Contractual Savings, Capital Markets and Firms' Financing Choices

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Abstract

We analyze the relationship between the development, and asset allocation, of contractual savings and firms' capital structures. We develop a simple model of firms' leverage and debt maturity decision. We illustrate the mechanisms through which contractual savings development may affect corporate financing patterns. In the empirical section, we show that the development and asset allocation of contractual savings have an independent impact on firms' financing choices. Different channels are identified. In market-based economies, an increase in the proportion of shares in the portfolio of contractual savings leads to a decline in firms' leverage. In bank-based economies, instead, an increase in the size of contractual savings is associated with an increase in leverage and debt maturity in the corporate sector.

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1. Introduction

The past two decades have witnessed a parallel explosion of equity markets and institutional investors, especially pension funds. In many stock markets, capitalization and liquidity have soared while institutional investors have become crucial actors in the capital markets of not only developed, Anglo-Saxon economies, but also in a handful of emerging economies (for instance Chile and South Africa). Demographic evolution, mainly in OECD but also in emerging economies, is bound to increase pressure on countries to reform their pension system, and to choose effective investment regulations and policies for the newly created institutions. Pension reforms, designed to guaranty a sufficient living standard after retirement, generate a stable source of long-term domestic savings. Recent studies argue that this will foster capital market development and deepening.[1] Ultimately, the array of funding possibilities for domestic firms will be enriched, in particular the access to long term capital. In the recent context of currency and financial crisis associated with asset-liability mismatch in the balance sheets of firms (and banks), and excess reliance on (foreign currency denominated) short-term debt,[2] it is becoming urgent to evaluate whether the presence of domestic institutional investors tend to reduce firms' and other economic agents' vulnerability to interest rate variations and other shocks. In a more general context, Caprio and Demirguc-Kunt (1997) show that the lack of long term finance in emerging economies is not totally explained by firms' characteristics. The institutional environment and macroeconomic factors affect significantly the supply of long-term finance. This paper is the first known attempt to assess both empirically and theoretically the impact of contractual savings[3] development on firms' financing decisions, in a sample of developed and emerging economies.

The primary objective of a pension reform is to provide sufficient and affordable benefits for old age that can be sustained in the long-run. Financial deepening only should not motivate a pension reform. Moreover, history teaches that contractual savings institutions are neither sufficient nor necessary for capital market development.[4] Still, the issue is the *speed* of financial development. Whether financial deepening takes two decades or two generations has very different implications in term of development strategies. Recent studies (see Catalan et al. (2000) and Impavido and Musalem (2000)) suggest, for instance, that the rapid growth of capital markets over the past 15-20 years is partly explained by the development of contractual savings institutions. Pension funds and life insurance companies[5] are becoming essential characteristics of modern financial systems, and as such will significantly modify the corporate sector financing choices.

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[1] See Impavido and Musalem (2000) for empirical evidence.

[2] See for instance Rodrik and Velasco (1999), and Aghion, Bacchetta and Banerjee (2000) for a theoretical model of monetary policies in such a context.

[3] Contractual savings institutions include pension funds and life insurance companies.

[4] See Vittas (2000).

[5] There are of course other central players on capital markets, such as mutual funds, hedge funds, investment companies, or simply non life insurance companies. However, we do believe that pension funds and life insurance companies are particular because of the long-term structure of their liabilities (see Impavido and Musalem (2000) who underline the different impacts of contractual savings and non life insurance companies on capital markets).

Moreover, in the present context of financial instability, developing countries may find worthwhile to develop a domestic source of long-term financing.[6]

Therefore, this study comes as a necessary complement to earlier works stressing the impact of financial and legal institutions on firms' financing patterns in a cross-country perspective.[7] In an asymmetric information world in which conflicts of interest between external investors and those who manage and control the productive assets, the financial institutions and the legal environment[8] will shape the capital structures[9] of firms, leading to systematic differences across countries. To the extent that contractual savings institutions modify the information set available to all investors, push for compliance with transparency rules and legal rights, or simply modify the relative supply of different securities, one should indeed expect to observe significant cross-country differences explained by contractual savings' characteristics.

We address the following questions. First, as contractual savings institutions develop, is there a sizeable impact on firms' leverage and debt maturity? Second, can such an impact be accounted for by the characteristics of firms in each country? Third, does this effect remain significant once we control for the activity of the banking sector, the size and activity of the stock market in each country, and unobserved fixed characteristics? Fourth, can we disentangle the potential channels through which contractual savings institutions affect firms' capital structures? Finally, what do our results imply for the resilience of domestic financial systems in the highly volatile environment of the international financial architecture?

We show that the development of contractual savings institutions, as well as their portfolio decisions, have significant impacts on firms' financing patterns, after controlling for firms' characteristics and macroeconomic determinants. We identify different channels through which contractual savings affect the financing decisions of firms. In bank-based economies, the development of contractual savings is associated with an increase in firms' leverage and maturity of debt. In market-based economies, instead, the asset allocation affects firms' leverage: an increase in the proportion of shares in the portfolio of contractual savings is associated with a decrease in firms' leverage. In a nutshell, the development and equity investments of contractual savings institutions are associated with an increase in the use of long-term finance. In the present context of highly volatile international capital movements, this can be a crucial role for domestic financial institutions. The policy implications of the paper are clear. If demographic, institutional and political preconditions are met for pension reforms[10] (or reform of the insurance industry), policy makers should pay particular attention to investment policies that enhance the contractual savings industry. The regulation, in particular for equity

[6] Walker and Lefort (2000) argue that equity investments by fully privately managed pension systems have reduced price volatility in Argentina, Chile and Peru.
[7] See Demirguc-Kunt and Maksimovic's papers.
[8] Demirguc-Kunt and Maksimovic (1996, 1999), Demirguc-Kunt and Levine (1999) and La Porta et al. (1998).
[9] See Shleifer and Vishny (1997) for a survey on corporate governance, La Porta et al.(1998) for the impact of the legal environment on external finance.
[10] See for instance Vittas (2000).

investments, may have a large impact, as suggested by our preliminary results, when portfolio limits happen to be binding. In addition, policy interventions should be based upon a precise evaluation of the interaction between institutional investors and other components of the financial system (especially banks), and should strongly avoid creating a captive source of funds.

There exists a rich literature that explores the effect of the institutional environment on firm financing choices in specific countries and across countries. Overall, it confirms that the institutional environment, together with the real characteristics of firms, determines the capital structures of firms.

First, the legal approach, led by La Porta and al. (1998), shows how legal traditions and specific creditors and minority shareholders rights shape the access to external finance and the corporate ownership structures around the world. Second, Rajan and Zingales (1995) and Demirguc-Kunt and Maksimovic (1995) document cross-country regularities in the correlation between corporate financial structures and various firms' characteristics. Demirguc-Kunt and Maksimovic (1996) explore the impact of stock market development on firms' leverage and Demirguc-Kunt and Maksimovic (1999) extend this analysis by looking more closely at the institutional and legal determinants of capital structure. They find that how much the firm can grow by relying on external finance does depend on the legal environment.[11] Rajan and Zingales (1998) and Carlin and Mayer (1999) disentangle the financial, legal and technological factors that determine firms' access to external finance. Third, others highlight the impact of particular institutional arrangements on firms' external financing possibilities (see for instance Hoshi, Kashyap and Scharfstein (1991)). Fourth, firms' characteristics will affect the financing choices: for instance firms try to match the maturity of their assets and liabilities (See Caprio and Demirguc-Kunt (1997) for a discussion). Moreover, informational asymmetries affect the choice of security when seeking for external finance, and restrict the feasibility set (see, among others,[12] Barclay and Smith (1995), Stoh and Mauer (1996), Myers and Majluf (1984), Rajan (1992), Petersen and Rajan (1994), Diamond (1991), Jensen and Meckling (1976), Myers (1977)). Overall, the existing literature confirms that the institutional environment, together with the real characteristics of firms, determines the capital structures of firms.

The rest of the paper is organized as follows. Section 2 briefly lists the potential mechanisms that explain why the development of contractual savings institutions may modify the corporate financing patterns. Section 3 sketches a model of firms' financing choices and provides a benchmark for discussing the interaction between informational issues and corporate capital structures in the context of contractual savings development. Section 4 introduces the data and discusses the variables used. Section 5 reports cross-country empirical results. Finally, Section 6 is devoted to a discussion of our results and of policy implications.

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[11] See Beck, Demirguc-Kunt, Levine, and Maksimovic (2000) for a synthetic approach, at three different levels (firms, industries and countries).

[12] See the survey by Harris and Raviv (1991) and Stulz (2000).

2. Contractual Savings Institutions and Corporate Financing Patterns

The development of pension funds and life insurance companies (that are contractual savings institutions) involves a gradual accumulation of long-term financial resources, in order to provide a variety of services: pension and life insurance benefits, as well as schemes tailored for unemployment, end-of-service indemnity, down payment for housing, education, weddings, or funerals. Although there is no evidence of a substantial impact on the aggregate saving rate (see Davis (1995) and Bailliu and Reisen (1997)), there is little doubt that the composition of savings is altered following the development of contractual savings institutions.[13] Consequently, the supply of long-term capital increases,[14] which will modify the financial structure of the economy, and therefore the financing possibilities of firms.

The impact of contractual savings development on capital market size and efficiency may be direct or indirect (Impavido and Musalem (2000) and Catalan, Impavido and Musalem (2000) provide empirical evidence on the links and causality between capital market size - and deepening - and contractual savings development and portfolio allocation). First, it is likely that pension funds and life insurance companies are more willing to hold market securities and long-term debt than are individual investors[15] - this has a direct impact on the size of securities markets. Second, these institutions act as a countervailing force to existing commercial and investment banks (see Vittas (1999) for examples). Hence they foster competition and thus efficiency of loans and primary securities markets. Third, they promote financial innovation[16] and modernization of trading systems. Fourth, professional asset management activities increase the pressure for investor protection,[17] transparency,[18] and sound governance practices. As dominant minority shareholders, they are bound to move from passive asset management activities to active corporate governance in the firms in which they invest.[19] Fifth, institutional investors development may enhance the deepening of the public debt market and progressively help to build a yield curve. Sixth, Impavido and Musalem (2000) argue that contractual savings institutions development is conducive to financial and macro economic stability and resilience to shocks. The existence of large domestic institutional

[13] Impavido and Musalem (2000) and Vittas (1999, 2000) provide a detailed analysis of the main arguments of this section.

[14] In the case of Chile, the financial assets held by contractual savings institutions have increased from 18% of GDP in 1988 to 53% of GDP in 1997.

[15] Transaction costs on capital markets, the ability to diversify their portfolio, and the long-term structure of their liabilities are possible explanations. However, in principle, the net aggregate effect on the supply of long term savings may be ambiguous if mandatory contributions lead individuals to save more in liquid assets.

[16] For instance the use of derivative and asset backed securities (see Davis, 1995).

[17] In particular, the protection of minority shareholders rights.

[18] According to Vittas (1999), pension reform in Chile led to an increase in the quality of private ratings by the creation of a committee that rates various instruments for their suitability as pension fund investments.

[19] More on this in the next section.

investors may explain the insulation of the Chilean and South African stock markets from the contagion effects[20] of the recent financial crisis.

What are the preconditions to pension reform and the development of contractual savings institutions?

"Feasibility" conditions, as argued by Vittas (1999, 2000) may be less stringent than expected if a gradual approach is chosen. They include macroeconomic stability and fiscal discipline, the existence of a core of efficient and sound banking and insurance institutions, and a lasting commitment for the creation of an effective regulatory and supervisory agency. The investment regulations and traditions may also have a significant impact on contractual savings behavior. Moreover, the experience of Peru and several Arab countries tend to favor a gradual approach if the demand for domestic public debt does not materialize or if only a handful of firms have access to capital markets. A careful macroeconomic management is therefore needed in order to avoid situations in which the existing demand does not absorb the accumulated resources.

Finally, the impact of contractual savings development will not materialize until a "critical" mass of savings has been mobilized.

For all these reasons, the development of contractual savings institutions, in order to be successful, requires a lasting commitment of policymakers to foster sound practices.

The development of contractual savings institutions modifies the efficiency and the structure of the financial system. It will thus affect, and most likely increase, the set of available external financing possibilities for firms. Generally, we should expect an increased reliance on long term finance in countries in which contractual savings are getting larger. The development of a public debt market will provide a benchmark yield for corporate debt, enhancing the development of a corporate bond market. The supply of equity finance will be also stimulated.[21] More specifically, the cost of equity should fall because (1) their large size allows institutional investors to diversify their portfolio, hence they will be willing to hold shares of a given firm at a lower risk premium, (2) the liquidity premium should also fall for the following reasons: (a) contractual savings can invest in long term instruments without incurring a balance sheet mismatch between assets and liabilities, (b) newly created funds, as they enlarge their contribution base, tend to adopt "buy and hold" strategies and modify their portfolio at the margin, by the allocation of new flows. (3) In markets with significant transaction costs (see Pagano (1989) for a theoretical framework of volatile capital markets), large institutional investors can exploit economies of scale. (4) There are efficiency gains if the development of institutional investors leads to a decrease in underwriting costs.

[20] Kaminsky et al. (1999) provide evidence of contagion in the behavior of both individual investors and fund managers of US mutual funds investing in Latin America. See also Walker and Lefort (2000).

[21] Legal issues may also impede the firm ability to increase its equity capital. In Germany, for instance, the decision to increase - or decrease – equity cannot be taken by the management board. It is made by vote at the shareholders' general meeting and usually require a 75% majority.

Generally, the existence of large institutional investors provides a stable demand for securities in primary markets.

The aggregate impact on firms' leverage is however not clear-cut. The development of stock markets may lead to an increase in the debt-to-equity ratio if informational spillovers from the stock market to the banking sector are large enough (see next section).[22] Informational mechanisms are likely to be stronger in countries in which contractual savings institutions invest more in shares and are relatively active monitors of public firms. The impact on the debt maturity is also an empirical issue. Indeed, if banks do not change significantly their loan policies, one should observe an increase in debt maturity on average. Moreover, if contractual savings institutions are complementary to banks, one should observe an increase in the maturity of bank loans as the balance sheet mismatch of banks is reduced. However, banks may respond to greater competition by concentrating on their core comparative advantage - that is their superior ability to monitor firms. If this happens, they will increase short-term loans. In this situation, the debt maturity will fall. The dominant effect will depend on whether contractual savings institutions invest in shares, bonds, make direct loans, or are large depositors in the banking system. In the two first cases, competition issues are more likely to dominate whereas the complementarity effect will be stronger in the last case. But competition per se does not imply a fall in the debt maturity if the fall in bank loans maturity is more than compensated by increased maturity of corporate bonds - this is an empirical issue.

3. A Simple Model of Firms' Financing Choices

In this section, we briefly sketch the main features and conclusions of a model developed in a companion paper.[23] This model emphasizes informational issues[24] and refinancing risks. More specifically, we provide a simple framework in which firms choose the debt maturity and can also issue equity. We discuss within this framework the potential benefits associated with the development of stock markets, and the nature of investors.

3.1 The Corporate Sector

There is a continuum of firms differing with respect to their initial equity $E_R<1$. Each firm has access to a project that requires an investment I=1. The investment can be spread between date 0 and date 1, under the following constraints:

(1) The present value of the two investments I_0 and I_1, respectively at dates 0 and 1, is equal to the total investment: $I_0 + I_1/R = 1$, where $R-1$ is the safe interest rate (the return on government bonds).

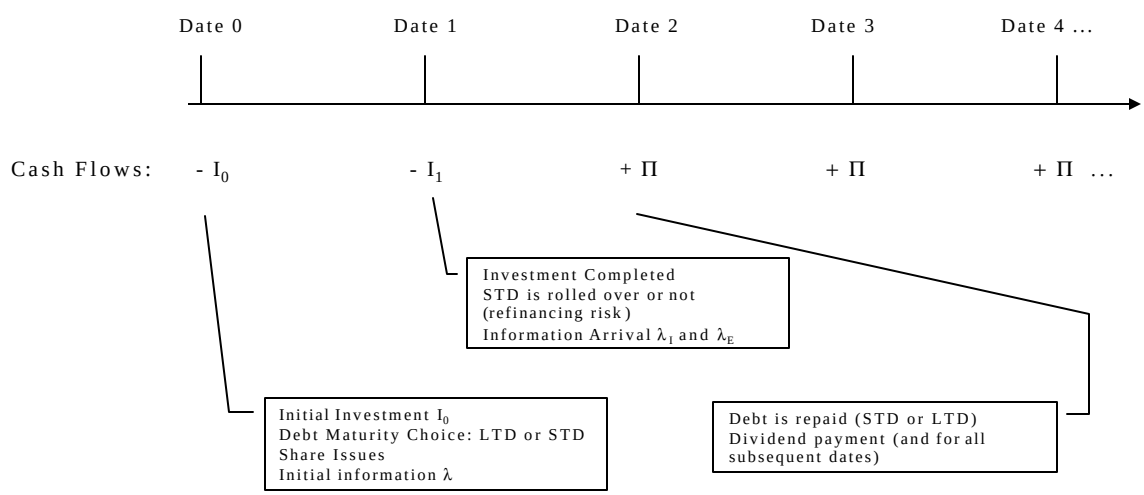
[22] And the paper by Demirgüç-Kunt and Maksimovic (1996).
[23] See Tressel (2001).
[24] More specifically, we focus on adverse selection issues, and the role of private information in the credit relationship. The literature has highlighted many considerations also relevant for the debt maturity decision that we won't tackle here: underinvestment (Myers (1977)), short-termism (Von Thadden (1995)), ex-post moral hazard (Rajan (1992), Rajan and Petersen (1994)), among others.

(2) The initial investment I_0 must be strictly positive:[25]

$$I_0 \geq g > 0$$

If the initial investment is realized and is not liquidated at date 1, the project will yield cash flows for all dates t>1. However, there are two types of firms in the economy. Good firms yield strictly positive cash flows Π[26] at each date t>1, and can be liquidated at date 1 for $l*I_0$, where l<1. Bad firms yield no cash flows. They are worth nothing if the project is terminated at date 1. Firms' types are private information, and cannot be credibly signaled to outsiders (creditors and new shareholders). The uncertainty regarding the project is measured by λ, the prior probability assigned by external providers of funds (banks or investors) that the firm is good at date 0.

Figure 1: Summary of the Events



The firm is run by a manager (who may be the controlling shareholder) who maximizes the expected discounted value of dividends paid to *initial* shareholders. As dividends will be the same in all periods, for t>2, this is equivalent to:

[25] As become clear in the analysis of short-term debt, firms that are good risks choose to minimize the first period short-term debt, in order to reduce the cross-subsidization of bad risks. If no constraint is imposed, they would choose not to borrow short-term at date 0. The constraint we impose here can be endogenized as in Rajan and Petersen (1994) by adding a moral hazard imperfection at date 1.

[26] Π is assumed to be greater than R^2 so that in the perfect information case, all firms have access to LTD.

$$MaxE_0(Div_2 + B)$$

where Div_2 is the date 2 dividend received by the initial shareholders, B the discounted value at date 2 of dividends for t>2,[27] and E_0 the expectation operator at date 0.

More precisely, $Div_2 = \Pi - R'*D$, when no shares are issued, where D is the face value of the debt and R' the gross repayment per dollar borrowed.

However, the firm undertakes the project if and only if it yields a greater cash flow than simply investing in government bonds:

$$MaxE_0(Div_2 + B) \geq R^2 \cdot E_R$$

We assume that a firm cannot have a mix of short term and long term debt. Therefore *external* financing (I- E_R) possibilities are:

(1) Short-term debt only (in this case the debt must be rolled over at date 1).
(2) Long-term debt only (the debt is issued at date 0 and repaid at date 2).
(3) A combination of short-term debt and external equity.
(4) A combination of long-term debt and external equity.

These financing possibilities are briefly described in the following paragraphs.

3.2 Long Term Debt

Banks are perfectly competitive. They gather savings from households and invest them in loans to either the public sector (government bonds) or to the private sector (corporate bonds). The structure of the economy is similar to Diamond's model with banking and limited access to the stock market (see Diamond (1997)). In particular, households are subject to liquidity needs at date 1. As in Diamond and Dybvig (1983), this feature may lead to runs (see the short-term debt section below) and firms may not be refinanced to complete the project. In the case of long-term debt, banks cannot force firms into liquidation when they face sudden withdrawals (and I_0=1).

For the sake of simplicity, long-term debt is repaid once and for all at date 2.[28] *Ex-ante* competition among banks implies that banks make zero expected profits on loans:

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[27] As dividends paid for dates t>2 are the same in this model, B is simply equal to $\sum_{1}^{+\infty} \frac{Div'}{R} = \frac{Div'}{R-1}$ where Div' is the dividend at each period t>2.

the expected rate of return on loans must be equal to the safe interest rate per period. However, as a proportion 1-λ of loans are never repaid, banks charge a two period gross return equal to $\frac{R^2}{l}$ per unit of capital borrowed.[29]

In this imperfect information world, some firms won't get access to long-term debt (LTD). Indeed, banks refuse to lend whenever the maximum expected return on the loan (LTD=1-E_R) is less than the return on government bonds:

$$\Pi < \frac{R^2}{l} \cdot LTD$$

Hence if: $E_R < E_1 = 1 - \frac{l\Pi}{R^2}$

The rationing region [0 ; E_1] becomes larger if the profitability of good firms fall, if the cost of capital R increases, or if informational frictions increase (λ increases).

3.3 Refinancing Risk and Financial Institutions

(1) Short term Debt

The firm may be able to obtain a short-term loan from a bank when long-term debt is not accessible. The existing relationship between the bank and the borrower allows the former to obtain private information about the quality of the project; by lending at short horizons, the bank can decide not to refinance the project if it obtains bad information on the firm (see Sharpe (1990), Rajan and Petersen (1994), and Stulz (2000) for a survey). In parallel, the bank gets an informational advantage with respect to other potential lenders, because the latter has a less precise information on the quality of the borrower at the interim date (more on this latter). Therefore, the initial lender can compensate initial losses on bad projects by charging a higher interest rate on second period loans. This process, known as staged financing, makes short-term debt more feasible in uncertain environment.[30]

The information game is modeled in the following way: by lending to a firm in the first period, a bank is able to refine the information on the quality of the project. More specifically, we assume that the bank can get two possible signals at date 1:

(a) signal *down* :

Signal down reveals with probability 1 that the firm is of bad type.

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[28] In the general case, long-term debt is repaid in n periods between date k and date k+n, with k, n finite, and k>1. It is straighforward to show that the qualitative results are not modified by this simplification. See Tressel (2001) for a detailed justification.

[29] The interest rate r on banks'loans is given by: $R^2/\lambda=(1+r)^2$.

(b) signal *up* :

The bank may receive signal up for *both* types of firms. However, this signal reduces the uncertainty on the type of the borrower. The probability of being good given signal up is λ_I. Other banks also receive a signal; however, their information is less precise: the probability that the firm is good given signal up is λ_E, with $\lambda_I > \lambda_E > \lambda$. This difference between private (measured by λ_I) and public information (measured by λ_E) creates a captive market for each bank at date 1, composed by the firms that it financed at date 0, and receiving signal up. Other banks will charge a gross rate of return equal to R/λ_E. However, the incumbent bank is willing to lend as long as the rate of return on the loan is greater or equal to R/λ_I which is strictly less than R/λ_E. Therefore that bank will be able to make positive profits on the firms it already financed by proposing a loan with a gross rate of return $R/\lambda_E-\varepsilon$ (with $\varepsilon \longrightarrow 0$). Finally, ex-ante competition among banks (i.e. at date 0) implies that expected profits of banks must be zero: their positive profits between date 1 and 2 compensate the losses made between date 0 and 1. Clearly, this means that more firms are funded at date 0: the threshold value E_2 under which the firm is rationed with short-term debt is lower[31] than E_1.

The drawback of short-term debt[32] is that if the bank refuses to roll over the debt, the firm will be forced into liquidation. We model the refinancing risk in the next section.

(2) Bank runs and refinancing risks

The initial lender will not refinance the project if it receives bad news on the borrower's type (signal down). However, *inefficient* liquidation may also occur, depending on the stability of the banking system, if for instance, depositors and generally banks' lenders have no confidence in the ability of banks to serve sudden withdrawals. Diamond and Dybvig (1983)[33] have rationalized the possibility of self-fulfilling runs when banks serve investors sequentially by drawing on a small liquidity reserve: it is rational for each individual creditor to join a run, since by doing so it secures a chance to be at the beginning of the queue and get his money back. Next, the question of equilibrium selection is addressed in the following way: we adopt the convention that investors coordinate on one equilibrium or the other depending on the realization of a sunspot variable: runs occur with a probability μ.

The liquidation value of the initial investment I_0 is $l^* I_0$ with $l<1$.

However, banks' assets are firms' liabilities. The ability of banks to get repaid in full (by refusing to roll over the debt, which forces the firm in bankruptcy, unless it can find other lenders) depends on the liabilities of the firm. Let us assume that the firm will

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[30] However, the market power of the incumbent bank may create distorsions ex-post, see for instance Rajan (1992), and Sharpe (1990)).

[31] More precisely, this is the case only if the refinancing risk described below is not too large.

[32] Long-term finance, contrary to short-term debt contracts, may also reduce "short-termisn" in the behavior of managers, see Von Thadden (1995).

[33] For the recent literature on the fragility of the banking system in the context of the recent financial crisis and capital flows, see Chang and Velasco (1999), Rodrik and Velasco (1999), among others.

not find other external funds if the initial lender refuses to roll over the debt (for instance, because of contagion, runs may occur on the whole banking system). Therefore the firm is forced to liquidate its assets[34] to repay the debt, hence goes bankrupt. The issue here is that bankruptcy occurs because of the *mismatch* between liabilities and assets in the corporate sector, that is because short term debt is used to finance long term, illiquid, productive investment. If the firm has a low debt-equity ratio, it will be able to repay the debt fully *because equity acts as a cushion*. On the contrary, if the firm is highly indebted, early liquidation implies that the bank cannot get the full value of the debt. Hence the bank may not be able to obtain enough liquidity if depositors (or generally all banks' creditors) decide to run (or not renew their loans to the bank).

The argument goes like this. Each bank borrows from many investors, and lends to many firms. *We assume that investors observe the average capital structure of these firms, hence know the value of bank assets in case of early liquidation*. If the value of the short-term debt is less than the liquidation value of the firm,[35] investors know that they will be fully repaid in case of run. Therefore, they have no reason to run in the first place (and to expect other investors to do so). On the contrary, if the date 1 value of the debt is more than the liquidation value of the firm, then runs are possible. They will occur with a probability μ.

Formally, runs are *possible* (and occur with probability ?) if and only if:

$$R_0 \cdot STD_0 > l \cdot I_0$$

Where R_0-1 is the rate of interest on the short-term debt STD_0.

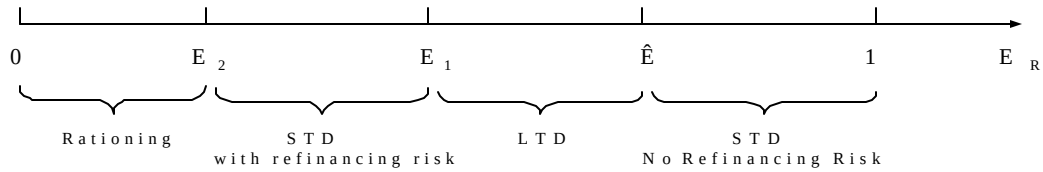
We can show (see Tressel (2001) for details) that, for intermediate values of μ, two types of firms will finance their project with STD rather than LTD: (1) firms that have limited internal liquidity, that cannot borrow long-term and which face a positive probability of runs. And (2) firms that have important reserves relative to their borrowing needs and which do not face a refinancing risk.[36] For intermediate values of liquidity reserves, the firm chooses long-term debt.

[34] Here we formally assume that each bank lends to a homogenous group of firms. This is obviously not realistic. This assumption is purely technical and does not affect the general argument.

[35] Here we formally assume that each bank lends to only one firm. This assumption is purely technical. In a more general context, the occurrence of runs should depend on the average capital structure of firms financed by a bank. See Tressel (2001) for a discussion.

[36] In this case, STD is cheaper than LTD because of its informational advantage.

Figure 2: Debt Maturity Choice



(3) Equity Markets

Firms may also increase their capital by issuing equity on the stock market. We neglect underwriting costs and assume that new shares are sold to dispersed investors so that the initial shareholder keeps all the control rights (see for instance Pagano and Röell (1998) and Shleifer and Wolfenson (2000) for a similar assumption). The equity contract for new (minority) shareholders is the following:

(1) each minority shareholder *i* invests E_i in the project at date 0.
(2) He receives a proportion α_i of all future cash flows, net of debt repayment, where $\alpha_i = E_i/E$ (E is total equity).

However, investors in the stock market do not observe the type of a firm at date 0: they only know that a proportion λ of firms are good. The participation constraint for an investor is therefore:

$$l\, a_i E_0 \left(Div_2 + B\right) \geq R^2 \cdot E_i$$

This condition assumes that (1) investors are risk-neutral (this assumption may depend on preferences and the ability of investors to hold a diversified portfolio), (2) there are no transaction costs on the stock market, (3) there are no liquidity premium on stocks, (4) the controlling shareholder of a firm cannot expropriate minority shareholders (in that situation, the effectiveness of investor protection can be crucial, see the theoretical analysis of Shleifer and Wolfenson{2000})

By relaxing one or several of these assumptions, we can formally derive simple equity rationing rules (that depend on investors' characteristics and the regulatory environment) affecting each firm willing to raise capital on the stock market.

The objective function of the controlling shareholder is now:

$$MaxE_0(1-a)(Div_2 + B)$$

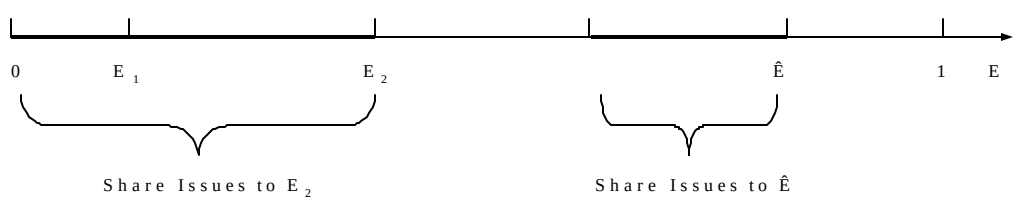
where $a = \sum_i a_i$.

The initial shareholder may decide to issue equity (1) to be able to undertake the project (eliminate the rationing situation),[37] (2) to be able to borrow long-term, or (3) or to be able to borrow short-term with no refinancing risk. The cost of raising equity on the stock market is that profits have to be shared with new shareholders.[38]

For intermediate values of the informational advantage of short-term debt (measured by $1/\lambda$-$1/\lambda_I$) and the refinancing risk (measured by μ), the model predicts that:

(1) firms with few initial reserves will issue shares so that they can borrow with long-term debt (i.e. they issue $E_X = E_1 - E_R$),
(2) firms with larger initial reserves issue shares so that they can borrow with short-term debt and no refinancing risk (they issue $E_X = \hat{E} - E_R$).

Figure 3: Equity Issues



Expropriation of minority shareholders:

We can introduce in this setting the possibility for the controlling shareholder to divert part of the cash flows after debt repayment. This can be done by assuming that the

[37] More precisely, the argument here is that the optimal financing strategy for some projects implies a mix of debt and equity finance, and that debt finance only may not be possible for projects either highly uncertain and/or with few cash flows in the short/medium run. For instance, Eurotunnel had its debt swapped into equity when it became clear that debt repayments were not sustainable. A substantial dilution of property rights followed – at the expense of minority shareholders.

[38] We are assuming here that the issuing price of shares is p=1: the controlling shareholder is not able to extract any of the additional return that investors get by buying shares instead of buying bonds.

controlling shareholder is able to hide (and consume) a non verifiable proportion κ of the dividends, and claim that the present value of total dividends is only $(1-\kappa)(Div_2 + B)$. Now, a minority shareholder with a stake α_i in the firm will only receive:

$$l\, a_i (1-k)(Div_2 + B)$$

The participation constraint of investors may imply the possibility of equity rationing for firms that are otherwise able to borrow from a bank. The value of κ depends on the legal environment (transparency rules, protection of minority shareholders, etc.).

(4) Predictions of the Model

This model provides predictions on (1) the characteristics of firms that benefit from an increase in long term credit or in equity, (2) the impact of information and corporate governance mechanisms on the debt maturity structure.

(1) Consider first an exogenous increase in the supply of long term credit. Start, for instance, from a situation in which long-term debt contracts are not proposed by banks. This may be the consequence of a lack of long-term liabilities in the banking system, making the probability of sudden withdrawal high, so that banks are reluctant to perform their term transformation activity.[39] It is reasonable to assume that an exogenous increase in the maturity of banks' liabilities may make banks willing to propose long-term contracts. The model predicts that:

(A) The firms that will benefit more from long-term loans are those:[40]

(a) with less initial asymmetric information (μ).[41]
(b) with less liquid investments (i.e. lower value of l).
(c) with intermediate values of internal liquid reserves
(i.e. firms with $E_I < E_R < \hat{E}$).
(d) with no access to STD without refinancing risk (i.e. $E_R < \hat{E}$), the firms that will benefit more from LTD are the more profitable ones (Π larger).
(e) with higher up-front investments (γ).

(B) More firms will benefit from an increased supply of long term debt when:

(a) the banking system is more subject to runs (μ large) because STD becomes more costly to firms.
(b) the informational advantage ($1/\lambda - 1/\lambda_I$) of STD is lower, because the benefit of STD is reduced.

[39] Although the model does not integrate why banks are or are not willing to offer long-term loans, it allows to discuss the impact on firms' financing choices when LTD contracts are proposed.
[40] In each case, all parameters, expect the one considered, are fixed.
[41] In this case, we extend the model to consider that we have several "sectors", each being characterized by a given value of the parameter μ.

(c) the market power of banks in the second period is lower (measured by λ_I/λ_E): in this situation, banks charge a higher interest rate in the first period, hence more firms become subject to the refinancing risk.

(2) Consider a reduction in equity rationing. This may happen because: (1) investors require a lower risk premium, or liquidity premium, to buy shares, (2) transaction costs are reduced, (3) there is less scope for minority shareholders expropriation.

(A) As illustrated in Figure 3, the average impact on the debt maturity is not clear-cut. In particular, it depends on the initial internal reserves of the firm. If firms are initially relatively well capitalized, the debt maturity will decrease; on the contrary, if firms have limited initial capital, the debt maturity will increase.

(B) The firms that will benefit more from an easier access to the stock market are those:

(a) with low or intermediate internal reserves,
(b) with lower liquidation value l,
(c) with higher up-front investments (γ).

(C) More firms will benefit from an easier access to the stock market when the banking system is more subject to runs (μ large).

(3) Information Disclosure and Corporate Governance. We discuss here the impact of exogenous modifications in the informational parameters on firms' financing choices.

(A) If the quality of ex-ante public information increases (λ increases), more firms have access to long-term debt (E_1 is lower).

(B) If the quality of interim public information increases relative to the initial public information (λ_E/λ increases), the second period interest rate on STD decreases. Hence, to maintain profitability, banks increase the first period interest rate on STD. This, in turn, increases the risk of early liquidation, which makes STD less attractive relative to LTD.

(C) If transparency increases at the interim date, relative to the private information of banks (λ_E/λ_I increases), the second period market power of banks decreases, which forces them to increase the first period interest rate on STD to maintain their expected profitability. Again, the refinancing risk increases, which makes STD less attractive than LTD.

(D) If, λ, λ_E and λ_I increase in the same proportion (both public information and private information),[42] short-term debt becomes relatively less attractive than long term debt (the reduction in the cost of debt by choosing STD instead of LTD is lower).

[42] This may be interpreted in term of shareholder activism: shareholder activism increases the transparency on the stock market, and simultaneously increases the efficiency of bank monitoring.

(5) Contractual Savings Development

As already noticed, the development of contractual savings may have an impact on the corporate financing decisions for the following reasons:

(1) Many developing countries lack a source a long-term credit (Caprio and Demirguc-Kunt (1997)). The two main explanations are : (a) there is no market for long term public debt that would provide a benchmark for corporate bonds yields; (b) in a highly uncertain environment, short-term debt will be preferred to long-term debt. Assuming an enabling macroeconomic environment, the development of contractual savings institutions will provide a stable source of long term capital which will allow a market for long term public debt to be progressively developed, providing a benchmark yield curve for corporate bonds. Initial uncertainty may also be reduced, at least for sufficiently large firms, if we expect contractual savings institution to foster information disclosure in the stock and bond markets.[43]

(2) Contractual savings, as potentially large investors in the stock market, may lower the cost of equity for firms. The existence of large contractual savings institutions provides a stable demand that facilitates the placement of new stocks by the underwriter (the market power of the underwriter may also decrease). Because of the particular structure of their liabilities (long term), the liquidity premium that they require in order to hold stocks is lower. Similarly, they tend to accept a lower risk premium because of their ability to diversify risk. Finally, as large financial intermediaries, they are able to exploit returns to scale. All those factors tend to affect directly the activity on primary equity markets, by reducing the cost of issuance (or equity rationing in the model).

(3) The behavior of contractual savings on the secondary market may also be crucial. First, as already noticed, they may have stronger motivation and ability than individual investors to foster information disclosure rules. Moreover, they may have an advantage in information acquisition relative to individual investors. Contrary to mutual funds and hedge funds, they have a long-term interest in the performance of firms in which they are equity holders. Ultimately, this informational effect will make Initial Public Offerings more attractive to firms (for theoretical arguments, see Holmstrom and Tirole (1993) who emphasize the importance of market liquidity, and Tressel (1999) who points out the change in governance mechanisms when a firm goes public). Accordingly, they are less prone to herding behavior; although the managers‘ performance may still be assessed on short-term criteria (among which relative performance evaluation schemes), the contractual savings industry as a whole cannot face sudden withdrawals if based on mandated participation, and arguably individual defined benefit or close ended contractual savings institutions are not subject to runs. Moreover, in addition to their traditional portfolio management expertise, they have started to become active in corporate governance.[44] As they become dominant in size, a buy-and-sell strategy

[43] See Iglesia-Palau (2000) for empirical evidence in Chile.
[44] See Davis (1995).

becomes less feasible[45] and they will tend to hold stocks of a particular firm for longer periods. For instance, indexing strategies by U.S pension funds impose a constraint on selling underperformers and provide a motivation for shareholder activism.[46] This however depends strongly on the regulatory environment (and the prevailing ownership structures) and is a relatively recent phenomenon in the US[47] and the UK. Gillan and Stark (2000) show that shareholder activism by U.S. public pension funds has been successful in the past 10 years, as measured by voting outcomes and stock market reaction. However, the ability of contractual savings institutions to interfere with management and controlling shareholders (which are the same in many developing economies) may be strongly affected by the prevalent concentration of ownership, as suggested by the Chilean example (see Iglesia-Palau (2000)).[48] Generally, contractual savings institutions have the sufficient power to counterbalance the control of productive assets by controlling shareholders. Again, the regulation will be crucial and will aim at balancing the two following effects. On the one hand, contractual savings managers should be allowed to have a significant proportion of shares in their portfolio in order to have proper incentives to be active minority shareholders. On the other hand, excessive concentration of their ownership stakes in a limited number of firms may lead to collusion with the management against minority shareholders.[49]

(4) Finally, the development of contractual savings institutions, by increasing the supply of long-term finance, may also lead to efficiency gains by increasing the number of different groups of investors. Dewatripont and Tirole (1994) claim for instance that proper incentives require that the firm have several classes of external investors. Shareholders will make efficient decisions when the firm has good results whereas debtholders will make efficient decisions when the firm is performing poorly. Efficiency requires diversity in the nature of funds providers. In the same vein, Berglof and Von Thadden (1994) show that firms will choose to have more than one class of investors (typically long-term and short-term creditors).

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[45] There is evidence that institutional trading in the U.S. is associated with price pressure (Chan and Lakonishok (1993), Holthausen and al.(1990); or Brown and Brooke (1993)). This is even more likely to be the case in less liquid stock markets with large institutional investors holdings, like in Chile. In this latter case in which corporate ownership is highly concentrated in the hands of families, the issue is probably to enhance minority shareholders protection and activism. It is reasonable to argue that contractual savings are more likely than other minority shareholders to be able to affect entrenched management. Readers should refer to Gillan and Starks (2000) for more references.

[46] TIAA-CERF indexes 80% of its domestic portfolio (Carleton et al. (1998)). CalPERS has annual turnover of its equity holdings of approximately 10%, and the New York Retirement funds a turnover of 7%.

[47] "The SEC's Shareholder Proposal Rule 14a-8 allows shareholders to submit issues for inclusion in the proxy material and for subsequent presentation at the annual general meeting. The proxy process has provided these shareholders with a formal mechanism through which concerns about corporate governance and corporate performance can be raised." (Gillan and Starks (2000)).

[48] He argues that pension fund participation has had a positive impact on corporate governance in Chile: "(1) the number of independent board members has increased, (2) monitoring costs have decreased as a result of improved public information quality, (3) companies where pension funds have invested are under close public scrutiny, (4) shareholder meetings are becoming more relevant."

[49] This argument has been used to justify investment limits of Chilean pension funds.

According to these arguments, the impact of contractual savings development on firms' financing choices can be assessed by considering that (1) it leads to an increase in the supply of long-term debt, (2) it reduces equity rationing, (3) it fosters information disclosure on the stock market.

The theoretical predictions imply that the development of contractual savings institutions will be more beneficial when projects are illiquid, when the banking sector is fragile and highly competitive. Although information disclosure tends to increase the maturity of debt, the impact of increased access to the equity market is ambiguous: it may either increase the maturity of debt, or decrease it, depending on whether firms initially have few liquid reserves or not.

The equilibrium capital structures of firms will be a function of (1) their characteristics (maturity of assets, profitability, risk, asymmetry of information, etc.), (2) the efficiency of the financial system (for instance in generating - ex-ante and interim - private and public information), (3) the supply of funds to capital markets, that are affected by the nature of investors.

4. Data and Empirical Strategy

4.1 Data

We use data from Worldscope, a firm-level database that has been widely used in recent papers. It includes publicly listed corporations in 54 countries. Our sample includes all companies except financial firms. We use an unbalanced sample of firms over the period 1989-1998, in order to maximize the time-series dimension for each country. We require having data on at least 10 firms per year in each country.[50]

The database on contractual savings is taken from Impavido and Musalem (2000), extended for several countries (Argentina, Brazil, India and Mexico). It includes information from different sources (including the OECD institutional investors database, and national sources) on total assets, financial assets, and allocation of assets for pension funds and insurance companies.

All other macroeconomic variables are obtained from various sources: Datastream, the World Development Indicators, and the Bank for International Settlement for bond markets data and the database constructed by Beck and al. (2000).

[50] Except for Luxembourg for which we have only 9 firms, and one single year of observation (in 1995) for the contractual savings data (so this country is dropped in all panel estimations).

4.2 Definition of Variables and Empirical Strategy

The empirical study aims at assessing the impact of contractual savings institutions development on firms' capital structures. The two fundamental characteristics that we analyze are: (i) the choice between debt and equity and (ii) the maturity structure of debt. We focus on pooled (OLS) estimates, robust to heteroskedasticity, and panel estimates (fixed effects).

The dependent variables that we consider are: (i) total debt over equity (TDTE), defined as the ratio of long-term plus short-term debt over the book value of equity, (ii) long-term debt over the book value of equity (LTDTE), (iii) short-term debt over the book value of equity (STDTE), and (iv) long term debt over total debt as a measure of debt maturity (LTDTD).

These variables are self-explanatory; note however that we choose to use the *book* value of equity rather than the *market* value. Although the market value of equity may be a better measure of the "true" value of the firm's net worth than its book value,[51] using the market value may introduce a spurious correlation between these dependent variables and the contractual savings variables simply because contractual savings investments (for instance in shares) are evaluated at their market value. We will return to this issue later.

We use three sets of explanatory variables: (i) firms' characteristics, (ii) macroeconomic factors, and (iii) financial system characteristics.

(1) Firm-specific Characteristics

Firm-specific considerations are important in determining the corporate financing patterns. The asymmetries of information and risk aspects to which firms are exposed will in general vary from firm to firm. Therefore, the macroeconomic and institutional environment may only partly explain the observed capital structures in different countries. For instance, the apparent lack of long-term finance in developing countries when compared with developed countries may simply be the consequence of cross-country differences at the corporate level rather than institutional factors.[52]

We define the following firms' specific control variables (see Table 2).

First, in accord with Myers' theory of underinvestment (1977), Barclay and Smith (1995) have shown that firms with more growth options in their investment opportunity sets have less long-term debt in their capital structure. The reason is that stockholders have incentives to reject profitable investments when they have to share their benefits with debtholders. Myers argues that, for a given indebtedness, this incentive problem can

[51] This is less likely to be the case in highly volatile and illiquid stock markets. Moreover, the market value may deviate from the fundamental if a bubble develops.

[52] As shown by Demirguc-Kunt and Maksimovic (1999), however, the institutional environment (i.e. the development of the financial and legal systems) does affect firms' financing decisions after controlling for cross-country differences in the averaged firms' characteristics.

be mitigated by shortening the maturity of debt.[53] We control for this by including as an explanatory variable the market to book ratio (a proxy for Tobin's Q) defined as the ratio of the sum of the market value of equity plus the book value of total debt over the book value of assets (i.e. the sum of the book value of equity plus the book value of debt). We expect that, if the market to book ratio is a good proxy for growth opportunities, we will observe a negative correlation between the long-term debt to total debt ratio and this variable.

Second, theories of lending under asymmetric information show that the debt capacity of a firm depends on the availability of collateral. We use the proportion of net fixed assets in total assets as an indicator. Moreover, Stoh and Mauer (1996) have shown that firms in the U.S. match the maturity of assets and liabilities (as suggested by Hart and Moore (1994), but it is also the case if firms try to limit the risks of illiquidity). Therefore the maturity of debt may also be positively correlated with this variable.

Third, as argued by Demirgüç-Kunt and Maksimovic (1999), high ratio of net sales to total assets may signal a need for short-term financing. To the extent that high sales (relative to total assets) imply high short-term assets (relative to total assets), maturity matching will also lead to a high short-term indebtedness. Thus, the ratio of net sales to total assets is also used as explanatory variable.

Fourth, the size of the firm may be an important determinant of the firm indebtedness. A positive correlation between leverage and size is expected if the size is a proxy for the public information[54] and the reputation of the firm. A similar correlation is expected with the debt maturity. Barclay and Smith (1995) find that large firms have more long-term debt in their capital structure.

Fifth, several studies in the past (Rajan and Zingales (1995) for developed economies and Demirgüç-Kunt and Maksimovic (1996) for emerging countries) have found a negative correlation between profitability and leverage. Although this correlation is not clearly explained, we also use a profitability measure in our regressions (defined as earnings before taxes and interest expenses over total assets, deflated for inflation).

Finally, risk considerations seem to be important determinants of corporate financing decisions (Graham and Harvey (2001)). Our risk control variable *at the firm level* is defined as the ratio of the standard deviation of earnings and the average of earnings over the period (in absolute value).

(2) Macroeconomic Factors

Various macroeconomic factors may affect the firms' financing patterns. We use the Log of GDP per capita as a broad measure of economic development. Richer economies have in general more efficient institutions, a better compliance with the legal

[53] Moreover, Fama (1980) shows that shortening the maturity of debt remains beneficial when stockholders can recapitalize the firm because the price at which they may repurchase the debt will reflect more the value of the investment for short-term debt than long-term debt.
[54] Note that all our firms are publicly listed.

system in general, and with investor rights, accounting standards and transparency rules (on the stock market) in particular. The inflation rate is an indicator of both the government's management of the economy and whether long-term contracting is likely to be widespread. It characterizes also the opportunity cost of holding money. Debt contracts may be specified in nominal terms. So we expect a negative correlation between the rate of inflation and firms' indebtedness. Two other control variables for asset markets conditions are: the real interest rate and the cost of equity.[55] Finally, the volatility of inflation is a proxy for macroeconomic instability.

(3) Financial System Characteristics

The financing patterns of firms, especially their access to external finance,[56] depend on the characteristics of the financial system. This in turn affects the ability of firms to have a higher rate of growth than the one permitted by their internal resources.[57]

The stock market and banking sector variables provide a control group guarantying that our contractual savings variables are not simply a proxy for the level of development of the financial system.

(a) The Stock Market

First, we measure the size of stock markets by the stock market capitalization (in percentage of GDP). This variable has been widely used in the recent literature. The ability of the stock market to provide risk diversification opportunities and information also depends on its level of activity and liquidity (Levine and Zervos (1998)). Greater liquidity will encourage investors to acquire stakes in risky firms[58] and will enhance information acquisition by large investors (Holmstrom and Tirole (1993)). Greater informational content in prices will increase the efficiency of capital allocation. And better public information may have a spillover effect on the long-term debt market by reducing initial informational asymmetries, as illustrated in the model. Activity on the stock market is measured by the turnover ratio, that is the total value traded, in proportion of the stock market capitalization.

(b) The Banking System

Banks have a comparative advantage in acquiring private information on borrowers and in monitoring their actions. A sound and efficient banking sector is obviously essential for firms especially those that do not have access to capital markets. The use of short-term debt reduces the scope for opportunistic behavior, thus reducing the

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[55] The cost of equity Req is: $\mathrm{Re}\,q = \dfrac{1+g}{P/E}$

where g is the average rate of growth of future earnings and P/E the current price-earnings ratio.
For g we use the average rate of growth of earnings over the period, and we use the P/E ratio index in a given year provided by Datastream.

[56] Demirguc-Kunt and Maksimovic (1996, 1999), Rajan and Zingales (1998) and Carlin and Mayer (1999).

[57] See Beck, Demirguc-Kunt, Levine and Maksimovic (2000) for a synthetic approach.

[58] And make efficient restructuring decisions, see Maug (1998) for a theoretical argument.

cost of monitoring. But the implication for the debt maturity of firms is not clear. A developed banking system implies lower monitoring costs in general. This will lead to an increase in the supply of short-term debt, but also in the supply in long-term debt in the sense that more projects will be able to be financed by long-term debt. The overall impact may be negative or positive. Moreover, monitoring *per se* is not the only issue. The market structure of the banking sector (i.e. the degree of competition among banks, and the indirect competition from other financial institutions) will have an impact on the lending behavior of banks. For instance, greater information disclosure on the stock market and in general easier outside options for firms will impact the lending behavior of banks: their ex-post informational rent may be reduced, which may reduce their ex-ante incentive to invest in information (see Stulz (2000)). On the contrary, greater information disclosure and better accounting standards associated with capital market development are likely to increase the supply of bank credit by limiting managerial slack. Finally, the development of non-bank financial intermediaries will probably not be neutral. This may increase competitive pressure on banks, leading them to specialize on their short-term debt comparative advantage. This competitive pressure may be direct or indirect. Contractual savings development may however complement the activity of the banking industry. This will be the case if these institutions act as suppliers of funds to the banking industry, instead of lending directly to firms. As contractual savings do not face unexpected liquidity needs, they will reduce the scope for bank runs, thus limiting the term transformation risk in the banking industry. Such a mechanism would increase the incentive of banks to offer long-term loans. As a measure of the activity of the banking sector, we use the total credit to the private sector, as a percentage of GDP.

(c) Contractual Savings Institutions

We define several variables that proxy for the development and investment behavior of contractual savings institutions. The first variable, CSFAGDP, is defined as total contractual savings financial assets, as a percentage of GDP. It measures the size of contractual savings institutions relative to the size of the economy.[59] The second variable describes the size of contractual savings institutions relative to capital markets (CSFAMKT). It is defined as the ratio of contractual savings financial assets to market capitalization plus total bonds outstanding (with maturity greater than one year). There are two motivations for this variable: (1) it grasps, although imperfectly, the relative importance of contractual savings as a provider of finance relative to total supply of long-term finance; (2) it partially corrects movements in the price of shares that may introduce a spurious correlation between our firm level variable and this explanatory variable (this is also true for the variable CSSHCAP defined below). Imagine for instance an exogenous rise in the prices of shares. Then the value of contractual savings assets and the stock market capitalization will increase, implying a correlation that has no economic meaning. Similarly, this may also introduce a negative correlation with firms' debt equity ratio. This effect is likely to be stronger when we measure firm equity by the market value of the firm. This is the reason why, as discussed in the previous paragraph, we prefer the book value of equity rather than the market value. Still, in principle, a negative correlation (but presumably weaker) may remain because firms are sensitive to their

[59] We define also the variable CSSHGDP, as contractual savings' equity investments, as a % of GDP.

market value when they decide to issue new shares.[60] Thus, we use both variables in order to get a rough idea of such price effects. Finally, the behavior of contractual savings institutions may significantly depend on their investments. For instance, they will have greater incentive to be active investors in the stock market when they hold a large share of their assets in stocks; conversely, explanations favoring corporate governance issues are less likely to be relevant in countries in which contractual savings hardly invest in the stock market. In order to account for such effects, we define the following variable: CSSHFA is defined as the proportion of shares in the portfolio of contractual savings institutions; It is likely that the incentive for contractual savings institutions to actively monitor on the stock market is positively correlated to CSSHFA. Therefore, this variable aims at capturing cross-country and time-series differences in the behavior of these institutions.[61]

(4) Empirical Strategy

We start with simple descriptions of corporate financing choices and contractual savings characteristics across countries. We look at the evolution of contractual savings size and investments, and we compute simple correlations between the variables. These simple statistics show strong correlations between the capital structure variables and the contractual savings characteristics. Next, we control for other variables in pooled and panel estimates that confirm the initial intuition. Given that we use macroeconomic variables in our estimations, firm level data are not appropriate. However, we still want to keep some heterogeneity within countries. For this reason, our analysis is conducted at two different levels. First, at the country level, by taking the average values of firms' characteristics by country, and for each year. This gives us 229 observations. We use this country-level data set to illustrate our results. Second, we confirm the robustness of the results by doing the same analysis at the 2 digit (SIC code) industry level by taking the average values of firms' characteristics by country, industry, and per year. Therefore, we obtain a panel data set (of approximately 6000 observations) in which the unit is industry-country-year.

5. Empirical Results

5.1 Descriptive Statistics

Table 1 presents the sample of countries that are included in our contractual savings database, and the total number of firms available for each country. We have data for 35 countries, including 13 emerging economies (Argentina, Brazil, Chile, Hungary, India, Korea, Malaysia, Mexico, Singapore, South Africa, Sri Lanka, Thailand and

[60] Pagano, Panetta and Zingales (1998) show for instance that IPOs are partly motivated by stock overvaluation in the industry in which the firm operates.

[61] In the final set of estimations, we also report the results obtained with the variable CSSHCAP (contractual savings' equity investments, as a % of stock market capitalization). This variable allows instead investigating whether the *size* of the contractual savings' stock holdings, relative to stock market capitalization, is an important factor.

Turkey). The contractual savings data include information on total financial assets and portfolio composition for pension funds and insurance companies (in particular corporate stocks), except for 6 countries for which we have no information on equity investments (Austria, Brazil, France, Japan, Spain, and Turkey). The Worldscope database covers mainly large listed firms. Previous works on this database (Claessens et al. (2000)) shows that for nine East Asian countries, this sample covers between 64% and 96% of the total market capitalization of firms listed on the stock market. We expect that the coverage is better for developed economies.[62] [63]

Table 2 provides the definition of the variables that we use in our estimations. Figure 4a illustrates the spectacular increase[64] in the assets managed by pension funds and life-insurance companies,[65] [66] relative to GDP. Expressed in rate of growth, the increase is even more impressive. Contractual savings financial assets, relative to GDP, have been growing at an average annual rate of growth of 17.7%, 3.4%, 6.9%, 6.0%, 7.9%, 8.99% and 4.6% respectively in France, Germany, South Africa, the United States, the United Kingdom, Chile and Korea. Figure 4b, however, shows that this evolution is less spectacular when the size of contractual savings institutions is compared to the size of capital markets (bond and stock markets). For a substantial number of countries (10 out of 29, including the United States), contractual savings' financial assets increases less than the size of capital markets. But this graph highlights another interesting feature: most of the countries in which contractual savings have grown relative to the capital market are located in the bottom half-sample at the beginning of the period. Conversely, contractual savings tend to have grown at a slower pace than the capital markets in the countries located in the top half-sample at the beginning of the period. These two groups of countries roughly correspond to (1) bank-based economies, or economies with underdeveloped financial systems (bottom group), and (2) market-based economies for the top group.

Moreover, there has been a widespread tendency to modify the portfolio in favor of equity investments (except in Korea, Thailand and Brazil) as shown by Figure 5a. Figure 5b confirms that these changes in the portfolio are roughly reflected in the proportion of shares held by contractual savings institutions relative to total stock market capitalization.

Globally, these strong time-series movements suggest that we can hope to capture not only cross-country variations but also within country differences in financing patterns

[62] Luxembourg and Sri Lanka, for which the firm database is limited to a handful of firms, are dropped in the panel estimates, for we have only 1 year of observation.

[63] Except in the case of the United States for which the database includes only 417 non-financial firms. We decided to restrict the U.S. data to the Worldscope source to be consistent with past studies using this database, and avoid mixing data from different sources.

[64] Singapore is the only country in which contractual savings assets decreased relative to GDP.

[65] Musalem and Impavido (2000) show on this sample of countries, that this explosion of contractual savings institutions may partly explain the rapid growth of stock markets over the last 15 years.

[66] In France, where pension funds are underdeveloped, the life insurance industry exploded at the beginning of the 90s as a result of strong fiscal incentives to save in life-insurance products (these savings were exempt of taxes).

that may be attributed to the development and investment policies of contractual savings institutions.

Table 3 provides simple cross-country comparisons.[67] We report corporate financing patterns averaged by country and financial system characteristics. The figures show that investment policies of contractual savings institutions vary strongly across countries. The top 6 countries for which equity investments are the largest, are all classified as market based financial systems by Demirguc-Kunt and Levine (1999): Australia, Ireland, South Africa, Sweden, the United Kingdom and the United States. In these countries (only South Africa is not part of the developed world), contractual savings institutions invest on average 52% of their assets on the stock market in 1997, their financial assets corresponds to 92% of GDP, 45% of (long-term) capital markets, and their equity investments to 45% of domestic stock market capitalization. The debt-to-equity ratio is on average equal to 81% and long-term debt is 65% of total indebtedness. At the other end of the spectrum, equity investments are negligible in Sri Lanka, Mexico, Singapore, Germany, Greece, and Austria. These countries can be classified in two groups: (1) developed economies, with bank-based financial systems (Germany, Austria and Greece), and (2) developing economies with market-based financial systems[68] (Sri Lanka, Mexico and Singapore). In these countries, contractual savings institutions invest no more than 3.3% of their financial assets on the stock market in 1997. These assets represent only 28% of GDP and 25.8% of long-term capital markets; if we drop Singapore,[69] the last figure falls to 15%. And their equity holdings are on average 2.75% of stock market capitalization. The average debt to equity ratio and debt maturity are respectively 98% and 44%.

At this stage, the only clear picture that seems to emerge is that the size and investment behavior of contractual savings institutions seems to be strongly correlated with the financial structure of the economy. Developed economies with market-based financial systems have large contractual savings (in term of GDP and Capital Markets) that invest significantly on the stock exchange, whereas contractual savings institutions tend to have more conservative investment policies[70] in developed economies with bank-based economies or in developing economies.

In Figure 6 we plot the debt-equity ratio and the debt maturity against the size of contractual savings (expressed in percentage of GDP). The first figure indicates that the level of development of contractual savings institutions seems to be negatively correlated with firms' leverage. The second figure suggests that there is a positive correlation between debt-maturity and contractual savings' size. Figure 7 repeats the same exercise with the allocation of contractual savings' assets. Again equity investments by institutional investors seem to be an indicator of the ability of firms to reduce their leverage and to increase the maturity of their debt.

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[67] In the case of Ireland, the contractual savings figures are for 1995.
[68] Mexico and Sri Lanka have underdeveloped financial systems.
[69] In Singapore, until recently, most resources of contractual savings institutions (in particular the large national provident fund) had to be invested in special non-marketable government securities.
[70] Resulting either from "tradition" (as in Germany) or strong restrictions (as in Singapore).

Table 4 displays pairwise correlations among the main variables. Leverage is strongly negatively correlated to the level of development of contractual savings institutions (relative to GDP and relative to the size of capital markets). It is also strongly negatively correlated with the proportion of financial assets held in equity. Debt maturity is strongly and positively correlated with the level of development of contractual savings institutions (for the two variables), and with the proportion of financial assets held in equity. Furthermore, the contractual savings variables seem to be slightly better indicators of the corporate financing patterns than the standard financial systems characteristics.

These simple statistics neither account for firms' characteristics, nor allow one to conclude that the correlations are not the result of the correlation with stock market and banks characteristics. In the next section, we provide a simple econometric analysis that confirms that the correlation between firms' financing patterns and the activity of institutional investors is not merely a function of firms' characteristics and other macroeconomic factors.

5.2 Regression Results

(1) The strategy

We investigate the relationship between the development of contractual savings institutions and corporate financing patterns, after controlling for firms' characteristics, macroeconomic factors and standard financial system characteristics. In each case, we report pooled[71] and within estimations. While endogeneity may be an issue in this type of analysis in general,[72] in our case the simultaneity bias can be expected to be lower for several reasons.

The size and characteristics of the financial system may indeed evolve to respond to the aggregate demand of capital by the corporate sector and the public sector. Although each firm takes the size and activity of the banking sector and capital markets as given, the aggregate decisions of firms affect the size of the financial institutions. Moreover, shocks affect the financial sector and the corporate sector simultaneously. For instance, an unexpected good news on profit opportunities will increase the demand for external finance by firms, and banks will also tend to offer more loans. Hence it will increase simultaneously the size of the banking sector and firms' indebtedness. In the case of contractual savings, however, it seems more difficult to expect that their size is significantly affected by firms' demand for capital, unless one is willing to argue that pension contributions and insurance premia are significantly affected by the current business environment. As already noted however, endogeneity may arise because the value of contractual savings assets will move with stock market capitalization. We provide three controls for this source of simultaneity bias. First, firms' net worth are

[71] In the pooled regressions, we include dummy variables for the countries having a book reserve system (Korea, Austria, Italy, Germany) or centrally managed provident funds (Malaysia, Singapore).

[72] See Demirguc-Kunt and Maksimovic (1999) for a 2 stage least square treatment of endogeneity of the banking sector size in a similar approach.

measured at their book value; second, the variable CSFAMKT should in principle partially correct for those price movements; finally, the stock market capitalization variable should also capture the effects of such price movements. Portfolio decisions will, of course, depend on the relative returns of the different assets; for this reason, the asset allocation of pension funds may be endogenous. However, we expect this endogeneity problem to be limited because (1) price movements affecting the corporate financing patterns should be captured in the stock market capitalization variable; (2) investment regulations may be binding, especially in developing countries;[73] and in many developed economies, implicit limits or strong (conservative) asset management traditions may be as important as relative returns in determining the allocation of assets;[74] (3) the results of Impavido and Musalem (2000) suggests that contractual savings development and asset allocation have had an exogenous impact on capital markets development over the period studied.

(2) Institutional Investors and Firms' Financing Patterns

First, firms' characteristics are averaged by country, which provides an unbalanced panel. We regress each of the leverage variable on the three sets of control variables, and then plot the unexplained residuals against the total financial assets of contractual savings, in percentage of GDP (Figures 5a, b and c). These OLS regressions confirm that the correlation between firms' capital structure and the development of contractual savings institutions remains significant after controlling for other potential explanatory variables. The correlation is not accounted for by firms' characteristics (such as the maturity of assets, profitability, risk or potential agency costs), macroeconomic factors (inflation, level of development, etc.), or banking sector and stock market size and liquidity.

The results of pooled cross-country and cross-industry regressions (Table 5a) lead to the same conclusion. After controlling for firms' characteristics averaged by industries in each country, for macroeconomic factors, and for financial system characteristics, the level of development of contractual savings institutions is negatively correlated with leverage and positively correlated with the maturity of debt. Moreover, it is positively correlated with debt maturity. Further inspection of the table shows that the coefficients on firms' characteristics are consistent with what we expected. Firms are more indebted and have more long-term debt when net fixed assets represent a larger share of total assets. Larger sales relative to total assets imply more debt and more short-term debt. More profitable firms tend to be less indebted, and growth firms have less long-term debt relative to total debt. Finally, riskier firms have a lower maturity of debt. The size of the banking sector is positively correlated to firms' leverage and negatively to the debt maturity. This second point is consistent with the result of Demirguc-Kunt and Maksimovic(1999). As expected, the stock market capitalization is negatively correlated to leverage. It is also positively correlated to the debt maturity. One explanation sometimes proposed for this effect is that there are informational spillovers from the

[73] See for instance Srinivas, Whitehouse and Yermo (1999).

[74] For instance, in the case of Germany, it seems difficult to attribute the 2.77% of equity in total financial assets to low stock returns relative to other assets.

stock market, which reduces the asymmetries of information, hence increasing the supply of long-term debt.

Our results are however not robust to the inclusion of unobserved fixed effects at the industry level in each country. In Table 5b, we perform the same regressions by using the variable CSFAMKT.[75] The results suggests the previous variable CSFAGDP indeed introduces a spurious correlation (as discussed before) between the level of development of contractual savings and leverage. Now, leverage is positively correlated with the level of development of contractual savings. However, as suggested by the regressions on LTDTE and LTDTD, the mechanism seems to go through an increase in long-term debt relative to equity and long term debt relative to short-term debt.

Overall, these two sets of regressions tend to support the hypothesis of a global impact of contractual savings development on leverage. Moreover, the development contractual savings institutions seems to foster the use of long-term debt.

The absence of a strongly robust effect on the whole sample should not be totally surprising given that contractual savings institutions, as we showed in the previous paragraph, have extremely different investment behaviors from one country to another. We should expect a fall in leverage when contractual savings develop only if the cost of equity finance falls, which happens if the aggregate supply of equity increases (or for other reasons listed in Section 4). How contractual savings institutions invest their resources should have a crucial impact. The next result confirms this hypothesis.

In Table 6, we look at the impact of contractual savings portfolio choices on corporate financial decisions. We obtain a strong and economically significant effect on leverage. An increase in the proportion of financial assets invested in shares is associated with a decrease in corporate leverage. It leads also to a decrease in short-term debt relative to equity. This is robust to unobserved industries fixed effects. This set of results is consistent with the claim that the investment behavior of contractual savings institutions matters for corporate financing patterns. Their investment decisions have a significant impact on firms' capital structure. This last result strongly suggests that (1) any attempt to understand cross and within country variations in corporate financing patterns needs to assess the role of non-bank financial intermediaries such as institutional investors. (2) Policy interventions that remove binding constraints on portfolios will have sizeable effects on the corporate sector financing patterns.[76] The coefficients of the pooled and within estimates imply that if Korean contractual savings institutions had had the same investment behavior as in South Africa (where contractual savings are investing 44% of their financial assets in shares on average over the period, compared to 12% in Korea), the debt equity ratio of Korean firms would have decreased from 4.9 to 4.6 in the pessimistic case, or to 3.9 in the optimistic case, hence a decrease between 6% and 20%.

[75] We ran the regressions with CSSHCAP, with very similar results (not reported here).

[76] Investment limits are binding in Latin America (Srinivas et al. (1999)), in Singapore, and in Korea for instance.

However, the channels through which contractual savings institutions affect the corporate financing decisions cannot be disentangled on the basis of this first cross-country analysis; moreover, as suggested by our descriptive statistics, we may capture cross-country differences in their overall financial structure (although such an argument cannot explain our fixed-effects results). The results displayed in the next section enlighten the channels through which contractual savings institutions affect corporate financing choices. They provide a basis for better targeted policy interventions.

(3) Financial Structure and Financial Channels

We use the classification of macroeconomic financial structures developed by Demirguc-Kunt and Levine (1999). Countries are divided into two sub-groups (see Table 2): (1) economies with bank-based financial structures, (2) economies with market-based financial structures. This classification has been constructed by using a large set of indicators for size, activity, and efficiency of the banking sector and the stock market. It provides a rough evaluation on whether savings are channeled to productive activities mainly through the banking system or the stock market.[77] This is therefore a relevant classification for our purposes: in market-based economies, for instance, the contractual savings industry accounts for 46.3% of long-term capital markets size, equity investments are 30.7% of total financial assets and 29% of stock market capitalization; in bank-based economies, the same figures are respectively 22.3%, 12.3% and 12.2%. Therefore, the contractual savings industry is less developed in countries classified as bank-based than in market-based countries. Moreover, pension funds and life insurance companies invest significantly less on the stock market in bank-based economies than in market-based economies.

Although we have no information on the maturity of debt instruments held by contractual savings institutions (except for 4 countries), we are able to break their assets between the two categories: (1) bills and bonds (henceafter BB), (2) loans (henceafter LL), for a significant number of countries. In market-based economies, BB represents 42.6% of total financial assets and LL only 13.9%. In bank-based economies, the same figures are respectively 45% and 31.6%. It seems therefore that, on average, the lower equity investments in bank-based economies are mostly explained by a higher proportion of loans in their portfolio.

The relative importance of pension funds and life insurance companies differs in the two groups of countries. Pension funds account on average for 30% and 20.4% of total contractual savings financial assets respectively in market-based and bank-based economies. In particular, Anglo-saxon and continental Europe exhibit strongly different contractual savings industries. Pension funds hold 70%, 54% and 50% of contractual savings financial assets in respectively the United States, the United Kingdom and Australia. In Germany, Italy and France the figures are 12%, 37%, and less than 1%.

[77] A recent paper by Beck et al. (2000) show that the financial structure does not explain economic growth and the reliance on external financing after controlling for the level of financial development. Our results are not contradictory: we show that this classification does help to identify different channels through which corporate financing choices are affected by the development of contractual savings institutions.

In Figures 9 a-b we display the conditional correlation between leverage and respectively contractual savings size and asset allocation in a pooled regression at the country level. After controlling for firms' characteristics, macroeconomic factors and bank and stock market size, a significant correlation remains between leverage and contractual savings size (Figure 9a). Contractual savings development has however a different impact on leverage in market-based or bank-based economies. In countries in which the stock market is the core of the financial system, the development of pension funds and insurance companies leads to a decrease in leverage. In bank-based financial systems the opposite effect seems to dominate: the development of contractual savings implies an increase in leverage. Figure 9b shows that the proportion of equity investments in the portfolio is negatively correlated to leverage in market-based financial systems whereas it seems to have no significant effect on leverage in bank-based economies.

Figure 11 plots the unexplained residuals of a pooled regression at the country level of debt maturity against contractual savings size. Again, the impact of contractual savings development is strikingly different in bank-based economies and in market-based economies. In the latter, the development of contractual savings institutions implies a decrease in debt maturity, whereas in the former it implies an increase in the debt maturity.

The industry level analysis (see Table 7) confirms the results obtained at the country level.[78] We report the coefficient on the contractual savings variable and its significance for each sub-group of countries. In market-based economies, there is a strongly significant impact of contractual savings portfolio choices on firms' financing patterns: an increase in equity investments by contractual savings leads to a decline in leverage, for our three variables. The effect is robust to unobserved industry specific fixed effects within countries; and it is economically large. The impact of contractual savings development is somewhat weaker, although it affects leverage in a similar way. Debt maturity is also negatively correlated either to the level of development of contractual savings or the proportion of share investments in the portfolios of contractual savings. These results are consistent with the intuition. As contractual savings are large in these countries on average, it is likely that their marginal effect on firms' financing patterns go through their investment choices rather than through an increase in their size.[79] As they increase their equity holdings, firms tend to substitute equity finance for debt finance. These results suggest that banks and institutional investors are indirect competitors. The fall in the maturity of debt may be partly attributed to the fact that banks concentrate on their core activity, which is short-term lending.

In the case of bank-based economies, the channels through which firms' capital structures are affected are noticeably different. The dominant effect is the level of development of the contractual savings industry, while the asset allocation hardly affects

[78] We ran the regression by moving Korea from the market-based subgroup to the bank-based one; results are essentially the same.

[79] More precisely, it seems that the characteristics of contractual savings portfolio are more important than the size of share holdings relative to stock market capitalization. This result favors a corporate governance explanation.

firms' capital structures (still we find evidence of a positive impact on the maturity of debt). The no-correlation result with the portfolio variable makes sense: as contractual savings investment in equity is no more than 12% of stock market capitalization, a change in their behavior (measured by CSSHFA) is very unlikely to affect significantly the aggregate corporate financing choices.

The level of development of the contractual savings industry has a strong positive effect on leverage and a positive effect on the maturity of debt. These results suggest that the channel through which contractual savings affect the corporate financing patterns does not go through the stock market. Indeed, contractual savings development is associated with an increase in debt finance – and an increase in debt maturity. As explained above, it is very unlikely that this can be explained by higher investments in bonds in bank-based economies than in market-based economies. Rather the explanation must be related to loans; either (1) they lend directly to the productive sector; (2) they are complementary to the banking sector. More specifically, by reducing the illiquidity risk in the banking system, they may increase the incentive to banks to increase long-term loans in proportion of total loans. A study at the bank level should give additional insights on which of these mechanisms dominate.

6. Conclusion

We show that the development of contractual savings institutions and their investment behavior have a significant on firms' financing patterns across and within countries. Contractual savings institutions have a comparative advantage in supplying long-term finance to the corporate sector. In market-based economies, their development and investment behavior leads to a decrease in firms' leverage. In bank-based financial systems, the development of contractual savings institutions leads to an increase in the maturity of debt. These results suggest that there is an efficiency gain at the firm level: increasing the array of external financing possibilities is associated with increased maturity of firms' liabilities, which suggests that when contractual savings institutions are underdeveloped, firms cannot obtain enough long-term finance. Increased maturity of the corporate sector liabilities should increase its resilience to various shocks (such as refinancing risks and bankruptcy risks). The impact goes through several possible channels; in market-based economies, the main effect seems to go through the stock market and equity finance. In bank-based economies, it seems to go through the supply of loans. More analysis is however needed to identify the precise channels through which contractual savings institutions interact with the financial system. In particular, regulations aiming at strengthening corporate governance are more likely to have a sizeable impact in market-based economies; in bank-based economies, the focus should be on the interaction with the banking sector.

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Table 1: The Sample

Obs	Country	Total Sample Size	Pension Funds		Insurance Companies		Life Insurance Companies	
			Financial Assets	*Portfolio Composition*	*Financial Assets*	*Portfolio Composition*	*Financial Assets*	*Portfolio Composition*
1	ARGENTINA	40	Yes	Yes	Yes	Yes	No	No
2	AUSTRALIA	217	Yes	Yes	Yes	Yes	Yes	Yes
3	AUSTRIA	91	Yes	No	Yes	No	Yes	No
4	BELGIUM	111	Yes	Yes	Yes	Yes	Yes	Yes
5	BRAZIL	149	Yes	Yes	Yes	No	Yes	No
6	CANADA	538	Yes	Yes	Yes	Yes	Yes	Yes
7	CHILE	74	Yes	Yes	Yes	Yes	Yes	Yes
8	DENMARK	165	Yes	Yes	Yes	Yes	Yes	Yes
9	FINLAND	124	Yes	Yes	Yes	Yes	Yes	Yes
10	FRANCE	753	Yes	No	Yes	No	Yes	No
11	GERMANY	749	Yes	Yes	Yes	Yes	Yes	Yes
12	GREECE	151	Yes	Yes	Yes	Yes	Yes	Yes
13	HUNGARY	27	Yes	Yes	Yes	Yes	Yes	Yes
14	INDIA	315	Yes	Yes	Yes	Yes	Yes	Yes
15	IRELAND	68	Yes	Yes	Yes	Yes	Yes	Yes
16	ITALY	165	Yes	Yes	Yes	Yes	Yes	Yes
17	JAPAN	2189	Yes	No	Yes	No	Yes	No
18	KOREA (SOUTH)	258	Yes	Yes	Yes	Yes	Yes	Yes
19	LUXEMBOURG*	9	Yes	Yes	Yes	Yes	Yes	Yes
20	MALAYSIA	336	Yes	Yes	Yes	Yes	Yes	Yes
21	MEXICO	83	Yes	Yes	Yes	No	No	No
22	NETHERLANDS	203	Yes	Yes	Yes	Yes	Yes	Yes
23	NEW ZEALAND	48	Yes	Yes	Yes	Yes	Yes	Yes
24	NORWAY	175	Yes	Yes	Yes	Yes	Yes	Yes
25	PORTUGAL	80	Yes	Yes	Yes	Yes	Yes	Yes
26	SINGAPORE	174	Yes	Yes	Yes	Yes	Yes	Yes
27	SOUTH AFRICA	210	Yes	Yes	Yes	Yes	Yes	Yes
28	SPAIN	145	Yes	No	Yes	No	Yes	No
29	SRI LANKA**	12	Yes	Yes	Yes	Yes	Yes	Yes
30	SWEDEN	248	Yes	Yes	Yes	Yes	Yes	Yes
31	SWITZERLAND	179	Yes	Yes	Yes	Yes	Yes	Yes
32	THAILAND	210	Yes	Yes	Yes	Yes	Yes	Yes
33	TURKEY	64	Yes	No	Yes	No	Yes	No
34	UNITED KINGDOM	1650	Yes	Yes	Yes	Yes	Yes	Yes
35	UNITED STATES	417	Yes	Yes	Yes	Yes	Yes	Yes

* : 1995 only, dropped in Panel Estimates
** : 1997 only, dropped in Panel Estimates

Table 2: Definition of Variables

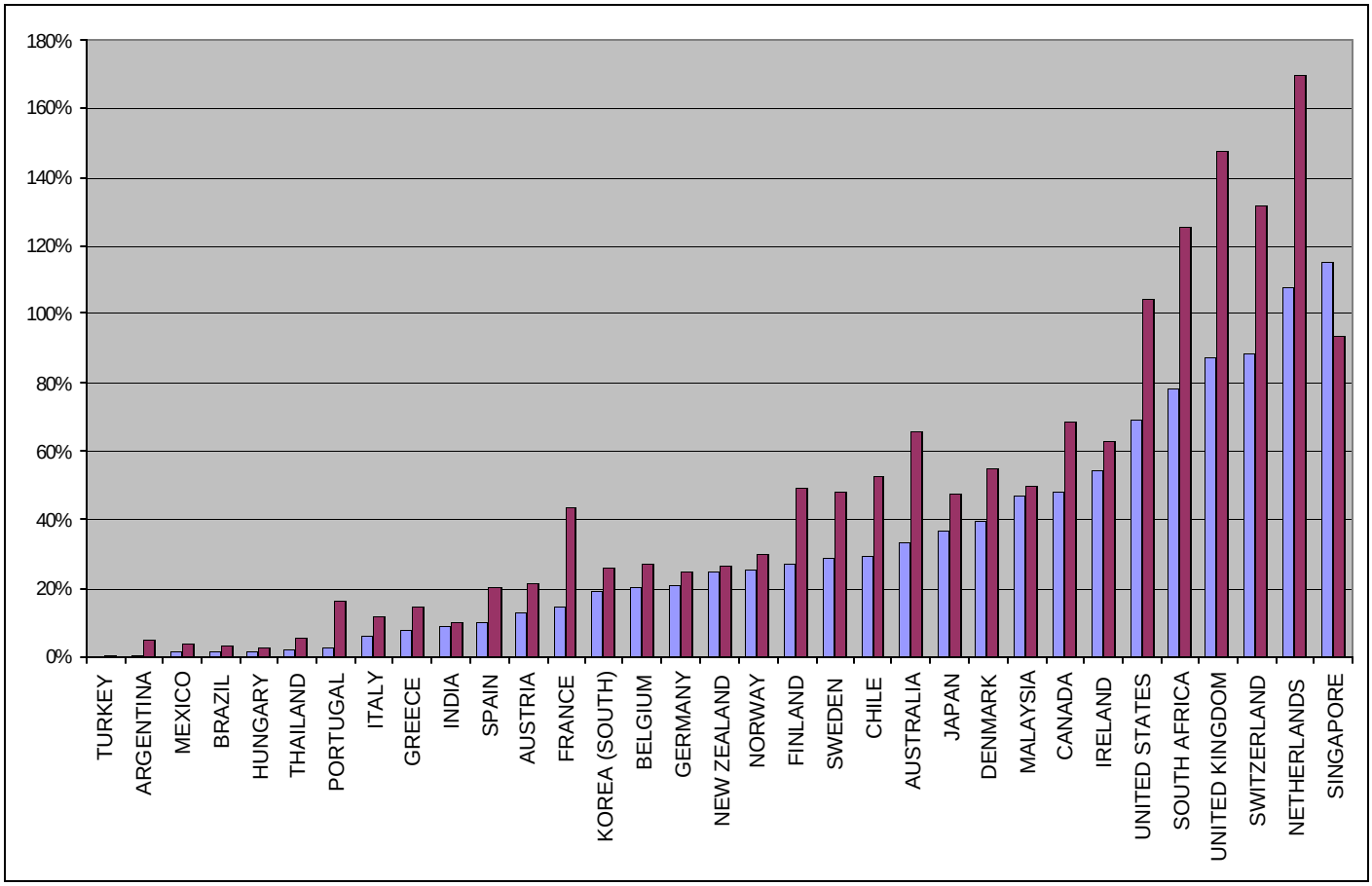
VARIABLE	DEFINITION
Firms ' Characteristics	
Leverage (TDTE)	Total Debt Over Book Value of Equity
Leverage (STDTE)	Short-term Debt over Book Value of Equity
Leverage (LTDTE)	Long-term Debt over Book Value of Equity
Debt Matuity (LTDTD)	Long-term Debt over Total Debt
Debt Maturity (STDTD)	Short-term Debt over Total Debt
Growth Opportunities (Tobin's Q)	(Market Value of Equity + Total Debt) / (Book value of Equity + Total Debt)
Net Fixed Assets (%)	Net Fixed Assets / Total Assets
Net Sales (%)	Net Sales / Total Assets
Size	Ln (Net Sales) (constant US $)
Profitability	[1 + (EBIT / Total Assets)] / [1 + CPI inflation] - 1
Volatility of Earnings	St. Dev. (EBIT) / Abs (Mean (EBIT))
Macroeconomic Factors	
Cost of Equity	(1 + g) / (P/E) where g is the average rate of growth of earnings over the period and P/E the closing P/E
Inflation	Consumer Price Index Rate of Growth
Real Interest rate	Lending Interest Rate adjusted for inflation (World Development Indicators)
Volatility of Inflation	St. Dev. (Inflation) / abs(mean(inflation))
Log(GDP/cap)	Ln (GDP/capita) (constant US $)
Financial System Development	
Credit to Private Sector (ec2)	Credit to Private Sector by Financial Intermediaries (% GDP)
Stock Market Capitalization (ec12)	Stock Market Capitalization (% GDP)
Stock Market Liquidity (ec19)	Value Traded (% GDP)
Turnover Ratio (TOR)	Value Traded (% Capitalization)
Contractual Savings Insitutions	
CS Development (% GDP) (csfaGDP)	Pension Funds + Life Insurance* Total Financial Assets (% GDP)
CS Development (% Sec Mkt) (csfamkt)	Pension Funds + Life Insurance* Total Financial Assets (% Stock Market Capitalization + Total Outstanding Debt on Domestic Debt Markets)
CS Portfolio Allocation (csshfa)	Shares, % Financial Assets (Pension Funds + Life Insurance*)
CS Shares (% CAP) (csshCAP)	Pension Funds + Life Insurance * Shares (% Stock Market Capitalization)
CS Shares (% GDP) (csshGDP)	Pension Funds + Life Insurance * Shares (% GDP)
Dummy Variables	
Book Reserve System	= 1 for Germany, Austria, Italy and South Korea, 0 otherwise.
Centrally Managed	=1 for Singapore and Malaysia, 0 otherwise.

* : Life and Non Life Insurance for Argentina and Mexico

Figure 4: Contractual Savings Size

Evolution 1990-1997

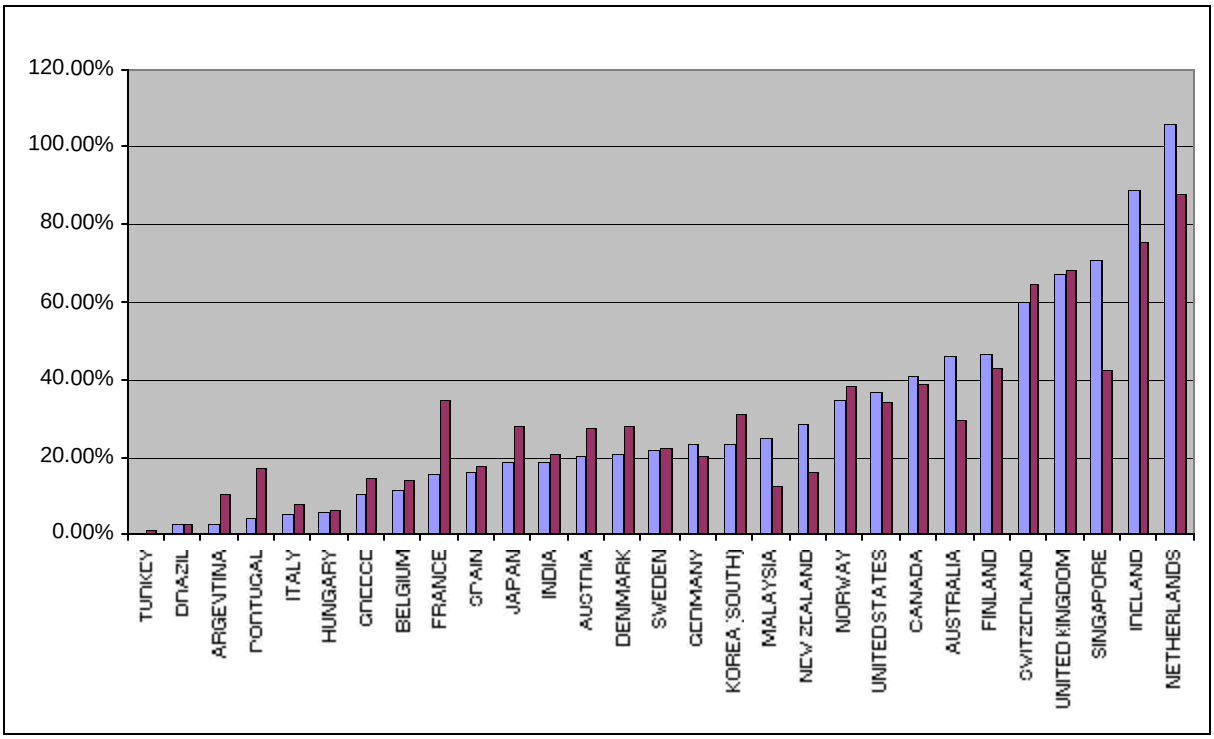
(a) Financial Assets, % of GDP



Note:

Argentina: 1994-1998 (pension funds + insurance companies)
Austria, Belgium, Denmark, Finland, Ireland, Japan, Norway, Singapore, Sweden, Switzerland, Turkey: 1996 instead of 1997.
Brazil: 1996-1999 (pension funds + insurance companies)
Greece: 1991-1996
Hungary: 1994-1996
India: 1995-1997
Ireland: 1990-1995
Malaysia: 1990-1993
Mexico: 1997-1999 (pension funds + insurance companies)

(b) Financial Assets, % of Capital Markets



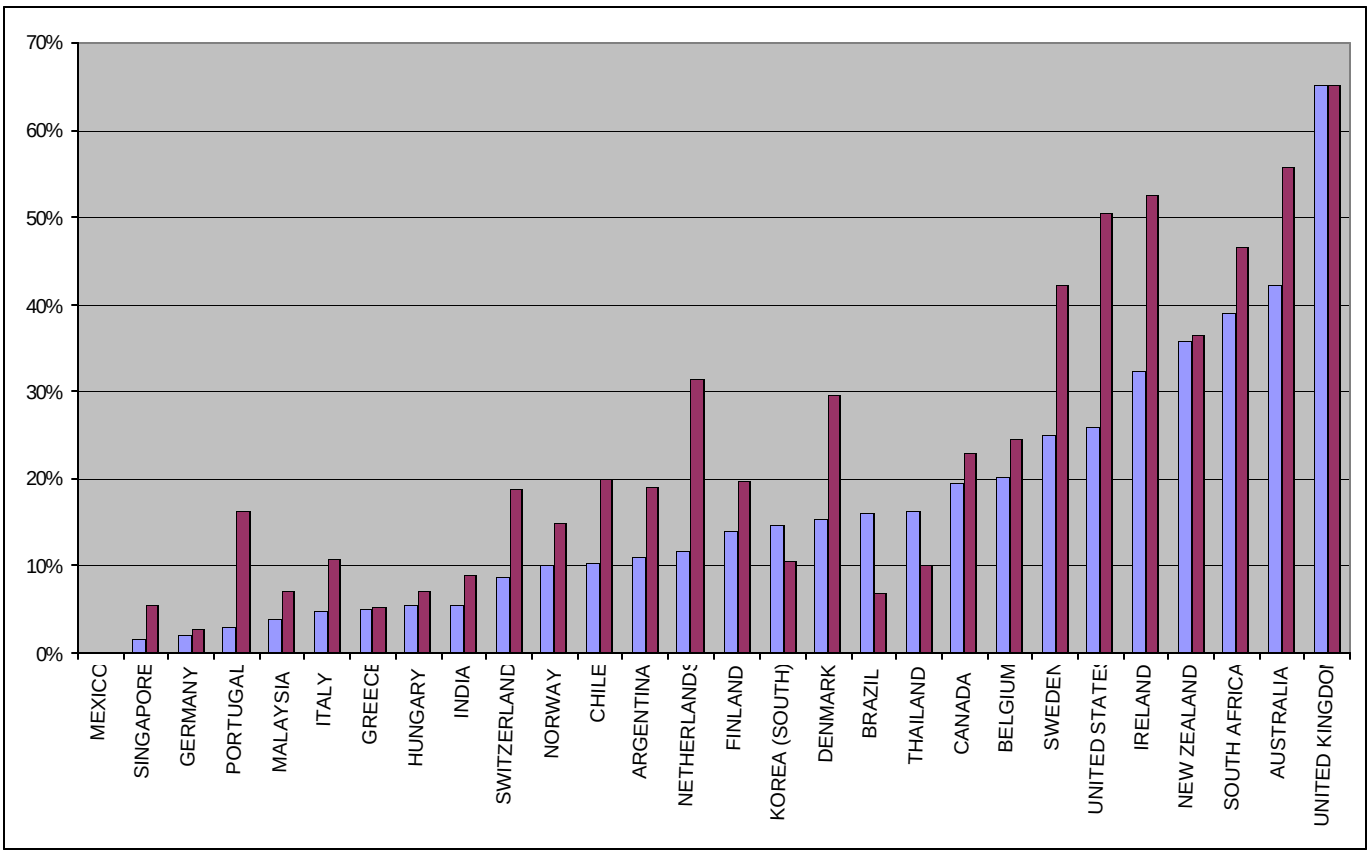
Note:

Argentina: 1994-1998 (pension funds + insurance companies)
Austria, Belgium, Denmark, Finland, Japan, Korea, Norway, Singapore, Sweden, Switzerland, Turkey: 1996 instead of 1997.
Malaysia: 1990-1993
Hungary: 1994-1996
Ireland: 1994-1995
New Zealand: 1995-1997
Greece 1991-1996
Brazil: 1996-1997
India: 1996-1998

Figure 5: Contractual Savings Portfolio Allocation

Evolution 1990-1997

- (a) Shares, % Financial Assets



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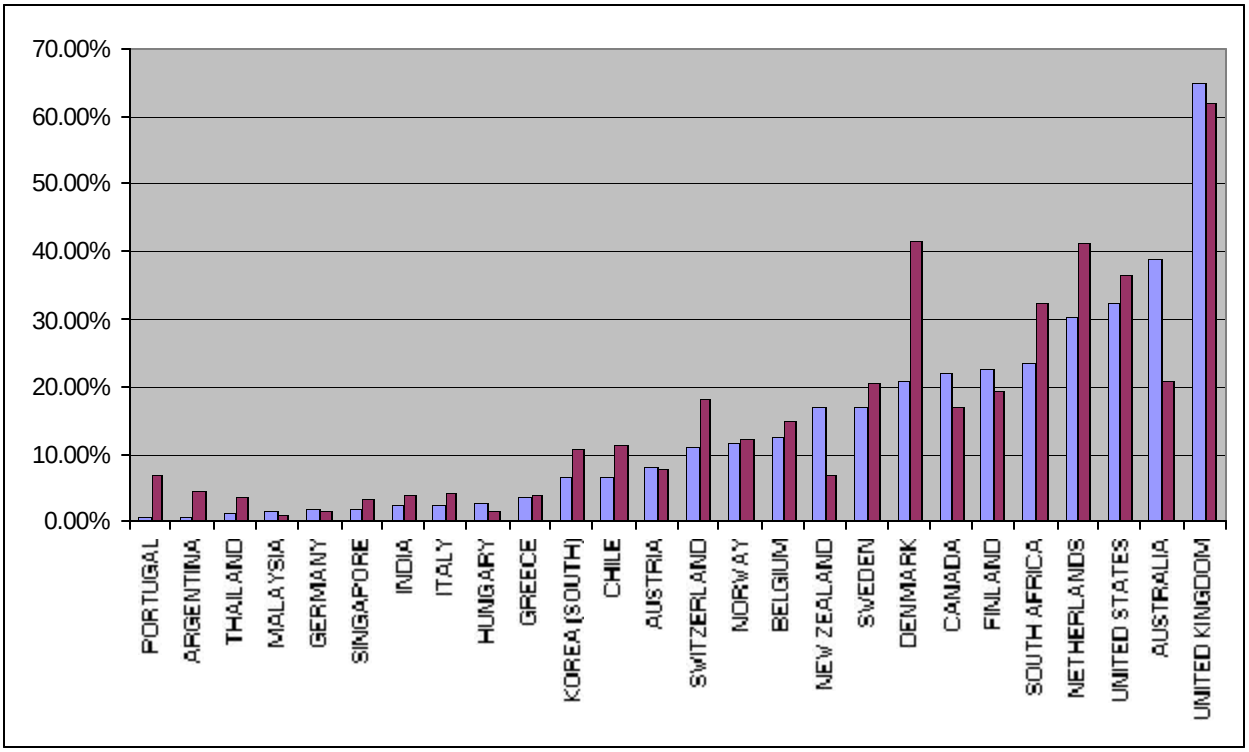
Note:

Argentina: 1994-1997 (pension funds + insurance companies)
Belgium, Denmark, Finland, India, New Zealand, Norway, Singapore, Sweden, Switzerland: 1996 instead of 1997.
Greece: 1991-1996
Hungary: 1994-1996
India: 1995-1997
Ireland: 1990-1995
Malaysia: 1990-1993
Mexico: 1997-1999 (pension funds only)

(b) Shares, % Stock Market Capitalization



Note:

Argentina: 1994-1997 (pension funds + insurance companies)
Belgium, Denmark, Finland, India, New Zealand, Norway, Singapore, Sweden, Switzerland: 1996 instead of 1997.
Greece: 1991-1996
Hungary: 1994-1996
India: 1995-1997
Malaysia: 1990-1993
Korea: 1990-1996
Mexico: 1997-1999 (pension funds only)
Ireland excluded (1994: 146%; 1995: 83%).

Table 3: Cross-country Comparisons

country	year	tdte	ltdte	stdebtte	ltdtd	ec2 %	ec12 %	ec19 %	TOR %	csfaGDP %	csshfa %	csfamkt %	csshGDP %	csshCAP %
ARGENTINA	1997	0.75	0.27	0.48	0.40	19.54	18.23	7.91	43.38	4.23	19.32	10.02	0.82	4.48
AUSTRALIA	1997	0.59	0.46	0.14	0.71	80.59	177.03	79.00	44.62	65.87	55.88	29.86	36.81	20.79
AUSTRIA	1996	1.10	1.29	0.57	0.46	103.15	17.32	11.94	68.95	21.35	5.30	27.34	1.13	6.53
BELGIUM	1996	1.29	0.78	0.51	0.49	67.44	56.48	12.25	21.69	27.20	24.48	13.77	6.66	11.79
BRAZIL	1997	2.27	1.29	0.99	0.50	30.76	31.14	24.78	79.56	1.94	NA	2.70	NA	NA
CANADA	1997	0.75	0.61	0.14	0.73	91.79	93.40	58.51	62.64	68.87	22.93	38.79	15.79	16.91
CHILE	1997	1.11	0.68	0.43	0.55	61.53	93.47	9.66	10.33	52.86	20.16	NA	10.66	11.40
DENMARK	1996	0.73	0.45	0.28	0.59	32.16	55.14	27.57	49.99	54.56	29.66	27.89	16.18	29.35
FINLAND	1996	0.88	0.65	0.23	0.65	54.51	61.19	30.35	49.60	48.95	19.80	42.73	9.69	15.84
FRANCE	1997	2.61	1.24	1.54	0.50	80.77	48.43	29.12	60.13	44.08	NA	34.54	NA	NA
GERMANY	1997	1.23	0.69	0.57	0.53	108.71	39.44	49.19	124.71	25.14	2.77	20.64	0.70	1.76
GREECE	1997	0.79	0.22	0.57	0.24	35.79	29.59	17.63	59.57	14.35	5.30	14.15	0.76	2.57
HUNGARY	1996	0.56	0.29	0.27	0.32	22.31	32.75	16.80	51.31	2.83	7.11	6.27	0.20	0.61
INDIA	1997	0.23	0.12	0.11	0.53	30.50	23.28	12.82	55.08	9.49	7.95	35.97	0.75	3.24
IRELAND	1997	1.03	0.76	0.26	0.59	81.75	32.17	20.22	62.85	63.05	52.55	75.33	33.13	82.90
ITALY	1997	2.44	1.20	1.24	0.47	51.46	30.09	17.30	57.52	12.20	10.89	7.69	1.33	4.42
JAPAN	1996	1.81	0.91	0.90	0.48	201.14	52.90	29.87	56.47	47.73	NA	27.99	NA	NA
KOREA (SOUTH)	1997	3.28	1.54	1.74	0.47	85.30	9.46	38.55	407.32	26.28	10.58	67.54	2.78	29.39
LUXEMBOURG	1995	1.37	0.95	0.41	0.63	100.49	176.06	1.18	6.00	55.86	9.17	NA	5.12	2.91
MALAYSIA	1993	1.22	0.54	0.67	0.46	160.97	95.06	149.32	157.08	50.25	7.02	12.27	3.53	3.71
MEXICO	1997	0.76	0.54	0.21	0.67	15.32	38.86	13.06	33.62	1.40	0.00	NA	0.00	0.00
NETHERLANDS	1997	1.22	0.72	0.49	0.57	112.20	130.10	79.07	60.77	169.44	31.65	87.74	53.62	41.21
NEW ZEALAND	1997	0.67	0.56	0.11	0.78	100.62	140.13	38.17	27.24	26.42	36.49	15.81	9.64	6.88
NORWAY	1996	0.80	0.66	0.14	0.73	77.46	43.36	30.27	69.80	30.02	15.04	38.22	4.51	10.41
PORTUGAL	1997	0.76	0.38	0.37	0.50	76.13	38.14	20.49	53.74	16.19	16.21	17.44	2.63	6.88
SINGAPORE	1996	0.62	0.32	0.31	0.43	112.89	110.38	66.40	60.15	93.50	5.67	42.20	5.30	4.80
SOUTH AFRICA	1997	0.36	0.22	0.15	0.51	135.74	179.77	34.78	19.34	125.01	46.64	NA	58.31	32.43
SPAIN	1997	1.02	0.47	0.55	0.46	80.75	54.58	85.15	156.01	20.60	NA	18.02	NA	NA
SRI LANKA	1997	1.40	0.58	0.82	0.31	24.13	13.89	2.06	14.84	16.75	0.71	NA	0.12	0.85
SWEDEN	1996	0.75	0.61	0.15	0.76	40.91	119.81	77.39	64.60	47.96	42.27	22.68	20.28	16.92
SWITZERLAND	1996	0.93	0.61	0.32	0.64	168.88	225.39	193.88	86.02	131.38	18.87	64.47	24.79	11.00
THAILAND	1997	4.14	2.65	1.50	0.40	129.81	15.29	15.02	98.22	5.71	10.04	NA	0.57	3.75
TURKEY	1995	2.07	0.63	1.43	0.34	18.49	12.27	30.35	247.41	0.33	NA	1.06	NA	NA
UNITED KINGDOM	1997	1.30	0.66	0.63	0.54	123.86	155.17	64.45	41.53	147.81	65.23	68.55	96.42	62.14
UNITED STATES	1997	0.85	0.66	0.19	0.81	126.77	144.35	130.41	90.34	104.57	50.34	34.18	52.64	36.47

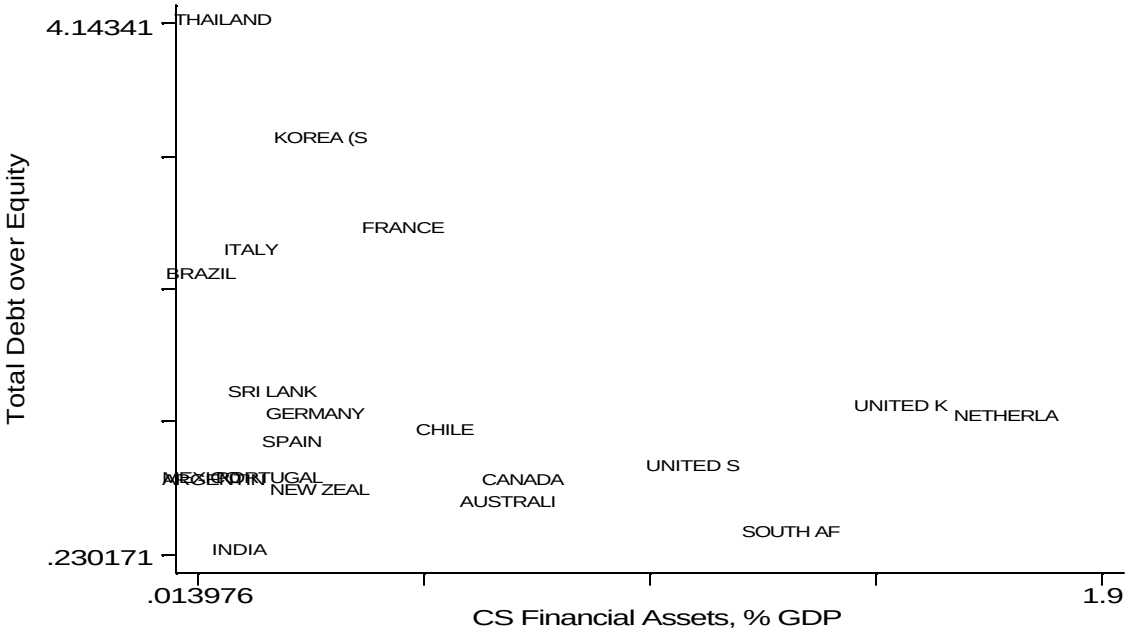
Table 3 - Continued

country	Legal origin	Bank-based	Market-based	Low Developed	Antidirector rights
ARGENTINA	F	0	0	1 (B)	4
AUSTRALIA	CL	0	1	0	4
AUSTRIA	G	1	0	0	2
BELGIUM	F	1	0	0	0
BRAZIL	F	0	0	1 (M)	3
Canada	CL	0	1	0	5
CHILE	F	0	0	1 (C)	5
DENMARK	SC	0	0	1 (M)	2
FINLAND	SC	1	0	0	3
France	F	1	0	0	3
GERMANY	G	1	0	0	1
GREECE	F	0	0	1 (B)	2
HUNGARY	G	0	0	1 (.)	3
INDIA	CL	0	0	1 (B)	5
IRELAND	CL	0	0	1 (B)	4
ITALY	F	1	0	0	1
JAPAN	G	1	0	0	4
KOREA (SOUTH)	G	0	1	0	2
MALAYSIA	CL	0	1	0	3
MEXICO	F	0	0	1 (M)	1
NETHERLANDS	F	0	1	0	2
NEW ZEALAND	CL	1	0	0	4
NORWAY	SC	1	0	0	4
Portugal	F	1	0	0	3
SINGAPORE	CL	0	1	0	4
SOUTH AFRICA	CL	0	1	0	5
SPAIN	F	1	0	0	4
SRI LANKA	CL	0	0	1 (B)	3
SWEDEN	SC	0	1	0	3
SWITZERLAND	G	0	1	0	2
THAILAND	F	0	1	0	2
TURKEY	F	0	0	1 (M)	2
UNITED KINGDOM	CL	0	1	0	5
UNITED STATES	CL	0	1	0	5

F: French Origin, G: German Origin, SC: Scandinavian Origin, CL: Common Law
B : Bank-based, M: Market-based financial systems

Figure 6: Capital Structures and Contractual Savings Development (% GDP)

Total Debt over Equity (1997)



Long-term Debt over Total Debt (1997)

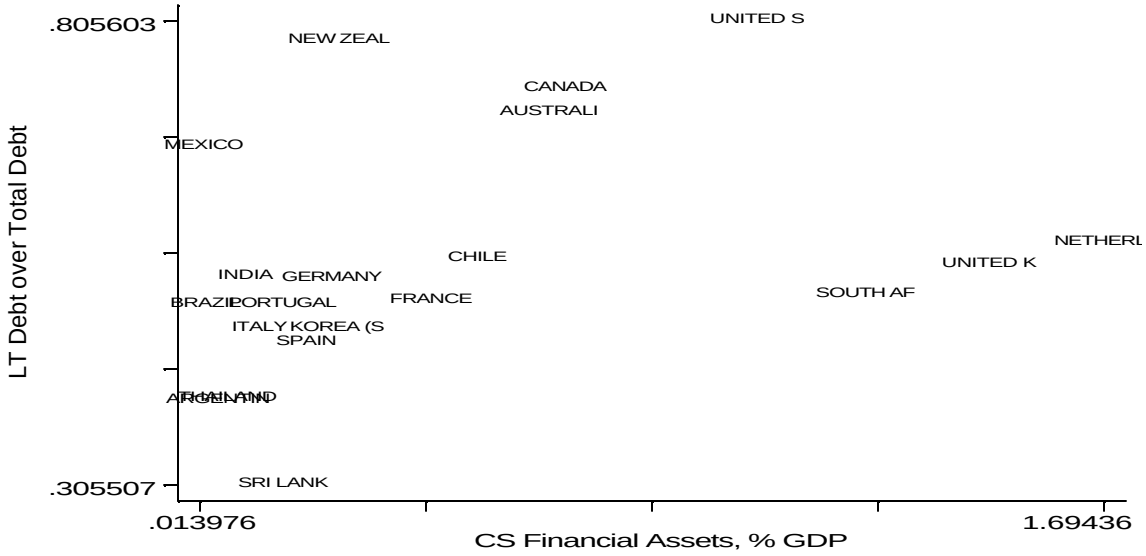
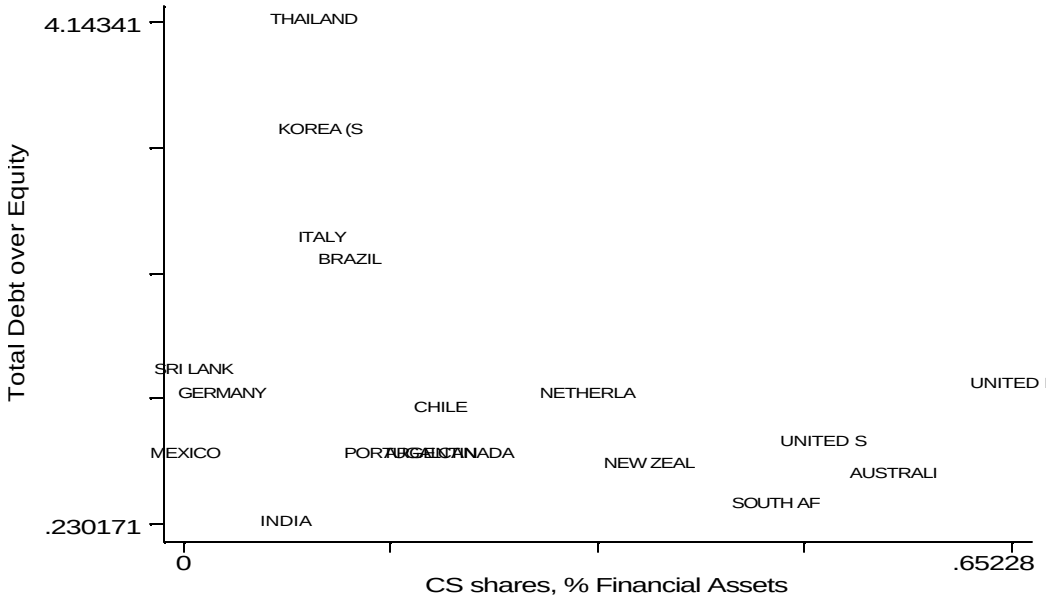


Figure 7: Capital Structures and Contractual Savings Portfolio

Total Debt over Equity (1997)



Long-term Debt over Total Debt

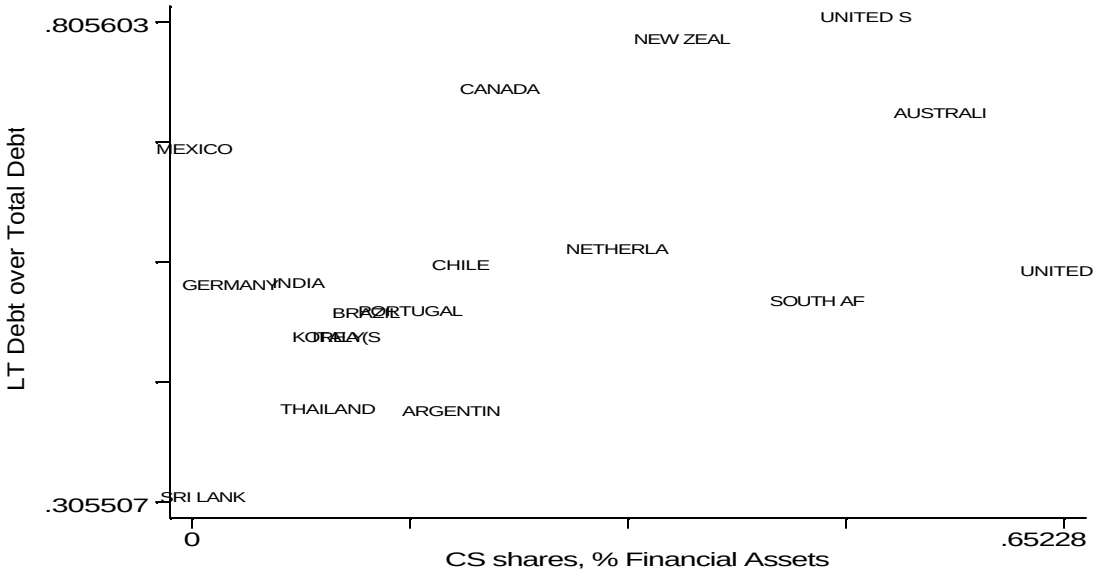


Table 4: Pairwise Correlations

	tdte	stdebtte	ltdte	ltdtd	stdtd	ec2	ec12
tdte	1.0000						
stdebtte	0.8124	1.0000					
	0.0000						
ltdte	0.6112	0.2823	1.0000				
	0.0000	*0.0000*					
ltdtd	-0.0005	-0.1794	0.1522	1.0000			
	0.9611	*0.0000*	*0.0000*				
stdtd	0.0005	0.1794	-0.1522	-1.0000	1.0000		
	0.9611	*0.0000*	*0.0000*	*0.0000*			
ec2	0.0380	0.0251	0.0297	0.0140	-0.0140	1.0000	
	0.0005	*0.0223*	*0.0068*	*0.2050*	*0.2050*		
ec12	-0.0933	-0.0813	-0.0603	-0.0252	0.0252	0.4370	1.0000
	0.0000	*0.0000*	*0.0000*	*0.0222*	*0.0222*	*0.0000*	
TOR	-0.0207	-0.0142	-0.0141	0.0327	-0.0327	-0.2050	-0.1184
	0.0586	*0.1951*	*0.1982*	*0.0030*	*0.0030*	*0.0000*	*0.0000*
ec19	-0.0398	-0.0286	-0.0264	-0.0067	0.0067	0.3788	0.7398
	0.0003	*0.0091*	*0.0159*	*0.5432*	*0.5432*	*0.0000*	*0.0000*
csfaGDP	-0.1127	-0.1229	-0.0514	0.1318	-0.1318	0.3597	0.6694
	0.0000	*0.0000*	*0.0000*	*0.0000*	*0.0000*	*0.0000*	*0.0000*
csfamkt	-0.0536	-0.0871	-0.0053	0.1319	-0.1319	0.2627	0.3322
	0.0000	*0.0000*	*0.6727*	*0.0000*	*0.0000*	*0.0000*	*0.0000*
csshfa	-0.1004	-0.1034	-0.0544	0.1061	-0.1061	0.3349	0.4372
	0.0000	*0.0000*	*0.0000*	*0.0000*	*0.0000*	*0.0000*	*0.0000*
csshCAP	-0.0690	-0.0908	-0.0277	0.1028	-0.1028	0.1801	0.1816
	0.0000	*0.0000*	*0.0371*	*0.0000*	*0.0000*	*0.0000*	*0.0000*

csshGDP	-0.1117	-0.0991	-0.0648	0.0155	-0.0155	0.4178	0.5211
	0.0000	*0.0000*	*0.0000*	*0.2472*	*0.2472*	*0.0000*	*0.0000*
LnGDPcap	0.0429	0.0141	0.0450	0.1219	-0.1219	0.3307	0.0012
	0.0001	*0.1947*	*0.0000*	*0.0000*	*0.0000*	*0.0000*	*0.9141*

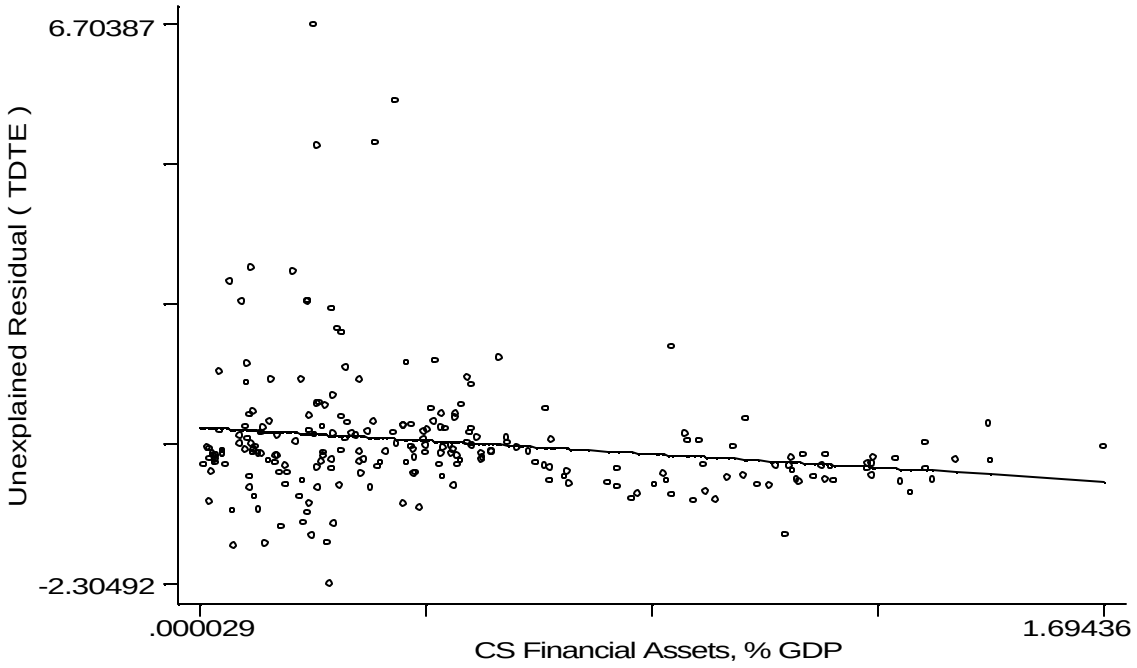
	TOR	ec19	csfaGDP	csfamkt	csshfa	csshCAP	csshGDP
TOR	1.0000						
ec19	-0.0535	1.0000					
	0.0000						
csfaGDP	-0.1268	0.4301	1.0000				
	0.0000	*0.0000*					
csfamkt	-0.0707	0.2244	0.8465	1.0000			
	0.0000	*0.0000*	*0.0000*				
csshfa	-0.1177	0.1727	0.5776	0.4521	1.0000		
	0.0000	*0.0000*	*0.0000*	*0.0000*			
csshCAP	0.0515	0.0634	0.5721	0.6425	0.8230	1.0000	
	0.0001	*0.0000*	*0.0000*	*0.0000*	*0.0000*		
csshGDP	-0.1671	0.2465	0.7642	0.5970	0.8908	0.8105	1.0000
	0.0000	*0.0000*	*0.0000*	*0.0000*	*0.0000*	*0.0000*	
LnGDPcap	-0.6971	0.0841	0.1888	0.1781	0.1286	0.0411	-0.0510
	0.0000	*0.0000*	*0.0000*	*0.0000*	*0.0000*	*0.0020*	*0.0001*

Note: P-values are in italic.

Figure 8: Leverage and Contractual Savings Development

- Conditional Correlation -

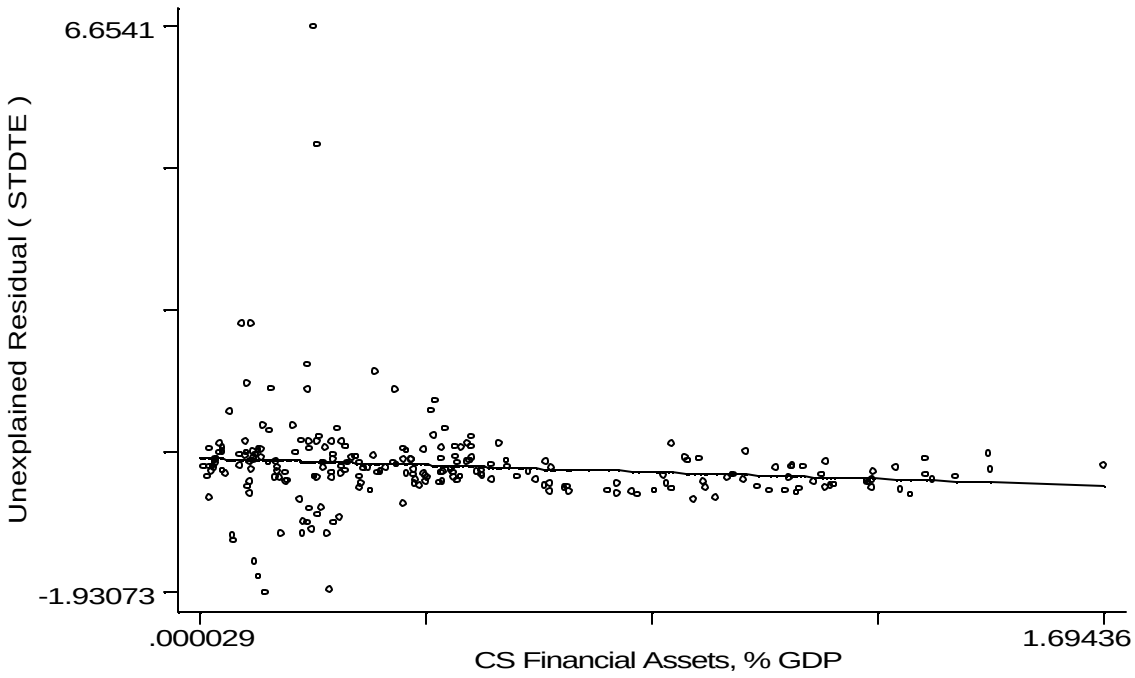
(a) Total Debt over Equity



Regression line*: Residual = - 0.50 * (CS Financial Assets, % GDP) (t-stat = -4.06)*
Pooled regression, 229 obs.

Note:
Values are the unexplained residuals of leverage plotted against Contractual Savings Financial Assets (% GDP). The control variables are :
(1) Firms' Characteristics,
(2) Macroeconomic Factors,
(3) Financial System Development Variables,
(4) Book reserve system and Centrally Managed Pension Funds dummies.
Firms Variables are averaged by countries for each year.

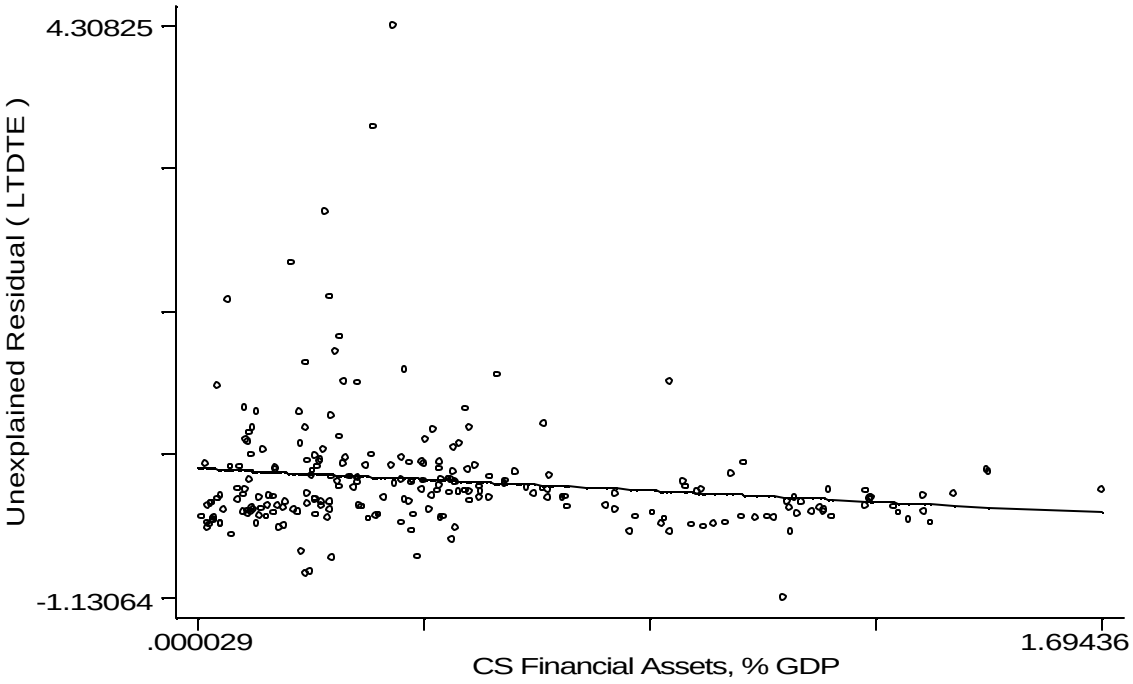
(b) Short-term Debt over Equity



Regression line*: Residual = - 0.25 * (CS Financial Assets, % GDP) (t-stat = -2.69)*
Pooled regression, 229 obs.

Note:
Values are the unexplained residuals of leverage plotted against Contractual Savings Financial Assets (% GDP). The control variables are :
(1) Firms' Characteristics,
(2) Macroeconomic Factors,
(3) Financial System Development Variables,
(4) Book reserve system and Centrally Managed Pension Funds dummies.
Firms' variables are averaged by countries for each year.

(c) Long-term Debt over Equity



Regression line*: Residual = - 0.24 * (CS Financial Assets, % GDP) (t-stat = -3.84)*
Pooled regression, 229 obs.

Note:
Values are the unexplained residuals of leverage plotted against Contractual Savings Financial Assets (% GDP). The control variables are :
(1) Firms' Characteristics,
(2) Macroeconomic Factors,
(3) Financial System Development Variables,
(4) Book reserve system and Centrally Managed Pension Funds dummies.
Firms' variables are averaged by countries for each year.

Table 5: Contractual Savings Institutions Development and Firms' Capital Structures

(a) Financial Assets, % GDP

Pooled and Panel Estimates

Dependent Variables :	Total Debt/Equity		Long-Term Debt/Equity		Short-Term Debt/Equity		Long-Term Debt/ Total Debt	
	Pooled	*Within*	*Pooled*	*Within*	*Pooled*	*Within*	*Pooled*	*Within*
Explanatory Variables :								
Firms' Characteristics :								
Growth opportunities	0.002	-0.016	-0.013	-0.023	0.026	0.01	-0.004***	-0.003***
	(0.1)	(-0.65)	(-1.08)	(-1.15)	(0.99)	(0.69)	(-3.98)	(-2.57)
Net Fixed Assets (%)	0.58***	0.43***	0.54***	0.56***	0.035	-0.11***	0.02***	0.014***
	(6.19)	(10.98)	(5.47)	(16.87)	(1.04)	(-4.95)	(5.86)	(7.57)
Net Sales (%)	0.015***	0.017***	-0.0004	-0.001	0.014***	0.018***	-0.0006***	-0.00038**
	(2.62)	(4.2)	(-0.31)	(-0.44)	(2.62)	(7.67)	(-3.18)	(-1.92)
Size	0.13***	0.031	-0.008	-0.29***	0.0597***	0.06	0.027***	0.0018
	(5.94)	(0.37)	(-0.10)	(-4.23)	(5.55)	(1.21)	(13.58)	(0.43)
Profitability	-0.07	-0.17***	-0.036***	-0.05	-0.036	-0.11***	-0.001	0.0014
	(-1.21)	(-3.75)	(-2.27)	(-1.38)	(-0.66)	(-4.29)	(-0.43)	(0.64)
Volatility of Earnings	-0.002	-0.003	-0.001	-0.004	-0.001	0.0005	0.0003	-0.0012***
	(-0.89)	(-0.66)	(-0.68)	(-1.06)	(-0.76)	(0.16)	(0.83)	(-4.86)
Macroeconomic Factors :								
Cost of Equity	0.77	-0.13	0.76**	-0.031	0.16	-0.026	-0.041*	-0.045**
	(1.46)	(-0.32)	(1.84)	(-0.09)	(0.75)	(-0.11)	(-1.90)	(-2.35)
Inflation	-0.04***	-0.004	-0.029***	0.004	-0.014***	-0.058	-0.0028***	-0.0002
	(-3.14)	(-0.17)	(-2.96)	(0.21)	(-2.86)	(-0.42)	(-2.36)	(-0.21)
Real Lending Interest Rate	-0.047***	0.037*	0.006	0.023	-0.044***	0.019	0.002***	-0.0021**
(Short-Term)	(-2.90)	(1.77)	(0.48)	(1.31)	(-4.27)	(1.53)	(1.86)	(-2.08)
Volatility of Inflation	0.04***	0.013	0.021***	0.002	0.02***	0.012	-0.006	-0.001
	(3.13)	(0.25)	(2.13)	(0.05)	(3.24)	(0.40)	(-1.40)	(-0.41)
Log (GDP/Capita)	-0.13*	-0.19	0.06	0.18	-0.15***	-0.034	0.07***	0.0078
	(-1.70)	(-0.62)	(0.81)	(0.68)	(-4.93)	(-0.18)	(12.5)	(0.52)
Financial System Development :								
Credit to Private Sector	0.006***	0.009***	0.0038***	0.0058**	0.0033***	0.0032	-0.0008***	-0.00038**
	(4.57)	(2.54)	(2.99)	(1.82)	(5.00)	(1.40)	(-11.03)	(-2.04)
Stock Market Capitalization	-0.0067***	-0.004**	-0.003***	-0.0026**	-0.003***	-0.002**	0.0006***	0.00008
	(-5.14)	(-2.47)	(-3.27)	(-1.91)	(-7.03)	(-2.10)	(5.98)	(0.96)
Stock Market Liquidity	-0.32**	0.005	-0.02	0.007		0.0008	-0.005	0.003
(Turnover Ratio)	(-1.88)	(0.34)	(-0.15)	(0.58)		(0.09)	(-0.54)	(0.48)
Contractual Savings Development	**-0.45*** **	0.36	**-0.13***	0.18	**-0.27*** **	0.29	**0.023** **	-0.0032
(financial assets, % GDP)	(-4.68)	(0.76)	(-1.72)	(0.46)	(-5.94)	(1.02)	(2.21)	(-0.14)
Dummy Variables :								
Sector - country (2 digit SIC code)	.	Yes	.	Yes	.	Yes	.	Yes
Book Reserve System	1.03***	.	0.3	.	0.96***	.	-0.07***	.
	(4.28)		(1.04)		(4.95)		(-6.40)	
Centrally Managed Pension Funds	-0.13	.	-0.16*	.	-0.028	.	-0.20***	.
	(-1.25)		(-1.79)		(-0.56)		(-11.74)	
Adjusted R-squared	0.096	0.04	0.05	0.024	0.087	0.019	0.18	0.023
Nb of Observations	6728	6728	6728	6728	6728	6728	6658	6658
Nb of Cross-Section Units	.	1046	.	1046	.	1046	.	1039
Fixed Effects	.	2.34***	.	4.06***	.	2.14***	.	11.55***

(b) Financial Assets, % Cap. Mkt.

Pooled and Panel Estimates

Dependent Variables :	Total Debt/Equity		Long-Term Debt/Equity		Short-Term Debt/Equity		Long-Term Debt/ Total Debt	
	Pooled	*Within*	*Pooled*	*Within*	*Pooled*	*Within*	*Pooled*	*Within*
Explanatory Variables :								
Firms' Characteristics :								
Growth opportunities	0.0026	-0.017	-0.008	-0.016	0.022	0.018	-0.0036***	-0.002*
	(0.08)	(-0.64)	(-0.62)	(-0.71)	(0.75)	(0.11)	(-3.10)	(-1.78)
Net Fixed Assets (%)	0.61***	0.45***	0.568***	0.58***	0.031	-0.12***	0.02***	0.014***
	(6.38)	(10.88)	(5.69)	(16.85)	(0.89)	(-4.77)	(6.23)	(7.23)
Net Sales (%)	0.016***	0.018***	-0.0008	-0.002	0.015***	0.021***	-0.0007***	-0.0006**
	(2.47)	(4.12)	(-0.51)	(-0.69)	(2.52)	(7.47)	(-3.58)	(-3.01)
Size	0.14***	0.037	-0.017	-0.36***	0.059***	0.07	0.026***	-0.006
	(5.87)	(0.39)	(-0.176)	(-4.3)	(5.31)	(1.21)	(12.05)	(-1.36)
Profitability	-0.08	-0.18***	-0.035**	-0.052	-0.045	-0.13***	-0.00006	0.0023
	(-1.31)	(-3.91)	(-2.23)	(-1.34)	(-0.78)	(-4.36)	(-0.02)	(1.08)
Volatility of Earnings	-0.002	-0.005	-0.001	-0.005	-0.001	-0.0006	0.0003	-0.0013***
	(-0.94)	(-0.91)	(-0.70)	(-1.25)	(-0.79)	(-0.18)	(0.80)	(-5.17)
Macroeconomic Factors :								
Cost of Equity	0.88	0.34	0.94**	0.39	0.11	-0.008	-0.057***	0.004
	(1.42)	(0.52)	(1.97)	(0.74)	(0.42)	(-0.02)	(-2.67)	(0.14)
Inflation	-0.025*	0.004	-0.029**	0.007	-0.007	-0.0079	-0.006***	-0.0029**
	(-1.71)	(0.16)	(-1.98)	(0.33)	(-1.21)	(-0.47)	(-4.49)	(-2.33)
Real Lending Interest Rate	-0.049**	0.046*	0.013	0.027	-0.051***	0.023	0.0027**	-0.001
(Short-Term)	(-2.26)	(1.79)	(0.76)	(1.27)	(-3.82)	(1.49)	(2.0)	(-0.92)
Volatility of Inflation	0.037***	0.009	0.002*	0.0001	0.017***	0.01	-0.006	-0.0006
	(2.64)	(0.17)	(1.82)	(0.004)	(2.81)	(0.30)	(-1.34)	(-0.25)
Log (GDP/Capita)	-0.226***	-0.50	0.15**	0.048	-0.32***	-0.17	0.09***	-0.016
	(-2.61)	(-1.44)	(2.08)	(0.16)	(-5.14)	(-0.79)	(10.51)	(-1.01)
Financial System Development :								
Credit to Private Sector	0.006***	0.012***	0.003***	0.0076**	0.0038***	0.004	-0.0009***	-0.00033*
	(4.49)	(2.78)	(2.44)	(2.13)	(5.31)	(1.58)	(-11.55)	(-1.66)
Stock Market Capitalization	-0.008***	-0.00017	-0.0044***	-0.002**	-0.0037***	-0.0002**	0.0004***	0.00019*
	(-6.59)	(0.08)	(-5.65)	(-0.13)	(-6.33)	(-0.19)	(5.29)	(1.89)
Stock Market Liquidity	-0.52**	0.008	-0.03	0.009	-0.29**	0.0026	0.02**	0.0017*
(Turnover Ratio)	(-2.92)	(0.44)	(-0.17)	(0.61)	(-2.39)	(0.21)	(1.96)	(1.88)
Contractual Savings Development	0.065	**2.09*** **	0.18	1.27*	**-0.14***	0.76	**0.046*** **	0.018
(financial assets, % CAP. MKT.)	(0.32)	(2.39)	(1.28)	(1.74)	(-1.80)	(1.42)	(3.51)	(0.44)
Dummy Variables :								
Sector - country (2 digit SIC code)	.	Yes	.	Yes	.	Yes	.	Yes
Book Reserve System	1.19***	.	0.34	.	0.96***	.	-0.086***	.
	(4.88)		(1.43)		(4.95)		(-6.87)	
Centrally Managed Pension Funds	-0.16	.	0.036	.	-0.028	.	-0.16***	.
	(-1.24)		(0.46)		(-0.56)		(-8.36)	
Adjusted R-squared	0.099	0.017	0.05	0.024	0.087	0.011	0.18	0.01
Nb of Observations	5867	5867	5867	5867	6728	5867	5729	5810
Nb of Cross-Section Units	.	943	.	1046	.	943	.	936
Fixed Effects	.	2.46***	.	4.06***	.	2.01***	.	11.3***

Table 6: Contractual Savings Portfolios and Firms' Capital Structures

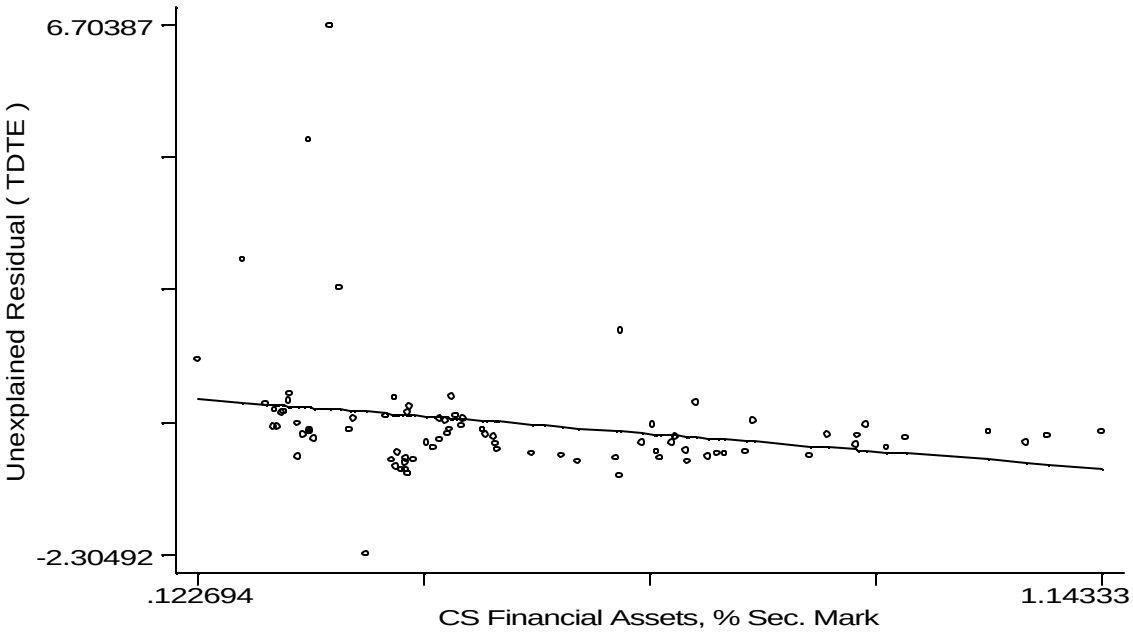
Dependent Variables :	Total Debt/Equity		Long-Term Debt/Equity		Short-Term Debt/Equity		Long-Term Debt/ Total Debt	
	Pooled	*Within*	*Pooled*	*Within*	*Pooled*	*Within*	*Pooled*	*Within*
Explanatory Variables :								
Firms' Characteristics :								
Growth opportunities	-0.02	-0.047	-0.0058	-0.0118	0.001	-0.023	-0.002**	-0.003**
	(-0.56)	(-1.48)	(-0.32)	(-0.43)	(0.05)	(-1.31)	(-1.92)	(-1.94)
Net Fixed Assets (%)	0.60***	0.43***	0.56***	0.58***	0.026	-0.13***	0.019***	0.0138***
	(5.58)	(10.17)	(4.71)	(15.08)	(0.74)	(-5.34)	(5.32)	(6.24)
Net Sales (%)	0.018***	0.021***	0.00001	-0.002	0.016***	0.022***	-0.0008***	-0.0005***
	(2.68)	(4.81)	(0.008)	(-0.54)	(2.57)	(8.50)	(-3.77)	(-2.45)
Size	0.09***	0.14	-0.035	-0.27***	0.034***	0.09*	0.027***	0.004
	(4.17)	(1.57)	(-0.35)	(-3.42)	(3.48)	(1.76)	(12.56)	(0.98)
Profitability	-0.077	-0.18***	-0.036***	-0.049	-0.043	-0.13***	-0.00004	0.0029
	(-1.26)	(-3.98)	(-2.77)	(-1.21)	(-0.75)	(-4.81)	(-0.017)	(1.24)
Volatility of Earnings	-0.007	-0.006	0.006	0.0068	-0.017	-0.0059	0.0009	0.004
	(-0.28)	(-0.09)	(0.75)	(0.11)	(-0.69)	(-0.15)	(0.75)	(1.24)
Macroeconomic Factors :								
Cost of Equity	0.82	-0.22	0.80*	-0.017	0.17	-0.10	-0.014	-0.039**
	(1.36)	(-0.55)	(1.75)	(-0.051)	(0.66)	(-0.44)	(-0.65)	(-1.94)
Inflation	-0.03**	-0.015	-0.022***	-0.0017	-0.013***	-0.012	-0.002**	-0.001
	(-3.42)	(-0.92)	(-2.79)	(-0.11)	(-3.44)	(-1.26)	(-2.09)	(-1.23)
Real Lending Interest Rate	-0.046***	0.02	-0.006	0.018	-0.034***	0.012	-0.002*	-0.002**
(Short-Term)	(-3.14)	(1.20)	(-0.63)	(0.97)	(-3.33)	(1.04)	(-1.88)	(-1.92)
Volatility of Inflation	0.022	-0.005	0.014	-0.003	0.007	-0.00046	-0.0068	-0.014
	(1.66)	(-0.10)	(1.35)	(-0.06)	(1.31)	(-0.015)	(-1.45)	(-0.507)
Log (GDP/Capita)	-0.19*	-0.44	0.046	0.17	-0.19***	-0.21	0.065***	0.014
	(-1.73)	(-1.25)	(0.45)	(0.50)	(-4.41)	(-0.99)	(10.1)	(0.76)
Financial System Development :								
Credit to Private Sector	0.006**	0.01***	0.007***	0.017*	-0.0002	0.0037	8.08E-06	-0.0006***
	(2.37)	(2.62)	(3.29)	(0.97)	(-0.23)	(1.63)	(0.065)	(-3.22)
Stock Market Capitalization	-0.007***	-0.009	-0.004***	-0.0017	-0.0028***	0.0001	0.0003***	-0.00004
	(-4.97)	(-0.53)	(-3.35)	(-1.14)	(-5.62)	(0.11)	(3.06)	(0.46)
Stock Market Liquidity	-0.24	0.0079	-0.014	0.0089	-0.07	0.002	0.005	0.00037
(Turnover Ratio)	(-1.09)	(0.52)	(-0.07)	(0.66)	(-0.54)	(0.29)	(0.58)	(0.48)
Contractual Savings Portfolio	**-0.92*** **	**-3.12*** **	**-0.96*** **	-1.08	-0.117	**-1.78*** **	**-0.13*** **	0.047
	(-3.48)	(-2.51)	(-4.13)	(-0.97)	(-1.03)	(-2.41)	(-6.03)	(0.74)
Dummy Variables :								
Sector - country (2 digit SIC code)	.	Yes	.	Yes	.	Yes	.	Yes
Book Reserve System	0.89***	.	0.02	.	1.05***	.	-0.16***	.
	(3.21)		(0.08)		(5.01)		(-12.41)	
Centrally Managed Pension Funds	-0.43***	.	-0.51***	.	-0.07	.	-0.258***	.
	(-3.77)		(-3.05)		(-1.37)		(-12.38)	
Adjusted R-squared	0.1	0.036	0.048	0.028	0.1	0.024	0.19	0.042
Nb of Observations	5501	5501	5501	5501	5501	5501	5438	5438
Nb of Cross-Section Units	.	904	.	904	.	904	.	897
Fixed Effects	.	2.66***	.	4.17***	.	2.13***	.	10.52***

Figure 9: Leverage (TDTE) and Contractual Savings Development

(Financial Assets, % Securities Market)

- Conditional Correlation -

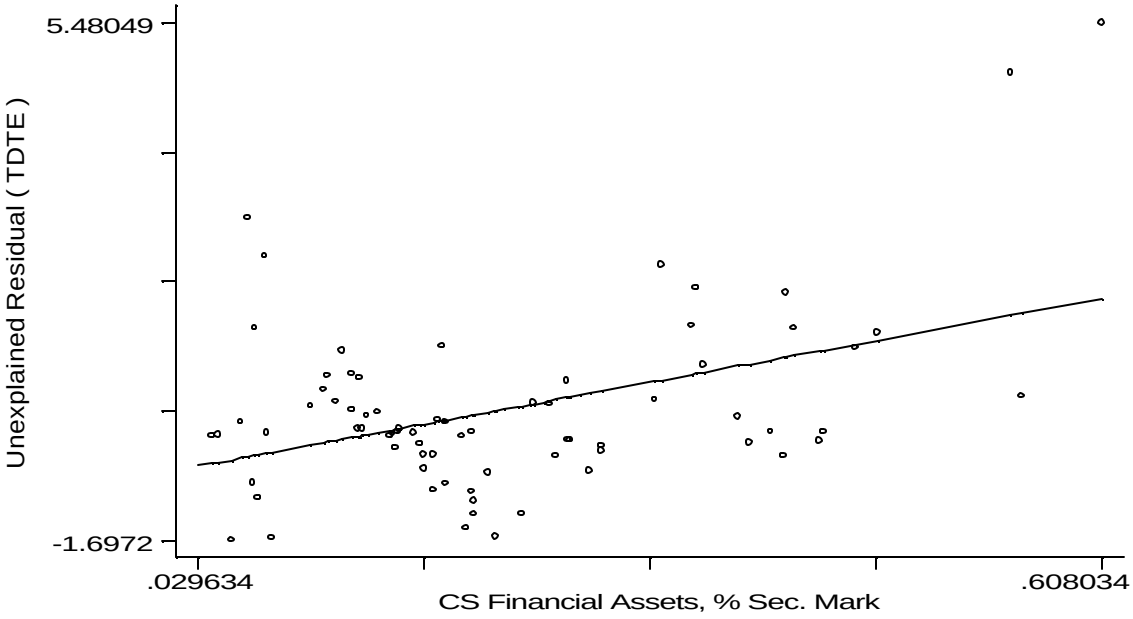
Market-based Financial Structure



Regression line*: Residual = -1.16 * (CS Financial Assets, % Sec. Market) (t-stat = -2.47)*
Pooled regression, 82 obs.

Note:
Values are the unexplained residuals of leverage (TDTE) plotted against Contractual Savings Financial Assets (% Sec. Market) for countries with Market-based financial systems. The control variables are :
(1) Firms' Characteristics,
(2) Macroeconomic Factors,
(3) Financial System Development Variables,
(4) Book reserve system and Centrally Managed Pension Funds dummies.
Firms' variables are averaged by countries for each year.

Bank-based Financial Structure



Regression line*: Residual = 4.0 * (CS Financial Assets, % Sec. Market) (t-stat = 2.37)*
Pooled regression, 74 obs.

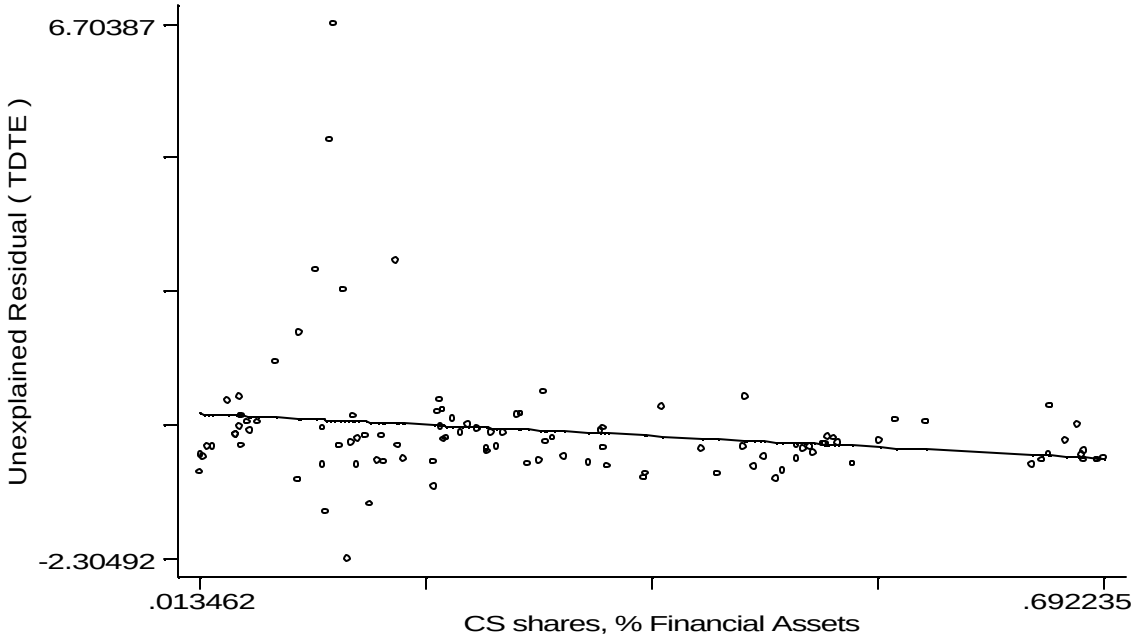
Note:
Values are the unexplained residuals of leverage (TDTE) plotted against Contractual Savings Financial Assets (% Sec. Market) for countries with Bank-based financial systems. The control variables are :
(1) Firms' Characteristics,
(2) Macroeconomic Factors,
(3) Financial System Development Variables,
(4) Book reserve system and Centrally Managed Pension Funds dummies.
Firms' variables are averaged by countries for each year.

Figure 10: Leverage (TDTE) and Contractual Savings Portfolio

(Shares, % Financial Assets)

- Conditional Correlation -

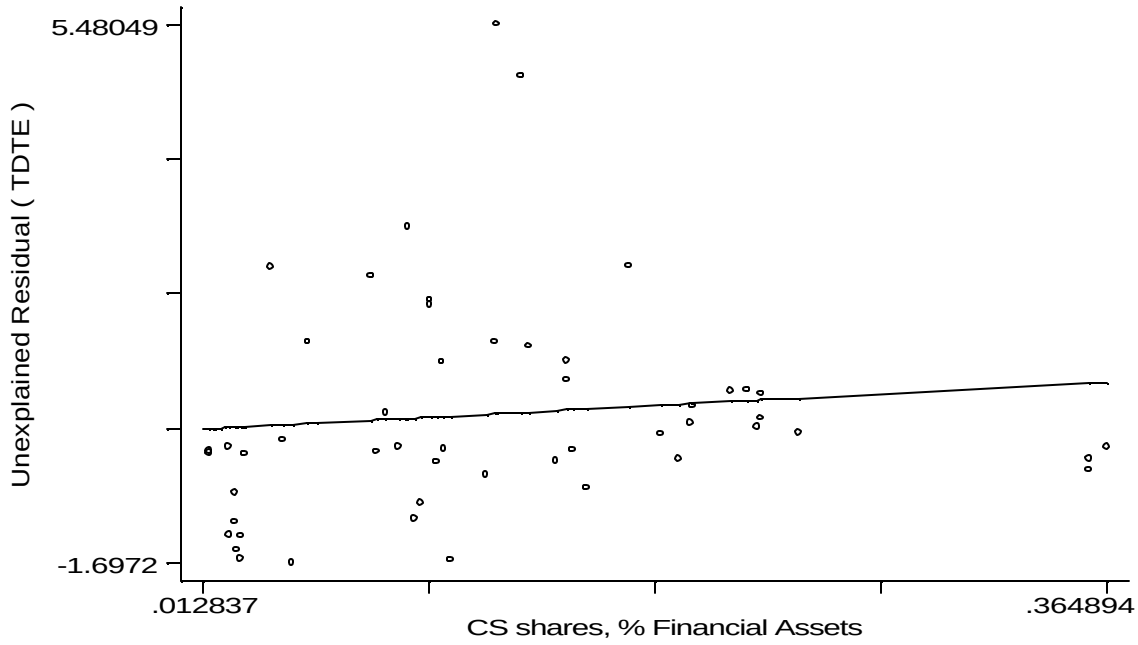
Market-based Financial Structure



Regression line*: Residual = - 1.11 * (CS Shares, % Financial Assets) (t-stat = -2.46)*
Pooled Regression, 105 obs.

Note:
Values are the unexplained residuals of leverage (TDTE) plotted against Contractual Savings Share Holdings (% Financial Assets) for countries with Market-based financial systems. The control variables are :
(1) Firms' Characteristics,
(2) Macroeconomic Factors,
(3) Financial System Development Variables,
(4) Book reserve system and Centrally Managed Pension Funds dummies.
Firms'variables are averaged by countries for each year.

Bank-based Financial Structure



Regression line*: Residual = 1.77 * (CS Shares, % Financial Assets) (t-stat = 1.09)*
Pooled regression, 51 obs.

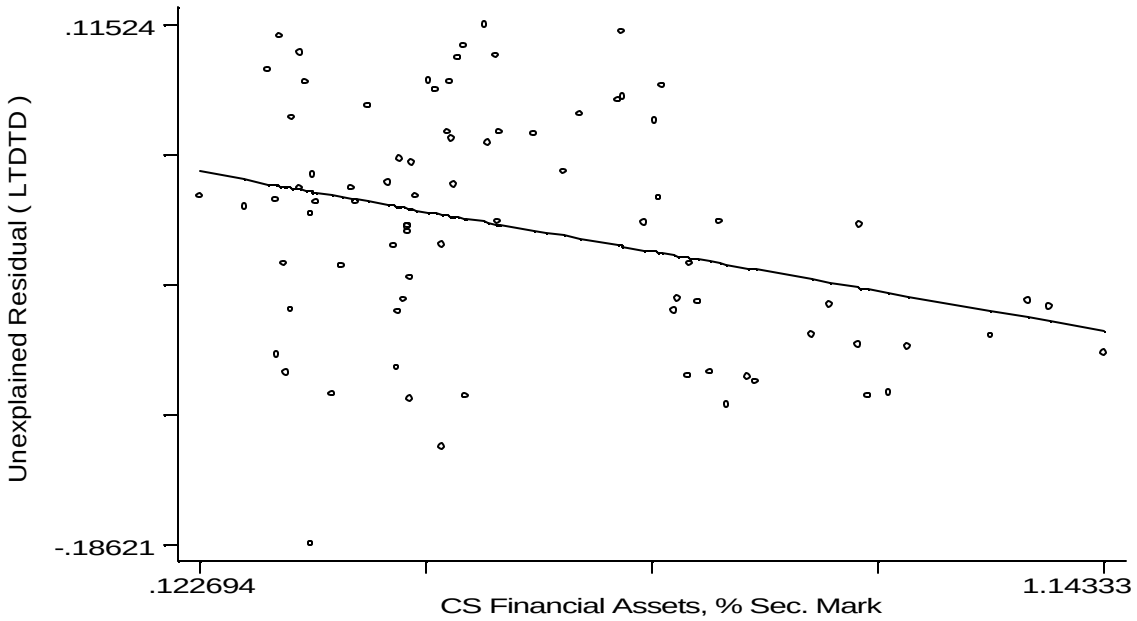
Note:
Values are the unexplained residuals of leverage (TDTE) plotted against Contractual Savings Share Holdings (% Financial Assets) for countries with Bank-based financial systems. The control variables are :
(1) Firms' Characteristics,
(2) Macroeconomic Factors,
(3) Financial System Development Variables,
(4) Book reserve system and Centrally Managed Pension Funds dummies.
Firms'variables are averaged by countries for each year.

Figure 11: Debt Maturity and Contractual Savings Development

(Financial Assets, % Securities Market)

- Conditional Correlation -

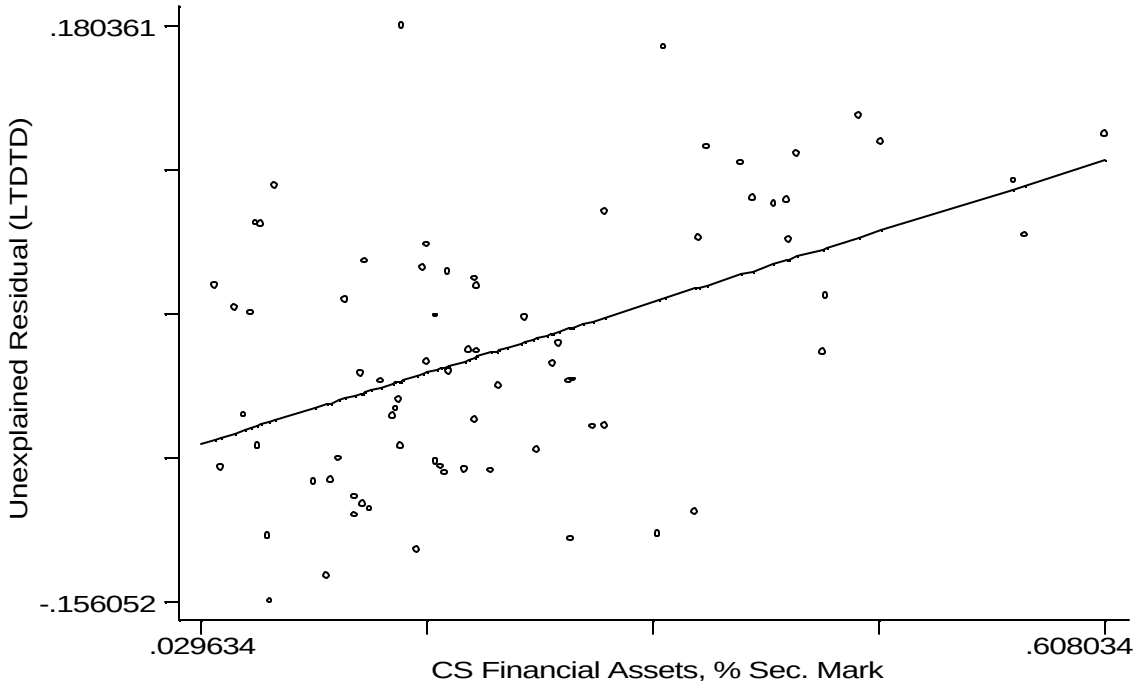
Market-based Financial Structure



Regression line*: Residual = -0.09 * (CS Financial Assets, % Sec Mkt) (t-stat = -3.84)*
Pooled regression, 82 obs.

Note:
Values are the unexplained residuals of debt maturity (LTDTD) plotted against Contractual Savings Financial Assets (% Securities Market Size) for countries with Market-based financial systems. The control variables are :
(1) Firms' Characteristics,
(2) Macroeconomic Factors,
(3) Financial System Development Variables,
(4) Book reserve system and Centrally Managed Pension Funds dummies.
Firms'variables are averaged by countries for each year.

Bank-based Financial Structure



Regression line*: Residual = 0.28 * (CS Financial Assets, % Sec Mkt) (t-stat = 5.28)*
Pooled Regression, 74 obs.

Note:
Values are the unexplained residuals of debt maturity (LTDTD) plotted against Contractual Savings Financial Assets (% Securities Market Size) for countries with Bank-based financial systems. The control variables are :
(1) Firms' Characteristics,
(2) Macroeconomic Factors,
(3) Financial System Development Variables ,
(4) Book reserve system and Centrally Managed Pension Funds dummies.
Firms'variables are averaged by countries for each year.

Table 7: Market-Based and Bank-Based Financial Systems

Contractual Savings and Firms' Financing Choices

Pooled and Panel Estimates

Summary of the Results

Market-based Financial Systems

	Total Debt/Equity		LT Debt/Equity		ST Debt/Equity		Long-Term Debt/ Total Debt	
	OLS	*Within*	*OLS*	*Within*	*OLS*	*Within*	*OLS*	*Within*
Contractual Savings Development	**-0.55*** **	0.007	**-0.37*** **	0.053	**-0.15***	0.003	**-0.08*** **	0.01
(financial assets, % GDP)	(-3.69)	(0.017)	(-3.93)	(0.19)	(-1.72)	(0.014)	(-6.24)	(0.6)
Contractual Savings Development	-0.28	-0.01	**-0.30*** **	0.4	0.042	-0.38	**-0.17*** **	0.019
(financial assets, % Capital Market)	(-1.39)	(-0.013)	(-2.81)	(1.013)	(0.31)	(-0.73)	(-9.37)	(0.36)
Contractual Savings Development	**-0.64*** **	0.23	**-0.44*** **	0.45	-0.18	-0.14	**-0.15*** **	-0.02
(shares, % Stock Market Cap.)	(-2.84)	(0.34)	(-3.18)	(1.14)	(-1.37)	(-0.34)	(-7.9)	(-0.48)
Contractual Savings Portfolio	**-0.96*** **	**-4.06*** **	**-0.64*** **	**-1.93*** **	**-0.33** **	**-2.01*** **	**-0.10*** **	0.01
(Shares, % financial assets)	(-3.46)	(-3.69)	(-3.65)	(-3.007)	(-1.97)	(-2.87)	(-4.10)	(0.16)

Bank Based Financial Systems

	Total Debt/Equity		LT Debt/Equity		ST Debt/Equity		Long-Term Debt/ Total Debt	
	OLS	*Within*	*OLS*	*Within*	*OLS*	*Within*	*OLS*	*Within*
Contractual Savings Development	**3.66*** **	**8.4*** **	**2.78** **	3.19	0.69	**3.74*** **	**0.217*** **	0.05
(financial assets, % GDP)	(3.42)	(3.85)	(2.49)	(1.59)	(1.14)	(2.89)	(3.83)	(0.68)
Contractual Savings Development	**3.3*** **	**8.92*** **	**2.85*** **	**4.41** **	0.21	**3.16** **	**0.41*** **	**0.14** **
(financial assets, % Capital Market)	(4.26)	(4.25)	(3.53)	(2.29)	(0.49)	(2.55)	(10.28)	(1.92)
Contractual Savings Development	**1.88*** **	**4.41** **	1.12	2.95	0.49	0.42	0.04	0.068
(shares, % Stock Market Cap.)	(2.47)	(2.09)	(1.25)	(1.4)	(1.19)	(0.35)	(1.19)	(0.95)
Contractual Savings Portfolio	2.27	-6.9	0.79	-2.51	0.98	-3.55	-0.013	**0.84*** **
(Shares, % financial assets)	(1.11)	(-1.11)	(0.32)	(-0.38)	(0.88)	(-1.009)	(-0.13)	(3.84)

We report (1) the coefficient, (2) t-statistic.

Control Variables include:

(1) Firm Characteristics (2) Macroeconomic Factors (3) Financial System Characteristics