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FISCAL POLICY ISSUES
IN THE AGING SOCIETIES

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Emilia Skrok, Anita Schwartz and Hernan Winkler

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March 9, 2015

Zeljko Bogetic, Harun Onder, Anil Onal, Emilia Skrok, Anita Schwartz, and Hernan Winkler

Abstract. Aging may be one of the most far-reaching processes defining the economic, fiscal, and social changes societies are likely to experience over the next 40 years. The demographic consequences of aging will have a dramatic impact on labor markets, economic growth, social structures—and government budgets. These issues have gained urgency after the second largest global recession in the past 100 years. Based on a broad comparative analysis of countries that include the EU and non-EU European and Central Asian countries, as well as several case studies and model simulations, the paper seeks to provide broad answers—tailored in part to distinct groups of countries according to their aging-fiscal profiles—to major questions facing governments’ budgets in aging societies: What are the fiscal-aging profiles of Western European, emerging European, and Central Asian countries? In other words, how good or bad is their fiscal situation—“initial conditions”—in view of their emerging aging-related problems? What kind of public spending pressures are likely to emerge in the coming decades, and what will be their relative importance? How do countries compare in terms of the possible impacts of aging on growth and long-term debt sustainability? What can be learned from in-depth and comparative case studies of aging, fiscal sustainability, and fiscal reform? Are there good-practice examples—countries doing things right at the right time—that may offer lessons for the others? And, perhaps most important, given the need for long-term fiscal consolidation for many countries, what kind of revenue and expenditure policy agendas are likely to emerge to mitigate the effects of aging? A key policy conclusion is that countries should aim for early rather than delayed reforms dealing with long-term aging pressures. The urgency is accentuated by the debt situations and/or adverse debt and demographic dynamics in almost all countries but also by the evolving voter preferences. As societies age and voting preferences increasingly reflect the political will of the older population, it will become more difficult to enact the necessary reforms ensuring social and fiscal sustainability.

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JEL Classification: E6, H5, H6, J1

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FISCAL POLICY IN THE AGING SOCIETIES

1. Introduction

Aging may be the most far-reaching process defining the economic, fiscal, and social changes societies are likely to experience over the next 40 years. Societies—whether they are currently young or old—are entering a type of demographic transition the scale and impact of which has never been experienced before. For example, in 1970, there were about 10 workers for every old person in the world. In 2050, there will be 4. In many European countries, this ratio will be less than 2.

The demographic consequences of aging will have a dramatic impact on labor markets, economic growth, social structures—and government budgets. Labor forces will shrink, the ratio between the old and the working-age population (the old-age dependency ratio) will rise, fertility will decline, and populations will either stabilize or decline. This may have adverse impact on potential economic growth even after accounting for longer working ages and technological progress. Major public spending on pensions, health care, and long-term care will likely increase, putting pressure on other public spending, notably for education and productive infrastructure investment, which in the past have been major contributors to economic growth and social prosperity.

These issues have gained urgency after the second largest global recession in the past 100 years. This is because many countries now have massive public debt, leaving them with no fiscal space for additional spending. In 2007, before the crisis, most countries in Europe had public debt-to-GDP ratios of less than 60 percent. In 2013, many had ratios in excess of 90 percent. As a result, many countries will need to engage in long-term fiscal consolidation to avoid insolvency and reduce debt to sustainable levels while making room for additional aging-related spending. And all this is likely to be taking place in the context of the “new normal” of more moderate growth prospects, at least until public and financial sector balance sheets have improved to pre-crisis levels.

How governments manage their budgets and spending trade-offs as their people age is the ultimate challenge for long-term fiscal policy. That is why for certain groups of countries this paper seeks answers to questions like the following:

- What are the fiscal-aging profiles of Western European, emerging European, and Central Asian countries?
- In other words, how good or bad is their fiscal situation—“initial conditions”—in view of their emerging aging-related problems?
- What kind of public spending pressures are likely to emerge in the coming decades, and what will be their relative importance?
- How do countries compare in terms of the possible impacts of aging on growth and long-term debt sustainability?
- What can be learned from in-depth and comparative case studies of aging, fiscal sustainability, and fiscal reform?
- Are there good-practice examples—countries doing things right at the right time---that may offer lessons for the others?
- And, perhaps most important, given the need for long-term fiscal consolidation for many countries, what kind of revenue and expenditure policy agendas are likely to emerge to mitigate the effects of aging?

The paper is organized as follows: First, it sets out the broad comparative context for fiscal policy in aging societies by considering where various countries are positioned in the “fiscal/debt/aging” space, a
good starting point for analysis of long-term fiscal policy in aging societies. This makes it possible to allocate the European and Central Asian countries that are the focus of the analysis into five country groupings (section 2). It then considers some broad stylized facts about the likely evolution of aging-related public spending as an indication of the type and magnitude of fiscal pressures confronting aging societies (section 3). There follow illustrative comparative simulations to shed light on the range of possible impacts of aging on economic growth and government budgets in European and Central Asian countries (section 4). The report then delves deeply into aging and fiscal issues in case studies of Bulgaria and Poland, in the hope of ascertaining the magnitude of aging-related fiscal effects, the relative impacts on different spending categories, and the policy options (sections 5 and 6). Next, it considers how New Zealand, Norway, and Germany have dealt with age-related reforms and the different ways they might be good-practice examples for various dimensions of aging-related policy reforms; it also tells the cautionary tale of Japan, the oldest country in the world and deeply in debt (section 7). This is supplemented by a first analysis of voting preferences in European and Central Asian countries indicating political economy constraints and policy trade-offs in future aging-related fiscal reforms (Section 8). Based on an analysis of revenue potential and the implications for tax policy (section 9) and basic consideration in cutting unproductive expenditures (section 10), the paper concludes with possible broad fiscal policy agendas tailored to different types of aging societies and their fiscal profiles (section 11).

2. Fiscal-Aging Profiles of European and Central Asian Societies

What are the aging and fiscal profiles of European and Central Asian societies today? Because the impact of aging on budgets is about the long-term future, it is important to understand the context and get a sense of the initial conditions. Several variables are of particular interest in defining the initial aging-fiscal profile of a country: old-age dependency ratio, net migration rate, and debt, deficit, revenue and expenditure ratios. The first two are drivers of demographic changes in population and labor force as a result of aging. The rest are basic indicators of the debt burden and the current stance of fiscal policy.

Most countries in this sample are both aging rapidly and experiencing considerable emigration. Specifically, 23 out of some 30 countries are aging rapidly and in some the old-age dependency ratios are very high (Latvia, Estonia, Bulgaria, Croatia, Hungary). Only 8 countries (Central Asian countries, Albania, Kosovo, and Turkey) have young populations. Two-thirds have negative net migration, especially Albania, Armenia, Moldova, and Lithuania. Western European countries typically have even higher old-age dependency ratios and net immigration, and many have higher public debt-, revenue- and expenditure-to-GDP ratios.

It is possible to classify countries into five groups according to their aging-migration profiles: (a) countries with a high old-age dependency ratio and net emigration (the largest group); (b) countries with a high old-age dependency ratio and net immigration; (c) Western European countries with a high old-age dependency ratio and high immigration; (d) oil-rich countries; and (e) countries with a low old-age dependency ratio and net outmigration (Figure 1). The three oil-rich countries (Russia, Kazakhstan, and Azerbaijan) are in a category of their own because compared to non-oil-rich countries their varied migration patterns and their oil resources substantially alter their long-term fiscal profiles.
Except for some that are oil-rich, most countries are running primary deficits, pushing fiscal consolidation into the future (Figure 2). In most countries public debt is deceptively moderate (30–60% of GDP)—but, again except in oil-rich countries, rising rapidly (Figure 3). A few countries face major short-term fiscal problems (Serbia, Albania, Montenegro, Slovenia, Hungary). Two-thirds are relatively high-tax countries, given their income levels, with revenues over 37–40 percent of GDP. The state footprint, however, may be higher there because of tax exemptions, resulting in a narrow tax base, “nuisance” taxes and fees, loss-making state-owned enterprises (SOEs), quasi-fiscal activities, and state guarantees. In addition, in terms of product market regulation, many of these countries have onerous regulatory frameworks. Labor taxes (social security contributions) tend to be high and there are important tax base and incentives issues that affect informality.
In most countries, fiscal space is already limited and public spending is high. Many have public revenues of 40 to 50 percent of GDP, including revenues for social contributions that are 10 to 15 percent of GDP (Figure 4). Public expenditures often exceed 40 percent of GDP—in a large group they are at 50 percent—in part because of high social spending (Figure 5). As a result, many countries have very little fiscal space for discretionary and growth-oriented public spending, and little scope over the long term to accommodate increases in aging-related spending.
Western European, rapidly aging countries face particularly high debt burden (Figure 6). The largest EU economies as well as the many smaller countries on the periphery of the EU face historically unprecedented public debt burdens, exceeding the Maastricht 60 percent threshold by 20-60 percent of GDP. Returning to pre-crisis levels of public debt is clearly going to be very difficult and requiring sustained fiscal consolidation over the next one or two decades. And this is happening at a time when these countries already have some of the highest old-age dependency ratios in the world. Only the Nordic countries and Luxembourg maintain public debt below the Maastricht threshold. More worrisome, four years after the global crisis, these countries (except Germany, Austria, Luxembourg and Nordic countries) continue to run...
primary deficits, sometimes large ones, a situation which is bound to result in further increases in public debt.

Against this backdrop, long-term already overextended budgets are likely to have to deal with substantial additional spending. Estimates suggest the additional aging-related expenditures will be 3–7 percent of GDP. Since many countries are already facing long-term fiscal consolidations of about 3–5 percent of GDP, the magnitude of the challenge is clear. Yet because most of these spending pressures will build fairly slowly over the medium- to long-term, timely action can go a long way toward alleviating them. The next section takes a preliminary look at the types of likely aging-related spending pressures across countries, and at some financing options.

3. Aging-Related Long-Term Fiscal Pressures and Financing Issues: A Preliminary Look

As countries age, their governments will need to spend a larger percentage of revenues on pensions and health programs. In 2010 average spending on these programs across a wide range of countries, including those of Western Europe and emerging Europe and Central Asia, was about one-third of general government expenditures. Figure 7 shows great disparity in spending by countries, but only 6 of 18 Western European countries—Italy, France, Greece, Portugal, Austria, and Luxembourg—spend more than 40 percent of general government spending on aging-related programs. Of the old and high-migration transition countries, 4 of 8—Serbia, Croatia, Poland, and Bulgaria—spend more than 40 percent on them. Of the 8 old and low-migration transition countries only the two entities of Bosnia-Herzegovina reach 40 percent, and none of the young or oil-rich countries do so.

Figure 7: Pension and Health Spending as Percentage of General Government Expenditures

Source: For EU countries, data for pension and health spending as a percentage of GDP from EU Aging Report 2012 were converted to shares of general government expenditures using IMF numbers for general government spending. For non-EU countries, World Bank’s PROST model projections for pension spending and estimates from Red to Gray report for health spending are used, with the same conversion to shares of general government spending. The working age population decline is from the UN Population Projections for all countries.

The picture projected for 2060 looks considerably different. By then, 13 of the 18 Western European countries are likely to be spending spend more than 40 percent of general revenues on pensions and health, and three of them will be allocating more than 50 percent (Figure 8). These numbers assume
that the ratio of general government expenditures to GDP remains constant through 2060. Many of the older
and high-migration transition countries are expected to reduce age-related spending on average from 36
percent of general government expenditures to 33 percent. Low-migration countries, by contrast, are
expected to see a marked increase in spending in these areas, from an average of 38 percent in 2010 to 46
percent in 2060. Even one of the young countries, Turkey, is expected to spend more than 40 percent of
general revenues on pensions and health alone.

Figure 8: Projected Pensions and Health Spending as a Percentage of General Government
Expenditures in 2060

Long-term care (LTC) is even harder to project but these expenditures are also likely to
increase over time. Currently families provide a significant portion of LTC. However, as the number of
elderly rises and the working age population falls, individuals who might have left the labor force to become
caregivers will see more pressure to keep working. Caregiving might also need to become more efficient;
one caregiver per elderly person, as is typical in a family setting, may become unaffordable. As a result,
more LTC financing than currently envisaged might fall on the state.

Increases in pension and health spending are often assumed to be at least partly mitigated by
decreases in spending on education as the number of children continues to fall. However, an affordable
pension policy will require the portion of time spent working to increase with life expectancy. Children and
youth will need better education to prepare them for a longer working career and give them enough
flexibility so that they can change careers over this longer working life as demand shifts. Currently,
whatever lifelong learning workers receive is typically provided by employers. But if individuals are
changing occupations and industries in response to shifts in global demand, it is less likely that individual
employers will want to invest in continuous learning, leaving the government as its only financier. Thus, it
is not clear that future education spending will fall even though there are fewer children because there may
be greater need for both higher quality in education and retraining.

A deeper look shows that most countries are likely to see pension spending rise as a
percentage of general government expenditures (Figure 9). Pension spending is expected to fall in three
groups of countries: (a) countries that have adopted notional accounts, like Sweden, Latvia, and Poland; (b)
countries of the former Yugoslavia that have adopted a point system with a specific type of indexation; and
(c) countries that have a relatively flat and small benefit, indexed only to inflation, like Armenia and Kazakhstan. In all three groups, for different reasons, benefits are expected to fall as a percentage of the average wage. In notional account countries, benefits, if provided at the same retirement age, are reduced as life expectancy increases. In point system countries, the point value that converts points earned during working years to benefits paid at retirement is indexed to something less than average wage growth, so that for successive cohorts the benefit declines as a percentage of the prevailing average wage. While indexation to inflation post-retirement is the recommended approach to protecting a pensioner’s purchasing power while containing fiscal costs, the flat benefit countries that index only to inflation are essentially indexing benefits to inflation throughout a worker’s career as well as during retirement; the result will be very low benefits relative to wages for future generations. These pension strategies may seem to be doing a good job of containing costs, but the question is whether they will actually be less expensive if governments are pressured to raise benefits levels because those currently contemplated are deemed socially unsustainable and inadequate.

**Figure 9: Current and Future Pension Spending as Percentage of General Government Expenditures**

![Diagram showing current and future pension spending as percentage of general government expenditures across various countries.]

*Source: As explained in figure 7.*

A similar decomposition for health spending suggests there might be some underestimation there in addition to the LTC costs that are not included. Figure 10 shows that as aging progresses health costs are not expected to increase much in most of the countries studied. This largely reflects assumptions that health spending is relatively flat until the last two years of life, whenever those last two years might be. Should spending or health needs accelerate earlier, health spending might suddenly shoot up.
Figure 10: Current and Projected Future Health Spending as a Percentage of General Government Expenditures

Source: As explained in figure 7.

On the revenue side, both pension and health spending is largely financed by the payroll taxes paid by employers and employees. In countries where the population has already begun to age and the revenue raised by these taxes has turned out to be insufficient to cover the full pension and health bill, general revenue is used to finance the deficits. In most of these countries, the working age population is projected to trend downward (Figure 11), making it difficult to raise even as much contribution revenue as is being raised today. With spending rising and revenues falling, an increasing share of pension and health spending will have to be covered from the general budget. This raises serious questions for countries like Bulgaria, where spending on pensions and health is expected to rise from 41 percent of general government expenditures to 46 percent by 2060, but the working age population, which finances this spending through both contributions and income taxes, is expected to fall by 40 percent. A few Western European countries, most of the young countries, and most of the oil-rich countries will see continued increases in the working age population, but for the young and oil-rich countries, the projections might be considered optimistic. As neighboring countries start to see the working-age population decline, emigration may accelerate, with more workers seeking better-paid employment in other countries.

For health spending, general revenue financing is not necessarily problematic. All individuals, regardless of their labor status, require access to health services. General revenue financing of health care may help to eliminate the two-tier health systems in some countries, leaving many with limited access and quality of services.
For pension spending, general revenue financing is more problematic. Typically, pension benefits are related to the income that individuals earned during their working years. As long as pension benefits are financed by contributions that are a percentage of salaries, income replacement is fine. But if the main source of pensions changes to general revenue financing, higher pensions for higher-income individuals becomes regressive. A shift to general revenue financing might require a change in the way pensions are provided, with general revenue financing basic pensions for all elderly with a top-up to contributors that is self-financed from the limited contribution revenue available.

As with any long-term projections with uncertain key parameters, a word of caution is in order. There is much we do not know about the future and whether the outlined scenario will play out in reality. Small differences in key variables build up over the years into very different long-term picture. As such, these should be considered little more than illustrative simulations and elements of organized thinking about a possible future. Specifically, there are uncertainty about fertility paths, and associated policies, which will affect population and working age population dynamics in a critical way. There is potentially a large budgetary dividend from lower demand for basic and secondary education in line with the decline of the young cohorts, but this will at least partly be offset by potentially greater demand for tertiary education and life-long learning and new skills that will emerge over the next thirty years. For example, there are also potential demand shifts associated with potentially healthy aging up to certain age cohorts for foreseeable future, especially in demand for health care, which could leave the possibility of positive, not just negative impact of aging on the budgets and productivity. Finally, one can envisage a possibility of technological breakthroughs in health care that will result in a step-increase in life expectancy as well as automation of many social services, including in long-term care, including through the use of robots (See The Economist’s special review of robotics, April 2014).
4. Aging, Growth, and Fiscal Policy

For more than half a century Europe’s aging societies have experienced the world’s lowest rate of population growth, and over the next four decades the European population is expected to actually decline. According to the most recent UN estimates, on average the European population grew by 0.48 percent annually between 1950 and 2013. Even assuming moderate fertility between 2013 and 2050 the European population is expected to decline at an annual average rate of 0.12 percent. In comparison, since 1950 total world population grew by 1.65 percent annually and through 2050 it is expected to grow by 0.78 percent annually. The average for Central Asian countries is similar to world averages: high population growth in the recent past and relatively slower growth in the next five years. The people of Europe are much older than in the rest of the world—and this gap is likely to expand. In 2013 individuals aged 60 and over constituted 23 percent of the total European population, compared to 12 percent in the world as a whole. By 2050, those over 60 are expected to constitute 34 percent of the population in Europe but just 21 percent in the entire world.

What exactly do such demographic characteristics imply for economic growth and public finances in the region? The answer is country-specific. It is determined by a complex set of factors that take into account the structure of the economy, the policy environment, intergenerational linkages, and the pattern of demographic change in terms of both the size and the age distribution of the population. Although policy recommendations should be derived from detailed studies tailored to each economy, a careful cross-sectional comparison of fundamental economic and demographic characteristics and relevant simulations, as in this study, can provide valuable information about trends, vulnerabilities, and possible policy choices.

4.1 Demographic Change and the Impact it May Have on Growth

For the vast majority of countries in the region, population growth rates are expected to lessen. Table 1 compares recent demographic dynamics (1980–2010) with what is expected in the region in the following four decades (2010–50). Highlights:

- Negative growth rates are highlighted in red (see table 1). In coming years total population is expected to shrink in 22 of the 32 countries in the sample, compared to 11 between 1980 and 2010. Bulgaria ranks highest in terms of the magnitude of shrinkage (0.94 percent annually).

Table 1. Annual Growth Rates of Key Variables in Percentages: 1980-2010 vs. 2010-2050 (negative values in red)

<table>
<thead>
<tr>
<th>Country</th>
<th>Output Per Working Age</th>
<th>Person in Share of Working Age Population in Total Population</th>
<th>Total Population</th>
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<tr>
<td>Albania</td>
<td>1.58</td>
<td>0.53 -0.18</td>
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<td>Armenia</td>
<td>3.66</td>
<td>0.23 -0.26</td>
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<td>Azerbaijan</td>
<td>2.41</td>
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<td>1.34 0.36</td>
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<td>Belarus</td>
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<td>0.17 -0.35</td>
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<td>10.50</td>
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<td>Bulgaria</td>
<td>2.20</td>
<td>0.06 -0.47</td>
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<td>Croatia</td>
<td>3.24</td>
<td>-0.08 -0.41</td>
<td>0.00 -0.46</td>
</tr>
</tbody>
</table>

1 The countries covered by this analysis are Albania, Armenia, Azerbaijan, Belarus, Bulgaria, Croatia, Czech Republic, Estonia, France, FYR Macedonia, Georgia, Germany, Hungary, Italy, Kazakhstan, Kyrgyz Republic, Latvia, Lithuania, Moldova, Montenegro, Poland, Romania, Russian Federation, Serbia, Slovak Republic, Slovenia, Tajikistan, Turkey, Turkmenistan, Ukraine, and Uzbekistan. The selection is mainly based on the availability of reliable data.
<table>
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<th>Country</th>
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<td>0.67</td>
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</tbody>
</table>

Source: UN World Population Prospects (2012), World Development Indicators.

* For this series data are incomplete for some countries, especially the CIS countries. Where data series are short, the average growth rates available (generally for 15 years) are extrapolated to represent the entire period of analysis (30 years).

- For 12 countries whose populations have been growing, a shrinking population will be a new phenomenon.

- In 10 countries, populations are expected to grow, but more slowly than they have been. Except for Spain, the Czech Republic, and FYR Macedonia, those growing are in Central Asia: Kazakhstan, Turkmenistan, Uzbekistan, Turkey, Kyrgyz Republic, and Tajikistan.

**Most countries analyzed are projected to experience a rising dependency ratio for the first time in recent history.** The share of persons of working age in the total population will decrease everywhere in the region except a few Central Asian countries (Kyrgyz Republic, Turkmenistan, Uzbekistan, and Tajikistan). Four countries have already begun that demographic transition (Italy, Germany, Estonia, and Latvia), but elsewhere it will be a new phenomenon. The share of the working-age group in total population is expected to drop fastest in Spain, by 0.69 percent annually. However, the most drastic change between the period
before 2010 and the period after is expected to be in the Slovak Republic, from 0.4 percent growth to a 0.55 percent drop in average annual terms.

Illustrative Scenarios

A useful benchmark for investigating the growth implications of these demographic changes is the “no policy change” scenario. Intuitively, it elaborates on how the GDP growth rate would change if there are no policy changes and no adjustments in economic behavior. Thus, any change in the growth rate should be driven exclusively by demographic shifts, such as variation in population size or age composition. This accounting exercise can be performed (see box 1 in the annex for methodological details) using a simple counterfactual experiment, where the anticipated future demographic dynamics interact with historical economic data in order to answer the question: What would happen to GDP growth if the future demographic transition occurred immediately?

Holding productivity growth constant at its recent historical averages, the combined effects of shrinking population and increasing dependency ratios translate into substantial losses in economic growth. Figure 12: Counterfactual Growth Rates with Demographic Dynamics from 2010-2050 shows the extent to which the growth rates of GDP and GDP per capita between 1980 and 2010 would have changed if economies had already exhibited the demographic transition expected for 2010–50. In panels a and b, the horizontal axes show the actual growth rates that were recorded historically in annual averages. For most countries the data cover 1980 through 2010; for others the series start at 1990 or 1995. The vertical axes, on the other hand, show the counterfactual growth rates with demographic dynamics for 2010–50 in annual averages. Therefore, vertical deviations from the 45 degree line show the reduction in growth rates due to future demographics.

Given the expected demographic dynamics, all countries in the sample would have less economic growth. For most, the impact of future demographic dynamics on GDP is greater than on GDP per capita, as shown by the greater vertical distances to the 45 degree line in panel a. This is mainly because the latter impact only affects the composition effect (working age group to population ratio) of the demographic shift, whereas the former also affects the scale effect of population growth.

Interestingly, the largest impact of demographic change on GDP growth occurs in countries whose population is expected to grow between 2010 and 2050; this demonstrates that relatively young countries will also be confronted by substantial demographic and growth challenges. Panel c in Figure 12 ranks countries by the magnitude of the projected demographic impact. Perhaps surprisingly, the impact will be most severe on Turkmenistan, Uzbekistan, Turkey, and Azerbaijan, which are mainly low old-age dependency countries, group 5, and oil-rich countries, group 4. Because population growth in these countries has been even more rapid in the recent past, the average loss due to reduced population growth is high even though it remains positive. In Turkmenistan, population growth, which averaged 1.91 percent between 1980 and 2010, will drop dramatically, to an average of 0.66 percent through 2050, and average growth in the share of the working age group in the total population will skid from 0.65 percent annually to 0.07 percent. Although both rates remain above zero, the differences between the two periods translate into a large 1.83 percentage point loss in GDP growth.
In comparison, the impact of labor force changes on growth in GDP per capita is highest in the EU11 countries. Of the 10 countries that show the largest differences between actual and counterfactual GDP per capita growth rates (Figure 12, panel d), 7 are EU11 members (Slovak Republic, Romania, Czech Republic, Poland, FYR Macedonia, Albania, and Slovenia). These are mainly members of the high old-age-dependency groups, 1 and 2). The impact of demographic change on GDP per capita is abstracted from the variations in total population. Therefore, this observation reflects the fact that, in general, compared to other countries in the region these EU11 members, other things being equal, will see the working age-to-population ratio in the coming decades drop even faster than in recent history. However, in other EU11
countries, among them Latvia, Estonia, and Croatia, changes in demographics are expected to have a comparatively milder impact on growth in GDP per capita.

The reductions in growth rates translate over time into large impacts on cumulative indicators of economic activity and the labor force. A comparison of 2010 actual and counterfactual GDP growth scenarios provides a means of understanding the cumulative impacts of demographic change. In Turkmenistan, where the largest impact can be seen, counterfactual GDP reaches only about 58 percent of actual GDP because, induced by demographics, for about 30 years GDP growth rates will be lower. In comparison, in Kazakhstan, where the impact of demographic change on GDP growth is the smallest in the sample, this ratio reaches 94.5 percent for the same period.

Shrinking size of consecutive generations is the main reason behind the impact of demographic change on GDP growth as shown by the counterfactual analysis. As labor productivity is held constant, changes in GDP can be mapped onto changes in the labor force in the exercise above. Figure 13 performs such decomposition where the differences between the actual and counterfactual growth rates of GDP in Figure 12 are explained by the factors that shape the labor force. Accordingly, more than half of the reductions in GDP growth rates are explained by decreasing size or growth rate of consecutive generations in all countries in the sample. This is shown by comparing the cohort growth rates as shown by the blue bars. In contrast, improvements in the mortality of working age population are expected to counteract this effect to a limited extent across the region. Contribution of migration, however, exhibits significant heterogeneity. Those countries with substantial emigration between 1980 and 2010 are expected to benefit from a limited reversal of this trend—because there will be far less young people to emigrate—which helps offset the pressures on labor force. Most countries in the sample are in this group. However, moderation in migration flow is expected to result in a further reduction in the labor force in a number of countries like Germany and Russia, which have traditionally been a major destination for migration.

![Figure 13: Average Contributions to the Differences Between Actual and Counterfactual Growth Rates of GDP](image)

<table>
<thead>
<tr>
<th>Cohort Growth</th>
<th>Mortality Rate</th>
<th>Migration Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>defines the growth rate of net inflows into the working age group that is based purely on change in age. If the size of incoming cohort (those just below the minimum age of working age population last year) falls short of the size of outgoing cohort (those just below the maximum age of working age population last year) at a rate higher than last year, then the cohort growth will be negative.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>defines the average percentage of death in working age population from one year to the next.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>defines the increase in number of working age people due to net inflow of workers.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In reality, behavioral adjustments in an aging society, which are not captured in this accounting experiment, are likely to alter these projections. First, the labor productivity projections are directly affected by capital accumulation in a closed economy that responds to aging via savings. The exact pattern of the change in savings, however, is determined by the main cause of aging (lower fertility, lower child mortality, or lower adult mortality) and current intergenerational linkages. Moreover, the education and skill choices of households are likely to respond to changing age composition and real wages. The case study presented below delves more deeply into some areas in an open economy environment in order to make country-specific conclusions. The next section evaluates the impact of demographics on public finances by using the growth estimates developed in this section.

4.2 Public Finance Implications of Aging

A transition in the size and age composition of the population has both direct and indirect consequences for public finances. On the revenue side, the transition changes the scale and composition of the labor force and induces behavioral adjustments in private savings, school attainment, and work hours. These in turn affect tax revenues as the size and composition of the tax base changes. Similarly, public spending on education, health care, and long-term care adjusts to accommodate changing societal needs. Moreover, the budget-financed deficit in the Pay-as-You-Go pension system, which builds as imbalances between the numbers of beneficiaries and of contributors rise, creates an additional burden on public finances.

Cross-country analyses of groups of countries with similar aging and fiscal profiles can reveal a great deal about relative trends in the effects of aging-related stress on public finances, but country-specific analysis is needed for concrete and effective policy recommendations. The net impact of aging on public finances is determined by both demographic and nondemographic factors, among them the openness of the economy, the size and characteristics of any unfunded social security system, the domestic tax system, and what primarily is driving aging.2 Sound policy recommendations depend on a careful assessment of how these factors operate in a given economy. Nevertheless, general trends in the stress on public finances associated with demographic change can highlight the need for further studies of a particular country.

Approaching the Aging-Fiscal Nexus

So how might aging affect public finances in an “archetype” economy? One stress indicator that mirrors the deficit-based measures is the amount of fiscal space that can be used to finance aging-related programs. The burden of population aging on fiscal policy can be measured in several ways. One is to assume fiscal sustainability by setting a ceiling on the debt-to-GDP ratio and then observing what policy adjustments would be needed to avoid breaching the target. Another is to choose the policies and then choose an indicator to observe whether sustainability is satisfied. The thought experiment presented here follows the first approach, mainly because without a detailed case study, a forward-looking analysis would have to make major assumptions about the budget flow implications of demographic change. Typically, the recent past is not a very good predictor of the future, mainly because in the short term debt issuance is barely if at all related to demographic shifts. Therefore, this study estimates the capacity of each government to issue debt (measured as debt per dependent person in the economy) without breaching a specified fiscal target. Box 2 in the annex describes the methodology.

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2 Dedry, Onder, and Pestieau (2014) show that both the type of aging (whether driven by a decrease in fertility or an increase in longevity) and the type of unfunded social security system (defined benefit or defined contribution) are important for understanding the impact of aging on capital accumulation and welfare. Aging driven by a decrease in fertility induces an increase in capital accumulation in an unfunded defined contribution pension system. In comparison, the equilibrium capital stock after the demographic transition may be lower than if the aging is driven by increasing longevity or if the prevailing social security system has defined benefit characteristics.
This approach shows the extent to which the government can implement a transfer and expenditure system if it cannot be financed by the aging work force. Typically, any age-related expenditures are financed by higher taxes or borrowing beyond a certain threshold. Because the threshold is determined by the relative size of the dependent population and the characteristics of the tax and transfer systems and of public spending, the extent to which a government can issue debt per dependent person without breaching a specified debt ceiling shows how much fiscal space it has available to accommodate the fiscal pressures of an aging society. A cap on the growth rate of debt per dependent person—a “speed rule” defined by the fiscal target—will be tighter if the dependent population grows faster than the working-age population. Similarly, an increase in the initial debt-to-GDP ratio or a tightening in the fiscal target will suggest need for a downward adjustment to the speed rule.  

**Fiscal Space and Fiscal Stress in Aging Societies: Two Scenarios**

The projections consider two types of fiscal targets: a stable debt-to-GDP ratio rule and a 60 percent threshold for the debt-to-GDP ratio by the end of the projection horizon. The first rule stabilizes the debt-to-GDP ratio at its value in 2010; the second stabilizes the average growth rate of the debt-to-GDP ratio to prevent breach of the 60 percent target by 2050. Using the demographic projections and their impact on the growth rate of GDP for 2010–50, both rules define a speed control on the rate of change in terms of debt per dependent person. The main difference is that because the speed rule is indifferent to the debt-to-GDP ratio at the beginning of the period (2010), in the first approach speed is only determined by demographics and implied GDP growth rates. Therefore, it does not distinguish those countries that are currently on the brink of a debt crisis from those that are not. Although this aspect reduces the relevance of the rule for short-term policy making, it is useful because it helps to isolate the net effects of productivity growth and demographic dynamics in the long term. In comparison, the 60 percent threshold rule involves a “punishment term” for high initial indebtedness; holding other factors constant, a higher initial debt-to-GDP ratio entails slower growth in debt per dependent person.

**Scenario 1: Keeping Debt at the Initial Level**

Since unfavorable demographics are common all these countries, differences in their productivity growth paths deeply affect their fiscal outlook. Table 2 shows projections for the maximum growth rate of debt per dependent person that satisfies the first debt sustainability criterion, the speed rule: A high growth rate means that the government can afford to externally finance rising public spending on those who are dependent. If the growth rate is negative, the government will have to cut debt-financed spending on dependents if it wants to abide by the fiscal target. Therefore, negative growth rates may threaten the welfare and the life quality of dependent populations. Because the characteristics of the growth rate vary with variations in the demographic characteristics in each country, the tightening of the fiscal space that is required, as defined here, is front-loaded in France, back-loaded in Turkey, a U shape in Germany and Italy, an inverted-U shape in Bulgaria, Czech Republic, Kazakhstan, Kyrgyz Republic, Latvia, and Russia, and a distorted W shape in the rest. Since average growth in labor productivity in recent history remains fixed throughout the projection horizon, the impact will be greatest on countries where productivity growth is

---

3 We use debt per dependent person as a measure of fiscal space to finance the aging related commitments that are no longer feasible to be financed by the contributions from the active population. If the aging is very rapid, productivity growth is slow, and initial indebtedness is high, then the government will not be able to issue debt to fulfill its long term commitments.

4 A 60 percent debt-to-GDP target is chosen so that the Maastricht criteria can be used as a benchmark. A different value would change the magnitude of the constraint on the growth of debt per dependent person; however, it would not change the time variation of the constraint. In practice, the actual debt threshold, beyond which debt distress is likely, is determined by many factors, such as the income level of the country, the currency composition of the debt stock, and the history and quality of fiscal and debt management.
low, such as Ukraine, Tajikistan, Georgia, Serbia, Moldova, and Kyrgyz Republic. Similarly, countries that have performed well in recent history, such as Estonia, Armenia, Turkey, and Poland, should be somewhat more resilient. (See figure 12, panel A, for average annual rates of growth in debt per dependent person ranked by magnitude.)

Table 2. How Much Can Countries Increase Debt per Dependent Person without Increasing the Initial Debt-to-GDP Ratio? (Annual Growth Rates, %)

<table>
<thead>
<tr>
<th>Country</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
<th>2035</th>
<th>2040</th>
<th>2045</th>
<th>2050</th>
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<td>2.9</td>
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<td>-0.3</td>
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</tbody>
</table>

Source: UN 2012: World Development Indicators.
Figure 134: Maximum Growth of Debt per Dependent Person for Different Fiscal Targets

a. Stabilizing the Debt-to-GDP Ratio at its 2010 Level (Annual Averages, 2010–50)

b. 60 Percent Debt-to-GDP Ratio Target in 2050 (Annual Averages, 2010–50)

Source: UN 2012; World Development Indicators.

Timing and Sequencing of Age-Related Fiscal Reforms

Although structural reforms are unavoidable in the medium term, they will be more effective and less costly the sooner policymakers act. The time variation in the degree of pressure on fiscal space offers opportunities to spread transition costs over several generations. For many countries, the likely shape of demographic change means that tightening debt-financed public spending for the dependent population will come soonest and be harshest; thus, for Armenia, Azerbaijan, Belarus, Croatia, Hungary, Lithuania, Moldova, Poland, Russian Federation, Turkmenistan, and Ukraine, the pressures on fiscal space will peak before 2030. Although the peak per se does not necessarily imply stress, it does imply an inferior condition for the corresponding generation in comparison to the ones before or after it. These countries should therefore consider short-term fiscal and structural measures to facilitate a smooth transition to long-term fiscal sustainability. Typical measures might be reducing debt if high and establishing the right incentive structure to attract more of the population to participate in the labor force and to promote productivity growth.

Scenario 2: Reducing Debt to Maastricht Levels

The amount of initial indebtedness may further restrict fiscal space over the projection period when a debt-to-GDP ratio is targeted. Shifting from a speed rule to a debt-to-GDP target is expected to cause the outlook to deteriorate for such highly indebted countries as Italy, Spain, and Hungary. Table 3 shows projections for the maximum growth rate of debt per dependent person that would satisfy the 60 percent target for the debt-to-GDP ratio for 2050. This approach implies a looser definition of fiscal space for countries whose debt was less than 60 percent of GDP in 2010. However, the closer a country is to the threshold in 2010, the smaller the addition to the fiscal space compared to the previous rule. Figure 2, panel b shows rankings for maximum growth in debt per dependent person under this rule, averaged over 2010–50. There are two major differences from the results in panel a: The fiscal outlook deteriorates significantly for a small number of countries with high initial debt (e.g., about 120 percent for Italy and 82 percent for Hungary). In contrast, for resource-rich countries the outlook brightens substantially because their initial debt is low (e.g., about 11 percent for Russia and 4 percent for Turkmenistan).
## Table 3. How much Can Countries Increase Debt per Dependent Person Without Breaching a 60 Percent Debt-to-GDP Target by 2050? (Annual Growth Rates in %)

*(Negative values in red)*

<table>
<thead>
<tr>
<th>Country</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
<th>2035</th>
<th>2040</th>
<th>2045</th>
<th>2050</th>
</tr>
</thead>
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<td>0.92</td>
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</table>

Source: UN 2012; World Development Indicators.

A rule-of-thumb classification shows that a 60 percent debt-to-GDP target will put major pressure on the fiscal space of most ECA countries. Table 4 classifies countries on the basis of three factors that affect the maximum growth rate of debt per dependent person: high productivity growth, low reduction in the share of working age people, and low initial debt; for each category, a value greater than the median is given a rating of high stress and a value below it a rating of low stress.
A country with relatively more favorable conditions in all three categories, e.g. high productivity growth, small increase in dependency ratio, and low initial debt, is considered at low stress. In comparison, one with relatively unfavorable conditions in all categories is considered at high stress. Finally, a country where conditions are mixed, such as one or two categories being unfavorable, is considered at moderate stress. Accordingly, stress is considered high for France, Germany, Italy, Hungary, Kyrgyz Republic, Poland, Serbia, and Spain, and low for Armenia, Azerbaijan, Bulgaria, Estonia, and Kazakhstan, and Uzbekistan, for example.\(^5\) Importantly, note that these categories show relative assessments within the sample and based on aggregate growth, demographic, and fiscal factors. Thus, a low stress assessment in a given country may still be consistent with an actual environment that is substantially more adverse than in countries with no immediate demographic concerns.

Table 4. Relative Rankings of Fiscal Space and Demographic Aging in the Region’s Economies (2010-50)

<table>
<thead>
<tr>
<th>Country</th>
<th>Productivity growth</th>
<th>Change in dependency ratio</th>
<th>Initial indebtedness</th>
<th>Overall assessment</th>
</tr>
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<td>High</td>
<td>Moderate stress</td>
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<td>Low stress</td>
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<td>Low</td>
<td>Low stress</td>
</tr>
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<td>Moderate stress</td>
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<td>Moderate</td>
<td>Moderate stress</td>
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<td>Low stress</td>
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<td>High</td>
<td>High stress</td>
</tr>
<tr>
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<td>High</td>
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<td>Moderate stress</td>
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<td>Georgia</td>
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<td>High stress</td>
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<td>Low</td>
<td>Moderate</td>
<td>Moderate stress</td>
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\(^5\) An important caveat here is that if the post-transition productivity path overstates long-term productivity growth potential, the assessment for a number of countries may be downgraded.
Turkey

<table>
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<tr>
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<th>High</th>
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<td>Low</td>
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Notes on the Methodology: For each indicator, countries are given scores from 1 to 3 based on their relative rank in the sample, e.g. a productivity growth rate that falls into the first three percentiles of all countries receives a 3 (high), whereas ones in the last three percentiles receive 1 (low). A weighted sum of these scores is used for the overall assessment using similar relative rank criteria of total scores. The weights are equal for the first two indicators; however, it is twice as much for the initial indebtedness.

Country-specific studies are crucial to identify which countries risk a breach of fiscal sustainability thresholds. The analysis so far has shown how a debt-to-GDP target may limit debt-financed public spending on the dependent population. This indicates the extent to which the government can scale up public spending on services to give an aging population a better quality of life. On the other hand, measuring the fiscal stress that arises without a ceiling—or from not honoring the ceiling—requires a more detailed characterization of the relationship between demographic change, the real economy, and the fiscal sector in a given country. The next section, a case study of Bulgaria, uses a modeling platform that integrates demographic projections into the real economy and the fiscal dimensions of the economy.

5. Case Study: Growth and Debt Dynamics in Bulgaria

Within the next few decades the population in Bulgaria is expected to fall farther than in any other country, from 7.4 million in 2012 to 5.5 million by 2050—a loss of 26.7 percent of the current population (UN 2012). The drop is even more pronounced for economically productive age groups (figure 15): The working-age population (ages 15–64) is expected to shrink by 35 percent, from about 5 million to 3.3 million. As a corollary, the old-age dependency ratio—the ratio of those aged 65 and above to the working-age population—will jump from 27 percent in 2012 to 51 percent by 2050.

On the real economy side, a smaller population is expected to depress the growth of economic output by constraining the factors of production. Since, of course, the labor input decreases directly, in an open economy, other things being held constant, the returns to investment also decrease, which restricts capital input. Together, the expected result is lower output. Box 3 in the annex describes the macrofiscal model used to estimate this impact. The simulations suggest that, even after reaching a long-term unemployment level of 5 percent, labor input will gradually shrink to near 2 million by 2050—a 50 percent drop—causing annual GDP growth to slow long-term to near 1 percent. Monte Carlo simulations show that in the long term growth rates are expected to remain within a band of 2.2 percent and 0.2 percent with a 90 percent degree of confidence.6

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6 These simulations introduce TFP growth shocks that are identically and independently distributed with a zero mean and 0.75 percent standard deviation.
A smaller population raises the growth rate of per capita GDP, but in the long term a smaller share of those of working age in the population reduces it. Figure 4, panel c decomposes per capita GDP growth into the main drivers, demonstrating the positive contribution from a shrinking population throughout the projection horizon. This is a pure denominator effect where over time output is divided by a smaller number of people. In contrast, the panel also documents the negative contribution of the employment ratio, especially toward the end of the projection horizon. Interestingly, the employment ratio contributes positively in the short term even though aging is prevalent in those years as well. This is mainly because the economy is assumed to recover from the recent downturn, and the unemployment ratio decreases in the coming decade.

Age-related public spending exhibits different patterns over the projection horizon: a downward trend in education, an upward trend in healthcare, and first a downward then an upward trend in pensions. Figure 5 shows the simulation results for age-related spending, the primary balance, and the debt-
to-GDP ratio over the next four decades. Education spending as a share of GDP decreases throughout the projection period because there are fewer school-age children—the total number falls by about half, from 1.03 million to 0.53 million. Although per student expenditures grow as a share of per capita income, the reduction in students enrolled dominates the outcome. As a result, spending on public education drops from 4.6 percent of GDP in 2012 to 3.2 percent by 2050. On the other hand, public spending on healthcare climbs steadily upward, leading to a 1 percentage point increase in its share of GDP, from 4.1 to 5.1 percent. Two factors drive this result: (1) An increase in the average age pushes up healthcare spending because the old tend to spend more on healthcare. (2) As income per capita grows in Bulgaria, its healthcare spending per capita catches up with the rest of Europe. Finally, transfers to the pension fund drop from 6.1 percent in 2012 to a low of 4.9 percent before climbing to about 5.6 percent by 2050. Transfers are driven mainly by the number of contributors and beneficiaries, though to some extent by movements in real wages as they affect indexation schemes.

**Bulgaria’s demographic transition is projected to lead to a steady rise in public debt.** The budget is projected to incur primary deficits throughout the projection horizon, which are expected to be close to 1 percent by 2050. These deficits in turn lead to accumulation of debt: The debt-to-GDP ratio increases from 18 percent in 2012 to about 51 percent by 2050. Decomposition of debt dynamics shows that the primary balance is the most prominent factor in this increase. On average, as 2050 closes in the deficits add about 0.9 percentage points to the debt-to-GDP ratio every year. The effect of output growth, which trickles down to the debt-to-GDP ratio, becomes smaller over time, from 0.5 percentage points a year in 2015 to about 0.3 points by 2050.

**Simulations with alternative scenarios suggest that one-off measures will not be enough to address the structural problems that accompany an aging population.** Policies that promote broad-based participation in the labor force, boost productivity and technological progress, and increase the quality and coverage of education can help reduce the negative impact of demographics on public finances. However, although they may provide transitory relief, one-off measures such as increasing the female retirement age to match the male age are not as effective as would be an across-the-board increase in labor force participation.

**Figure 156: Baseline Projections for Public Finances**

![Aging-Related Public Spending](image)
Until the global financial crisis, in terms of economic performance Poland was one of the flagships of the European Union (EU). Blessed with a sound economy, high economic growth, short-term fiscal stability, and relatively moderate unemployment, it was praised in the EU as an example of fiscal prudence and economic performance.

Today the Polish fiscal policy debate is focused on the European Economic and Monetary Union (EMU) but the main long-term fiscal issue is aging. The desire to adopt the euro is now compelling the Polish government to tighten fiscal policy so it can fulfill the Maastricht criteria of a deficit-to-GDP ratio of less than 3 percent and a declining debt-to-GDP ratio. Since 2010, bringing the ratios down has been the main policy target. In 2013 the deficit was reduced to about 3 percent of GDP and in 2014 the public debt ratio will stabilize at 54 percent. Sound macroeconomic and fiscal management notwithstanding, however, over the long term Poland is being dramatically confronted by an aging population.

No other EU country except perhaps Slovakia can expect as big a surge in the number of elderly people relative to the working population as is predicted for Poland in the next 50 years. The surge could severely destabilize public finances considering that higher age-related spending must be financed by fewer workers. As the age-dependency ratio increases, it will be tracked by rising public spending on health, long-term care, and pensions (Figure 17). For pensions, the estimated increase in the dependency ratio will be partly offset by the expected substantial decline in benefits (Figure 178). But revenues will also be falling as more Poles retire.
Policy Reforms and Debates

Although the discussion on the effects of aging is as controversial in Poland as in any other country, recent changes to the social security system have turned up the heat. In 1999 Poland replaced its defined-benefits system, which set pensions as a percentage of final salary at retirement, with one in which pensions are based on the accumulated value of contributions during a person’s working life. This allowed the government to cap liabilities while reducing expected final-salary replacement rates by about half.

This shift to contribution-based pensions, together with the recent extension of the minimum retirement age to 67 for both men and women, put Poland at the forefront of international efforts to control aging-related budget deficits. Politically, however, they were not an easy sell. Even more controversial were recent proposals to shift funded contributions to the pay-as-you-go pension scheme and as of 2014 further cut the funded pension pillar. Some argue that as the aging process intensifies, the latter proposal will reduce future pensions to the point where they would not be socially sustainable, prompting subsequent increases that would ultimately jeopardize fiscal sustainability generally. The history of policy reform is full of examples of major reforms being reversed because of rising pressure from vocal social and political groups. So there is a question not just of fiscal sustainability but also of the sustainability of the reform. This case study is concerned with fiscal sustainability only. The question of the political economy is addressed in a broader comparative context in section 8.

Meanwhile, Poles are still waiting for major health reform. The health care system is characterized by low spending, heavy out-of-pocket payments, and long waiting lists that generate inequities in access to care. Spending on health care is likely to go up in coming years as demand for health care rises, driven by demography, income growth, and technological changes. Bold action will be needed to ensure that Poles have the best possible access to health services, get the most health gains possible from every zloty spent, and ensure that health spending is sustainable for future generations.

So, given the major reforms so far, the question has become: Can the Polish fiscal system be sustained over the long term? To begin to answer it, it is important to assess if the recent reforms improve or threaten fiscal sustainability. Since traditional methods of cash or accrued deficit and nominal debt measures focus only on the current fiscal situation, and the impact of aging on the budget is spread over many decades, the answer depends to a significant extent on long-term debt stability indicators. This case study seeks both to define such indicators and to evaluate which isolated subsystems of public finances are the main drivers of long-term instability for Polish public finances. To do so, it applies the generational accounting (GA) methodology formulated by Auerbach, Gokhale, and Kotlikoff (1991, 1992, and 1994) in order to illustrate
the fiscal effects of intergenerational policy. Since the early 1990s, GA has often been used to measure fiscal sustainability.  

Poland’s Fiscal Sustainability in View of Aging

Despite important reforms, given the large long-term impact of aging, the gap associated with Poland’s current fiscal policy over the long term is also large—but it can be eliminated with moderate adjustments to the primary fiscal deficit sustained over the long term (figure 189 and Box 1). The total sustainability gap of Polish public finances in such a passive scenario of no new policy changes is estimated to amount to 129.8 percent of initial-year GDP. Polish explicit public debt amounted to 54.8 percent of GDP in 2010, but that gives only a partial picture. The implicit debt that may arise if current fiscal policy is carried over for many years would sum up to another 75 percent of GDP, which explains the 129.8 figure. While large, such a gap can be eliminated by moderate improvements in the primary budget balance, sustained over the long term. Specifically, closing the total fiscal gap requires that the primary balance be reduced by 1.4 percent of GDP and those savings maintained over the long term. A cut of 0.6 percent of GDP in the primary budget balance is all that is needed to close the gap caused by explicit debt, but another cut of 0.8 percent is necessary to cover the implicit debt gap. How could this be achieved? Revenues, spending, or both would need to change if the primary balance is to improve. The magnitude of these fiscal changes is illustrated by the transfer and revenue gaps. Politicians have the option to increase all revenues by 3.4 percent of GDP to close the revenue gap, reduce all transfers by 3.3 percent to close the transfer gap—or use a combination of revenue increases and expenditure cuts—to ensure fiscal sustainability.

Figure 199: The Sustainability Gap in Polish Public Finance

![Box 1: Sustainability Indicators Applied](Picture)

The sustainability gap indicator is similar to the debt quota well-known since the Maastricht Treaty; it measures public liabilities in relation to base year GDP. Unlike the Maastricht formulation, it includes not only accrued (explicit) debt but also future (implicit) public debt, assuming present fiscal policy continues.

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8 The value of 1.4 percent of GDP refers to the primary budget gap (see box 1), which is similar to the S2 Indicator that the European Commission (EC) uses.
The **revenue gap** indicator outlines necessary immediate and durable adjustments of all taxes and contributions to close the sustainability gap in terms of overall revenues. Its counterpart, the **transfer gap** indicator, shows the change required for all public transfers to close the intertemporal budget constraint in terms of overall transfers.

The **primary budget gap** indicator reflects the necessary immediate and durable adjustment of the primary budget balance to close the sustainability gap in terms of percent of GDP. It is similar to the EC’s S2 indicator.

**Generational accounts** reflect payments net of tax over the remaining life expectancy for a given birth year, projecting current fiscal policy into the future. As these accounts are constructed in a purely forward-looking manner, they usually cannot be compared across living generations because they incorporate the effects of different lifetimes. These indicators give a single number for measuring sustainability. This approach is valuable because it provides a comprehensive indicator of long-term fiscal stability. It is especially appropriate for comparing both reforms and fiscal systems. However, most policymakers are not yet familiar with such aggregated figures and the concepts underlying them.


*For a full description of these indicators see Jablonowski and Müller 2013 as well as EC 2012.*

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**In general, the long-term stability of Polish public finances has improved significantly in recent years.** The reforms the government has adopted since 2010 (see box 2) have helped to reduce the sustainability gap (box 1) by more than 80 percent of GDP—the rise in disability contribution rates alone contributed about 42 percent of GDP. The permanent transfer of part of second-pillar contributions to the unfunded defined contribution (NDC) system adopted in 2011 (the “FDC cut”) decreased the gap by another 30 percent of GDP. This reform led to immediate expansion of revenue. Although the reforms did raise future pension spending, the present value calculations discount that. Finally, the recent rise of retirement ages to 67 (RA67) lowered the sustainability gap by about 10 percent of GDP. The impact of this last reform is relatively small because the gains, in the form of higher contributions and tax payments for a longer time, are to a large extent offset by higher expected disability spending as the higher retirement age prolongs the possible duration in disability.

**Box 2: Recent Major Pension and Disability Reforms**

**2011 increase in the disability contribution rate:** Starting in 2012, the disability contribution rate went up by 2 percentage points, from 6 to 8 percent of gross wage. This was a partial correction of the reduction begun in 2007 that brought the statutory rate down from 13 to 6 percent.

**2011 FDC cut:** In 2011 the government decided to change the balance between the notional and funded parts of the old-age pension contribution. From the time the Notional Defined Contribution (NDC)/Financial Defined Contribution (FDC) reform was introduced in 1999 until 2011, contribution rates held steady at 12.22 percent of gross salary or income; contributions were notionally recorded on each person’s NDC account; and 7.3 percent was actually saved in the FDC account. Driven by budget problems, in May 2011 the government lowered the FDC part from the initial 7.3 percent to 2.3 percent and split the NDC part into two subaccounts, NDC 1 and NDC 2. The indexation rule for NDC 1 continued to be nominal growth of the wage fund in the economy, but the new NDC 2 part, also held in the Social Security Institution (ZUS), is indexed to average nominal growth of GDP over the previous five years. Moreover, possible maximum FDC contribution fees were cut from 7 to 3.5 percent. The limit on investment of FDC funds is also being gradually changed, from the current 40 percent to 90 percent in 2034.
2012 increase in the legal retirement age to 67: With the reform passed by Parliament in May 2012, the statutory retirement age for Poles insured in the general public old-age pension system (NDC/FDC) will gradually rise, for women from 60 in 2013 to 67 in 2040 and for men from 65 in 2013 to 67 in 2020, in increments of three months a year. The reform leaves unchanged special privileges previously granted to, e.g., miners, bridging pensioners, teachers, and pre-retirement beneficiaries.

2013 FDC “cut 2”: The temporary review of the sustainability of the pension system in early 2013 suggested a need for the funded pillar of the system to function better. The main points of the proposed reform as of December 2013 are as follows:

- The FDC contribution rate will be fixed at 2.92 percent with no further changes in the future.
- 51.5 percent of FDC assets, at first government bonds, and the value of the liabilities will be taken over by the general government and recorded on NDC2 accounts.
- Government bonds taken over will be redeemed immediately.
- FDC will no longer be mandatory.
- A new mechanism of FDC-related pensions will be introduced (the “zipper”): For 10 years before people reach the statutory retirement age, their FDC assets will be cashed in (10 percent annually) and gradually cumulated in their personal NDC2 account.
- The FDC may not purchase government bonds; portfolios must turn more aggressively share-oriented and operate mainly in the Polish stock exchange but with limited possibilities of investing abroad.


The most recent reform of the FDC system, “FDC cut2,” reduces both the current and the future deficit of the social security old age pension fund. If implemented as scheduled in mid-2014, this reform would lead first to a significant shift of FDC assets and liabilities to the general government (for details, see box 2) in the amount of the 51.5 percent of FDC assets that are invested in government bonds (about 8.5 percent of GDP). The eventual impact of this on public finances depends on how many people opt to switch back to the mono-pillar system. These people pay higher contributions to the NDC pension system. In the baseline scenario it was assumed that 50 percent of FDC participants will choose to switch; the sensitivity of this assumption is discussed in World Bank 2014.

Besides the one-off transfer of FDC assets, the 2013 reform would lead to a gradual increase in social security revenues over the next three decades (see Figure ). First, average contributions to the NDC system increase in 2014 by about 0.2 percent of GDP (those who switched to the mono-pillar system will contribute 19.5 percent instead of 16.42 percent of earnings to the pay-as-you-go [PAYG] system). After 2014, the steady rise of revenues can be explained mainly by a new mechanism of FDC pensions (see box 2). In fact, the years affected by this mechanism over time do show increasing FDC participation. Consequently, rising amounts of FDC pension funding are shifted before retirement to the NDC system.10 Upon retirement, after a lag of about 10 years benefits paid out in the unfunded NDC system are higher, which will increase transfers by about 1 percent over the long term. To summarize, the 2013 FDC cut 2 improves the fiscal sustainability of the public pension system in the next decades because the mismatch between pension contributions and benefits is significant.

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9It was also assumed that 50 percent of future entrants will choose to participate in the mixed pillar, NDC/FDC, system.
10The amount of FDC assets shifted each year via the zipper depends on the rate of return for FDC assets. The baseline assumes a 3 percent rate of return in real terms.
The Impact of Aging on the Sustainability of Individual Social Systems

There are wide differences in the long-term fiscal stability of public financial subsystems, with the health sector being the most problematic (see Figure 212). The social security old age pension, disability fund, sickness, and accident system could in general be considered sustainable even under current rules. Positive for its sustainability is the fact that the sizable farming and mining sectors in Poland are expected to decline gradually in coming decades. Both have generous pension schemes heavily subsidized by the state budget that will also shrink. Finally, with fertility rates declining, current spending for education is expected to take up a smaller share of GDP. But the public health care system may turn out to be the rotten apple of public finances: If the growth in costs observed in recent years is projected into the future, public finances will be severely challenged. Moreover, the civil servant pension system will be negatively affected by increasing longevity and the resulting increases in the duration of retirement.
The NDC old-age pension system will stabilize in coming decades. Current earmarked contributions will clearly not be sufficient to cover the spending likely to arise in the next 20 years as the sizable cohorts born between 1950 and 1965 retire. The sustainability gap without new taxes is about 167 percent of GDP. Deficits will also arise because the Polish pension system is still being transformed from the generous pre-1999 pure PAYG system to the two-pillar FDC/NDC system. The flow of current tax revenues into the social security pension fund is huge—about half of all revenues. Such huge subsidies will not be necessary in coming decades, as can be seen from the negative sustainability gap with tax inflows (−73 percent of GDP). As a consequence, current inflows into this system may then be used to some degree for other government activities. The sickness and accident systems can be regarded as sustainable in the long term; they are not much affected by the increase in the old-age dependency ratio.

The disability fund seems sustainable under current rules. Its long-term fiscal stability improved significantly after eligibility criteria were tightened. Stricter rules have led to lower inflows into disability; in 2010 outflows from disability were almost double total inflows. The disability system can also benefit from future demographic developments. In the next decade the baby-boomer generations aged 50–60 today will reach statutory retirement age and leave the disability system, and fewer will be entering it in coming years because fewer cohorts will be entering the high-risk age group, 50–64. Finally, the increase in contribution rates from 6 to 8 percent of wages has improved the long-term stability of the disability fund. However, its sustainability depends to some extent on the increase in retirement age to 67, because that prolongs the duration of disability and consequently increases disability spending.

The education system generates the highest implicit asset in the tax inflow scenario, adding up to 113 percent of GDP. This is the only subsystem that is clearly affected positively by changes in the age distribution of society because of low fertility rates. This evaluation is based, however, on the optimistic assumption that age-specific per capita transfers will hold constant. In other words, it is assumed that the number of pupils per class remains constant, schools can be easily shut down, and the number of teachers reduced smoothly if the number of pupils decreases. This requires constant government adjustments to
maintain pupil-teacher ratios. Thus, the highly positive projection of sustainability for the education system—and its impact on public finances as a whole—should be received with caution.

The civil servant pension system, however, is likely to be negatively affected by increases in longevity and the accompanying increases in the duration of retirement. Without recent reforms, this sustainability gap amounts to about 42 percent of GDP. The increase in retirement ages for civil servants legislated in 2012, however, lowers the sustainability gap by about 10 percent. Projections for this isolated scheme, however, can only be tentative because there is a lack of precise information on the number of active civil servants.

The two systems with the highest mismatch between contributions paid in and transfers paid out are those for farmers and miners. Contributions cover only about 10 percent of spending for farmers and 20 percent for miners, which implies a large sustainability gap for both systems if tax inflows are left out. The appendix discusses a possible scenario for reform of the miners’ pension system. The sustainability gaps with taxes, however, indicate that the currently high inflow from the state budget will most likely not be necessary for either subsystem in future. In fact for the coming decades a gradual decrease in employment is predicted for these two sectors.11

Thus, the main driver of the sustainability gap in Poland is the public health care system. If current tax inflows into the system are carried forward, the sustainability gap would amount to 140 percent of GDP; without any tax inflows the gap could be as much as 228 percent of GDP.12 The baseline scenario assumes that governments will be able to limit the growth of health care spending (HCS) to 0.5 percent above the growth of real GDP per capita up to 2050. This is a relatively optimistic assumption considering that in the past the growth of Poland’s HCS on average exceeded growth in GDP per capita by 1.7 percentage points. This result is sensitive to a number of assumptions about future health status, demography, and cost development (for details, see World Bank 2014).

A sensitivity analysis shows that the public health care system still has a significant sustainability gap under a range of assumptions. To evaluate the robustness of the baseline results, four alternative scenarios were considered (Box 3). The sensitivity of the baseline result with respect to those scenarios is shown in

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11 The baseline assumes a gradual transformation of the farming sector in line with EC projections. Consequently, it is also assumed that there will be an inflow of additional members into the general pension scheme and fewer contributors and future pensioners in the KRUS pension scheme. For miners the base year probabilities to contribute to this system are kept constant over time. This fact will lead to drop of future pensioners in the miners’ pension system.

12 The subsystem sustainability gaps show the extent to which future contributions and taxes will be sufficient to cover the future expenditures of each subsystem. A positive sustainability gap system need not necessarily be interpreted as problematic as resources of other subsystems, if available, might be used to close the gap. The sustainability of subsystems is assessed in two steps. The first is to calculate whether contributions earmarked for a subsystem are sufficient to cover future expenditures. Then current state budget transfers into that subsystem are analyzed. For some systems, such as farmers or ZUS old-age pensions, the difference between these two perspectives is substantial because to a large degree they are financed by taxes. Some other subsystems, such as civil servant pensions or education, are completely funded by the state budget.
Figure 223, which presents the sustainability gap for the public health care sector alone. The results show that a changing population structure (a pure demographic scenario) would result in a sustainability gap of roughly 94 percent of GDP. The gap would, however, be much lower in a scenario with a longer healthy lifetime (healthy longevity scenario). In contrast, the expansion of the public LTC system may severely affect fiscal sustainability. The convergence scenario that assumes an LTC prevalence rate in Poland similar to that of Germany shows a sustainability gap of 154 percent of GDP. If the growth of HCS in Poland simply follows past trends (exceeding growth in GDP per capita by 1.5 percentage points), the sustainability gap would explode to 365 percent of GDP. Unfortunately, that scenario is not unrealistic. Medical technology changes may in future decades lead to excessive growth in cost. Furthermore, labor costs (wages of nurses, physicians, etc.) are likely to grow in line with growth in labor productivity, which in future decades will be higher than the growth of GDP per capita.

**Box 3: Health Care Scenarios**

To evaluate the robustness of the baseline results the following alternative scenarios were tested:

- The *pure demographics scenario* is based on time-invariant age and gender-specific profiles for all categories of health care. Costs are assumed to track GDP per capita; thus this scenario reflects the impact of a changing population structure only on future expenditures and revenues.

- The *healthy longevity scenario* assumes that future gains in life expectancy translate fully into increased years of good health. Technically, this causes a shift of health care profiles in line with the age and gender-specific rise in life expectancy. Thus the relatively high per capita costs, e.g., of hospital treatment, occur at later ages.

- The *convergence of Polish prevalence rates* scenario assumes that public long-term care (LTC) prevalence rates in Poland converge to Western Europe standards. It is reasonable to expect that LTC coverage for Polish elderly is likely to increase in coming years from its very low level. The probability of being an LTC beneficiary in Poland amounts to roughly 6 percent in the age groups 80 and over, but prevalence rates are much higher in Western economies.

- Finally, the *cost pressure scenario* assumes higher growth in health care expenditures than in GDP per capita. Excess cost growth of 1.5 percent a year until 2050 is embodied in the cost pressure scenario. It is backed by a number of current studies that found that past rises in health care expenditures were largely determined by nondemographic drivers, such as medical technological progress. The hypothesis is that costly product innovations to cure disease seem to have overwhelmed cost-saving process innovations in recent decades.


A considerable part of the public budget is not covered in the subsystems already discussed. This part is listed as “all other government systems” (figure 22). On the spending side, the category covers government purchases, such as infrastructure projects or research and development investments. On the revenues side, it covers valued-added (VAT), personal income (PIT), and excise taxes as well as other current and capital revenues. If none of these were transferred to other subsystems, the “all other” system would be over-financed—as indicated by implicit wealth amounting to about 380 percent of GDP. If, however, the base year tax flow into subsystems, such as the ZUS pension fund, is considered, then all other systems are generating an implicit liability of about 178 percent of GDP. To close the sustainability gap, this subsystem may require more revenues (namely, taxes) or fewer government purchases.

While Poland gets credit for having achieved fiscal sustainability in its old age pension system, the notional accounts system it has adopted, however, achieves fiscal sustainability by reducing benefits significantly as life expectancy increases. Projections of benefit levels suggest that, even without the FDC cut, future benefit levels would fall markedly as shown in Figure 234. The figure shows that the first FDC cut reduced the benefits further to the dashed line, while the increase in retirement age raised them to the dotted line. The second FDC cut is expected to reduce the benefits further. The question is why individuals in Poland would be willing to contribute 27.5 percent of wage for more than 40 years to collect less than that as a percentage of average wage for only 15 years. Will this be socially sustainable going forward? If it is not, then maybe the ex-ante fiscal sustainability is an illusion and might require early corrective action.

Beyond these in-depth case studies, how have countries coped with aging-related fiscal pressures? What reforms did they undertake and what, if any, lessons of experience may arise? International experience can be instructive here, especially in countries with significant aging-related fiscal pressures and those that have adopted wide-ranging reforms. This section briefly review the aging-related reforms in three countries at the forefront of sound and timely reforms—New Zealand, Norway, Germany, and Sweden. It also reviews the experience of Japan, the oldest country in the world, for a glimpse into the demographic future and policy challenges that may confront many European countries.

For comparability and ease of drawing lessons, each country review is centered on four related questions: How significant is the aging-related challenge? How prudent has fiscal policy been so far? What is being done to ensure lasting fiscal prudence? And what aging-related reforms has the country undertaken? The intent is to provide broader comparative examples, lessons of experience, and insights into the policy choices other European countries face.

7.1 New Zealand: Sound Fiscal Institutions and Early Action

How significant is New Zealand’s aging challenge? Even though demographically New Zealand is one of the younger OECD countries, the share of its population aged 65 and over is projected to almost double to 46.7 percent by 2060. The shift is expected to occur mainly between 2010 and 2040 as the old-age population rises from over 22 percent of the working-age population to 41.4 percent. Pension spending is therefore projected to increase from 4.3 percent of GDP in 2010 to 7.9 percent in 2060. Even though the extent of the demographic change is almost the same as for the OECD average, and much smaller than what Korea, an outlier by OECD standards, must deal with, it nonetheless requires early and sustained fiscal measures and solid fiscal institutions to secure public finances for the long run.

How prudent has New Zealand’s fiscal policy been? New Zealand has a long record of outstanding fiscal performance. Between 1995 and 2009, it had consistent fiscal surpluses, which peaked at 4.6 percent of GDP in 2005. As the fiscal situation deteriorated with the global crisis and the Canterbury earthquake in 2010, this small, highly open economy moved to deficit, which peaked at 9.2 percent of GDP in 2011. By 2013, however, the deficit had declined to 2.1 percent of GDP and, in line with the government’s target, it is projected to return to surplus in 2015. The deficits during the past five years increased the public debt-to-GDP ratio from 24.2 percent in 2007 to 48.2 percent in 2012. Net core Crown debt, the policy target, shot up from 5.5 percent of GDP in 2008 to 24.3 percent in 2012; the rise in the ratio is projected to continue through 2015 but begin to decline thereafter, stabilizing at the government’s target of 20 percent by 2020. The government also plans to reduce spending to 30 percent of GDP.

What has been done to ensure fiscal prudence? New Zealand’s capacity to address the problems expected from the demographic shift is heavily influenced by its results-oriented public financial

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management system, which is transparent and accountable and has a long-term orientation. The process of budget preparation and monitoring has a clear focus on outputs, and the government’s budgeting, monitoring, and medium- and long-term fiscal strategies are very transparent. Every year, its 10-year fiscal projections are updated; they reflect the very long-term 40-year fiscal strategy, which is reassessed every four years.

**What major aging-related reforms did New Zealand undertake?** New Zealand started its age-related reforms well before the onset of the demographic transition. Starting in 1991 when its old-age dependency ratio stood at just 19.4 percent, it began a nine-year program to increase the age of eligibility for universal public pension benefits from 60 to 65. In 2010, the old-age dependency ratio was still just 22 percent. The increase in the retirement age is estimated to have increased labor force participation rates among older males by almost 15 percentage points—from 53.9 percent in 1990 to 68.3 percent in 2000.

The New Zealand Superannuation (NZS) fund was established in 2002 to build up assets for the expected increase in pension expenditures. The fund is managed by an independent entity and the government is not scheduled to make withdrawals until 2029. Since 2009 total NZS assets have almost doubled, and are now at about $23 billion (about 11 percent of GDP). With its debt rising, in June 2009 the government paused its contributions to the fund, but they are scheduled to resume in 2020.

### 7.2 Norway: A Resource-Rich Economy, a Well-Managed Oil Fund, and a Permanent Fiscal Rule

**How significant is Norway’s aging challenge?** Norway’s economy depends heavily on its oil and gas production and reserves. In 2011 oil production accounted for more than 20 percent of GDP, and oil and gas constituted 70 percent of its goods exports. Norway’s sovereign wealth fund, the Government Pension Fund Global (GPFG) which is responsible for managing resource income, is one of the two largest in the world by asset size. Meanwhile, as in the other European countries, Norway’s population is aging. Between 2010 and 2060 its effective economic old-age dependency ratio is projected to double to 56 percent. While the ratio will still be below EU averages, between 2010 and 2060 age-related expenditures (pensions, health and long-term care [LTC], education, and unemployment benefits) are expected to go up by almost 10 percent of GDP, reaching 37.8 percent of GDP—the third highest increase in the EU.

**How prudent has Norway’s fiscal policy been?** With its resource-rich economy and sound macroeconomic institutions and management, Norway is in a much stronger position than many other countries dealing with the same demographic shift. The overall fiscal position continues to be sound, with a general government surplus projected to reach almost 15 percent. The oil revenues mask an underlying trend in the structural non-oil government deficit, which reached a projected 5.6 percent in 2009, reflecting the effects of the global crisis, and declined to a projected 5.2 percent in 2013. This is still larger than the limit imposed by the fiscal rule—4 percent of GPFG assets. The growth in GPFG assets beyond the growth rate of the economy in recent years allowed the government to increase its non-oil structural deficit as a share of GDP, but the overall fiscal position continues to be solid, with a general government surplus of over 11 percent. The size of the GPFG is estimated to exceed 170 percent of GDP. Meanwhile, the country’s debt-to-GDP ratio declined from 58.7 percent in 2006 to a projected 34.1 percent in 2013.

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14 **Sources:** 2013 Article IV Consultation: Selected issues, IMF. Staff Report for the 2013 Article IV Consultation, IMF. Ageing and Employment Policies: Norway 2013, OECD. The 2012 Ageing Report, European Commission.
What ensures Norway’s continuing fiscal prudence? Norway’s long-term fiscal policy performance
depends on three factors: (1) the Oil Fund and the way it is structured, (2) autonomy and professional
management, and (3) the permanent fiscal balance rule.

1. Early on, Norway established the Oil Fund and has managed it well, and a permanent fiscal rule
has helped it stay prudent and limit the domestic impact of world oil price fluctuations. However,
Norway is estimated to have already extracted about half its potential oil reserves. This, coupled
with the impending increase in age-related public spending, calls for even greater emphasis on
keeping the oil income stream sustainable. Central to the Norwegian system of resource
management is clear separation of management of the resources and management of the revenues
from them. Rather than being treated as income, oil revenues are transferred to the GPFG, which
has no direct connection to pension obligations but does finance the non-oil fiscal deficit, though
only up to a limit.

2. The GPFG receives all government oil and gas income, including taxes, ownership shares, and
dividends, and invests them outside Norway to insulate the economy from Dutch disease.
Because the fund, though owned by the Ministry of Finance, is managed by the central bank, it
is considered to be insulated from direct political influence.

3. A fiscal rule enacted in 2001 tied transfers to the budget from the GPFG to the expected return
on GPFG investments. Most recently the expected return has been estimated at 4 percent,
consistent with the long-term non-oil permanent fiscal deficit limit of 4 percent of GDP.

What major aging-related reforms has Norway undertaken? Despite its comfortable position in
terms of addressing the fiscal challenges posed by the demographic shift, Norway has moved to increase
the labor force participation of older workers. The 2011 pension reform, for instance, allowed flexible
retirement between the ages of 62 and 75 on the basis of actuarial neutrality, improving incentives to
work beyond the age of retirement. The reform also incorporated life expectancy adjustment for new
pensioners and the benefits are indexed to wage growth.

7.3 Germany: Fiscal Institutions and Long-Term Fiscal Prudence

How significant is Germany’s aging challenge? At 34.4 percent Germany has the second highest old-
age dependency ratio in the world behind Japan. The old-age dependency ratio (defined as the ratio of
inactive population 65 and older as a percentage of the employed population aged 15 to 64) is projected
to increase from 44 percent in 2010 to 77 percent in 2060, again second only to Japan. As a result, by
2060 age-related public expenditures (on pensions, health care and LTC, education, and unemployment
benefits) are expected to go from 25.2 percent of GDP to 30.4 percent. The projected increase of 5.2
percent of GDP is above the EU27 average of 3.7 percent. The government aims to limit increases in
long-term care benefits to inflation. If that can be done, it will reduce the total increase in age-related
public expenditures between 2010 and 2060 to 3.6 percent of GDP. Predictably, the largest increase
would be in pension spending, followed by LTC and health care spending. Spending on education and
on unemployment benefits is expected to fall.

How prudent has Germany’s fiscal policy been? Early in this century Germany’s actual and structural
fiscal balance was improving. In 2003, the actual deficit exceeded 4 percent of GDP, but by 2006 it had
already fallen below the Maastricht reference value of 3 percent and the deficit became a surplus in 2007.
With the global crisis, however, the fiscal situation deteriorated rapidly and in 2010 the deficit was once
again 4.1 percent. In response, public debt shot up from 65.4 percent of GDP in 2007 to 82.4 percent in

Sources: German Stability Programme: 2013 Update, Federal Ministry of Finance. Compendium on the Federation’s Budget
It is estimated that in 2013 the fiscal deficit reached 0.5 percent of GDP and public debt to 80.5 percent of GDP.

**What has been done to ensure fiscal prudence?** In 2009 the government enacted a new, stronger budget rule, the “debt brake.” The brake, which came into effect in 2011, revised Article 115 of the Basic Law, Germany’s constitution, replacing the old budget rule, the “golden rule.” The golden rule had limited net borrowing to gross capital formation less depreciation and disinvestment; the debt brake sets the limit at a specific percentage.

The debt brake is derived from the medium-term budgetary objective defined by the European Stability and Growth Pact. Since Germany limits its general government structural deficit to 0.5 percent in the medium term, the brake limits the federal government’s structural net borrowing after 2016 to 0.35 percent of GDP. It does not allow creation of special funds with their own borrowing authorization. It also limits the cyclical component of federal net borrowing to 1.5 percent of GDP. If this limit is reached, the government will have to reduce its borrowing. In terms of containing its public debt stock, Germany is also bound by the Stability and Growth Pact’s 1/20 rule. This states that if the debt-to-GDP ratio exceeds the Maastricht reference value of 60 percent, each year on average 1/20th of the gap will be reduced. Given its current debt, this requires Germany to reduce its debt ratio by about 1 percent of GDP a year.

The new fiscal rule demonstrates Germany’s commitment to secure public finances in the long run and acceptance of the immediate short-run implications. In 2011, the general government fiscal deficit was significantly below the Maastricht reference value of 3 percent. In 2012 the structural federal deficit was less than the limit of 0.35 percent and the general government deficit was already below the medium-term target of 0.5 percent. With federal structural borrowing limited to 0.35 percent, public debt is projected to decline by more than 1 percent of GDP in accordance with the 1/20 rule.

**What major aging-related reforms has Germany undertaken?** Germany has been trying to contain the fiscal costs of population aging with policies targeted to increasing labor force participation across different age groups and genders. It also has a long-standing tradition of bringing in skilled immigrants. Aggregate public expenditure control has been a hallmark of the country’s conservative fiscal management. This included effective efforts at controlling spending on pensions, health care, and long-term care.

At least as important, Germany has been taking all these sustainability measures under the umbrella of strong fiscal institutions enshrined in the law. The structural budget balance rule limits annual structural deficits and ensures convergence towards the country’s medium-term budgetary objective. Constraints on medium term levels of expenditures have been introduced as a mechanism of longer term control of expenditure pressures. Germany is also only one of the small number of countries that systematically analyze and report on financial system risks and implications in their budgets.
### 7.4 Sweden: A Pension System with an Automatic Adjustment Mechanism

#### How significant is Sweden’s aging challenge?
Sweden has the fourth highest old-age dependency ratio in the world. Population aged 65 and over reached 31.2 percent of the working-age population (aged between 20 and 64) in 2010. The “economic” old-age dependency ratio defined as the inactive population aged 65 and over as a percentage of the employed population aged 15 to 64 is expected to increase from 37 percent in 2010 to 58 percent by 2060. While significant, the increase is relatively modest compared to dramatic changes expected in countries such as Germany. At 27.9 percent of GDP, Sweden has slightly higher age-related public expenditures (including pensions, health and long-term care, education and unemployment benefits) than the EU average. These expenditures are expected to increase by 3.8 percentage points of GDP between 2010 and 2060, about the EU average. Long-term care spending is projected to bring the largest increase in age-related public expenditures.

#### How prudent has Sweden’s fiscal policy been?
Sweden has traditionally run fiscal surpluses. The fiscal surplus consistently increased after the late 1990’s, reaching 3.6 percent in 2007. However, the global crisis resulted in declining surplus, which turned into a deficit of 1.3 percent of GDP in 2013 (within the Maastricht threshold of 3 percent of GDP). Public debt had earlier been reduced to 38.8 percent of GDP in 2008, but increased to 41 percent of GDP in 2013, one of the lowest levels in the EU.

#### How do fiscal institutions contribute to fiscal prudence?
The Swedish fiscal policy operates under an expenditure ceiling and a surplus target. The expenditure ceiling is calculated for the current year and the next three years under the medium-term budget framework. The ceiling includes a safety buffer to account for cyclical fiscal policies, and is set according to the surplus target. The surplus target is calculated using a backward-looking and a forward-looking indicator based on 10-year averages. The current surplus target is 1 percent of GDP. In terms of local government finances, the Swedish fiscal policy framework requires a balanced budget. The Swedish government also assesses the long-term sustainability of public finances using five key indicators: fiscal gap, future generations’ burden, revenue gap, expenditure gap, and annual fiscal gap.

#### What major aging-related reforms were undertaken?
Sweden implemented a comprehensive pension system reform quite early—in the early 2000’s. The current Swedish pension system indexes the rate of return on the pensions to the per capita real wage growth. There is an automatic adjustment mechanism, which links the wage indexation to the balance of the pension system assets and liabilities. When liabilities exceed assets, the mechanism is activated, which reduces the per capita wage indexation for both current workers and current pensioners to restore the system balance. This is a crucial self-correcting feature of the system, ensuring its fiscal sustainability. Two other characteristics of the Swedish pension system contribute to its long-term sustainability. The first is that pension benefits are linked to lifetime contributions. The second is that upon retirement the accumulated contributions are converted to an annuity based on life expectancy. Therefore, increasing life expectancy automatically leads to lower pension payments, contributing to long-term fiscal sustainability. The Swedish system was tested during the global crisis—and it appeared to have operated as intended. The automatic adjustments kicked in to ensure balance of the pension system, with pension benefits slated to decline by about 3 percent in 2010 and 2011. Interestingly, the use of three-year averages in helped smooth the adjustment over time (Sunden 2009).

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7.5 Japan: Tough Policy Options, Mounting Public Debt, and a Rapidly Aging Population

How significant is Japan’s aging challenge? At 38.9 percent in 2010, Japan has the largest number of old-age dependents in the world. However, the country is far from having completed its demographic transition. By 2050 the old-age dependency ratio is projected to almost double to 78.4 percent, so that Japan will continue to have the oldest population in the world. In that sense, Japan’s demographic present and future give a glimpse of the demographic problems lying in wait for other countries. Japan has already had to take numerous steps to cushion against the fiscal implications of aging even as its public debt mounts.

How prudent has Japan’s fiscal policy been? It is well-known that Japanese economic growth decelerated substantially at the beginning of the 1990s, and stayed low for the next two decades. The economy had expanded at a rate of 7.1 percent in 1988, but by 1993 growth had dwindled to a mere 0.2 percent. Sluggish growth continued into the late 2000s, when it turned into a recession exacerbated by the global crisis and the 2011 earthquake. In response, the Japanese government chose to use fiscal stimulus for almost two decades; the result has been persistent deficits since 1993. The deficit was below 3 percent only in 1993 and 2007 and in 2009 was as high as 10.4 percent. Public debt more than tripled over the same period, exceeding 240 percent of GDP in 2013. Japan now has very limited fiscal room to maneuver and needs significant and sustained long-term fiscal consolidation.

How do fiscal institutions contribute to fiscal prudence? Japan has been trapped in a period of excessively sluggish growth and deflation for almost two decades and has been using fiscal stimulus without much restraint for almost the entire time, except for 2002–07. In an attempt to enhance its institutional capacity to secure public finances and move public debt to a more sustainable trajectory, only in 2010 did the government introduce a medium-term fiscal framework on a three-year rolling basis. The framework sets forth deficit and public debt targets for the next three years. However, there seem to be ample room to improve its enforcement.

What major aging-related reforms did Japan undertake? At 10.2 percent public pension spending is above the OECD average of 7.8 percent, though still below Austria (13.5 percent), France (13.7 percent), Italy (15.4 percent), Greece (13 percent), Poland (11.8 percent), and Slovenia (10.9 percent). Japan has one of the lowest gross replacement rates in the OECD.

The pension retirement age is still 65 in Japan. Since 2001 early retirement with full benefits is being phased out, although early retirement with reduced benefits will still be possible. In the latter case, the benefit is reduced by 6 percent per year of early retirement. Meanwhile, if retirement is deferred, the benefit is increased by 8.4 percent a year. Since 2006 combining work and pension is possible. As a result, at 69.1 Japan has one of the highest labor market exit ages in the OECD.

Between 2000 and 2002 the government kept pension payments level although prices were falling. As a result, pension payments are 2.5 percent higher than they would have been if they had been adjusted to the prevailing deflation. The government plans to eliminate the difference by April 2015. The national

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government’s basic pension burden will be permanently fixed at 50 percent by increasing the consumption tax in April 2014. In 2004, benefits for new retirees had been cut by 0.9 percent a year.

7.6 Some Lessons

This review provides insights into the experience of several countries and potential policy lessons for European and Central Asian countries. Keeping in mind that these lessons apply primarily to broad policy directions rather than being a concrete blueprint for reforms in specific countries; reforms can only be based on in-depth country studies. Still, it should provide useful insights about, among other things, the strategy and timing of aging-related reforms. In this regard, the following lessons stand out:

a) **It is critical to start early to implement and sustain deep long-term-oriented, aging-related reforms.** Conversely, delaying aging-related fiscal reforms can soon lead to a massive build-up of debt and a much more painful ultimate adjustment. Perhaps nowhere is this lesson as clear as in New Zealand, a country that can be considered a best-international-practice example of aging-related reforms. Even though it had a relatively low old-age dependency ratio and a tradition of fiscal discipline, New Zealand put in place far-reaching reforms as early as the beginning of the 1990s. Those reforms were deep and designed with clear long-term objectives and strategy—and they have been sustained over the long term. As a result, when the global crisis hit, New Zealand was so well-prepared it was able to return to its policy of fiscal surpluses within five years of the crisis. Even so, New Zealand’s debt doubled quickly between 2007 and 2012. In response, the government put in place plans to bring debt down from 48 percent of GDP to its long-term target of 20 percent by 2020. By contrast, Japan’s experience with the massive build-up of public debt, which in 2013 amounted to 240 percent of GDP, is also instructive. It shows how years of fiscal deficits even in very large and developed countries with low borrowing costs can lead to an unsustainable debt burden that will require a huge adjustment in the future. The experience of New Zealand and Japan speak forcefully about the consequences of delays to fiscally and economically weak economies experiencing rapid demographic transition.

b) **To support fiscal sustainability, it is prudent to consider automatic adjustments to some aging-related expenditure in response to changes in key long-term cost drivers.** Sweden is a good example of such reforms, with three key features. First, in Sweden, there is an explicit link between the wage indexation to the balance of the pension system assets and liabilities. When liabilities exceed assets, the automatic adjustment is activated, reducing the wage indexation for both current workers and current pensioners to restore the system balance. Second, pension benefits are linked to lifetime contributions. And finally, upon retirement the accumulated contributions are converted to an annuity based on life expectancy in such a way that increasing life expectancy automatically leads to lower pension payments, contributing to long-term fiscal sustainability. So the fiscal sustainability of the pension system is, so to speak, on auto-pilot: ensuring greater benefit generosity in good times, but reducing benefits in bad times to restore long-term pension system balance.

c) **Beyond Maastricht: Ensuring long-term fiscal prudence.** The EU has formulated, as part of the EU Stability and Growth Pact, comprehensive rules and institutions for ensuring and enforcing fiscal prudence. These rules have evolved from the original Maastricht limits to debt (60 percent of GDP) and deficits (3 percent of GDP) to the recent “six-pack” and “two-pack” sets of rules designed to reinforce fiscal discipline and enforce compliance in member countries. Yet, many EU countries are now experiencing debts far in excess of the Maastricht limit. New Zealand’s experience here is also illuminating: The lesson is that these rules are conventions that, if observed, will help limit—but will by no means eliminate—the risk of rapid escalation of debt if the shocks
are sufficiently large. In response to these realities Germany has introduced a more forceful fiscal rule, the debt brake. These average rules are not necessarily a fool-proof shield against major economic shocks, as the global crisis amply demonstrated. In fact, the latest IMF research on prudent debt levels suggests that in many middle- and low-income countries (e.g., several new member states, EU neighbors, the Western Balkans, and Central Asia), a debt limit of 40 percent might be more in order (Baldacci and Gupta 2010). This would imply stronger primary fiscal balance positions over the longer term. To put it simply: Smaller, vulnerable economies are inevitably more susceptible to large external shocks and may need to ensure more fiscal room to maneuver than much larger and more robust economies with easier access to external financing.

d) **Without solid institutions rules are no guarantee of fiscal prudence.** Arguably, the reason New Zealand was able to implement its strong fiscal rule and return to it quickly after the crisis is its institutions. Its formal fiscal rules are underpinned by sound institutions, fiscal responsibility legislation that is enforced, a long-term fiscal strategy, solid technical capacity in the Ministry of Finance, long-term vision and results-oriented budgets, and the tradition of disciplined fiscal management. Germany and Sweden are also example of countries with strong institutions with power and capacity to enforce its own institutional rules. Without sound institutions, the rules may simply not be observed. This serves as a warning to new member and candidate countries that have recently adopted fiscal rules and begun to strengthen fiscal institutions (e.g., Croatia, the Western Balkan countries) but have for many years failed to rein in deficits and debt. In those countries, a shift in the focus of fiscal reforms might be needed to jumpstart technical assistance and capacity building geared to long-term fiscal prudence across the board.

e) **Oil-rich countries would be well-advised to maintain non-oil fiscal deficits consistent with a permanent non-oil fiscal rule and follow good international practice for sovereign fund management.** In a nutshell: Because of oil price fluctuations, oil-rich countries have inherently more volatile output and fiscal and export revenues than more diversified economies (Gill, de Rosa, van Eeghen 2013; Bogetic, Smits, Budina, and van Wijnbergen 2008). Managing oil resources prudently is therefore essential to managing volatility and reducing the risk of Dutch disease and the governance risks associated with large public resources. Norway provides an example of good practice. Its long-term non-oil fiscal deficit has generally been consistent with its 4 percent of GDP non-oil permanent fiscal rule and its rule on the rate of return on oil fund assets. By contrast, Russia’s permanent fiscal rule has been suspended since the global crisis began, and its non-oil fiscal deficit has been running at about 9 percent of GDP, although 4.5 percent has been estimated as the long-term sustainable level (World Bank 2010; Bogetic, Smits, Budina and van Wijnbergen 2010). For oil producers, it is important to separate management of oil resources from management of oil revenues, and to ensure professional, independent management of both (Gelb et al 2014).

f) **International labor mobility and well-managed immigration is good for recipient countries facing demographic pressures.** In general, countries with robust economies, labor shortages, and rapidly aging populations will benefit significantly over the long term from the immigration of younger workers in terms of slowing the demographic transition, lowering the old-age dependency ratio, and broadening the tax base. And Europe is and is likely to continue to be a magnet for immigration: Out of top 12 immigration countries in the world, Europe is home to seven (in the order of importance as percent of population): Russian Federation, Germany, France, UK, Spain, France, and Italy (Migration and Remittances Factbook 2011, World Bank). A policy of greater economic immigration can of course be controversial in the domestic political arena but it can also

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18 Consider a country with a robust economy, borrowing costs of 2–3 percent, public debt of 60 percent of GDP, and an economy growing at 3 percent a year. This country is in a very different fiscal position from a country with borrowing costs of 6 percent, the same levels of public debt and deficit, but the economy growing only 1 percent (or less) annually. The latter country is much more vulnerable to major shocks and its debt could quickly surge, threatening sustainability and even solvency. The latter scenario is what happened to many countries during the global crisis, including in Western Balkans.
prove good domestic politics if the economic benefits are explained to the public and concerns over its impact on the social fabric of the recipient country can be alleviated. Germany is an example of a country with a long-standing tradition of attracting skilled workers from around the world. On the side of sending countries, remittance flows can be a major source of income, saving, and investments in middle-income (e.g., Western Balkans) and low-income countries (e.g., Central Asia).

8. Aging and Voter Preferences for Expenditure Priorities

Aging societies—much like aging individuals—are experiencing shifts in both voter preferences and associated public spending patterns. Government policy, and ultimately the goods and services government provides, are shaped by individual preferences expressed through the political process. In turn, these policy preferences, and willingness to participate in the political process, are affected by individual characteristics, such as age.

Theory

Theory based on the median-voter model provides guidance on who benefits from changes in income distribution. For example, it compares how, depending on how progressive the tax system is, both benefits and their costs are distributed among individuals (Meltzer and Richard 1981; Cattaneo and Wolter 2009). The theory is particularly useful to link the distribution of income within a society to the level of government spending on redistributive programs, such as transfers to households, controlling for individual characteristics that shape preferences beyond government provision (de Mello and Tiongson 2006; Keely and Tan 2008). As societies grow unequal, the gaps between mean and median incomes and between the rich and the poor widen, creating an incentive for the median voter, who in majority voting sets the agenda, to push government to spend more on redistributive programs. When taxation is progressive, the voter with median income benefits from an increment in redistributive spending and wealthier taxpayers bear its costs.

The theory also sheds light on how policy preferences may change with age, especially as the benefits and costs of different services are likely to vary over the lifecycle. For example, in a pay-as-you-go system older individuals are the main beneficiaries of increased government spending on pensions but the costs are borne mostly by the younger generation. The elderly are also likely to support heavier government spending on healthcare and long-term care, especially when the costs can be financed through general taxation. On the other hand, higher spending on primary or secondary education often gets considerable support from younger generations whose children benefit. Finally, support for climate change policies may be lower among older cohorts, who are less likely than younger generations to reap the eventual benefits. But if policy preferences indeed differ by age group, changes in the age structure of the population might affect a country’s future policy priorities. This is important because population aging, especially in some ECA countries where old-age dependency ratios are already high, will put increasing pressure on government budgets to finance age-related expenditure, which may crowd out outlays on other programs.

Evidence

Empirical evidence in the literature on the impacts of aging on public spending and voter preferences is limited, especially in European countries, and the results are mixed (see Cattaneo and Wolter 2009, Poterba 1998, Ladd and Murray 2001, and Harris et al. 2001 for the United States; and Hollanders and Koster 2011, Breyer and Craig 1997, Tabellini 2000, Perotti 1996; Breyer and Craig 1997 for cross-country studies; and Borge and Rattso 2008 using Danish data and Grob and Wolter 2007 Swiss canton data. Using a unique and representative survey of Swiss voters of all age groups, Cattaneo and Wolter (2009) showed that elderly people tend to be less willing for money to be spent on education. De Mello, Tiongson, and
Winkler (2014) seem to be the only authors to shed light on the relationship between age and preferences about government spending in Eastern Europe and Central Asia.

Aging seems to be highly correlated with voter preferences and public spending priorities in Europe and Central Asia. Based on data from the Life in Transition Survey II (LITS) conducted by the European Bank for Reconstruction and Development and the World Bank in late 2010, the findings of De Mello et al. (2014) are consistent with the “gray peril” hypothesis (Figure 25): as individuals grow older, they become less supportive of government spending on education and more likely to consider pensions a higher priority. There are, however, some interesting differences by country group. While the policy priorities of residents of “old” and oil-rich countries shift at about age 50, for residents of Western Europe and younger economies, the shift does not occur until their 70s.

Figure 255. Education or Pensions? Policy Priorities by Age in Europe and Central Asia*  

Source: De Mello, Tiongson, and Winkler 2014.
Note: Each line indicates the percentage of respondents who chose pensions or education as the second or first priority for government spending (each line is a polynomial approximation). The specific question was “In your opinion, which of these fields should be the first and second priorities for extra government spending?” The possible choices were (1) education, (2) healthcare, (3) housing, (4) pensions, (5) assisting the poor, (6) environment (including water quality), (7) public infrastructure, and (8) other.

Several factors may explain why older people in Western Europe and younger economies are more supportive of education. Positive intergenerational externalities from a more educated labor force could be higher, or at least perceived to be higher, in these economies if higher productivity is essential for financing transfers that benefit the elderly (Cattaneo and Wolter 2009). The higher educational levels of adults in Western Europe compared to the other countries studied may suggest that their voting-age populations are more aware of the benefits of education and hence more informed about its externalities. Yet the elderly in the youngest countries in the region may perceive that better education will have a more positive impact on their economies because their school-age populations are larger than in older economies. Thus, cross-country differences in intergenerational altruism, and implicitly culture and values, could also be driving these patterns.

A descriptive analysis of the ECA data reveals four clear patterns of preferences for government spending:

1. **Healthcare is the top policy priority** for the citizens of every country in Europe and Central Asia, but education, pensions, and assistance to the poor are also high priorities.

2. Though support for additional government spending on education is high generally, it falls with age in every region, and the converse is true for additional spending on pensions.

3. Support for assisting the poor is consistently higher in Balkan countries than in other regions.

4. Higher government spending for environmental purposes garners the least support in every region, although support is slightly higher in Western Europe.

This analysis was the basis for empirical analysis of correlates of spending policy preferences in the ECA region (De Mello, Tiongson, and Winkler 2014). Using responses on first and second priorities, they estimated binary choice models for each spending category, explaining the declared preferences using a set of individual and household characteristics as explanatory variables. Their main findings were that:

- **Elderly ECA populations are more likely than their younger peers to support an increase in government spending on pensions and healthcare and less likely to support more spending on education, the environment, and transfers to the poor.** Older people are also more likely than younger to be involved in the electoral process (Figure 26), which may also affect future political support for changes in the government budget. De Mello, Tiongson, and Winkler (2014) found that policy preferences among those who vote show less variation by age than among those who do not vote. Nevertheless, the age patterns described also exist in the nonvoting population.

**Conclusion**

Since the elderly are more likely to vote and less likely to support lower pension spending, reforms to rationalize public spending might become more difficult as societies age; this raises the urgency of reforms in the near future. The results also raise concerns about the possible effects aging may have on sustainable economic growth through the political economy channel, given that an aging population may prefer to reduce spending on the environment. Moreover, the fact that the elderly are less likely to support transfers to the poor might complicate future social protection of vulnerable groups. On the other hand, even though a larger elderly population may reduce total education expenditures, it is not clear that it will
reduce spending per student, since a lower fertility rate also means fewer school-age children. The overall effect of aging on expenditures per student will depend on which of the two forces prevail. The digital revolution and profound changes in the prevailing paradigm of delivering education services may in any case result in a lower cost of delivery as brick-and-mortar facilities geared to mass education give ground to Internet and virtual education services more tailored to individuals and business demand.

Older people are more likely than younger to be involved in the electoral process (Figure 275), which may also affect future political support for changes in the government budget. De Mello, Tiongson, and Winkler (2014) found that policy preferences among those who vote show less variation by age than among those who do not vote. Nevertheless, the age patterns described also exist in the nonvoting population. For example, individuals aged 45–55 are 15 percent more likely than youth to consider higher pensions to be a priority and those 55 and older are 28 percent more likely. Those aged 45–55 are also 9 per cent less likely, and those 55 and older 14 percent less likely, to consider education a priority than those younger than 25.

These results hold even after controlling for other individual characteristics that change over the lifecycle, such as per capita consumption, marital status, and number of children. In other words, holding other observable socioeconomic characteristics constant, it can be expected that as the share of the elderly in ECA populations grows, there will be less political support for cuts in pension and healthcare spending and more support for cutting spending on education, the environment, and transfers to the poor.

Figure 266: First or Second Priority for Extra Government Spending; Aggregate Results for all ECA Countries


Note: Marginal effects using a Probit model for the probability of mentioning each spending category as a priority for government spending. The age group category omitted is younger than 25 years. Control variables were marital status, gender, education, work status, consumption per capita, and country dummy variables.
Figure 277. Share of the Population who Voted in the Last Election, by Age and Country Groupings


9.1 Determining Tax Revenue Potential

This section investigates the tax effort and tax potential of 61 countries—23 in the ECA region and the rest having tax structures similar to those of ECA countries. This section is based on detailed analysis in Khwaja and Iyer 2013. The idea is to determine whether, how much, and which countries may have scope to increase revenues, an important question in the context of large aging related expenditure pressures. The analysis distinguishes between revenue potential based on a country’s inherent economic capacity and potential based on what the country’s laws prescribe.

Accordingly, the analysis determines both the economic revenue potential and the legal revenue potential. The difference between the legal revenue potential and actual revenue collected is commonly understood as the tax gap. The difference between the economic revenue potential and actual revenue collected can be termed the tax space—the amount a country can afford to collect, given its economic strength rather than what the legislature has mandated. A positive difference between the tax gap and the tax space indicates that mandated tax collections were significantly higher than the country’s economic fundamentals could support.

The data cover the 11 years from 2000 through 2010. To account for a possible structural break caused by the worldwide recession in 2008, the model has a post-2008 dummy variable. The panel is estimated using Panel Corrected Standard Errors (PCSE) with panel-level heteroskedasticity and contemporaneous correlation across panels.

If the shadow economy is taken into account, the actual GDP of a country is much greater than what is reported, which means that actual tax collections as a percentage of the GDP that includes the shadow
economy are much lower than reported. This paper analyzes the tax gap of each country taking into account the shadow economy.

9.2 Main Findings

How Large Are Revenue Potentials and Tax Gaps?

Legal revenue potential is usually higher than economic, particularly in ECA economies, indicating that countries mandate tax levels that may be in excess of their economic potential. Only Kazakhstan and Montenegro showed legal revenue potential significantly lower than economic. The largest difference between the two was in Belarus (6.63 percent of GDP), followed by Tajikistan (4.98 percent) and Ukraine (4.66 percent). Only in Bosnia and Herzegovina, Macedonia, Georgia, Bulgaria, and Serbia was legal revenue potential less than 1 percent higher than economic (table 5).

A country’s tax gap is significantly higher if the shadow economy is taken into account. For instance, during the period studied, 2000–10, the gap as a percentage of GDP in Azerbaijan more than doubled, from 4.39 to 10.97 percent of GDP, and in Ukraine it went from –4.13 to 7.10 percent. In Georgia, too, the presence of a large shadow economy (65 percent of GDP) greatly amplified the gap, from 4.82 to 12.73 percent.

How Much Tax Space Do Countries Have for Raising Revenues?

A positive tax space indicates that the country is not taking advantage of revenue potential up to its economic capacity. Among countries with positive tax space greater than 1 percent of GDP are Albania, Armenia, Azerbaijan, Georgia, Kazakhstan, the Slovak Republic, and Turkey.

How Adequate Are Tax Effort and Tax Collections?

This study also makes use of the tax effort index, the ratio between actual tax collection and tax potential. While many countries are performing close to their economic revenue potential, it is harder for them to match their legal revenue potential. If the shadow economy is taken into account, all the ECA countries had a legal tax effort of less than 1.0, ranging from the lowest, 0.49, for Georgia up to 0.99 for Bosnia and Herzegovina.

However, for all countries studied there is a Laffer curve–like effect for the legal tax effort. This indicates that tax administrations work harder to collect revenue that is prescribed by law when it is above their economic capacity. Interestingly, if the shadow economy is taken into account, both the legal and the economic tax effort are higher in richer countries.

Countries in the sample were grouped with respect to their actual tax collections (low, medium, and high) and their tax effort (low, medium, and high). In the ECA region, Albania, Armenia, Azerbaijan, Georgia, Kazakhstan, and Turkey had both low tax effort and low collections; Belarus, Bosnia & Herzegovina, and Montenegro had both high tax effort and high collections (table 6).

Revenue Potential and VAT Productivity

The study also found that the larger the difference between legal and economic revenue potential, the less productive the VAT is. This indicates that a country trying to raise taxes far above its intrinsic economic strength stretches the capacity of its tax administration, and there is also more incentive for cheating and evasion since the country is trying to collect more than its people can afford.
**Tax Potential, the Shadow Economy, and Corruption**

The relationship between legal revenue potential and the size of the shadow economy is also negative for the entire sample of countries, but ECA countries show a Laffer curve effect for tax effort and the shadow economy.

**There is a positive relationship between tax potential and control of corruption:** The better the control of corruption, the higher the potential for collecting more revenue. This is true for both the entire sample and the ECA countries specifically.
## Table 4. Revenue Potentials, Difference in Potentials, Tax Gap and Tax Space

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### 1. Group Average: High Old-Age Dependence

- **Revenue Potentials, Difference in Potentials, Tax Gap and Tax Space**

1.67  9.36  29.01  tax_act

2.81  1.62  31.94  tax_act_shad

3.74  3.74  16.32  tax_legal

16.32  16.32  15.62  legal_poten

21.73  21.73  15.62  tax_space

32.48  32.48  15.62  tax_gap

12.73  12.73  15.62  tax_gap_shad

### 2. Group Average: Old-Age Dependence

- **Revenue Potentials, Difference in Potentials, Tax Gap and Tax Space**

18.38  28.78  38.98  tax_act

35.27  35.27  38.98  tax_act_shad

17.78  17.78  38.98  tax_poten

21.19  21.19  38.98  tax_legal

28.78  28.78  38.98  legal_poten

32.48  32.48  38.98  tax_space

15.62  15.62  38.98  tax_gap

12.73  12.73  38.98  tax_gap_shad

### 3. Group Average: Western Europe

- **Revenue Potentials, Difference in Potentials, Tax Gap and Tax Space**

17.78  17.78  38.98  tax_act

32.48  32.48  38.98  tax_act_shad

17.78  17.78  38.98  tax_poten

21.19  21.19  38.98  tax_legal

28.78  28.78  38.98  legal_poten

32.48  32.48  38.98  tax_space

15.62  15.62  38.98  tax_gap

12.73  12.73  38.98  tax_gap_shad

### 4. Group Average: Oil-Rich

- **Revenue Potentials, Difference in Potentials, Tax Gap and Tax Space**

47.29  47.29  38.98  tax_act

56.62  56.62  38.98  tax_act_shad

56.62  56.62  38.98  tax_poten

56.62  56.62  38.98  tax_legal

56.62  56.62  38.98  legal_poten

56.62  56.62  38.98  tax_space

56.62  56.62  38.98  tax_gap

56.62  56.62  38.98  tax_gap_shad

### 5. Group Average: Low Old-Age Dependence

- **Revenue Potentials, Difference in Potentials, Tax Gap and Tax Space**

37.81  37.81  38.98  tax_act

47.16  47.16  38.98  tax_act_shad

47.16  47.16  38.98  tax_poten

47.16  47.16  38.98  tax_legal

47.16  47.16  38.98  legal_poten

47.16  47.16  38.98  tax_space

47.16  47.16  38.98  tax_gap

47.16  47.16  38.98  tax_gap_shad

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*Countries are organized according to the group classification in column G.
Western Europe classification is based on UN classification + other European countries are added to the list.

Data not available for the following countries:

- **Group 3**: Western Europe: Data on Liechtenstein, Luxembourg and Monaco is not available.
- **Group 5**: Low Old-Age Dependence: Data for Uzbekistan is not available (based on the Table 1 in the tab "Original-Table1").
### Table 5. Tax Effort and Tax Collections

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#### 9.3 Findings by Country Groups According to their Fiscal-Aging Profile

Overall, there seems to exist large scope to improve revenue performance in most countries. But how do countries, grouped by their fiscal-aging profile, compare in terms of tax gaps and tax space? Also, what do these findings imply for potential tax policy and reform in these countries? Since aging implies the need for additional revenues over the long term for many countries, the answer is relevant for providing direction about feasible long-term revenue reforms that will be needed in view of aging expenditure pressures. The analysis looks at the following groups of countries: (a) countries with high old-age dependence and high emigration (e.g., Bulgaria); (b) countries with low-old age dependency and high

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19 “Tax Collection with Shadow” is actual tax collections as a percent of an estimated GDP that combines reported GDP plus the additional GDP generated by the shadow economy: GDP (estimated) = GDP + (shadow*GDP). “Tax Effort (with Shadow) = Tax Collection with Shadow / Potential Legal Tax Revenue. A country is classified as having a low tax effort (E) if E < 0.7; a medium effort if 0.7 ≤ E ≤ 0.9; and a high effort if E > 0.9.

The mean tax-to-GDP ratio in the full sample of 61 countries is 30.04 percent. The standard deviation is 9. A country is classified as “medium tax collection” (C) country if it is 0.5 standard deviation below or above the mean tax-to-GDP collection ratio. Accordingly, a country is classified as low collection if C < 26.5; medium collection country if 26.5 ≤ C ≤ 34.5; and high collection if C > 34.5.
emigration; (c) oil-rich countries; (d) Western European countries; and (e) countries with low old-age dependency.

**Countries with high old-age dependency and high emigration** are estimated to have larger shadow economies, collect less tax revenue as a share of GDP, and have lower revenue potential of both kinds than countries with high old-age dependency that benefit from immigration. In the whole of the ECA only oil-rich countries and the very small group that have low old-age dependency are estimated to have large shadow economies.

As a group, except for oil-rich countries, **countries with high old-age dependency and high emigration** have the smallest tax space—they have less space to raise additional revenue without moving beyond their medium- to long-term economic potential. (These also tend to be medium-tax effort and medium-collection countries). This is largely because the size of their shadow economies restricts the revenue-raising potential because the tax burden falls on a much smaller base. The difference between the largest and smallest shadow economies and between the top and bottom taxing countries is largest in high old-age dependency and emigration countries than in any other group. Standard deviations also tend to be among the highest here. By contrast, **countries with shrinking populations but positive immigration** may have more room to increase tax revenues.

**Countries with low old-age dependency** have comparatively large informal sectors (only those in oil-rich countries are larger) and as a group the lowest taxes. They tend to be low-tax effort and low-tax collection countries. Perhaps some age-associated spending needs are lower, but whether their pension collections are high enough is a reasonable question. The time to save is when a country is young, so if these countries have public pension systems, taxes should perhaps be higher and basic tax instruments (e.g., VAT, excises) could be used more to that end but this would need to be accompanied with strengthened tax administration to improve collection; if the pension systems are private, less taxation may be acceptable.

**Western European countries** tend to be more homogenous in terms of tax collection and the size of the informal economy than either of the other large country groupings. They also tend to be high-tax and high-collection countries (Table 6). Interestingly, within Western Europe, countries in fiscal crisis (Portugal, Italy, Greece, and Spain) and Belgium are the only countries with informal economies estimated to be more than 20 percent of GDP. In terms of the tax space, Portugal and Greece in particular seem to be taxing compliant citizens more than they can afford over the medium- to long-term, and Spain is about at the limit. This means that if they want to raise more taxes, they need to broaden the tax base or bring the informal economy into the formal one (Table 2). These broad considerations are further elaborated in the concluding section on Fiscal Policy Agenda in the Aging Societies (section 11). Before discussing that broad agenda, however, some basic thoughts about potential unproductive expenditures and scope for their reduction are needed.
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1. Group Average: High Old-Age Dependency

2. Group Average: High Old-Age Dependency

3. Group Average: High Old-Age Dependency

4. Group Average: Oil-Rich

5. Group Average: Low Old-Age Dependency

*Countries are organized according to the group classification in column G.
Western Europe classification is based on UN classification + other European countries are added to the list.

Data not available for the following countries:
Group 3: Western Europe: Data on Liechtenstein, Luxembourg and Monaco is not available.
Group 5: Low Old-Age Dependency: Data for Uzbekistan is not available (based on the Table 1 in the tab "Original-Table1").

Table 6: Revenue Potential, Differences in Tax Gap and Tax Space*
10. Scope for Reducing Unproductive Public Expenditures

In managing the fiscal impact of population aging, the composition and efficiency of public spending is as important as its magnitude (table 7). Changing the composition toward more productive uses would support productivity growth, or better targeting of social expenditures would in turn create fiscal space to help accommodate long-term aging-related pressures. Countries would be well advised to constantly review the levels, composition, targeting and efficiency of their spending with the view to weeding out waste and creating space for productive expenditures (see, for example, Gupta et al. 1995; 2000).

Current public spending, the wage bill and subsidies in particular, is considered to be a less productive use of already limited amounts of public resources. In the ECA countries in 2012, though there is significant variation by country, the wage bill amounted on average to almost 22 percent of total public spending and 8.6 percent of GDP. Montenegro had the highest wage bill as a share of total public spending (more than 29 percent), followed by Bosnia and Herzegovina (26.4 percent). At the other end of the ECA spectrum Armenia (8.8 percent), Azerbaijan (13 percent), Kazakhstan (15.3 percent), and Georgia (15.6 percent) allocated a significantly smaller share of public spending to wages.

Across the world, energy subsidies are pervasive, with estimates of about 2.5 percent of global GDP. While the intent is to protect consumers—although most benefits are captured by higher-income households—energy subsidies enlarge fiscal imbalances and aggravate externalities from energy production and consumption. The ECA share of global energy subsidies amounts to 15 percent. Energy subsidies are particularly high in the CIS and oil-rich countries, reaching 14.1 percent of GDP in the Kyrgyz Republic. Energy subsidies are also high in Ukraine (11.7 percent), where they exceed public spending on education. Other categories of public spending such as education, military spending and general government purchases of goods and services can hide considerable scope for rationalization. Given the depopulation of many secondary towns and villages and the sharp drop in the teacher/student ratios in many Eastern European countries, rationalization of education facilities could raise substantial savings that could be reallocated to learning education programs, early child care or other priority, productive spending.

In 2012 average public investment in ECA, on the other hand, was about 14 percent of total spending, 5 percent of GDP, though CIS countries invested significantly more as a share of total spending than the ECA average. For instance, public investment in Azerbaijan, an oil-rich country, equaled 42.3 percent of total spending (16.3 percent of GDP). Investing least were the Slovak Republic (5.1 percent of total spending, 1.9 percent of GDP) and Slovenia (6 percent of total spending, 2.9 percent of GDP).

Table 6: Composition of Public Spending, Sample Countries, 2012

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<td>10.0</td>
<td>24.3</td>
<td>14.1</td>
<td>7.8</td>
</tr>
<tr>
<td>Tajikistan</td>
<td>5.6</td>
<td>22.3</td>
<td>3.0</td>
<td>6.7</td>
</tr>
<tr>
<td>Turkey</td>
<td>7.8</td>
<td>22.9</td>
<td>1.0</td>
<td>3.1</td>
</tr>
<tr>
<td>Average</td>
<td>7.8</td>
<td>23.1</td>
<td>6.0</td>
<td>5.9</td>
</tr>
</tbody>
</table>

Source: IMF (2013); and ECSPE Fiscal Database, Europe and Central Asia region, World Bank.

11. Fiscal Policy Agenda for Aging Societies

Many EU and Non-EU European economies who must now deal with aging-related spending pressures are already heavily burdened and must launch long-term fiscal consolidations to reduce the debt to pre-crisis levels. In Central Asian countries, though debt levels are much lower, the societies are aging fast, so making room for aging-related spending must also be on their agendas. In fact, successful fiscal consolidations tend to be long-term endeavors, many taking a decade; not surprisingly, many short-lived consolidations have been decidedly oriented to the short term (Baldacci and Gupta 2010).

Given the scale of adjustment and the sustained fiscal effort necessary, many countries will likely need to apply both revenue (both tax policy and tax administration) and expenditure measures. The
experience with fiscal consolidation also suggests that predominantly revenue-oriented fiscal consolidations tend to fail because they do not rein in spending. But excessive and unsustainable expenditure-oriented consolidations can be equally short-lived. To ensure steady but robust consolidation sustainable over time requires a long-term fiscal horizon, robust medium-to-long term fiscal framework, realistic interim fiscal targets and enforceable corrective mechanism, and appropriate choice of revenue and expenditure measures.

**On the revenue side, the choice of tax policy and tax administration measures will depend in part on tax gaps and tax space of a country, and its economic strength.** Countries that have little to no room to raise revenues from the existing tax base must opt for revenue measures that broaden the tax base, bringing non-taxed activity into the tax base by eliminating exemptions and other tax preferences and bringing the informal economy into the tax net by reducing barriers to formality. These efforts may involve trade-offs: for example, countries with excessively high labor taxes may find it difficult to bring the informal sector into the tax net without reducing labor taxes, but that would have an immediate short-run cost in terms of foregone revenues.

**Over the long term, because in most countries the relative number of workers financing dependents will decline, labor income as the major tax base will also decline relative to other tax bases, such as consumption.** The policy choice will then be between raising labor tax rates, bringing informal labor into the tax base, increasing consumption tax rates or its base—or some combination of these. Since consumption is typically the largest macroeconomic aggregate, its tax rate can be lower than rates on much narrower tax bases; not to mention that taxing consumption, other things being equal, does not result in taxing investments and exports. By contrast, labor taxes, especially when already high, may suppress employment. For these reasons, it is likely that tax policy in many countries will gradually favor a shift from labor to consumption taxes because the latter will provide the stable and growing tax base needed to cover the costs of spending more in aging-related areas. Even so, other tax instruments might need to be used more, especially if they are comparatively underutilized, notably excise taxes and in particular property taxes, which represent untapped revenue potential in many emerging European economies.

**On the spending side, aging-related pressures will typically mandate spending less in categories that hide waste, unproductive spending, and untargeted social programs.** Wasteful public investments will also have to be weeded out, but given the much larger size of current spending and the magnitude of the leakages, attention will need to be directed to rationalizing current spending. For example, the rationale for many subsidies, fiscal and quasi-fiscal, will need to be reviewed in terms of just how efficient, affordable, and equitable they are. This is especially true of fuel subsidies, whose distortionary effects and the adverse effect of fuel emissions on the environment are well-documented. Such subsidies are especially large in some of the CIS countries, squeezing out other productive spending, such as on infrastructure. Also, current spending on goods and services and procurement practices need to be scrutinized for potential savings, as does the government wage bill, in the context of possible civil service reform to rationalize employment and wages. Beyond these general considerations, more specific policy options are available that are in part tailored to the specific aging, demographic and fiscal profiles of different groups of countries.

**Finally, fiscal policy affects income inequality and, given increases in inequality in recent decades, countries may wish to consider adjusting their consolidation programs, tax and expenditure policy to cushion or reduce fiscal impact on inequality.** The structure and pace of fiscal consolidation can take account of equity effects, in particular by safeguarding the targeted social safety nets that benefit the poor, but also by taking into account the progressivity of different tax measures. In this regard, tax design could take into account inequality concerns, for example, by introducing higher rates in countries with flat personal income taxes—while understanding the revenue limits of such increases—and also by increasing thresholds of personal income and registration thresholds for VAT taxes. A more complete discussion of inequality implications of fiscal policy, which is attracting increasing attention. Suffice it to say that recent comprehensive reviews (e.g., IMF 2014) provide guidance on the policy options on tax and expenditure
measures for addressing inequality concerns and directions for policy design based on an asset-based approach to analyzing and promoting shared prosperity understood as the growth of incomes of the bottom 40 percent of the population (Bussolo and Lopez-Calva 2014). Moreover, recent international debates over wealth and income inequality (Picketty 2013) gave rise to renewed discussions of the potential for greater use of wealth taxes (Box 4) as instruments of wealth and income redistribution.

Box 4: Time for a Wealth Tax?

What is a wealth tax? Wealth tax here is considered a tax on net wealth (assets minus liabilities), comprising all types of assets. In that sense, it is a much more comprehensive tax and tax base than the more common taxes on land and property, for example.

Wealth tax in practice. Most OECD countries abolished the wealth tax based on various concerns discussed below. Switzerland, France and Iceland maintain wealth taxes. There remains an empirical question of the significance of their revenue, efficiency and equity impact as they are applied in practice. A pan-European wealth tax used to pay off public debt above a certain threshold of 60 percent of GDP has been proposed but multi-country politics of it seems almost impossible.

Pros and cons. The pros are related to the potential impacts of this tax on revenues, inequality of income and wealth, and, potentially, (in)equality of opportunity. Because its base is large, a small rate could raise substantial revenue, potentially leading to a reduction in labor taxes with attendant impact on labor demand. It might stimulate the use or turnover of wealth instead of “passive” ownership. In that sense, it is similar to the land tax except that land is not mobile and wealth/capital is. The cons are substantive and mostly related to administration and collection in a world of highly mobile capital. Estimating wealth comprising different classes of assets and tracking its changes over time can be a formidable tax as even some of the basic assets (e.g., real estate) often lacks up-to-date valuations and cadasters that are preconditions for efficient identification of the tax base. Given mobility of capital, especially in countries with territorial tax jurisdiction systems, collection might also be difficult. As a result, such a tax may not, in fact, raise much revenue. Finally, it is potentially unfair in the upper brackets of the income/wealth distribution that superwealthy may be able to reduce tax liability with much more mobile capital while “relatively” wealthy and middle class whose wealth is tied up in housing and real estate may see most of their burden higher than that of the superwealthy. While such a tax could still be highly progressive overall, the fact that it would likely raise the tax burden on the middle class and upper income classes not necessarily on the superwealthy may make it politically difficult to adopt. Also, there are potential double taxation with property taxation of capital income (Broadway R. et al. 2011, Dimensions of Tax Design, Chapter 8, Institute of Fiscal Studies, London). At the same time, wealth is accumulated stock of past stream of income. In that sense, a tax on wealth is a tax on past income, which taxes income twice. Also, when the wealth is concentrated in a single asset such as house or a farm, for example, a payment of wealth tax can result in the need to sell the asset in order to pay for the tax (Hillman, 2003). On balance, therefore, a proposal for a viable wealth tax would likely be country-focused and would require comprehensive assessment of its administrative, capacity, revenue, and equity impacts (and within a broader assessment of existing asset taxes) in order for it to be politically feasible.

Wealth tax alternatives. Property taxes should be considered an important and underutilized alternative to net wealth tax, especially in middle income and low-income countries. Such a tax is potentially revenue productive, efficient, and equitable. Such a tax could also be an important instrument of making the broader tax system more progressive, contributing to lower, after-tax wealth/income inequality.

“Optimal” mix of fiscal policy measures to deal with the long-term aging pressures are likely to vary across countries and types of countries. This is likely to depend on their initial debt levels, and demographic and migration profiles. Without pretense of “optimality” it is possible, based on this review, to distill broad, pragmatic policy agendas and fiscal options tailored to the different groups of countries in Europe and Central Asia.

1. Countries with high old-age dependency and large outmigration rates

As indicated in figure 1, at the beginning of this paper, in descending order of old-age dependency countries that also have high emigration rates are Latvia, Bulgaria, Croatia, Estonia, Lithuania, Bosnia and Herzegovina, Romania, Georgia, Serbia, Poland, Montenegro, FYR Macedonia, Albania, Armenia and
Moldova. The first six—Latvia, Bulgaria, Croatia, the Baltics, and Bosnia and Herzegovina—have especially high old-age dependency ratios at 25 or more. In addition, Croatia, Serbia, Montenegro, and Albania in particular face major short-term fiscal and public debt problems. In these countries, given an advanced demographic transition compounded by sizeable emigration, aging-related spending pressures are significant and, in some cases, escalating public debt requires early and significant reforms. The in-depth case studies of Bulgaria and Poland and the comparative analysis above suggest the following broad policy agenda for long-term fiscal policy. These measures should be thought of as broad general options rather than specific recommendations for individual countries. A country-specific agenda would depend on detailed analysis of each country.

**Broad policy options in these countries are likely to be centered on the following areas.** While these issues are particularly relevant for this group of countries, to various degrees, they are present in most countries, hence the broader relevance of this agenda.

- **Early, sustained fiscal consolidation with special attention to reforming aging-related social spending.** This will first require raising and equalizing the retirement age for men and women, which would help support higher participation of the elderly in the labor force. In Bulgaria, for example, this would mean first equalizing the retirement age for men and women at 65 and then considering additional increases as life expectancy rises. Second, it will be important to control pension increases and, especially, avoiding ad hoc increases (as has recently been the case, for example, in Serbia and FYR Macedonia) beyond the rules prescribed in the law and preferably tied to specific indicators of inflation. Third, it will be necessary to tighten and streamline special pensions (e.g., veteran pensions in Bosnia and Herzegovina and early pensions in Montenegro); tightening certification criteria (e.g., disability pensions in Bulgaria) will also be important in countries with sizeable special pension expenditures. Fourth, governments will need to streamline public spending on health, especially hospitals, while safeguarding and improving health outcomes, especially among the disadvantaged, make procurement of pharmaceutical products more efficient, and implement the modern diagnostic-related group (DRG) payment system with outpatient caps and development of outpatient alternatives. Greater emphasis on public health and prevention is also called for. As difficult health reforms proceed, it will be important to ensure financial and health protection for the poor. In this regard, all countries should seek, at least over time, to ensure that all old-age pensioners receive pensions above the poverty level irrespective of contribution history; a rule of thumb for such level of pension could be 20 percent about 20 percent of GDP per capita (Arias and Schwartz 2014). Beyond this, countries could seek to top up this “basic social pension” with contribution based benefits. Finally, to safeguard the poverty-fighting role of the system, countries should seek to provide adequate coverage for those who for health reasons must retire earlier as well as to survivor benefits.

- **Broadening the tax base and sustainably increasing revenues.** Countries will need to reduce or eliminate a variety of tax exemptions (including those for the value-added tax) and cut tax spending, which can bring in substantial revenue. There may be a trade off in the short- and longer term between the quick revenue increases that can usually be effected by small increases in payroll taxes or standard VAT rate where those rates are not already very high (e.g., 22 percent rate for VAT). While there may be fiscal urgency to resort to rate increases, often the rates are already high, which suggests that long-term reform should give precedence to broadening the base. Here, it is important to consider how major tax bases—labor income and consumption—are likely to evolve over the long term. With the number of contributors to payroll taxes and shrinking and non-labor income increasing as societies in the region age, the tax base will shift increasingly from labor income to
consumption. As a result, to ensure sustainable financing for future large social obligations, it might be necessary to consider a gradual shift from payroll to consumption taxes (e.g., VAT and excises) and other underutilized instruments (e.g., property taxes). There are also employment and growth reasons why considering fiscally prudent reduction in labor taxes, particularly for low wage earners might be a good idea. Recent empirical work shows that labor taxes in the EU (including new EU member states) take up about 40 percent of total gross labor costs, far above the high 34 percent average in the OECD countries (Eckardt, Sanchez, and Varoudakis 2014). This results in large wedge between the wages a firm pays and the wages that workers receive, especially for low wage earners, discouraging work in the formal sector.

- **Improving labor, inclusion, and saving policies.** In many of these countries unemployment is very high (e.g., FYR Macedonia, Bosnia and Herzegovina, Montenegro, Serbia), youth emigration is considerable (Albania, Moldova, Romania, Bulgaria), or both. These issues are critical not only from the fiscal perspective but even more important for long-term economic growth and productivity. They will need to be dealt with forcefully upfront to avoid the countries getting trapped in a low equilibrium of low growth, high unemployment, large outmigration, rapid aging and major fiscal pressures. First, general labor market regulation and the business climate will need to improve and in some cases labor tax wedges be reduced, and the education system must become much more flexible and responsive to business demand in order to increase job creation. Second, specific labor policies will probably be needed to promote participation of youth, women, the elderly, and socially excluded groups (e.g., Roma, which account for over 10 percent of the population in Romania and Bulgaria). Such policies could relate to job search and placement services, training, remedial education, vocational and back-to-school programs, maternity leave, and child care. Greater access to child care by all groups, in particular, would have a beneficial impact on the participation of women and under-represented groups. Along with improvements in the general investment climate and the job environment, greater attention is needed to the diaspora and its potential for its members to return to the home country as workers and investors. Over the long-term, this might help limit migration, retain talent, and increase investment. Finally, measures to increase financial literacy, expand access to financing, especially for under-represented groups, and promote voluntary pension insurance and household saving will prove beneficial in terms of limiting the adverse impact on saving of demographic transition.

2. **Countries with high old-age dependency and net immigration**

Countries in this category are Hungary, Slovenia, Ukraine, Czech Republic, Belarus, and Slovakia. Enjoying relatively higher per capita income than many outmigration countries, they tend to have a more favorable migration profile. Also, several have already put in place important pension reforms, such as increases in the retirement age (Slovenia, Czech Republic, Slovakia). However, some—Ukraine, Hungary, and Slovenia—also face major fiscal problems caused by escalating public debt and need to consolidate. However, they are also high-tax and high-expenditure countries. As a result, the emphasis of reforms both of revenue and spending is likely to be more on fiscal than labor policies. Hungary, Slovenia, and Belarus also need major reform of the investment climate to help increase employment and domestic and foreign investment. In Ukraine, quasi-fiscal expenditures including fuel subsidies will need to be rationalized within broader reforms that include better overall budget and public investment management (Balabushko et al. 2012) and governance in the SOEs that take up a significant share of the Ukraine economy, especially in rail, transport, utilities, energy, and telecommunications (Prigozhina and Swami 2011).
3. Western European countries

Western European (EU) countries must deal with major, long-term debt problems, now compounded by aging and related fiscal pressures. Even without those pressures, in many European countries public debt exceeds or is fast approaching 100 percent of GDP—unprecedented levels for peacetime economies. As a result, many countries must accept deep fiscal consolidation over a decade or more to bring debt back to pre-crisis levels (Cecchetti, Mohanty, and Zampolli 2010). Further debt reduction might also be needed in the over-indebted countries on the periphery of the Eurozone (Greece, Italy, Spain, Portugal). It thus appears that the central problem Western Europe must deal with is sustained long-term fiscal consolidation that does not compromise economic recovery and long-term growth. The magnitude of the problem requires an appropriate mix of both revenue and spending reforms as well as structural measures to increase the flexibility and efficiency of the economy and its capacity for long-term growth (Baldacci, Gupta and Mulas-Granados 2010). In addition, given the scale of the consolidation and debt reduction challenge, some countries may have to rethink the options for financing major social expenditures like pensions with the view to reducing future liabilities.

Since Western European countries are generally high-tax countries, and the informal economy is sizeable in those that are most indebted, revenue reforms should concentrate on broadening the tax base, cutting waste in current expenditures, and reducing future liabilities. This can be achieved by an aggressive program of eliminating loopholes and tax exemptions. Italy has been making progress in this area but more efforts will be needed. A variety of tax and debt instruments have been proposed in order to accelerate debt reduction, among them a tax on financial transactions, a wealth tax, and Eurozone-wide bonds to pay down public debt above a certain threshold (60 percent of GDP). Evaluation of these proposals is beyond the scope of this paper (see, for example, Mirlees 2010, chapter 8). Suffice it to say that, given the political difficulties associated with any pan-European fiscal/debt initiative, such initiatives are more likely to be limited only in a small number of countries that are under fiscal stress. Moreover, given the significant scope for revenue enhancements from existing tax bases, these would likely take priority over entirely new tax proposals. Spending reforms will need to emphasize reducing future pension liabilities to what is fiscally affordable and containing the rise of health expenditures while safeguarding health outcome and inclusion. The international experience of New Zealand and Germany are instructive. Particularly interesting is the experience of Sweden discussed in the section 7 above where pension liabilities automatically adjust to changes in excess liabilities and life expectancy through automatic changes in the indexation of pensions to real wages.

4. Oil/Resource-Rich Countries

The oil-rich CIS countries are Russia, Kazakhstan, Azerbaijan, and Turkmenistan, and they are joined in Western Europe by Norway. While this is a heterogeneous group in terms of old-age and migration profiles—Russia is an immigration country with moderate old-age dependency ratio and Kazakhstan, Azerbaijan, and Turkmenistan having young, emigrating populations—they are all dependent on oil revenues and reserves. This offers both peril and opportunity, depending on how well they manage their oil reserves and revenues to meet their long-term obligations. Given their generally strong short-term fiscal positions and low public debt, the peril for them lies in complacency because of a lack of urgency about fiscal consolidation. Complacency can also allow these countries to postpone long-term reforms, especially those related to the management of oil revenues.

Nevertheless, they have an opportunity: these countries have the time, resources, and good examples to follow to get policies right early—and for the long term. Norway provides a good example of international best practice in terms of management of an oil fund and prudent long-term fiscal management generally. Since these countries are earlier in the demographic transition than older Western European countries, they can benefit from such lessons of experience and sound design of long-term fiscal reforms and have the time to get things right from the outset.
Sound fiscal policy in these countries requires prudent management of oil revenues for the long term. First, these countries are well advised to implement conservative fiscal policy with and use transparent and well-managed resource funds to insulate their economies from swings in commodity prices and unproductive rent-seeking of oil resources, and build up the cushions for future shocks. Second, these countries should seek to expand the non-oil tax base by eliminating exemptions in non-oil tax instruments and bring their excise tax rates to the international norms; this includes greater use of some underutilized tax instruments such as fuel taxes and vehicle fees, especially in Russia (World Bank 2011a). Third, they should implement simple, transparent oil-revenue rules such as the permanent income fiscal rule that equates the stream of income from oil reserves to the permitted non-oil fiscal deficit (Bogetic 2010). For Russia, such rule has been estimated to require Russia to run non-oil fiscal deficit no larger than 4.3 percent of GDP for long-term sustainability (Bogetic, Smits, Budina, and van Wijnbergen 2010). Similarly, the Kazakhstan fiscal rule has recently evaluated as adequate from sustainability angle with two the following key features: target non-oil fiscal deficit of 3 percent of GDP, a fixed annual transfer from the oil fund, minimum oil fund balance of 20 percent of GDP, and limits on public debt service (World Bank 2013). Finally, sovereign wealth funds will need to maintain transparency, rules-based operation, and separation of their their operations/investments from other government investment vehicles, and they should keep the size of the “home bias” in their investment policy explicit, limited, and rule-bound (Gelb, Tordo, and Halland 2014).

These policies will need to be supplemented with strong expenditure controls, management, and improvements in the efficiency and composition of public expenditures and management of SOEs. Perhaps because these countries have ample budgetary and oil revenues, domestic pressures to control and improve the quality of public spending may be weak. Several of these countries are running non-oil deficits well above the levels required for long-term fiscal sustainability (e.g., Russia and Azerbaijan; see World Bank 2011 and 2013b). So there remains scope for significant rationalization of public expenditures, especially in the areas of social expenditures and transport subsidies, government purchases of goods and services, and improvements in capital budgeting (especially in transport), and the quality of public investments (World Bank 2011a,b). Finally, given the large and often poorly performing state-owned enterprise sector in these countries, improvements in governance and management are warranted as well as guarding against quasi-fiscal liabilities, especially in Azerbaijan (World Bank 2013b).

5. Countries with low old-age dependency ratio and net out-migration

These countries, perhaps paradoxically, need to take aging and long-term fiscal pressures seriously, despite their young population. They include Turkey and Central Asian countries not included in the oil-rich group. Despite comparatively low old-age dependency ratio and low public debt, these countries are aging even more rapidly than some of the older countries, except starting at the lower average age. So while many of the aging-related pressures will not translate into significant additional expenditures and broader fiscal pressures at least for another decade, the demographic transition is inevitable. This provides these countries with time and opportunity to prepare their fiscal policy institutions and measures for long-term sustainability. Moreover, because their debt is currently low, the scale of fiscal adjustment over the long-term will be substantially lower than, for example, in Western European countries.

In addition to considering the general policy options outlined at the beginning of this section above, these countries could consider the following additional policy options. First, in addition to ensuring aggregate fiscal and expenditure discipline, and given their demographics and lower revenue and expenditure ratios, these countries could be well served to ensure pro-poor pension and social assistance spending so that scarce expenditure resources are concentrated on the neediest. Also, broadening the tax base from existing instruments (especially VAT and excises, where rates are not already high) and gradually raising the rates in line with increases in taxable base should be a long-term priority. This should help create fiscal space to accommodate long-term fiscal pressures associated with aging.
ANNEX I: Methodology for analyzing growth and aging pressures

Box 1. A Counterfactual Analysis of GDP Growth under Demographic Pressure

This counterfactual analysis provides a rule-of-thumb method for assessing how an expected demographic change may affect GDP growth. The first step is to reorganize GDP per member of the working age population in order to identify explicitly population size and age structures.

Let $Y_t$ be GDP (measured in real PPP terms) and $P_t$ tal population in year $t$. Then the following produces an identity that must hold regardless of specific values:

$$\frac{Y_t}{P_t} = \frac{Y_t/L_t}{P_t/L_t}$$

where, $L_t$ shows the working age population; based on a set of assumptions such as absence of unemployment, full labor force participation by this age group, and no labor force participation by the elderly and children, the working age population would also equal the workforce. Using a log transformation and rearranging, the above identity becomes:

$$\ln\left(\frac{Y_t}{P_t}\right) = \ln\left(\frac{Y_t}{L_t}\right) + \ln\left(\frac{L_t}{P_t}\right)$$

The left-hand side denotes income per capita in year $t$; the first term on the right-hand side shows output per working age person (or per worker, and thus a productivity indicator); and the second term shows the share of the working age group in total population (the employment ratio, thus a measure inversely related to the dependency ratio).

Finally, the population can be removed from the left-hand side to zero in on GDP growth.

$$\ln(Y_t) = \ln\left(\frac{Y_t}{L_t}\right) + \ln\left(\frac{L_t}{P_t}\right) + \ln(P_t)$$

Iterating this identity for one period and subtracting gives us the growth rates in each component:

$$g_{t+1} = \frac{\ln(Y_{t+1}) - \ln(Y_t)}{\text{Output growth}} = \left[\frac{\ln\left(\frac{Y_{t+1}}{L_{t+1}}\right) - \ln\left(\frac{Y_t}{L_t}\right)}{\text{output per worker growth}}\right] + \left[\frac{\ln\left(\frac{L_{t+1}}{P_{t+1}}\right) - \ln\left(\frac{L_t}{P_t}\right)}{\text{employment ratio growth}}\right] + \left[\ln\left(\frac{P_{t+1}}{P_t}\right)\right]$$

The first term in square brackets on the right-hand side shows the growth in per worker output, thus in labor productivity. The second term shows the growth in the working age group to population ratio, thus the change in the dependency ratio. Finally, the third term shows population growth.

In the spirit of Bloom, Canning, and Fink (2011) the second stage of the experiment uses the decomposition to generate counterfactual GDP growth rates. Specifically, the average annual employment ratio growth and population growth rates from the years between 2010 and 2050 are plugged into the equation along with the actual values of growth in output per worker for 1980–2010. The results show what the average annual growth rate of GDP would be between 1980 and 2010 had the country in question already experienced the coming demographic change.
Box 2. Dynamics of Fiscal Space and Demographic Pressure

As with the counterfactual growth analysis (box 1), evolution of the debt-to-GDP ratio can be decomposed to reflect demographic dynamics. Letting $d_t$ denote the debt-to-GDP ratio ($D_t/Y_t$) in year $t$, then:

$$\ln(d_t) = \ln(D_t/Y_t) = \ln(D_t) - \ln(Y_t)$$

rewriting the right-hand side as:

$$\ln(D_t/Y_t) = \ln\left(\frac{D_t}{(P_t-L_t)}\right) + \ln(P_t - L_t) - \ln(Y_t)$$

The first term on the right-hand side shows debt per dependent person (defined as non-working-age).

Iterating this identity forward for one period and subtracting provides the growth rates:

$$\Delta d_t = \ln\left(\frac{D_{t+1}}{Y_{t+1}}\right) - \ln\left(\frac{D_t}{Y_t}\right) = \left[\ln\left(\frac{D_{t+1}}{(P_{t+1}-L_{t+1})}\right) - \ln\left(\frac{D_t}{(P_t-L_t)}\right)\right]$$

$$+ \left[\ln(P_{t+1}-L_{t+1}) - \ln(P_t - L_t)\right] - \left[\ln(Y_{t+1}) - \ln(Y_t)\right]$$

The second stage of this experiment uses alternative targets in the debt-to-GDP ratio targets in order to assess the extent to which debt per dependent person needs to adjust to prevent breach of a debt target. In an economy where the dependent population is increasing, a ceiling on the growth of debt per dependent person can be considered an indicator of how much fiscal space the government has available to take on debt to finance the surge in such age-related expenses as pension benefits, healthcare, and long-term care.

In order to compute a time-varying ceiling on the growth of debt per dependent person, first, forward-looking output growth rates are estimated using the recent history of average labor productivity growth rates and demographic projections for the future (as described in box 1). The average annual growth of the debt-to-GDP ratio is then calculated using projected debt-to-GDP levels when the period ends (targeted value in 2050) and the actual value of the ratio at the beginning (2010). Finally, the ceiling on the growth rate of debt per dependent person is calculated as a residual using the equation above.
Box 3. Characteristics of the Macro-Fiscal Model for the Analysis of Demographic Change

Onder, Ley, and Pestieau (2013) establish a simple model that brings together consistently the projections for population, labor force, pension system, and fiscal aspects of the economy. Figure B3.1 shows the structure of the model.

The model characterizes Bulgaria as a small and open economy where capital is the mobile factor. Output is produced by a standard Cobb-Douglas production function with constant returns to scale and two factors of production: capital and the efficiency unit of labor. Physical labor is converted to efficiency units using a Mincerian transformation. Labor supply is exogenous to the model. Policies designed to raise labor force participation, such as changes in the statutory retirement age or establishment of daycare facilities, may affect the aggregate supply of labor, but these are incorporated through different scenarios. The equilibrium level of capital is found by equalizing risk-adjusted returns between domestic markets and the rest of the world.

In the model, government collects taxes, receives non-tax revenues and grants, and provides public services. Tax revenues comprise indirect taxes, capital income taxes, and labor income taxes; public spending is for education, health, pension fund transfers, among other expenditures. Public spending on education and health care is projected using a “pure aging” scenario approach where age- and enrollment-specific expenditures are kept proportional. Therefore, aggregate expenditures in these categories respond respectively to the scale and age composition of the population, enrollment numbers, and per capita income. Finally, transfers from the fiscal budget to the pension fund are projected using the real economy estimates from the World Bank PROST model.
ANNEX II: Are Expenditure Preferences Robust Across Country Groups?

To check the robustness of these findings across different groups of countries and also to relate them to alternative groupings selected based on similarities in country aging and fiscal profiles, results were generated for the following groups of countries: (1) high old-age dependency and emigration; (2) high old-age dependency ratio and immigration; (3) Western Europe; (4) oil-rich; and (5) Low old-age dependency. Figure A1 shows that the aggregate results are not driven by a single set of countries. In fact, the patterns described are observed in almost every group. Within each group, the elderly population of every single ECA country studied is less likely than younger counterparts to support higher spending on education and more likely to support spending on pensions (see De Mello, Tiongson, and Winkler 2014 for individual country results). Figure A1A1 shows that the association between age and preference for additional spending on pensions is higher among the oldest economies in the region (groups 1 and 2). The inference is that two forces may affect rationalization of public spending on pensions within these economies through a political economy channel: the larger shares of the elderly in the voting population and their stronger preference for pensions as a priority for more government spending.

Figure A1. First or Second Priority for Extra Government Spending by Alternative Country Groupings.

Note: Groups: 1: high old-age dependency and emigration; 2: high old-age dependency ratio and immigration; 3: Western Europe; 4: oil-rich; 5: low old-age dependency.
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