

Aging and Poverty and Inequality

Introduction

Do inequality and poverty increase in an aging society? Demographic variables have often been considered important determinants of the distribution of income, going back to the classical economists (Malthus, Smith, and Ricardo). A main theme was that fast population growth would put downward pressure on returns to labor versus returns to capital (land, and other physical and natural resources). Conversely, aging—that is, low or even negative population growth—would increase wages relative to returns to capital. Since ownership of capital assets tends to be concentrated, this change in relative factor returns could reduce income inequality. Furthermore, capital holders, usually older people, are likely to lose while young workers gain. More recently, empirical evidence from developed and aging countries, such as Japan, the United States, and Western Europe, shows that age groups tend to become more vulnerable and unequal over their life cycle. Across people within the same age group, some manage to accumulate more wealth over a longer working life while others risk falling into poverty with limited savings stretched over a longer retirement period (see, for example, Attanasio, Hurst, and Pistaferri 2014;

This chapter uses results from the following background papers commissioned for aging work in the Europe and Central Asia Region of the World Bank: “Old Age and Poverty in ECA Countries” (2014), by João Pedro Azevedo, Ana María Muñoz Boudet, and Minh Nguyen; “Inequality and Aging” (2014), by Maurizio Bussolo, Tu Chi Nguyen, Sara Signorelli, and Simone Schotte; “Expenditure Patterns over the Lifecycle and Time” (2014), by Brooks Evans, Z. Majoka, Kenneth Simler, and Nistha Sinha; “Intergenerational Support in Europe” (2014), by Marco Albertini; and “Subjective Well-Being in the ECA Region” (2014), by Jan Bauer, Peng Nie, and Alfonso Sousa-Poza.



Deaton and Paxson 1994; Ohtake and Saito 1998). Societies with different age structures will have different levels (and structures) of income and wealth distribution.

Assessing whether and how aging affects poverty and inequality is a complex task. Welfare can be measured using individual-level variables, such as labor earnings or pensions. In this case, the age structure of a population can be straightforwardly linked with the distribution of income across individuals. However, for other welfare measures, such as consumption, which is almost always estimated at the household level, aging can be linked with the welfare distribution only through the composition of the household. While individuals' income, consumption, and saving choices may follow a certain life cycle, households do not necessarily exhibit the same pattern. People of the same age can have different income and consumption patterns depending on the resources they share with other members of their households. Therefore, not taking into account the composition of the household can lead to biases in the estimation of the welfare of individuals (see box 5.1), and in assessing the relationship of welfare and aging.

Another difficulty of assessing the welfare dynamics of aging societies is that aging is normally a slow process. Even in the fastest cases (see examples on demographics in part I of this volume), it takes years before shifts in age structures become apparent. It is therefore a challenge to observe the impact of aging and even more difficult to separate it from many other forces—technological progress, economic growth, and trade, among others—that are at play during the same period. During the decade from the mid-1980s to the mid-1990s, poverty and inequality in the region were driven by the recession that accompanied the transition to market economies in the 1990s and the subsequent recovery (box 5.2).

A slight positive relationship can be detected between aging and both inequality and poverty reduction in the past decade, but there is a large heterogeneity in these variables among countries of similar demographic evolutions (figure 5.1). For example, both Lithuania and Romania saw the share of the elderly in the total population increase by around 1.7 percentage points, but Lithuania's Gini increased by 1 point while Romania's decreased by 2 points. Similarly, the share of elderly in the populations of Moldova and Turkey increased by around 1.3 percentage points, but the former reduced the poor population by 68 percentage points, whereas poverty in the latter dropped by only 8 percentage points. Furthermore, countries that succeed in lifting people out of poverty are not necessarily becoming more equal, suggesting that even as the bottom income group improves its welfare, its growth may not be fast enough to catch up with the better off.

This chapter tries to overcome these challenges to show the impact, or at least the potential influence, of aging on poverty and inequality. While it may be difficult to conclude whether poverty and inequality increase in aging societies, identifying winners and losers from the aging process can be very useful. As shown in part III, voting patterns change with age, and reforms that may benefit the whole society—such as those balancing adequacy and affordability of pension benefits or care arrangements that facilitate the labor participation of women—may be blocked by narrow interest groups.

The elderly are not the poorest group in Europe and Central Asia, and aging does not necessarily lead to higher poverty rates. Pensions and transfers have helped.

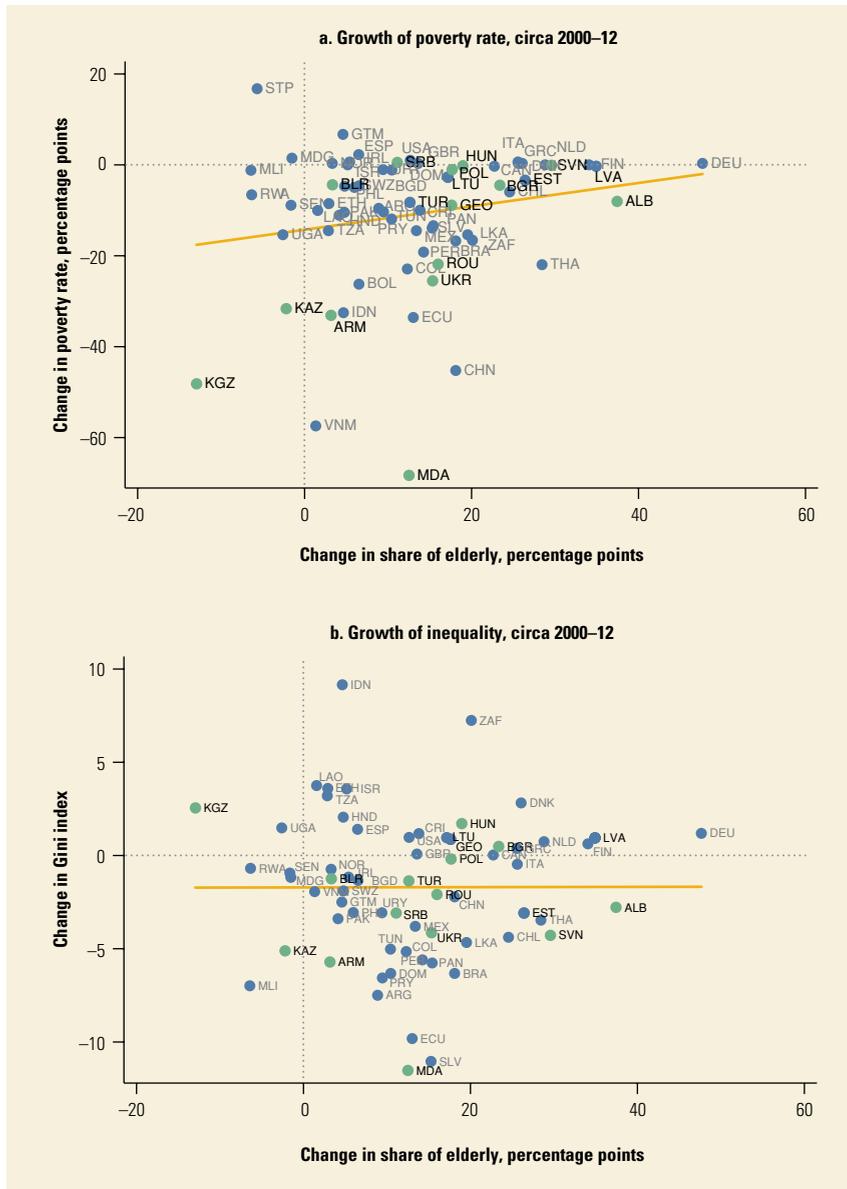


FIGURE 5.1
Aging societies are not necessarily becoming poorer and more unequal

- Europe and Central Asia
- Rest of the world

Source: World Bank calculations based on WDI.
 Note: Poverty rates are calculated using the US\$2.5 a day (2005 purchasing power parity equivalent) poverty line.

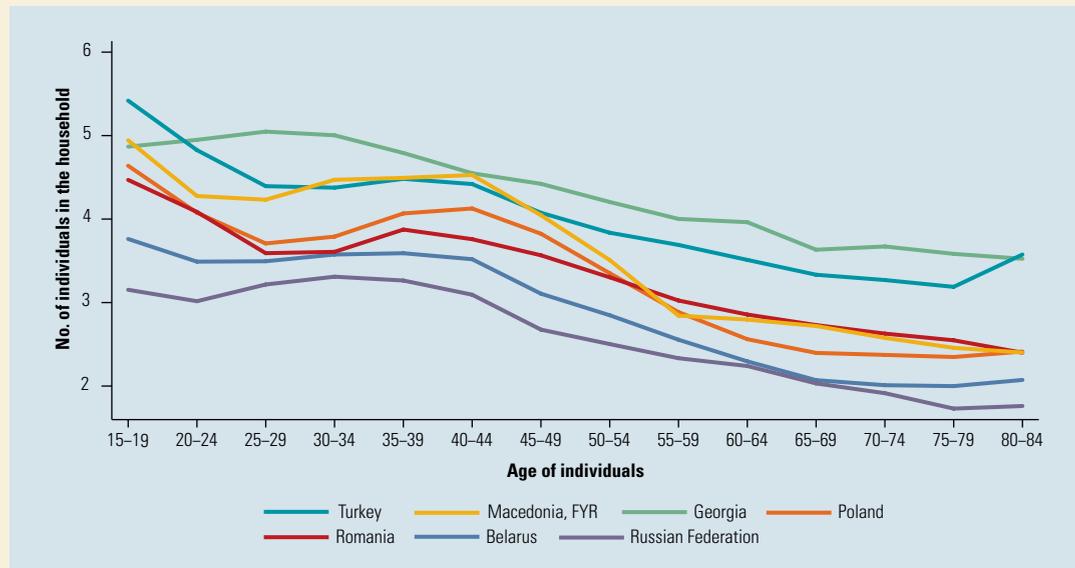
The assessment of the impact of aging on welfare proceeds in stages. First, the chapter examines the extent of poverty among the elderly, which is expected to account for a major part of poverty overall, and how that is affected by household composition, interhousehold transfers, and consumption patterns. Then, using the model developed in chapter 3, the chapter examines the likely relationship between demographic changes, including a decline in fertility and a rise in longevity, on inequality. This analysis is complemented by a review of inequality within the

BOX 5.1 Estimating Poverty for Demographically Different Households

An individual is counted as poor when his or her income (or consumption)—obtained by dividing total household income (or consumption) by the number of individuals of the household—is less than a poverty line. A poverty line is defined based on the needs of an individual living in a household of typical size and age composition. However, individuals do not live in households with the same demographic composition, and the “average”

demographic composition is actually changing in an aging society. Some live in smaller households, which do not benefit from scale economies (for example, housing costs are lower per person in larger households). Old individuals, in particular, tend to live with other old individuals in smaller households (figure B5.1.1). These elderly households also have different consumption patterns from households with mixed-age members.

FIGURE B5.1.1 Older individuals tend to live in smaller households in Europe and Central Asia



Source: Calculations based on most recent year available in ECAPOV harmonized data.

The economic literature has come up with mechanisms for adjusting poverty measurements for these differences in household composition. When the demographic composition of households and scale effects are taken into account, poverty estimates change (Rothbarth 1943; Deaton and Muellbauer 1986; Lanjouw and Ravallion 1995; Batana, Bussolo, and Cockburn 2013). An exercise in 17 countries in the Europe and Central Asia region and the Baltics using ASPIRE, a World Bank database that compiles social protection and labor

indicators from officially recognized international household surveys, shows that unadjusted calculations would yield a poverty incidence (at the 40th percentile poverty line) of 36 percent among the elderly and 52 percent among youths. However, taking into account scale and age composition effects,^a the poverty rate differential between the young and the elderly becomes smaller and even negative in a few countries: Georgia, Hungary, Kosovo, Lithuania, Serbia, and Ukraine (Evans 2014; Evans and Palacios 2014).

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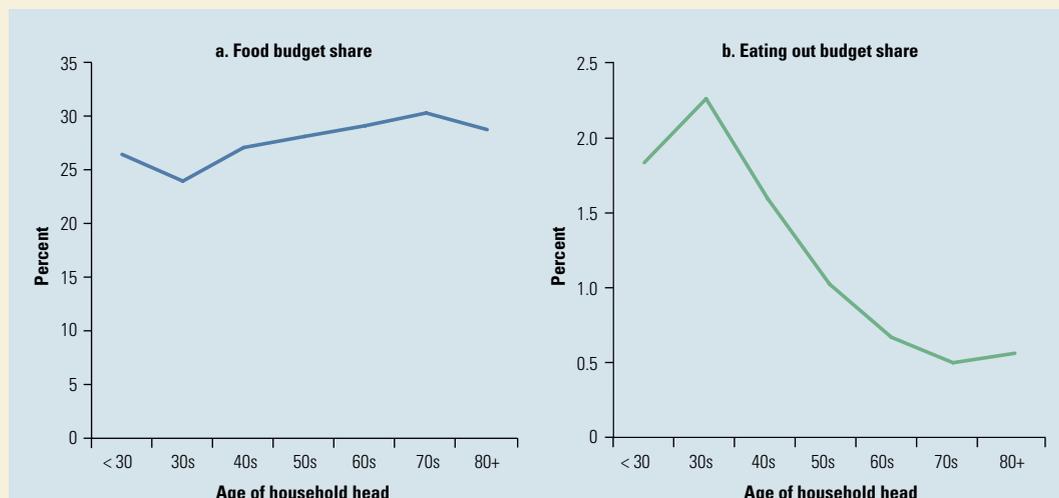
BOX 5.1 (continued)

Another bias of poverty estimation may come from the survey selection or mortality bias. More educated and wealthier individuals tend to have healthier lifestyles, and hence they have a higher probability of surviving longer (Attanasio and Hoynes 2000). In contrast, poorer individuals tend to die earlier or, if less healthy, may reside in elder-care centers and thus are not captured in surveys. In other words, there are age-related biases that may make the elderly seem less poor than they actually are.

Conversely, a bias in the measurement of consumption may lead to an overestimation of the poverty level among the elderly. The elderly have

different preferences and needs from the young. Specifically, the opportunity cost of (leisure) time tends to fall after retirement, which affects consumption patterns. For example, household data from Poland show that although the share of food consumption does not decline with age, the elderly are more likely to consume more purchased foods (which are prepared at home) and less likely to eat away from home (figure B5.1.2) (Evans et al. 2014). As a result, although total consumption, including imputed value for home production, may not decline after retirement, poverty for old people will appear higher if calculated using exclusively the value of goods and services purchased in the market.

FIGURE B5.1.2 Food consumption does not decline with age, but the pattern changes, Poland, 2010



Source: Evans et al. 2014. Calculations based on ECAPOV harmonized data.
Note: Consumption is measured at the household level.

a. The methodology of equivalence sensitivity is based on Deaton and Paxson (1997) and Lanjouw and Marra (2013). The economies of scale parameter takes any value between 0 and 1 and 1, where 1 assumes no economies of scale (unadjusted per capita), and 0.5 assumes that half the resources are shared. The economies of composition parameters give different discounts for children and elderly, assuming that they require fewer resources than adults for the same level of welfare.

elderly population and the rise in wealth inequality and its implications for future generations. The next section considers the importance of pensions for poverty and inequality and the likely implications of pension reform programs in the region. Finally, the chapter summarizes the discussion with an estimation of how the channels between aging and poverty or inequality may play out in different countries in the Europe and Central Asia (ECA) region and the Baltics.

BOX 5.2 Recent Trends in Poverty and Inequality in Europe and Central Asia, 1987–2012

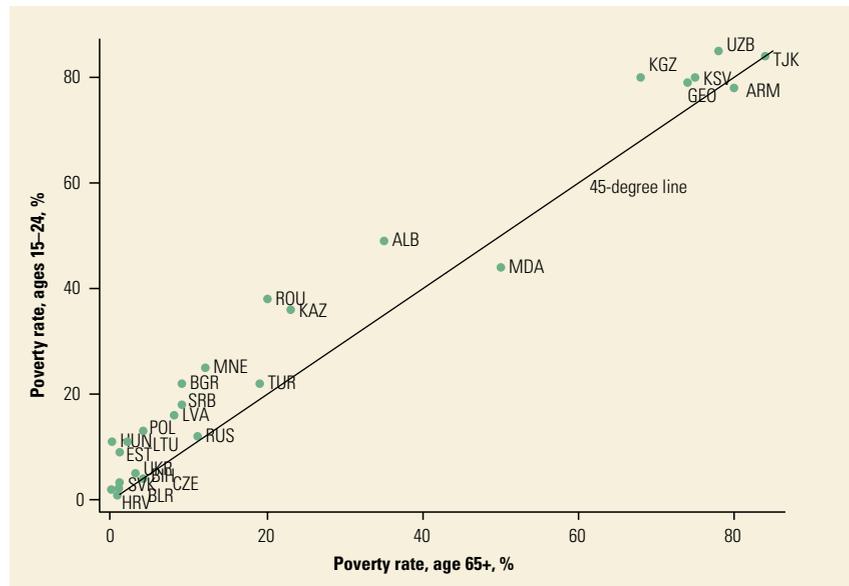
Recent trends in poverty and inequality in the region have been characterized by two distinct phases: the first covers the decade from the mid-1980s to the mid-1990s; the second extends from the mid-1990s until now. During the first period, poverty and inequality rose sharply as countries transitioned to market economies. On average across countries, the Gini index of inequality of consumption per capita increased from 23 in 1988 to 35 in 1994. For some countries, the expansion was large: the Gini climbed 18 points in the Kyrgyz Republic and Ukraine and 24 points in the Russian Federation within five years. Similarly, between 1988 and 1998, absolute poverty (based on consumption per capita) in the region rose from 2 to 21 percent (World Bank 2000).

This evolution in poverty and inequality is closely linked with the economic transition that many countries experienced. Under the planned economy, most people had secure employment and stable wages, assets were concentrated in the state, earnings dispersion in the dominant state sector was explicitly restricted, and tax and transfer policies were designed to limit income differentials. The result was a rather low level of poverty and inequality. The collapse of the Soviet Union was accompanied by a rise in vulnerability and inequality. Observers have provided several reasons for this increase: the redistribution of capital from the state to private agents; the ensuing shrinkage of the public sector and the creation of a fully liberalized private sector; the emergence of entrepreneurial opportunities for creative individuals; price liberalization; the changes in asset returns, especially the liberalization of wage setting leading to a rise of skill premiums; the appearance of unemployment; trade liberalization and the resulting creation of winners and losers; and the general decline in safety net and redistributive policies (see, for example, Commander, Tolstopiatenko, and Yemtsov 1999; De Soto and Dudwick 1999; Ferreira 1999; Giammatteo 2006;

Ivaschenko 2003; Milanovic 1999; Mitra and Yemtsov 2006).

In the next 15 years, absolute poverty dropped to less than 10 percent on average across countries. Inequality stabilized after the transition and even decreased in some cases. The Gini declined and remained relatively stable at around 32 in most countries. To this day, inequality in regional countries remains among the lowest in the world. The average Gini in Europe and Central Asia in the past decade was approximately 35, compared with 39 in East Asia and the Pacific and 41 in the Middle East and North Africa, as well as in South Asia. In contrast, the average Gini is 49 in Latin America and 45 in Sub-Saharan Africa (World Bank 2014).

These shifts, however, differed across countries. Progress on poverty was more dramatic in some countries, and the stabilization of inequality happened earlier for some countries than others. Some countries, including most Central European countries, emerged from the transition in a better position in terms of welfare. They became middle-income countries with low poverty rates and inherited a relatively large human capital stock from the Socialist period. Fluctuations in inequality in these countries have declined since the early part of the 2000s (Simai 2006). Other countries that began the millennium in the low-income group—including Armenia, Azerbaijan, Belarus, Kazakhstan, the Kyrgyz Republic, Moldova, Tajikistan, and Ukraine—saw inequality decrease a bit later, from around 2005 onward. Nevertheless, these countries achieved the largest reduction in poverty, albeit from a very high base. Most impressive is Moldova, which cut absolute poverty by 68 percentage points from 2000 to 2012. The decreasing trend did not start in Bosnia and Herzegovina, Kosovo, the former Yugoslav Republic of Macedonia, and Serbia until after 2010, partly because they were subject to political and economic transformation much later, which may have led to more stratification in society.

**FIGURE 5.2**

The elderly are less poor than the young in many countries in Europe and Central Asia, circa 2010

Source: Azevedo, Munoz Boudet, and Nguyen 2014. Calculations based on ECAPOV harmonized data. Note: Poverty is calculated from household income (or consumption) per capita using the US\$5 a day (2005 purchasing power parity equivalent) poverty line.

The Extent of Poverty in Aging Societies

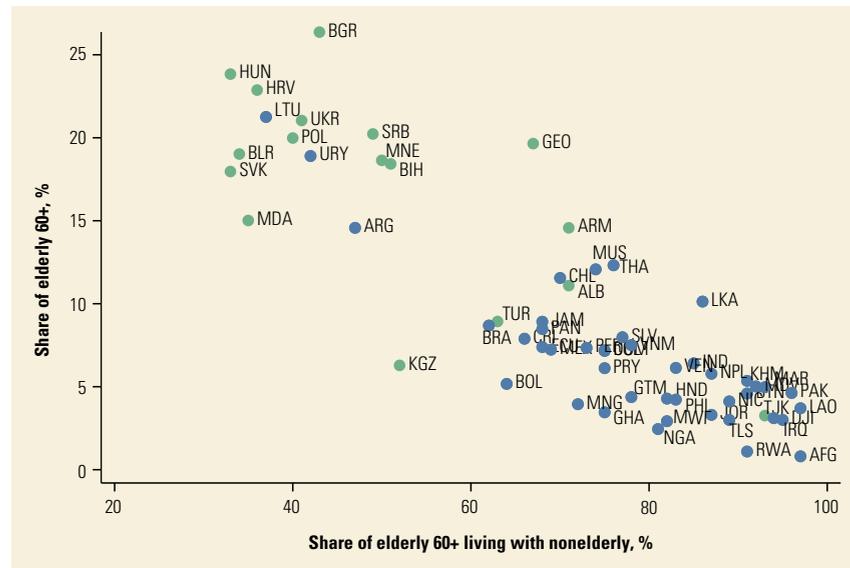
Poverty in aging societies can change for two broad reasons. The first is rather mechanical: as the share of old people increases in a population, the poverty incidence of this group will account for a larger weight in the calculation of the poverty rate of the society as a whole. The second broad reason for poverty change is less direct and more difficult to quantify, but it can be important. As societies become older, household composition changes, and more elderly live alone. As a result of this change in living arrangements, older and younger people are less likely to share their incomes. The former become more dependent on pensions, and the younger become more vulnerable to downturns in the economy. In addition, growing demand by the elderly for certain goods and services—health care, for example—can put pressure on the prices of these services and affect consumption levels and therefore poverty. These issues are discussed in detail below.

The elderly are not the poorest group in Europe and Central Asia and aging does not necessarily lead to higher poverty rates. Household survey data show that poverty among the young is higher than among the old. Even in poorer countries such as Armenia, Azerbaijan, Georgia, the Kyrgyz Republic, Tajikistan, and Uzbekistan, where overall poverty rates ranged from 75 to 85 percent at the US\$5 purchasing power parity (PPP) level in 2005, the old-age poverty rate is still below that of the young. Across age groups, the difference in the incidence of poverty is quite large (figure 5.2). The average poverty incidence for the group aged 15–24 around the year 2010 (specific year for each country depends on data availability) is 32 percent, and its median is 20 percent.¹ In contrast, for the old group (65 or more years) the average and the median poverty incidence are 26 and 10 percent, respectively.

FIGURE 5.3

The elderly are less likely to live with nonelderly in aging societies

- Europe and Central Asia
- Other countries



Sources: Calculations based on coresidence data from Evans and Palacios (2014) and elderly share data from World Population Prospects: The 2012 Revision. Coresidence data are from the ASPIRE database, which harmonizes the most recent available household surveys across 62 countries. Note: The figure reflects the most recent year available. Not all countries in the region are represented due to availability of data.

Poverty rates are higher for old individuals than for young ones in only two countries (Armenia and Moldova) out of 26. Societies with a higher share of elderly, therefore, do not necessarily have higher overall poverty rates.

The aging of a society can still influence the overall poverty rate in indirect ways. One important mechanism is the change in household composition and the related shifts in income sources and consumption patterns.

The elderly in an aging society are more likely to live alone or only with other elderly (figure 5.3). The rise in elderly-only households is directly linked to decreasing fertility or increasing longevity—there are simply fewer younger individuals—but it is also due to the declining prevalence of multigenerational households. Figure 5.3 also highlights that this living arrangement among the elderly is particularly common in Europe and Central Asia. For the same share of elderly in the population, a country in this region has more elderly living alone (or with other elderly) than in other regions. For example, people aged 60 or older account for approximately 7.8 percent of the total population in India and the Kyrgyz Republic, but in the Kyrgyz Republic just 52 percent live with nonelderly, whereas in India 85 percent do. And in older societies, such as Argentina and Moldova, where the elderly account for 15 percent, the share of elderly living with nonelderly is 35 percent in Moldova but close to 50 percent in Argentina. Elderly-only households account for about 10 percent of households in Europe and Central Asia,² but only 1–5 percent in Latin America, Africa, and Asia (Evans and Palacios 2014). In addition, an average (weighted by population) of eight countries in Central Europe and the Baltics based on European Union Statistics on Income and Living Conditions (EU-SILC) data³ shows that the share of elderly-only households has increased in recent years, from 8.6 percent in 2005 to 9.2 percent in 2012. The rise is particularly large among the bottom 40 percent of the income distribution, from 9.4 percent in 2005 to 12.2 percent in 2012.

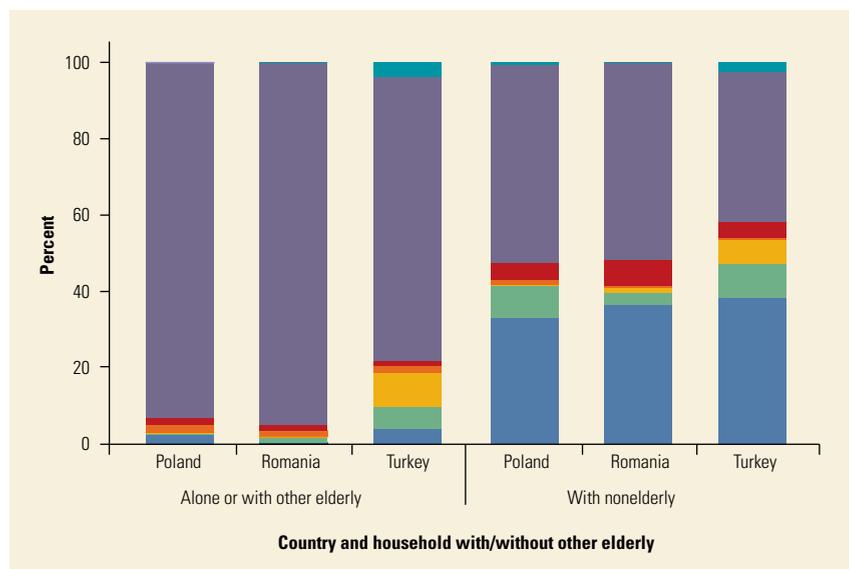


FIGURE 5.4
Elderly (65+) living by themselves rely significantly on pension income, 2010

■ Labor
■ Agriculture
■ Capital
■ Transfers
■ Benefits
■ Pensions
■ Other

Sources: World Bank calculations based on ECAPOV harmonized data.

Note: Labor includes wages and self-employment. Agriculture includes income from farm production. Capital includes rents and the sale of property. Transfers include interhousehold transfers, whether domestic or involving a foreign country. Benefits include all social assistance transfers such as housing subsidies and child, unemployment, and disability benefits. Pensions include contributory, survivor, and social pensions. Other includes scholarships, alimony, and other unspecified income.

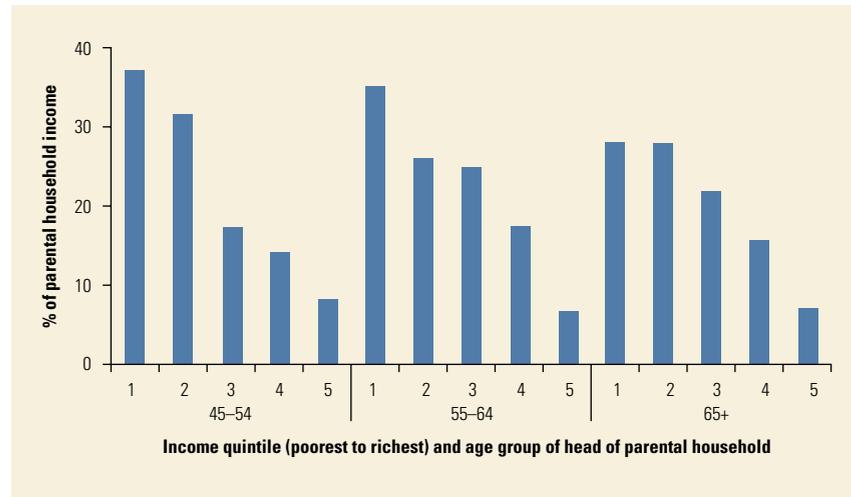
Who the elderly live with is an important determinant of their access to resources. Elderly living with nonelderly have some access to labor income, whereas elderly living alone or only with other elderly rely almost exclusively on pension income (figure 5.4). On average, in Poland, Romania, and Turkey more than 80 percent of the incomes of elderly living alone or with other elderly comes from pensions. In contrast, elderly living with nonelderly have a higher proportion of their incomes (50 percent on average) linked to other sources (such as labor income). This highlights the vulnerability of elderly living by themselves (alone or with an elderly partner) when the pension system becomes less generous and moves away from its safety net function (see below for a discussion of these effects).

Women are particularly likely to live alone. Although elderly women and men are equally likely to live without their children (about one in three elderly men or women), a higher share of female elderly live alone because they outlive their partners. Available data from 14 countries in the region indicate that, on average, 19 percent of elderly women live alone, compared with 7 percent of the male elderly (Evans and Palacios 2014). In Belarus and Moldova, as many as 47–48 percent of female elderly live alone. These women may not necessarily be impoverished, thanks to the prevalence of a survivor pension, a legacy of the Soviet system in many regional countries. However, their income is on average lower than that of other women; they hold less savings and experience poorer health (Azevedo, Muñoz Boudet, and Nguyen 2014).

Beyond their own income and resources shared within the household, the elderly can rely on support from other parts of society, such as social benefits and interhousehold transfers (transfers between generations residing in separate households). Social and interhousehold transfers play a limited role in poverty reduction but could be important for the most vulnerable, especially if they have no

FIGURE 5.5

Transfers from children to their parents tend to be progressive, 2004–07



Source: World Bank calculations based on GGS Wave 1 (database).

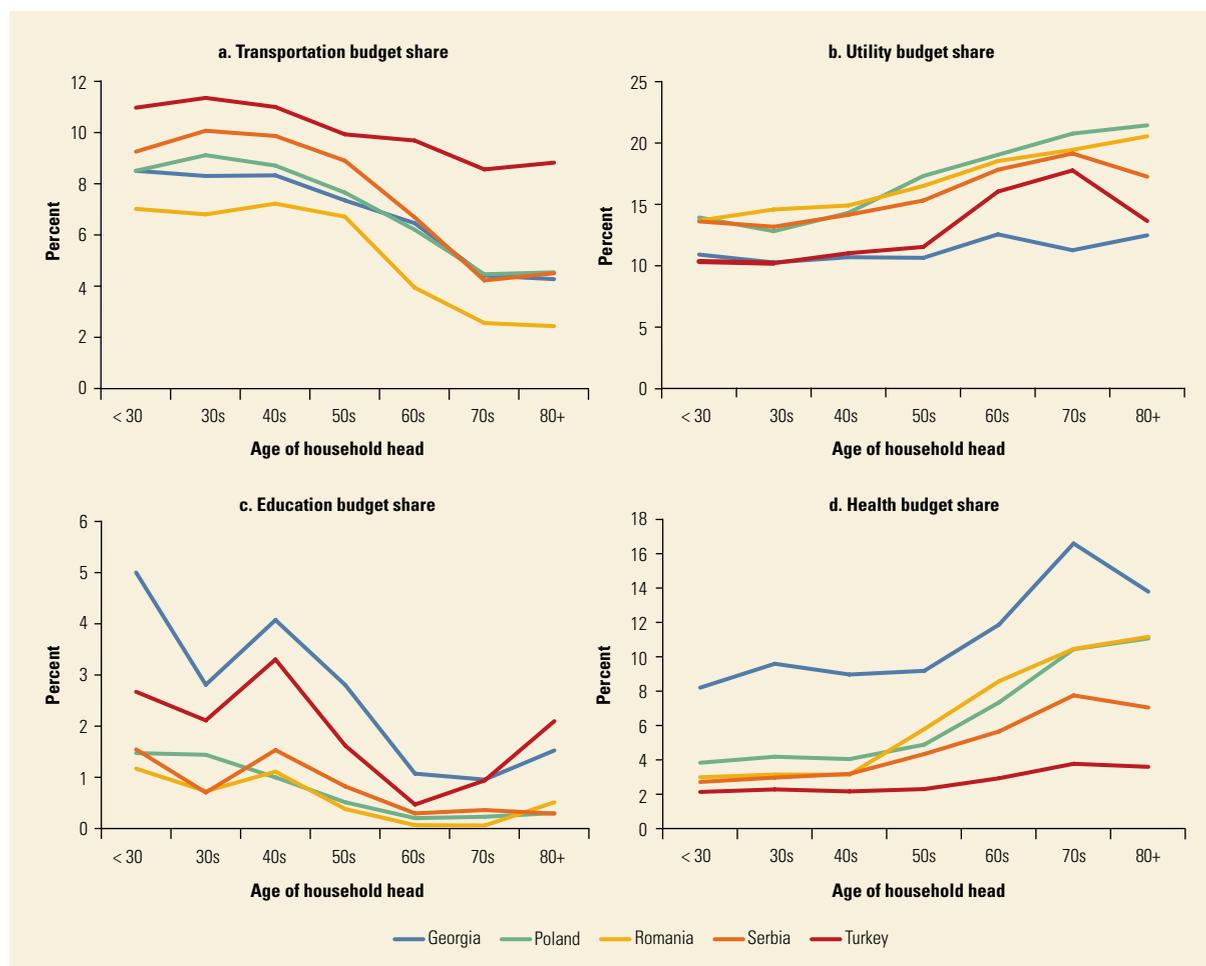
Note: The transfers indicated are weighted averages of transfers in Bulgaria, the Czech Republic, Georgia, Romania, and the Russian Federation.

other resources. Social assistance from the government (excluding pensions) does not make up much of the elderly's income, probably because many of these benefits are not targeted to the elderly (see figure 5.4). Poland, where these transfers played an important role in reducing poverty among households with elderly from 2005 to 2010, may be an exception. Interhousehold transfers also play a small role in supporting the elderly. Data for the region from different sources—including the EU-SILC, the Generations and Gender Survey (GGS), and the Survey of Health, Ageing and Retirement in Europe (SHARE)—show that less than 7 percent of the elderly respondents received financial support from a child.⁴

These transfers, although small, tend to be progressive, as they benefit the poorest old. According to the SHARE data, there is a negative correlation between the pension income and real wealth of the elderly and the likelihood of receiving transfers from their children. Elderly women living without a partner, and especially if they face limitations in their ability to cope with daily living activities, are among the most frequent recipients of private transfers.⁵ Similarly, GGS data show a declining trend of transfers as a share of household income as income rises.⁶ On average, the older poor receive 20–40 percent of their income from their children, and, notably, a much larger share is received in poorer countries such as Georgia and Romania (see figure 5.5). Similarly, public transfers delivered through social assistance programs are often targeted to the poorest. Nevertheless, governments of aging societies will be confronted with the need to assist a portion of the growing elderly population who suffer from dwindling pensions, the deprivation of living alone, and the lack of support from elsewhere.

Increasing shares of old individuals and shifts in household composition are also related to changes in demand patterns for aging societies. The share of consumption expenditures devoted to transportation and education drops rapidly as the age of the household head advances beyond retirement, due to a reduced need to commute to work and a smaller number of children in the household. In contrast, the consumption share for health and utilities increases (see figure 5.6). The increase in health spending often stems from older individuals' higher needs

FIGURE 5.6 Older individuals spend a higher share of their expenditures on health and utilities and less on transportation and education, circa 2012



Sources: Evans et al. 2014. Calculations based on ECAPOV harmonized data.
Note: Consumption is measured at the household level.

for medical services related to rehabilitation and long-term care. The rise in consumption of electricity, heating, and other utilities may be due to the elderly living in smaller households but larger houses (as their children move out), spending more time at home, and owning older and less energy-efficient appliances (Yamasaki and Tominaga 1997).

This shift in consumption patterns is expected to be more pronounced as populations become older. The rising demand for energy and certain health care services in aging countries could put upward pressure on prices of those services if supply does not adjust accordingly. The elderly may have to spend a lot on medicine and care, whether they are rich or poor or whether prices increase or not, out of necessity. Rising prices could then reduce the purchasing power of vulnerable elderly households and push them into poverty. Furthermore, as energy and medicine are goods of necessity, the poor may adjust to the rising prices through suboptimal mechanisms, such as reducing food or education spending.

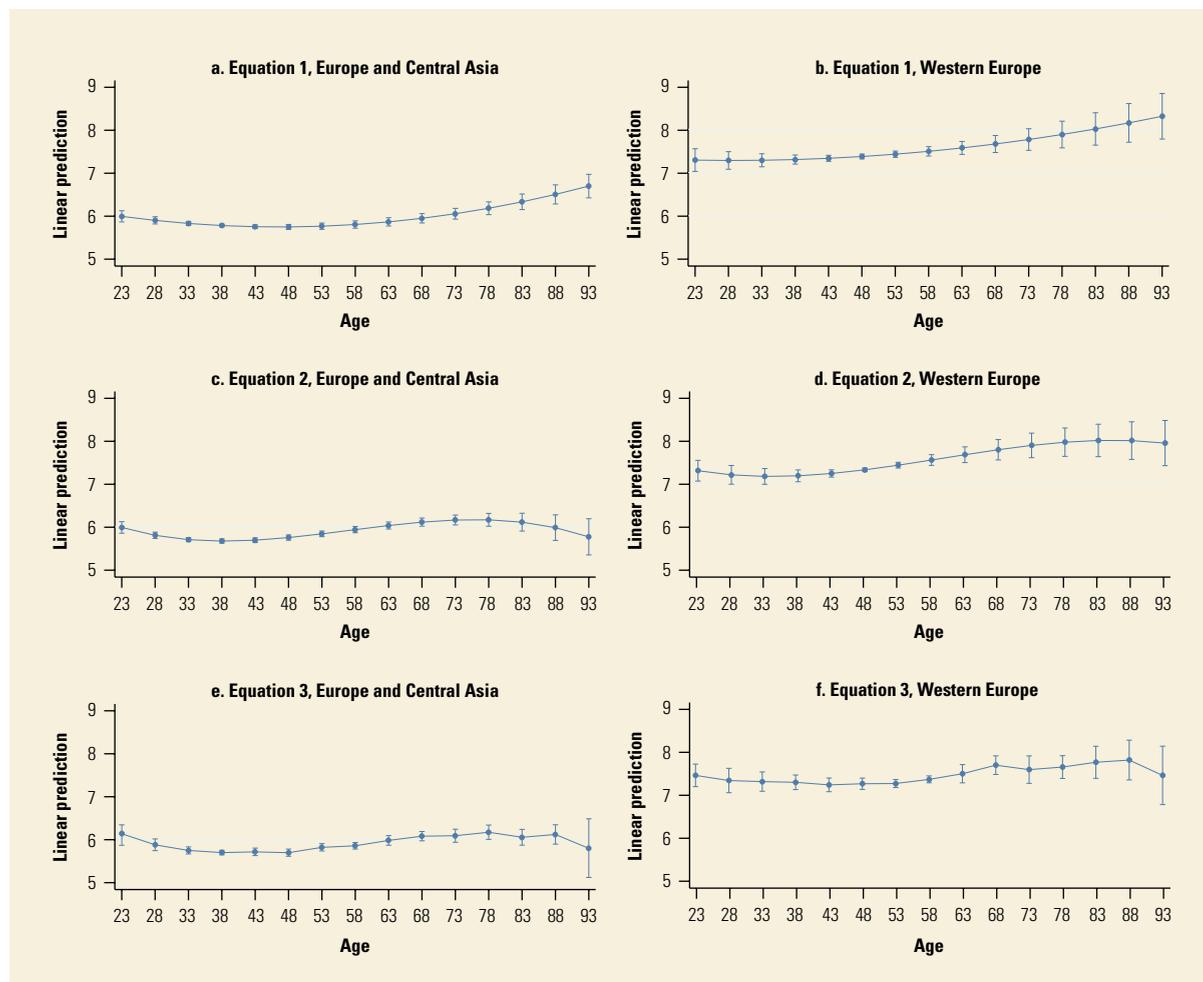
It should be noted that these aging-related issues affect poverty in a deeper sense. Poverty is measured for individuals. However, their welfare, incomes, and consumption depend on household arrangements, in particular on how incomes are pooled and how consumption and saving decisions are taken within the household and then recorded in household survey data. Taking into account these measurement issues may actually change the assessment of the situation (see box 5.1 for details).

Do the Elderly Perceive Themselves as Worse Off?

It is not easy to examine changes in subjective well-being at old age, because the development of well-being along the life cycle can differ vastly across countries, age groups, gender, and income groups. There is also no agreement in the literature on the definition of subjective well-being (or life satisfaction), which is a complex concept easily susceptible to bias. Similarly, subjective well-being can determine one's longevity as much as age is a predictor of well-being (the direction of causation between well-being and age is unclear). In Europe and Central Asia in particular, analyses of well-being have produced mixed results. On the one hand, Deaton (2008) argues that in middle-income and transition countries, where health satisfaction seems to be affected more negatively by age, life satisfaction declines with age. He points out that this age-related decrease is strongest in Central Europe and the Baltics and the former Soviet countries, where the elderly seem to be the most dissatisfied age group of all, but he attributes this trend to cohort effects. On the other hand, analyses that controlled for other factors affecting well-being find a U-shaped relationship between age and satisfaction (Hayo and Seifert 2003; Blanchflower, Oswald, and Stutzer 2008), where well-being picks up after middle age (although the exact age varies across studies).

A closer look at Europe and Central Asia shows that perceptions of well-being do not appear to deteriorate significantly at old age. A first analysis uses the Integrated Values Survey, which measures subjective well-being by asking respondents to rank their individual life satisfaction on a 10-point scale, with 10 being the most satisfied.⁷ Although the exact relationship between age and life satisfaction is unclear, life satisfaction does not show significant differences across age groups (figure 5.7). There is a small increase after retirement followed by a limited decline toward the end of the life cycle, but it is barely significant. Another analysis uses the Life in Transition Survey, which covers all countries in Europe and Central Asia except Kosovo, to follow individuals from 2006 to 2010. Subjective well-being in this survey is measured on a 5-point scale,⁸ but again perceptions of well-being are not strongly related to age.

A few additional observations regarding subjective well-being among the elderly in Europe and Central Asia are worth noting. First, individuals in the region tend to be less satisfied with their lives than their Western European counterparts are. Being employed, married, in good health, and rich seem to be positively correlated with life satisfaction, which may explain the lower outcome in the region than in more developed countries. Similarly, unemployment can result in long-term depression of individual well-being. Although widowhood is expected to reduce life satisfaction due to loneliness and, in some cases, loss of income, according to the Russian panel data, individuals can adapt to these events rather quickly. In short, the impact of aging on subjective welfare warrants deeper re-

FIGURE 5.7 Subjective well-being does not change significantly over the life cycle

Sources: Bauer, Nie, and Sousa-Poza 2014. Calculations are based on the Integrated Values Survey, which merges the European Values Study (EVS, 1981–2008) with the World Values Survey (WVS, 1981–2009).

Note: Life satisfaction is individually self-rated on a 10-point scale. Controls include sex; employment status (5-point scale, 0 = unemployed, 1 = full-time employed, 2 = part-time employed, 3 = self-employed, 4 = other; unemployment as reference); marital status (4-point scale, 0 = single/never married, 1 = married/living together, 2 = divorced/separated, 3 = widowed; single/never married as reference); education (3-point scale, 0 = low-level education, 1 = medium-level education, and 2 = high-level education; low-level education as reference); income (5-point scale, first-step income as reference); self-reported health (5-point scale, self-reported very poor health as reference); and dummies for cohort, children living in household, and year. Equation 1 regresses life satisfaction on age and age squared. Equation 2 regresses life satisfaction on age, age squared, and age cubic. Equation 3 regresses life satisfaction on age group dummies. The bars represent 95% confidence interval.

search, but there is no concrete evidence that the elderly in Europe and Central Asia are less satisfied with their lives than the young, although they may be less happy than their counterparts in more developed countries.

Does Inequality Rise with Population Aging?

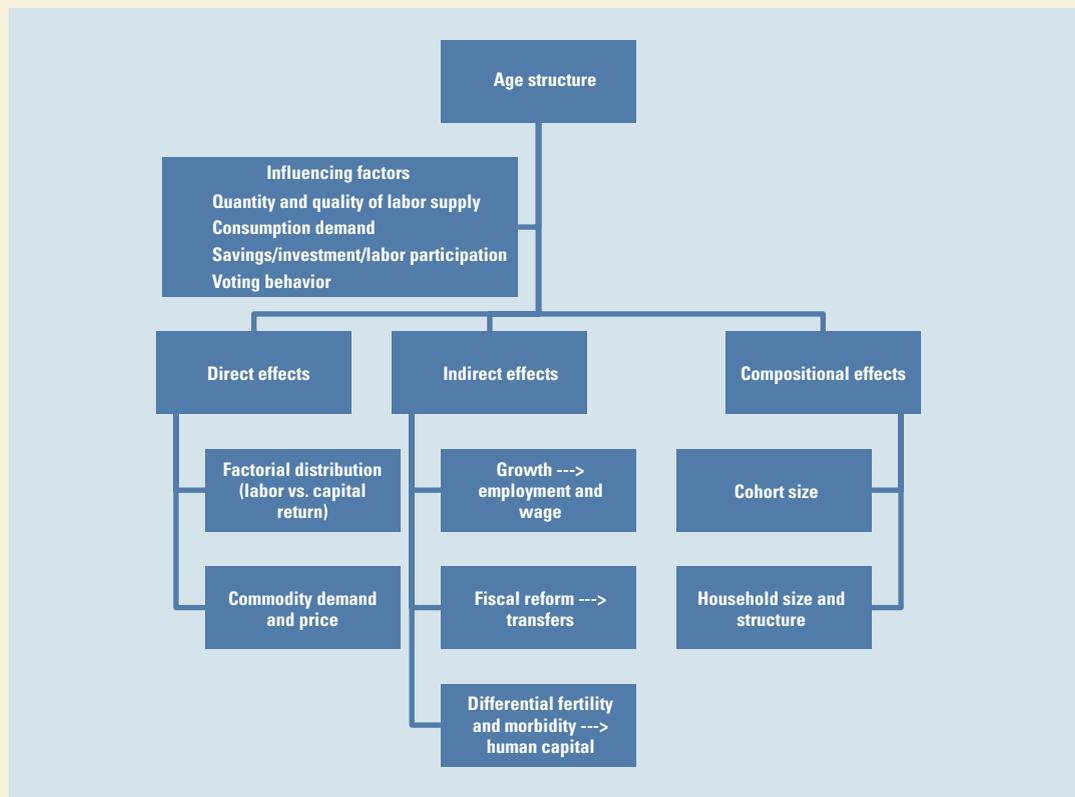
The aging of a society can also influence inequality. As in the case of poverty, aging affects inequality through different channels; the net impact is uncertain and depends on country characteristics (box 5.3 provides a more technical overview of

BOX 5.3 The Impact of Aging on Inequality

There is a vast literature on the effects of demographic changes on welfare and inequality. This research can be divided into three broad areas, according to the channels analyzed: (1) direct effects; (2) indirect effects; and (3) compositional effects (Lam 1997). Figure B5.3.1 illustrates the elements considered by each.

The direct effects include the impact of a change in the age structure on production through shifts in the relative supply of labor and capital, and on consumption through changes in the relative demand for different goods. For example, the entrance of the large baby-boom cohort into the labor force considerably reduced the mean wages

FIGURE B5.3.1 Aging affects inequality through multiple channels



of young workers and thus increased inequality between generations (see, for example, Berger 1989; Freeman 1979; Lam 2006; Welch 1979). Whether this impact is permanent or transitory remains to be seen. However, as the baby-boom cohort ages, the relatively smaller young generation will benefit from higher returns to labor com-

pared to capital (Krueger and Ludwig 2007). This mechanism can potentially shift resources from the old, many of whom own capital, toward the young wageworkers, widening the income gap between the two age groups. The higher returns to human capital investments may also exacerbate inequality among workers. Since the poor rely more on

(Continued)

BOX 5.3 (continued)

labor income and the rich more on capital income, however, a rise in the return to labor can reduce inequality for the society as a whole.

Aging also affects inequality indirectly, through the impact of aging on economic growth, through changes in individual and firm behavior, and through measures taken by the government in response to structural shifts. Although the literature on the impact of aging on growth draws mixed conclusions (see chapter 3), individuals are likely to adjust to the prospect of living longer through more investment in human capital, greater labor force participation, and higher savings, thus raising growth (Miyazawa 2006). Growth, in turn, is expected to affect inequality, although the direction of the impact depends on the pattern of growth. On the one hand, growth may widen inequality, since the rich are likely in a better position to invest in human capital and save, and through bequests they will transmit this inequality to the next generation. On the other hand, growth may generate more opportunities for the poor, hence reducing inequality. Governments may be under pressure to curtail pension provision for the elderly, and the choice of pension systems, defined contributions or defined benefits, can provide different incentives for savings and labor force participation (Dedry, Onder, and Pestieau 2014). Conversely, governments may be influenced by a greater political power of the elderly and divert resources away from the young (Arawatari and Ono 2008).

Finally, aging may affect inequality by changing the relative size of age groups, referred to as the compositional effect (Deaton and Paxson 1994; Lam 1997). If birth cohorts (groups of popu-

lation born in the same period) tend to become more unequal as they age, as is hypothesized by the Mincerian theory of increasing skill premium along with experience (Mincer 1974), the rise in the share of the elderly in the population will increase total inequality. If the mean income of the elderly is closer to the population average than that of the young, however, total inequality will decrease. Nevertheless, the magnitude of this shift is rather small, for two reasons. One is that the demographic transition takes a long time, and it can be decades before a significant rise in the share of the elderly is recorded. Second, since total income can be measured only at the household level and the age structure of households may shift more slowly than the individual age structure, the rise in the share of “older” households may be smaller.

A framework is useful for putting these effects together. A population can be divided into different age groups, and overall inequality will depend on the distribution within and across age groups, as well as their sizes. In more formal terms, most inequality indexes can be written as a function of three components: inequality within groups I_g , the average levels of welfare \bar{w}_g of the groups, and the population share of each group, as follows:

$$I_{total} = f(I_g, \bar{w}_g, n_g).$$

In this framework, the within- and between-group inequality is influenced by the direct and indirect effects of aging, while the group size drives the compositional effect. But adding these elements can be tricky, because they sometimes counterbalance each other. The impact of aging on total inequality, therefore, depends on how each channel plays out in different contexts.

these dynamics). A useful way to organize the discussion on aging and inequality is to split the population into different groups according to their ages and consider what happens to inequality between groups and within groups as the share of older people increases.

Inequality between groups, also called intergenerational inequality, takes into account the gap between the average individual in one group and the average individual(s) in the other group(s). For simplicity, consider just two groups, the

Aging societies run the risk of becoming polarized as differences in earnings, participation, health status, and even mortality between skilled and unskilled tend to increase with age.

young and the old. In most cases, the young tend to rely on wages and the old tend to rely on returns on their assets. In an aging population, the return on labor tends to rise relative to the return on capital (assets), so that the young will be better off. The shift in returns may result in lower overall income inequality if the young group was initially poorer and larger, but this varies among countries.

Inequality within each age group (or generation) depends on the dispersion of assets and returns owned by the various members of the group. A general finding is that the skill premium, or the gap in labor incomes between a skilled and an unskilled worker, tends to be larger in older groups. This is because better-educated workers tend to work on more complex tasks and usually improve their productivity with experience. In addition, they tend to work less physically demanding jobs and thus have longer work lives. If this skill gap persists as society ages, a larger polarized group of old workers could push up overall inequality in a society.

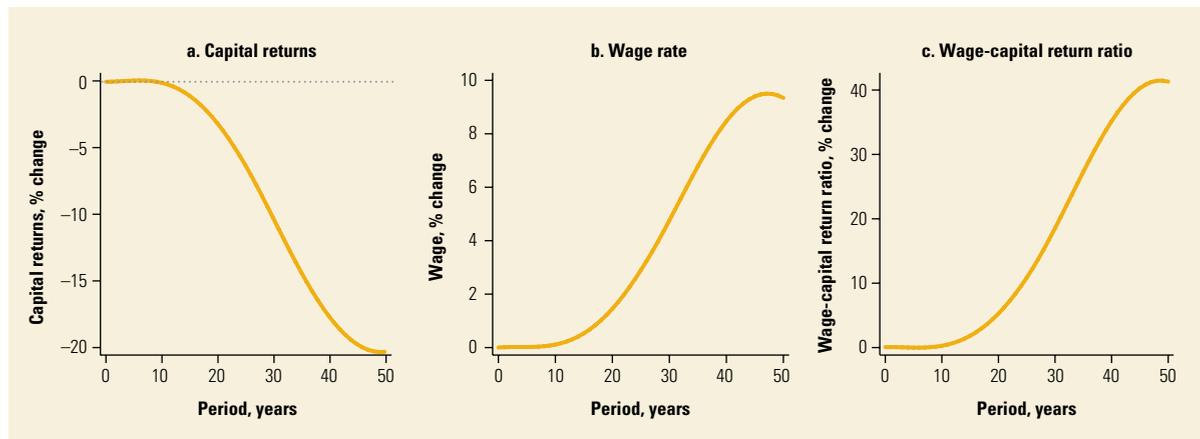
The higher accumulated benefits of better-educated individuals—or individuals starting their life cycle with some other advantage—can translate into larger savings and wealth later in life and be passed on to the next generations. Thus, intergenerational transfers or inheritance mechanisms could reproduce inequality within the younger generations of the future.

These issues are discussed in more detail in the sections that follow. The first section focuses on inequality between the young and the old, or how inequality between age groups changes as a result of aging. The second section looks at some evidence that human capital returns rise with age, which leads to higher inequality among the old than among the young. The third and final section explains how inequality at old age can be passed on to younger generations. These dynamics are examples of the risks that aging poses to equality.

Will Aging Shift the Distribution of Income toward the Young?

Aging is expected to shift relative factor prices—in practice, the ratio of wages to the return on capital (w/r), which plays a central role in determining the winners and losers from demographic change. Aging brings about an increase in the capital-labor ratio (and the capital-output ratio) and a corresponding increase in the ratio of wages to capital income. Simulations using the overlapping generations (OLG) model developed in chapter 3 find that both declines in fertility and increases in longevity increase wages relative to the return on capital. With improved longevity, higher savings (due to agents' foreseeing longer lives) push up investment and support a larger capital stock. The larger capital-to-labor ratio is associated with higher wages relative to the return on capital. With reduced fertility, the growth rates of population and gross domestic product (GDP) slow down, but, given that the saving rate is not affected, the investment-to-GDP ratio remains the same. As a result, the capital stock increases relative to labor supply. In the fertility scenario, the w/r ratio rises by more than one-third over the 50-year period of the simulation (see figure 5.8).⁹ This result is consistent with other empirical exercises. For example, Krueger and Ludwig (2007), studying the impact of aging, project an approximately one-percentage-point decline in the interest rate and a

FIGURE 5.8 The wage-capital return ratio increases as fertility declines



Source: Overlapping generations (OLG) model developed for this study.

4 percent rise in wage rates in the countries of the Organisation for Economic Co-operation and Development (OECD) between 2005 and 2050.

Given that capital is held in larger proportion by older individuals, while younger individuals rely mainly on income from wages, changes in the w/r ratio can result in a redistribution of income from the old to the young. So that the impact of these changes in factor prices on changes in the personal income distribution can be measured, the population is split into three age groups: young (ages 15–40), middle aged (ages 41–65), and old (above age 65). In the steady state, the young rely heavily on labor income, while their capital income is negative; that is, they borrow (figure 5.9). With a decline in fertility, the young benefit from both the increase in wages and the decline in the price of capital. For the middle aged, the effect is ambiguous because they supply labor, while also holding assets. Unlike the young

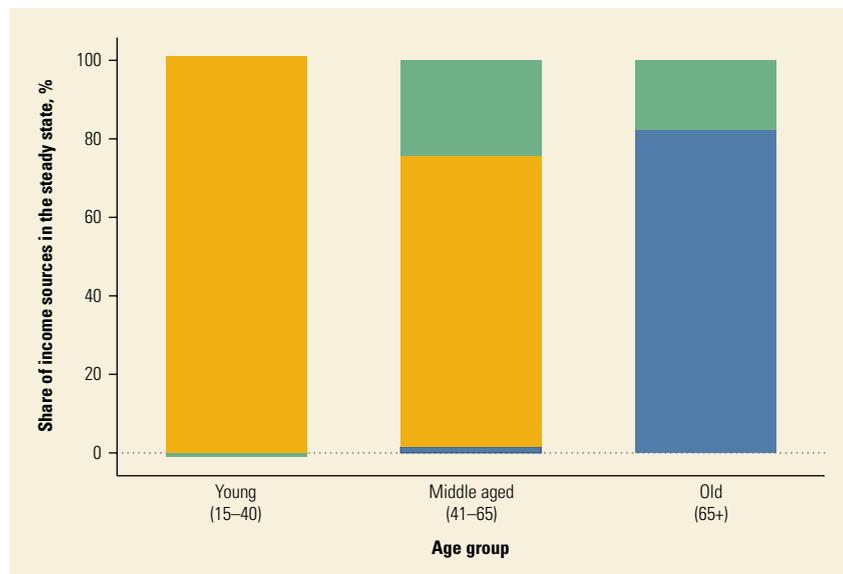
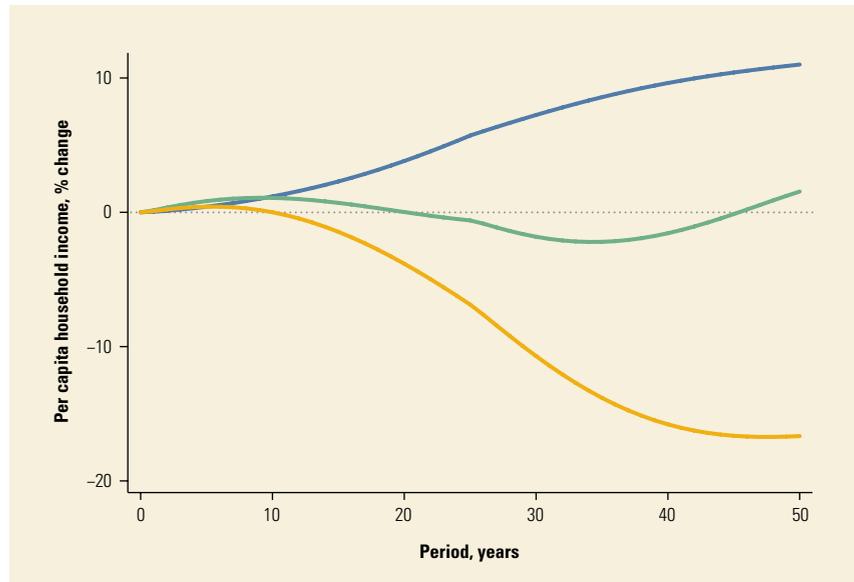


FIGURE 5.9 In a stable population, the young rely heavily on labor income while the old rely more on income from assets

Source: Overlapping generations (OLG) model developed for this study.

FIGURE 5.10
The young may experience income gains while the old may be worse off as fertility declines

— Young (15–40)
— Middle aged (41–65)
— Old (65+)



Source: Overlapping generations (OLG) model developed for this study.

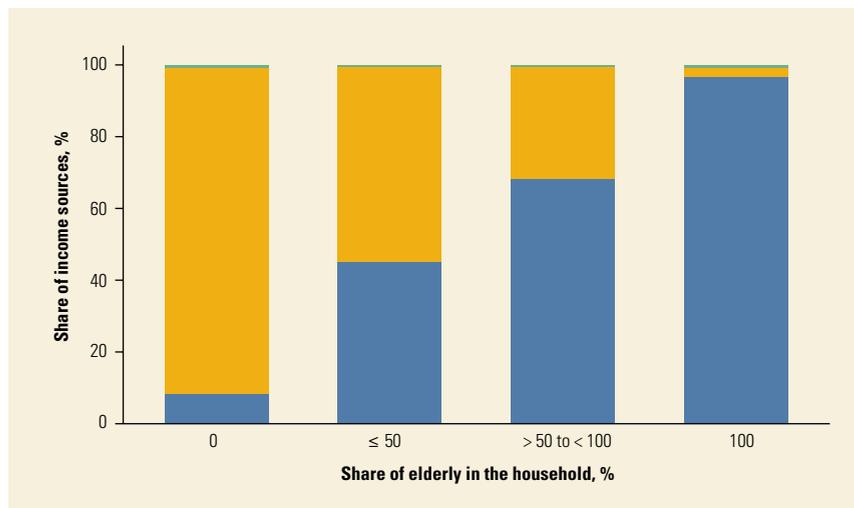
and the middle aged, the old do not benefit from higher wages because they do not participate in the workforce, while they lose because of the decline in capital returns.

Thus, the young experience a remarkable increase in market incomes, the elderly are clearly less well off, and the middle aged are mostly unaffected (figure 5.10). Similar shifts in income among generations can be seen with aging due to an increase in longevity.

The redistribution of income from the old to the young in reaction to population aging predicted by the model simulation may also be observed in the real world, because the differences in income composition assumed in the model (see figure 5.9) closely match actual patterns (figure 5.11). Labor income is the principal

FIGURE 5.11
Households with more elderly are more dependent on pensions, Central Europe and the Baltics, 2010

■ Capital
■ Labor
■ Pensions



Source: World Bank calculations using data from EU-SILC.

TABLE 5.1 Change in Income Inequality after a Reduction in Fertility

Age category	Annual income per capita		Population share (%)		Gini index of income distribution	
	Steady state (US\$)	Fertility scenario (US\$)	Steady state	Fertility shock	Steady state	Fertility shock
Young	16,157	17,929	43	31		
Middle aged	19,322	20,100	38	41	15	18
Old	11,649	9,779	19	28		

Source: Overlapping generations (OLG) model developed for this study.

Note: The estimates of incomes and population shares refer to the 50th year after the start of the fertility decline.

income source among younger households in Central Europe and the Baltics. As the share of elderly in households rises, pension benefits become more important, although capital returns constitute a relatively minor income source. This implies that younger households will tend to benefit from a rise in the ratio of wages to the return on capital in reaction to population aging, while the old will tend to suffer a welfare loss.

Two additional elements need to be taken into account to measure the impact of the redistribution of income from the old to the young on societal inequality. First, the extent to which the younger age groups that are gaining from the rise in wages were initially poorer, or richer, than the older age groups that are losing must be clarified. Second, the relative size of the three age groups must be determined. In the model scenarios based on data from the Russian Federation, the young and middle aged are initially a larger and richer group than the old. The reduction in fertility ultimately (after 50 years) increases the incomes of the already richer young and middle aged relative to the poorer old. In addition, the population weight shifts away from the initially large group of the young, who have earnings in the middle of the distribution, toward the initially smaller and poorer old group (table 5.1). As a result, the Gini index rises by 20 percent (from 15 in the steady state to 18) over the 50-year period.¹⁰ Fifty years after the start of the demographic shift, the middle aged are earning more than twice as much as the elderly, compared to 1.66 times in the steady state.

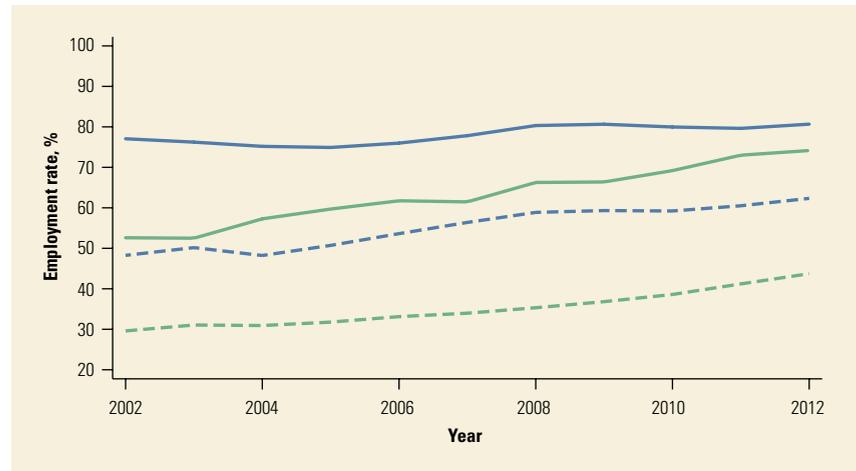
The inequality outcomes are similar in the increased longevity scenario, although the two scenarios diverge in the longer run. The impact of the rise in fertility is only temporary, and when the dependency ratio returns to its steady-state level, inequality also returns to its initial level. But the dependency ratio in the increased longevity scenario is permanently higher, so that the change in the distribution of income is likewise permanent.

Will the Gap between Low- and High-Skilled Workers Widen with Age?

The above discussion of intergenerational inequality is essentially an *aggregate* story that depends on the return on labor versus capital. However, inequality is also, and in reality mostly, due to dispersion around these aggregate macroprices: not everyone is getting the average wage or benefiting equally from its increase. For the full story of aging and inequality to become clear, inequality within age groups and the aging-related shifts in the relative sizes of these groups must be examined. The following discussion examines the dispersion around the average

FIGURE 5.12
Low-skilled elderly have increased their employment, but their employment rates are still below those of their skilled counterparts

— College, male
 — College, female
 - - - No college, male
 - - - No college, female



Source: Giles, Koettl, and Huang 2015, using data from EU LFS.

Note: Weighted average of Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, the Slovak Republic, and Slovenia by country populations.

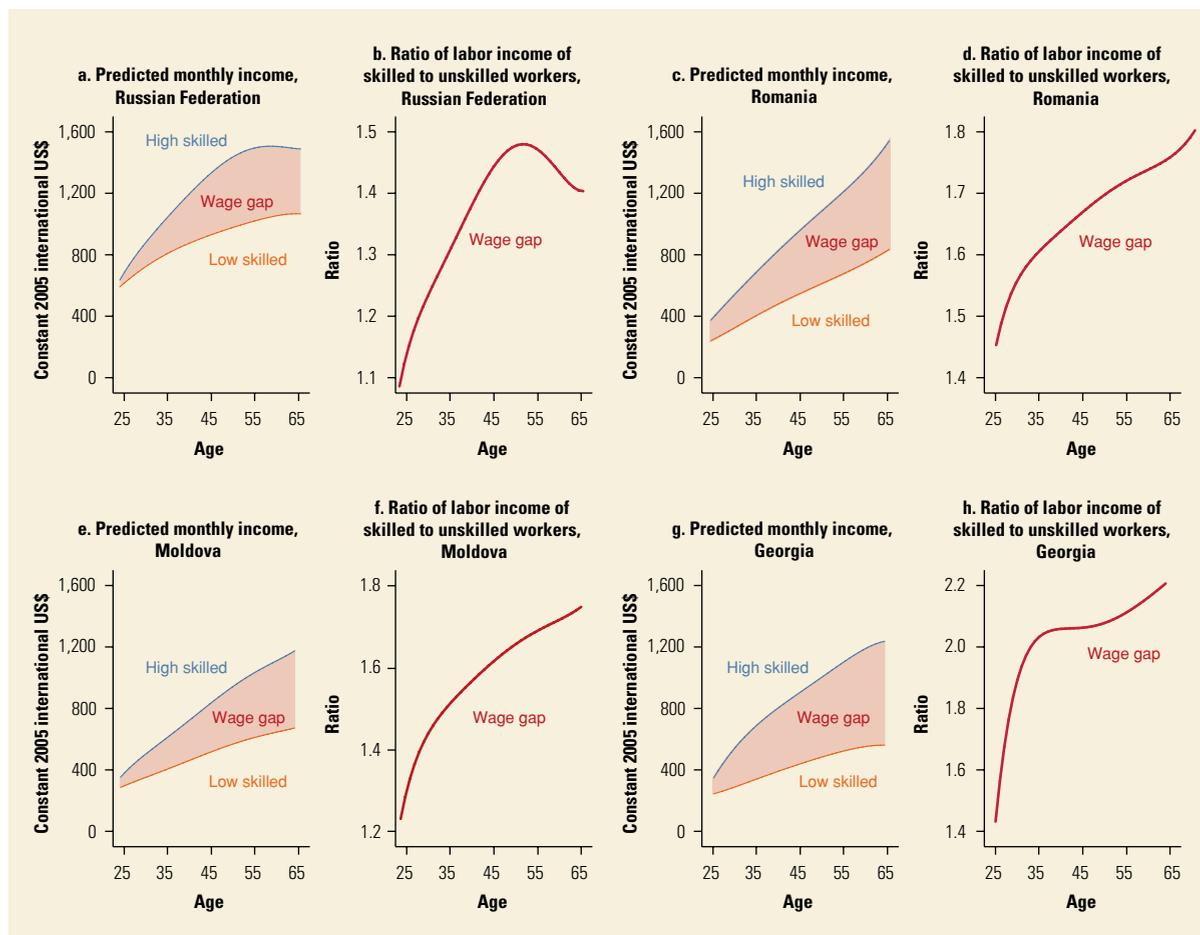
wages for different age groups, highlighting the increase in dispersion as the average age of the group increases.

Inequality within a specific age group can be explained, at least in part, by the different composition of the group in education and participation in the labor market. For the older age groups, the gaps in earning and participation among the skilled and unskilled are higher than in the younger age groups.

Within the older age groups, some elderly benefit from the rise in the relative return to labor as they work longer, but many others do not. First of all, the choice to work longer is not available to all. Differences in participation choices between low- and highly educated individuals tend to be exacerbated by aging. Because of meager wages, but also because of worse health conditions (see chapter 2), unskilled workers in a selection of regional countries tend to become unemployed or inactive at earlier ages than their skilled counterparts (figure 5.12). Older workers (aged 56–60) with tertiary education and above are much more likely to be employed than those with less than a college education. This gap has been closing for men (from 30 percentage points in 2002 to 18 percentage points in 2012) but has been widening for women (from 22 to 30 percentage points), as the employment rate of high-skilled females is increasing much faster than for low-skilled females.

An older society may be a polarized one, with the large cohort of older workers split into a rich and a poor group. A large literature (Acemoglu 2002; Acemoglu and Autor 2011; Denk et al. 2013; Golding and Katz 2007; OECD 2011; World Bank 2014) emphasizes that the skill premium plays a key role in explaining the recent increases in inequality of labor incomes in OECD countries and has also been an important force in pushing up inequality in ECA countries during the transition (box 5.2). There is evidence that the skill premium is widening with age (Kitov and Kitov 2013; Marotzke 2014). As experience is rewarded more for the better educated, the skill gap for workers who enter the labor market around the same time widens over their working lives, and inequality is then higher for the working elderly (Blundell 2014; Card and Lemieux 2001; Acemoglu and Autor 2011).

The magnitude of this effect for Europe and Central Asia (using data on Georgia, Moldova, Romania, and Russia) can be assessed by identifying different

FIGURE 5.13 Labor income inequality between high- and low-skilled workers increases with age

Sources: Bussolo et al. 2014. Data for Georgia: Household Budget Survey, GeoStat, Tbilisi, <http://www.geostat.ge/index.php?action=0&lang=eng>; for Moldova: Household Budget Survey, National Bureau of Statistics, Chisinau, <http://www.statistica.md/index.php?l=en>; for Romania: Household Labour Force Survey, National Institute of Statistics, Bucharest, <http://www.insse.ro/cms/en>; for the Russian Federation: RIMS-HSE database.

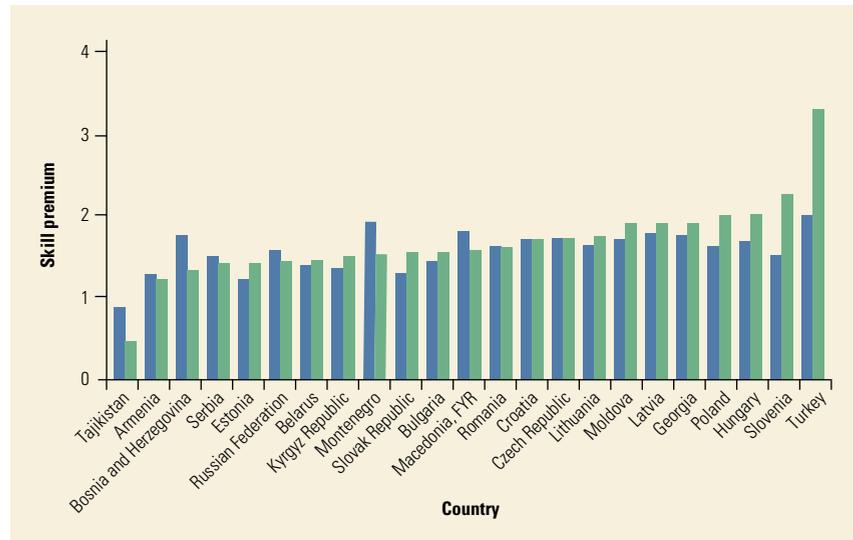
Note: High skilled = tertiary and above; low skilled = less than tertiary. The results are for cohorts of workers born between 1981 and 1985. The college/high-school mean labor income ratio serves as a summary index of the premium that high-skilled workers command relative to low-skilled workers, and this premium is determined by the relative supply and relative demand for skills. Since information on labor status is not available for all countries in all years, there is no differentiation between wage-employed and self-employed. However, for those countries where the information is available, robustness checks revealed very similar patterns when restricting the sample only to wageworkers.

cohorts of workers, according to their year of birth, and by “following” them as they go through their life cycles.¹¹ The returns to experience (approximated by age) are higher for the high skilled than for the low skilled, causing the wage gap to be particularly large among the active old (figure 5.13).¹²

In Russia, for example, 25- to 29-year-old university graduates earn on average US\$90 (constant 2005 PPP equivalent) more per month than lower-skilled individuals at the same age, which is equivalent to a premium of almost 15 percent.¹³ This premium increases over the life cycle, reaching about 40 percent, or approximately US\$450, for workers close to retirement (ages 50 to 64). In Romania, the overall pattern is similar, but the skill premium starts for the younger workers at a much higher level. With approximately US\$450 compared to US\$300 per month, 25- to

FIGURE 5.14
The skill premium for older workers is higher than for younger workers in most countries, circa 2010

■ 30- to 34-year-olds
■ 56- to 60-year-olds



Sources: Bussolo et al. 2014. Calculations based on ECAPOV harmonized data except Romania; for Romania, Household Labour Force Survey, National Institute of Statistics, Bucharest, <http://www.insse.ro/cms/en>; for the Russian Federation: RLMS–HSE (database); for Turkey: Labour Force Statistics, TurkStat, Ankara, <http://www.turkstat.gov.tr/Start.do>.

Note: Skill premium is defined as the high/low skill mean monthly wage ratio of wage-employed workers (high skilled = tertiary and above; low skilled = less than tertiary).

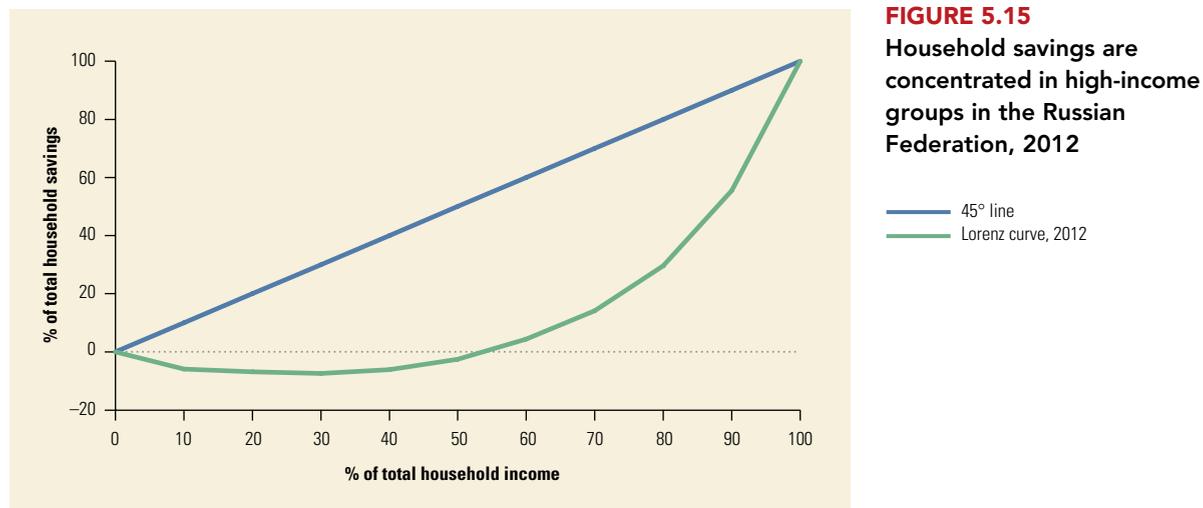
29-year-old university graduates earn on average 50 percent more than their lower-skilled counterparts. At ages 50 to 64, the difference is expected to rise to more than 70 percent, equivalent to a wage gap of about US\$500 per month.

An interesting feature of the evolution of the skill premium, especially clear for the cases of Moldova and Russia, is that it does not increase at the same speed across all ages. The age effect estimated from the data is shown to be concave, as the skill premium increases at decreasing rates after ages 45 or 50. This slowing of the growth in the premium may be associated with a reduction in cognitive skills as workers age (see chapter 4). It may also imply that high-skilled workers at later stages of their working life profit less from skill-biased technological change, as they have more difficulty in picking up new technologies.

Similar patterns are observed in many other countries in Europe and Central Asia where the skill premium among older workers (56–60 years old) is higher than among younger workers (30–34 years old) (figure 5.14). These patterns refer to a particular year and thus do not reflect the true life-cycle evolution of the wage gap as in the results for Georgia, Moldova, Romania, and Russia. Nevertheless, the results are indicative of a higher wage inequality among the older workers.

Inequality of Wealth among the Elderly and Implications for Future Generations

The cumulative advantage hypothesis predicts that a favorable position in early life generates additional benefits throughout the life cycle, widening the welfare dispersion among the elderly.¹⁴ Differential earning power in the earlier years of the life cycle builds up as time passes, so that there are wider disparities in accumu-



Source: Bussolo and Schotte 2014. Calculations based on data in RLMS-HSE.

Note: Savings are calculated as the sum of the net change in financial assets, minus the net change in liabilities, plus the net change in real estate holdings in the previous 30 days.

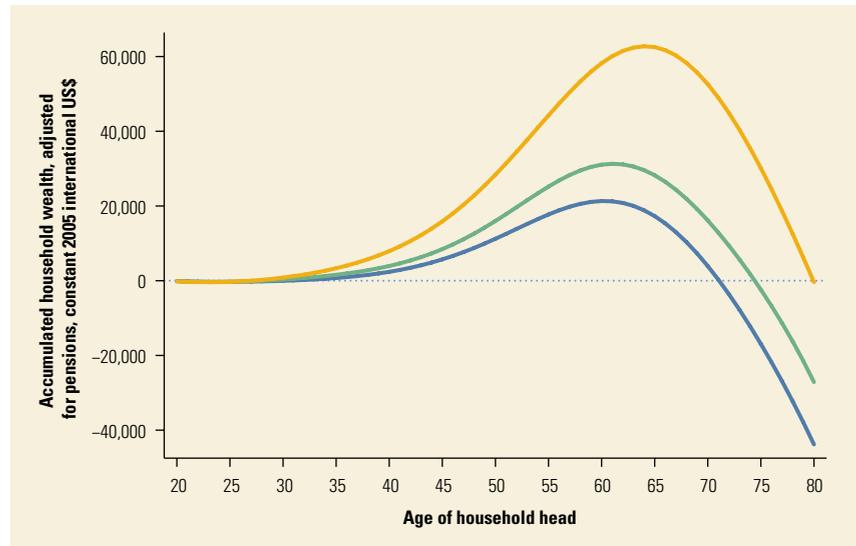
lated wealth in the later years (Budría Rodriguez et al. 2002; Davies and Shorrocks 2000). Inequality in incomes over the life cycle can lead to much larger inequality in wealth among the retired elderly, because differences in stock variables, such as wealth, can become multiples of differences in flow variables, such as incomes. An extensive literature, both empirical and theoretical, shows that asset holdings are generally much more unequally distributed than labor earnings (Budría Rodriguez et al. 2002; Davies and Shorrocks 2000). In most countries, the Gini index for wealth typically lies in the range of about 60–80, twice that of disposable income, which falls in the range 30–50 (Davies et al. 2011).

The rich generally have more savings than the poor, because they have more lifetime income and save more as a percentage of their earnings.¹⁵ Poorer households tend to save for precautionary purposes and retirement provision, while households with higher lifetime income also keep substantial amounts of assets even during old age in order to leave bequests.¹⁶ Moreover, in anticipation of higher longevity, people, especially the rich elderly, may increase their savings (see chapter 3).¹⁷ For example, in 2012 the richest 20 percent of all households in Russia accounted for approximately 70 percent of total household savings (figure 5.15).

The unequal wealth distribution, therefore, is particularly large toward the end of the life cycle. The positive relationship between age and savings may be steeper among the rich, who tend to have longer life expectancies. By contrast, poorer individuals with flat income-age profiles will accumulate fewer assets. Data from Russia suggest that, at the peak (at the end of one's working life), those with tertiary education—a proxy for a higher income profile—accumulate a stock of wealth more than three times as large as those with lower education (figure 5.16).¹⁸ Although this wealth diminishes during retirement as the elderly draw down their savings, those with lower levels of education run out of their accumulated wealth quicker (at around 70–75 years old compared with around 80 years old for the

FIGURE 5.16
Wealth accumulation is greater for the higher-educated group across the life cycle in the Russian Federation, 1994–2012

— Secondary education
— Advanced secondary education
— Tertiary education



Source: Bussolo and Schotte 2014. Calculations based on data in RLMS–HSE.

college educated), and some of the rich elderly may have enough at the end of their life cycle to pass on to their offspring.¹⁹

High wealth inequality among the elderly increases inequality among younger generations. Children of better-off parents enjoy many advantages from a young age well into adulthood. From the beginning, children of more educated parents tend to receive better educations, allowing them to have a better welfare start than their peers (see, for example, Breen and Goldthorpe 1997; Breen and Jonsson 2005). A family's sponsorship of children may also continue well beyond childhood. Parents from higher (occupational) social classes, with higher educational levels, incomes, and financial wealth, are more likely than lower-class parents to provide adult children with financial and social support. Social support can include parents' investment in adult children's housing, entrepreneurship, geographical mobility, and the like, which then lead to more and better job opportunities (Litwak 1960; Kohli and Albertini 2008; Albertini and Radl 2012). By providing their time in the form of grandparenting, the elderly make it possible for their children—mainly women—to have more children and participate in the paid labor market. Among the countries sampled in SHARE, on average more than one grandparent out of two had provided some grandparenting time in the 12 months previous to the interview.²⁰ Although there is no evidence on whether this intergenerational time transfer differs across income groups, the longer life expectancy and better health among the rich may mean that they are better able to provide care and social support to their children.

As for financial support, there is a large literature on parents' support for children (see, for example, Kurz 2002; Spilerman 2004; Kohli and Albertini 2008; Spilerman and Wolff 2012). This support can even go beyond the joint life course of the two generations in the form of bequests, thus widening inequality for society as a whole in subsequent periods (Bernheim, Shleifer, and Summers 1985; Szydluk 2004; Mare 2011). An analysis based on the Generations and Gender Sur-

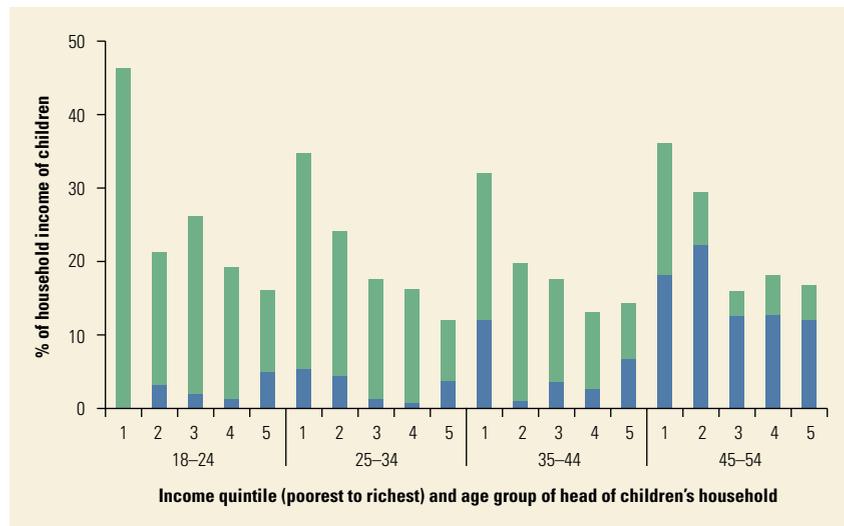


FIGURE 5.17
Adult children receive a significant part of their income from their parents, 2004–07

■ Inheritance
■ Other

Source: World Bank calculations based on GGS Wave 1.

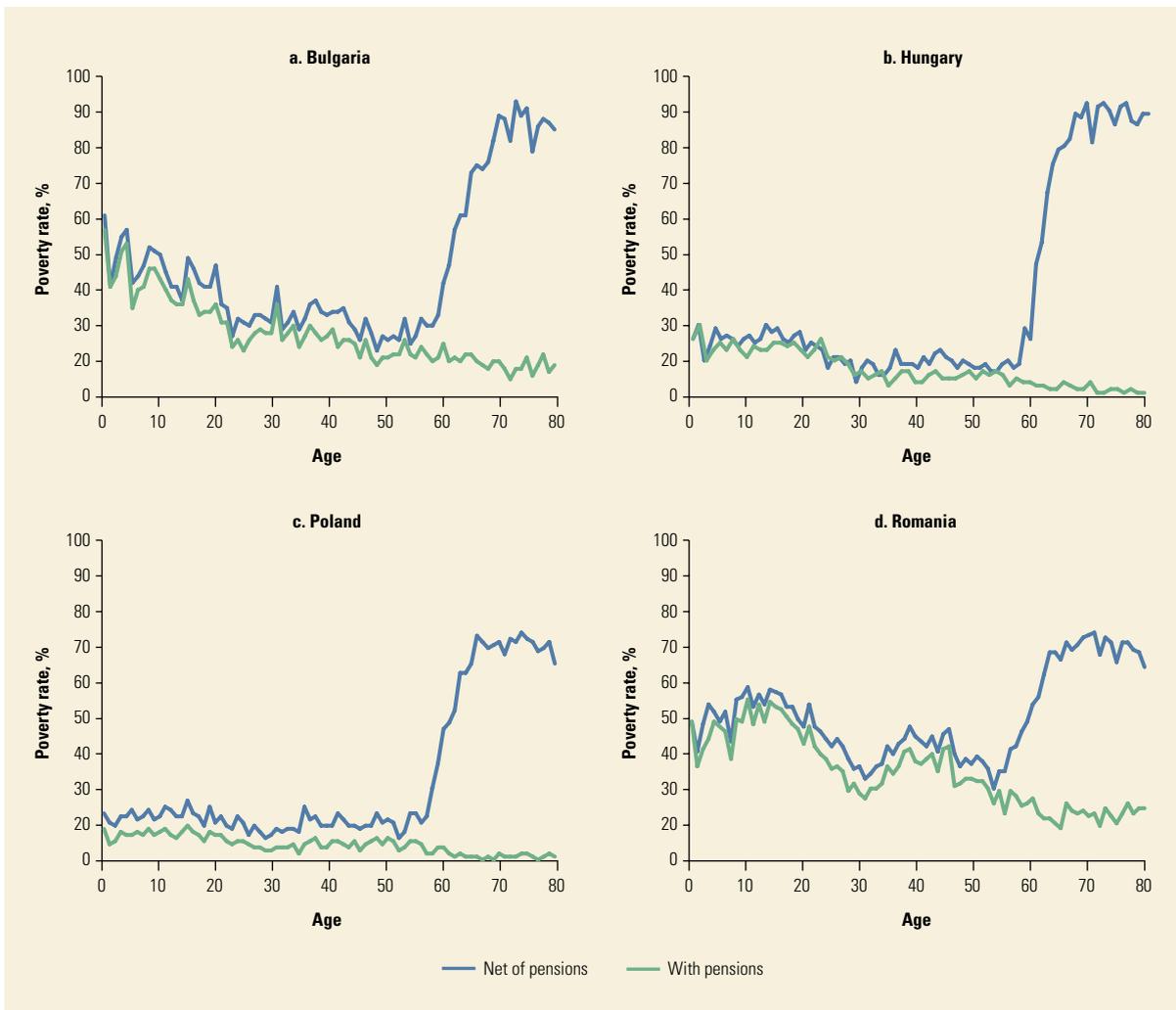
Note: The transfers indicated are weighted averages of transfers in Bulgaria, the Czech Republic, Georgia, Romania, and the Russian Federation.

vey data reveals that the money children receive from their parents can be a non-trivial source of income (figure 5.17). For household heads in their late 40s or early 50s, a large part of the transfers come from inheritances from their parents. Although households in the bottom quintile received the most as a share of their income, there is not much difference among other quintiles, which translates into a large disparity in the absolute amount of the transfers across income groups. Data on the region from EU-SILC and SHARE confirm this pattern. For example, an analysis of the SHARE data shows that children of more wealthy families are more likely to receive economic help.²¹ In addition, the fact that richer households tend to have fewer children than poorer households would exacerbate the unequal effect of transfers from parents to children, because the large transfers from richer parents would go to fewer children while the reverse is true for transfers from poorer parents.

In summary, the widening disparity in labor income among the old, the higher saving rates among the rich, and the steeper relationship between age and savings among the rich imply a growing discrepancy in accumulated wealth between the rich and the poor. This increased inequality is likely to persist in the future through the financial and social support that the older generations transfer to their children.

The Effects of Reforms on the Ability of Pensions to Limit Poverty and Inequality among the Elderly

Pensions—the main source of income for individuals aged 55 or older—play a crucial role in explaining why poverty incidence among the elderly is generally low.²² This can be illustrated by recalculating poverty incidence by age after subtracting pension receipts from total income (figure 5.18). For example, in the

FIGURE 5.18 Pensions help reduce poverty in old age, 2011

Source: Azevedo et al. 2014. Calculations based on ECAPOV harmonized data.

Note: Poverty is calculated based on household income per capita using the US\$5 a day (2005 purchasing power parity equivalent) poverty line.

absence of pensions, up to 70 percent of the elderly in Hungary in 2011 would have fallen into absolute poverty (US\$5 2005 PPP equivalent). In general, most countries in the region have some form of public pension program that aims at providing a minimum standard of living to address the problem of old-age poverty.²³

The calculation of poverty rates without counting pensions may, however, overemphasize the importance of pensions, for two reasons. First, in figure 5.18, pensions include both contributory and noncontributory transfers, but only the latter can be strictly considered a pure transfer that could be subtracted from total income to measure net-of-pension poverty. Second, calculating poverty by using the income net of pensions (both contributory and noncontributory) assumes an extreme and rather unrealistic counterfactual. Individuals would indeed save more

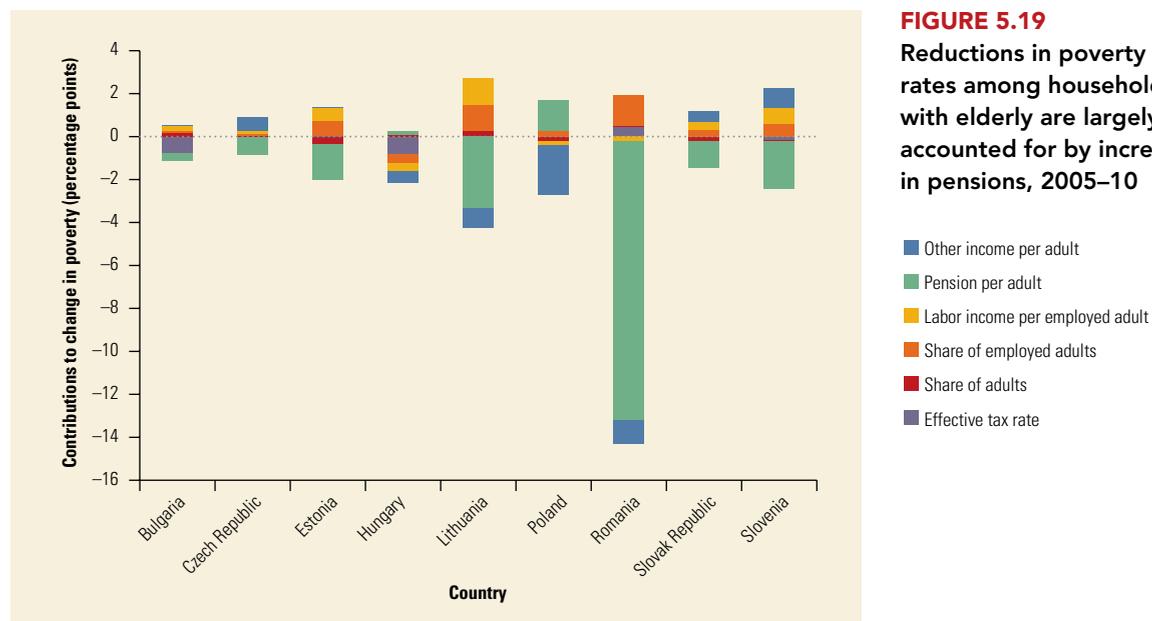


FIGURE 5.19
Reductions in poverty rates among households with elderly are largely accounted for by increases in pensions, 2005–10

Other income per adult
Pension per adult
Labor income per employed adult
Share of employed adults
Share of adults
Effective tax rate

Source: Azevedo et al. 2014. Calculations based on the EU-SILC data in the ECAPOV harmonized data.

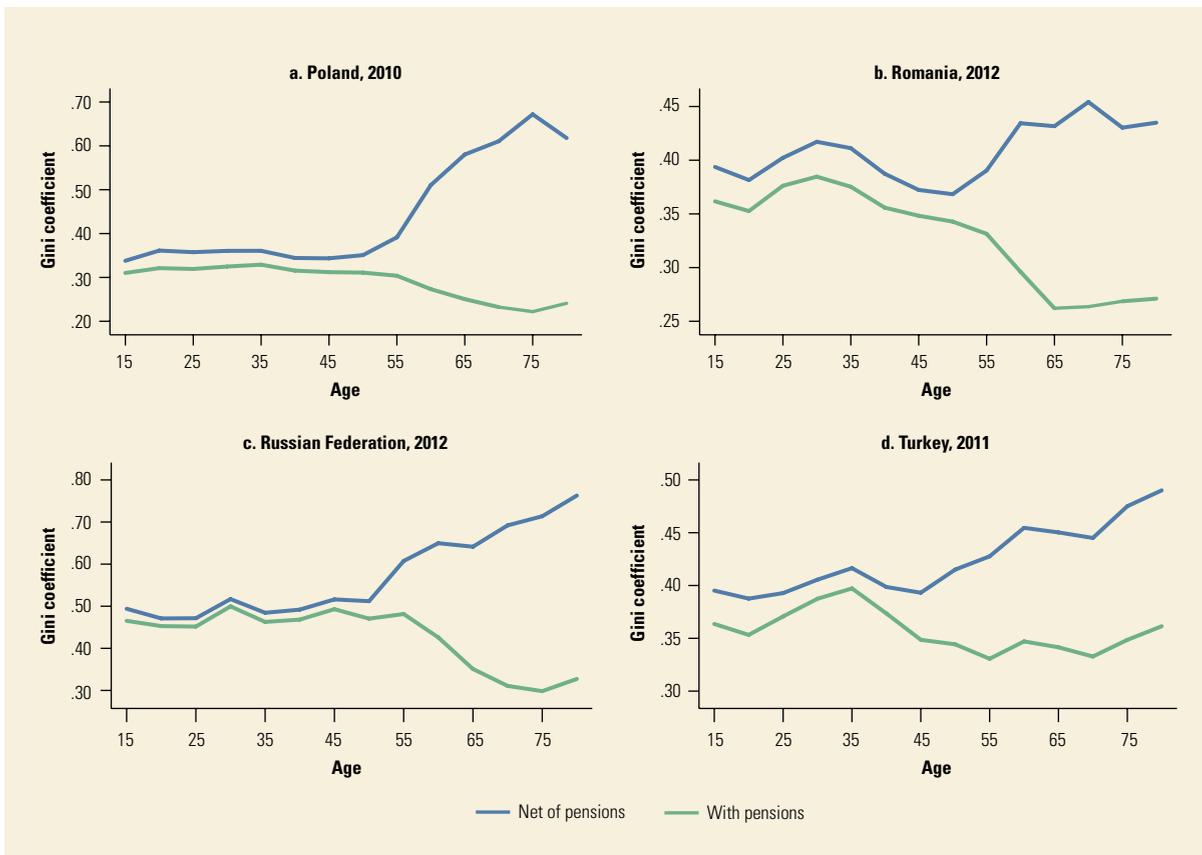
Note: Poverty is calculated from household income per capita using the US\$5 a day (2005 purchasing power parity equivalent) poverty line.

on their own against the possibility of losing, or not receiving, a pension. Nevertheless, changes to the pension system may have significant implications for old-age poverty.

Pensions reduce poverty not only for the elderly but also for those who live with them. Among the 19 countries for which data are available, households with pensioners are less likely to be poor than households without pensioners in six countries—Armenia, Georgia, Hungary, the Kyrgyz Republic, Poland, and Romania—and are at least on the same level of welfare in seven countries.

Only in six—Bosnia and Herzegovina, Bulgaria, Croatia, Kosovo, Lithuania, and Moldova—are households with pensioners perceptibly more likely to be poor than households without pensioners. It appears that, at least in some countries, pensioners are bringing enough regular income into the household to pull the entire household out of poverty (Schwarz et al. 2014).

The contribution of pensions to reducing poverty for households with elderly can be quantified by decomposing the change in income for each household over a period of time. A household's disposable income is derived from the labor income of employed adults (which depends on the wages and the share of adults employed), pensions, and other nonlabor income, net of taxes. Changes in each of these components, therefore, make up the total change in the household's income. This decomposition was applied to nine countries in Central Europe and the Baltics over a period of five to six years (circa 2005–10). In seven countries (Bulgaria, the Czech Republic, Estonia, Lithuania, Romania, the Slovak Republic, and Slovenia), pensions help reduce poverty among households (figure 5.19). The only exceptions are Hungary and Poland, where other income (social assistance transfers, for example) are more important in reducing poverty. This period,

FIGURE 5.20 Pensions help lower inequality among the elderly

Sources: Bussolo et al. 2014. Calculations based on ECAPOV harmonized data except for the Russian Federation: RLMS–HSE; for Turkey, Labour Force Statistics, TurkStat, Ankara, <http://www.turkstat.gov.tr/Start.do>.

Note: Inequality is calculated for income per capita within five-year age groups.

encompassing the crisis, also saw a decrease in wages and employment, which drove the increase in poverty in many countries.

Pensions also have an equalizing effect on the retirees, since the distribution of pensions has been rather equal. The wide coverage and low dispersion of pension benefits is a legacy of the central planning system. Until recently, almost 100 percent of the elderly in most countries in the region received pensions (Schwarz et al. 2014), given that most of the elderly population, who were in their working age under the centrally planned economy, were formally employed and eligible for pensions. The flat pensions reflect the low wage differentiation in the central planning system (Schwarz et al. 2014). The low pension inequality also reflects the flat, or progressive, features of some pension systems, such as the aforementioned targeted or minimum benefits and ceilings on pensionable earnings (OECD 2013). In fact, as illustrated in figure 5.20, inequality among the retirees would be much higher, and wider than that among the young, if pensions were excluded. Again, similar to the case of poverty, inequality net of pensions may be overestimated

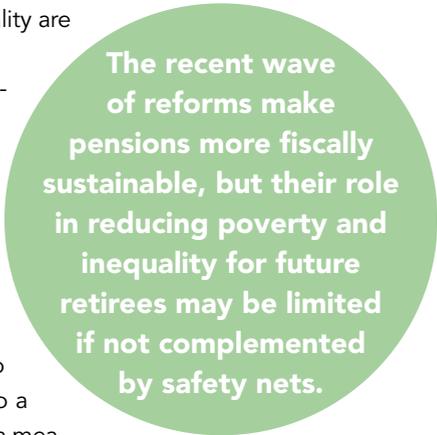
since pensions include both contributory and noncontributory sources, and people would tend to adjust their income and savings throughout their life cycle if pensions were not available. Nevertheless, this scenario illustrates the equalizing role of pensions.

The recent wave of pension reforms may undermine the role of pensions in reducing poverty and inequality for future retirees. To reduce the potential fiscal burden of pensions as dependency rates increase, governments have implemented reforms to cut pension expenditures. Such measures include strengthening the connection between contributions and benefits, raising the retirement age, tightening the eligibility criteria, and decreasing the generosity or duration of benefits (World Bank 2013). In particular, many countries in the region have shifted toward a multipillar system with more focus on the insurance and saving functions of pensions, so that minimum income provision and redistribution among the elderly are no longer a key goal (Chłoń-Domińczak and Strzelecki 2013).²⁴ This is not to say that the income replacement goal of pensions is undesirable, but if reforms mean that pensions no longer fulfill the goal of poverty and inequality reduction and this function is not picked up by other measures, poverty and inequality are expected to increase.

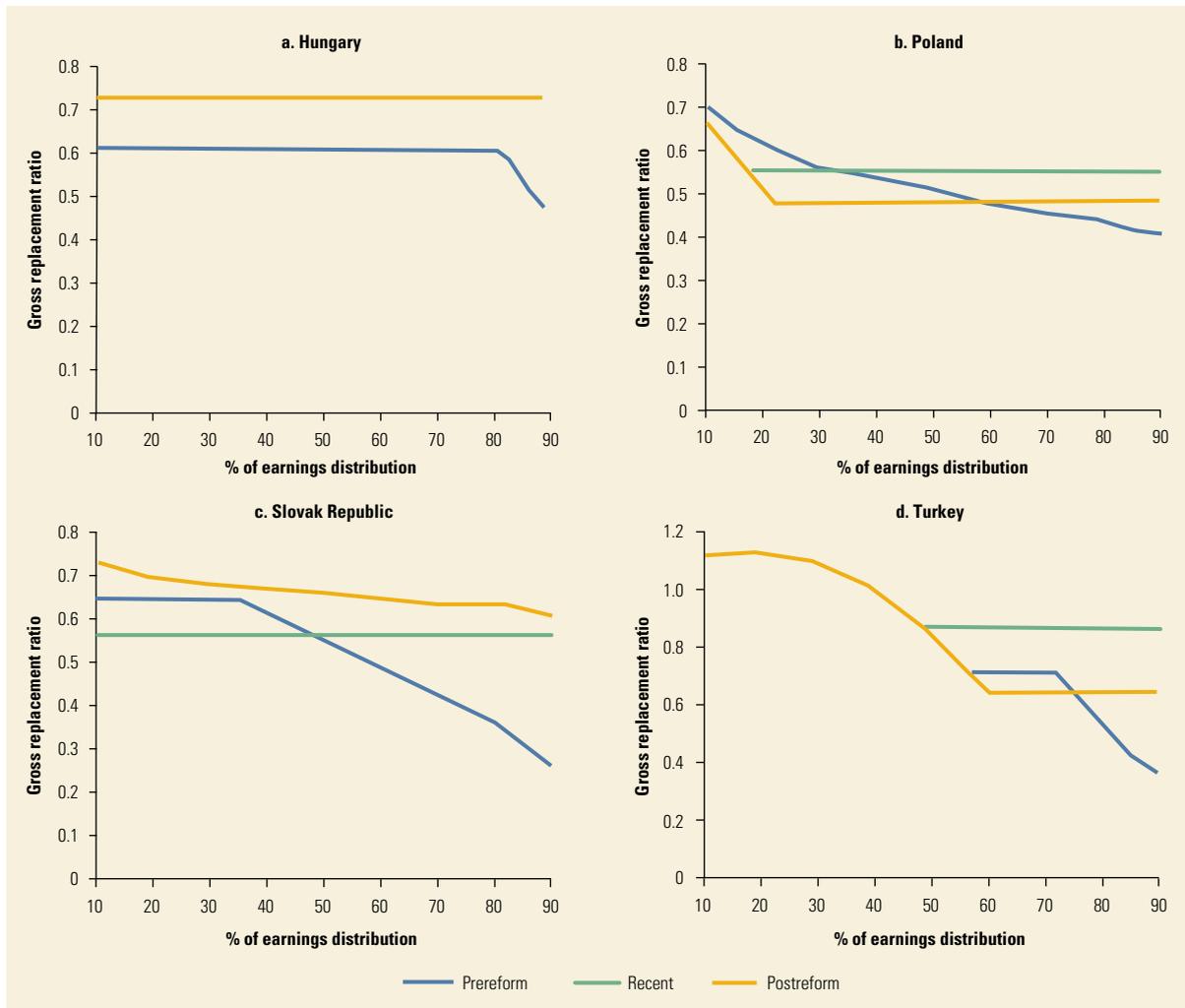
The reduction in progressiveness as a result of these reforms is illustrated in figure 5.21. Before reforms, many systems replace a higher share of income for low earners than for high earners. As a result of reforms, the postreform gross replacement rates—the ratio between gross pension entitlement upon retirement and gross preretirement earnings—are flatter across all earnings levels. In Poland and the Slovak Republic, for example, the introduction of a defined-contribution component links benefits more closely to contributions, as defined-contribution schemes create individual pension pots that are then converted to annuities upon retirement. As a result, the replacement rate increased to a much larger extent for higher earners than for low earners. Turkey retains a measure of progressiveness but is less progressive than before the reform. In Hungary, the higher replacement rate for all income levels is due to an increase of five years in men's retirement age, which was part of the 2009 reform (OECD 2013).

Similar patterns are observed in other countries in Europe and Central Asia. Romania has been implementing a point system since 2001, whereby the benefit is calculated according to the number of contributing years and the wage from which the contributions are made. In addition, many countries have encouraged voluntary saving through supplementary or private pension schemes, which further reproduce the income dispersion observed within the working-age groups among the elderly (OECD 2013). The stronger reliance on contribution schemes undermines the role that public pensions have played in equalizing incomes by providing for a larger share of the net replacement rate for the low-wage earners than for the better-off (Holzmann and Guven 2009).

The unequalizing effect of linking pensions with wage and contributions will be compounded by the increase in the retirement age. Many countries, including Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Poland, Romania, Slovenia, and Turkey, are gradually increasing the retirement age, as well as restricting eligibility or lowering benefit amounts for early retirement. As explained above,



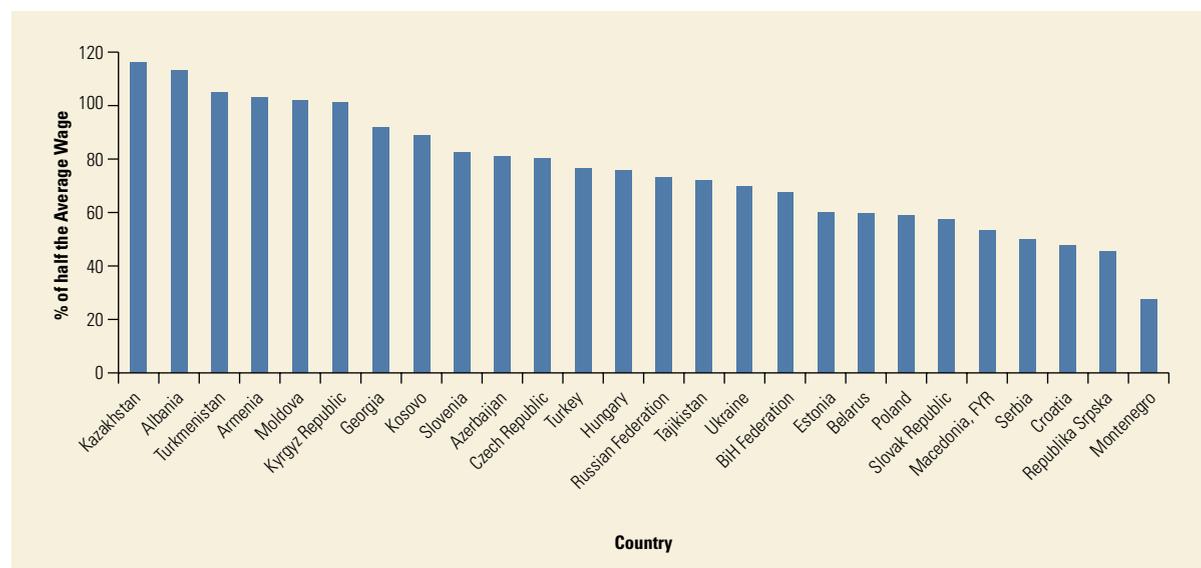
The recent wave of reforms make pensions more fiscally sustainable, but their role in reducing poverty and inequality for future retirees may be limited if not complemented by safety nets.

FIGURE 5.21 Replacement rates become less progressive after pension reforms

Source: OECD 2013.

Note: The gross replacement rate is defined as the individual pension entitlement from all mandatory sources of retirement income divided by net preretirement earnings. Pension entitlement is calculated for a full-career worker working each year from age 20 to the country's standard retirement age. The assumption is that individuals stay at the same point in the earnings distribution throughout their careers. The calculation is forward looking: it presumes that a full career is spent working according to the long-term rules envisaged in the pension system at each stage of the reform process. Hungary introduced a defined-contribution system in 1998 but closed it in 2012 as a result of the 2009 pension reform. The *prereform* curve applies to the pension system in place in the early 1990s; *postreform* denotes the results of the latest—or current—scheme introduced up to 20 years later; *recent* denotes reforms undertaken in the interim period between the early 1990s (*prereform*) and the latest legislation (*postreform*).

although this longer working life is important for economic growth and fiscal sustainability, it is not necessarily available to all. Those who choose, or can afford, to stay in the workforce are generally better off, while workers at the lower end of the income distribution are more likely to drop out early because their jobs are more physically demanding, they have worse health outcomes, or there is more competition from younger workers. Thus, the pension distribution will increasingly become polarized, as high-skilled workers enjoy pension benefits mirroring their high

FIGURE 5.22 Pension benefits for low-wage earners are projected to be low in most countries

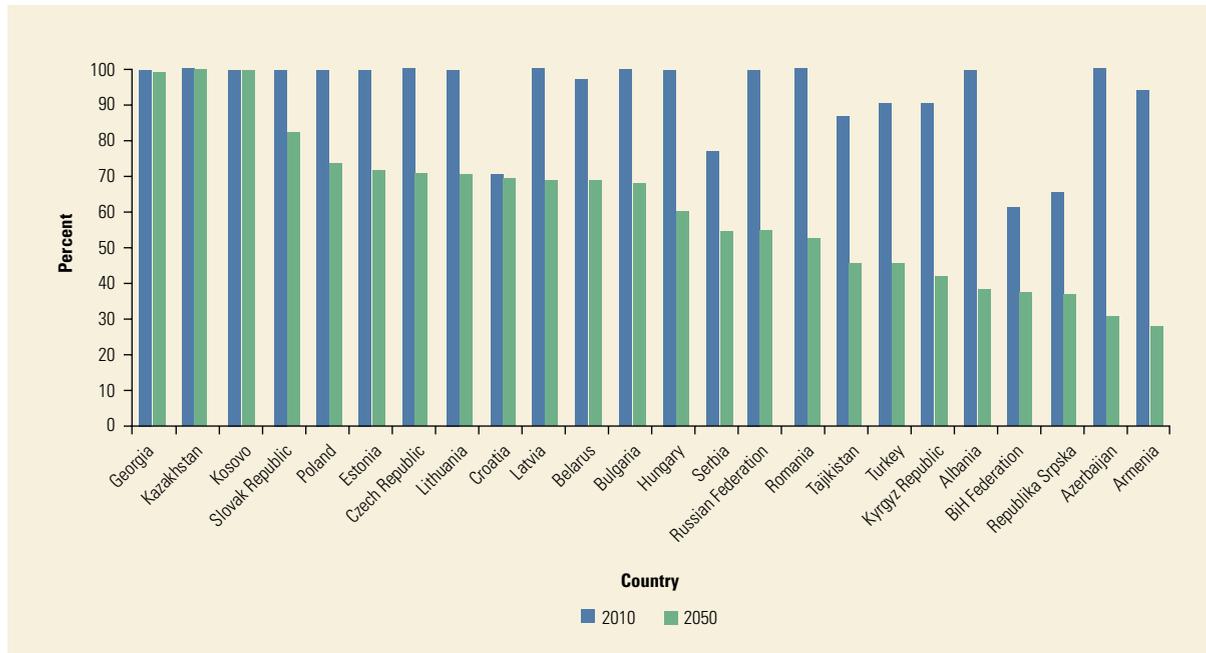
Source: Schwarz et al. 2014.

Note: The Federation of Bosnia-Herzegovina (BiH Federation) and Republika Srpska, which together make up the country of Bosnia and Herzegovina, have separate pension systems and are treated as separate data points in the figure. Hypothetical wage replacement rates for low-wage earners are calculated for a hypothetical individual who starts work at age 20 in year 2010, earning half the average wage of that country. That person is further assumed to work continuously until retirement age, always earning half the average wage of the current year. The benefits are calculated as a share of half the average wage of the country.

lifetime wages, and low-skilled workers receive low benefits due to their low lifetime wages and possibly reduced benefits if they retire early.

Those at the bottom of the pension distribution may, after the reforms, receive less than what is needed to cover their needs. It was calculated that the poverty line at US\$5 a day (2005 PPP equivalent) equals about 70 percent of the average wage across Central Europe and the Baltics (Holzmann and Guven 2009).²⁵ As seen in figure 5.22, a typical low-wage earner (defined as earning half the average wage) with a full career in most countries would receive pension benefits equivalent to less than 120 percent of his or her preretirement wage (and well below this level in most countries), or less than 60 percent of the average wage. While this threshold may be higher than the poverty line in some countries, this means that most low-wage earners are at risk of falling into poverty if they rely only on their pension receipts. In reality, many low-wage earners, especially women, do not have full careers since they may retire early or suffer from periods of unemployment and will retire with even lower pension benefits than projected here.

Moreover, many elderly will be left out of the contributory pension system because they are not eligible. Coverage is projected to decline as a result of high unemployment, informality, and more stringent old-age pension eligibility conditions (increasing the minimum contribution years and rate, for example).²⁶ Participation in the formal labor market has dropped, and informal employment has increased since the transition to market-based economies in the 1990s. On average in 2010, 30 percent of the working-age population in the region was employed in

FIGURE 5.23 Coverage of pensions for the elderly is projected to decline sharply in many countries

Source: Schwarz et al. 2014.

Note: The Federation of Bosnia-Herzegovina (BiH Federation) and Republika Srpska, which, together, make up the country of Bosnia and Herzegovina, have separate pension systems and are treated as separate data points in the figure. Pensions refer to the contributory pension scheme, and the projected coverage for 2050 is calculated based on the share of contributors among the prime working-age population (aged 35–39) in 2010.

the informal sector (Schwarz et al. 2014). The persistently high youth unemployment rate observed in many regional countries as a result of the 2008–09 financial crisis means that many will not have the contributory length required to qualify for pension benefits. The frequent movements in and out of the formal workforce of many workers, especially women, may lead to sporadic contributions that make them ineligible. Although some of these trends are not directly related to aging, their impact is exacerbated by the more stringent pension eligibility criteria. In the future, a growing population of retirees who had been unemployed, informally employed, inactive, or underemployed will be left out of the pension system. Thus, the share of the elderly that will qualify for pensions after the reforms is likely to decline sharply by 2050 (figure 5.23). People without pension rights are likely to be poorer, since they tend to have had less earning opportunity and lower income in their lifetime. Many of these people will not have sufficient savings to sustain themselves in old age.

The reform of the pension system is an important step toward achieving fiscal sustainability in many regional countries with aging populations but should be complemented by a safety net for the elderly poor. Until recently, those who are not covered by the contributory system and those who do not receive enough to meet basic needs have been supported by public-provided pensions with a function of old-age protection, among others. However, these schemes have experienced a retrenchment in recent years. The Czech Republic, Georgia, and Kazakhstan are among the few countries in the region that retain universal benefits.

Others, such as Armenia, Azerbaijan, Croatia, Hungary, and Poland, have abolished the minimum or universal pension schemes and folded them into either the guaranteed minimum income (which is means tested but not specifically targeted to the elderly) or the basic pension, which requires a minimum number of years of service (Holzmann and Guven 2009; World Bank 2013). As of now, the coverage of safety net retirement benefits in many countries (such as Estonia, Hungary, Poland, the Slovak Republic, Slovenia, and Turkey) is less than 30 percent of the elderly, which is often lower than the share of the workforce in the informal labor market who would be ineligible for contributory pensions (OECD 2013). The benefits are already low and in some cases insufficient to protect the elderly from poverty. For example, in Slovenia, net (after taxes) targeted and minimum pension benefits were worth around 40 percent and 93 percent of the poverty threshold in 2008, respectively (OECD 2013).

In sum, although pension reform is important for fiscal sustainability and for the other functions of pensions, such as saving and insurance, excessive moves toward linking pensions with wages and years in the labor force may undermine the old-age protection and redistribution functions of the pension system. As the distribution of pensions increasingly mimics the distribution of wages and wages are becoming more unequal with age, income inequality among retirees will increase. These reforms would also pose disadvantages to low-income workers who lack the means to finance their retirement. Furthermore, the retrenchment of public pensions means that they will not be adequate to protect those who are at the bottom, or who are left out of the contributory pension system, from poverty.

The Risk of Increasing Poverty and Inequality

This chapter has outlined the main channels through which aging affects poverty and inequality. How each of these channels plays out in each country depends on the country context. Table 5.2 summarizes the risk of rising poverty through these channels in selected countries in the region, and table 5.3 does the same for inequality. In each table, countries are first separated between currently young (average age below 35) and already aging (average age above 35) societies. Young countries are aging fast, but they have some time to build up the poverty-reduction and redistribution functions of their pension and safety net systems. Each country group is further divided according to the risk of future increases in poverty or inequality (if no further policy changes are made). These tables provide a snapshot of the channels through which aging is likely to affect poverty and inequality in each country.

For *poverty*, the critical channels include household composition and pension adequacy. While the former determines how much the elderly depend on pension income, the latter reflects whether the pension scheme in each country covers a significant share of retirees and provides sufficient benefits to keep them out of poverty. The lack of data makes it difficult to assess the extent to which private savings (either through pension funds or other accounts) can complement pension income at old age. Nevertheless, for many low-income countries in Europe and Central Asia where the capital market is less developed, workers, especially low-income ones, are not expected to save enough to finance their retirement, and

TABLE 5.2 Aging and Risk of Poverty in Selected Countries

Type	Country	Average age, 2014	Projected change in average age, 2014–60	Poverty, circa 2012 (%)	Elderly poverty, circa 2012 (%)	Coverage of contributory pension, 2050 (%)	Coverage of social pension, circa 2012 (%)	Risk factors			Risk
								Benefits for low earners: contributory pension, 2050 (% average wage)	Benefits from social pension, circa 2012 (% average wage)	Elderly dependent on pensions, circa 2012 (%)	
Young	Kazakhstan	31.7	5.8	34.7	23.4	100.0	—	58.1	—	34.2	L
	Tajikistan	25.1	7.7	51.5	51.8	46.0	—	36.0	—	8.4	M
	Turkey	32.0	12.6	20.7	18.8	45.8	22	38.2	5.2	37.9	M
	Kyrgyz Republic	27.8	7.8	79.0	68.5	41.8	Available	50.7	—	48.9	M
	Azerbaijan	32.3	10.8	75.5	71.7	31.0	Available	40.5	—	15.8	M
	Uzbekistan	28.6	11.8	85.2	78.4	—	—	—	—	17.4	U
	Old	Georgia	41.5	3.1	77.9	73.7	100.0	Available	45.9	—	31.6
Czech Republic		42.5	5.1	0.8	0.0	71.3	SA	40.1	—	73.7	L
Bulgaria		40.0	3.6	16.7	9.2	68.3	MT	55.0	17.7	56.7	L
Slovak Republic		39.6	7.3	1.9	0.1	82.8	3	28.8	22.2	60.1	M
Poland		40.4	7.2	4.9	1.2	73.9	12	29.5	14.7	56.4	M
Estonia		41.3	3.9	5.0	0.6	71.8	6	30.1	14.7	71.3	M
Lithuania		41.9	1.2	8.0	1.6	71.1	—	—	—	71.7	M
Croatia		38.9	5.6	0.9	1.1	70.2	SA	23.8	—	62.2	M
Latvia		40.2	3.9	11.3	2.7	68.9	MT	—	—	61.0	M
Belarus		43.1	3.3	1.6	0.8	68.9	—	30.0	—	67.6	M
Hungary		41.6	3.9	5.8	0.4	60.5	MT	37.9	12.4	64.5	M
Russian Federation		39.4	2.8	10.7	11.3	55.0	Available	36.5	—	49.6	M
Romania		40.5	6.9	34.5	18.0	52.6	SA	45.0	9.0	63.2	M
Slovenia		42.5	4.9	0.2	0.1	—	17	41.3	31.1	68.9	M
Albania		35.7	11.4	47.5	35.4	38.6	—	56.6	—	30.5	M
Armenia		35.7	10.5	79.6	80.1	27.7	Available	51.5	—	28.7	M
Serbia		39.9	9.1	15.1	9.1	55.2	—	25.0	—	50.8	H
Bosnia and Herzegovina		40.2	8.1	4.5	4.4	37.7	—	28.5	—	48.7	H
Moldova		38.4	9.4	46.5	50.2	—	—	51.0	—	65.4	U
Macedonia, FYR		37.9	7.2	35.1	28.1	—	—	26.6	—	39.9	U
Montenegro		38.3	6.7	14.7	9.1	—	—	13.7	—	52.1	U
Ukraine		40.7	2.7	3.9	2.6	—	—	34.9	—	58.7	U

Sources: Pension data compiled from European Commission 2012; Holzmann and Guven 2009; OECD 2013; Schwarz et al. 2014. Population data from World Population Prospects: The 2012 Revision. Poverty and coresidence data from ECAPOV harmonized data.

Note: Poverty is calculated based on consumption (or income) per capita using the US\$5 a day (2005 purchasing power parity equivalent) poverty line.

Coverage of contributory pensions is projected based on the share of contributors among the prime working-age population (aged 35–39) in 2010.

Benefits of contributory pensions for low-wage earners are projected for a hypothetical individual who starts work at age 20 in the year 2010, earning half the average wage of that country. That person is further assumed to work continuously until retirement age, always earning half the average wage of the current year.

The elderly dependent on pensions are those who live alone or only with other elderly.

The Federation of Bosnia-Herzegovina and Republika Srpska, which together make up the country of Bosnia and Herzegovina, have separate data; the value here reflects a simple average of the two.

MT = means-tested scheme specifically for the elderly; SA = social assistance scheme that is means tested and available to all population, not just the elderly; L = low; M = moderate; H = high; U = unclassified; — = data unavailable.

TABLE 5.3 Aging and Risk of Inequality in Selected Countries

Type	Country	Average age, 2014	Projected change in average age, 2014–60	Gini, circa 2012	Elderly Gini, circa 2012	Risk factors			Risk
						Contributory pension benefits for high earners vs. low earners, 2050	Wage premiums (old vs. young), circa 2012	Employment gap, circa 2012	
Young	Kyrgyz Republic	27.8	7.8	33.4	31.3	1.1	1.1	1.3	L
	Kazakhstan	31.7	5.8	28.6	27.0	1.8	—	1.2	L
	Azerbaijan	32.3	10.8	16.6	17.5	2.1	—	1.5	L
	Tajikistan	25.1	7.7	30.8	33.4	3.1	0.5	1.8	H
	Turkey	32.0	12.6	40.2	38.9	3.4	1.6	1.3	H
	Uzbekistan	28.6	11.8	35.3	36.7	—	—	3.9	U
Old	Moldova	38.4	9.4	29.2	26.3	0.9	1.1	1.0	L
	Macedonia, FYR	37.9	7.2	44.0	40.8	0.9	0.9	1.9	L
	Armenia	35.7	10.5	30.5	28.8	1.0	1.0	1.0	L
	Hungary	41.6	3.9	28.9	19.9	1.5	1.2	1.5	L
	Russian Federation	39.4	2.8	39.7	32.1	1.6	0.9	1.4	L
	Albania	35.7	11.4	29.0	27.7	1.9	—	2.2	L
	Georgia	41.5	3.1	41.3	40.6	2.5	1.1	1.0	L
	Bosnia and Herzegovina	40.2	8.1	33.0	32.8	2.7	0.8	2.3	L
	Belarus	43.1	3.3	28.1	22.4	2.8	1.0	1.1	L
	Czech Republic	42.5	5.1	26.4	16.3	3.1	1.0	1.6	H
	Serbia	39.9	9.1	29.6	27.8	3.6	0.9	1.5	H
	Ukraine	40.7	2.7	24.7	23.0	3.9	—	1.5	H
	Croatia	38.9	5.6	33.7	36.9	4.0	1.0	2.6	H
	Slovak Republic	39.6	7.3	26.5	16.3	4.0	1.2	1.5	H
	Poland	40.4	7.2	33.2	25.8	4.0	1.2	1.6	H
	Slovenia	42.5	4.9	24.9	22.7	4.6	1.5	2.5	H
	Estonia	41.3	3.9	32.3	19.2	5.0	1.2	1.3	H
	Montenegro	38.3	6.7	30.6	27.2	5.8	0.8	1.6	H
	Bulgaria	40.0	3.6	34.2	28.1	—	1.1	1.7	U
	Latvia	40.2	3.9	35.7	25.3	—	1.1	1.3	U
Romania	40.5	6.9	34.9	27.1	—	1.0	1.9	U	
Lithuania	41.9	1.2	32.3	22.3	—	1.1	1.5	U	

Sources: Pension data compiled from European Commission 2012; Holzmann and Guven 2009; OECD 2013; Schwarz et al. 2014. Population data from World Population Prospects: The 2012 Revision. Gini, wage premium, and employment calculations based on ECAPOV harmonized data.

Note: Gini is calculated based on consumption (or income) per capita.

Benefits of contributory pensions are projected for a hypothetical individual who starts work at age 20 in the year 2010. High-wage earners are those who are earning twice the average wage of that country. Low-wage earners are those who are earning half the average wage of that country. That person is further assumed to work continuously until retirement age, always earning the same relative wage of the current year.

Wage premiums (old vs. young) is the ratio of the wage premium (between college educated and less than college educated) among employed workers aged 56–60 to the wage premium among workers aged 30–34.

The employment gap is the ratio of the employment rate among college educated to the less than college educated aged 56–60.

The Federation of Bosnia-Herzegovina and Republika Srpska, which together make up the country of Bosnia and Herzegovina, have separate data; the value here reflects a simple average of the two.

L = low; H = high; U = unclassified; — = data unavailable.

pension income is crucial. This estimation also does not take into account other transfers, public or private, besides pensions, but, as discussed at the beginning of this chapter, household survey data show that they currently make up an insignificant share of the elderly's income.

Among young countries, the only one with a low risk of higher poverty is Kazakhstan, which has a universal pension scheme that covers all elderly. The benefits for low earners under Kazakhstan's system are moderate, almost 60 percent of the average wage or slightly less than the US\$5 a day poverty line. Other young countries (Central Asia and Turkey) will face a moderate risk of an increase in poverty if the current system remains, since less than 50 percent of retirees will be covered by the contributory pension system (estimated by the share of current contributors among prime working-age population). These young countries also have some form of social pension, but the benefits are barely sufficient to lift the elderly out of poverty. In addition, the indexation of pensions has not been sufficiently updated, so the real value of pension receipts is declining.

Among the older societies, countries with a low risk of a poverty increase are those that provide contributory pensions of high coverage (more than 60 percent) and moderate benefits for low-wage earners (more than 35 percent of average wage, or equivalent to US\$2.50 a day), accompanied by some form of social pensions, most often a means-tested scheme targeted toward retirees with limited support. These include Bulgaria, the Czech Republic, and Georgia. Those that have a moderate risk are lacking in either coverage or benefits. They include Albania, Armenia, Belarus, Croatia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Russia, the Slovak Republic, and Slovenia. Finally, Bosnia and Herzegovina and Serbia are considered to have a high risk of poverty increase, because they have a pension system with low coverage and low benefits. Furthermore, around 50 percent of their elderly currently do not live in households with working-age members, which raises their dependence on pension income.

Increases in *inequality* with aging will be driven by potential changes in inequality in pensions and labor income. Inequality in labor income depends on differences in labor force participation and wages between the high and the low skilled. In most countries, these gaps increase with age, so that the rise in the average age of workers will increase the polarization between the low and the high skilled. Differences in labor force participation and wages between the low and the high skilled will generate differences in the number of years and amount of contributions to pension systems, which determine the pensions available during retirement. How big these gaps are, however, depends on the labor market and the progressiveness of the pension system in each country, which affects how much inequality may increase in the future.

Most young countries will face a low risk of rising inequality with aging, thanks to their progressive pension systems. These include Azerbaijan, Kazakhstan, and the Kyrgyz Republic. In these countries, a high earner (with wages twice the average wage) would receive on average less than twice the pension income of a low earner (earning half the average wage). This means that the difference in contributory pension benefits between high and low earners is much less than the difference in their income during their working years.²⁷ Conversely, Tajikistan and Turkey will face higher risk since they have less progressive pension systems: a high earner in Tajikistan would receive pension benefits more than three times higher than a low earner (although this still reflects some redistribution, given that a high earner earns four times the wage of a low earner). The risk is even higher in Turkey, where the wage premium among old workers is 1.6 times that among young workers. If

this trend continues, the higher share of old workers in the labor market means that wage inequality (and in consequence pension inequality) will rise in the future.

Among older societies, those with a more progressive pension system, such as Albania, Armenia, Belarus, Bosnia and Herzegovina, Georgia, Hungary, FYR Macedonia, Moldova, and Russia, have a lower risk of rising inequality. In addition, their wage premiums do not differ much between young and old workers. Countries with less progressive pension systems will have a higher risk of rising inequality. These are Croatia, the Czech Republic, Estonia, Montenegro, Poland, Serbia, the Slovak Republic, Slovenia, and Ukraine. In particular, in Estonia and Montenegro, a high earner will receive more than five times as much in pension benefits as a low earner, exacerbating the gap between them during working age. These polarization trends are important to consider, since they can drive the widening of inequality among the older age groups, which can then be passed on to younger generations.

It is important to note, however, that some countries with low risk of inequality may have moderate to high risk of poverty increase, such as Belarus, Bosnia and Herzegovina, Hungary, and Russia. This could be the case if countries maintain a flat, but low, benefit system that is equal but ineffective in poverty protection. In contrast, some countries that have reformed their pension system to enhance sustainability and the income replacement function by moving away from the flat benefit system, such as the Czech Republic, Estonia, and Poland, may fare less well on the inequality risk but are better at reducing poverty. This assessment, therefore, needs to be seen in the context of each country. Countries should choose which functions the pension system can serve, in view of their demographic and labor market situations as well as the availability of other tools. If pensions are not effective at reducing poverty and inequality, they should be complemented by other measures, such as social safety nets, to ensure that poverty and inequality do not rise as a result of aging.

Notes

1. The averages in this paragraph are calculated as simple averages of the poverty incidence levels for each country.
2. Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Georgia, Kazakhstan, the Kyrgyz Republic, the former Yugoslav Republic of Macedonia, Montenegro, Poland, Romania, Russia, Serbia, Turkey, and Ukraine.
3. The Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, the Slovak Republic, and Slovenia.
4. Across the GGS and SHARE, most interhousehold transfers are from parents to children rather than the other way around.
5. Complete details of the analysis can be found in Albertini (2014).
6. Note that even if transfers account for a small percentage of the income of the richer recipients, they can be larger—in monetary amount—than the transfers going to the poorer recipients.
7. The question asked is, “All things considered, how satisfied are you with your life as a whole these days?”
8. The question asked is, “To what extent do you agree with the following statement? All things considered, I am satisfied with my life now.”

9. In the fertility scenario, there is a gradual decline in the number of newborns by 50 percent distributed over 25 years, that is, an annual decline by 2 percent of the initial value over 25 years. With a fertility decline of this magnitude, one can expect an increase in the wage rate (w) of about 10 percent (between year 0 and year 45), while returns to capital (r) will be reduced by 20 percent. This implies an increase in the wage-capital return ratio (w/r) of 38 percent.
10. The Gini index is calculated here for inequality across the income per capita of the various age cohorts. It does not account for any dispersion that may exist within a specific age group. Therefore, both the level and the changes in this Gini index underestimate the real-world level and changes.
11. A decomposition technique initially proposed by Deaton and Paxson (1994) for separating the cohort from the age effects was used. Countries that have frequent wage data for a long period of time (12 years or more) were chosen. Ideally, to determine how the skill premium changes with age, one would need to follow a cohort of workers over time. Without long-running panels, synthetic cohort techniques were employed on long-running cross-sections tracking cohorts of individuals born around the same period of time (within a five-year interval). There was no series of cross-sections that covers the entire working life of a cohort so it was assumed that different cohorts follow similar aging patterns, and the age effects were obtained from different cohorts at different stages of the life cycle. Longer and more frequent cross-sections, therefore, allow for more accurate estimation of the age effects.
12. High-skilled workers were defined as tertiary educated or “college equivalent” workers and low-skilled workers as workers with less than tertiary education. Note also that other factors affect the skill premium and need to be controlled for to properly identify the age effect. An important one is skill-biased technological change. New technologies tend to complement high-skilled workers and substitute for low-skilled workers. As a result, the relative demand for high-skilled labor tends to increase faster over time than does relative supply (see, for example, Acemoglu 2002; Acemoglu and Autor 2011; Fitzenberger and Kohn 2006; Katz and Autor 1999). This time effect needs to be isolated from the age and cohort effect, and the data for these four countries allow doing so up to a point, given that these datasets are not real panels.
13. The analysis has not been performed for hourly earnings, so it is not possible to exclude the possibility that part-time or underemployment may be more important for either the skilled or unskilled category of workers and thus may bias the results on the monthly wages.
14. There is a large literature on the cumulative advantage hypothesis; see, for example, DiPrete and Eirich 2006.
15. In some countries, however, the capital markets may be incomplete so there are insufficient channels for saving (for example, mistrust in or lack of access to financial institutions), which limits the capacity to accumulate wealth throughout the life cycle. In addition, people who save through asset accumulation may be asset rich but less wealthy in income if their ability to liquidate their assets is limited by the inflexibility of the market.
16. Older households tend to increase their savings for two main reasons: (1) the risk of high medical expenses in old age; and (2) bequest motives (Székely and Attanasio 2000; Chamon and Prasad 2010; Belke, Dreger, and Ochmann 2012; Carroll 1998; De Nardi, French, and Jones 2010; Dynan, Skinner, and Zeldes 2004).
17. It may take some generations of longer life expectancy for the population to adjust their saving behaviors.
18. In the calculation of wealth accumulation, pension contributions were treated as savings and pension receipts as dissaving. Pension contributions were imputed by estimating the contribution rate which, if applied to all forms of labor income, would balance the pension fund, that is, which equilibrates pension contributions and receipts. Though this method is very rough given the complexity of the Russian pension system, it provides a valid approximation. The estimated contribution rate of 24.18

- percent closely matches the official rate of insurance premium to the Pension Fund of Russia (applied to wages below the set limit value), which was fixed at 22 percent in 2012 (http://www.pfrf.ru/rates_premiums/).
19. This estimation may be underestimating wealth since pension receipts include not only contributory pensions but also noncontributory sources, which are direct transfers from the government.
 20. More evidence on the prevalence of grandparenting help in the region is described in chapter 2 (figure 2.9). Complete details of the analysis can be found in Albertini (2014).
 21. Complete details of the analysis can be found in Albertini (2014).
 22. The pivotal role of pensions in reducing the risk of old-age poverty is not new. Their relevance was highlighted when discussing the transition of the former Soviet Union in the early 2000s to avoid poverty for individuals after reaching retirement age (Chawla, Betcherman, and Banerji 2007; Chand and Jaeger 1996).
 23. These schemes can take many forms, including a minimum pension that covers some set of minimum needs of the elderly (for example, Poland, the Slovak Republic, Slovenia, and Turkey), a basic scheme that pays at a flat rate independent of the earnings of contributors (for example, the Czech Republic and Russia), and a resource-tested or targeted plan that pays out a progressive benefit to retirees based on their incomes (for example, Bulgaria) (Hauer 2008; OECD 2013; World Bank 2013). Not all of them are well targeted or effective, however, as some of them may apply to a very small subset of pensioners while others are universal but provide very little benefit. The wide coverage of some programs also makes them unsustainable and has led to reforms in recent years (Williamson, Howling, and Maroto 2006).
 24. A multipillar system typically consists of four pillars: the zero pillar retains the safety net function by providing a fixed pension to all or a targeted group of retirees regardless of contributions; the first pillar replicates the pay-as-you-go system previously existing in many ECA countries and plays a limited insurance and redistributive role by providing minimum or progressive pension benefits to contributors; the second pillar is a defined-contribution scheme and ties benefits to preretirement earnings with the aim of enhancing benefit adequacy; the third pillar is voluntary but similar to the second one in design and aims to supplement the savings of the retirees.
 25. This is an average across eight countries (Bulgaria, Croatia, the Czech Republic, Hungary, Poland, Romania, the Slovak Republic, and Slovenia).
 26. The only exceptions are Georgia and Kazakhstan, which maintain a universal pension to provide pensions to all persons reaching retirement age, regardless of work history or contributions to the pension system (although the former is preparing to move to a universal, means-tested social assistance system) (Falkingham and Vlachantoni 2012).
 27. Inequality would actually be somewhat higher than this indicates, because skilled workers are more likely than unskilled workers to work until retirement age, so the latter do not always get the full pension benefits.

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