substitutes for local products. Tradables are classified either as importable or as exportables, depending on whether their net imports (which are denoted below by the vector  $E$ ) are positive or negative, respectively.

There are no foreign capital flows in the model. The balance of payment account consists solely of the current trade flows. The real exchange rate is in equilibrium if the trade deficit is zero.

The final demand functions of consumers are:

$$(12-6) \quad C_{bj} = Y_b Y_{bj} / q_j \quad \forall b \text{ and } \forall j$$

where  $C_{bj}$  is the final demand of consumer  $b$  for good  $j$ ,  $Y_{bj}$  is the constant expenditure share of good  $j$  in the total income of consumer  $b$ ,  $q_j$  is the consumer price of good  $j$ , and  $Y_b$  is the income of consumer  $b$ , which is equal to

$$(12-7) \quad Y_b = \sum_{i=1}^K w_i \bar{F}_{bi} + \sum_{i=1}^N \beta_{bi} \bar{r}_i \quad \forall b$$

where  $\bar{F}_{bi}$  and  $\beta_{bi}$  and  $\beta_{bi}$  are, respectively, the endowment of consumer  $b$  of variable factor  $i$  and the share of consumer  $b$  in the rents accruing to the fixed factor in sector  $i$ .

### Tax Policies and Other Distortions

As mentioned earlier, the tax measures covered in this study are excise, import, value added, corporate, and personal income taxes. Their revenues are calculated as follows:<sup>2</sup>

Tariffs:

$$(12-8) \quad R_T = e \sum_{j=1}^N \bar{p}_j t_{mj} E_j$$

where  $e$ , the exchange rate is defined below and

$$t_{mj} = 0 \text{ if } E_j \leq 0$$

Excise taxes:

$$(12-9) \quad R_E = \sum_{j=1}^N \tau_{mj} \bar{p}_j \left( \sum_{b=1}^H C_{bj} \right)$$

Value added taxes:

$$(12-10) \quad R_v = \sum_{j=1}^N \left( \frac{\tau_{vj}}{1 + \tau_{vj}} \right) p_v V_j$$

where  $p_v$  is the price of the value added gross of the value added tax.

Corporate income taxes:

$$(12-11) \quad R_c = w_k \sum_{j=1}^N \left( \frac{\tau_{cj}}{1 + \tau_{cj}} \right) R_{kj}$$

where  $k$  refers to capital.

Personal income taxes:

$$(12-12) \quad R_p = \sum_{b=1}^H \left( \frac{\tau_{pb}}{1 + \tau_{pb}} \right) Y_b$$

The model also incorporates the following stylized features of developing countries: foreign exchange rationing, quantitative import restrictions, rent seeking, and a Harris–Todaro labor market distortion.

The nominal exchange rate,  $e$ , is given by

$$(12-13) \quad e = \min(r, \bar{e}),$$

where  $r$  is the market-clearing exchange rate and  $\bar{e}$  is the fixed nominal exchange rate.

Because of the fixed nominal exchange rate policy, the monetary sector of this economy needs to be explicitly modeled. As in Clarete and Whalley (1991), a simple transactions demand for money is specified in the model. The velocity of money is assumed to be equal to one and the money supply is fixed in the model.

Letting  $M^d$  and  $M^s$  be the demand and supply of local currency,

$$(12-14) \quad M^d = \sum_{i=1}^N q_i C_i \text{ and} \\ M^s = \bar{M}^s$$

When the exogenous money supply exceeds the amount that makes the nominal exchange rate  $\bar{e}$  the market-clearing exchange rate, an excess demand for foreign exchange develops in the model. Since the only source of foreign exchange in the model is exports, rationing is initiated. This process is captured with an endogenous foreign exchange premium rate, which drives a wedge between the lower official exchange rate and the exchange rate applied to all imports. To relieve the excess demand for foreign exchange, the foreign exchange premium rate increases until this excess demand is eliminated.

Domestic producer prices are

$$(12-15) \quad p_i = \begin{cases} \phi_i (1 + t_{mi}) & \text{if } i \text{ is an exportable} \\ \phi_i (1 + t_{mi}) (1 + z_i) (1 + \lambda) & \text{if } i \text{ is an importable} \\ p_i & \text{otherwise} \end{cases}$$

where  $\lambda$  is the foreign exchange premium rate and  $z_i$  is the premium rate associated with the quantitative import restrictions in sector  $i$ .

Consumer prices are equal to

$$(12-16) \quad q_j = p_j (1 + t_{sp}) \quad \forall j.$$

Consumer goods are identical to producer goods in the model.

The rents from quantitative import restrictions,  $QR$ , amount to

$$(12-17) \quad QR = \sum_{j \in T'} z_j \bar{Q}_j$$

where  $\bar{Q}_j$  is the volume of imported goods  $j$  allowed by the government and  $T'$  is the set of importable commodities with quantitative restrictions.

The rents from foreign exchange restrictions,  $RF$ , are equal to

$$(12-18) \quad RF = \theta \lambda \sum_{j \in T'} \bar{p}_j (1 + t_{sp}) (1 + z_j) E_j$$

where  $E_j$  is the net import of good  $j$ , and  $\lambda = 0$  if  $E_j$  is negative.

If there is any rent-seeking activity in the economy, these rents are sought by importers in the model. According to the competitive theory of rent seeking (Krueger 1972), importers will invest resources to secure rent-generating assets up to the value of the rents. Following Hamilton and Whalley (1984), the amount of the variable factor  $i$  used in rent seeking is given by

$$(12-19) \quad FRS_i = \frac{\bar{F}_i}{\sum_{j=1}^K w_j \bar{F}_j} (QR + RF).$$

We did not attempt to implement the rent-seeking feature in the present study. Instead, we assumed the rents from quantitative import restrictions and foreign exchange restrictions go to the government. This feature will clearly affect the distribution of tax burdens. We discuss how this distribution may change if the rents go to the private sector when we interpret the results of the study.

$U$  and  $R$  denote the sets of sectors located in urban and rural areas, respectively. Following Harris and Todaro (1970), the wage rate in urban areas is assumed to be exogenous and exceeds the wage rate in rural areas. Thus, the rural-to-urban wage gap is equal to

$$(12-20) \quad \rho = \frac{w^R}{w^U} < 1.$$

$\rho$  can be interpreted as the probability of finding a job in the urban areas. Thus, equation (12–20) is the equilibrium migration condition of the Harris–Todaro model. If  $\rho \bar{w}^U > w^R > w^R$ , rural workers will migrate to the

urban areas. This migration process stops when the expected wage in the urban areas is equal to the rural wage.

The total wage bill in this economy is given by

$$(12-21) \quad \sum_{i \in U} \bar{w}_i^U L_i + \sum_{i \in R} w_i^R L_i = w_i^R \left( \sum_{i \in U} L_i + L_i \frac{(1-\rho)}{\rho} + \sum_{i \in R} L_i \right)$$

The number of workers,  $\sum_{i \in U} L_i \left( \frac{(1-\rho)}{\rho} \right)$ , unemployed in the urban areas are denoted by  $UE$ .

### General Equilibrium Conditions

The general equilibrium conditions of the model incorporating all the tax policies and domestic distortions are listed in equations (12–22) to (12–26). Equations (12–22) and (12–23) are factor market–clearing conditions. Equation (12–24) is the trade balance condition. Finally, equations (12–25) and (12–26) are market–clearing conditions for quota–restricted importable goods and the local currency.

Equations (12–22 to 12–26) can be solved for the rural wage, other factors, prices,  $\lambda$ , and  $p_i$ .

By Walras's law,  $M^d = M^s$  if equations (12–22) to (12–25) hold in general equilibrium. The numeraire in the model is the price of the local currency.

$$(12-22) \quad \sum_{i=1}^N F_{L_i} + UE + FRS_L - \bar{F}_L = 0$$

for labor services;

$$(12-23) \quad \sum_{j=1}^N F_{Y_j} + FRS_Y - \bar{F}_Y = 0$$

▷ variable factor  $i \neq$  labor;

$$(12-24) \quad C_f - X_f = 0;$$

$$(12-25) \quad C_i + ID_i - X_i - \bar{Q}_i = 0 \quad \text{▷ } i \in T'; \text{ and}$$

$$(12-26) \quad M^d - \bar{M}^s = 0.$$

### Calibrating the Model and Its Variants

The general equilibrium model described in the preceding sections was calibrated using data on the Philippine economy. The latest available input–output data for the Philippine economy is the 1983 input–output table (NEDA 1985) and cover 127 sectors. This information is the updated version of data for 1979, when the last

input–output survey was done (NCSO 1980).<sup>3</sup>

We aggregated the 127 sectors of the Philippine input–output table into 7 sectors. The sectors that are numbered consecutively from 1 to 7 are crops; other primary agricultural products; food, beverages, and tobacco; manufactured products; and services. These sectors are referred to in the text by their respective numbers. Since the value added tax was not introduced until 1988, we decided to use 1988 as the base year of the model. Thus, we updated the 1983 7–sector data to 1988 using the value added ratios for 1983 and 1988.

All utility and value added functions of the model are Cobb–Douglas functions. Production functions are specified as Leontief–type functions of value added and the intermediate inputs. Three kinds of factors of production were taken into account: labor, capital, and sector–specific factors.

We made two modifications to the 1983 trade data. First, we computed net imports in order to avoid the cross–hauling of trade flows. The analytical model described in the preceding section does not accommodate an Armington–type structure. Thus, sectors had to be identified as producing exportable goods, importable goods, or home goods, using the sector's net imports. Of the seven sectors, three produce exportables and the remaining four produce importables.

Second, we imposed a trade balance on the aggregated trade data. The existing trade flows in 1988 amounted to a trade deficit. Rather than introduce capital inflows to balance the country's external account, we adjusted the personal consumption expenditures, gross private capital investments, net inventory changes, and government expenditures to eliminate the trade deficit in 1988.

The artificial external closure using endogenous capital inflows may be analytically defective. A small country can maximize national income by maximizing its trade deficit. Nor would it help if we just added exogenous capital inflows, since this would imply that such foreign exchange resources flow into the country in every period of time covered by the model. The trade deficit in 1988 was not the average annual capital inflow to the country.

We used Habito's (1984) classification for the eleven households in the model. This classification is based on a Family Income and Expenditure Survey (FIES) done in 1975. We are using the same data on income sources, assuming that this endowment structure was the one prevailing in 1988. To reconcile the income levels used in the 1975 survey with those for 1988, we updated the 1975 levels to 1988 using Habito's shares of households of primary factors and the total factor payments from the updated input–output data.

Habito (1984) has eighteen consumer goods in his model of the Philippine economy. We aggregated these eighteen into seven consumer goods in estimating the expenditure shares of each of the eleven consumers in our seven–sector model. Producer and consumer goods are the same as those in Habito's model.

### **Tax Structure**

About 80 percent of the Philippine tax revenues in 1988 came from the five tax measures under consideration here.<sup>4</sup> Those with the highest yield were the import tariffs, which provided about 30 percent of the government's tax income in 1988. Under the 1981 Tariff Reform Program, the country's tariff rates had been reduced to an average of 28 percent from their previous average of 43 percent. At present, there is a ceiling tariff rate of 50 percent and five categories of rates below it: 40, 30, 20, 10, and 0 percent. The duty is based on the home consumption value of the imports plus a markup of 10 percent and some other charges, excluding freight and insurance. In 1986 the government modified the tariff rate structure slightly on account of its import liberalization program, which had removed part of the import–licensing system.

## Tax Policy in Developing Countries

From 1970 to 1986 the government collected taxes on the leading agricultural exports of the country. When the present administration took office in 1986, it removed the export taxes because they were a disincentive to agricultural producers.

Next in yield were the excise taxes, which contributed about 22.5 percent of the government's tax income in 1988. These taxes are imposed primarily on tobacco, alcoholic beverages, petroleum, and petroleum-based products. The yield is collected as a specific tax, an ad valorem tax, or both. For example, the tax on distilled spirits and wines is specific, whereas that on diesel fuel oil is an ad valorem excise tax. Cigarettes, fermented liquors, gasoline, and bunker fuel oils are taxed with both specific and ad valorem taxes.

The value added tax (VAT) was introduced in 1988. It replaced several sales taxes, including the manufacturer's tax, turnover tax, and the advance sales tax. Primary agricultural products and exports are excluded from the VAT system. As in other countries, the VAT is the difference between the taxes paid on outputs and those on inputs. A collection system close to this had been in place for the sales tax since 1978. To remove the cascading effect of the sales tax, manufacturers were allowed to deduct the taxes they paid on raw materials as reflected in the prices of the production inputs. Unlike the sales taxes that it replaced, the VAT has only two rates, namely, 0 and 10 percent.

In its first year, the VAT had a disappointing yield. Revenues amounted to only 6.6 percent of total tax income. If all products had been covered by the VAT and compliance had been perfect, the yield would have been 10 percent of the country's national income at factor cost. Considering that primary agriculture and exports are excluded from the VAT, its potential yield may be closer to 7 percent of national income, again assuming perfect enforcement. Instead, the VAT collection amounted to only 1 percent of national income in 1988.

This poor performance could be attributed to poor registration, since the VAT was introduced only in 1988. According to the Bureau of Internal Revenue (1989), a total of 80,699 taxpayers registered for the VAT, but only 59,303 filed their returns. Most of the taxpayers who registered came from the national capital region. Compliance ranged from 100 to 30.41 percent of registrants across the country. This performance was deemed satisfactory in view of the initial resistance to the VAT from various quarters.

The corporate income tax produces a higher income than does the personal income tax. The level is set at 35 percent of the taxable income of corporations. In 1988 the corporate tax contributed 19.4 percent of the government's tax income.

The other direct tax analyzed in this study is the personal income tax. The personal tax schedule consists of nine rates ranging from 1 to 35 percent. The corresponding nine income classes are defined as follows (in pesos): 2,500,999; 5,000,999; 10,000,999; 20,000,999; 40,000,999; 60,000,999; 100,000,999; 250,000,999; and 500,000 and up. Persons with incomes less than P2,500 are exempted from paying the income tax. The increase in the tax rate per step is four percentage points for the first six categories of rates, five percentage points for the next two categories, and six percentage points for the last rate category. In addition, a flat fee is collected per income class ranging from 0 to P122,175 for the highest income class. The fee schedule is also progressive. Adding the fee (expressed as a percentage of the mean income of the income class) and the percentage tax, the effective percentage income tax rates for the nine income classes are 1.00, 3.33, 8.15, 13.91, 21.15, 26.59, 31.81, 42.25, and 59.44 percent.

The tax is based on the modified gross income of individuals receiving compensation income, and on net income in the case of business and professional income. Modified gross income is income less allowable tax deductions, and net income is income less deductions and allowable business expenses (Nolledo 1988).

Personal tax revenues amounted to only 9.18 percent of the government's tax income in 1988. A total of 2,369,560 tax returns were filed in 1988, which was

13.19 percent higher than the returns filed in 1987. Despite this increase, the actual collection was 13.08 percent less than the goal set by the Bureau of Internal Revenue (1989).

The actual rates we used in the model are average tax rates. Statutory rates would grossly overestimate actual tax rates because of poor compliance and enforcement.

### **Institutional Distortions and Model Variants**

We constructed four benchmark equilibrium data sets for each of the four variants of the model. Model A is the standard general equilibrium model in which prices are fully flexible. Model B incorporates quantitative import restrictions. The implicit quota premium rates are obtained from Clarete (1989), who estimated quota premium rates from the price comparisons done by the Tariff Commission and assumed marketing margins. Clarete assembled a twenty-five sector model of the Philippine economy to assess the effects of the country's trade liberalization program on agriculture. In the present study, we averaged Clarete's estimates to obtain the model's quota premium rates. The rents from these quantitative restrictions are given to the government.

Model C incorporates the Harris-Todaro labor market distortion. Four of the seven sectors of the model are assumed to be located in the urban areas. They are sectors 4,5,6, and 7. The rest are assumed to be based in rural areas. The rural-urban wage gap is 0.75.

Model D is a foreign exchange rationing model. The implicit premium on foreign exchange used by importers is assumed to be 20 percent. As in quantitative import restrictions, the rents go to the government.

### **Incidence of Philippine Taxes**

The distribution of the Philippine tax burden was computed using the four model variants described above. In the policy experiments, each variant was run without the excise taxes, value added, tariffs, and corporate and personal income taxes and without holding real government spending constant. In addition, we ran tests on indirect taxes, direct taxes, [5](#) and all the taxes.

The results of the experiments are shown in tables 12-1 to 12-8. Each table presents the equivalent variations in income for all consumer groups and for the government associated with the removal of a given tax or group of taxes. The distribution of the tax burden among the eleven consumer group is also shown. The numbers indicate the respective amounts of taxes paid by the various groups of consumers as a percentage of their average income. If a given group of consumers happens to benefit from the imposition of a tax measure, then obviously the group's tax burden is zero. For this set of consumers, the equivalent income variations associated with the removal of the tax measure are negative.

The tax burden paid by consumer  $i$  is therefore computed as follows:[6](#)

$$T_i = \left( \frac{EV_i}{\sum_i EV_i} \right) \left( \frac{R}{Y_i} \right) \text{ for all } EV_i > 0$$

where  $EV_i$  is the equivalent income variation for consumer  $i$  associated with removing the tax measure;  $Y_i$  is the income of consumer  $i$  in the benchmark equilibrium; and  $R$  is the yield of the tax.

**Table 12–1. Incidence of Philippine Excise Taxes**  
(in million pesos, 1988 prices)

Consumer group	Model A		Model B		Model C		Model D	
	EV	Tax burden (%)	EV	Tax burden (%)	EV	Tax burden (%)	EV	Tax burden (%)
1	87.57	4.07	88.22	4.19	89.66	4.09	108.06	1.57
2	192.19	3.88	191.43	3.95	195.32	3.87	375.90	2.37
3	1,461.00	3.88	1,469.50	3.99	1,494.80	3.89	1,999.75	1.66
4	1,796.10	3.80	1,806.80	3.90	1,837.80	3.81	2,512.25	1.66
5	1,852.40	3.79	1,862.10	3.89	1,894.20	3.80	2,680.50	1.71
6	1,726.10	3.68	1,734.80	3.78	1,764.50	3.69	2,563.35	1.71
7	2,188.90	3.66	2,199.00	3.75	2,237.30	3.67	3,306.00	1.72
8	1,831.70	3.58	1,838.90	3.67	1,871.40	3.59	2,911.00	1.77
9	2,273.00	3.52	2,281.80	3.61	2,321.20	3.53	3,769.50	1.82
10	2,191.50	3.54	2,200.30	3.63	2,236.90	3.54	3,718.00	1.87
11	5,833.00	3.32	5,843.00	3.40	5,943.00	3.32	11,165.00	1.98
Government	(21,203.20)		(21,448.90)		(21,688.20)		13,456.50	
Total	230.26		66.95		197.88		48,565.81	

*Note:* Model A = conventional CGE model; model B = quantitative import restrictions model; model C = Harris–Todaro Model; model D = foreign exchange rationing model. EV = equivalent variation.

*Source:* Author's calculations.

### Indirect Taxes

Table 12–1 shows the efficiency effects and the distribution of Philippine excise taxes. Under model A, the economy nets a total P230.26 million as a result of lifting the country's excise taxes. The largest loser is obviously the government, which receives the tax revenues. This loss is less than the amount of tax revenues generated by the excise taxes in the benchmark equilibrium, which suggests that the respective yields of the remaining tax measures increase as the economy becomes more efficient.

An efficiency gain is also observed under models B, C, and D. Under model B, which incorporates quantitative import restrictions, the total gain amounts to P66.95 million. Although the lifting of excise taxes tend to encourage the production of processed agricultural products, the country's principal source of export earnings, the continuing quantitative import restrictions limit the expansion of the country's exports, cause an appreciation of the exchange rate, and raise the import quota premium rates. The total efficiency gains of lifting the excise taxes are sensitive to model structure. In the case of model B, the efficiency gains of lifting the excise taxes are considerably dampened by the efficiency losses associated with an import rationing regime.

In model C, with the Harris–Todaro labor market specification, the economy nets P197.88 million. The excise taxes are levied mainly on urban sectors. Removing them increases the level of economic activity in the urban

areas and thus attracts labor migration into the cities. Consequently the number of unemployed workers increases, which in turn offsets the efficiency gain associated with eliminating the excise taxes.

The efficiency gain under model D, with foreign exchange rationing, is significantly greater than the gains under models A and B. It appears that the lifting of excise taxes has encouraged exports, thereby substantially easing the pressure on the foreign exchange market. The foreign exchange premium declined from its benchmark value of 20 percent to 8.67 percent. The lifting of the excise taxes on food, beverages, and tobacco—which are the country's principal exports—enables producers to expand production and thus exports. Although the government loses some revenues and foreign exchange rents because of the lower foreign exchange premium rate, it gains substantially from the other tax revenues, particularly tariff revenues, that are generated by a larger tax base.

The excise taxes appear to be regressive, as shown by the results using models A, B, and C. The tax burdens fall more heavily on the lower-income groups. They appear to be progressive, however, if model D is used in the simulation. This illustrates how model structure changes the pattern of tax incidence. The results of models A, B, and C, in contrast to model D, indicate that excises are regressive. It appears that in Model D the loss associated with the foreign exchange rationing is progressively distributed. Lower-income groups bear less of the income loss associated with foreign exchange rationing as a percentage of income relative to the higher-income groups. Thus as excise taxes are removed, and with them the larger efficiency loss of rationing foreign exchange, lower-income groups appear to benefit less than the higher-income groups. Excise taxes are therefore progressive in the presence of foreign exchange rationing.

A related issue is the allocation of quota and foreign exchange rents in models B and D, respectively. Under the present scheme, the government gets all such rents. If rents are allocated on the basis of capital endowments, the excise taxes may turn out to be progressive in model B and more so in model D, since capital is progressively owned by the higher-income classes.

The case of low-income consumer 2 muddles the distribution pattern of the tax burdens. This is clearly the case in model D, wherein the low-income consumer shares the highest tax burden, which is 2.37 percent. This consumer is relatively more endowed with capital than with labor. Without the excise taxes, the price of capital services increases relative to that of labor services. Thus this consumer is worse off under a regime of excise taxes and accordingly pays a large share of the tax burden.

Table 12–2 shows the incidence of value added taxes. As with excise taxes, the welfare effects of the value added taxes depend on the model specification of the economy. Under models A, B, and C, the value added taxes reduce economic efficiency. The equivalent income variation associated with their removal is P1,205.81 million for model A, P40.05 million for model B, and P572.79 million for model C.

In the case of model D, however, the value added taxes increase economic efficiency. The corresponding total equivalent income variation of the value added taxes is negative P1,487.03 million. The foreign exchange rationing becomes more restrictive if value added taxes are removed. Exports decline in response to the lifting of the value added taxes. The foreign exchange premium rate goes up from its benchmark value of 20 percent to 21.4 percent. The explanation for this lies in the design of the country's value added tax system itself. Exports are exempted from the country's VAT system. Thus, the VAT system plays an important role in offsetting the penalty imposed on exports by the foreign exchange rationing process. Removing the VAT will therefore penalize exports further.

The distribution of the value added tax burdens varies with the model variant, from slightly progressive for model variants A, B, and C to almost proportional

**Table 12–2. Incidence of Philippine Value Added Taxes**  
(in million pesos, 1988 prices)

Consumer group	Model A		Model B		Model C		Model D	
	EV	Tax burden (%)						
1	18.45	0.85	19.40	0.92	17.88	0.86	18.47	0.00
2	54.96	1.10	45.55	0.94	51.91	1.09	47.05	0.51
3	331.80	0.87	339.90	0.92	319.00	0.88	321.85	0.45
4	418.80	0.88	429.40	0.93	401.70	0.88	404.25	0.45
5	443.30	0.90	445.20	0.93	424.20	0.90	423.00	0.46
6	432.30	0.91	429.80	0.94	412.60	0.92	410.85	0.47
7	555.30	0.92	549.90	0.94	529.60	0.92	525.00	0.47
8	483.90	0.93	473.00	0.94	459.80	0.94	451.00	0.47
9	620.00	0.95	601.80	0.95	586.40	0.95	571.50	0.47
10	604.10	0.96	580.30	0.96	569.60	0.96	552.50	0.47
11	1,830.00	1.03	1,680.00	0.98	1,713.00	1.02	1,626.50	0.49
Government	(4,587.10)		(5,554.20)		(4,912.90)		(6,839.00)	
Total	1,205.81		40.05		572.79		(1,487.03)	

*Note:* Model A = conventional CGE model; model B = quantitative import restrictions model; model C = Harris–Todaro model; model D = foreign exchange rationing model. EV = equivalent variation.

*Source:* Author's calculations.

in the case of model variant D. As in excise taxes, consumer 2 shoulders a larger tax burden than the other low-income classes. Except in the case of consumer 2, all tax burdens clearly show that the value added tax is progressive, the pattern being more pronounced in the upper tail of the distribution.

Table 12–3 shows the incidence of import tariff measures. Except in model B, which shows no efficiency effects, the lifting of import tariffs improves economic efficiency. The welfare gain amounts to P26,052.51 million under model A, P18,552.79 million under model C, and P2,653.25 million under model D.

The interactions of tariff policies with the Harris–Todaro distortion and foreign exchange rationing explain the lower welfare gain of removing tariff policies compared with that obtained under the conventional model A. In the Harris–Todaro model, many of the tariff-protected sectors are in urban areas. Most of this protection goes to fixed factors rather than to labor. Tariff liberalization increases wages in general, but proportionately more in urban areas, and in the process draws workers from the rural areas to the cities and thus causes additional unemployment. In the case of foreign exchange rationing, tariff liberalization puts further

**Table 12–3. Incidence of Philippine Tariffs**

(in million pesos, 1988 prices)

<i>Consumer group</i>	<i>Model A</i>		<i>Model B</i>		<i>Model C</i>		<i>Model D</i>	
	<i>EV</i>	<i>Tax burden (%)</i>						
1	73.95	1.29	0.00	0.00	50.77	1.16	3.80	0.86
2	348.66	2.65	0.00	0.00	(2,453.18)	0.00	11.00	1.08
3	1,571.10	1.57	0.00	0.00	1,166.40	1.53	65.50	0.84
4	2,053.50	1.64	0.00	0.00	1,541.80	1.61	81.25	0.83
5	2,238.20	1.72	0.00	0.00	1,703.50	1.72	88.00	0.87
6	2,197.70	1.77	0.00	0.00	1,679.30	1.77	82.20	0.85
7	2,870.50	1.81	0.00	0.00	2,200.30	1.81	102.00	0.83
8	2,654.60	1.95	0.00	0.00	2,077.30	2.00	88.50	0.84
9	3,626.90	2.12	0.00	0.00	2,890.90	2.21	124.00	0.93
10	3,675.20	2.24	0.00	0.00	2,962.40	2.36	136.50	1.07
11	11,807.00	2.53	0.00	0.00	9,786.00	2.75	389.50	1.08
Government	(7,064.80)		0.00		(5,052.70)		1,481.00	
Total	26,052.51		0.00		18,552.79		2,653.25	

*Note:* Model A = conventional CGE model; model B = quantitative import restrictions model; model C = Harris–Todaro model; model D = foreign exchange rationing model. EV = equivalent variation.

*Source:* See table 12–1.

pressure on the foreign exchange market. Consequently, the foreign exchange premium rate goes up from its benchmark value of 20.6 to 39.4 percent.

Tariff liberalization under model B has no effects. The import tariffs with binding quantitative import restrictions serve to tax the rents associated with such restrictions. The government receives these rents, as well as the tariff revenues. Thus the lifting of the tariffs in model B does not change the real values of the model. If the rents had been allocated to private consumers with larger capital endowments or higher incomes, however, the tariffs would have had a real impact on the economy.

Notwithstanding how the rents are apportioned in the model, the distribution of the tariff burden among the private consumers seems to indicate that the tariffs are moderately progressive. The second consumer again carries a large share of the tariff burden compared with other low–income groups. But under model C, consumer 2 is actually better off in the presence of the tariff measures.

The incidence of Philippine indirect taxes is shown in table 12–4. The removal of the excise taxes, value added taxes, and the import tariffs improves economic efficiency. The total equivalent income variation associated with removing these indirect taxes, however, ranges from P106.83 million under model B to P55,834.14 million under model D.

The incidence of indirect taxes is also sensitive to the kind of model used. Indirect taxes appear to be progressive under models A, C, and D and regressive under model B with quantitative import restrictions. In the presence of these restrictions, import tariff policies are neutral because they merely serve to tax the rents associated with the restrictions on imports, as shown in table 12–3. Therefore the pattern of incidence of indirect taxes under model B follows that of excise taxes, which are regressive, as shown in table 12–1. Although value added taxes are progressive, they have a significantly smaller yield compared with import tariffs and excise taxes.

### Direct Taxes

The two direct taxes analyzed in this study are corporate and personal income taxes. Table 12–5 shows the results of our analysis for corporate taxes. These taxes incur a welfare cost to the economy, ranging from P262.32 million under model B to P2,574.14 million under the conventional CGE model. The institutional distortion associated with the quantitative import restrictions (model B) and with the Harris–Todaro wage differential (model C) discounted some of the efficiency gains observed if corporate taxes are removed using model A. In the case of model B, desired imports increase after corporate taxes are lifted, and, given that the quantitative import restrictions are still in place, the import quota premium rates go up as well. In two agricultural importables, the rates increase by about 50 percent. As for model C, corporate taxes fall mainly in the urban-based sectors. If they are removed, economic activity picks up in urban areas as additional migrants are attracted from rural areas, but this in turn increases urban unemployment.

The economy is worse off under model D if corporate taxes are removed. This result is explained by the higher foreign exchange premium rate under a regime without corporate taxes. The rate goes up from 20 percent to about 25 percent. Like the value added taxes, corporate income taxes offset the penalties imposed on

**Table 12–4. Incidence of Philippine Indirect Taxes**  
(in million pesos, 1988 prices)

<i>Consumer group</i>	<i>Model A</i>		<i>Model B</i>		<i>Model C</i>		<i>Model D</i>	
	<i>EV</i>	<i>Tax burden (%)</i>						
1	188.26	5.56	108.31	7.37	165.01	5.47	153.78	2.86
2	621.08	7.97	238.52	7.06	571.48	8.25	479.90	3.88
3	3,511.70	5.92	1,820.90	7.08	3,106.70	5.89	2,815.85	2.99
4	4,446.80	5.98	2,250.60	6.97	3,938.60	5.95	3,549.25	3.00
5	4,720.60	6.13	2,322.20	6.95	4,197.80	6.13	3,753.50	3.07
6	4,529.60	6.14	2,178.70	6.81	4,029.50	6.14	3,585.85	3.06
7	5,838.50	6.19	2,766.90	6.76	5,200.30	6.20	4,610.50	3.08
8	5,157.20	6.40	2,327.10	6.66	4,614.10	6.44	4,043.00	3.16
9	6,737.20	6.63	2,903.10	6.58	6,054.40	6.70	5,250.00	3.25
10	6,666.00	6.84	2,799.80	6.62	6,013.40	6.94	5,183.00	3.35
11	19,984.00	7.23	7,577.00	6.32	18,162.00	7.39	15,325.00	3.49
Government	(36,127.90)		(27,186.30)		(37,544.60)		7,084.50	
Total	26,273.04		106.83		18,508.69		55,834.13	

*Note:* Model A = conventional CGE model; model B = quantitative import restrictions model; model C = Harris–Todaro model; model D = foreign exchange rationing model. EV = equivalent variation.

*Source:* Author's calculations.

**Table 12–5. Incidence of Philippine Corporate Taxes**

(in million pesos, 1988 prices)

<i>Consumer group</i>	<i>Model A</i>		<i>Model B</i>		<i>Model C</i>		<i>Model D</i>	
	<i>EV</i>	<i>Tax burden (%)</i>						
1	21.03	0.92	20.19	0.93	17.57	0.81	15.82	0.40
2	245.41	4.68	221.83	4.45	239.99	4.80	212.05	2.35
3	532.20	1.33	506.50	1.33	473.80	1.24	420.50	0.61
4	724.30	1.45	697.20	1.46	651.90	1.36	582.25	0.68
5	907.70	1.75	862.50	1.75	834.80	1.69	745.00	0.84
6	996.50	2.01	948.40	2.01	928.40	1.96	839.85	0.98
7	1,323.00	2.09	1,258.80	2.08	1,236.80	2.04	1,119.50	1.03
8	1,296.30	2.39	1,234.20	2.39	1,225.00	2.37	1,106.00	1.19
9	1,828.70	2.67	1,750.60	2.69	1,741.60	2.67	1,564.00	1.33
10	1,920.70	2.93	1,837.40	2.94	1,839.40	2.94	1,639.50	1.45
11	7,393.00	3.97	7,036.00	3.97	7,190.00	4.05	6,476.50	2.03
Government	(14,614.70)		(16,111.30)		(15,030.20)		(22,424.00)	
Total	2,574.14		262.32		1,349.06		(7,703.03)	

*Note:* Model A = conventional CGE model; model B = quantitative import restrictions model; model C = Harris–Todaro model; model D = foreign exchange rationing model. EV = equivalent variation.

*Source:* Author's calculations.

export-oriented sectors by foreign exchange rationing. These taxes are levied on capital that tends to be used more intensively on import–substituting sectors. Removing them accentuates the bias against exports provided by rationing foreign exchange.

Corporate taxes appear to be progressive except in the case of consumer 2, who has a proportionately higher tax burden than the other lower-income groups. We recall that this consumer is relatively more endowed with capital. This progressive pattern appears to hold in all model variants, reflecting the progressive pattern of capital endowments.

Table 12–6 shows the incidence of Philippine personal taxes. These taxes incur a welfare cost to the economy. The equivalent income variation associated with removing the personal taxes equals P70.79 million for model A, P21.79 million for model B, and P61.84 million for model C. But these taxes improve economic efficiency; the equivalent income variation associated with foreign exchange rationing is negative P233.1 million. Removing personal taxes increases desire imports and consequently put pressure on foreign exchange rationing. The added

economic inefficiency resulting from this more than offsets the efficiency gains associated with removing the personal taxes.

Because of their book rates, personal taxes are progressive, as mentioned earlier. This structure is clearly evident in the pattern of tax burdens shown in Table

**Table 12–6. Incidence of Philippine Personal Taxes**  
(in million pesos, 1988 prices)

Consumer group	Model A		Model B		Model C		Model D	
	EV	Tax burden (%)						
1	(0.15)	0.00	(0.04)	0.00	(0.06)	0.00	(0.14)	0.00
2	(0.06)	0.00	(0.27)	0.00	(0.20)	0.00	(0.80)	0.00
3	29.20	0.07	30.60	0.08	30.90	0.08	28.25	0.04
4	112.90	0.23	114.80	0.23	116.60	0.23	111.75	0.11
5	264.80	0.51	266.50	0.51	271.10	0.51	262.50	0.26
6	386.80	0.78	388.50	0.78	395.30	0.78	384.80	0.39
7	652.60	1.03	654.50	1.03	666.40	1.03	649.50	0.52
8	685.40	1.27	686.90	1.27	699.30	1.27	682.00	0.64
9	1,053.50	1.55	1,055.80	1.55	1,074.30	1.55	1,049.00	0.78
10	1,175.60	1.80	1,178.40	1.80	1,198.40	1.80	1,170.50	0.90
11	3,860.00	2.08	3,865.00	2.08	3,931.00	2.08	3,839.50	1.04
Government	(8,149.80)		(8,218.90)		(8,321.20)		(8,410.00)	
Total	70.79		21.79		61.84		(233.15)	

*Note:* Model A = vonventional CGE model; model B = quantitative import restrictions model; model C = Harris–Todaro model; model D = foreign exchange rationing model. EV = equivalent variation.

*Source:* Author's calculations.

12–6. The bottom two consumer groups (1 and 2) have zero personal tax rates because their personal incomes are below the threshold income covered by the tax. Thus, they are made worse off when personal taxes are removed. Accordingly their tax burdens are set equal to zero.

Interestingly, the incidence pattern of personal taxes appears to be insensitive to model specification for models A, B, and C. This result is due to rounding off tax burden estimates to two decimal places. Nonetheless, changes in the

tax burdens in these three models are negligible, despite the fact that the net efficiency costs of personal taxes vary distinctly with model structure. What this implies is that the added inefficiencies due to quantitative import restrictions (model B) or to Harris–Todaro labor market specification (model C) do not have strong enough distributional effects to change the pattern of tax incidence to any extent

As a whole, the Philippine direct taxes are clearly progressive. The tax burdens range from 0.38 to 0.91 percent of real income for the poorest income class to 3.08 to 6.16 percent of real income for the richest consumer (see table 12–7).

### All Taxes

Philippine taxes are progressive in all model variants (table 12–8). As already mentioned, indirect taxes appear to be progressive in three of the four model variants. They are only regressive in the case of model B, which features quantitative import restrictions. Direct taxes are also progressive in all model variants. Given these results, the Philippine tax system can be described as one that allocates a higher tax burden to a higher-income class.

Note, however, that the efficiency effects of all taxes are sensitive to the model used. Under the conventional CGE model, all five taxes appear to make the economy better off. The taxes have a welfare benefit equal to P5,062.69 million. This result is not repeated in the other model variants, where the taxes have a welfare cost ranging from P363.19 million for model B to P71,121.17 million for model C.

### Concluding Remarks

This study has demonstrated that the estimates of the efficiency cost and the distribution of tax burdens obtained using an applied general equilibrium model are sensitive to the way the model is specified. The analysis was done on five Philippine tax measures using four alternative specifications of the Philippine economy, one of which is the standard general equilibrium model, and each of the remaining three highlights a stylized institutional distortion in a developing country. The three distortions were quantitative import restrictions, Harris–Todaro labor market distortion, and foreign exchange rationing. The five tax measures were excise, value added, tariff, corporate, and personal taxes.

The key results concerning the distribution of tax burdens are as follows. Excise taxes are regressive if the economy has quantitative import restrictions and a Harris–Todaro labor market distortion, but are progressive if it is rationing foreign exchange. Value added taxes range from being almost proportional if there is foreign exchange rationing to slightly progressive in the presence of the other two institutional distortions. Tariffs are neutral in the case of an economy with binding quantitative import restrictions but are pro–

**Table 12–7. Incidence of Philippine Direct Taxes**  
(in million pesos, 1988 prices)

<i>Consumer group</i>	<i>Model A</i>		<i>Model B</i>		<i>Model C</i>		<i>Model D</i>	
	<i>EV</i>	<i>Tax burden (%)</i>						
1	20.88	0.91	20.16	0.90	17.43	0.78	15.61	0.38
2	245.36	4.64	221.54	4.33	239.92	4.65	211.25	2.21
3	561.80	1.40	537.60	1.38	503.80	1.28	448.05	0.62
4	838.90	1.66	813.70	1.66	768.40	1.56	693.75	0.76
5	1,177.10	2.25	1,133.60	2.24	1,108.90	2.18	1,010.50	1.07
6	1,391.10	2.78	1,344.40	2.77	1,329.80	2.72	1,229.85	1.36
7	1,989.40	3.11	1,926.40	3.11	1,914.50	3.07	1,779.50	1.54

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8	1,998.20	3.65	1,936.80	3.66	1,938.80	3.63	1,801.50	1.82
9	2,910.50	4.22	2,833.60	4.24	2,841.70	4.22	2,635.50	2.12
10	3,130.80	4.73	3,049.00	4.76	3,070.10	4.76	2,838.00	2.37
11	11,406.00	6.08	11,048.00	6.08	11,270.00	6.16	10,448.50	3.08
Government	(23,025.20)		(24,580.90)		(23,584.50)		(31,091.00)	
Total	2,644.84		283.90		1,418.85		(7,978.99)	

*Note:* Model A = conventional CGE model; model B = quantitative import restrictions model; model C = Harris–Todaro model; model D = foreign exchange rationing model. EV = equivalent variation.

*Source:* Author's calculations.

**Table 12–8. Overall Incidence of Philippine Taxes**  
(in million pesos, 1988 prices)

<i>Consumer group</i>	<i>Model A</i>		<i>Model B</i>		<i>Model C</i>		<i>Model D</i>	
	<i>EV</i>	<i>Tax burden (%)</i>						
1	113.58	5.40	129.56	7.23	192.59	6.58	167.92	3.43
2	649.03	13.42	469.03	11.39	875.18	13.02	700.85	6.22
3	2,395.40	6.51	2,385.40	7.61	3,825.30	7.47	3,235.65	3.77
4	3,186.00	6.90	3,105.10	7.89	4,994.00	7.77	4,210.75	3.91
5	3,740.30	7.83	3,510.20	8.62	5,648.60	8.50	4,756.00	4.27
6	3,880.00	8.47	3,585.70	9.19	5,721.90	8.99	4,821.85	4.52
7	5,228.80	8.94	4,781.80	9.59	7,602.90	9.34	6,406.50	4.70
8	4,943.10	9.88	4,351.40	10.21	7,017.50	10.09	5,874.00	5.04
9	6,865.50	10.89	5,864.50	10.91	9,544.20	10.88	7,953.50	5.41
10	7,134.90	11.79	5,987.10	11.61	9,760.80	11.60	8,128.00	5.77
11	24,056.00	14.02	19,095.00	13.06	31,799.00	13.33	26,227.50	6.56
Government	(67,255.30)		(52,901.60)		(15,860.80)		(22,697.50)	
Total	(5,062.69)		363.19		71,121.17		49,785.02	

*Note:* Model A = conventional CGE model; model B = quantitative import restrictions model; model C = Harris–Todaro model; model D = foreign exchange rationing model. EV = equivalent variation.

*Source:* Author's calculations.

gressive under the alternative specifications of the Philippine economy. The progressive distribution of the burden of corporate and personal taxes is, however, insensitive to the way the model is specified.

If one used the conventional applied general equilibrium model with its fully flexible prices in analyzing the same tax measures, this would have been the estimated distribution of tax burdens. Excise taxes are regressive, but all

the other tax measures analyzed are progressive.

These results seem to suggest that applied general equilibrium analysis of the tax policies of a developing country should incorporate the country's institutional distortions into its analytical model.

### Notes

The authors are grateful to Ms. A. Cruz for research assistance.

1. Some of the elements of the model are described in greater detail in Clarete and Whalley (1988, 1991).
2. The following notations are used for these taxes:  $t_m$  for the vector of tariffs;  $t_x$ , the vector of excise taxes;  $t_v$ , the vector of value added taxes;  $t_c$ , the vector of corporate income taxes; and  $p$ , the vector of personal income taxes.
3. An Input–output survey was done in 1985, but the results have not been published yet.
4. See also Manasan and Querubin (1986) for a review of the Philippine tax system.
5. The models were solved using an algorithm called MPS/GE (Rutherford 1988).
6. We did not measure some of the well–known tax progressivity indices such as those of Kakwani (1977), Musgrave and Thin (1948), Suits (1977), and Slitor (1948).

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## **PART VI— USE OF QUANTITATIVE TOOLS IN TAX POLICY ANALYSIS**

### **13— Applying Tax Policy Models in Country Economic Work: Bangladesh, China, and India**

Henrik Dahl and Pradeep Mitra

Tax reforms are usually guided by certain general principles. One such principle is that the value added tax should form the mainstay of the indirect tax system, should apply to as large a part of the economy as administrative constraints permit, should exempt nonmarketed food consumed by the poor, and should be supplemented by a luxury rate or excises on selected luxury items and on those goods whose consumption the government wishes to discourage. Another is that company taxation should emphasize broadening of the base, neutral treatment of different sectors, and alternative sources of investment finance. Still another is that personal income taxes should be based on an exemption level that is consistent with administrative capacity and a small number of tax rates and should avoid special incentives that typically lose revenue rather than promote the objectives that are said to justify their existence.

Although a number of developing countries have undertaken significant tax reforms, many are more concerned with changing certain taxes and their rates as part of the budget-making or planning exercises. In such situations, policymakers are interested in ascertaining how the proposals would affect government revenue as well as the real income of different socioeconomic groups. General principles alone are of limited use in such cases and it becomes necessary, to undertake some quantitative analysis. This chapter reports on the use of three tax policy models developed at the World Bank to analyze these questions. The first model, that for Bangladesh, demonstrates that the relative attractiveness of different revenue-raising options depends on the workings of labor markets and substitution relationships in production, regarding both of which conventional partial equilibrium incidence analysis makes strong assumptions. The second model, developed for China, emphasizes the importance of taking a systemwide view of taxation in a decentralizing socialist economy, where the coexistence of administered and free-market prices for the same commodities can make standard tax reform prescriptions inappropriate. The exercise highlights some of the links between tax reform and price reform. The third model, drawn from a study of India, examines the kinds of domestic tax adjustments that would be necessary in the wake of reductions in import tariffs to allow the government to continue to meet its real expenditures without any change in foreign borrowing, but taking into account the changes in the prices of intermediates and capital goods resulting from the tariff reform.

### **Bangladesh**

The model for Bangladesh shows how shifting assumptions in production and the operation of factor markets can greatly influence the choice of sectors that must be additionally taxed to raise government revenue.

This discussion focuses on excise taxation, but a similar analysis of other taxes can be found in Dahl and Mitra (1989).

Bangladesh has long depended on trade taxes for as much as 50 percent of its total tax revenue. In an effort to reduce this dependence, it has increasingly relied on an excise tax, which now accounts for 97 percent of taxes on domestic production in Bangladesh. This is an ex factory turnover tax on domestic production and also on some services, and its effects cascade throughout the economy. In recent years excise taxes have accounted for 23 percent of tax revenue. The average rate of excise taxation, defined as the ratio of collections to the gross value of excisable production, is about 8 percent. Two-thirds of excise tax revenue comes from three categories of goods: tobacco, gas, and petroleum or oil lubricants.

#### **Underlying Assumptions of the Tax Policy Model**

Like any tax reform, a proposed change in excise taxation would affect (a) revenue and (b) the real incomes of various socioeconomic groups. To understand the kinds of effects shifting would have, it is necessary to examine the principal assumptions of the Bangladesh tax policy model, which distinguishes thirty-five production sectors and ten socioeconomic groups. First, household preferences are modeled using a linear expenditure system for each socioeconomic group. Second, supplies of primary factors are modeled as follows. In each of the urban and

rural areas, supplies of primary factors are isoelastic in the real wage rate for all classes, except one. Members of the remaining class, termed the residual class (the landless in the rural area, the informal sector in the urban area) migrate freely into and out of other classes in the same area, thus providing a pool of labor that adjusts to the demand for other kinds of primary inputs. When the demand for other classes of factors increases, the residual class accommodates this demand pressure, thus reducing the supply of the landless or urban informals. When the demand for other factors decreases, the numbers in the residual class increase.<sup>1</sup> When members of the residual class migrate to other classes, they are assumed to adopt the spending habits of their new class. Third, the primary factor inputs of each socioeconomic group are aggregated (using a CES function) into value added in each sector.<sup>2</sup> Fourth, output is a Cobb–Douglas aggregate of intermediate inputs and value added.

These assumptions imply in general that a tax increase on a commodity would in part be shifted forward into increased prices paid by users of the commodity and in part be shifted backward into depressed returns to factors employed in its production. The degree of shifting is endogenous and is determined, among other things, by the relevant supply and demand elasticities for the commodity.

In contrast, it has been common in partial equilibrium work on developing country tax incidence to assume either (a) full forward shifting, where producer prices remain constant and commodity taxes are fully reflected in changes in the corresponding consumer prices, or (b) full backward shifting, where, for example, domestic commodity prices are anchored by world prices, corrected for trade taxes and subsidies, so that changes in those taxes are reflected in returns to the factors employed in those sectors (see Ahmad and Stern 1984, 1987; and Hughes 1986). The desirability of particular tax changes clearly depends on the view adopted regarding incidence, which in turn is influenced by the assumptions made about shifting. Since tax analysts necessarily make such assumptions, whether explicitly or implicitly, it is important to examine the sensitivity of judgments about desirable directions of reform to the shifting assumptions that have been used in empirical studies.

### The Agenda

That exercise may be performed using the tax policy model described above. The first step is to ask what increase in the ad valorem excise taxation of a given sector will raise an additional 1 percent of total indirect tax revenue (or Tk 230 million at 198485 prices) with government expenditure requirements (that is, public consumption and investment) held fixed. The experiment is done for every sector, and the efficiency and distributional effects of the changes examined. Second, the revenue and incidence information generated in the first step is summarized in a single measure that captures the relative desirability of increased taxation of a particular sector. Third, the underlying elasticities of the model are changed to reproduce the full forward– and full backward–shifting cases. Fourth, the summary measure is calculated for each sector for the full forward– and full backward–shifting cases. Fifth, the change in sectoral rankings is examined to assess the sensitivity of the desirable directions of reform to shifting assumptions.

**STEP 1: THE CONSEQUENCES OF TAX REFORM.** Table 13–1 summarizes the consequences of raising an additional Tk 230 million at 198485 prices from each sector of the economy with government expenditure requirements held fixed. Two points about these particular experiments deserve comment. First, to raise an additional 1 percent in total revenue, it is necessary to raise more than an extra Tk 230 million from the sector in question alone. Although this may not always be true, it holds here because the direct and cascading–induced

increases in market prices lead to a reduction in the level of activity, imports, and hence import tax receipts, which is not offset by the government's disposition of the additional tax revenue; we shall return to this point later. Second, the demand for an additional 1 percent of total indirect tax revenue at constant prices means that the results can be compared across sectors: in all cases, the government drain on the economy is the same. Thus, if the required increase of the excise tax rate is one percentage point in one sector, and ten percentage points in another, the first sector is more readily able to raise revenue. It need not be the more preferable instrument, however,

because its inherent welfare cost or its distributional consequences may be undesirable.

Table 13–2 shows the relative real incomes in the base year of the model (1984/85) of socioeconomic groups identified by a household expenditure survey. The numbers are presented as ratios to the economywide average, in which the latter is weighted by the population in each group. The distributional impact of the excise tax changes of table 13–1 are shown in detail in table 13–3, which indicates the impact on real income—that is, income deflated by the consumer price index—for each socioeconomic group. An informal

examination of those numbers is used to generate

**Table 13–1. Macroeconomic Effects of Raising 1 Percent of Real Revenue From Excise Taxes on Different Commodities in Bangladesh**  
(percent)

Sector	Increase in						Relative loss of social welfare
	Excise tax rate	Consumer prices	Trade deficit	Excise tax revenue	Customs duty and sales tax revenue	Distribution effect (sign) a	
Rice	0.18	–0.17	–0.39	3.31	–0.02	–	2.35
Wheat	2.73	–0.08	–0.37	3.31	–0.03	–	2.06
Jute	4.10	–0.95	–0.76	3.38	–0.05	–	4.79
Cotton	7.02	–0.14	–0.23	3.55	–0.13	?/–	1.38
Tea	16.57	–0.05	–0.11	3.27	–0.01	?/–	0.57
Other crops	0.61	–0.19	–0.40	3.37	–0.05	?/–	2.25
Livestock	1.84	–0.20	–0.41	3.32	–0.03	?/–	2.19
Fisheries	0.99	–0.17	–0.38	3.31	–0.03	?/–	2.11
Forestry	2.72	–0.06	–0.13	3.38	–0.06	0	0.66
Sugar	3.50	–0.09	–0.26	3.53	–0.12	0/–	1.44
Edible oil	2.82	–0.11	–0.36	3.41	–0.07	0/–	2.00
Tobacco	7.27	–0.10	–0.36	3.32	–0.03	0/–	2.41
Other food	3.14	–0.15	–0.37	3.35	–0.04	0/–	1.77
Cotton yarn	3.90	–0.24	–0.42	3.64	–0.17	0/–	2.45
Cloth	1.11	–0.10	–0.32	3.41	–0.07	0/–	1.87
Jute textiles	2.04	–0.01	–0.03	3.26	–0.00	+	0.13
Paper	8.08	–0.16	–0.27	3.55	–0.13	0/–	1.51
Leather	2.91	–0.18	–0.33	3.31	–0.03	0/+	1.93
Fertilizer	2.98	–0.13	–0.38	3.33	–0.03	?	2.07
Pharmaceuticals and chemicals	2.28	–0.12	–0.32	3.54	–0.13	0/–	1.68

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Cement	11.13	0.03	0.01	3.47	-0.10	+	-0.03
Basic metals	1.85	0.01	0.01	3.73	-0.21	+	0.03
Metal products	1.20	-0.01	-0.05	3.30	-0.02	0	0.23
Wood and other industries	1.32	-0.06	-0.17	3.47	-0.10	0/-	0.84
Urban housebuilding	8.78	-0.01	-0.04	3.27	-0.01	0	0.19
Rural housebuilding	3.45	0.00	-0.01	3.26	0.00	0	0.07
Other construction	1.40	-0.01	-0.02	3.26	0.00	0	0.09
Petroleum	0.48	-0.13	-0.35	3.41	-0.07	0/-	1.85
Electricity and gas	3.32	-0.13	-0.20	3.39	-0.06	0/-	1.16
Transport services	1.11	-0.19	-0.37	3.40	-0.06	0/-	2.05
Housing	2.14	-0.16	-0.36	3.30	-0.02	0/-	2.02
Health	6.51	-0.07	-0.26	3.31	-0.03	—	0.88
Education	3.29	-0.04	-0.12	3.27	-0.01	0	0.46
Public administration	1.35	-0.01	-0.02	3.27	-0.01	0	0.11
Trade and other	0.30	-0.20	-0.38	3.44	-0.08	—	2.03

a. This column is derived from table 13-3. A plus (+) means progressive, zero (0) indicates neutrality, and a minus (-) indicates regressive incidence. A question mark indicates that the outcome is unclear.

**Table 13-2. Base Per Capita Relative Real Income by Socioeconomic Group in Bangladesh**

(relative to weighted average across groups)

<i>Sector</i>	<i>Percent</i>
Urban informal	0.766
Rural informal	0.903
Landless rural	0.915
Medium farmers (tenants)	1.015
Small farmers	1.018
Urban formal	1.064
Medium farmers (owners)	1.079
Rural formal	1.097

Large farmers 1.109

Largest farmers 1.204

column 6 of table 13–1. Thus, a plus means progressive, zero indicates neutrality, a minus indicates regressive incidence, and a question mark signifies that the outcome is unclear. The results of table 13–3 are frequently of considerable interest to analysts and policymakers in identifying the main elements of a tax package. Such a package, once identified, can then be simulated using the model, which makes it possible to examine the impact of the package on revenue and incidence in detail.

Tables 13–1 and 13–3 show that excise taxes on certain commodities have a number of desirable properties: they raise revenue, have little effect on the trade balance, and may even exhibit progressive incidence. This is true, most notably, of the basic metals sector. The table also shows, for example, that whereas jute textiles are a satisfactory tax base, jute is not, mainly because it is an intensive employer of the rural landless. Jute is also a smaller industry, so that a larger tax increase is necessary to raise the same revenue.

**Table 13–3. Effects of Raising 1 Percent of Real Revenue From Excise Taxes on Different Commodities on Per Capita Income of Socioeconomic Classes, Bangladesh**  
(percent)

Sector	Medium–size farmers				Rural		Urban		
	Landless	Small farmers	Tenants	Owners	Large farmers	Largest farmers	Informal sector	Formal sector	Informal sector
Rice	–0.43	–0.08	–0.09	–0.10	–0.10	–0.11	–0.05	–0.04	0.22
Wheat	–0.36	–0.07	–0.08	–0.08	–0.08	–0.08	–0.05	–0.04	0.11
Jute	–0.88	–0.19	–0.15	–0.15	–0.14	–0.13	–0.01	–0.05	–0.04
Cotton	–0.25	–0.05	–0.07	–0.07	–0.07	–0.06	–0.05	–0.03	0.19
Tea	–0.11	–0.02	–0.03	–0.03	–0.03	–0.03	–0.02	–0.01	0.06
Other crops	–0.43	–0.08	–0.11	–0.11	–0.11	–0.11	–0.06	–0.05	0.25
Livestock	–0.42	–0.09	–0.11	–0.11	–0.10	–0.09	–0.08	–0.05	0.23
Fisheries	–0.41	–0.07	–0.10	–0.09	–0.10	–0.10	–0.09	–0.07	0.23
Forestry	–0.14	–0.03	–0.03	–0.03	–0.03	–0.02	–0.02	–0.05	0.09
Sugar	–0.29	–0.06	–0.07	–0.07	–0.07	–0.07	–0.04	0.03	0.12
Edible oil	–0.37	–0.07	–0.09	–0.09	–0.09	–0.10	–0.05	–0.04	0.16
Tobacco	–0.44	–0.09	–0.11	–0.11	–0.11	–0.11	–0.06	–0.04	0.14
Other food	–0.38	–0.08	–0.10	–0.11	–0.10	–0.10	–0.04	–0.03	0.20
Cotton yarn	–0.42	–0.09	–0.12	–0.11	–0.11	–0.11	–0.09	–0.06	0.21
Cloth	–0.31	–0.05	–0.07	–0.07	–0.07	–0.07	–0.10	–0.03	0.08
Jute textiles	–0.02	–0.01	–0.01	–0.01	–0.01	–0.01	–0.00	–0.00	0.01
Paper	–0.31	–0.06	–0.08	–0.08	–0.08	–0.07	–0.06	–0.03	0.20
Leather	–0.33	–0.07	–0.09	–0.09	–0.08	–0.08	–0.06	–0.04	0.19

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Fertilizer	-0.35	-0.07	-0.10	-0.09	-0.09	-0.08	-0.08	-0.06	0.11
Pharmaceuticals and chemicals	-0.33	-0.07	-0.08	-0.08	-0.08	-0.07	-0.07	-0.03	0.15
Cement	0.00	0.00	0.00	0.00	-0.01	-0.01	0.00	-0.01	0.03
Basic metals	-0.01	-0.00	-0.00	-0.00	0.00	0.00	0.00	-0.01	0.01
Metal products	-0.05	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	0.01
Wood and other industries	-0.18	-0.03	-0.04	-0.04	-0.04	-0.04	-0.03	-0.03	0.08
Urban housebuilding	-0.03	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	0.00
Rural housebuilding	-0.01	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	0.00
Other construction	-0.02	-0.00	-0.01	-0.00	-0.00	-0.00	-0.00	-0.00	0.01
Petroleum	-0.36	-0.07	-0.09	-0.08	-0.08	-0.08	-0.06	-0.04	0.17
Electricity and gas	-0.23	-0.05	-0.05	-0.05	-0.05	-0.04	-0.04	-0.03	0.11
Transport services	-0.38	-0.08	-0.11	-0.10	-0.09	-0.08	-0.07	-0.04	0.20
Housing	-0.38	-0.07	-0.09	-0.09	-0.09	-0.10	-0.06	-0.05	0.19
Health	-0.19	-0.03	-0.04	-0.04	-0.04	-0.04	-0.05	-0.08	-0.11
Education	-0.08	-0.01	-0.02	-0.02	-0.02	-0.02	-0.02	-0.04	-0.08
Public administration	-0.02	-0.00	-0.01	-0.01	-0.01	-0.00	-0.00	-0.00	0.01
Trade and other	-0.38	-0.08	-0.11	-0.10	-0.10	-0.09	-0.07	-0.05	0.20

**STEP 2: A SUMMARY MEASURE** .A change in the tax rate on any good affects government revenue and, through changes in the burden of taxation, the welfare of different socioeconomic groups. The loss caused to the socioeconomic groups per unit of revenue raised thus takes into account both revenue and incidence effects and provides a natural measure of the desirability of intensifying taxation on any particular sector. Of two sectors, the one with the lower (higher) loss per unit of revenue is a better (worse) candidate for taxation in the sense that, at the margin, a revenue-neutral switch from the worse to the better sector would improve welfare.

The model is used to calculate the effect on welfare and on revenue of a marginal (strictly, infinitesimal) increase in the excise tax on each sector, taking into account the general equilibrium interactions of that change. The welfare effect is then divided by the revenue effect to yield the measure described above.<sup>3</sup>

To aggregate the welfare affects across socioeconomic groups, we use the following social welfare function:

$$W = \sum_b \frac{N_b U_b^v}{v}$$

where  $N_b$  is the population of socioeconomic group  $h$  ( $b = 1 \dots 10$ ),  $U_b$  is the per capita utility level of  $b$  ( $b = 1 \dots 10$ ), and  $v$  is the index of inequality aversion ( $v \leq 1$ ).<sup>4</sup> We choose as the central case a value of  $-5$  for  $v$ , reflecting a degree of inequality aversion greater than that used in many exercises. A detailed justification for choosing such a value is provided later in this section.<sup>5</sup>

**STEP 3:SHIFTING ASSUMPTION** . To implement different kinds of shifting scenarios, a particular configuration of labor supply and substitution elasticities among factors is chosen as a "central case" and those parameters then varied to generate two polar cases: (a) full forward shifting and (b) full backward shifting. These cases, although polar, are not extreme, and, as mentioned before, both have appeared in the empirical literature.

The central case, from which the results of tables 13–1 to 13–3 were taken, is defined by labor supply elasticities of 0.5 for all socioeconomic groups and a uniform elasticity of substitution across sectors of 0.5 among all primary factors in generating value added. This configuration of parameters implies that taxes are partly forward shifted and partly backward shifted.

Although different parameter values can be used to yield full–forward or full–backward shifting, the parameters chosen here come closest to reproducing the important cases of full forward shifting and full backward shifting recently produced by Ahmad and Stem (1984,1987) and Hughes (1986), respectively. To that end, full forward shifting obtains in the model when (a) all elasticities of substitution between factors are set to zero and (b) the labor supply elasticities by socioeconomic groups are set to infinity.<sup>6</sup> These assumptions allow the primary factors to be aggregated into a single factor, thus ensuring that no unit cost increases due to taxation may be shifted back into reduced factor returns. Full backward shifting is achieved by setting all labor supply elasticities to zero. In this case, the supply of labor is constant, and any changes in labor demand lead to changes in the real wage rate. Thus, when taxes are increased, the demands for factors decrease, resulting in a lower real wage rate, with general equilibrium repercussions throughout the economy.

**STEP 4:THE RANKING OF SECTORS** . Table 13–4 assigns the highest rank to sectors with the lowest ratio of marginal welfare costs to revenue. As mentioned earlier, this means that a revenue–neutral switch from a lowerto a higher–ranked sector improves welfare. Before proceeding to the results, it should be observed that the ratio of welfare cost to revenue will be affected by the assumption made regarding the disposition of the revenue raised by the government through taxation. The figures reported here are calculated on the assumption that the government saves the additional revenue raised through taxation, using it in part to retire foreign debt. An alternative assumption—namely, that the government invests the extra revenue subject to the current account deficit in the balance of payments being fixed—makes little difference to the rankings (these are reported in Dahl and Mitra 1989).

As is apparent from table 13–4, the ratios of welfare cost to revenue are widely dispersed across sectors. However, it is true under all shifting assumptions that cotton yam, jute, and tobacco are among the worst candidates for taxation. Desirable tax bases are rural housebuilding, other construction, and public administration and, except for full forward shifting where cascading is strong, cement. It may be noted that housebuilding, construction, and cement are linked together and serve investment needs (which do not yield immediate welfare effects in the static model).

A striking example of the impact of shifting assumptions on rankings is provided by the rice sector. This sector uses a large share of landless in its production. When taxes are shifted backward, income effects are strong for this group, which is both the poorest group in the country and the labor reserve class for the rural area. Its ranking, however, climbs to 2 under full forward shifting. This is related to the fact that the supernumerary usage of rice in the linear expenditure system is not progressive in income, thus yielding much smaller total distributional and income effects than it would if taxes were shifted backward.

Another notable example is the basic metals sector, which becomes a better candidate for taxation the greater the degree of backward shifting. This is so because the sector employs mainly higher–income classes, in particular, the urban formal sector. When

**Table 13–4. Ranking by Welfare–Cost–to–Revenue Ratio of Marginal Changes in Excise Taxes by Sector, Bangladesh a**

<i>Sector</i>	<i>Central case</i>	<i>Full forward shifting</i>	<i>Full backward shifting</i>
Rice	10	2	14
Wheat	29	21	32
Jute	35	31	35
Cotton	21	25	21
Tea	12	17	12
Other crops	15	11	22
Livestock	24	15	30
Fisheries	7	1	10
Forestry	13	19	13
Sugar	22	24	20
Edible oil	28	29	28
Tobacco	33	34	34
Other food	26	26	19
Cotton yarn	34	35	33
Cloth	17	13	25
Jute textiles	6	7	6
Paper	23	27	16
Leather	27	30	26
Fertilizer	14	12	18
Pharmaceuticals and chemicals	25	28	23
Cement	1	6	1
Basic metals	3	8	3
Metal products	9	10	8
Wood and other industries	16	18	15
Housebuilding			
Urban	8	9	7
Rural	2	3	2
Other construction	4	4	4
Petroleum	20	16	24
Electricity and gas	19	22	17
Transport services	32	23	29

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Housing	30	32	31
Health	18	20	11
Education	11	14	9
Public administration	5	5	5
Trade and other	31	33	27

a. Sectors with the lowest welfare–cost–to–revenue ratios enjoy the highest rank(1, 2, etc.).

taxes are fully forward shifted, however, the basic metals sector becomes less attractive since the prices of many other sectors using metals are affected, thus increasing the cost of living for other household groups, including the landless.

Step 5:sensitivity of rankings to shifting. The sensitivity of sectoral rankings to shifting assumptions

**Table 13–5. Rank Correlation Coefficients across Different Shifting Assumptions, Bangladesh**

<i>Assumption</i>	<i>Excise taxes</i>
Full backward shifting, central case	0.943
Full forward shifting, central case	0.916
Full forward shifting—full backward shifting	0.785

is summarized in the Spearman rank correlation coefficients reported in table 13–5. The coefficient is 0.79 for two economies that differ only with respect to the production and labor market parameters that affect tax shifting. This is quite a low number and indicates that judgments about desirable directions of tax reform can be quite sensitive to underlying assumptions about tax shifting.

### **Distributional Emphasis and Disaggregation**

Recall that the parameter  $\nu$  was set at  $-5$ , to reflect a strong degree of aversion to inequality. If instead we choose  $\nu = -1$ , the rankings become highly correlated. Thus it appears that unless inequality aversion is high, the analyst need not take a particular view regarding substitutability assumptions in production and factor

market conditions. As Dahl and Mitra (1989) have argued, however, this would be a mistake, for the following reason. Tax categories are usually considerably more disaggregated than represented in this model, or in most workable applied general equilibrium models in which the degree of disaggregation is constrained by the availability of data. By taxing different goods appearing in the same model sector at different rates, it is in practice possible to target selected households or income groups on the basis of differences in consumption and employment patterns more effectively than is represented here. Thus, the petroleum sector of the Bangladesh model includes heavy fuels, light fuels, kerosene, and the like. The distributional characteristics of the groups consuming each of those products are different, a feature that is obscured in the model by the fact that all users are affected by a tax on petroleum. For the same reason, no account can be taken of differences among

socioeconomic groups employed in the production of different commodities belonging to the same sector. The need to tax all commodities making up a "model" sector at the same rate may be viewed as a tax restriction. This imposes a constraint on the redistribution desired by even a moderately inequality-averse government (one with  $\nu = -1$ ). To correct for the fact that the conduct of tax policy has, in practice, more degrees of freedom than may be represented by the model, it was decided, for modeling purposes, to assume a higher degree of inequality aversion than that expected to be characteristic of a government.

The suggested tradeoff between aggregation and the redistributive potential of commodity taxation was confirmed when the model with thirty-five sectors was aggregated into five sectors and it was found that the sectoral rankings were almost perfectly correlated even for  $\nu = -5$ . This finding confirms that moderate redistributive concerns are enough to make shifting assumptions matter, the greater the degree of sectoral disaggregation. In practice, policymakers face a large number of commodities and sectors and highly disaggregated classifications, thus illustrating the importance for those advising on tax policy to devote careful attention to the underlying determinants of shifting in incidence analysis.

### Implication for Tax Policy Analysis

The analysis performed with the Bangladesh tax policy model has shown that desirable directions of tax reform based on revenue and incidence analysis can be quite sensitive to the modeling of the degree of substitution among factors in production and the conditions prevailing in factor markets in the economy.<sup>7</sup> Moreover, this conclusion applies to comparisons between different model specifications which, far from being extreme, implicitly underpin the shifting assumptions actually used in partial equilibrium-based empirical work.

Given the uncertainty about the true values of some of the underlying elasticities, models such as the one developed here should be used to identify revenue-raising tax packages that are broadly satisfactory for plausible rather than polar values of the elasticities, an approach implemented in the World Bank's tax work on Bangladesh. Furthermore, the robustness of recommended packages with respect to changes in assumptions about those elasticities should be examined whenever possible.

### China

Like a number of other countries, China is placing increasing emphasis on the value added tax (VAT) in its indirect tax system. The VAT rates are, however, decided on a product-by-product basis and are set to yield broadly the same revenue as the turnover tax the VAT has replaced, although some goods, such as textiles, have seen a reduction in their tax burden. This means that China has a large number of VAT rates, as reported for broad groups in table 13-6 (for further details, see World Bank 1990).

In such circumstances, a standard recommendation of tax analysts is to unify the VAT rate across all the sectors that the tax administration is able to reach, with the rate set to generate the same revenue as that raised before unification.<sup>8</sup> Would this advice be appropriate in China?

**Table 13-6. Value Added Tax Rates on Main Product Groups, China**  
(percent)

<i>Product group</i>	<i>Rate</i>
Textiles	1423
Clothing and footwear	1420

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Enamel products	20
Glass and glass products	1426
Medicines	14
Household machinery	1443
Electrical appliances	1420
Electronic appliances	1216
Machinery	1214
Steel	8
Steel products	14
Paper	1430
Stationery	1230
Household chemicals	1445
Ceramics	1230
Processed food and beverages	1430
Leather	1420
Furniture	14

*Source:* World Bank (1990).

### **Institutional Structure**

To answer this question, it is first necessary to sketch the institutional framework in which the tax system is embedded (World Bank 1990). Two of its features are particularly important.

First, economic reforms in China have led to the introduction of the so-called dual pricing system, which allows state enterprises to purchase part of their inputs and sell part of their output at market prices. State enterprises must deliver their plan quota at controlled prices (known as state list prices) before selling output on the free market. To allow this, such enterprises may also buy inputs necessary to fulfill plan targets at controlled prices.<sup>9</sup> The system of price controls is an implicit subsidy to users, financed by an implicit tax on producers. Thus, for example, price controls on final goods subsidize final consumers at the expense of enterprises that produce consumer goods, while price controls on intermediate goods boost profitability in enterprises that produce consumer goods at the expense of those producing intermediate goods.<sup>10</sup> Since indirect taxes must operate within the framework of price controls, it is necessary to view taxes and price controls as constituting an integrated system.

Second, before the economic reforms, state enterprises received all funds for expansion from the state, and, in return, remitted all profits to the state. The reform process, recognizing that this system deprived enterprises of

any incentives to improve efficiency, introduced so-called profit responsibility, which replaced profit remittances with enterprise income taxes. The enterprise was allowed to keep its after-tax profits and to divide them between three alternative uses: (a) investment and research and development; (b) the workers' welfare fund; and (c) wage bonuses.

Controlled prices and free inherited capital stocks, the latter equivalent to nonremovable lump-sum subsidies, could, however, lead to highly unequal profitability among enterprises in different industries. As a result, enterprises would differ greatly in the amount of after-tax profits they could devote to the three uses. In order to prevent this, China set commodity taxes (which had been of minor significance before the reform) at different rates for different industries.<sup>11</sup>

The coexistence of the two sets of prices has significant implications for tax policy analysis. Taxes on controlled-price sales have to be borne by the enterprise and they reduce investment, payments into the workers' welfare fund, and bonuses. In contrast, taxes on free-market sales can be passed on to the consumer and only harm the enterprise through a reduction in the demand for its output.

### VAT Simplification or Unification?

Difficulties with tax administration and opportunities for wasteful rent seeking strongly suggest that the structure of VAT rates in China needs to be simplified. Since price controls have a significant effect on profitability, however, it would be premature to unify the VAT rate structure without reforming prices and charging state enterprises for free inherited capital stocks.<sup>12</sup>

A tax policy model based on Chinese data was used to ascertain the losses that would arise from unifying VAT rates in the presence of controlled prices for plan transactions and free-market prices for other transactions.<sup>13</sup> The model distinguishes twenty-four production sectors and assumes that inequality arises from differences in workers' bonuses caused by the backward shifting of taxes on sales occurring at controlled prices.<sup>14</sup>

Table 13-7 demonstrates the welfare losses (measured in GDP equivalents) from (a) uniform taxes and (b) planning and the existence of free capital. The loss is measured as the percentage reduction in income that would have produced the same reduction in social welfare. The social welfare function used in the calculation is, as before, of the form:

$$W = \sum_b \frac{N_b U_b^\nu}{\nu}$$

where  $N_b$  is employment in industry  $h$ ,  $U_b$  is the utility function of a worker in industry  $h$ , assumed to be Cobb-Douglas, and  $\nu$  is the index of inequality aversion ( $\nu \leq 1$ ).<sup>15</sup> We take  $\nu = 0$ , whence the above reduces to

$$W = \sum_b N_b \log U_b$$

**Table 13-7. Welfare Loss (in GDP equivalents) from Uniform Taxation and from Planning and Free Capital (percentage change)**

Cause of welfare loss	Extent of planning a				
	0	25	50	75	100
Imposing uniform taxes	0	1.4	4.7	9.1	14.8

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Free capital	8.0	7.6	6.3	5.1	4.2
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Note: It is assumed that 90 percent of capital stock is provided free by the state.

a. Planned inputs and outputs as a percentage of their 1981 values, assuming that plan prices are the same as in 1981.

The first column of table 13–7 gives the results when there is no planning. Although free capital introduces inequality in profit and bonus payments, the assumption of homothetic preferences imposed by the Cobb-Douglas assumption prevents commodity taxation from playing a role in reducing such inequality. With an assumed inelastic labor supply, uniform taxes are eventually optimal in this case.<sup>16</sup> The second column presents the results where, for each sector, the planned inputs and planned outputs are equal to one-quarter of their 1981 values and plan prices are the same as in 1981. The remaining columns correspond to increasing the plan quantities, always as a uniform proportion of the 1981 inputs and outputs.

The first row of Table 13–7 shows that the loss from uniform taxation increases with the extent of planning. The reason for this is that planning introduces inequality in profits and bonuses, a consequence that can be offset only by sacrificing uniform taxation, which preserves efficiency in the goods market. Note that the losses from uniform taxation are large compared with losses computed in free-market economies (see, for example, Ebrahimi and Heady 1988). Even the planning of only a quarter of output produces significant losses from uniformity.

The second row of Table 13–7 shows that the loss from planning and free capital, with no uniformity restriction on taxes is reduced as planning increases, because controlled prices allow nonuniform taxes to offset the inequality caused by the free capital.

Although the losses from imposing uniformity are substantial, it would be inappropriate to recommend, for example, that any country adopt a VAT with many different rates, given the administrative costs and attendant opportunities for tax fraud and rent seeking. Instead, the results should be seen as providing strong evidence that considerable welfare losses could occur if tax rates were equalized without substantial price reform and capital market reform (a result reflected in the more institutionally oriented discussion in World Bank 1990). A sensible compromise between the stark simplicity of the model and the reality of the tax system might be to divide goods into perhaps three groups with a low, standard, and high rate of VAT. Other simulations performed with the model show that the introduction of three groups with separate tax rates captures at least two-thirds of the gains that would be available in moving from uniform to sectorally differentiated taxation (Heady and Mitra 1991b).

### Tax Reform and System Reform

Given the practical difficulties of administering a highly differentiated tax system, the numbers presented here should be seen as providing a measure of the desirability of reforming prices and instituting charges for free inherited capital in state enterprises. More generally, the framework demonstrates the importance of seeing the tax system and its reform in the context of other reforms. It also makes clear that recommendations on tax policy necessarily depend on a careful reading of the likelihood of accompanying policy changes in other parts of the economy.

### India

To move toward an outward-oriented development strategy and derive its attendant benefits, a country needs to lower its tariffs and quantitative restrictions on trade. Since many developing countries rely on tariffs to raise public revenue, a reduction of tariffs would usually have negative fiscal consequences, even though the conversion of quantitative restrictions into tariff equivalents would raise revenue.<sup>17</sup> Therefore, various fiscal

adjustments would be required to offset tariff reductions in India, a country where import duties

**Table 13–8. Composition of Indirect Tax Revenue, India, 198788**  
(percentage of total tax revenue)

<i>Source of revenue</i>	<i>Imported goods</i>	<i>Domestic goods</i>	<i>Total</i>
<i>Union</i>			
Protective import duty	31.23		31.23
Countervailing import duty	4.10		4.10
Union excise tax	–	43.64	43.64
Total	35.33	43.64	78.97
<i>Union and states</i>			
Protective import duty	23.57		23.57
Countervailing import duty	2.74		2.74
Union excise tax		29.11	29.11
State excise tax		4.61	4.61
State excise tax	0.84	18.59	19.43
Total	27.15	52.31	79.46

Source: World Bank estimates.

represented 63 percent of the value of imports in 1987–88.<sup>18</sup>

Like many other countries, tariffs in India comprise (a) a protective element (known as basic and auxiliary customs duties) and (b) a purely revenue–raising element (known as the additional or countervailing customs duty, CVD) that matches the domestic excise tax. The CVD and the central excise tax come under the modified value added tax (MODVAT). Table 13–8 reports the contribution of the various taxes to the revenue of the Union (the central government) and that of the Union and the states.

Protective customs duties account for 31 percent of Union revenues. Hence, a reduction of those duties may be expected to have a significant impact on the public finances and would require offsetting policies, most likely with respect to excise taxes and the CVD.<sup>19</sup> The budgetary impact and the magnitude of those offsetting changes can be estimated if attention is paid to the appropriate economywide links. But the categories used in tariff reform analysis are sectorally disaggregated, so that it also is necessary to ascertain how the economywide changes traced above would affect, for example, various subsectors within the manufacturing sector. These objectives are reconciled by implementing two models on a common (198788) data base: (a) a disaggregated version with seventy–two sectors, which makes simple assumptions regarding certain economywide relationships, and (b) an aggregated six–sector version that makes more appropriate assumptions about those relationships and suggests

what corrections must therefore be made to the results of the sectorality detailed analysis.

For ease of computation, the disaggregated model assumes that the real returns to primary factors such as capital and various types of labor are fixed at their base-year levels or, equivalently, that the factors are in perfectly elastic supply at those real factor prices. These factors combine with intermediate inputs, both domestic and imported, to produce domestic output. The latter, in turn, is subject to import competition under various licensing arrangements for certain kinds of intermediates and capital goods, but reflecting the Indian situation is not exposed to such competition for consumer goods. Incomes are paid to a single average rural and single average urban household and are then divided between consumption and savings. Exports depend on the ratio of export prices to the prices of substitutes in international markets, as well as income in the rest of the world. The government collects tariff and tax revenue from intermediates, capital, and final goods and spends on public consumption: what remains is public savings, which, together with private savings and the excess of imports over exports (or foreign savings), finances investment (for details, see Mitra and Go 1991).

India has a budget deficit of about 10 percent of GDP and a current account deficit in excess of 3 percent of GDP. To calculate the magnitude of the adjustments required to support tariff reform, it is necessary to determine how much excise taxes and CVDs need on average to be increased for a given across-the-board reduction in protective customs duties to allow the government to finance its expenditures without any change in the trade deficit.<sup>20</sup>

### The Agenda

The analysis consists of the following steps. First, the required average increase in taxes is calculated in the model with seventy-two sectors under the assumption that real returns to factors are held constant at their 198788 values. Second, the responsiveness of the required average increase in taxes to changes in the real factor prices is calculated, again in the model with seventy-two sectors. Third, the six-sector model, with flexible real factor prices, is used to determine the impact of an across-the-board cut in protective tariffs on the real returns to labor and capital. Finally, the change in factor prices (step 3) is multiplied by the responsiveness to factor prices (step 2) to adjust the estimates in step 1.

**STEP 1:REQUIRED TAX CHANGE, DISAGGREGATED MODEL .** The macroeconomic effects of an across-the-board reduction in protective customs duties are as follows. Investment and government expenditures are held constant in real terms, so that the model will be seen to exhibit certain Keynesian features. A decrease in tariffs has a negative effect on public revenue, and on public savings (since government consumption is fixed in real terms). Given that about 60 percent of imports are inputs into the production process, however, a tariff reduction has a favorable effect on output and private sector incomes, and hence on private savings. But since only a fraction of extra private sector income finds its way into private savings, the increase in the latter is less than the decline in public savings. With a given trade deficit (foreign savings), total savings in the economy decline and, notwithstanding the tariff reduction-induced fall in investment goods prices, are no longer sufficient to finance investment expenditures. With fixed expenditures, the government saves all additional income, whereas the private sector saves only part of its additional income. Therefore, domestic savings may be increased by transferring income to the public sector by increasing excise taxes and CVD. With real returns to primary factors fixed, it is estimated in the seventy-two sector model that a 1 percent across-the-board cut in protective tariffs would call for an 0.48 percent increase in excise taxes and CVD.

Note that excises and CVD accounted for 48 percent of union revenues in 198788 (table 13-8) or, roughly one-and-a-half times as much as protective duties. Hence, it would have been tempting to conclude that

excise taxes and CVD would have to be increased by approximately 0.67 percent to offset the impact of a 1 percent reduction in protective tariffs. This, however, does not take into account the fact that the fall in prices

induced by the tariff cuts reduces the cost of government expenditure and hence requires less revenue to be raised.

The tariff reduction and tax increase with an unchanged trade deficit leads to a 0.14 percent increase in total imports and a 0.19 percent increase in exports.

**STEP 2: RESPONSIVENESS TO FACTOR PRICES, DISAGGREGATED MODEL .** An increase in real factor prices, by boosting aggregate demand, has an expansionary impact on the private economy, with a positive effect on income, consumption, and savings. Although this increases the value of fixed investment expenditures, the rise in private savings is larger and, using the arguments developed above, requires a reduction in taxes to transfer income to the government. The adjustment required in excise taxes and CVD as a result of a 1 percent average increase in nonagricultural real wages and a 1 percent average increase in nonagricultural real returns to capital is  $-6.4$  and  $-2$  percent, respectively.

**STEP 3: THE EFFECT ON FACTOR PRICES, AGGREGATED MODEL .** The aggregated model maps the seventy-two sectors into six sectors but allows factor prices to be determined endogenously. Except for the residual labor classes in the rural and urban areas, as in the Bangladesh model, labor is mobile across sectors and has an elasticity of 1.2. There is a bigger change in the treatment of capital, which is taken to be sector-specific, so that its rate of return is residually determined, which is the reverse of the assumption made in the seventy-two-sector model. Since a cut in protective tariffs would be expansionary, the pull of demand raises real factor prices. Since capital is supplied inelastically in each sector, its average real return is bid up to a greater extent. In the aggregated model, a 1 percent across-the-board cut in protective tariffs has a negligible impact on nonagricultural real wages but raises nonagricultural real returns to capital on average by 0.09 percent.

**STEP 4: REQUIRED CORRECTION TO THE DISAGGREGATED MODEL .** The previous two sets of calculations may now be put together to determine the correction required in the seventy-two-sector model on account of the assumption of constant real factor prices. If the change in both sets of factor prices yielded by the six-sector model, as a result of a 1 percent across-the-board reduction in protective tariffs (step 3), is multiplied by the responsiveness of the adjustment factor for excise taxes and CVD to changes in those factor prices (step 2), the latter adjustment factor falls by roughly 0.2 percent for a 1 percent reduction in protective tariffs. This should be subtracted from the 0.48 percent arrived at in the seventy-two-sector model with constant factor prices, to yield 0.28 percent as the average adjustment factor.

### Summary

The two models together show that the order of magnitude of the average upward adjustment to excises and CVD varies from 0.28 to 0.48 percent in response to a 1 percent across-the-board cut in protective tariffs, depending on what assumption is made about the elasticity of supply of capital to each sector. To recapitulate, the tariff cut raises real factor returns; the greater the effect on factor prices, the less the savingsinvestment gap that needs to be made up by increasing taxes.

### Implementing Tax Policy Models

The three models presented in the preceding sections are capable of addressing a broad range of questions in a consistent way. These benefits must of course be weighed against the costs that are incurred in their construction.<sup>21</sup>

The costs of building and running a general equilibrium model for tax policy analysis may be assessed by considering the phases of a model's "life cycle." Although the phases are not disjoint, they can be broken down as follows for the purposes of discussion: (a) selection of model structure, (b) compilation of a raw data base, (c) model implementation, (d) generation of a consistent data base, (e) model calibration, and (f) experimentation with the model.

### Selecting the Model Structure

The structure of the model depends on nature of the problem. For instance, one would need to use a fairly disaggregated description of the production structure to evaluate excise taxes, whereas income tax analysis might require closer attention to income generation, transfer incomes, and the determinants of factor supplies and demands. Studies of trade taxation naturally call for a detailed description of foreign trade.

### Compiling a Raw Data Base

The structure of model makes clear what data are required. Compiling a raw data base is usually a timeconsuming task. A typical model requires statistics on production, factor employment and income, demand patterns, foreign trade, and government revenue and expenditure. The data come from diverse sources. National accounts, aggregate foreign trade statistics, and government revenues and expenditures are usually easily obtained. An increasing number of countries

have conducted household expenditure surveys and many have input–output tables that can be updated using other information. Employment and income statistics are harder to obtain, especially when sectorally disaggregated information is needed. In particular, it is difficult to obtain reliable estimates of land use and capital stocks, which must therefore be guesstimated, for example, by postulating plausible capital–output ratios. Although it would clearly be desirable to collect time series of such data in order to obtain parameter estimates for use in the model, most important pieces of information are available for only a few years at most.

### Implementing the Model

Once a raw data base has been put together, the size and structure of the model can be determined. This will typically represent a compromise between the desired level of sophistication as chosen in the first step above and data availability.

Until only a few years ago, modeling required a great deal of knowledge about computer programming, data base organization, and solution algorithms. With the development of modeling languages, the situation has changed significantly. Today it is a rather straightforward matter to translate formal mathematical relationships into computer statements. For instance, the General Algebraic Modeling System, GAMS, in which all three models of this paper have been implemented, allows the user to input a model in virtually the same way as he or she would write it mathematically. A compact algebraic notation also means that formally similar equations for different sectors can be written as a single statement. This implies, for example, that even models as large as the one for Bangladesh, which contains about 2,500 equations and variables, can be written in less than two pages. They may also be solved on a portable PC 386. Furthermore, the modeling languages have made possible a separation of model formulation and solution algorithm, a fact that makes it easy to alter the formulation without the modeler having to make corresponding changes to several thousand lines of solver code.

In addition, some prototypical models are available for use as a template for the formulation of new models. Although each model must focus on the specific issues that it is designed to illuminate, most models share accounting identities and equilibrium conditions that may be taken over without much editing. These developments make it possible for modeler to concentrate on the important tasks of describing behavior and the particular institutional structure of the economy.

### Generating a Consistent Data Base

Model implementation makes clear the format in which the data will be used. The next step is to work through the raw data base to produce a set of data that is specific to the model and consistent with its framework.

This is a major task. The raw data base will typically contain varying pieces of information from one year to another. Different sector and commodity groupings tend to turn up in the input–output table, the household expenditure survey, and foreign trade statistics. And different data sources often use different definitions for households and labor groups. These need to be reconciled to produce data for a base year (and preferably for more years) and common definitions need to be established for all the other entities identified by the model as well.

Once data have been adjusted to match common definitions, it is usually found that different pieces of data are mutually inconsistent. For instance, supplies and demands do not match for a given sector, or the savings–investment identity does not hold. Since general equilibrium models must account for all flows in a consistent manner, it becomes necessary to adjust parts of the data to produce a balanced set of numbers. Although algorithms (such as the RAS) are available for this purpose and are easily implemented on a spreadsheet or in a programming language, they tend to give equal credibility to all data entries and are therefore too mechanical to produce sensible results. It is therefore essential to identify the relatively more and less reliable parts of the data base before deciding what to adjust and what to keep unchanged.

### **Calibrating the Model**

Once the model–specific data base has been established, the model is calibrated to produce a set of parameters that will make the model reproduce the base year and make it possible to track actual economic performance over several years. Although existing procedures allow for considerable automation, the timeconsuming part of the exercise is to ensure that the calibration assumptions are chosen appropriately, that is, in a way that allows the model to perform in accordance with what good economic analysis would lead one to expect. Since general equilibrium models embody simultaneous interactions, this requires a full understanding of the structure and properties of the model.

### **Experimenting with the Model**

Running experiments with model, after it has been sensibly calibrated, is not usually difficult or timeconsuming. Existing modeling languages allow parameters to be changed readily for counterfactual what–if analysis and make it fairly simple to change behavioral assumptions.

Equally important from the point of view of the experiments reported earlier in this paper, some mod–

eling systems such as GAMS allow optimization to be done on the model. This has two important uses. First, it enables the analyst to calculate optimal policies, as in the China model, and to compare optimal policies with other alternatives, such as the uniform value added tax. Second, the optimization feature makes it possible to find general equilibrium multipliers and elasticities. Even though a model may have as many unknowns as equations and may thus preclude optimization, as is the case with the Bangladesh and India models, the algorithm calculates shadow prices on all constraints in the model. For example, it could be that various excise tax rates are fixed at their current values. If the objective function provided for GAMS is the social welfare function, the shadow price on a tax constraint is interpreted as the welfare cost of changing that tax instrument, allowing for all other changes that would occur to preserve general equilibrium. These features have been extensively used in the experiments reported earlier with the Bangladesh and India models.

### **General Assessment**

In a number of cases, the data that need to be collected for general equilibrium tax policy models have already been compiled for various other purposes in country economic and sector work. The modeling exercise can impose some discipline on what needs to be done. Remember, however, that substantial effort must be devoted both to making the data base consistent and to calibrating the model in ways that will make its behavior accord

with more a priori views of the functioning of the economy that it purports to represent. This means that modelers must be familiar with the ways in which the data are put together, so that they may make informed judgments about the relative strengths and weaknesses of the different pieces of information needed to generate a consistent data base. Furthermore, they must thoroughly understand the behavior of their own model if they hope to make judicious decisions with respect to calibration. Otherwise, they will be unable to explain why results from policy simulations come out the way they do. Since a knowledge of the data and the model does not readily lend itself to automation, as do solution algorithms, the model will only be as good as the people available to work on it.

The examples presented in this chapter indicate the kinds of benefits that may be derived from modeling exercises. First, they can be used to analyze a broad range of questions—whether certain tax proposals are appropriate, whether revenue and incidence analysis is sensitive to assumptions about production structures and labor market specifications, how tax policies should be designed in the presence of dual pricing, how to coordinate the reform of tariffs and indirect taxes, to name but a few. Second, the range of results available are a useful input into sectoral and project decisionmaking outside the immediate context of tax policy. To give an example, raising Tk 1 of revenue through excise taxation in Bangladesh imposes an additional economic cost of Tk 1 to Tk 2 over and above the revenue raised, depending on the particular tax that is raised, a fact that highlights the importance of paying special attention to fiscal consequences in the cost–benefit analysis of public investment projects. This, for example, would reduce the attractiveness of projects that have a negative impact on the government budget. Third, with the aid of existing modeling languages, the entire operation can be well–documented and the results replicated by other policy analysts.

The average fixed costs of constructing tax policy models are lowered and the exercise rendered more cost–effective when models are used on a continuing basis for policy analysis rather than being one–time efforts. Thus, the Bangladesh model, in addition to being used for tax policy analysis in the World Bank's tax study, has been transferred, at the country's request, to the National Board of Revenue. The China model, in addition to being used for tax analysis, will be applied to a study on price reform. Likewise, the India model is expected to be adapted for an investigation of related macroeconomic, fiscal, and exchange rate issues.

### Conclusions

This chapter has described three applications of tax policy models developed by the World Bank during the course of economic work on Bangladesh, China, and India.

The Bangladesh model was used to highlight the role of shifting assumptions in influencing the relative attractiveness of different options for raising revenue. To that end, revenue and incidence effects of tax changes were combined and summarized in a single measure that allowed different sectors to be ranked with respect to the efficiency and equity cost of raising revenue. The rankings were then used to compare traditional as against general equilibrium methods of incidence analysis. This was done by ascertaining what would happen to the rankings (a) if, as is common in partial equilibrium incidence analysis, all tax increases were to be fully forward shifted into user prices, and (b) if, as is sometimes the case in partial equilibrium analysis, all tax increases were to be fully backward shifted into factor returns. Incidence judgments were more heavily influenced in the first case by the characteristics of the socioeconomic groups that consume the product on which the tax is to be increased and in the second case by the characteristics of those employed in its production. The change in the rankings in the three cases (full forward shifting, full backward shifting, and a combination of forward and backward shifting of taxes) was considerable, a finding that underlined the importance

of labor market specifications and substitutability assumptions in production in evaluating tax policy proposals. Attention was drawn to the importance of identifying revenue–raising packages that are broadly satisfactory for plausible rather than polar values of the underlying elasticities.

The China model examined the desirability of applying broadly uniform tax rates over a large number of sectors. Although such a rule of thumb leads to generally acceptable outcomes in market-based economies, it requires substantial reexamination in a decentralizing socialist economy such as China, where some production is centrally planned and subject to price controls and some is subject to decentralized decisionmaking and transacted at market prices. Taxes on controlled price sales have to be borne by the enterprise and tend to reduce investment, welfare benefits, and bonuses. In contrast, taxes on free-market sales can be passed on to the consumer and only harm the enterprise through a reduction in the demand for its output. In view of the coexistence of the forward shifting of taxes on market sales and backward shifting on price-controlled sales, nonuniform tax rates are more desirable in this case—because, with price controls, backward shifting would cause uniform tax rates to lead to highly unequal profitability and workers' bonuses across sectors. The model showed not only that the losses from uniform taxation increase rapidly with the extent of price controls, but also that those losses are much larger than the losses computed in economies without such controls. Thus, although it would be desirable to simplify rates on administrative grounds and because this would reduce opportunities for rent seeking, a unification of value added tax rates is not appropriate in the presence of price controls. More generally, the exercise underlined the importance of viewing the tax system and its reform in the context of reforms in other areas of the economy.

The India model focused on aspects of the relationship between trade liberalization undertaken to reduce antiexport bias and tax reform, namely, the need for tax increases to offset potential revenue losses arising from the reduction of tariffs in an economy where the latter make a substantial contribution to public revenue. This was done using two models implemented on a common data base: (a) a disaggregated version that made simple assumptions regarding certain economywide relationships in order to focus on the consequences of tariff reform for various subsectors, and (b) an aggregated model that made more appropriate assumptions about those relationships and suggested what corrections therefore ought to be made to the results of the sectorally detailed analysis. Together, the models illustrated how much indirect taxes need on average to be increased following a reduction in protective customs duties, to allow the government to meet its expenditures without increasing the current account deficit. The required adjustment in taxes was quite different from what an inspection of the shares of taxes and tariffs in public revenue alone might have suggested. The difference was due to the fact that price decreases induced by tariff reductions led to a fall in the value of the same real expenditures and hence reduced the amount of revenue that needed to be raised.

The costs of constructing tax policy models depend on the data required, the computing demands, and judgments regarding model structure and calibration. The two most important and time-consuming aspects consist of generating a consistent data base and calibrating the model in ways that will make its behavior accord with more a priori views of the functioning of the economy which it purports to represent. The former requires a knowledge of the relatively more and less reliable parts of the data base, and the latter requires an understanding of the structure of the model if one hopes to explain why results from policy simulations come out the way they do. These costs must be weighed against the fact that the models are capable of addressing a broad range of questions and of doing so in a consistent and potentially replicable way. Moreover, some of the results generated are useful in sectoral and project analysis that transcends the immediate context of tax policy. The costs of constructing tax policy models are seen as investments in tools that can be used on a continuing basis for many kinds of policy analysis.

### Notes

1. This view of the labor market underlies the discussion in Little and Mirriees (1974).
2. The model does not include quasi-fixed sector-specific primary factors. This is due to the lack of data on capital in Bangladesh. Thus the wage rate actually refers to the price of value added.

3. This is the general equilibrium analogue of the measure proposed by Ahmad and Stern (1984, 1987) in evaluating tax reform in the more partial context of full forward shifting.
4. The utility function chosen to represent the linear expenditure system is  $U_b = \prod_i (C_{ib} - \gamma_{ib})^{\beta_{ib}}$ , where  $C_{ib}$  is the consumption of good  $i$  and  $\beta_{ib}$  is the marginal budget share of good  $i$ . The subscript  $b$  refers to a typical member of socioeconomic group  $b$ .
4. Column 7 of table 13–1 presents the welfare loss arising from raising an additional Tk 230 million from each sector. This is a discrete rather than a marginal change.
5. In fact, to achieve numerical stability, they are set equal to 20.
6. The demand system is kept constant in these experiments. Sensitivity of the rankings to changes in demand systems is examined in Dahl and Mitra (1992).
7. To this would be added supplementary excises or a luxury rate of VAT on selected goods on distributional grounds.
8. It is estimated, for example, that the proportions of agricultural products, consumer goods, and intermediate goods not transacted at controlled prices in 1986 were 76 percent, 53 percent, and 40 percent, respectively. See World Bank (1990).
9. Thus, an illustrative calculation suggests that the effect of price controls on nonagricultural final goods is to reduce the index of retail prices by about 7 percent. See World Bank (1990).
10. Originally, the commodity taxes were the product tax and the business tax. These are both turnover taxes and are gradually being replaced by the VAT. Part of the justification for using taxes to equalize profitability could be removed by setting the controlled prices to just cover cost (including any taxes that might be desired for other reasons), and by revising them regularly to reflect cost changes; however, this would not eliminate inequalities in profitability that are due to differences in state–provided capital stocks.
11. Some estimates are provided in World Bank (1990).
12. For a fuller exposition and other details, see Heady and Mitra (1991a). Note that the input–output table used in this exercise is for 1981 and is therefore somewhat out of date. Although this affects the numbers in table 13–7, it does not affect the basic argument of this section.
13. This assumption is made to provide income inequality as a simple representation of the harm caused by unequal profitability. If, instead, unequal profits produced unequal investment, long–run inefficiency might result. Given the increasing liberalization of capital markets in China, however, debt financing might be used as an

alternative to retained profits. In this case, unequal profitability will not produce unequal investment, but the allocation of current profits to investment would reduce future interest payments on debt and lead to larger future bonuses. Thus, all profits eventually benefit workers through bonuses or the size of the workers welfare funds.

14. This assumption is made in order to calibrate the function from the available data that report budget shares spent on each sector.

15. Subject to a qualification noted in Heady and Mitra (1991a).

16. The *World Development Report 1988* estimates that the contribution of import taxes to public revenue is in excess of 20 percent in Asia, Sub-Saharan Africa, the Middle East, and North Africa compared with 2 percent in the industrial countries.

17. For full details, see Mitra and Go (1991). The effect of relaxing nontariff import licensing that are held constant in this paper is examined in that study. Available evidence, quoted in Kishor (1989), suggests that the premium on import replenishment licenses given to exporters fell to about 5 percent in the 1980s, largely because of a shift to a more active exchange rate policy and increased tariffs on imports, thus limiting the revenue gains to which relaxing nontariff import licenses could give rise. Such licenses cannot, however, be used to import goods on the so-called restricted list.

18. It is important that the adjustment be made to both the excise and the CVD that matches the excise tax. The argument is spelled out in Mitra (1991).

19. The increase in excise taxes is confined to the nonagricultural sector, since the contribution of agriculture to excise tax revenue is only 0.03 percent.

20. For a detailed account of how a model can be implemented, see Dahl (1987), which reviews the necessary steps in the context of a particular model.

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### 14—

## Tax–Benefit Models for Developing Countries: Lessons from Developed Countries

Anthony B. Atkinson and François Bourguignon

The redistributive systems of industrialized countries have become more and more complex as their share of GDP has increased. Through successive reforms and additions to preexisting systems many countries have juxtaposed several, often administratively independent, components. On the financing side, these include the personal income tax, social security taxes, and contributions to private or quasi-private bodies, and on the receipts side, social insurance benefits, solidarity payments, income maintenance programs, and child benefits. The distribution and total effect of this complex set of measures on household incomes is often unclear, as is their impact on the budget constraints and resulting decisions faced by households. Hence there is a need for models that can be used to analyze the effect of the entire redistributive system and of possible reforms to the system.

Such models should have three main ingredients, in different degrees: (a) information on the distribution of income and other characteristics in the household population, drawn from household surveys, income tax records, or other sources; (b) information on the rules governing tax and benefit systems, accompanied by information from administrative and other sources about the differences between the theory and practice of the rules; and (c) estimates of the behavioral responses to changes in tax and benefit parameters, covering such matters as the supply of hours of work, participation in the labor force, and savings and portfolio decisions.

Historically, the first studies of redistributive systems were those that sought to assess the impact of the government budget in the United States (Musgrave and others 1951; Pechman and Okner 1974), in the United Kingdom (Economic Trends, various years), and in a number of other countries (see Cazenave and Morrisson 1978). These studies incorporated components (a) and (c), although the latter usually amounted to a series of assumptions about behavioral response (for example, that excise taxes are fully reflected in consumer prices). In general, the taxes paid and the benefits received were calculated for each household, relative to an assumed situation in the absence of taxation and benefits. The taxes and benefits were those reported in the source data. The conclusions reached were of the form: "The Gini coefficient was  $x$  percent lower for income after taxes and benefits than for income in the pre-government situation."

From the standpoint of policy, it is obviously valuable to be able to predict the consequences of changes in policy, and this has been the objective of a second type of model that has been developed—the tax–benefit model recently built in several countries (the United Kingdom, France, the United States, Sweden, and Ireland, among others). In order to predict the consequences of changes in policy parameters, these models apply to each household in the sample the official calculation rules for the various taxes and benefits the household may be entitled to and show the consequences of changes in these rules. By doing so, the tax–benefit models allow the user to put himself in the position of the minister of finance. The models derive the resulting distribution of net incomes, as well as other important characteristics of the redistributive system, such as the effective marginal tax rates faced by households, the distribution of individual gains and

losses associated with a specific reform of the system, and, of course, the change in net tax receipts. The first generation of these models ignored behavioral responses and thus corresponded to a purely arithmetical exercise. Nonetheless, given the complexity and the importance of the general redistribution scheme relative to gross incomes in most industrialized countries, these models have proved extremely helpful in assessing the direct effects of possible reforms. The questions "Who in the first instance pays what?" and "Who gets what?" are certainly the first that need to be answered in any evaluation of a tax–benefit reform.

Tax–benefit models describe the possible changes in disincentive effects in terms of the changes a given reform is likely to make in household budget constraints. Household responses to these changes are estimated using econometric evidence (see, for example, the work of Blundell and others 1986). In this way, the numerical tax–benefit models are moving toward applied general equilibrium models of the kind developed by Shoven and Whalley (1984), which embody elements (b) and (c) described earlier.

As they stand at present, tax–benefit models are also static. This certainly is an obstacle for the analysis of that part of the redistribution system concerned with intertemporal transfers—for example, pay–as–you–go pension systems. The intertemporal models that have been developed (for example, by Auerbach and Kodikoff 1987) are based on elements (b) and (c).

Turning to developing countries, we see that redistribution issues are of increasing concern, either because these countries have reached a development stage in which the administrative channels for redistribution may be enlarged or because a slowdown in growth and the adjustment process make it necessary to transfer a larger part of the national income to the poor. The actual effects of the redistribution tools, whether they already exist or are yet to be created, may be still more complex than in industrial countries. There are several reasons for this. First, the administrative channels through which taxes may be collected and cash benefits efficiently distributed are rudimentary or limited to some fraction of the population. This means that there may be a wide gap between official policy and the way in which it actually works. Second, the share of redistribution that goes through the public provision of basic services is probably much larger than in industrial countries. Focusing only on cash transfers could, therefore, be quite misleading. Third, behavioral responses might be stronger in developing countries because economic institutions are more flexible. For example, the borderline between "formal" (where income flows may be observed and controlled) and "informal" activities (where they are not) may be quite mobile (see

Newbery 1987). As a result, private income transfer schemes or income-sharing practices may be drastically affected by, say, public programs for the relief of poverty.

Tools like the tax-benefit models constructed in industrial countries would undoubtedly be most helpful in making the redistributive system more efficient. At the same time, they must certainly be substantially modified in order to account for the specific redistribution mechanisms in those countries. The purpose of this chapter is to review some of the lessons that can be drawn from the experiences in developed countries and to provide some guidelines for adapting tax-benefit models to developing countries. The first section summarizes the features of the tax-benefit models available in the United Kingdom and France, identifies the conceptual and practical problems that have to be solved, and makes explicit some of the assumptions behind these models. The second section considers how far the same problems are likely to arise in the context of developing countries (using Brazil as an example) and how far the same assumptions may be justified.

### **Tax-Benefit Models in Industrial Countries**

Tax-benefit models arose as an alternative to the common practice in policymaking of basing redistributive reforms on the analysis of a few hypothetical examples meant to represent "typical families"—such as a married couple with two children and an average income or a single pensioner. As M. King (1988) argued, the trouble with such a practice is that it is far from clear how typical these typical households are. Mixing characteristics as simple as family, labor market, home ownership, and income status covers a wide variety of personal circumstances in which the reform under analysis may have effects quite different from those identified for a few typical cases. This is especially true where the reform interacts with other components of the redistributive system. Moreover, in the analysis of proposed reforms there is a natural bias toward the people whom the reform is intended to benefit rather than those—possibly less obvious—people who will lose.

Therefore considerable advances have been made through the systematic work on representative samples of households, such as those drawn from family expenditure surveys, and on their responses to proposed changes in the calculation of taxes and benefits.

#### **The Features of Tax-Benefit Models**

Element (a) identified earlier represents an essential ingredient in the formation of tax-benefit policy. Element (b) is also important. Most hypothetical examples used in policy discussions have assumed that policy operates according to the legislative provisions,

whereas there may well be a considerable distance between the law and the reality. For example, both tax evasion and avoidance may seriously affect the conclusions drawn. Income may be treated in examples as a homogeneous variable, but the reality of tax legislation is far removed from a Haig-Simons concept of income, and the tax paid may depend sensitively on the source of income and the method of payment. The difference between law and reality appears on the benefit side as well. Programs may be limited geographically or according to other criteria. Individuals are often not allowed to avail themselves of the rights to which they are entitled. Thus a second important function of tax-benefit models is that they take into account this diversity of experience under an apparently identical set of legislation.

The difference between law and reality may be apparent from household survey data, which record the receipt of benefits and the payment of taxes. But tax-benefit models may also make use of other information. Indeed, another notable feature of models constructed in developed countries is the degree to which they have taken into account information outside the survey on which they are based. For example, administrative control totals may be used for the number receiving a particular benefit, or the data from two different surveys may be merged.

Outside information is essential to ensure that the results obtained from the models are consistent with the results available from other sources. Discrepancies must be explained if the approach is to be acceptable. An obvious example is that of reconciliation with the national accounts. Are the data multiplied up consistent with the totals for personal income, spending, and other variables in the macroeconomic accounts? This raises the question of the "grossing up" of the survey data to population totals. This procedure needs to take into account, for example, the fact that survey data may not cover the entire sample or that there may be a differential nonresponse. Furthermore, there may be significant differences between the definitions used by two sources, and the national accounts data may not necessarily be more reliable.

Tax-benefit models also differ in the degree to which they are accessible to the nonspecialist. At one extreme, the user has to know not just the details of the policy structure but also the operations of the command program, whereas at the other, the program prompts the user with details of the present tax-benefit system. The user-friendly models are a great deal more costly because of the time it takes to construct them, but they are likely to be used more widely.

### **A Selective Survey of Tax-Benefit Models**

In the United Kingdom, as in other countries, tax-benefit models have been developed both within the government and in academic institutions. The Central Statistical Office has coordinated the official model-building activities, and individual government departments (notably the Department of Social Security) have developed models for their own particular purposes. In academic circles, models have been constructed by teams at the Institute for Fiscal Studies and at the London School of Economics. The London model is the one referred to in this analysis, as it is the model with which we are most familiar.

The TAXMOD model built in 1986 by Atkinson and Sutherland is an arithmetic tax-benefit model. Starting from the sample of households included in the Family Expenditure Survey, they developed microcomputer software capable of rapidly computing the amount of taxes paid and (cash) benefits received by each household in the sample under alternative tax-benefit systems. The demographic and economic characteristics of each household was taken into account in the computations. Considerable attention was devoted to assessing the reliability of the underlying survey data by comparing survey results with external sources and the implications of different methods of grossing up. It was evident that corrections needed to be made for particular kinds of income (self-employment income and investment income) and for the problem of differential nonresponse (for example, the proportion of children was overstated). Procedures were devised to make approximate corrections for both these problems.

Element (b) of this computer program consists of the parameters of the various tax and benefit schemes. These parameters sometimes describe the very structure of the schemes, as in the case of joint as opposed to individual tax returns for married couples. Together, these parameters describe a given tax-benefit system. TAXMOD can be used to model the income tax, National Insurance contributions, National Insurance pensions, unemployment benefit, widows' benefits, income support, housing benefit, and family credit.

The output of the calculations is the change in (1) the distribution of mean net incomes, of mean net (of benefit) tax rates, and of effective marginal tax rates; (2) the mean demographic and economic characteristics of households ranked by percentage gains or losses in net incomes; and (3) the aggregate receipts or spending for each type of tax or benefit.

Several research groups in other countries have taken the basic idea of the TAXMOD model a step further. The French SYSIFF model (Bourguignon and others 1988), for example, combines individual components of various national tax-benefit systems whose basic structure may vary drastically. Another study has examined the effects of introducing specific features of the British systems into the French redistributive system. Generalizing from that approach, one could consider building a "library" of tax and benefit instruments used in various countries in

different periods. A tax–benefit

model such as SYSIFF would then permit one to apply alternative combinations of instruments to a given population of households and thereby introduce considerable flexibility in the structure rather than in the parameters of simulated tax–benefit systems.

An example of the application of SYSIFF is given in table 14–1. This simulated reform is concerned with the way in which the French tax–benefit system treats family size. Instead of using the "quotient familial" system, whereby the progressivity of the income tax is defined in income per capita, thus granting larger child deductions in rich families, we analyze a reform that consists of a lump–sum deduction for each child. The results reported in table 14–1 are taken from SYSIFF output. They show the distribution of working households ranked by disposable income per capita, the effect of the tax–benefit system on total incomes (columns 2 and 3), the redistributive effect of the reform in terms of total (column 4) and per capita (column 6) income, and the average family size of households in each decile of the population.

From the first two columns, it may be seen that the French tax–benefit system increases the mean income of the poorest 30 percent of the population by approximately 25 percent and reduces that of the top decile by 22 percent. The reform substantially reinforces the redistributive power of the system, although middle–income households gain more than the poorest ones. Other output tables from SYSIFF not shown here give information on the characteristics of the main gainers and the main losers (large rich families), the change in the distribution of marginal tax rates, and the change in the distribution of households ranked by such indicators as gross income and family size. Thus this gives a complete picture of the effects of the reform under analysis. The reform may then be modified or enriched by changing the parameters of the original system until some initial objective or some a priori constraints are satisfied.

### **Limitations of the Models**

Before considering how to adapt modeling tools such as TAXMOD or SYSIFF to developing countries, the implicit assumptions behind these models—and their degree of restrictiveness—must be made explicit. An understanding of these limitations is necessary to guide the future development of these models in countries in the Organisation for Economic Co–operation and Development (OECD) and is necessary to establish whether they are sustainable in contexts different from those found in the United Kingdom, France, or other industrial countries.

**INCOMPLETE COVERAGE** . The first serious limitation is that taxes and benefits are only partly covered. This incomplete coverage has been of particular concern in studies that have sought to measure the redistributive impact of the government budget (see Peacock 1984). It may be that those public expenditures and receipts not included in the model are not redistributive or are not intended to be (as in the case of defense and general administrative expenditures). Nevertheless, considerable ambiguity surrounds a large part of the public expenditures and receipts not included in tax–benefit analyses. The corporate income tax and tariff duties, for example, are known to have potentially important redistributive effects, whereas education expenditures are known to be unequally distributed beyond a certain educational level. The problem with

**Table 14–1. An Example of SYSIFF Output**

<i>Deciles net income per capita (percent)</i>	<i>Simulation Results</i>				<i>Tax benefits: DEDFORO</i>	
	<i>Gross income</i>	<i>Net income</i>	<i>Change net income</i>	<i>Net income per capita</i>	<i>Change net income per capita</i>	<i>Family size (x100) a</i>
010	48691	67560	45	20667	18	318
1020	73926	89450	614	28804	242	311
2030	88431	100009	1396	34796	554	288
3040	104029	112469	1492	40936	659	275
4050	115568	118357	1889	47074	937	252
5060	133373	131434	1595	54168	1082	244
6070	149962	142491	662	60730	1025	237
7080	164847	152325	438	69854	1349	222
8090	200261	176780	–1427	82319	862	219
9095	235623	197453	–2506	102370	1579	199
9599	320986	246906	–8718	127543	–442	199
99100	555159	363514	–15875	205341	–3836	187
Total	138119	132505	38	56225	696	256

a. A child is counted as 1/2 adult.

these and other policy instruments is that we are not equipped to ascertain the way in which they may affect economic welfare and the distribution of income. In some instances, the difficulty is conceptual. In other words, are educational expenditures a transfer to the parents of pupils and students, a social "right" of all children, or a transfer to the future generation of adults? In other cases, such as the ambiguous incidence of corporate taxes, the difficulty is analytical (see Atkinson and Stiglitz 1980).

The problem of limited coverage is in one sense less serious in tax–benefit models, in that it may be addressed by one particular set of policy instruments. A model to be used by the Ministry of Social Security, for example, may reasonably focus on the range of social security taxes and benefits. But this in itself is likely to be restrictive in terms of policy formation. One purpose of tax–benefit models is to draw attention to the interdependencies between policies. It makes little sense, for example, to design income tax policy to reduce the marginal tax rates faced by households if changes in social security—such as an extension of means–tested benefits—have the opposite effect.

Width of coverage is therefore important, and existing models leave room for improvement. On the tax side, TAXMOD includes only about a third of total tax revenues, whereas on the spending side, it accounts for

approximately 25 percent of total government expenditures (table 14–2). On both sides, however, the payments and receipts included in the model clearly correspond to the most redistributive instruments. It is known, for instance, that indirect taxes, which account for the major part of the missing tax revenue in the model, have practically no redistributive effects when related to consumption expenditures (although not to income, as is often incorrectly done) and when it is recognized that the services consumed by higher-income groups are often not subject to tax.<sup>1</sup>

On the side of spending, it can be seen from table 14–2 that, even when the National Insurance pensions are excluded, the social security system in the United Kingdom gives the public sector control of approximately 5 percent of GDP for redistributive cash transfers. Given that the income distribution is skewed, such an amount should permit a priori a drastic reduction in the level of inequality and the extent of poverty; for example, 5 percent of GDP represents approximately a quarter of the income of the poorest 50 percent of households.<sup>2</sup>

**TREATMENT OF BEHAVIORAL RESPONSE** . Since models such as TAXMOD ignore behavioral responses, their results cannot be taken to predict the full consequences of a change in tax and benefit policy. The calculations are done on an "as if" basis, which provides one element of the policy change but overlooks the possible reactions of households and the wider general equilibrium implications.

A number of recent studies have incorporated behavioral responses, and this work has raised some interesting questions.

The first has to do with the selection of the behavioral responses to be modeled. In the literature on the OECD countries, notably the United States, labor–supply responses have received the most attention, although work has also been done on the level of savings, portfolio composition, and geographical migration, among other responses (see Heckman and MaCurdy 1984). Labor supply has many dimensions. The supply of hours, the participation decision, and the retirement decision have been studied the most. Dimensions that are less tangible but may be more sensitive, such as the supply of effort or the willingness to take responsibility, have received less attention.

Second is the problem of extrapolating from studies of incentives based on subsamples of the population to the whole tax–benefit model population. Some evidence concerning the United States, for example, relates to a selected subsample that corresponds to less than 50 percent of the population (see Sutherland 1989). Put another way, can we apply to the self–employed labor supply equations devised for the employed?

Third is the question of the apparent sensitivity of the estimated responses to the choice of functional form, the specification of the stochastic term, and the choice of sample period. Although there is some consensus on the broad kinds of response to be expected, the precision of estimates typically implies a wide confidence interval about the predicted results (see Mroz 1987; Bourguignon and Magnac 1990; and MaCurdy and others 1990). This in turn raises the question of how this lack of precision should be conveyed to the user of a tax–benefit model.

Fourth, what interpretation should be placed on the stochastic term in an estimated relationship? The standard practice in arithmetic tax–benefit models is to treat each household as having a specific fixed effect that can be calculated from its observed income. But this heterogeneity of preferences is not the only interpretation that can be applied to the stochastic term. For example, there may be transitory variations (so that the observed diversity overstates the true degree of diversity) or measurement errors.

**ABSENCE OF DYNAMICS** . The tax–benefit models that we have considered are essentially static. This is limiting in two respects. First, even if the economy has attained a steady state, policy changes can be slow to make an impact, so some of the decisions taken in the 1980s, notably those with regard to pensions, will have

**Table 14–2. Comparative Structure of Public Expenditures and Receipts: United Kingdom and Brazil, 1986**

	<i>United Kingdom</i>	<i>Brazil</i>
<i>Spending</i>		
Benefits in cash	25.9a	17.7
Social Security: contributory	14.3	17.7
Retirement	10.3	13.0
Other	4.0	4.7
Social Security: non-contributory	9.2	—
Rent rebates	1.9	—
Other cash benefits	0.5	—
Benefits in kind	22.9	15.3
Health services	10.6	5.2
Education	10.1	9.5
School meals, welfare food	0.4	0.6
Housing subsidies	0.9	—
Other	0.9	—
Other expenditures	51.2	67.0
Total	100.0	100.0
(Share of GDP	(46.2)	(21.1)
<i>Financing</i>		
Direct taxes		
Personal income tax	23.8a	6.4
Corporate income tax	6.1	11.0
Social security contributions (payroll taxes)	16.2	24.7
Employees	8.0a	5.7
Employers	8.1	19.0
Other direct taxes	6.3	9.1
Indirect taxes		
VAT	14.1	30.6
Excise and trade taxes	14.9	6.8

## Tax Policy in Developing Countries

Local taxes	9.1	1.4
Social security		6.4
Other taxes	9.5	3.6
Total	100.0	100.0
(Share of GDP	(37.8)	(21.9)

— Not available.

a. Covered by TAXMOD.

*Source:* Brazil, World Bank (1988, 1989); United Kingdom, Economic Trends.

implications well into the next century. Second, the dynamics of the economy itself will be affected by policy changes.

The treatment of these dynamic considerations is far from straightforward, however. Incorporating dynamic responses introduces all the problems just discussed. If the welfare consequences are to be evaluated, one must consider the degree of intertemporal rationality, the level of information, and the welfare treatment of interdependencies in utility functions. At the same time, these difficulties are not avoided in a static model. Consider the treatment of the link between social security contributions and pensions: the latter are not seen as some kind of return on the former, but as a component of the redistributive system that, at some point in time, transfers income from the active to the inactive population.

### The Relevance of Tax–benefit Models in Developing Countries

We now turn to the question of how far the kind of model described above can be applied to a middle–income country such as Brazil. As a starting point, table 14–2 illustrates the differences between the structure of public expenditures and their financing in the United Kingdom (our earlier example) and in Brazil.

The main differences between the public expenditures of the United Kingdom and Brazil are (a) a much smaller GDP share of public expenditures in Brazil—less than half of that observed in the United Kingdom; (b) a much larger share of unallocated expenditures; and (c) practically nonexistent noncontributory cash benefits. As a consequence, the redistributive power of Brazilian public expenditure appears severely limited in comparison with that of the United Kingdom.

On the tax side, personal income tax accounts for a much smaller percentage of total receipts, and indirect taxes and employers' social security contributions for correspondingly larger proportions. Given the overall tax burden relative to GDP in the two countries and the strong redistributive power of the personal income tax, the same conclusion as for public spending applies. The redistributive power of the tax system is much lower in Brazil. Moreover, given the fact that both personal income tax and social security contributions affect mainly the modern sector of the economy, that redistributive power is in fact limited to the top of the income distribution.

This comparison suggests that it is of limited use to apply, without modification, the tax–benefit models used in OECD countries to a developing country.

#### Treatment of Individual Programs

Identifying the direct beneficiaries and the amount transferred to them seems a priori easier for cash than for in–kind benefits. In general, household income and expenditure surveys provide information either on received benefits themselves (retirement pensions, for instance) or on the household characteristics necessary to compute

them (such as gross income, family composition, and rental charges). Our discussion of TAXMOD and other models shows, however, that in both cases some corrections are necessary, either because of sample biases in the survey (for example, as a result of nonresponses), or because, in contrast to what is assumed in the preceding technique, the take-up rate for some benefits is substantially below unity.

In-kind benefits give rise to two types of difficulties. First is the issue of the amount to impute to allocated services. Public education, for instance, may be evaluated at public average cost, at its opportunity cost in the private sector (where such information is available and relevant), or at households' marginal willingness to pay. If the last is chosen, however, a demand function has to be estimated for schooling, a task that cannot be conducted at the individual household level and the results of which may be highly imprecise (see Gertler and Glewwe 1989). Concerning the average public cost, there is much evidence in developing countries, Brazil being no exception, that the quality of education varies greatly across regions and areas (see World Bank 1988). This means, for instance, that there would be some arbitrariness in imputing the observed average cost of primary education to each child enrolled in primary school. The same holds for health and other publicly provided or publicly subsidized services.

The other difficulty lies in identifying the beneficiaries of those services. Here, conventional microeconomic data bases do not always provide the relevant information. For education, for instance, household surveys indicate whether children in a household are enrolled in school or not. But, in countries where educational services are partly supplied by the private sector, these surveys do not report whether a child goes to private or public school. Likewise, it is not customary for household expenditure surveys to report on public health services that households did not pay for or on the presence of a dispensary or a subsidized food station in the vicinity of the household's residence. In Brazil, as in some other countries, special surveys have sometimes been conducted on these matters.<sup>3</sup> But because they do not necessarily include the variables relevant for some other aspect of redistribution and because they have often been conducted some time before, those special surveys give rise to additional technical difficulties. Updating, grossing up, and merging various cross-sectoral surveys are necessary operations that often require somewhat arbitrary assumptions.

Clearly, the share of public expenditures that may be directly allocated to individual households in Brazil on the basis of a standard household survey is extremely limited. It consists of social security pension payments, which amount to less than 20 percent of the total budget.<sup>4</sup> These transfers, moreover, refer to a segment of the population that is not of the highest concern for social policymaking, since it consists largely of the modern sector or the upper part of the individual welfare distribution in the economy. Allocating in-kind benefits to individual households is certainly feasible. But it requires several assumptions about conceptual—for example, the imputation problem—or statistical issues, which will probably always be open to debate.

Generalized public subsidies to privately provided goods and services deserve special treatment. If they have bearing on goods whose income elasticity is much below unity, they may be efficient redistributive devices. Under the assumption of full forward shifting by producers, they can be allocated to individual households on the basis of household expenditure surveys. We shall deal with them more extensively below, when analyzing indirect taxation. In the case of Brazil, for instance, the wheat price subsidy accounts for 0.8 percent of total public expenditures.

The financing side of table 14-2 leads to similar conclusions. Taxes that may be directly allocated to individual households are essentially the personal income tax, employees' social security contributions, and complementary employers' social security contributions. Under some assumptions, indirect taxes may be considered fully shifted to the final users of the goods and services they bear upon. As such, most of them may be allocated to individual households on the basis of their expenditures.

It follows from the preceding discussion that directly applying available tax–benefit models that focus on cash allocated benefits and personal income taxation to a country such as Brazil would be of limited use. Such a model would concentrate on a restricted part of the actual and potential redistribution system, and not even the most important one, since it would concentrate on the upper part of the income distribution, leaving aside the possibility of making transfers to the poorest segment of the population. To be operational, tax–benefit models for developing countries must include redistributive channels that are ignored in existing models for industrial countries. It seems essential, in particular, to include the indirect tax (and subsidy) system, as well as public transfers in kind. Indeed, indirect taxation has long been the main focus of redistribution analysis in developing countries (see the extensive contributions of Ahmad and Stern on that subject, in particular Ahmad and Stern 1989). Likewise, the distributive effects of public expenditures have always received much attention, even though exhaustive microeconomic surveys, such as the one realized by Selowsky (1979) in Colombia, are still scarce. Nor is it surprising that most of the recent debate on antipoverty policies and "targeting" has focused on the allocation of public expenditures and on public subsidies (see Kanbur 1987; and Pfefferman 1987). We devote the rest of this section to ways in which those policy instruments could be introduced into the existing tax–benefit framework.

### **Use of Microeconomic Data**

The principal feature of the original tax–benefit models is their use of actual microeconomic data, rather than hypothetical ("typical") households or "aggre–

gated" households defined by a few common income and demographic characteristics. Redistribution analysis that relies on hypothetical households is uninformative because it misses the variability observed in individual circumstances and therefore in the way individual households may be affected by a reform of the redistributive system. The objective of such analysis should thus be to maintain the fully disaggregated approach to indirect taxation and redistribution through public expenditures, but to marry it with the more conventional general equilibrium method of tackling those questions.

**TREATMENT OF INDIRECT TAXATION .** In the case of indirect taxation (and subsidies), the logic of tax–benefit models based on microeconomic data dictates that changes in consumer prices resulting from changes in the tax structure be applied to the observed expenditures of individuals in household expenditure surveys, and not, as is commonly done, to a few groups of aggregate households. Although debatable, the link between changes in indirect tax rates (value added taxes, excises, subsidies) and those in final consumer prices would follow the usual practice in general equilibrium modeling—that is, full forward shifting under the assumption of constant returns to scale and perfect competition (see, for example, Ahmad and Stern 1987; for alternative assumptions, see Dahl and Mitra 1990). But informal activities that tend to escape taxation, such as the consumption of home–produced goods in farm households, would be treated differently. In this case, contrary to what is usually done, the possible behavior responses of household spending to the change in the structure of prices should simply be ignored. Such a choice is clearly consistent with the practice of ignoring labor supply or saving responses in existing tax–benefit models that focus on the income tax and on means–tested cash benefits. This treatment also has some other justifications.

It is well known that, in the case of a marginal reform in indirect taxation, the changes in welfare measures brought about by changes in "welfare income equivalent" are equal to the change in net taxes paid by individual households. This characteristic makes it possible to handle direct and indirect taxation in the same manner (see Ahmad and Stern 1987). In contrast, the second–round effects of a reform in indirect taxation (which consists of changes in the structure of demand and therefore of production), in factor allocation, and in factor rewards are generally ignored in empirical indirect tax incidence analyses that do not rely on a complete general equilibrium framework of the Shoven–Whalley type (see the theoretical suggestions in Ahmad and Stern 1987). To include them in a disaggregated microeconomic framework would pose formidable problems, since it would make the

distribution of gross incomes endogenous and would in fact make it necessary to model income (and employment) changes at the individual level. In this respect, further research seems necessary to evaluate the extent of the bias arising from the neglect of the production response to indirect tax reforms.

There is, however, one main drawback in ignoring spending responses to changes in indirect taxation. It would not be useful to simulate the welfare effects of an indirect tax and subsidy reform on the basis of observed individual consumption if the reform implied an unbearable budget deficit because of expenditure switching at the individual and the aggregate level. A possible way of ensuring aggregate financial consistency would be to rely on econometric estimates of the full aggregate demand system, based on National Account time series. Of course, this would imply a discrepancy between the aggregation of the budget constraints of individual households in the model and the overall budget constraint of the redistributive system.<sup>5</sup> At the same time, this discrepancy would give a useful measure of the bias arising from the neglect of behavioral responses in the microeconomic-based model.

Even though the preceding methodology follows the standard practice described in the literature on indirect tax incidence, working with microeconomic data rather than with a few aggregate households raises additional difficulties. An important one is that household expenditure surveys may reflect transitory rather than permanent household consumption behavior. It is difficult to know, as is well known, whether zero consumptions mean that a household is truly not consuming a particular good or is simply not being observed consuming that good at the time of the survey (see Deaton and Irish 1984; and Kay and others 1984). Applying changes in consumer prices stemming from a reform in indirect taxation to the observed expenditures of individual households may therefore give an inaccurate measure of the "permanent" effect of the reform on the households' welfare. Clearly, this problem disappears when households are aggregated in a small number of supposedly homogeneous groups because transitory components of consumption expenditures tend to cancel out. At the same time, the diversity of individual circumstances is lost.

On reflection, however, the problem created by the transitory nature of expenditures observed in household surveys is not so different from that of observed incomes and should not be an obstacle to including indirect taxation in tax-benefit models based on micro-economic data. Household incomes observed at a given point in time include transitory components that lead to an overestimation of the extent of inequality; longitudinal earnings analyses show that the transitory component accounts for approximately 30 percent of the variance of earnings logarithms (see the survey of panel income studies by Atkinson and others 1988).

Yet, analyzing the effects of an income tax reform remains informative, even though there is some ambiguity about what part of these effects will have a permanent impact on households. The same applies to indirect taxation. In fact, the problem may even be less serious if one assumes that the purchase frequency of a particular good is directly related to the quantity consumed. In simulating the effects of an increase in the price of that good, the burden borne by heavy consumers will necessarily be larger than that by light consumers or nonconsumers. In any case, this ambiguity seems a small price to pay for preserving all the information contained in microeconomic data bases when analyzing tax reforms and for being able to take into account interactions between indirect and direct taxation.

**TREATMENT OF PUBLIC EXPENDITURES** . The question of how to handle the redistributive role of public expenditures raises other issues. As mentioned earlier, the problem here is that all the necessary information is not available in the same source. In the case of Brazil, for instance, data on health services and nutrition have been collected as a supplementary module of the labor force survey (PNAD 1988), as were detailed data on education a few years earlier (PNAD 1983). Thus the main technical difficulty is to merge different data sources and to ensure that the results are consistent with the available macroeconomic information.

Various techniques of merging may be used (see Pass 1986). For example, all household characteristics common to the two sources may be merged and observations matched with those same characteristics randomly. A similar technique would be to regress the variable that is available in source A (health services, for instance) and to be integrated in source B (the household expenditure survey) on the set of household characteristics common to the two sources. The predicted value, using the household characteristics in source B, is then added to each household record with an additional simulated error term aimed at preserving the variability of that variable across households. Such an approach is only valid under restrictive assumptions, and further research is needed to determine whether these random matching techniques can provide much useful information.

The other set of data needed to implement the model is total expenditures by type of public service. The simplest imputation technique for those services is their average cost per beneficiary, or potential beneficiary in the case of health insurance. Given the observed inequality in the availability and the quality of public services, however, it would seem desirable to rely on some disaggregation of total expenditures by geographical areas. The model could then be used to investigate, in a rough manner, the scope for gains in redistributive power through the mere reallocation of existing expenditures.

As with indirect taxation, behavioral responses to changes in the provision or quality of public services would probably have to be ignored, although they might be substantial in some instances, as would be the case for changes in spending behavior in response to a change in a public nutritional program. Unfortunately, our knowledge in this field is still more limited than in individual household spending behavior, although even this is extremely imprecise.

### **Conclusion**

The preceding suggestions for adapting tax–benefit models employing microeconomic data to developing countries imply that considerable work needs to be done to refine the technique and that there may be some doubt as to the utility of simply transferring the existing technology. This certainly would be an extremely pessimistic view. The fact is that constructing new models is a gradual process and it is not necessary to take a comprehensive look at the whole redistributive system from the outset. Even a model that covers only some of the redistribution instruments can yield useful results.

In the case of Brazil, the simplest instruments to be integrated in the framework of microeconomic data were the personal income tax, social security contributions, and pensions. Although they may affect only a small fraction of the whole population, there are at present 3.2 million people paying income taxes in Brazil, and these instruments already offer considerable scope for reform in, for example, their tax base, progressivity, deductions and abatements, and distribution of marginal tax rates. Indeed, personal income and payroll taxes were substantially modified in the 1989 tax reform passed in Brazil, and further reforms are recommended in a recent study by the World Bank (1989). A tax–benefit model based on microeconomic data would have been useful in analyzing these reforms. In particular, it would have allowed for an integrated view of the various changes in the taxation of personal incomes.

The construction of a model that only takes into account the preceding transfers must be considered merely a first step toward a more comprehensive analytical tool. It is true that the principal redistributive issue in Brazil, as in most developing countries, is that of transferring real income to the poorest segment of the population, those not at all subject to the personal income tax or social security pension payments. Therefore the model should be extended to include indirect taxes, subsidies, and redistributive public expenditures. Some of these extensions do indeed seem feasi–

ble. For instance, if one starts from a standard household survey such as PNAD in Brazil, it is probably not a difficult task to include publicly provided school meals in the computation of net household incomes. Other

extensions will require modifying or enlarging the microeconomic data base by merging other data sources with the original one and building additional modules into the computation of net incomes. Successive additions of data and continuous updating, as well as the inclusion of a variety of alternative redistributive schemes, should progressively lead to a comprehensive, powerful, and yet simple instrument for the design of an efficient redistribution system adapted to the specific needs of developing countries.

### Notes

1. In France, for instance, the incidence of indirect taxes on consumption expenditures varies from 9.5 to 10.5 percent where households are ranked by expenditure level and family size. See Bazy–Malausie and others (1982). The incidence is regressive when income, rather than expenditure, is used. But this does not take into account the fact that savings are for a large part postponed expenditures.
2. Assuming reasonably that household incomes represent 80 percent of GDP, of which the bottom half of the population receives 25 percent.
3. The annual household labor force and income survey, PNAD (Pesquisa Nacional por Amostra de Domicilios), often includes supplementary modules on specific topics such as education, health, and fertility.
4. The extent to which recorded pension payments in the PNAD data coincides with macroeconomic data is to be checked.
5. A way of avoiding this inconsistency between microeconomic and macroeconomic data would be to identify microeconomic price responses to the macroeconomic estimates. This may be done under "perfect aggregation" conditions. See Jorgenson and others (1980).

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## **PART VII— TAX POLICY AND ECONOMIC GROWTH**

### **15— Taxes, Outward Orientation, and Growth Performance in the Republic of Korea**

Irene Trela and John Whalley

Although the growth performance of the Republic of Korea and other newly industrialized economies (NIES) of Asia has captured increasing attention in recent years (see Chenery and others 1986), few studies have explicitly examined the role of taxes in the growth process. The literature on Korean tax policy has been largely concerned with documenting the changes in tax structure as growth has occurred and with providing calculations that might reflect some of the impact of taxes, for example, on the cost of capital (see World Bank 1987a; Choi 1988; and Kim 1988). Admittedly, it is both difficult and well beyond current capabilities to capture all the elements underlying Korean growth performance (high savings rates, human capital accumulation, intersectoral resource shifts) in a single model. Nonetheless, modeling can be used to evaluate some aspects of the contribution of tax policy to growth in Korea.

In this chapter, we discuss an applied general equilibrium model that we recently used (Trela and Whalley 1989) to investigate the contribution of tax policy to Korean growth through induced intersectoral resource transfers and through the impact on effort and labor supply in agriculture and manufacturing. Although we focused only on one aspect of the Korean experience, our calculations suggest that one should look beyond tax policy for the main factors underlying the strong Korean growth of recent years. The tax component of outward-oriented policies accounts for 6.2 to 7.9 percent of Korean growth between 1962 and 1982, and only 6.7 percent between 1962 and 1972. This conclusion mirrors what we portray as the robust response of Korean growth to various policy regime switches, including tax policy. High savings rates (amounting to almost 38 percent of GDP in 1988; see Park 1989: table 3) and high investment rates have been central to Korea's performance, as have significant transfers of labor from rural to urban sectors, especially in the early phases of growth. Therefore, tax policy in Korea should be seen as accommodating high growth, rather than as one of the main factors driving it.

Since the early 1960s, Korea has used tax policy in several different ways to meet varying economic objectives. In the outward-oriented phase of economic expansion (1961-72), it used direct and indirect rebate and exemption schemes to encourage high growth. Then, in the second phase (1973-79), when the growth of heavy industry (steel and chemicals) was being promoted, it relied on the tax system to facilitate capital accumulation in specific sectors. The revenue-raising potential of the value added tax (VAT) has played an important part in the most recent growth phase, from 1979 onward. Mean growth rates apparently resilient to these frequent switches in policy, have remained high in each phase. In 1989, however, the growth rate took a sharp fall, and turned negative. Since then, there has been talk of a new economic crisis.

### Background

The mean growth rate in Korea from 1981 to 1986 was about 8.3 percent. Korea's economic growth has been attributed in large part to the policy shift from import substitution to export promotion in the 1960s.<sup>1</sup>

This is not to say that Korea's growth rates can be explained solely by changes in trade policy. Its policy structure is substantially more complex than this, and there have been three distinct regime switches since the early 1960s.<sup>2</sup> Growth in Korea has also been more volatile than in other Asian NIES, such as Taiwan and Hong Kong, with prolonged periods of extraordinarily rapid growth followed by years in which growth rates have been zero and even negative.

Even though growth has been high, the country has experienced repeated and sharp policy changes following various crises, such as those of 1973 and 1979. From 1961 to 1972, policy was strongly oriented outward and was characterized by duty remissions, tax rebates on exports, registration schemes for importers, and other measures tied to export performance. Between 1973 and 1979 the emphasis switched to the development of heavy and chemical industries, including iron and steel, nonferrous metals, shipbuilding, general machinery, chemicals, and electronics. Many earlier export performance policies and tax holidays were withdrawn, along with other outward-oriented incentives for targeted industries. Since 1980, policies have focused instead on structural adjustment and trade liberalization, with a pronounced move toward neutrality in policy and the removal of most existing incentives.

Despite these policy switches and the accompanying changes in tax policy, growth continued unabated. Taxes played a role in the early outward-oriented strategy through the rebating of cascading sales and excise taxes, and the rebating of a portion of corporate taxes to export industries. As protection has come down in the trade liberalization and structural adjustment phase, however, so duty remissions have become less important. Furthermore, a number of the tax rebate schemes linked to exports have been eliminated over the past ten to fifteen years. In the process, the Korean tax system has matured from a narrowly based system, focused on traditional excisables, trade, and other taxes, to one with a broadly based VAT accounting for a major portion of revenues, along with income and corporate taxes having much wider coverage and more sophisticated

administration than in most other developing countries (see Han 1986).

### Growth Performance and Korean Policy Regimes

Between 1961 and 1986 Korea's annual rate of real GNP growth was 8.3 percent. This was among the highest rates in the world and contrasts with a rate of approximately 4 percent in the preceding period, 1954-60. Korea effectively transformed itself from an underdeveloped, predominantly agricultural economy to a prominent NIE.

During the reconstruction period of 1954 to 1960 following the Korean War, policy in Korea had been basically inward looking, with import substitution through tariffs and quotas for light manufactured and nondurable consumer goods. The government made some effort to promote exports, but the resulting growth remained small, ranging from 2.2 to 4.1 percent of GNP.<sup>3</sup>

In the 1960s, policy moved away from inward-looking, import substitution toward an outward-oriented development strategy. Authorities introduced a comprehensive export promotion scheme involving a range of incentives: preferential credit for exporters, indirect tax exemptions on inputs for export production and export sales, a reduction of corporate and income taxes on export earnings, wastage allowances on imported raw materials for export production, accelerated depreciation allowances for fixed capital directly used in export production, foreign-loan guarantees, and import and export financing assistance. Import controls were liberalized so that entrepreneurs could import machinery and equipment free of tariffs for use in export production. Foreign loans were encouraged to fill the domestic savings gap and, with the devaluation of the Korean won in 1964 and interest rate reforms in 1965, interest rates on ordinary loans from banking institutions were substantially raised. As a result, bank deposits increased rapidly, enlarging the supply of loanable funds to Korean exporters.

Many attribute Korea's economic growth to these outward-oriented policies. As can be seen from table 15-1, exports grew rapidly, reflecting the expansion in the production of labor-intensive manufactures (textiles, apparel, plywood, and footwear), in which exporters were believed to have significant comparative advantage at this time. The volume of exports grew at a rate of about 30 percent a year between 1961 and 1972, and real GNP grew at an annual rate of 8.2 percent. The manufacturing sector was the dominant force in this export growth; manufactured exports rose from 18.2 percent of total exports in 1961 to 88 percent by 1972.

With the expansion of manufacturing in domestic product (from 8.9 percent in 1961 to 20 percent in 1972), labor was drawn away from agriculture and other primary industries, where output per worker was low, to manufacturing and other activities, where output was higher (see Economic Planning Board 1982: table 315d). Thus, the proportion of the working population in agriculture steadily declined, from 63.1 percent in 1963 to 50.6 percent by 1972 (table 15-2). In contrast, the percentage of employment in manufacturing increased from 8.7 percent in 1963 to 14.2 in 1972; total employment increased by about 38 percent between 1963 and 1972. Hence, the expansion of nonagricultural employment was achieved both by sectoral

**Table 15-1. Major Economic Indicators of Korean Growth, 1955-86**  
(percent)

Year	Per capita GNP (\$US)	Growth rate of GNP (1975 constant won)	Inflation rate (GNP deflator)	Gross fixed investment to GNP	National saving to GNP	Growth rate of exports	Ratio of exports to GNP	Ratio of manufacturing to total exports
1955	65	4.1	62.1	10.2	5.2	22.1	2.9	—

## Tax Policy in Developing Countries

1956	66	-1.4	34.0	10.3	-1.9	-9.0	2.3	—
1957	74	7.6	22.2	10.6	5.5	33.9	2.2	—
1958	80	5.5	-1.3	10.2	4.9	24.6	2.8	—
1959	81	3.8	1.3	11.0	4.2	15.0	3.4	—
1960	79	1.1	11.7	10.8	0.8	20.8	4.1	—
1961	82	5.6	14.0	11.7	2.9	38.7	6.3	18
1962	87	2.2	18.4	13.7	3.2	13.0	6.0	27
1963	100	9.1	29.3	13.5	8.7	9.0	5.4	51
1964	103	9.6	30.0	11.3	8.7	23.5	6.7	51
1965	105	5.8	6.2	14.8	7.4	35.9	9.5	62
1966	125	12.7	14.5	20.2	11.8	42.4	11.9	62
1967	142	6.6	15.6	21.4	11.4	32.7	13.6	70
1968	169	11.3	16.1	25.0	15.1	39.5	14.7	77
1969	210	13.8	14.8	25.8	18.8	36.1	15.4	79
1970	252	7.6	15.6	24.7	16.2	19.6	15.0	83
1971	288	9.1	12.9	22.5	14.5	21.1	16.1	86
1972	318	5.3	16.3	20.4	15.7	36.0	20.6	87
1973	395	14.0	12.1	23.2	21.4	53.0	30.0	88
1974	540	8.5	30.4	25.6	19.3	-0.8	28.4	90
1975	590	6.8	24.6	25.3	16.8	19.0	28.2	88
1976	797	13.4	21.0	24.4	22.2	41.5	32.0	89
1977	1,008	10.7	15.9	27.3	25.4	23.3	32.7	87
1978	1,392	11.0	21.6	31.3	27.3	12.5	30.6	89
1979	1,640	7.0	20.0	33.2	26.5	-1.1	27.7	90
1980	1,589	-4.8	25.3	32.3	20.8	10.2	34.4	92
1981	1,719	6.6	15.4	28.7	20.5	15.0	37.8	92
1982	1,773	5.4	6.7	30.5	20.9	6.5	36.9	93
1983	1,914	11.9	3.9	31.3	25.3	15.5	37.5	94
1984	1,044	8.4	3.8	31.3	27.9	10.0	38.7	95
1985	1,047	5.4	4.1	30.8	28.6	2.1	37.7	95
1986	1,300	12.3	2.7	31.4	32.6	26.5	42.5	94

—Not available

*Source:* Chol (1988: table II-I); Economic Planning Board (1976, 1988)

shifts of labor and an increase in total employment. The share of employment in the social overhead capital and service sectors also increased—from 28.2 percent in 1963 to 35.2 percent in 1972.

## Tax Policy in Developing Countries

In the early 1970s, the government began to shift policy away from general export promotion toward sectoral development, focusing on heavy and chemical industries (HCI). This change was in response to several factors, notably the increase in relative labor costs and the slower growth in traditional labor-intensive export industries, rising import barriers in developed countries against labor-intensive manufactures, and the desire to develop the domestic production of intermediate inputs to supply the earlier export industries (see Kwack 1986:7677). This drive toward sectoral growth was supported by a wide range of measures, including import protection for infant industries, industry-specific tax preferences, and credit rationing. The industries targeted in this drive were steel, metal products, chemicals, shipbuilding, machinery, and auto production.

Under this new policy, light industry saw its share of gross output fall during 1975-80, whereas the share of heavy industry almost doubled and then rose even higher by 1980 (table 15-3). The share of manufacturing in production increased from 40.3 percent in 1970 to 51 percent in 1980. The promotion of HCI also helped upgrade exports, and the share of HCI products in total exports increased from 21.3 percent in 1972 to 38.3 percent by 1980 (Choi 1988:11; Pyo 1989: table 6). The share of agriculture in production continued to decline, from 17 percent in 1970 to 8.3 percent in 1980.

Large investments in the targeted HCI industries, however, had several adverse effects during this period, including (allegedly) excessive real wage increases in these industries, insufficient investment in

**Table 15-2. Employment and Labor Productivity in Korea by Sector, 1963-86**

Year	Employment				Production per worker (1975 constant thousand won)		
	Employed population (thousands)	Agriculture, forestry, and fishery (%) a	Mining and manufacturing (%) a	Social overhead capital and others (%) a	Agriculture, forestry, and fishery	Mining and manufacturing	Social overhead capital and others
1963	7,662	63.1	8.7	28.2			
1964	7,799	61.9	8.8	29.3			
1965	8,206	58.6	10.3	31.0			
1966	8,423	57.9	10.8	31.3	432	1,902	692
1967	8,717	55.2	12.8	32.0			
1968	9,155	52.4	14.0	33.6			
1969	9,414	51.3	14.3	34.4			
1970	9,745	50.4	14.3	35.2	541	3,110	1,041
1971	10,066	48.4	14.2	37.2			
1972	10,559	50.9	14.2	35.2			
1973	11,139	50.0	16.3	33.7			
1974	11,586	48.2	17.8	34.0			
1975	11,830	45.9	19.1	35.0	658	4,589	1,851
1976	12,556	44.6	21.8	33.5			

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1977	12,929	41.8	22.4	35.8			
1978	13,490	38.4	23.2	38.4			
1979	13,664	35.8	23.7	40.5			
1980	13,706	34.0	22.6	43.4	731	9,190	4,667
1981	14,048	34.2	21.3	44.5			
1982	14,424	32.1	21.9	46.1			
1983	14,515	29.7	23.3	47.0			
1984	14,417	27.1	24.2	48.7			
1985	14,935	24.9	24.5	50.6			
1986	15,505	23.6	25.9	50.0			

a. Percentage of total employed population.

*Source:* Economic Planning Board (1982, 1986, 1988) and Kim (1988).

light industries, and capital market distortions. The government responded in mid-1979 by designing the Comprehensive Stabilization Program, which included stringent monetary and fiscal measures, as well as new policy measures to promote greater industrial neutrality. The underlying forces that had prompted the government to launch this new program were, however, strongly reinforced in 1979-80 by a poor grain harvest, a second oil shock, rising interest rates, and domestic political disturbances. These events combined to produce a negative real growth rate of 4.8 percent in 1980, an inflation rate of 25.3 percent (as measured by an increase in the GNP deflator), and a record current account deficit of 9 percent of GNP. The government thus began a new policy effort in 1980 organized around three goals: to achieve price stability, renew rapid economic growth, and improve income distribution. This strategy was reflected in a wide range of stabilization and adjustment programs (documented in Choi 1988; and World Bank 1987a).

Stringent monetary and fiscal policies were implemented first. Once the macroeconomic imbalances were greatly reduced, the government undertook trade and financial reforms. Average tariff rates were lowered from 35 percent in 1980 to 23.7 percent in 1983, and then to 12.7 percent by 1988. Quotas were sharply reduced, and restrictions on direct foreign investment were substantially relaxed.

In the move toward financial liberalization, the government privatized commercial banks, lowered entry barriers in financial markets, partly deregulated the interest rates offered by financial intermediaries, and abolished preferential loan policies. The Fair Trade and Antimonopoly Law was adopted in 1981 to prevent anticompetitive practices, and strategic promotion of industries was replaced by more indirect and functional support for industries in order to promote greater industrial neutrality.

This stabilization and adjustment program was remarkably successful. Between 1983 and 1988, the rate of growth of real GNP averaged 10.2 percent, whereas domestic inflation (GNP deflator) averaged 3.8 percent (compared to 20.8 percent during the period 1973-79). The current account balance continued to improve through the 1980s to reach a record surplus of \$14.3 billion by 1988 (Pyo 1989; table 7; Oum 1989: table 1).

In 1989, however, the Korean economy produced yet another downturn in growth performance, and there is now growing concern that the economy is headed for a further crisis (see Park 1989:2). Estimates

**Table 15–3. Industrial Composition of Koream Output, Selected Years**  
(percentage shares in total output)

<i>Output category</i>	<i>1970</i>	<i>1975</i>	<i>1980</i>	<i>1983</i>
Agriculture	17.0	12.8	8.3	8.2
Mining	1.1	0.9	0.8	0.7
Manufacturing	40.3	50.4	51.0	50.0
Light industry	28.4	29.5	24.7	22.1
Food, beverages, and tobacco	15.9	14.4	10.8	9.6
Textiles and leather	7.1	9.9	8.4	7.0
Lumber and wood products	1.4	1.2	1.0	0.9
Paper printing and publishing	1.4	1.4	1.6	1.8
Nonmetallic metal manufacturing	1.4	1.5	1.9	1.8
Miscellaneous manufacturing	1.2	1.1	1.0	1.0
Heavy and chemical products	11.9	20.9	26.3	27.9
Chemical and chemical products	5.9	10.8	12.6	11.8
Primary metal manufacturing	2.0	3.4	5.1	5.0
Metal products and machinery	4.0	6.7	8.6	11.2
Construction	8.6	6.2	8.0	8.2
Social overhead	6.7	6.7	8.1	8.9
Services	26.3	23.0	23.8	23.9

*Source:* World Bank (1987b: tables 1.1 and 1.2).

for 1989 indicate that real GNP growth fell from 12 to 6.7 percent, the current account surplus fell from \$14.2 billion to \$5 billion, the inflation rate rose to 6 percent, and export volumes declined by 6.5 percent, the first such decline since the early 1960s.<sup>4</sup> The Koreans believe that these dramatic changes are the result primarily of a sharp deterioration in Korea's export competitiveness, caused by the appreciation of the won over the past three years, and social and political reforms toward democratization since 1987 which have prompted large wage increases (see Oum, 1989: 13).

### **Tax Policy during the Growth Process**

Disentangling the contribution of tax policy to this strong growth is a difficult task, not only because of the changes in tax policies that have occurred, but also because of many other factors.

Korea's tax system is composed of both national and local taxes. Because the share of local taxes in total revenues is small, the present discussion concentrates on national taxes.<sup>5</sup> The importance of taxes, measured by tax revenues as a proportion of GNP, rose from 9.1 percent in 1962 to 15.5 percent in 1987 (see table 15–4). But this growth in taxes was uneven, reflecting periods of lower growth in the economy, as in 1963–65, when the ratio of revenue to GDP fell, in 1972–73, when substantial tax cuts were used for incentive purposes.

In 1977 a VAT, which is an indirect tax, replaced eight other indirect taxes and has since become the single largest source of revenue in Korea, accounting for 25.3 percent of tax revenues in 1987. Since the introduction of the VAT, indirect taxes have become the most important source of revenue in Korea. The shares of direct and indirect taxes in total national revenue were 42.3 percent and 26.6 percent, respectively, in 1976 but then switched places, moving to 23.4 percent and 40.3 percent in 1987.

### Tax Incentives

Perhaps the most important factor to consider in evaluating the contribution of tax policy to strong growth performance in Korea is the use of tax incentives.<sup>6</sup> These have taken different forms in the three periods of growth outlined above.

1961–72. In the 1960s, the main concern of Korean policy was export growth, which the government of the day equated with nation building. It saw tax incentives as a way of promoting the growth of foreign exchange earnings, particularly from labor-intensive exports in which Korea was believed to have a comparative advantage. The most prominent measures were those rebating indirect taxes on inputs (whether imported or domestically purchased) into export production and indirect taxes on export sales.<sup>7</sup> These operated alongside tariff exemptions on capital equipment and raw materials imported for export production. Beyond these were direct tax exemptions for exporters, which included a 30 percent corporate tax exemption on income from export business and a 20 percent exemption on income from tourism and sales of goods and services to UN military forces in Korea, although from 1962 on all income from foreign currency earning activities was given this same treatment, and exemption rate was raised to 50 percent.

Export incentives also included special depreciation arrangements, first introduced in 1962. Machinery and equipment used in export production and sales quali-

**Table 15–4. Structure of National Taxes in Korea, 1962–87**  
(percentage of total national taxes)

Year	Direct Taxes				Indirect Taxes							
	Income tax	Corporation tax	Business tax	Other	VAT	Special consumption tax	Liquor tax	Commodity tax	Others	Stamp revenue	Custom duties	Duties on services
1962	16.2	7.2	6.9	3.1	n.a.	n.a.	8.9	16.7	13.8	2.3	23.9	n.a.
1963	19.1	9.6	8.2	2.7	n.a.	n.a.	8.9	12.1	14.5	2.5	20.5	n.a.
1964	23.0	11.0	8.6	2.8	n.a.	n.a.	7.9	8.8	12.6	2.3	22.0	n.a.
1965	21.4	10.4	8.0	2.8	n.a.	n.a.	6.9	12.9	12.3	1.4	23.0	n.a.
1966	23.2	12.4	8.3	3.0	n.a.	n.a.	7.2	11.8	11.2	1.7	20.1	n.a.
1967	23.9	12.3	8.9	3.3	n.a.	n.a.	6.3	11.9	11.1	1.8	19.7	n.a.

## Tax Policy in Developing Countries

1968	24.5	12.7	9.0	2.8	n.a.	n.a.	5.7	11.4	12.5	1.3	19.5	n.
1969	26.5	12.6	8.8	2.7	n.a.	n.a.	6.1	11.7	12.6	1.2	17.0	n.
1970	25.2	12.7	9.3	3.5	n.a.	n.a.	6.5	9.5	17.1	4.9	15.2	n.
1971	26.4	13.9	9.3	3.5	n.a.	n.a.	6.8	8.6	17.7	0.6	12.8	n.
1972	24.2	12.6	11.2	3.7	n.a.	n.a.	6.5	8.5	16.8	1.8	13.6	n.
1973	23.7	9.5	11.5	4.8	n.a.	n.a.	6.5	9.6	16.4	1.6	15.8	n.
1974	19.5	13.1	11.5	4.5	n.a.	n.a.	6.3	9.4	18.2	1.6	15.0	n.
1975	15.8	10.4	15.8	4.1	n.a.	n.a.	6.5	9.4	13.7	1.0	14.4	5.
1976	16.7	8.9	13.6	3.0	n.a.	n.a.	4.9	8.7	13.0	0.8	14.4	14.
1977	14.7	9.8	8.7	0.8	10.1	4.2	5.1	5.0	9.3	0.8	16.1	14.
1978	13.9	10.6	n.a.	0.5	24.9	9.7	5.8	0.0	0.7	0.7	19.2	14.
1979	14.0	11.2	n.a.	0.4	24.7	11.0	6.0	n.a.	0.8	0.8	16.6	14.
1980	12.5	9.2	n.a.	0.6	27.8	11.0	5.6	n.a.	1.0	0.6	14.5	10.
1981	13.5	9.0	n.a.	1.0	27.4	10.1	5.7	n.a.	1.1	0.8	13.5	10.
1982	13.2	10.2	n.a.	1.2	27.4	8.7	5.2	n.a.	1.4	0.7	13.3	15.
1983	12.3	9.4	n.a.	1.0	27.8	8.6	4.8	n.a.	1.4	0.7	15.9	14.
1984	12.2	9.2	n.a.	0.8	26.9	8.9	4.9	n.a.	1.6	0.7	15.9	14.
1985	13.4	10.2	n.a.	0.6	26.3	8.9	4.5	n.a.	1.6	0.7	14.2	15.
1986	14.1	9.4	n.a.	0.6	25.9	8.6	4.4	n.a.	1.7	0.7	15.4	14.
1987	13.6	9.3	n.a.	0.5	25.3	8.8	4.5	n.a.	1.7	0.6	17.0	14.

n.a. Not applicable.

*Source:* Economic Planning Board (1982, 1988).

fied for an additional allowance equivalent to 30 percent of the normal depreciation allowance. After 1966, the scheme changed slightly. The allowance was 30 percent if the export share of total revenues exceeded 50 percent, and 15 percent if the share was less than or equal to 50 percent. In 1971 the formula for the latter case was changed to 30 percent times twice the share. Machinery and equipment used by small and mediumsize firms (SMFS) were also eligible for an additional 30 percent special depreciation allowance from 1968 onward.

Other features of the tax regime in these years, although not directly tied to trade performance, affected economic performance in the trade area. Tax holidays had been provided in Korea from 1949 onward for selected industries deemed important for national economic development. Over the years, these had included shipbuilding, machinery, basic metals, petrochemicals, and chemical fertilizers. Typically, these were classified into one of two groups, each with a different tax–holiday schedule. Those in the first group—which included, oil refining, steel, shipbuilding, iron and steel, copper, cement, and chemicals—were eligible for a complete tax holiday for five years and those in the second group could obtain a threeyear corporate tax exemption of 100 percent. Over the years minor changes were made to these schedules until 1968, when they were abolished, but by then the idea of using incentives for selected industries had taken root in the tax system.

In 1968 a 6 percent investment tax credit was given to qualified firms operating in selected industries, notably

shipbuilding, steel and iron, chemical fertilizer, synthetic fiber, automobiles, machinery, straw pulp, food processing, petrochemicals, electronic equipment, electrical machinery and equipment, construction, and some mining industries. In 1970 a 6 to 10 percent investment tax credit was provided for machinery and equipment investment in iron and steel manufacturing, with the larger firms receiving the higher rate. Tax incentives under a 1972 presidential emergency decree also included a 10 percent temporary credit for investment using domestic capital goods manufactured before 1975, and a 40 to 80 percent special depreciation allowance for fixed assets employed by firms in the selected industries. From 1970 on, the five-year tax holiday with 100 percent exemption was only given to selected petrochemical industries.

The initial outward-oriented phase of Korean growth therefore featured a number of tax measures to spur development, including tax rebates and exemptions for exports. Although it did not necessarily play a central role, tax policy clearly contributed to outward orientation and growth during this period.

197379. In the early 1970s, the Korean government began to scale down its export promotion schemes and to give higher priority to sectoral development, primarily in the heavy and chemical industries.

A significant change occurred in the indirect tax rebates on exports in 1977; a destination-based VAT replaced eight existing indirect taxes, making the rebating of indirect taxes both easier and more transparent. The VAT was regarded as a simpler and more effective way of rebating taxes on exports because exports are zero-rated under the VAT.<sup>8</sup> Indirect tax refunds for exports increased sharply following the introduction of the VAT, in part because the tax rate increased. For example, the indirect tax refund, as a percentage of export, increased from 6.0 percent in 1976 to 9.0 percent in 1978 and 10.0 percent in 1982 (Choi 1984: table 14).<sup>9</sup>

Changes were also introduced in the direct taxes and their incentive features. In 1973 the 30 percent corporate tax exemption on export earnings was replaced by two tax-free reserve funds, one to develop new foreign markets and the other to defray export or foreign investment losses. Under the former, licensed exporters could deduct 1 percent of their foreign exchange earnings from taxable income for deposit in a reserve fund. After a grace period of two years, the amount was to be added evenly to taxable income over the succeeding three years. Under the new export and foreign investment loss program, any firm earning foreign exchange could deduct an amount not exceeding the lesser of total sales in foreign exchange or 50 percent of total incomes, and, as was the case under the foreign market reserve system, could add it back into taxable income after a two-year grace period.<sup>10</sup>

There were other changes. In 1974 the system of prior tariff exemptions for capital equipment imported for export production was changed to an installment payment system. In 1975 the tariff exemptions on raw material inputs for export production were dropped in favor of a drawback system, which required exporter's to pay tariffs and indirect taxes when importing their inputs. These were rebated, however, when exports were actually shipped out.

Outside the trade-based incentives, a reform in 1974 replaced all major tax incentives to key industries with a program of "special tax treatment for key industries." Under this new system, eligible firms in selected industries could get either (a) a tax holiday for five years, with 100 percent tax exemption for the first three years, 50 percent exemption for the following two years, and an 8 percent investment tax credit for machinery and equipment (10 percent for investments using domestic capital goods); or (b) an additional 100 percent special depreciation allowance. Industries selected for this treatment included shipbuilding, naphtha cracking plants, selected machine and electronics manufacturers, iron and steel, fertilizer, copper, lead and zinc smelting, selected mining and refining, and electric power generation. Firms in iron and steel, petrochem-

icals, shipbuilding, chemical-fiber, chemical-pulp, marine food processing, and other food-processing industries not qualifying for the three optional benefits were entitled to a 60 percent special depreciation allowance for machinery and equipment investment. The special depreciation rate for SMFS was also raised from 30 to 50 percent by the tax reform of 1977.

Thus, during the promotion of heavy industry, tax incentives for export were downgraded and greater priority was given to industry incentive schemes, which, however, tended to concentrate Korean investment over this period on a relatively small number of industries.

198089. In 1980, in the face of financial losses and structural distortions caused by the HCI drive, Korea began pursuing a policy of structural adjustment and liberalization, which stressed neutrality in policy.

Once again, tax policy was changed. Substantial modifications were introduced in a 1981 tax reform. Effective in 1982, petrochemicals, steel, nonferrous metal refining, chemical fertilizer, and power generation were excluded from the industry beneficiary list. The 60 percent special depreciation system and the tax-holiday option were terminated, and eligibility for the special tax credit was limited to the machinery and electronics industries. Also, the tax credit rate was reduced to 6 percent (10 percent for investment using domestic capital goods), and then it was halved to 3 percent (5 percent for investment using domestic capital goods) in 1983.

A distinctive feature of tax incentives used in recent years is that they are not designed to affect the sectoral structure of the economy; rather, their main purpose is to promote greater industrial neutrality by correcting market failures or compensating for them throughout the economy. As part of its new functional approach, the government has attempted to promote SMFS to offset the power of conglomerates and to speed the adoption of new technologies. Up to 15 percent of the book value of the fixed business assets at the end of the previous accounting period can be reserved as a taxable income deduction. If, after a four-year grace period, actual investment expenditures exceed the reserved amount, it is added evenly to taxable income over the succeeding three years. But if the reserved amount exceeds actual investment expenditures, the difference is added to taxable income in the fourth year.

Further new incentives include a six-year personal income tax exemption of 100 percent for the first four years and 50 percent for the subsequent two years for owners of newly established SMFS in rural or sea districts running a business in manufacturing, mining, construction, transportation, or fishery industries, and for owners of SMFS organized in technology-intensive industries. Furthermore, newly organized SMFS are given a 50 percent deduction from property taxes for five years and a 50 percent reduction in acquisition and registration taxes for two years. Tax incentives for companies investing in newly organized SMFS include tax-free reserves for investment losses, 100 percent exemption from capital gains tax, and a special 10 percent tax rate on dividend income.

### **Incentive Effects of Tax Arrangements for Exports**

It is difficult to establish the exact incentive effects of these measures over time. For the purposes of the present analysis, we draw heavily on a recent study by Kim (1988) that estimated the export subsidy effect of a range of tax and nontax policies in Korea over the period 1958-83 (see table 15-5). We use these estimates in our subsequent model calculations of the effects of Korean tax policies on outward orientation and growth. Kim focused on policies for which consistent and quantitatively significant time-series data were available. These fell in two categories. One consisted of net export subsidies, which included only those subsidies that directly increased the profit margin of exporters, such as direct cash subsidies, exchange rate premiums, interest subsidies, and direct tax reductions (exclusive of accelerated depreciation provisions and reserve funds for developing export markets and for covering export losses). The other category, defined as gross export subsidies, comprised indirect tax exemptions and tariff exemptions in addition to net export subsidies.

The export subsidy effect of direct tax exemptions was derived as the difference between tax liabilities in the absence of any such exemptions and actual direct tax payments. The incentive effect of different interest rates was determined in an analogous fashion. The interest subsidy was the difference between the interest rate paid at the nonpreferential commercial bank lending rate and the interest actually paid. Similar calculations were made for the various other tax and nontax export incentives.

## Tax Policy in Developing Countries

Several interesting observations flow from table 15–5. Exchange rate policy, via the foreign exchange premiums, played an important role in stimulating exports during the late 1950s and early 1960s, before being changed in 1965. Furthermore, the largest export incentives were in force during the 1960s and early 1970s, which was also the period in which the effects of export promotion schemes increased markedly. Beginning in the early 1970s, however, the government tried to reduce the scope of export incentives, as is clearly evident from the fluctuations in these subsidies, from 26.9 percent in 1972 to a low of 16.7 percent in 1975 and, with subsequent rises, to a high of 21.3 percent in 1980 (Kim 1988). Gross export subsidies declined from 136.2 percent of the official exchange rate in 1960 to 18.1 percent in 1961, mainly because of the substantial

**Table 15–5. Annual Average Net and Gross Exports Subsidies per Dollar of Export for Korea, 195883**

*Various export subsidies calculated per U.S. dollar of export (won)*

<i>Year</i>	<i>Official ex- change rate (won/\$) (1)</i>	<i>Direct cash subsidies (2)</i>	<i>Export dollar premium (3)</i>	<i>Direct tax reductions for exporters (4)</i>	<i>Interest rate preference for exporters (5)</i>	<i>Net export subsidies a (6=2+3+4+5)</i>	<i>Indirect tax exemptions for exporters (7)</i>	<i>Tariff rebates for exporters (8)</i>	<i>Gross export subsidies a (9=6+7+8)</i>
1958	50.0	0.0	64.0	n.a	1.2	65.2	n.a	n.a	65.2
1959	50.0	0.0	84.7	n.a	1.3	86.0	n.a	n.a	86.0
1960	62.5	0.0	83.9	n.a	1.2	85.1	n.a	n.a	85.1
1961	127.5	7.5	14.6	n.a	1.0	23.1	n.a	n.a	23.1
1962	130.0	10.3	n.a	0.6	0.9	11.8	5.1	4.7	21.6
1963	130.0	4.1	39.8	0.8	2.9	47.6	5.3	6.6	59.5
1964	214.3	2.9	39.7	0.7	6.0	49.3	7.6	10.1	67.0
1965	265.4	n.a	n.a	2.3	7.6	9.9	13.9	15.4	39.2
1966	271.3	n.a	n.a	2.3	10.3	12.5	17.8	21.3	51.6
1967	270.7	n.a	n.a	5.2	14.7	20.0	17.8	24.6	62.4
1968	276.6	n.a	n.a	3.0	15.2	18.2	19.9	39.6	77.7
1969	288.2	n.a	n.a	3.7	14.7	18.4	27.4	34.3	80.1
1970	310.7	n.a	n.a	3.5	17.3	20.8	27.0	40.4	38.1
1971	347.7	n.a	n.a	4.8	18.1	22.8	32.2	48.0	103.0
1972	391.8	n.a	n.a	1.9	10.5	12.5	26.4	66.3	105.2
1973	398.3	n.a	n.a	1.4	7.4	8.7	21.0	64.4	94.2
1974	407.0	n.a	n.a	n.a	8.6	8.6	22.5	55.1	86.3
1975	484.0	n.a	n.a	n.a	12.9	12.9	33.8	34.3	81.0
1976	484.0	n.a	n.a	n.a	12.3	12.3	33.6	35.9	81.8
1977	484.0	n.a	n.a	n.a	9.4	9.4	53.1	30.6	93.1

## Tax Policy in Developing Countries

1978	484.0	n.a	n.a	n.a	11.0	11.0	53.6	30.0	94.6
1979	484.0	n.a	n.a	n.a	11.0	11.0	56.6	30.3	97.9
1980	618.5	n.a	n.a	n.a	20.6	20.6	74.6	36.4	131.6
1981	686.0	n.a	n.a	n.a	15.0	15.0	—	—	—
1982	737.7	n.a	n.a	n.a	3.0	3.0	—	—	—
1983	781.2	n.a	n.a	n.a	0.0	0.0	—	—	—

— Not available.

n.a, Not applicable.

a, Totals may not add up due to rounding errors.

*Source:* Kim (1988: table 3.1).

depreciation of the won and the resulting rapid increase in exports. Net export subsidies per U.S. dollar declined from 23 percent of the official exchange rate in 1964 to about 4 to 7 percent during 1965-67, mainly because of the abolition of the export–import link system.

Table 15–5 also indicates the growing importance of tax policy to the outward–oriented strategy of the 1970s. The direct tax reductions for exporters were consistently small and had disappeared by the early 1970s. But indirect tax exemptions for exporters grew from approximately one–third of gross export subsidies in 1965 to approximately one–half by 1980. Adoption of the destination basis VAT system in 1977, under which exports are zero–rated, increased the border tax rebates on exports sharply and were included by Kim (1988) as part of his export subsidy measure.

### **The General Equilibrium Model Applied to Korea's Tax System**

It is difficult to evaluate the effects of Korea's tax policy on economic growth over the past three decades in the framework of a single model because of the numerous changes both in the tax regime and in the economy. Savings rates have risen sharply, there has been substantial human capital accumulation, resources have transferred from the rural to the urban sector, and so on. The incentive effects of the various tax schemes used over the years have come into play on several margins—export performance, savings, investment, and sectoral structure, among others—and all need to be captured if the contribution of taxes to growth is to be properly assessed.

Rather than try to build a comprehensive model from scratch, we used a model we developed earlier (Trela and Whalley 1989)<sup>11</sup> to analyze the contribution of intersectoral resource transfers and tax incentives to outward orientation and to growth during Korea's early growth phase. This two–sector model<sup>12</sup> does not include the effects of such general factors as savings and human capital, but it does capture the effects of export promotion on manufacturing, the effects of tax policies on rural and urban migration and, the endogenous determination of effort in both the manufacturing and nonmanufacturing sectors.

Unlike other multisectoral modeling efforts that have looked at growth in Korea and other Asian NIES (see Chenery and others 1986), this model uses the average product pricing of labor in agriculture to reflect traditional family farming arrangements. Decisions regarding effort in all sectors are endogenously determined through utility–maximizing behavior. Average product pricing of labor in agriculture, in contrast to marginal product pricing in manufacturing sectors, generates lower effort in agriculture than in manufacturing, which is matched by a correspondingly lower wage rate in agriculture than in manufacturing. Promoting manufacturing through exports thus transfers labor from the low–effort agricultural sector to the high–effort manufacturing sectors,

thereby fueling growth.

We have used this model here to assess the importance of tax policies for Korean growth, especially in the earlier phase (1962-72). As we emphasized above, the second and third phases of this growth sharply curtailed some of the key features of the outward-oriented policies of the early years. In addition, many of the features that fostered high Korean growth are not captured by the model, such as high savings rates and rapid human capital accumulation, to mention but two.

Our modeling strategy is to construct a microconsistent data set for a given base year and to calibrate the model to this set. We then compute counterfactuals to find a new equilibrium for the model in which outward-oriented policies (including tax elements of outward orientation) are removed. A comparison of the two equilibria gives an indication of the contribution of outward-oriented policies to GDP during the year. Because of the work involved in constructing base-year data sets for each of a series of years, we use two alternative base years, and sequentially introduce the policy variable characteristics of earlier or later years for comparison with the policy-neutral equilibrium.

Thus, using what we term the 1962 base-year model, we compute a policy-neutral equilibrium and then compare the 1962 model with 1962 policies, with 1963 policies, 1964 policies, and so on. The policy contribution to GDP from each year's policy regime is assessed and the combined effect over ten (or twenty) years evaluated. We also use a 1982 base-year model in which earlier year policies (1981, 1980, . . .) can be sequentially introduced in the same way. This procedure allows us to evaluate the contribution of the tax component of outward-oriented policies to growth through induced intersectoral resource transfers. We are also able to evaluate the contribution of outward-oriented policies in general, the specific indirect tax component of policies, and the specific direct tax component of policies.

In the model, Korea is treated as a small, open, price-taking economy. The resource endowment of the economy comprises three primary factors—capital, labor, and land. Only two of these appear as inputs for any sector. The rural sector uses only land and labor, whereas the urban sector uses capital and labor. The supply of workers is endogenous; rural urban migration proceeds in response to differences in worker utility across sectors.

Utility is assumed to be a positive function of consumption and a negative function of effort, with individuals trading off differences in effort against differences in income. We induce rural urban migration in the model by introducing policy incentives to promote exports, including tax policies.

### Production

The two production sectors that appear in the model are distinguished by the types of goods they produce. The rural sector specializes in the production of a single agricultural good (sector/good 1), whereas the urban sector produces several manufactured goods (sector/good 2). The output of each good is produced according to a constant elasticity of substitution (CES) production function:

$$(15-1) \quad Q_j = F \gamma_j \left[ \alpha_j L^{\frac{\sigma_j-1}{\sigma_j}} + (1 - \alpha_j) \left( \sum_{q=1}^{N_j} \epsilon_j^q \right)^{\frac{\sigma_j-1}{\sigma_j}} \right]^{\frac{\sigma_j}{\sigma_j-1}}, \quad j = 1$$

$$(15-2) \quad Q_j = \gamma_j \left[ \alpha_j K^{\frac{\sigma_j-1}{\sigma_j}} + (1 - \alpha_j) \left( \sum_{q=1}^{N_j} \epsilon_j^q \right)^{\frac{\sigma_j-1}{\sigma_j}} \right]^{\frac{\sigma_j}{\sigma_j-1}}, \quad j = 2$$

where  $Q_j$  represents the output of sector  $j$ ,  $\gamma_j$  is a constant defining units of measurement,  $\alpha_j$  is a share parameter,  $F$  denotes the number of farms,  $e_j^q$  is the effort of a typical worker in sector  $j$ ,  $L$  denotes for land used per farm in agriculture,  $K$  and  $N_j$  are capital and labor, <sup>13</sup> and  $\sigma_j$  is the elasticity of substitution between factor inputs.

On the factor side, land and capital are assumed to be sector-specific while labor is intersectorally mobile, although because of the differential effort across sectors, wage rates are not equalized across sectors. In equilibrium, factors are fully employed:

$$(15-3) \quad \bar{L} = L$$

$$(15-4) \quad \bar{K} = K$$

$$(15-5) \quad \bar{N} = FN_1 + N_2$$

where  $\bar{L}$ , and  $\bar{K}$  define the economy's fixed factor endowments.

Assuming that urban producers wish to minimize their costs and given that capital supply is fixed, producers in the urban sector choose the labor input that minimizes their costs:

$$(15-6) \quad \min L = w_j \sum_{q=1}^{N_j} e_j^q + \lambda_j \left( Q_j - \gamma_j \left[ \alpha_j K^{\frac{\sigma_j-1}{\sigma_j}} + (1-\alpha_j) \left( \sum_{q=1}^{N_j} e_j^q \right)^{\frac{\sigma_j-1}{\sigma_j}} \right]^{\frac{\sigma_j}{\sigma_j-1}} \right),$$

$j = 2$

where  $w_j$  is the price of labor in the urban sector measured in efficiency units. This leads to the firstorder condition:

$$(15-7) \quad w_j = \frac{P_j \gamma_j \left[ \alpha_j K^{\frac{\sigma_j-1}{\sigma_j}} + (1-\alpha_j) \left( \sum_{q=1}^{N_j} e_j^q \right)^{\frac{\sigma_j-1}{\sigma_j}} \right]^{\frac{1}{\sigma_j-1}} (1-\alpha_j)}{\left( \sum_{q=1}^{N_j} e_j^q \right)^{\frac{1}{\sigma_j}}},$$

$j = 2$

where  $P_j$  is the price of good  $j$  produced in the urban sector.

The optimal amount of labor in the rural sector is determined using the average product pricing rule for labor:

$$(15-8) \quad w_j = \frac{P_j \gamma_j \left[ \alpha_j K^{\frac{\sigma_j-1}{\sigma_j}} + (1-\alpha_j) \left( \sum_{q=1}^{N_j} e_j^q \right)^{\frac{\sigma_j-1}{\sigma_j}} \right]^{\frac{\sigma_j}{\sigma_j-1}}}{N_j},$$

$j = 1$

where  $w_j$  is the return to labor in the rural sector.

The return to capital in the urban sector is derived by residual:

$$(15-9) \quad r = \frac{P_j \gamma_j \left[ \alpha_j K^{\frac{\sigma_j-1}{\sigma_j}} + (1-\alpha_j) \left( \sum_{q=1}^{N_j} \varepsilon_j^q \right)^{\frac{\sigma_j-1}{\sigma_j}} \right]^{\frac{\sigma_j}{\sigma_j-1}} - w_j \sum_{q=1}^{N_j} \varepsilon_j^q}{K}, \quad j=2.$$

**Consumption**

Consumers are differentiated according to their sector of residence, although their utility functions defined over goods and effort (leisure) are the same. We assume an augmented CES form:

$$(15-10) \quad U = \left[ \sum_{j=1}^2 \beta_j X_j^{\frac{\theta-1}{\theta}} \right]^{\frac{\theta}{\theta-1}} - \frac{e^z}{2\delta}$$

where  $X_j$  defines consumption of good  $j$ ,  $\beta_j$  is a share parameter,  $\theta$  is an elasticity parameter, and  $z > 1$  and  $\delta > 0$  are constants, with  $z$  measuring the curvature of the disutility of effort function and defined as a units term in this subfunction.

Each consumer owns labor and an equal proportion of the economy's capital endowment, which, along

with transfers, yields consumer incomes. If  $T^q$  denotes transfers (recycled tax revenues) received by individual

$q$  ( $\sum_{q=1}^{\bar{N}} T^q = T$ )  $\bar{K}^q$  denotes capital owned by individual

$q$  ( $\sum_{q=1}^{\bar{N}} \bar{K}^q = \bar{K}$ ), and  $X_j^q$  are purchases of good  $j$  by individual  $q$ , then individual budget constraints can be written as

follows:

for workers in the rural sector

$$(15-11) \quad \sum_{j=1}^2 P_j X_j^q = w_1 + r \bar{K}^q + T^q$$

and for workers in the urban sector

$$(15-12) \quad \sum_{j=1}^2 P_j X_j^q = w_2 e_2 + r \bar{K}^q + T^q$$

Maximizing (15-10) subject to (15-11) and (15-12) yields the demand functions:

$$(15-13) \quad X_j^q = \frac{I_j^q \beta_j^{\theta}}{P_j^{\theta} \left( \sum_{j=1}^2 P_j^{1-\theta} X_j^{\theta} \right)}, \quad j=1, 2$$

where  $I$  represents consumer income.

Substituting (15–13) into (15–10) yields the indirect utility function:

$$(15-14) \quad U = IC - \frac{e^2}{2\delta}$$

where

$$C = \left[ \sum_{j=1}^2 \left( \frac{\beta_j^\theta}{P_j^{\theta-1} \left( \sum_{k=1}^2 P_k^{1-\theta} \beta_k^\theta \right)^{\frac{\theta-1}{\theta}}} \right) \right]^{\frac{\theta}{\theta-1}}$$

Substituting (15–7) and (15–11) into (15–14) and optimizing with respect to  $e_2$  implies the optimal effort of a typical individual in the urban sector:

$$(15-16) \quad e_2 = [w_2 C \delta]^{\frac{1}{\theta-1}}$$

Substituting (15–8) and (15–12) into (15–15) and optimizing with respect to  $e_1$  implies that the optimal effort of a typical individual in the rural sector satisfies

$$(15-17) \quad \gamma P_1 (1 - \alpha_1) \delta C = \frac{e_1^{\theta-1} \frac{1}{\theta} N_1^{\frac{\theta+1}{\theta}}}{\left[ \alpha_j L^{\frac{\theta-1}{\theta}} + (1 - \alpha_1) \left( \sum_{q=1}^N e_q^{\frac{\theta-1}{\theta}} \right)^{\frac{1}{\theta-1}} \right]}$$

**Government**

Government interventions in taxes, subsidies, and transfers are also incorporated in the model. The government collects net revenues from the tax subsidy system and is assumed to distribute them on an equal per capita basis. In the model, we only capture those components of government revenues that are affected by taxing imports and subsidizing exports.

Revenue raised is thus given by

$$(15-18) \quad R = \sum_{j=1}^2 t_j P_j^w (X_j - Q_j)$$

where  $X_j$  and  $Q_j$  are consumption and production respectively, and  $t_j$  is the ad valorem tariff rate applied to imports of good  $j$  evaluated at world prices  $P_j^w$ . Subsidies paid are thus given by

$$(17-19) \quad S = \sum_{j=1}^2 \frac{s_j}{(1 - s_j)} P_j^w Q_j$$

where  $s_j$  is the subsidy rate applied to production of good  $j$ .

In setting the parameters of the model, we use estimates of effective subsidy rates in Korea. Thus, neither rebates of indirect or direct taxes on exports nor import duty remissions on exports are directly modeled, but are captured through the parameter values used to represent trade taxes and export subsidies. These are modeled in ad valorem form.

The government net revenue  $T$  is, therefore, given by

$$(15-20) \quad T = R - S$$

The expenditure side of the government budget consists only of transfers to households as the government makes no real expenditures on goods. The government collects tariff revenues, pays export subsidies, and transfers its net revenues to individuals such that in equilibrium its budget is balanced. If transfers are made in lump-sum form and are distributed on an equal per capita basis, then transfers received by each individual are

$$(15-21) \quad T^q = \frac{T}{N} \quad q = 1, \dots, \bar{N}$$

### Foreign Sector

A specification of the external sector (rest of the world, ROW) completes our model. The ROW produces the same number of goods as the domestic Korean economy and both imports and exports so that, in equilibrium, it meets Korean desired net trades. Foreign and domestically produced goods are treated in the model as homogeneous commodities; commodities are treated as importables if net imports by Korea are positive, and as exportables if net imports are negative.

The model incorporates an external balance condition that requires that the value of imports equal the value of exports, evaluated at world prices:

$$(15-22) \quad \sum_{j=1}^2 P_j^w (X_j - Q_j) = 0$$

Korea is modeled as a taker of prices on world markets for all tradables where  $P_j^w$  denote the fixed world prices. The relationship between Korean domestic producer prices and world prices for importables is

$$(15-23) \quad P_j = P_j^w (1 + t_j), \quad j = 1$$

and for exportables is

$$(15-24) \quad P_j = \frac{P_j^w}{(1 - s_j)}, \quad j = 2$$

### Equilibrium

We use an iterative search procedure to solve for the equilibrium combination of rural to urban employment in the model. From this, commodity demand and supplies are determined as well as net trades. Because of the small, open economy assumption, equilibrium in the model involves factor market clearing and government budget balance, with trade balance a property of such an equilibrium. We begin by making an initial estimate of the wage rate in the urban sector and of the return to labor in the rural sector. We then vary the parameters until an equilibrium is found that produces a set of factor prices that clears goods and factor markets, that holds external balance conditions and that equalizes utility across the two sectors.

### The General Equilibrium Analysis

We have used the model described above in counterfactual equilibrium analysis to assess the contribution of tax policy to growth in Korea. As indicated above, we calibrate the model to a microconsistent data set for a given

base year incorporating a number of outward-oriented growth policies, including tax policies. Because of data difficulties, we have built data sets for two years only, 1962 and 1982, which represent early and recent years in Korea's growth process. This yields two alternative models, a 1962 and a 1982 baseyear model.

Using each base year model, we perform a series of counterfactual equilibrium calculations. First, we remove the export subsidy component of the policy mix used in the base year, yielding what we term an "export policy—neutral equilibrium" (in other words, tariffs remain present). This enables us to assess the contribution to Korean growth of policies pursued in the base year. The contribution to growth of policies pursued in other years is evaluated by introducing the policies of the alternative year into the model in place of the base year policies and computing a new equilibrium in the presence of each. A comparison of each equilibrium and the policy-neutral equilibrium then provides the model estimate of the year's policy contribution to growth in the year. The effects of policies over a number of years are evaluated as the sum of the individual year's effects.

We have performed these calculations using both the 1962 and 1982 base-year models; different results are obtained in each case, depending on the choice of base-year model. We also perform calculations for different types of policy evaluation, for a removal of all export subsidies, for the tax component alone, and for the direct (or indirect) tax component.

### Calibration

Parameter values for the production and demand functions in the model are determined using calibration techniques. Calibration procedures widely used in other applied general equilibrium models are followed (see Mansur and Whalley 1984). The requirement set for parameter values chosen in this way is that they be capable of replicating the base-year microconsistent data set as an equilibrium solution to the model, given extraneous estimates of elasticities of substitution, policy parameters, endowments, and other data.

The first step in calibration is to break down the base-year microconsistent data, constructed in value terms, into separate price and quantity data. For this purpose, a unit's convention is adopted (also see Mansur and Whalley 1984) that defines physical units

for commodities as those amounts that sell for one currency unit (US\$1.00).<sup>14</sup> For factors, base-year equilibrium data on the price of capital, labor employment, and rural urban wage differentials are used to decompose capital and labor payments into separate price and quantity observations.

The share parameters for the demand and production functions can then be determined by calibration, depending on the choice of elasticity values for the production and utility functions in the model. In the rural sector, the values of the share parameter  $\alpha_j$  are taken from the average product pricing rule for labor and from the first-order condition from producer cost minimization in the urban sector.

These are

$$(15-25) \quad \alpha_j = \frac{\left( \frac{w_j N_j}{\gamma_j P_j} \right)^{\frac{\sigma_j - 1}{\sigma_j}} - \left( \sum_{q=1}^{N_j} \epsilon_j^q \right)^{\frac{\sigma_j - 1}{\sigma_j}}}{L_j^{\frac{\sigma_j - 1}{\sigma_j}} - \left( \sum_{q=1}^{N_j} \epsilon_j^q \right)^{\frac{\sigma_j - 1}{\sigma_j}}}, \quad j=1$$

$$(15-26) \quad \alpha_j = \frac{1}{1 + \frac{w_j}{r} \left( \frac{\sum_{q=1}^{N_j} e_j^q}{K} \right)^{\frac{1}{\delta}}}, \quad j=2$$

$\gamma_1$ , the units term in the production function, is arbitrarily set equal to one allowing equation (1525) to be solved for  $\alpha_1$ . The value for  $\gamma_2$  is then derived by residual, using equation (15–9), given the units' definition for output.

Demand side parameters are determined in an analogous fashion using calibration techniques, except that first-order conditions for utility maximization are used. Taking the derivative of (15–10) with respect to  $X_j$  yields

$$(15-27) \quad \frac{\beta_j}{\beta_k} = \frac{P_j}{P_k} \left( \frac{X_j}{X_k} \right)^{\frac{1}{\delta}}, \quad j=1, 2, \quad k=1, 2.$$

Normalizing so that  $\sum_{j=1}^2 \beta_j = 1$ , individual  $\beta_j$  values can be obtained. Because  $\epsilon_2$  can be arbitrarily set equal to one in the base case data, the value for  $\delta$  can be derived from (1516);  $\epsilon_1$  can then be determined directly from the equal utility condition linking the manufacturing and agricultural sectors.

The microconsistent data sets to which we calibrate our model are built for the two years of 1962 and 1982, each chosen to reflect different stages of Korean growth. One is largely pre-outward orientation, and the other post-outward orientation and for a more recent year. In constructing these data sets, different basic data sources have been used and various incompatibilities between source materials have had to be dealt with. Adjustments have been made to the data, both to resolve incompatibilities (differences in definition and in the measurements) and to ensure that the equilibrium conditions of the model are satisfied in the data.

Data on the income of urban wage earners are from the Economic Planning Board (1964, 1984). The urban wage rate (in terms of efficiency units) is calculated by dividing the urban wage bill by the product of the number of employed persons in the urban sector and the effort level of a typical worker in this sector, which is arbitrarily set equal to 1.0 in the base-case equilibrium data. Data on urban employment for both years are from the Economic Planning Board (1964, 1984). The average farm income per worker is estimated using data on urban rural differences in earnings taken from Hong (1979). Since the data from Hong are only available up to 1976, we assume that they also reflect urban rural differences in earnings in 1982. The rural wage bill is estimated as the product of average farm income per worker and the number of persons employed in the rural sector. Data on rural employment in each year are from the Economic Planning Board (1982, 1986).

The income return to capital in the urban sector is estimated as the residual of the value of production less labor income. To translate this into an observation on the physical quantity of capital used in determining parameters in the model, one needs an estimate of the rate of return on capital in manufacturing. We use estimates on rates of return on capital during 195461 and 197275 (the latest period available to us) and assume them to be roughly equivalent to the rates in 1962 and 1982.

Data on the value of production and net trade by commodity for each year are from the Economic Planning Board (1964, 1984), except for data on agricultural production, which from our model definition are equal to labor income from employment in the rural sector.<sup>15</sup> The value of consumption for each commodity is determined as the residual between the value of production and trade. The value of trade evaluated at world prices must, for general equilibrium consistency, satisfy trade balance, and a scaling procedure incorporating the import data is used to ensure that condition holds.

The model also requires elasticity values for production and demand functions. We use values of 1.5 and  $-1.5$ . The unobservable parameter  $z$ , which measures the curvature of the utility function, is assumed to be 1.5. Because of the potentially crucial nature of these values for model behavior, these constitute our central set of values for the sensitivity analyses.

To incorporate outward-oriented growth policies into the model, we use data on tariffs and export subsidies. Since agriculture is the only imported good in our model, we need tariff rates only on this product.

We use the weighted average tariff rate on primary products (adjusted for rebates) in 1968 (the earliest period available to us) from Westphal and Kim (1977) and assume it to be roughly equivalent to the tariff rate in 1962. For tariff rates in 1982, we use a simple average tariff rate on live animals and vegetable products in 1982 from the World Bank (1987a).

Data on subsidy rates are from table 15–5, which we reproduced from Kim (1988). Since 1980 is the most recent year for which detailed information on subsidy rates from this source is available, we use the 1980 data and assume they are roughly equivalent to the rates in both 1981 and 1982.

Table 15–6 reports some summary statistics from the two data sets we have constructed. The rapid expansion in the economy between 1962 and 1982 is evident, as is the change in the industrial composition of employment and output, and the changes in importance of trade to the economy. What remains to be established is the extent to which tax policies helped promote outward orientation and contributed to Korea's strong growth performance.

### Results

In the counterfactual policy exercises we performed, the base year (1962 or 1982) policies were removed and a new equilibrium for the model was computed and compared to the benchmark equilibrium. This comparison yielded estimates of quantitative changes in all the endogenous model variables under the policy change. Further counterfactual experiments were then performed in which outward-oriented tax policies during each year of the specified time periods (196382, 196372, or 198182) were sequentially introduced. For each of these policy changes, a new counterfactual equilibrium was computed and compared with the same no-policy equilibrium.

The sum of the effects from each of the model experiments across each of the years during the 196282 period are reported in table 15–7. The average annual increase in GDP over this period attributable to tax policies is small, only 0.54 percent using the 1982 base-year model, or less than 10 percent of actual average annual Korean growth in real GDP. A similar result is reached with each of the other model experiments, which use the 1962 base-year model. These results suggest that tax policies played only a minor role in Korea's outward-oriented developmental process, even in the early phases of Korean growth (196272). These policies also clearly induced migration from the rural to the urban sector. When the 1982 tax policies are removed from the 1982 base-year model, the share of labor in agriculture increase to 70.63 percent from its 1982 benchmark level of 67.35 percent, whereas the share of labor employed in manufacturing falls from 32.67 to 29.37 percent. Also, these policies caused exports of manufactures to expand by 1.07 percent on an annual basis over the twenty-year period.

Using the same modeling methodology, a relatively small contribution of tax policies to growth can also be broken down into two separate effects—direct tax reductions (mainly corporate tax rebates for exporters) and indirect tax exemptions (rebates of sales and excise taxes on exports). These results are reported in table 15–8. The results indicate that indirect tax exemptions have contributed far more to Korean growth than have direct tax measures, which have been relatively inconsequential.

Table 15–8 also reports the results for a model experiment in which both tax and nontax components of outward-oriented Korean growth strategies are removed. The quantitative magnitudes examined emphasize the

dominant role that nontax components (tariff rebates, interest preferences, direct cash subsidies, and export premiums) have played in Korea's development process. In general, however, the results seem to imply that outward-oriented policies in Korea have had little input in driving growth.<sup>16</sup>

Table 15–9 reports on the sensitivity of these results to certain key model parameters. Three sets of parameters are varied—demand and production function

**Table 15–6. Summary Features of 1962 and 1982 Microconsistent Data sets Used to Evaluate Inputs of Tax Policies in Korea's Outward-Oriented Growth Strategy**

	<i>1962 Microconsistent data set</i>	<i>1982 Microconsistent data set</i>
Value of GDP (millions U.S. dollars)	1,935.59	92,587.56
Ratio of employment in manufacturing to agriculture	1:15	1:2
<i>Percentage of GDP</i>		
Imports <sup>a</sup>	16.0	43.9
Exports <sup>a</sup>	6.0	36.9
Manufactured exports		
As percentage total exports <sup>b</sup>	27.0	93.7
Average tariff rate on imports (%)	13.4	7.09
Average export subsidy rate (%)	16.6	21.3

a. The numbers used in the model are smaller owing to netting out of two-way trade.

b. These figures are based on actual data. In the model, Korea exports only one manufactured good on a net basis.

**Table 15–7 General Equilibrium Estimates of Effects of Korean Tax Policies, 1962–82 (percent)**

<i>Area affected</i>	<i>1982 base model over 20 years</i>	<i>1962 base model over 20 years</i>	<i>1962 base model over 10 years</i>	<i>Actual data</i>	
				1962–82	1962–72
<i>Annual average growth rate</i>					
GDP	0.54	0.68	0.62	8.65	9.25
Exports of manufactures using 1982 base model <sup>d</sup>	1.07	n.a.	n.a.	35.37	55.66
Imports of agriculture using 1982 base model <sup>d</sup>	1.10	n.a.	n.a.	11.94a	21.58a

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	<i>Actual data b</i>						
	<i>1982 base model with 1982 policies</i>	<i>1982 base model with tax policy neutral mix</i>	<i>1962 base model with 1962 policies</i>	<i>1962 base model with tax policy neutral mix</i>	<i>1962 c</i>	<i>1972</i>	<i>1982</i>
<i>Distribution of employment</i>							
Agriculture	67.35	70.63	93.73	94.16	63.1	50.6	32.1
Manufacturing	32.67	29.37	6.21	5.84	36.9	49.4	67.9

n.a. Not applicable.

a. Figures are based on imports of food and live animals.

b. The distribution is between agriculture and nonagriculture.

c. Based on the 1963 distribution.

d. Trade growth using the 1962 base model are unrealistically high because of the small manufactured export base involved, and are not reported.

*Source:* Estimates from the general equilibrium model.

elasticities and the utility function curvature parameter affecting effort decisions. Table 15–9 suggests that the model results are sensitive to the values chosen for the substitution elasticities in production, but less sensitive to the other model parameters examined. The importance of production–side elasticities is that their values affect the slope of the marginal value product of labor schedules in the two sectors, and hence the size of intersectoral resource transfers associated with alternative policies. Even with this sensitivity of results, however, the quantitative magnitudes that emerge indicate that the main factors underlying Korean growth in recent decades lie outside of tax policy.

### Conclusion

The tax system in Korea has evolved over nearly thirty years from a series of narrowly based taxes raising small amounts of revenue to a more mature system raising more revenue that relies heavily on a broadly

**Table 15–8. Assessing the Effects of Tax Policies on Korean Growth Using the 1982 Base Model** (percent)

<i>Area affected</i>	<i>Indirect tax</i>	<i>Direct tax</i>	<i>Combined tax</i>	<i>Both tax and nontax components</i>	<i>Actual data</i>	
<i>Annual average growth rate</i>						
GDP	0.51	0.03	0.54	1.40	8.65	
Exports of manufactures	1.01	0.07	1.07	2.64	35.37	
Imports of agriculture	1.04	0.07	1.10	266	11.94a	
	<i>Actual data b</i>					
	<i>With 1982 policies</i>	<i>Without 1982 indirect tax policies</i>	<i>Without 1982 direct tax policies</i>	<i>With tax policy neutral mix</i>	<i>With export policy neutral mix: 1962c</i>	<i>1982</i>

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Distribution of employment							
Agriculture	67.35	70.63	67.32	70.63	73.27	63.1	50.6
Manufacturing	32.67	29.37	32.68	29.37	26.73	36.9	49.4

a. Figure is based on imports of food and live animals.

b. The distribution is between agriculture and nonagriculture.

c. Based on the 1963 distribution.

*Source.* Estimates from the general equilibrium model.

**Table 15.9. Sensitivity Analysis of Assessments of the Contribution of Tax Policies to Korean Growth Using the 1982 Base Model**

(percent)

Area affected	With central case model parameters	With substitution elasticities in production set equal to 0.75	With substitution elasticities in consumption set equal to -0.75	With the utility function curvature parameter set equal to 2.5	Actual data		
		<i>Average annual growth rate</i>					
GDP	0.54	0.24	0.54	0.54		8.65	
Exports of manufacturers	1.07	1.57	1.06	1.06		35.37	
Imports of agriculture	1.10	1.60	1.10	1.10		11.94a	
					<i>Actual data b</i>		
	With 1982 policies and central case model parameters	With tax policy neutral mix and central case model parameters	With tax policy neutral mix and consumption elasticities set equal to 0.75	With tax policy neutral mix and consumption elasticities set equal to -0.75	With tax policy neutral mix and curvature parameter set equal to 2.5	1962 c	1982
<i>Distribution of employment</i>							
Agriculture	67.35	70.63	69.42	70.63	70.63	63.1	50.6
Manufacturing	32.67	29.37	30.58	29.37	29.37	36.94	49.4

a. Figure is based on imports of food and live animals.

b. The distribution is between agriculture and nonagriculture.

c. Based on the 1963 distribution.

*Source:* Estimates from the general equilibrium model.

based VAT. Throughout this period, the Korean tax system has also been remarkably adept at responding to the various swings in Korean growth policies. In the outward-oriented phase (1961-72), the government relied on rebates of direct and indirect taxes on exports; in the heavy and chemical industry phase (1973-79), it instituted investment tax credits, tax holidays, and other incentives for these industries; and in the most recent trade liberalization and structural adjustment phase (1980-89), it has emphasized neutrality in tax policy. The GDP growth rate in each of these phases has been consistently high, which implies that the changing tax system in Korea has probably facilitated rather than fueled high growth.

A general equilibrium model can be used to investigate the significance of intersectoral resource transfers for Korean growth and thereby assess the contribution of tax policy in Korea. This model provides only a partial view of the Korean growth process, as savings, investment, human capital formation, and many other key factors are missing. But unlike earlier modeling efforts, it allows agriculture to represent traditional farming patterns with an equal sharing of the proceeds between farm members. As a result, effort levels in agriculture are lower than in manufacturing, which relies on the marginal product pricing of labor, and there is an accompanying differential between the urban wage and (implicit) rural wage. Export promotion policies, which stimulate manufacturing, move labor from the low-efficiency rural sector to the high-efficiency urban sector.

The modeling results indicate that tax policy accounted for less than 10 percent of actual Korean growth over the period 1962-82 and over the intensive outward-oriented phase of 1962-72, although it did contribute to about 3 percent of export growth.

### Notes

1. For some useful interpretive essays and research studies on the proximate causes of success, see Brown (1973), Hasan and Rao (1979), Kruger (1979), Kwack (1988), and Scitovsky (1985). In contrast to the conclusions from these studies, the results from Chenery and others (1986: table 11-3) seem to indicate that outward-oriented policies have been relatively unimportant to Korean growth.

2. Caution should be exercised in making any broad generalizations and oversimplifications on the relationship between tax incentives and growth, or between outward orientation and growth, inasmuch as these relationships are complex and depend on other variables, whose impact and significance are difficult to test. For instance, there is a growing body of evidence that exporting accelerates technological development and the formation of human capital. Also, inward investment induced by tax holidays in the 1960s increased know-how, and corporate tax exemptions helped generate substantial additional domestic savings.

3. These included provisions for converting export earnings into foreign exchange certificates, which were traded at a premium in a free market. Moreover, the export-import link system entitled holders of foreign exchange certificates to import certain popular (luxury) items that were not other-

wise available. Direct subsidies on exports and preferential interest rates on loans for export activities were used, although not extensively. See Westphal and Kim (1977: 1-21-3).

4. These data are from Park (1989: 34) and Oum (1989: table 1).

5. During the period 1962-87 the local tax share ranged from 8.1 percent to 17.3 percent. See Economic Planning Board (1982, 1988).
6. The discussion that follows draws on Westphal and Kim (1977), Hong (1979), Scitovsky (1985), World Bank (1987a), and Choi (1988).
7. A good number of studies stress the neutrality for trade of switches between origin- (or production-) based indirect taxes with no border tax adjustments, and destination- (or consumption-) based indirect taxes under which such adjustments occur (see Johnson and Krauss 1970; and Whalley 1979). In Korea, however, the tax rebate was also seen as undoing existing export biases in the policy structure as much as explicitly promoting exports. Thus, one can argue that it had a favorable influence on exports.
8. One can argue that no export subsidy is involved with VAT rebates on exports, since they compensate for taxes on imports and have no effect on trade flows. However, results from Choi (1984) show that the government had underestimated the border tax adjustment under the previous tax system. In this sense, the adoption of the VAT had a positive effect on trade flows.
9. It appears that Choi has made an error in reporting his figures, labeling them as percentages rather than ratios.
10. A further tax-free reserve scheme was introduced later (1977) to deal with price fluctuations. Any licensed exporter could deduct additions to a reserve fund from its taxable income within a limit of 5 percent of inventory asset value, as evaluated at the end of the accounting period. This amount was also added to taxable income after a one year grace period.
11. This is a static model in which growth is reflected in changes in levels as the model economy moves from one equilibrium to another. We justify our procedure of trying to estimate policy effects on growth from a static model on the grounds that we are not attempting to explain all of Korean growth. This would require a complex growth model in which a comparison between a growth path with actual policies and one with neutral policies would be made. Instead, we are analyzing the contribution of the tax component of outward-oriented policies to Korean growth via different relative tax treatments across different industries.
12. Our model can be used in higher dimensionality form. In part, but because of the complexity in implementing migration conditions linking sectors, we limit ourselves here to two sectors.
13. In the agricultural sector,  $N_j$  is labor per farm.
14. The 1962 and 1982 benchmark data on production and labor income in won are converted into U.S. dollars using official exchange rates from the Economic Planning Board (1964, 1984). Trade data for both years are reported in U.S. dollars.

15. Korea was a net importer of manufactures in both 1962 and 1982 but is treated as a net exporter of manufactures in the model. This inconsistency occurs because of our assumption that there are only two sectors in the model. Since agriculture is treated as an importable in the model it follows, through microconsistency, that manufacturing must be treated as an exportable. We make the strong assumption that net exports of manufactures in 1982 are given not by net trade in total manufactures, but rather in specific aggregate categories (consumption and investment goods), of which Korea was a net exporter in 1982. In 1962 Korea was a net importer in all specific aggregate categories (consumption, investment, and raw material goods). We therefore use 1982 export data on the composition of trade in producing our 1962 microconsistent data set.

16. A recent study by Chenery and others (1986) also uses a multisectoral general equilibrium model for analyzing the contribution of trade policy to growth in Korea. Results of their model simulations indicate outward-oriented policies account for as much as 1 percent of output growth in Korea. Our results indicate a somewhat larger contribution to growth; however, our model only provides a partial view of the Korean growth process, since savings, investment, human capital formation, and many other factors are missing.

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## **PART VIII PERSPECTIVES ON TAX REFORM AND AGENDA FOR FUTURE RESEARCH**

**16—**

### **Roundtable Discussions**

**Amaresh Bagchi**

We have had a rich fare of ideas and experiences on tax reform at this conference. The basic message that has come through, if one can summarize it, seems to be as follows. Choose those taxes that can raise revenue with the least noise. The tax system simply cannot achieve vertical equity or redistribution. Leave that to expenditure policies. Be happy if the tax system does not make things worse.

The prescriptions that follow that message are like these. Rely mainly on the value added tax. It begets large amounts of revenue by expanding the base and avoids distortions. Have an income tax, but make the structure simple with a broad base, fewer exemptions, and low rates. Do not bother with progressivity. Try to accommodate distributional considerations in the tax system by differentiating between luxuries and nonluxuries in the VAT rates. Theoretical sanction for this approach is provided by the optimal tax literature and the problems in enforcing highly progressive direct taxes because of evasion and the disincentive effects. This is a far cry from the kind of tax regimes advocated by Kaldor and Kalecki for developing countries in the 1950s. Although on the face of it these prescriptions for tax policy are unexceptionable, since they have many plus points, one feels a little uneasy because they do not fully correct for the minuses.

First, the outcome of the value added tax will in all probability be regressive. However carefully commodity taxes are designed, they are difficult to control, especially when most of the revenue comes from inputs or mass

consumption goods, either through taxation or the pricing of public sector products. Take the latest Indian budget, for example. Additional resources are to come largely from the petroleum products and hike in railway fares and postal rates. Incidence studies rarely take into account the burden of such pricing on consumers. Reliance on these instruments is unlikely to diminish in the near future. The Indian government finds it difficult to extend even a modified VAT to petroleum products or several other principal exciseyielding commodities like textiles and tobacco.

Second, expenditure programs are limited in their provisions for the poor, especially in developing countries where social security does not yet exist. Apart from limited coverage of such programs, there are the problems of leakage and burden on the budget. Given this reality, can the tax system be absolved of the task of redistribution?

Third, the move toward the VAT has originated primarily out of the concern about tax-induced distortions in industrial countries, which have much fewer market imperfections and more vigorous competition than developing countries. Where the markets are imperfect and there are big pockets of rent, welfare may not advance if no effort is made to correct the distortions. In addition, the question of the neutrality of the tax system in a developing country has to be considered in a dynamic perspective.

In any case, direct taxes with a degree of progressivity will still be needed. No doubt the structure should be simple and the rates moderate. But efficacy of the direct taxes will depend ultimately on how efficiently they are administered. More research is needed on what influences compliance behavior and what kind of direct tax structure developing countries can best ad-

minister. More attention must also be paid to the most effective use of the resources available to tax authorities.

This conference has been concerned more with the correction of tax-induced distortions. The central problem with the tax system of developing countries is evasion and parallel economy. A challenging question for research would be the impact on growth, resource allocation, and inequalities in an economy where taxes are poorly administered and there is a parallel economy. Another issue that has been neglected is what happens when taxes that are rational on paper are widely evaded. It would help developing countries if international agencies such as the World Bank promoted research to explore how taxes can be implemented efficiently—more specifically, how an efficient information system can be set up in the tax departments or how tax withholding can be expanded and presumptive taxation made acceptable. The trouble with the present tax reform initiatives that emphasize value added taxation is that begetting revenues almost painlessly seems to weaken the will to enforce the direct taxes vigorously. Investigation is needed into what happens to equity and efficiency if a VAT is also evaded on a large scale, if the products of large segments of the economy such as agriculture are left out of its purview, and if certain sectors like small-scale industries are treated preferentially. These issues should figure prominently in the agenda for future research.

### **Richard Musgrave**

The 1980s, the "decade of tax reform," brought substantial progress toward the traditional goals of income taxation. A broadening of the tax base, combined with rate reduction, yielded horizontal gains in equity and efficiency in countries throughout the world. Progress was also made toward corporate tax integration. Commodity taxation in turn benefited from the substitution of value added for turnover taxes, all improvements for which students of taxation can take credit, a belated blossoming of Henry Simon's vision of half a century ago. At the same time, the 1980s brought retreat from the income tax as a vehicle of progressive taxation. U.S. legislation in 1981 took the lead by flattening the distribution of the burden, and in 1986 the broadening of the base in the upper range was matched by further cuts in the high brackets. These cuts left effective rates unchanged, but they also sealed the shift in the distribution of the burden. With a top rate of 28 percent, a large step toward a proportional rate system had been taken. Other countries followed, if in less extreme form.

This dual pattern of income tax reform was associated with an increased acceptance of consumption as a tax base, supported by the emergence of the value added tax (VAT) as an appropriate vehicle for just this purpose. This shift was in line with the growing academic preference for consumption as a superior tax base and the romance surrounding the personal expenditure tax. But these were not the moving forces. Rather, the trend reflected impatience with the inherent complexities of direct taxation, concern with incentive effects, and most important perhaps, political interest in vertical equity. Relief for the lower end of the income scale via exemptions or credits remained on the agenda, but inequality higher up, and with it the case for raising bracket rates, came to be viewed with less concern. The income tax base can be improved, so the compromise went, provided its role as a vehicle for vertical equity is deemphasized. Thus there was less need to rely on income taxation, and this was at the very time improvements in its base were being achieved.

These trends, which were widely evident in developed countries, also took root in the tax reforms of developing countries. This should not be surprising. Tax reformers are a closely knit community extending across national borders, and there are principles of good taxation that should demand general acceptance. Nevertheless, the uniformity in their thinking is somewhat disturbing. Given the institutional differences between the developed and the developing countries, and even among the latter, one would expect concerns and priorities to differ in significant respects. The role of vertical equity in tax design is particularly important in this context and is the focus of my comments.

Vertical equity is an awkward topic for economists, especially as tax reformers. What constitutes a fair distribution of after-tax income transcends the safe haven of Paretian analysis. Moreover, optimal tax theory has weakened the case for rate progression by pointing to the emergence of deadweight losses, and the potential damage to growth imposes further constraints. The latter, in particular, is of concern to developing countries. All this must be taken into account but does not justify setting aside vertical equity as a nonissue. The typical distribution of income in developing countries remains highly skewed, with a large low-income group, a thin middle range, and a heavy concentration of income and wealth at the top. Tax policy can hardly be indifferent to this problem, whether for reasons of political stability or social policy.

Several contributors to this volume have suggested that distributional concerns may be left to the expenditure side of the budget. Linking the two sides of the budget in reform thinking is a splendid idea, but taxation cannot escape its share of responsibility. To be sure, tax policy at the lower end of the scale can do little. By leaving a tax-free range, it can avoid making matters worse, but that is all. Expenditure policy is needed to make improvements, be they in education, health, or income supports. Their finance in turn re-

quires some degree of progression, lest an excessive burden be placed on the middle. Such is the case especially in developing countries, where the share of the tax base over the middle range is much smaller and that over the upper range much larger than in developed countries.

Tax policy in developing countries typically falls short of its task at both ends of the scale. Beginning at the low end, it is disturbing that the effective rate over the bottom quintile in many countries, as reported by Thirsk, remains close to 10 percent, or to one-half of the average rate. Since income taxes are limited to the higher ranges, the fault must thus lie with a poorly designed structure of commodity taxes. Is this because countries have failed to exempt food and certain essentials from the VAT, or is it because consumption patterns are not sufficiently separable to provide low-income protection without a substantial loss of the tax base? More attention might well be given to this problem.

Turning to the upper half and especially top end of the income scale, the question is how this potentially rich part of the tax base can be drawn upon without soliciting evasion. Beginning with earned income, salaries and wages can be reached by withholding at the source, but this leaves the much more difficult task of reaching the income of the self-employed, a group of considerable size in the developing countries. Although the tax reformer who

seeks an elegant solution may find presumptive taxes unappealing and crude by nature, they may well be better than permitting the widespread escape of such income. To repeat, more attention needs to be given to this issue.

The taxation of capital income, which has received the most attention in the tax reform discussion revolving around the developed countries, is also a concern in the developing nations. With capital income the predominant source of income at the upper end of the scale, its coverage is essential to attain even a modicum of vertical equity. As Thirsk notes, taxation at the corporate level is imperative as a means of source collection. Applied to domestic capital, double taxation can then be avoided by excluding dividends or crediting shareholders. Applied to foreign capital, the corporation tax is needed to give the domestic treasury a share in that tax base. Whatever credits may be granted will then be paid for by the treasury in the countries of origin.

In the developed economies, much attention has recently been given to replacing the corporation income tax by a simpler cash-flow approach. Whatever its merits or demerits for these countries, the cash-flow tax cannot be extended readily to developing countries. For one thing, it greatly limits the taxation of capital income. Unless matched by a progressive personal expenditure tax (which in fact it would not be), this would result in a loss that developing countries can ill afford. For another, it would deprive the host country of an adequate share in the return to foreign-owned capital. A separate withholding tax would continue to be needed, thereby resurrecting all the problems involved in determining net income. As a means of withholding income tax on wage income, the cashflow tax would lack the essential floor of personal exemptions unless these were added, as in the case of income tax withholding.

According to various reports, tax reform in the developing countries, as in the developed countries, is withdrawing from incentive devices. Would it not be better, so the developed countries argued, to do away with selective measures—which are messy and open to abuse in practice—and to generalize the incentive by lowering the rate of tax? This approach, too, has its merits, but it also tends to reduce the revenue that can be obtained from capital income, once more, a luxury that developing countries may not be able to afford. Well-designed incentives (for example, by initial allowance) applied where investment responses will be most productive may thus remain a useful tool in the finance of developing countries. More attention might also be given to alternative approaches, including the taxation of capital assets and net worth. Rather than seeing progress in that direction, I was sorry to learn of the demise of the Colombian net worth tax. In addition, special problems arise with the taxation of land and real estate, and with the extension of tax reform thinking to the local level.

More can and should be done along these lines, but there remains the sad fact that any one country acting by itself can do little to effectively reach capital income, lest its attempt to do so result in capital flight. With capital the highly mobile factor, only international cooperation, including that of the countries of source, could offer a satisfactory solution. Given these difficulties, it is evident that the task of adequately reaching the upper end of the income scale, especially in developing countries, cannot be left to income taxation only. The consumption base must be drawn upon as well. If it were feasible, a progressive expenditure tax would offer the ideal solution, but unfortunately this is not an available option in developing countries. Luxury excises or a multiple-rate VAT must therefore be brought into play. It is easy to understand why VATophiles would not want to see their prodigy messed up by multiple rates, but might not a set of supplementary excises be worse? Again this seems to be an important area of research.

In all, tax reform thinking should pay attention not only to streamlining the systems in developing countries and bringing them up to standards in the developed economies, but also to improving second-best messy devices, such as presumptive taxes and consumption levies oriented toward high incomes, devices

that may be needed for the time being, especially if a modest degree of vertical equity is to be achieved.

### Charles E. McLure, Jr.

One basic question that needs to be resolved is whether countries should have generous tax incentives and high tax rates or a comprehensive tax base and low rates. I prefer a broad base and low rates. If there are high rates and numerous incentives, marginal effective tax rates are likely to differ across sectors and types of investment; there may even be negative marginal effective tax rates. It takes special circumstances to justify that on policy grounds.

The equity implications of such a policy are also undesirable. To the extent that inequities fail to wash out in the equalization of rates of return, horizontal equity suffers, and more than likely vertical equity suffers as well. Also, incentives create opportunities to manipulate transfer pricing and use other gimmicks to reduce taxes; income that is ineligible to benefit from the incentive does benefit. Most countries do not have data on either the fiscal cost or the benefits of incentives. Even in countries where taxpayers are supposed to calculate the fiscal sacrifice caused by incentives, that is not often done. The tax administration generally does not care, since it appears that no money is at stake. In short, incentives interfere with both equity and efficiency.

Richard Musgrave has mentioned a tough problem in this area—international tax competition. Can any one country eliminate incentives, if all of its competitors for foreign investment offer them? We are going to see this question arise in spades in Eastern Europe. Hungary, for example, offers a 100 percent investment tax credit to certain foreign investors; that is, taxpayers can either pay taxes or invest the money. In addition, there are tax holidays for five years—which can be extended to ten years under certain circumstances. The only reason that the marginal effective tax rates are not negative is that there is no income against which to offset these various benefits at present; they cannot be below zero. But as investment begins to generate income, we will see marginal effective tax rates below zero.

Some kind of international agreement is needed to limit investment incentives. Otherwise marginal effective tax rates on income from capital are going to be near zero or perhaps negative—a situation that does not make much sense.

All of us have learned that global taxation is preferable to schedular taxation; certainly it is necessary for horizontal equity. And yet countries are still moving toward schedular taxation. Implicit in the preference for global taxation is a notion all income is being taxed, that is, that the tax base looks something like income and is not shot through with exemptions, unjustified deductions, and perhaps evasion.

The situation in the real world is quite different. Many countries offer extremely generous incentives for investment; there may be interest exclusions, and yet nominal interest expense is often fully deductible; capital gains may be exempted or taxed preferentially; and there is likely to be substantial evasion. In that kind of world it may not make much sense to speak of a global income tax. Much income is left out of the tax base, and deductions are allowed for all the expenses of earning income, whether the income is taxed or not. It is in that kind of world that some have come to favor schedular taxation. The United States, of all countries, has moved toward a schedular system in order to prevent the benefits of tax shelters from being used in ways that seem inappropriate.

Richard Musgrave sees the 1986 reform in the United States as a retreat from vertical equity. Yet the 1986 reform eliminated six million poor people from the tax rolls—which is surely desirable from the standpoint of vertical equity.

In a sense, the 1986 tax changes were distributionally neutral among individuals. (When the division of taxes between individuals and corporations is changing, it is hard to know how to define distributional neutrality.) Perhaps what Musgrave would really like to see is base broadening, as in 1986, but without the reduction in rate progressivity that was needed to maintain distributional neutrality. That simply was not in the cards. Besides, his complaint is not really about the 1986 act, which only ratified the then existing distribution of individual burdens.

His complaint is against the 1981 act, which drastically reduced progressivity.

There was a tremendous shift in the tax burden from individuals to corporations. Unless one thinks that the corporate tax is borne by consumers or labor and has no effect on the net return to income from capital, one has to see that as a progressive shift. Whether the corporate tax is paid by shareholders or by capital in general, a shift of that magnitude almost certainly increased the progressivity of the taxes. Among other things, the 1986 act virtually eliminated tax shelters and used revenue from that and the repeal of the Investment Tax Credit (ITC) to lower rates. The ITC is clearly a capital benefit, and tax shelters do not benefit the poor. So it is wrong to say that the 1986 act reduced progressivity.

Finally, one has to distinguish between the opinions of the general public and those of tax experts. Many tax experts think that we need more progressivity. The general public does not seem to go along with that completely. Over the years the view that the income tax is the best tax has been seriously eroded. Most of the public now seems to think that the sales tax is better. This may in part be the result of the growth of tax

shelters in the early 1980s, which undermined confidence in the income tax. In any event, as economists, we really do not have much to say about vertical equity and should not mourn that the public seems to be shifting toward a tax it thinks is better to start with. Do we really have the right to make this kind of judgment?

### **Nicholas Stern**

I would like to discuss the problem of where tax reform should go from here under the following six headings: the integration of revenue and expenditure, administration, the role of presumptive taxation, the funding of social security, environmental taxes, and the dynamic aspects of taxation.

Expressing the taxation problem as the funding of an exogenous expenditure target is misleading in a number of ways. First, the expenditure target will depend on the availability and costs of the taxation that will be used to finance it. Second, many aspects of expenditure are just like taxes. Subsidies or losses of public enterprises are important examples here. Both are in many respects like negative taxes and should be analyzed together with the positive taxes that usually form the subject matter of tax policy. The problem is deeper than this, however, and brings up a third point. The political acceptability of a tax system may well be closely linked to the expenditure pattern it is intended to finance. Fourth, the appropriate pattern for any particular form of taxation will depend on other parts of the government budget. For example, the arguments for the differentiation of indirect taxes to take into account the different consumption patterns of richer and poorer groups are much stronger where the government transfers and income support systems are weaker.

Recent Chinese history illustrates the close link between revenue and expenditure. Over the past ten years or so government revenue has almost halved in China as a proportion of national income. At first sight, this might look like a collapse of the tax system. Following the decentralization of the 1980s, however, expenditure responsibilities were transferred away from the government to enterprises, with the result that revenue and expenditure control moved to different parts of the economy. Therefore an examination of revenue by itself would provide a misleading picture of the history of the public finances over that particular period.

Under the second heading of administration, tax reformers are keenly aware of the importance of keeping tax systems simple. Yet far too little attention has been given to the meaning of simplicity, in particular to finding out why some patterns of taxes are administratively more feasible and politically acceptable than others. From many perspectives, poll taxes, as in the United Kingdom, and land taxes are rather straightforward administratively, at least in comparison with income taxes. But sometimes the simplicity goes along with visibility, and visibility can be a political disadvantage for a tax. Indeed, it is one of the ironies of tax analysis that many of those taxes that have administrative and economic advantages (because they are close to lump sum in nature) have severe political

disadvantages, for reasons that are tied in with their economic and administrative advantages.

One may also ask what constitutes simplicity in indirect taxation. Many people argue the merits of an indirect domestic tax system that consists of a VAT with one or two rates and a system of exemptions, supplemented by specific excises on alcohol, tobacco, and some luxuries. That system seems to work and fits quite well with a number of theoretical desiderata. From the point of view of the number of rates in the system, however, it is not something that can obviously be described as simple. It would be valuable, then, if the combined experience of tax reformers could be analyzed more systematically in terms of those attributes of simplicity that go along with administrative feasibility.

As many contributors to this volume have mentioned, presumptive taxation (our third topic) has its advantages. Many bases for taxation that we would like to measure present severe information difficulties in developing countries. It may well be possible, however, to form a view of the level of activity or profitability of an enterprise. Thus more attention should be given to the use of indicators where bases are hard to measure.

Next, we have the question of whether developing countries can afford a social security system. Their weak tax base is often taken as an argument that they "cannot afford" a social security system. This argument is worrying and unpersuasive. It is precisely in developing countries that the need for social security is greatest. Thus the benefits of this form of government expenditure, if properly designed, may be high enough to offset the potentially high costs of taxation. The question should be how the expenditure can be designed to provide security cheaply and effectively and how taxes can be designed to support that expenditure in an efficient way (one that does not undermine any redistributive benefits of social security). That is a challenge economists should face.

Further attention should be devoted to the analysis of environmental taxes in an imperfect world. This effort seems to be lagging some way behind that of other parts of public finance, notwithstanding the resurgence of interest in taxes in relation to the marginal costs of externalities. These marginal costs are indeed a central element in the calculation of taxes, but just as "price equals marginal cost" is an incorrect rule for public sector pricing in a revenue-constrained economy, so too is "tax equal to the marginal cost of exter-

nality" an incorrect rule in the treatment of externalities in such economies. As with any tax, we have to consider its contribution to revenue and its effects on income distribution.

Finally, to those who complain that tax analysis is not dynamic, it should be pointed out that this may have been the case in the past, when our ability to analyze dynamic tax issues was limited by our inability to construct plausible positive models of dynamic economies. Analysts had to face all the problems of expectations, imperfect capital markets, understanding the development of knowledge and of technical progress, dynamic inconsistency, and so on. But over the past ten years or so, the dynamic analysis of positive aspects of economics has improved a great deal, and notwithstanding the great difficulties that remain, some significant advantages in the normative analysis of taxation will now be available. As in other areas of tax theory, we should press on with serious analysis, while retaining a healthy skepticism.

### **John Whalley**

I will add a word or two to what has already been said, stressing additional issues and also the execution of future research in this area. On the issue side, to the list might be added the environment and taxation. It is clear that the potential income for developing countries from carbon taxes and tradable permits is high. According to some calculations, depending on how revenues are redistributed, a carbon tax scheme could bring developing countries as much as two hundred billion dollars a year, which is perhaps six to eight times their current annual aid flow.

There are other global issues. We have already talked about capital flight and tax policy in developed countries, and how developing countries may have some leverage there for raising revenues. Tax competition has also come up, and the room for some cooperative arrangements between countries to deal with some of the competition effects of incentives. But as we are approaching the end of the GATT Uruguay Round, there is also talk in Geneva both of permanent negotiation and of taxes being included in this process—in other words, a GATT for taxes and tax treaty issues. Given this prospect, the global component of tax issues should be kept at the forefront of research. Evasion and administration are also central tax issues; we still know very little in these areas and need to do a lot more work there.

As for the way tax research affecting developing countries is executed, there are a number of questions. One is in accumulating data. How far should the effort go to build general-purpose data sets? And is current data collection sufficiently oriented toward specific issues, even when it is stored and accumulated? I would also like to emphasize the need for continuing a multidisciplinary approach in this area. On the issue of tax evasion, for example, we could learn a great deal from political scientists and lawyers. Also, research carried on at institutions such as the World Bank should rely more heavily on the expertise of outside researchers, from developing as well as developed countries. This could also make an important contribution in the Bank toward capacity building in the developing world.

### **Eduardo Wiesner**

As chapters 4 and 5 point out, two general topics that tax analysts tend to pass over are (a) the relationship between tax policy reform and tax administration, or what could perhaps be called the political economy of tax reform; and (b) the relationship between tax policy reforms, fiscal policy, and stabilization programs. Here, the message is that good tax policy can be seriously impaired by macroeconomic imbalances and that the restoration of macroeconomic balance (in other words, the reduction of inflation) can strengthen the role of good tax policy. It can also minimize the negative aspects of a weak tax administration structure.

#### **The Political Economy of Tax Reform**

Should tax policy considerations have supremacy over tax administration? Or is it true that tax administration *is* tax reform? Those who have had some experience with tax reforms in developing countries will be tempted to declare, "Yes, tax administration *is* tax reform"—because, of course, they know that without due consideration to the constraints of tax administration, even the finest tax policy reform will fail. And yet, at the end of the day one must be assured that the intrinsic content of tax policy (in terms of revenue adequacy, efficiency, neutrality, and equity) meets some minimum criteria of public finance. After all, you do not want to waste good tax administration on poor tax structure. In other words, one must start out from good—but not ideal—tax structure and then build in modest increases of efficiency in the tax administration. As Richard Bird has noted in chapter 3, "The key to successful tax reform is to design a tax structure that can be administered adequately with the available resources while at the same time making the best possible use of those resources from a long-term perspective".

It should also be pointed out, however, that quite often what one does when designing fiscal structure is to include elements that will improve and facilitate tax administration. This happens, for example, when one eliminates subsidies or simplifies the mechanisms for dealing with inflation, or when one does not insist on fine tuning. This is what Colombia has been doing recently—assuring a minimum of intrinsic quality in the

policy content of its reforms *and* recognizing, as Charles McLure and Richard Zodrow have said elsewhere in this volume, that a system that can be administered "is preferable to a conceptually superior system that cannot be administered."

Another important aspect of the political economy of tax reform is the link between tax reform, on the one hand, and the types of expenditures the new revenue is supposed to finance, on the other. Often, tax reform only becomes politically acceptable or feasible when it is perceived by some segments of the population to be supportive of a given type of expenditure or of a given transfer within the public sector. Despite the advantages of a VAT, for example, if the additional expected revenue is not seen as a potential transfer or as a means of financing certain types of expenditures, it will not get enough political support. And here, one may also discover that "benefit taxation" often burdens the administration with exigencies that it can hardly deal with. These are complex questions and the tradeoffs are difficult to quantify. Pragmatism may be the only answer. If, to obtain political support, the VAT (in an initially modest version) has to share or transfer part of the proceeds to finance certain expenditures, one has to accept that in the short run there will be some inefficiencies in tax administration.

### **Tax Policy and Macroeconomic Imbalances**

Reading through the detailed report in chapter 1 on tax reform in Colombia, I realized that bringing into our discussion the broad macroeconomic background is not, after all, bizarre. Again and again, one finds references to the need for some sort of inflation–adjustment mechanism. The more intensive the search for a "good" mechanism to index assets and incomes, the greater the demands on administrative resources. The way out of this problem is not so much through fine–tuning the tax policy or improving the tax administrative structure, but through macroeconomic correction. In other words, the macroeconomic environment is a key factor in the success or failure of tax policy reform and of tax administration reform.

The lessons that have been learned about the political economy of tax reforms can be summed up as follows. First, most generalizations about tax policy and about fiscal policy are probably suspect, as they would be in most areas of economic policy. What works in one country may not work in another. Tax policy may be a successful industrial policy in the Republic of Korea but a failure in Colombia. A great deal depends on the details and dynamics of a particular situation. "Only what works . . . works" may be the right tautology to draw as the first lesson.

Second, although pragmatism may be the best guideline in judging the tradeoffs involved, policymakers will still not be able to know in advance what will work. Hence, it seems practically impossible to avoid some sort of a risk. If that case, the lesser risk is to give priority to the intrinsic quality of the policy content of reform. But one must hasten to add that close surveillance of experience, as the reform evolves, is probably the best course of action. This way one can be sure to correct what does not work and to strengthen what does. Over time, most tax reform is a gradual buildup of experience. One could say that effective (in contrast to statutory) tax reform is always gradual in developing countries.

Perhaps most important, tax reform and tax policy do not take place in a vacuum. If these topics are to be discussed meaningfully, they have to be placed in their respective macroeconomic environments, where they interact with other policy objectives, needs, and constraints. All this becomes a complex and dynamic system that is constantly changing. This explains, among other things, the immense difficulty of intercountry and intertemporal comparison. Although it may be true that some tax policy objectives have a degree of universal validity, their applicability is going to depend on the specifics of each case. This may sound like an anodyne statement, but a good number of tax experts and economists, particularly those who have had hands–on experience, would not dismiss this lesson as something inconsequential. They probably remember what Schumpeter said more than seventy years ago on the significance and complexity of fiscal issues: "The spirit of a people, its cultural level, its social structure, the deeds its policy may prepare, all this and more is written in its fiscal history, stripped of all phrases. He who knows how to listen to its message here discerns the thunder of world history more clearly than anywhere else" (Schumpeter 1954: 7).

**References**

Schumpeter, Joseph A. 1954. "The Crisis of the Tax State." *International Economic Papers* 4:7.