POLAND
SAVING FOR GROWTH AND PROSPEROUS AGING
Country Economic Memorandum

Poverty Reduction and Economic Management Unit
Europe and Central Asia Region

June 2014

Document of the World Bank
ABBREVIATIONS AND ACRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
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<tbody>
<tr>
<td>AR</td>
<td>Adequacy Ratios</td>
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<tr>
<td>CEE</td>
<td>Central and Eastern Europe</td>
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<td>CESEE</td>
<td>Central, Eastern and Southeastern Europe</td>
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<td>CF</td>
<td>Cash Flow</td>
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<td>CS</td>
<td>Corporate Saving</td>
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<td>DB</td>
<td>Defined Benefit</td>
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<td>DC</td>
<td>Defined Contribution</td>
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<td>DSGE</td>
<td>Dynamic Stochastic General Equilibrium</td>
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<td>EET</td>
<td>Exempt-exempt-taxed</td>
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<td>EU</td>
<td>European Union</td>
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<td>FDC</td>
<td>Financial Defined Contribution</td>
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<td>FDI</td>
<td>Foreign Direct Investment</td>
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<td>FSAP</td>
<td>Financial Sector Assessment Program</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>HCE</td>
<td>Health Care Expenditure</td>
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<td>HCS</td>
<td>Health Care System</td>
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<td>IKE</td>
<td>Individual Pension Accounts</td>
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<td>IKZE</td>
<td>Individual Pension Security Accounts</td>
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<td>KRUS</td>
<td>Farmers' Social Security Fund</td>
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<td>LCR</td>
<td>Liquidity Coverage Ratio</td>
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<td>LTC</td>
<td>Long-term Care</td>
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<td>MFI</td>
<td>Monetary and Financial Institutions</td>
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<td>MoF</td>
<td>Ministry of Finance</td>
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<td>MTO</td>
<td>Medium-Term Objective</td>
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<td>NBP</td>
<td>National Bank of Poland</td>
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<td>NDC</td>
<td>Notional Defined Contribution</td>
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<td>NFL</td>
<td>Net Foreign Liabilities</td>
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<td>NFZ</td>
<td>National Health Fund</td>
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CURRENCY AND EQUIVALENT UNITS

Exchange Rate as of June 2, 2014

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<thead>
<tr>
<th>Currency Unit</th>
<th>Polish Zloty</th>
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<td>US$1</td>
<td>3,0413PLN</td>
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Government Fiscal Year

January 1 - December 31

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EXECUTIVE SUMMARY
Executive Summary

Why does Poland need to save more?

1. **Although its economic growth over the last two decades has been impressive, serious challenges to Poland’s growth prospects are appearing on the horizon.** Since 1995 growth has averaged about 4 percent a year, led by growth in total factor productivity (TFP) and capital deepening. The speed of convergence to the average income in the European Union (EU) has been impressive, with income per capita increasing from less than 42 percent of the EU15 average in 2000 to 60 percent in 2012. However, much of the catching-up process relied on exuberant domestic demand, which outpaced the supply potential of the economy. Consumption averaged 80 percent of GDP for 2004–08, and the contribution of investment was particularly powerful in the years immediately after EU accession, when public investment was boosted by EU transfers. The slackening of Poland’s economic performance after the financial crisis reflects the vulnerabilities of the growth model Poland adopted: strong domestic consumption fuelled by borrowing, high reliance on the EU15 for export markets and capital inflows, and national saving that is inadequate to fund investment. These factors have instead become the source of risks in light of the long-term challenges facing the Polish economy in coming decades: probable slower growth in productivity, the economic and social implications of population aging, and less supportive global financial conditions undermining further capital deepening.

2. **Sustaining strong productivity growth will not be easy.** Poland’s high growth rates after the economic transition reflected to a large extent a rapid rise in TFP as its productivity caught up with that of other countries at similar levels of GDP per capita. Economic liberalization, the privatization of state-owned enterprises, and opening up to international trade and capital flows resulted in sustained productivity growth as resources were reallocated toward more productive sectors and firms. The transition-related catching-up process in the countries of Central and Eastern Europe (CEE), however, seems to be coming to an end (EBRD, 2013). Productivity growth is now mainly driven by efficiency gains within individual firms, and productivity patterns increasingly resemble those of advanced market economies. While they have largely closed the gap with similar countries, Poland and other CEE economies are likely to grow more slowly in the future, mainly for two reasons: the slowing of structural reform since the mid-2000s, and the effects of the financial crisis. Sustaining robust TFP growth in Poland, even at only slightly above the long-term global projection of 1.5 percent, will be challenging.

3. **Strong headwinds are to be expected also from demographic trends: Poland has one of the most rapidly aging populations in the EU.** Given its profound economic, social, and cultural implications, population aging is currently becoming one of the world’s most significant challenges. It is particularly pronounced for Poland, where life expectancy at birth has increased in Poland by about six years for both men and women since the early 1990s. Meanwhile, in the early 1990s fertility rates in Poland fell below the simple replacement rate of 2.1, and have been trending downward (apart from a short-lived upturn during the 2004–09 boom), hitting 1.3 by 2012—one of the fastest demographic transitions on record. As a result, Poland’s old-age dependency ratio (population aged 65 and more as a percentage of the population aged 20-64) is expected to increase from 20.9 percent in 2010 to 58 percent in 2050 and 70.7 percent in 2060 (European Commission, 2012). Meanwhile, the share of the working-age population, which was 71.3 percent of the total population in 2010, is projected to sink to 53.4 percent by 2060. The magnitude and pace of these changes will have serious implications for both the economy and society. It is likely that aging will affect the supply of labor and reduce both private and public saving, repressing investment and capital accumulation.

4. **Foreign financing to support capital deepening may also be harder to attract, given tighter global financial conditions and regulatory action since the financial crisis.** The crisis has changed global financial markets, particularly by changing the perception of credit risk in highly leveraged institutions, which caused capital to suddenly dry up at the peak of the crisis. This in turn increased the refinancing risk for both private and public entities. In Europe this change contributed to the Eurozone crisis, with a number of peripheral Eurozone members forced to seek external support to cover growing public and banking system debt. For emerging markets like Poland, the crisis triggered a steep reduction in previously large inflows of interbank and foreign direct investment, which are now forecast to remain below their earlier levels for the foreseeable future. The financial crisis has had particularly serious implications for CEE banking sectors. In Poland, as elsewhere, foreign banks have rebalanced their funding away from parent bank financing toward domestic sources. Thus, the crisis may imply permanently lower external financing, which is bound to affect growth prospects. For Poland a significant challenge will also be the gradual reduction of EU structural funds to finance investment.

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1 The EU15 countries are Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom.
5. **To sustain long-term growth, Poland needs to modify its growth model to favor saving-led growth over consumption.** In this difficult post-crisis environment, Poland, like many other countries, needs to strengthen its long-term growth prospects. Increasing domestic saving seems to be a viable proposition that can help Poland address some of its challenges. Higher saving will help Poland to finance its large investment needs and sustain dynamic productivity growth, which should sustain higher economic growth generally. It will then be possible to replace the large inflows of EU funds as they ebb and provide more stable, diversified, and long-term funding for economic activities. Saving more will also reduce Poland’s vulnerability to conditions outside Poland and in doing so reduce the chances of interruptions in growth. Finally, higher savings are likely to support a more resilient and wealthier society.

6. **The relationship between national saving and economic growth, however, is far from obvious.** The positive relationship between saving and economic growth has proved to be quantitatively strong and robust to different types of data and methodologies (see Mankiw et al., 1992, Attanasio et al., 2000, and Banerjee and Duflo 2005, among many others). Countries that have high saving rates for long periods of time tend to experience larger and sustained economic growth. Prime examples are developing countries in East Asia, such as China, Singapore, Korea, Malaysia, Thailand, and Taiwan. Of course, some of the relationship between growth and saving reflects the positive impact that growing income has on saving (see Loayza et al., 2000b), but the reverse causality—from higher saving to faster growth—is also demonstrable, where the mechanism works through the well-known process of capital accumulation. Improved national saving provides funding for a country to take advantage of more and larger investment opportunities. This in turn increases the capital stock, which if used effectively for economic production pushes up growth in output. Although in theory domestic investment does not have to be supported by national saving, since foreign savings are also available, in practice the connection between the two is quite close (see Aizenman, Pinto, and Radziwill, 2007). This is especially true in the long run, when external sources of funds cannot be tapped freely: large current account deficits cannot be sustained indefinitely and are inherent sources of vulnerability.

7. **Growth in income over the longer run depends on increases in productivity, which are rooted in investments that must be financed.** A sound growth model for Poland, with its aging population and relatively undeveloped infrastructure, will require substantial investment to supply a labor force that is growing slowly with more productive equipment. The two main drivers of growth should remain capital accumulation and TFP. More capital accumulation (capital deepening) has to be financed by savings, and higher TFP similarly needs to be embodied in additional capital investment, which has to be financed. If the necessarily higher level of investment spending is not to cause a dangerous worsening of the balance of payments and net international investment position, it has to be financed with increased savings.

8. **Poland has benefited enormously from using foreign savings, not only those intermediated through the banking system but also from EU cohesion and structural funds.** Poland has shown itself to be well-organized in accessing such financing and to have used it well. While the EU has just agreed on a level of financing for the 2014–20 period that is largely unchanged from the previous period, after 2020 the amount of EU funding that will be available to Poland is likely to fall, reflecting both the more difficult financial positions of stronger members of the EU and Poland’s success in convergence. But even after convergence Poland still has a long way to go in upgrading its infrastructure and investing in its economy. That is why EU funds will need to be replaced by higher domestic saving.

9. **Higher savings are also needed to make the economy more resilient to financial shocks.** If Poland relies less on inflows of foreign savings that are subject to sudden stops and reversal, especially short and medium-term interbank flows, that will help make the economy less vulnerable to conditions outside Poland and thus less subject to interruptions in growth. A stronger current account, achieved through higher national savings rather than less investment, will allow Poland to build up foreign assets that support resilience and policy independence as well as improving its net international investment position.

10. **Higher domestic savings can also provide longer-term funding for a banking system that has until now relied on short-term deposits, supplemented with funding from parent banks or international money markets.** The
latter forms of funding are now less accessible than in the run-up to the global financial crisis, and international regulatory changes are making it more difficult for banks to use them to finance credit expansion. If the banking system is to continue to provide the credit that the economy needs for growth, longer-term domestic funding based on higher domestic savings will be necessary. Such savings will not only fund bank lending but should also support development of a more vibrant domestic capital market that can provide financing for the economy in less crisis-prone forms.

11. **Sustaining per capita economic growth of 3.5 percent annually would require the national saving rate to increase gradually from just below 18 percent of GDP today to reach 23 percent in 2030 (assuming strong TFP growth); if TFP growth is weaker (more realistically at 1.5 percent of GDP) the required increase in national saving is much larger – to over 35 percent of GDP by 2030.** To sustain per capita growth at the level close to the that observed between 1995 and 2012, national saving would need to hold at approximately the current level until 2020, then rise to about 20 percent by 2024 and keep rising steadily to 23 percent by 2030. Most of the increase in national saving is to be driven by private saving; public saving between 2015 and 2028 is projected to be negative. As the growth decomposition shows, TFP would contribute a vast 57 percent to growth in GDP per capita, and capital accumulation would contribute about 42 percent. This scenario assumes, however, that TFP will grow at the high pre-crisis average of 2 percent a year, which allows GDP per capita to grow substantially without very large increases in national and public saving. If TFP growth is weaker (more realistically at 1.5 percent) the required capital accumulation to attain the target growth rate is much larger. To support rapid capital accumulation, the national saving rate would need to jump immediately to 22 percent of GDP and then continue increasing to over 35 percent of GDP by 2030. This would imply an enormous increase in public and private saving.

12. **The rapid aging of the Polish population is not only a possible brake on growth but also raises the question of how national income can be transferred to the growing group of pensioners.** The reform of 1999 made the pension system fiscally sustainable and fair in the sense that individual pensions would ultimately reflect individual contributions—but at the cost of a substantial drop in the average replacement rate, to the extent that the pensions of a growing group will be below the statutory minimum. If in future the replacement rate declines by about 20 percent, the relative poverty rate will increase from 20.7 percent in 2010 to 22 percent in 2060. Additional transfers to pensioners of part of national income will be needed if old-age poverty is to be avoided and if the incomes of different cohorts, those earning and those retired, are to be kept in proportion. One way to do this would be the fiscal route, with either income or consumption taxed to provide a supplement to public pensions. But a less contentious approach would be for pensioners, either individually or collectively, to have more assets the earnings on which could supplement their state pensions. Among the ways to achieve this would be to boost individual saving and asset accumulation. This report suggests that those aged 20 to 50 who are currently working will have to save about 10 percent of their earnings on top of what they are already saving if they are to enjoy current replacement rates.

**How did Poland get here and what can Poles expect?**

13. **In recent years Poland has not saved enough to finance its growing investment needs.** That is why Poland has lagged behind other European countries with similar GDP per capita in terms of investment and capital stock. Between 2001 and 2012 Poland’s investment accounted for 20 percent of GDP, below its peers—the Baltic states, Slovakia, and the Czech Republic—and even less than slower-growing Hungary. Poland has been saving even less than it invests and is again far below international standards. For the last decade Poland’s domestic savings were not only lower than in most European and OECD countries, including peers the Czech Republic, Estonia, and Slovakia, but also lower than in developed EU countries when they were at Poland’s level of development. Poland has also relied less than its peers on foreign saving to finance investment. Almost 90 percent of its stock of tangible capital was supported by domestic saving; net foreign saving was just 2 to 6 percent of GDP in 2000–12.

14. **Not only the amount but also the structure of saving in Poland is a source of concern.** The structure of saving has been changing dramatically. Declining household saving (already among the lowest in the EU) is being offset by rising nonfinancial corporate saving. Household saving has trended down, reaching 3 percent of GDP in 2012, when it was a mere

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4 The relative poverty measure uses a poverty definition in which persons with a household income that is less than 60 percent of the median household income in the country where they live are regarded as at risk of poverty.
6 percent of total gross saving. Voluntary household saving (not counting mandatory pension funds) fell even more, to 0.2 percent of GDP. In stark contrast, corporate saving has shot up from 55 percent of total saving in the early 2000s to about 85 percent today. This phenomenon of rising corporate saving combined with falling or stagnant household saving can be observed in many other countries, both industrial and emerging, and is not fully understood. Except for 2006–08, the Polish government has been dis-saving since 2000. The current structure of saving is a concern for the country’s future. An aging population is likely to suppress already low household and government saving. Meanwhile, whether high corporate savings are sustainable will depend on whether the recent increase represents a temporary phenomenon or a fundamental change in corporate behavior. Finally, the scope for ultimately substituting domestic saving for by foreign saving is constrained by the level of Poland’s net foreign liabilities (NFL), which climbed to 67 percent of GDP in 2012.

Will current drivers of household saving persist?

15. **Household savings in Poland have been driven by the growth of both disposable income and education and are closely linked to both corporate and government saving behavior.** Household savings have been shaped by a stable macroeconomic environment with declining inflation and interest rates, income convergence toward EU15 levels, and the emergence of a domestic financial system that expanded access to credit. While most of these developments tended to reduce saving, the growth of household income had the opposite effect. Until 2004 greater uncertainty and higher returns on savings pushed up the saving rate. Later, as uncertainty eased to the point of unimportance, low real interest rates reduced both the return on saving and the cost of borrowing, which encouraged households to consume. The growth of real incomes, from which richer groups in the population have benefited more, also seems to have boosted household savings throughout the period of analysis. Controlling for level of income, younger cohorts in Poland were found to have greater propensity to save than their elders. Finally, there is evidence of some substitution between household and public saving, as well as household and corporate saving. This report shows that in Poland the households saving offset is estimated to be about 25 percent in the case of public dis-saving, which is consistent, though at the lower end, with other empirical research (Röhn, 2010). Moreover, there are reasons to believe that the household relationship to corporate savings may be structural, while the relationship to government savings is probably cyclical.

16. **Household savings are likely to be reduced as the population ages,** but the decline can be mitigated by increasing educational levels and postponing retirement. Polish households behave like lifecycle permanent income consumers and savers: they accumulate savings before retirement and dis-save in retirement, thus smoothing consumption (holding the marginal utility of money constant) across the stages of life. Such behavior results in a hump-shaped income, consumption, and savings profile as the household ages. In Poland, compared to the level in 2010 the expected changes in population structure alone would leave aggregate household saving almost unchanged by 2030 but would reduce it by about 15 percent by 2060. However, when population aging is combined with the projected higher education level there will be a positive impact on total household savings. After accounting for changes in age and education, total saving by 2030 will be 17 percent above the 2010 level and by 2060 6 percent above.

Is high corporate saving sustainable?

17. **Growing profits explain the rise in corporate saving in Poland.** Between 2000 and 2012 corporate saving generally tracked the rise in profits. Profits mainly rose because of higher gross operating surpluses rather than lower tax and interest payments. Both a substantial rise in corporate value-added and a reduction in employment costs boosted operating profitability. Net interest payments have only recently declined as a result of the much lower interest rates. Income from property has been volatile, driven by changes in net reinvested earnings on foreign direct investment. At the same time, higher dividends from both national and foreign sources and higher current transfers were offset by higher withdrawals from the income of quasi-corporations. Since dividends generally did not rise in line with profits, they also contributed to greater gross corporate saving. Regression analysis also illuminated the role of leverage ratios, demand conditions, and firm size in corporate saving. For instance, when the global crisis hit Poland in 2009, corporate saving fell not only because profitability dropped but was also due to deleveraging. In Poland, smaller firms save more than bigger ones.
18. Though not easy, sustaining an increase in corporate saving is feasible. The profit outlook seems to be critical if high corporate saving is to be sustained. For Poland, part of the increase in corporate profitability may not be temporary; corporate profits have benefited primarily from the rise in gross operating surplus rather than such temporary factors as low interest rates, the cyclical upturn, or reductions in corporate tax payments. Thus, if the healthy growth in corporate sector value-added can be sustained and wage growth remains under control, corporate saving is likely to stay high. As the society ages, however, wages are likely to rise as labor becomes scarcer. This may reduce corporate saving but it is likely to push up household and government saving (working in the opposite direction than indicated in the previous paragraphs with the overall effect extremely difficult to predict). There will be nothing wrong with that, since corporate savings are only useful to an aging society if a way can be found to invest them for the benefit of the old. Either pension funds have to acquire these savings or the government has to tax the earnings on them. Finally, it is worth bearing in mind that if Poland is to grow, corporate as well as other saving must be channeled into productive investment. Thus for Poland, the challenge will be not only to keep corporate saving high but also to translate it effectively into investment.

Can the government be expected to improve its own saving position?

19. Government dis-saving has resulted from both cyclical and structural factors, though the biggest pressures are still ahead. Since 2000, except for 2006–08, the Polish government has been dis-saving, although its deficits are expected to decline in the next few years. The dis-saving reflects both the effects of the economic cycle and policy-driven tax reductions and spending increases. Over the long term, however, Poland’s fiscal challenges will become more formidable. An aging population will put pressure on both the government saving position and long-term sustainability. The pressures will come largely from spending on health and long-term care (LTC). Combined public health and LTC spending, currently about 5 percent of GDP, is projected to reach at least 7.2 percent in 2060, and even 11.6 percent if cost pressures are not contained. The cost of health care and LTC will be partly offset by lower spending on pensions and education. Pension spending in Poland is expected to fall from about 13 percent of GDP in 2010 to just below 12 percent between 2030 and 2050. The estimated decreases, in pension spending, however, come with the substantial decline in benefits already noted.

20. The extent to which government saving can be expected to improve over a longer period depends on the government’s ability to address the impact of aging. The government saving position and long-term sustainability are likely to deteriorate if age-related spending is not contained or offset. If current fiscal policy is carried over into future years, the sustainability gap (which measures public explicit and implicit liabilities in relation to base year GDP) could reach 129.6 percent of GDP. Closing the gap requires that the primary deficit be reduced by 1.4 percent of GDP. To keep the government saving position in check, three main challenges need to be addressed in order: (1) contain health spending; (2) avoid a reversal of the 1999 pension reforms; and (3) find resources to top up future pensions for certain social groups. If the health-related spending pressures are not contained, the government will save considerably less or healthcare contributions will have to be doubled. For pensions, the upward pressure on spending seems to be contained by a sizable reduction in future benefits, but lower benefits are likely to undermine the ability of public pensions to alleviate poverty among the elderly and may intensify political pressure to reverse the reform that established the notional defined contribution (NDC) system. The cost of reversal could be huge. This report shows that if the pension system were to retain current average replacement rates, pension spending would increase to about 16 percent of GDP through 2060 from the current 13 percent or so. Finally, even if a reversal of pension reform is avoided, the government will need to spend 1–1.5 percent of GDP in order to top up actuarial pensions to align them with the minimum pension.

Is the saving environment right?

21. Government policies in Poland do not seem to create major disincentives to private saving, but nor do they give individuals incentives to save. Taxation of savings in Poland is uneven, which may sway preferences for one form or another. While capital income is generally taxed at a lower rate than the OECD average, it is still higher than in other Visegrad countries. Poland’s holding-period test reduces or eliminates taxation of capital gains only for real estate. In addition, tax
Incentives to stimulate private retirement savings have not effectively motivated Polish households. Ten years after the first private voluntary pension scheme was established, total assets of all Polish voluntary private pension accounts together amounted to only about 0.75 percent of GDP; participation in such schemes is very low. On the other hand, the design of the public pension system and the functioning of the health system should in principle help encourage household saving. The first offers future retirees very low replacement rates; the second does not guarantee adequate access to care and relies on heavy out-of-pocket payments. Moreover, there is evidence that after the 1999 reform the pension system crowded out savings to a lesser extent than had been the case before the reform.

22. **Removing obstacles to the further development of the financial sector would promote saving.** The activities of the financial sector are fundamental to mobilizing and utilizing savings. This report shows that in Poland financial sector development beyond the current credit penetration of 54 percent of GDP would likely help to both generate savings and raise the growth rate. Financial markets in Poland are generally more developed than regional comparators but are also more volatile. The banking system is well-capitalized and properly supervised and is funded largely from deposits and to a lesser extent from parent banks or international markets. Its main vulnerabilities of the banking system are exposure to foreign exchange risk, the need for foreign exchange liquidity, and the short-term nature of its funding. Bank lending is skewed toward loans for house purchases and consumption credit; exposure to nonfinancial corporations is relatively low. Although the development of the banking sector is consistent with Poland’s income level, further development of capital markets is needed. More developed local currency capital markets can offer savers long-term investment instruments and banks a more stable funding base. From this point of view, there are at least three weak points in the functioning of local currency capital markets in Poland: underdevelopment of the corporate bond market and securitization, a lack of long-term domestic funding sources, and operation of the second and third pension pillars.

**What policies would boost national saving?**

23. **Because analysis of saving policy is so difficult, recommendations for a policy package to promote saving must be tentative.** The analysis of saving policy is difficult for four reasons: (1) high-quality data about saving in Poland (both macro and micro) are elusive, especially for household saving; (2) international evidence about the effectiveness of possible measures to lift saving is often ambiguous; (3) interventions that are effective in achieving one objective usually have downsides in terms of other objectives; and (4) the economic impact of saving policies is difficult to quantify. That is why any recommendations are bound to come wrapped in caveats.

24. **Policies directed to the key determinants of saving in Poland is likely to increase national saving over the long term, which will in turn boost GDP.** In order to boost saving it will be important to support income growth, raise household propensity to save, and limit government dis-saving. Together such policies are likely to boost both saving and output growth, with the following quantitative results:

- If income convergence is boosted by increased labor force participation and more education, GDP and saving could be about 1 percent higher in 2050 than if there are no policy changes.

- A greater propensity to save that raises saving by 1 percentage point would boost GDP by 0.4–0.7 percent annually compared to the baseline, with the biggest impact in about 2030.

- Of four possible options for financing age-related spending—tax hikes, less public investment, higher debt, and cuts in transfers—the last option best balances benefits for saving and growth. When age-related spending on health is financed by cuts in transfers, growth increases by an additional 0.5 percent a year and saving declines by about 4 percent annually compared to the baseline. If tax financing is used, GDP could decline by about 0.2–0.6 percent annually and saving could be lower by 3–8 percent.

- The cost of delaying the policy response to mounting age-related pressures is high. If the government acts today to moderate the projected growth in health spending and avoid abrupt adjustments as fiscal tensions accumulate, GDP in 2050 could be 1.5 percent higher than in the baseline.
25. **A number of complementary policy changes are likely to be needed to achieve a significant and sustained increase in Poland’s national saving.** A package containing a number of the options outlined in this report could, over the medium to long term, add up to significant desirable changes in the level and structure of national saving. In forming such a package, government policy choices can decisively affect the environment that influences how individuals save. Therefore, five areas of policies are proposed to mobilize national savings in Poland: (1) Policies to support incomes and growth; (2) policies to encourage households to save; (3) policies to limit government dis-saving; (4) policies to substitute for foreign savings; and (5) policies to support a local currency capital market over the long term.

**Boosting income and growth**

26. **There are several policies that could boost national income in Poland. Income is obviously a significant determinant of how much individuals save.** To achieve a significant increase in national saving, government policies should support income growth. Likewise, the government’s saving policy package should have a positive impact on economic growth as well as boosting national saving. The main policies to increase national and individual income would promote labor force participation and employment, support internal and intersectoral mobility, and improve the education system.

27. **Increasing labor force participation and the employment of women, youth, the elderly, and low-skilled workers seems to be the foundation for raising incomes.** To this end, efforts to increase female labor market participation should be continued, in particular by investing in affordable quality childcare and preschool education and ensuring that educational institutions have stable funding and qualified staff. General pension reform should also be underpinned by measures that promote the employability of older workers. Youth unemployment could be reduced, for example, through further deregulation of professions, increasing the availability of apprenticeships and work-based learning, closer cooperation between schools and employers, and improving the quality of teaching. Adjustments to taxes and benefits to increase labor market activity might be also considered. It would be advisable to shift the tax system toward less reliance on social security contributions (SSCs) and reduce the labor tax wedge, especially for low-skilled workers. Such a reform should combine reducing tax rates and SSCs (e.g., lowering them for low-wage earners) with broadening the tax base (e.g., removing the preferential system for taxing agricultural income). There also needs to be a comprehensive review of tax and benefit provisions that apply to families with children in order to reduce disincentives for second earners to take up work.

28. **Supporting internal and intersectoral mobility is also important for boosting employment.** To improve labor mobility, the government should move to reform KRUS, the farmers’ social security scheme, and phase out the special pension system for miners with a view to integrating them into the general scheme. To remove impediments to internal labor mobility, the functioning of the housing market should be enhanced by addressing the lack of supply in the private urban rental market, making mandatory the release of zoning plans by municipalities, changing the taxation of housing purchases, and further relaxing rent controls and tenant protection.

29. **Improvements in education will help Poles to achieve better economic outcomes.** Education policies should aim at a supply of skills from the school system that will bring about improvements in general skill levels over time and a tertiary system that meets the skill needs of a growing economy. To do this the main weaknesses in the education system need to be addressed: low preschool enrollment rates, poor functioning of the vocational tertiary education (VTE) system, and fragmentation of tertiary education, which distorts competition and causes skills mismatches. Tackling these flaws requires a wide array of policy actions, such as developing preschool facilities, expanding the capacity of VTE schools, and raising the quality of teaching; introducing cost-related tuition fees in the public sector; allocation of academic positions based on transparent and competitive procedures; and systematic assessment of the quality of higher education institutions. Encouragement of on-the-job training and lifelong learning can also help to adapt worker skills to a rapidly changing technological environment and thereby prevent the entrenchment of under-skilling. Enhancing job-matching services, such as through better job-market information and fostering labor mobility, would also help to reduce skill mismatches.
Government as saver

30. Although the quickest way to improve national saving would be to increase how much the government saves, this should not be a goal in itself. The recent global financial and sovereign debt crisis has shown that fiscal policy is crucial to stabilizing the economy. Another crucial objective of fiscal policy is fiscal sustainability, which is essential for keeping the economy stable, reducing economic vulnerabilities, and achieving sustained growth in living standards. Finally, government saving affects the economy. Taking into account all these objectives, the government should pursue a prudent, forward-looking fiscal policy that is mindful of growth. In order to avoid potential dis-saving and secure long term fiscal sustainability without harming growth prospects, this report recommends that the government (1) adheres to its short and long-term fiscal goals; (2) moves promptly to introduce measures to moderate the projected growth in publicly-financed age-related spending; and (3) continues to improve the quality of its spending.

31. Ensuring planned progress toward termination of the excessive deficit procedure and reaching the medium-term objective should be a priority. In the short term, the main goal for the government will be to correct the fiscal deficit quickly enough to allow a sustainable exit from the excessive deficit procedure by 2015. After that, the government is advised to pursue structural adjustment that will enable Poland to reach its medium-term objective. The effective implementation of a permanent spending rule will be critical to delivering these results, but it will also require significant improvements in budgetary processes. The arrangements for setting and reflecting government spending priorities beyond the short term are currently inadequate, and there is too much reliance on ad hoc budget adjustments. Thus the government might also consider establishing regular in-depth spending reviews at all levels of governments, which will help reduce or reallocate budgetary spending over the medium term.

32. Moderating growth in age-related public spending is important for the medium term. It is important for the government not to delay introduction of measures to moderate the projected growth in publicly financed age-related spending; delay could cause a major reduction of government saving in the long term. Therefore, this report recommends steps to improve the sustainability and adequacy of the pension system. It will be important to complete the reform by removing pension privileges for certain occupations, such as miners and the uniformed services (soldiers and police officers), bringing them closer to actuarial fairness. It is also vital that the government resist pressures to reverse its defined contribution pension reform. It is also vital that the government resist pressures to reverse its defined contribution pension reform. To reduce the risk of a reversal, replacement rate reductions should not be allowed to undermine the ability of public pension systems to alleviate poverty among the elderly. To address the problem of old-age poverty, the government should continue to guarantee minimum pensions and revamp incentives for private pension plans. Finally, the government should make an effort to contain upward pressure on public health spending while maintaining access and the quality of care. There are many possible options for containing health costs. Two that are discussed in this report are introducing copayments and limiting coverage of the health system—in other words, changing the mix of public and private funding for health care.

33. Improving the quality of public finances would be beneficial for both saving and growth. Policies to improve government saving may also affect economic growth. Reductions in current spending would be more beneficial for economic growth in Poland than cuts in productive spending (investment) or distortionary increases in taxes (e.g., labor taxes). Thus, with a view to improving the quality of public finances this report recommends minimizing cuts in growth-enhancing investment and reassessing spending policies to increase the cost-effectiveness and efficiency of current spending. In any case, government investment is part of government saving—in other words, cutting the fiscal deficit by cutting investment spending does not increase public saving. Finally, the government should continue to broaden the tax base, improve tax enforcement, and strengthen the functioning of tax administration because higher revenue would support an increase in public savings.

Incentivizing and requiring individual saving

34. There is scope for the government to heighten individual incentives to save. The government may want to incentivize private retirement savings and increase the availability of saving instruments. To do this, it should consider revamping its support of private pension (third pillar) schemes, revising Open pension Funds (OFE) investment guidelines and lengthening
the period of performance measure,7 and making it obligatory for third pillar pensions to offer partial deferred annuities while remaining flexible on other pay-out options.

35. **A number of recommendations concerning the future operation of the second pillar are relevant to provision of appropriate savings instruments in Poland.** Improvement in the future operations of OFEs would also have implications for more extensive use of third pillar pension vehicles. In particular, there are issues connected with the investment strategies and savings vehicles offered by the OFEs that are relevant to privately funded pension schemes. The benchmarking system for measuring the performance of OFEs has been a cause of the relatively slow development of longer-term capital market instruments in Poland. Thus the government should set minimum durations for the fixed-income portfolios of pension funds to increase demand for longer-term securities and encourage corporations to issue longer-term bonds. Measures are also recommended to improve the product mix for savers. The key will be to offer savers portfolios that better reflect lifecycle investment strategies. This might be done by offering standard portfolios with different risk/return characteristics, or offering a product that alters the bond-equity mix with the age of the saver.

36. **It is time to reconsider current tax incentives for private pension savings.** Although taxes tend to have more impact on how people save than on how much, tax changes can promote greater and more efficient national saving. International evidence suggests that taxation is likely to have only a modest impact on how much people save and invest but can have a very significant impact on how they choose to do so. There is also the impact of the tax expenditure on government savings, another component of national saving. The incentive may cost more than it generates in new saving. In Poland tax incentives for the private pension pillar, though small, have not encouraged much saving. Thus it would be advisable for policy makers to evaluate how effective and efficient tax support of retirement saving schemes is in delivering the expected results. Tax incentives should avoid generous benefits to high-income earners who are already saving and will most likely simply switch between different forms of saving. Since most benefits of higher savings come from higher national saving, the fiscal cost of tax incentives or other subsidies involved in a scheme should not come at the expense of a major reduction in government saving. Thus the cost of such a scheme should mainly be funded within a fiscal plan that keeps to the current gross debt track.

37. **The government might decide to introduce a new scheme that combines automatic enrollment with obligatory employer contributions.** Because most households in the bottom half of the income distribution are so liquidity-constrained that active saving is impossible, passive saving through automatic enrollment schemes may be helpful. All employers might be obliged to offer a new scheme to their employees, who would be enrolled automatically but with the possibility of opting out. Inertia would lead one to expect that most employees would stay in the system. Employee contributions would be matched by employer contributions, and the state might provide an additional flat payment to the account. Amounts contributed and earnings might be tax-free, with income tax paid on distributions. The contributions would be invested in instruments approved by the Polish Financial Supervision Authority (PFSA), and there might be a dynamic development of the portfolio backing this instrument with the share of bonds rising with the participant’s age. Part of the contribution might go to purchase a deferred annuity, starting, say, at age 85, to ensure that the pensioner does not suffer poverty when the other payments run out. While the main objective would be to provide retirement income, accumulated savings, minus what is spent on the annuity, could be drawn for other specified purposes.

38. **Finally, it is not advisable for the government to embark on financial literacy campaigns—essentially they have proved not to produce results.** Whereas it is possible to design savings schemes that can have a strong and lasting influence on household savings rates, financial literacy campaigns to persuade people of the advantages of saving more have not been effective. The effort that goes into financial literacy campaigns does not seem in line with their exiguous results, and the authorities are not advised to make this a plank of any program to raise savings. In principle, financial education could increase participation in savings schemes. However, the evidence (mainly from the U.S.) is that it is not very effective in generating sustained changes in saving behavior. Fernandes et al. (2013) conducted a meta-analysis of the effects of financial literacy and financial education on financial behavior in 155 papers covering 188 studies and found that interventions to improve financial literacy explain only 0.1 percent of the variance in financial behavior.

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7 The benchmarking system for measuring the performance of OFEs has been one reason for the slow development of longer-term capital market instruments in Poland. The current system, which penalizes relatively small deviations from average performance, encourages a conservative herding strategy and a buy-to-hold approach that does not contribute to market liquidity. When high fees are already a significant barrier to market acceptance, it also raises costs by encouraging defensive strategies.
Developing a long-term local currency capital market

39. **The further development of a local currency capital markets can create a more stable domestic financial system** that is less reliant on bank funding and supplies the instruments that savers need, directly or indirectly. This report endorses the findings of earlier studies of capital market development in Poland. The dominance of banks in financial systems in Poland, as in much of Europe, is a source of vulnerability, particularly when bank portfolios are shrinking. Building a domestic capital market will also benefit savers and investors by giving them wider choice. Since residential mortgage lending is particularly significant in the portfolios of Polish banks, removing legal obstacles to the wider issuing of covered bonds could make a significant contribution to capital market development. Amending the law on collateral to make its transfer easier could both facilitate both covered bonds and other forms of securitization, and efforts could be made to deepen the market for municipal bonds. Another measure to deepen the domestic capital market would be to revise the guidelines for OFEs and private pension funds to give them more flexibility to respond to saver lifecycle strategies and deviate from benchmarks.

40. **Raising national savings is likely to bring about a more resilient economy.** Stable macroeconomic policies, related to both demand management and the exchange rate, should ensure that the current account deficit stays within bounds and that there is gradual improvement in Poland’s net international investment position. The structure of capital inflows needs to change, reducing the role of the more volatile elements, especially the short-term exposure of the banking system. Potentially volatile funding from foreign parents or using the swap market is still cheaper than longer-term domestic financing, so it is essential to continue with plans to require that banks meet the new Basel III/CRD IV requirements for higher net stable funding ratios. That will give them more incentive to issue longer-term PLN instruments, which will also serve as vehicles for investment of increased long-term domestic savings.

41. **Lastly, there is the option of doing very little, or even nothing.** If this option is chosen, Poland’s savings rates will remain low by international standards. That implies that current investment will remain depressed and consumption will stagnate. It will then be difficult to manage the slower growth in consumption of people of working age. They could also find themselves bearing an additional tax burden to support old people who themselves did not save enough while young. Alternatively, those who have not saved could be left to bear the consequences of their earlier decisions, and poverty would grow among the old. In either case, unless there is at some point in the future a surge in labor productivity that can generate higher saving, aggregate consumption is likely to grow more slowly than labor income.

**Summary of Policy Options to Support National Saving in Poland**

I. **Policies to support incomes and growth**

1. **Increase labor force participation and employment:**
   - Invest in affordable quality childcare and preschool education
   - Promote the employability of older workers
   - Continue to deregulate professions
   - Strengthen cooperation between schools and employers
   - Shift the tax system toward less reliance on social security contributions and reduce the labor tax wedge, especially for low-skilled workers
   - Conduct a comprehensive review of tax and benefit system provisions that apply to families with children
2. Support internal and intersectoral mobility:

- Reform the farmers’ social security scheme by phasing out the special pension system for farmers
- Enhance the functioning of the housing market

3. Improve the education system:

- Expand preschool facilities and the enrollment capacity of VTE schools
- Introduce cost-related tuition fees in the public sector
- Improve the quality of higher education institutions
- Promote lifelong learning
- Enhance job-matching services

II. Policies to encourage households to save

1. Revamp state support to the private retirement pension scheme:

   - Reconsider current tax incentives for private pension savings
   - Introduce a new, employer-based, automatic enrollment scheme, with the following features:
     - Compulsory for employers to offer to new employees
     - Available to other employees and those out of employment
     - Automatic enrollment with possibility of opt-out
     - Regular deduction from salary with a matched employer contribution and possibly a government bonus
     - Schemes and investments approved by KNF
     - Varying risk/return mixes offered to participants
     - Part of assets reserved for a deferred partial annuity
     - Withdrawal at regular intervals after retirement
     - Flexible withdrawals for specified purposes (e.g., house purchase, medical costs)

2. Do not embark on financial literacy campaigns

III. Policies to limit government dis-saving

1. Stick to short and long-term fiscal goals:

   - Correct the fiscal deficit promptly to allow sustainable exit from the excessive deficit procedure by 2015
   - Pursue structural adjustment to enable Poland to reach its medium-term objective in the next few years
Executive Summary

- Implement the permanent expenditure rule starting from in 2014
- Establish regular in-depth spending reviews

2. **Do not delay introduction of measures to moderate the projected growth in publicly-financed age-related spending**

   - Complete the pension reform by removing pension privileges for certain occupations, such as miners and the uniformed service (soldiers, police officers)
   - Resist pressures to reverse the defined contribution pension reform
   - Continue to guarantee minimum pensions
   - Revamp incentives for private pension plans
   - Contain upward pressure on public health spending while maintaining accessible and quality care (e.g., by introducing copayments and limiting the coverage of the health system)

3. **Continue improving the quality of government spending**

   - Minimize cuts in growth-enhancing investment
   - Reassess spending policies to increase the cost-effectiveness and efficiency of current spending

### IV. Policies in respect of foreign savings

1. **Pursue macroeconomic policies to strengthen the balance of payments**

   - Pursue stable and restrained demand management policies, both fiscal and monetary:
     - Ensure that foreign savings are attracted in the form of long-term direct and portfolio investment (instead of relatively volatile short-term interbank and financial market flows)
     - Keep the exchange rate floating (prior to euro adoption)
     - Ensure export competitiveness

2. **Implement new regulatory requirements (Basel III and CRD IV)**

### V. **Policies to develop the local currency capital market**

1. **Reinvigorate the covered bond market**:

   - Allow universal banks to issue covered bonds
   - Set and enforce minimum standards for conforming mortgages
   - Modify legislation governing the transfer of collateral, including bank secrecy aspects
   - Modify the bankruptcy law to provide for the failure of the issuing bank
2. Facilitate other forms of securitization:
   • Strengthen enforcement of security interests and judicial decisions
   • Develop a modern securitization framework
   • Introduce tripartite repos
   • Use a central depository for debt securities to improve market liquidity

3. Improve operation of pension funds and other saving funds:
   • Revise OFE investment guidelines
   • Lengthen the period of performance measure
   • Make it obligatory to offer wider a product mix for savers, including partial deferred
Introduction

1. The recent financial crisis has emphasized the role of national saving for rising economic growth and promoting development. Since the crisis began, global markets have experienced deteriorating public finances, household deleveraging, differing speeds of recovery, and eroding confidence in financial systems, all of which have deterred long-term investments. Exacerbating these developments are two long-term trends that are reducing the growth potential for many countries: slowing growth of global productivity and population aging. In this difficult environment, countries need to re-define their current growth models to reinvigorate their economies and put them on a higher growth path. One way to do this is to support saving-based growth1. At a national level, this is related to such macroeconomic questions as whether saving rates are too low and how they should evolve to support investment and long-term growth without jeopardizing the sustainability of the external balances. As the population ages, a mechanism is needed to ensure that retirees obtain a sufficient share of national income. At the micro level this translates itself into a concern about the ability of households to save for retirement.

2. In the context of this new growth agenda, the present report analyzes the trends and determinants of domestic saving in Poland and provides policy options for increasing saving, particularly over the long term2. This focus is based on the fact that increased national saving can generate a range of macroeconomic and development benefits for the economy, especially after a sustained period of saving (15-20 years). These include better macroeconomic outcomes, such as higher growth, financial market development, and improved financial resilience for individuals. Therefore, many governments around the world are focusing on increasing saving and fostering people's saving habits3.

3. The relationship between national saving and economic growth, however, is far from obvious. The positive relationship between saving and economic growth has proved to be quantitatively strong and robust to different types of data and methodologies (see Mankiw et al., 1992, Attanasio et al., 2000, and Banerjee and Duflo, 2005, among many others). Countries that have high saving rates for long periods of time tend to experience large and sustained economic growth. Prime examples are developing countries in East Asia, such as China, Singapore, Korea, Malaysia, Thailand, and Taiwan. Of course, some of the relationship between growth and saving reflects the positive impact that growing income has on saving (see Loayza et al., 2000b), but the reverse causality—from higher saving to faster growth—is also demonstrable, where the mechanism works through the well-known process of capital accumulation.

4. Improved national saving provides funding for a country to take advantage of more investment opportunities. This in turn increases the capital stock, which if used effectively for economic production pushes up growth in output. Although in theory domestic investment does not have to be supported by national saving, since foreign savings are also available, in practice the connection between the two is quite close (see Aizenman, Pinto, and Radziwiłł, 2007). Investment and saving are found to be highly correlated at the national level (Feldstein and Horioka (1980), F-H puzzle, see Box 1.1 below). Although the integration of financial markets has weakened this correlation, the empirical literature (Di Iorio and Fachin (2007), Christopoulos (2007)) still finds evidence of the Feldstein-Horioka puzzle, especially in developing countries. In favorable circumstances, if there is indeed a short-run causality from saving to investment and when channels by which saving translates into growth are not blocked, increased national saving can translate into higher investment and economic growth. This could be important for the Polish economy, allowing it to address its high investment needs given the expected decrease in the availability of EU structural funds in the years ahead.

1 A switch from consumption to investment is needed, which in turn needs to be matched by higher saving.
2 Data cut-off date for the analysis is end-December 2013.
3 One of the examples is New Zealand, where efforts on increasing national saving have aimed at addressing overall resilience of the economy and high level of external imbalances. See for example New Zealand Treasury (2003, 2007, 2010) and Savings Working Group (2011).
Box 1.1. What is the saving-growth transmission mechanism?

The economic literature suggests a variety of mechanisms through which national saving can affect economic growth, but one of the main transmission channels is from savings to accumulation of fixed capital. Investment is an important influence on both the demand and the supply sides of an economy. On the demand side, it is one of the more variable components of expenditure, with swings in investment contributing significantly to fluctuations in the economic cycle. On the supply side, investment in business assets and infrastructure boosts the productive potential of the economy, supporting rising productivity and living standards.

The positive association between national saving and investment was discussed in a landmark paper by Feldstein and Horioka (1980), in which they showed that investment and saving are highly correlated in advanced economies, despite the reduction in barriers to international capital mobility. The results of their research showed that the so-called saving-retention coefficient, which measured the level of capital mobility in 21 member states of the Organization of Economic Cooperation and Development (OECD), was between 0.871 and 0.909, which indicated a relatively low level of capital mobility in these countries. Although the so-called Feldstein-Horioka puzzle has been confirmed by further empirical research, the direction of the causal relationship between national saving and investment is not clear. Hence, it is perfectly possible in principle that investment can be high even without matching national saving, which can be replaced by foreign saving attracted to the economy by higher returns to capital than offered elsewhere.

On the other hand, national and foreign saving are not perfect substitutes, as financing investment with foreign capital may create vulnerabilities for the economy (i.e., the possibility of a reversal in capital inflows or possible appreciation of the currency, putting pressure on the profitability and competitiveness of tradable sectors). More recent research (Prasad, Rajan and Subramanian, 2007) suggests that national and foreign saving are complements rather than substitutes in the sense that national saving supports investment and finance of the ancillary businesses that are needed to support the large-scale activity financed by foreign capital.

Furthermore, there seem to be significant differences in the relationship between saving and investment between developed and developing countries. Apparently, in advanced economies the integration of financial markets has indeed substantially weakened the correlation between investment and national saving. The coefficient for high-income countries on the investment-savings regression has been declining since 1997, and by 2007 it had become negative (see Hevia, 2010). This would confirm the view that in the short run, saving and investment has become completely decoupled in high-income countries (WB 2011). However, the Feldstein-Horioka puzzle, even if somewhat weaker than before, can still be observed in developing countries, at least in the short run.

Importantly, the extent to which the level of saving can affect capital accumulation, and hence growth, depends heavily on the capacity of an economy to channel saving into productive use, including the ability of financial markets to effectively channel resources efficiently to the right users and uses (see Chapter 5 for more details). An efficient financial system means that the best investment opportunities can be matched with available savings (see Levine, 2005). In particular, the financial system can affect saving and investment decisions (and hence capital accumulation and technological innovation) by reducing information and transaction costs, creating mechanisms for risk-sharing, facilitating trade and payments among economic agents, and providing a range of supporting services. But the intensity and speed of capital accumulation are driven by a multitude of factors related not only to economic fundamentals but also to the institutional, political, and social context. Without strong public institutions that guarantee economic stability and contract enforcement, for instance, accumulated capital may remain idle or be used ineffectively (WB 2011).

5. Higher national saving could increase the resilience of the economy by reducing macroeconomic vulnerabilities. As discussed in the box above, national and foreign savings are not perfect substitutes for financing domestic investment. The latter can come at the cost of creating external vulnerability for the economy (i.e., the possibility of a reversal in capital inflows or possible appreciation of the currency, putting pressure on the profitability and competitiveness of tradable sectors). Thus, in a case where low national saving implies higher external financing of investment, the sustainability of economic growth may be at risk. In other words, greater reliance on national saving could help lessen the vulnerability to external shocks and volatile capital flows.

6. Higher national saving could translate into sounder and deeper financial system. After the global financial crisis the bank funding model in Poland and other countries has been evolving. In this context building a strong base of national saving would help rebalance sources of bank financing, thus reducing the vulnerability in the banking system. That could also mean deepening of the entire financial system, particularly the stock market and the market for corporate debt, with
beneficial knock-on effects on firm growth and productivity. Sustained increases in national saving could also support financial innovation, by creating demand for new financial instruments. This would allow for increased diversification of household balance sheets (where there is a bias towards saving in a particular form, e.g. housing), thereby reducing household exposure to declines in the value of particular classes of assets.

7. From the microeconomic perspective, increasing national saving would support incomes in an aging society, helping address the issue of the adequacy of retirement incomes. Higher national saving would finance consumption of a larger retired population. In particular, that part of the accumulated stock invested abroad could be used to support national income when economic growth is constrained by declining labor supply. Accumulated private saving could supplement state-provided pensions, translating into improved financial resilience before retirement and incomes of individuals after retirement.

8. However, increasing national saving involves also some costs, which should be carefully balanced against the potential benefits. Firstly, costs include the sacrifice of current consumption, as saving involves reducing consumption today to increase it in the future. Secondly, there may be some fiscal costs in the case of possible government interventions to support saving (i.e. compulsory saving programs or tax incentives). There may also be economic efficiency costs of incentives or regulations to promote saving that significantly distort behavior. Importantly, higher national saving alone is not sufficient to promote sustainable growth. In the long-run the main driver of sustainable economic growth is productivity improvement. This fact cannot be neglected when discussing the role of national saving and potential benefits from increasing it. Simulations presented later in this study suggest that growth is only feasible with a reasonable combination of savings and productivity growth. Another important factor is the quality of the financial system, including the availability of financial instruments to mobilize savings and direct them to the best investment opportunities, as well as the quality of public institutions in general, to guarantee economic stability and favorable business environment.

9. The report has 7 chapters. Chapter 2 presents recent trends and determinants of growth in Poland, as well as challenges for its long-term prospects. The chapter then tries to address two fundamental questions – on the macro level – is the Polish economy saving enough to finance its growth? and – on the micro level – are Poles saving enough to ensure adequate income in old age? Chapter 3 discusses the determinants of and influences on the level of private saving. It also reviews data on saving outcomes for Poland and key issues with respect to how saving is measured. Finally, it provides an assessment of sustainability of private saving trends in Poland. Chapter 4 complements this discussion by portraying the government’s role in determining the level of saving in the economy. It analyzes both the direct and indirect (incentive) effects of the fiscal policy on national saving. The chapter devotes considerable attention to aging pressures that will shape and constrain fiscal policy and the government’s saving position in the coming decades. Chapter 5 discusses the importance of saving for the financial sector, its ability to promote such saving, and instruments that might be promoted to meet the needs of Polish savers. Chapter 6 quantifies the impact of potential changes to the main determinants of saving on performance of saving and economic growth in Poland. Finally, Chapter 7 focuses on policy analysis. It formulates the main policy issues for Poland and proposes policy actions to support saving (and economic growth). It emphasizes the policies supporting aging populations as demographics shift. Rather than make highly specific recommendations, the chapter is intended to identify and discuss the issues that Polish policy makers will need to take into account in their consideration of saving and development strategies.
CHAPTER 2
WHY DOES NATIONAL SAVING MATTER FOR THE POLISH ECONOMY?
Economic growth and its drivers – recent experience and challenges ahead

10. **In the past two decades, Poland’s economic growth has been impressive.** After first collapsing during the transition to a market economy, Poland’s output recovered gradually through the 1990s, and recovery accelerated in the second half of the 2000s. Economic growth in Poland since 1995 averaged about 4 percent a year, led by growth in total factor productivity (TFP) and capital deepening. It is estimated that TFP (including labor quality) was responsible for 57 percent of the output growth and capital for 31 percent. Labor accounted for a mere 11 percent, and largely reflected the increase in the working age population (Figure 2.1). Poland’s good economic performance and productivity growth over the past two decades supported sustained competitiveness, growing incomes, and improving living standards. The speed of income convergence to the average EU levels has been impressive, with income per capita increasing from less than 42 percent of the EU15 average in 2000 to 60 percent in 2012.

![Figure 2.1. Growth decomposition 1995-2012 (Percent)](image)

**Note:** The contribution of labor to economic growth has been decomposed into two components: impact of demographics and labor market specific component. Demographics reflect changes in native population, cumulated net migration, and the share of working age population. Labor market specific component reflects changes in labor force participation rates of various groups of population, unemployment rate and the number of average hours worked.

Source: Staff calculations based on updated LIME assessment framework (LAF) database (available at [http://ec.europa.eu/economy_finance/db_indicators/laf/index_en.htm](http://ec.europa.eu/economy_finance/db_indicators/laf/index_en.htm)).

![Figure 2.2. GDP per capita 2000 and 2012 (in PPS as percent of EU15 average)](image)

Source: Eurostat.

11. **However, the main drivers of economic growth, in particular TFP growth, have been weakening (Figure 2.3).** Economic growth in the late 1990s reflected to a large extent a rapid catch-up in productivity, with a growing contribution from capital deepening in the following years, in the run-up to the EU accession, and later, after 2008, reflecting extensive...
investment programs financed from the EU funds. However, since 2004 the contribution of TFP appears to be weakening – picking up only in 2010-11, which may reflect more effective utilization of workers during the economic slowdown (as a result of significant lay-offs and cautious hiring, evidenced also by the strongly negative labor-market specific component). The contribution from the labor-market specific component has been mainly driven by changes in the unemployment rate and has been highly correlated with the economic cycle. Finally, the contribution from demographics has been small and positive, mainly due to an increasing share of working age population.

Figure 2.3. Growth decomposition 1995-2012 (Percent)

Note: The contribution of labor to economic growth has been decomposed into two components: impact of demographics and labor market specific component. Demographics reflect changes in native population, cumulated net migration, and the share of working age population. Labor market specific component reflects changes in labor force participation rates of various groups of population, unemployment rate and the number of average hours worked.

Source: Staff calculations based on updated LAF database (available at http://ec.europa.eu/economy_finance/db_indicators/laf/index_en.htm).

12. Without decisive reform actions the main engines of growth, most importantly productivity growth, will lose steam. Poland's high growth rates following the economic transition reflected to a large extent a rapid rise in TFP as productivity caught up with that of other countries at similar levels of GDP per capita. Economic liberalization, the privatization of state-owned enterprises, technology transfers from abroad, in part due to Poland's increasing trade openness and integration in global value chains resulted in sustained productivity growth, as resources were reallocated toward more productive sectors and firms. By the mid-2000s, however, productivity levels in countries of Central and Eastern Europe (CEE) were comparable to those of other emerging economies with similar income levels, and thus the transition-related catching-up process came to an end (EBRD, 2013). Productivity growth is currently mainly driven by efficiency gains within individual firms, and the productivity patterns resemble those of advanced market economies. Having successfully closed the gap, CEE economies including Poland are likely to grow more slowly in the future also due to the slowing of structural reform since mid-2000s, as well as to the political and social repercussions of the financial crisis and the low growth seen since 2008 (EBRD, 2013). Finally, the negative contribution of physical capital intensity to TFP can be an important drag in

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6 Poland’s average annual allocation of EU funds under the 2007-2013 fiscal framework was close to 3 percent of GDP annually. A similar allocation of EU funds is planned for 2014-20. Estimations show that these fund transfers should positively influence the GDP dynamics: the additional average annual GDP growth in Poland attained with the EU funds inflow is estimated at between 0.3 and 0.7 percentage points for 2004–15, depending on the model used (Institute for Structural Research 2013; Kaczor, Mackiewicz-Łyziak, and Michniewicz 2012; WARR 2013).

7 See also Alam, Cavero, Khan, and Udomsaph (2008) for a detailed analysis of productivity developments in transition economies of Eastern Europe and the Former Soviet Union, including at the micro and firm level.
the future (Égert and Kierzenkowski, 2013). Sustaining robust TFP growth, even at a level only slightly above the long-term global projection of 1.5 percent, will require significant structural reforms.

13. In the long run productivity growth is the key determinant of economic growth and improvements in living standards. Productivity, the ratio between the volume of output and the volume of inputs, measures how efficiently production inputs, such as labor and capital, are being used in an economy to produce a given level of output. Reflecting both embodied and disembodied technological change and the general efficiency of production, productivity is a key source of economic growth, convergence and competitiveness. In the last fifteen years, differences in GDP per capita growth across OECD countries can be mainly attributed to differences in labor productivity growth (growth in GDP per hour worked). This can be achieved if more capital, such as machinery or software, or better vintages of capital are used in production (capital deepening). But labor productivity can also grow by improving the overall efficiency with which labor and capital are used together (total factor productivity growth, TFP). Thus, labor productivity growth can be decomposed into the contribution of capital deepening and TFP. While capital deepening has historically contributed to growth (notably in lower-income countries), with decreasing returns to capital, capital deepening itself is not likely to boost long-run growth in most countries (this however may not be true for intangible capital, which is becoming increasing relevant in advanced economies). TFP growth has contributed strongly to labor productivity growth (between one half and two thirds of aggregate labor productivity growth) across OECD countries over the period 1995 to 2011 (OECD, 2013c).

14. To close the existing productivity gap with advanced economies Poland needs productivity-enhancing structural reforms. Almost all the gap in GDP per capita in Poland relative to the average OECD level reflects the gap in labor productivity (both about 40 percent below the OECD average in 2012, see Figure 2.4.), suggesting a significant potential for productivity catch-up. As already noted above, for many emerging market economies, productivity gains from past reforms and sectoral reallocation away from agriculture may have already peaked and, in any event, old growth models may no longer suffice, especially in a less favorable external environment and with less benign demographics. Sustaining growth and income convergence will instead require more intensive patterns of growth, greater flexibility to shift resources across sectors, efforts to reduce resource misallocation within sectors, and the capacity to innovate and apply more knowledge and skills-intensive production techniques (see also Egert and Kierzenkowski, 2013). In upper-middle income countries like Poland, boosting productivity growth will require a focus on deepening capital markets, developing more competitive and flexible product and labor markets, fostering human capital accumulation, and investing in research and development and new technologies (Dabla-Norris, Ho, Kochhar, Kyobe, Tchaidze, 2013).

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8 Expected average annual TFP growth globally over the next 50 years (Johansson, et. al., 2012).
9 See Johansson, et al. (2012).
10 In traditional economic theory, changes in TFP are considered exogenous. But research by De Michelis, Estevão, and Wilson (2013), looking at the experience of Canada, suggests that TFP may respond endogenously to the availability of labor, i.e. instead of taking TFP as given, firms and industries may vary TFP and employment depending on factor endowment and labor costs, choosing an optimal trade-off between TFP and labor intensity on the production frontier. This suggests that in response to aging populations countries may experience accelerating TFP as firms find ways to utilize existing workers more effectively.
15. From the growth accounting perspective, strong headwinds are to be expected also from demographic trends as Poland has one of the most rapidly aging populations in the European Union (EU). Given its profound economic, social and cultural implications, population aging is currently becoming one of the key global challenges (see Box 2.1), with the situation particularly challenging for Poland. Life expectancy at birth has increased in Poland by about 6 years for both men and women since the early 1990s. Meanwhile, fertility rates in Poland have generally remained below the simple replacement rate of 2.1 since the early 1990s, with a generally declining trend (apart from a short-lived upturn in the 2004-09 boom years) and reaching 1.3 in 2012. The latter corresponds to one of the fastest demographic transitions recorded, and as a result, the old-age dependency ratio (population aged 65 and more as a percentage of the population aged 20-64) in Poland is expected to increase from 20.9 percent in 2010 to 58 percent in 2050 and 70.7 percent in 2060 (EC, 2012a). The share of working age population (15-64) (71.3 percent of the total population in 2010) is projected to drop to 53.4 percent by 2060. The magnitude and pace of these changes will have important implications for the Polish economy and society.

16. Furthermore, the challenge is even greater as the Poles are getting old before they are becoming rich. The challenge of aging in Poland – like in many other countries in Eastern Europe – coincides with incomplete economic convergence and incomplete transition to the mature market institutions helpful in dealing with the adverse economic consequences of aging. Poland lags substantially behind the aging industrial countries, such as Austria and Italy, in terms of income and institutional maturity. Furthermore, due to the historic background of socialist times, cohorts older than 40 in the 1990s and now approaching retirement mostly failed to accumulate significant savings, apart from real estate.11 All in all, the age structure of Poland is almost that of mature high-income countries, yet with significantly less income and wealth.

11 With strictly controlled earnings and access to credit, any available savings financed the consumption of durables and the purchase of property. Additional savings accumulated in bank deposits or pillowcases were devalued by the hyperinflation of the early years of transition, which also saw real wages drop and unemployment increase. (Chawla, et. al., 2007).
**Box 2.1. Population aging**

Population aging refers to the global demographic trend toward longer life expectancy and lower fertility rates, and the resulting shift toward population structures dominated by old rather than young people, and ultimately to the shrinking of the population. This demographic transition has profound economic, social and cultural implications, and for many countries worldwide, including in Europe, will be a defining feature of the economic landscape over the next few decades. Population aging poses a challenge for economic growth, further improvements in living standards, and the sustainability of public finance. It is likely to cause significant behavioral changes as well as affect cultural and social choices. All these have implications for the structure of the economy, relative prices of assets, and the distribution of welfare and prosperity, requiring changes in the economic and social models of many countries.

The primary macroeconomic implication of aging is the shrinking working-age population and thus the supply of labor. This in turn has implications for economic growth, which depends on the supply and productivity of labor. The quantity effects of a shrinking labor force may be to some extent offset by three factors. First, labor’s contribution to growth could be maintained and improved by productivity increases, the key driver of economic growth in the long run. Second, the impact of aging on the labor supply could be partially offset by increases in labor force participation rates, which in Poland remain relatively low. Third, the labor force can be augmented by allowing inward migration. On the other hand, increasing productivity growth would require supporting measures and structural reforms. Furthermore, even if low participation rates provide a labor force buffer, elder care duties (currently mostly home-based) for the aging population will keep increasing numbers, especially of women, out of the labor force. Finally, Poland itself is a high outmigration country, with migrants being mainly working-age individuals leaving for more attractive labor markets in other, wealthier economies.

The structure of the working-age population will change as well, with potential implications for labor productivity. Aging will alter the structure and characteristics of the labor force – increasing the share of older workers may result in a loss of dynamism with less job reallocation across occupations, sectors, and locations. This reduced mobility creates some productivity concerns as aging economies could be more susceptible to technological shifts and offshoring, and less able to take advantage of new opportunities. With the risk that skills can become outdated during a long working life, the education system will need to move to lifelong learning and flexible retraining modes to sustain productivity improvements. This would also require that investment in new technologies and other factors of production not be constrained by low foreign and national saving – which may be a challenge in itself for an aging population and a more difficult access to funding following the financial crisis.

Another concern is that changing demographics may slow down economic growth because aging populations tend to save less, with potentially negative consequences for investment and capital accumulation. Investment, which drives capital accumulation and thus translates into economic growth, requires an equivalent amount of matching saving. Meanwhile, aggregate saving is likely to decline in an aging population because – according to life-cycle hypothesis – people save less as they grow older. In turn declining saving make capital more expensive. However, aging is not the only factor affecting household saving, and this in turn is not the only source of resources available for investment, i.e. a decline in household saving does not necessarily imply a decline in total saving and therefore investment, which may be financed from corporate, government, or foreign saving (provided that it offers competitive return on capital to that available elsewhere). But with population aging the returns to capital are likely to fall relative to scarcer labor. It is not clear, though, if this is going to reduce the level of saving and thus investment as the relationship between return on capital and saving is ambiguous, as the direction of casual relationship between saving and investment is vague.

The financial market in Poland is still underdeveloped which creates an opportunity for more effective and productive use of saving to finance investment and support economic growth. The financial system in Poland is dominated by banks that channel most financing from savers to its final users. Financial deepening will increase the number and variety of available financial instruments, creating greater opportunity for formal saving. Furthermore, it will likely boost overall productivity, as financial markets are able to channel capital more efficiently to the most productive uses. On the other hand,
the expected increase in the number of pensioners poses a challenge regarding how best to manage saving (allocated between domestic investment and investment abroad) to ensure acceptable rates of return, especially in view of decreasing returns to capital.

**Population aging is likely to have implications for the economy also on the demand side, with changes of relative prices of capital and labor possibly having large redistributive effects.** By increasing the capital labor ratio, demographic changes are likely to alter relative prices of factors of production with capital returns diminishing and returns to increasingly scarce labor rising. This can have large intergenerational redistributive effects as the older population with abundant capital asset holders can lose relative to younger cohorts\(^15\). This can also imply redistribution across countries, with “old” countries possibly becoming suppliers of capital to “young” countries (through changes in relative returns to labor and capital affecting the current account). And all these effects may in turn translate into significant behavioral changes.

**Population aging will affect demand for key public services, with greatest demand pressures in the provision of health care.** Demographic changes are likely to change consumption and trade patterns, creating greater demand for services and thus altering the structure of the economy. Given excess morbidity of the population (particularly of males), healthy aging in Poland may be a challenge requiring an overhaul in the health care system\(^16\) as an older population will spend more time in sickness, disability and dependency on others in their daily activities. This would require moving away from excessive reliance on hospital care towards primary, preventive and community-based long-term care, the provision of which (both public and private) is currently very low. Another challenge would be to achieve health-improving behavioral change through public health campaigns and other methods.

**Last but not least, population aging, through increasing expenditure on pensions and healthcare, will have clear implications for long-term fiscal sustainability.** A decrease in the working age population translates into an increase in the old-age dependency ratio, which has significant implications for the sustainability of the pension system. While the issue of sustainability of the system in Poland has been mostly addressed by the reform starting in 1999, this has been achieved through reductions in future pension adequacy, which is largely contingent on changes in people’s retirement and long-term saving behavior. With replacement rates projected to fall to around 40 percent, the concern is whether the system would be socially sustainable and politically feasible, given the voting power of the growing old-age population. Even more of a concern is healthcare expenditure, which is likely to be the main drag on public finance in Poland over the medium term (see also Chapter 4).

**17. Finally, the growth model where capital deepening is mainly supported by foreign financing may also face challenges, as the external environment has deteriorated and global financial conditions have become tighter following the financial crisis.** The crisis has changed global financial markets, importantly by changing the perception of credit risk, which was behind sudden stops of capital at the peak of the crisis. This in turn increased the refinancing risk, both for private and public entities. In the European context this change contributed to the EU debt crisis, with a number of peripheral Euro-zone members forced to seek external support. For emerging markets, like Poland, the crisis triggered a sharp reduction in previously large inflows of interbank and foreign direct investment flows, which have not fully recovered and are forecast to remain below those earlier levels. Thus, the crisis may imply permanently lower levels of external financing, with potential implications for growth prospects (EBRD, 2013). In the context of Poland a significant challenge will be also a gradual reduction of EU structural funds as an important source of public investment financing.

**18. The financial crisis has also resulted in substantial debt accumulation by public sectors forced to sustain demand in the context of deleveraging and to bail out weakened financial institutions.** Financial sector accumulated significant vulnerabilities in the pre-crisis boom years. During the crisis many of these pressures and underlying risks materialized, with some financial institutions facing significant short-term liquidity pressures and long-term capital needs. To prevent serious systemic risks, public sectors around the globe had to intervene to provide bail-outs for weakening financial sector entities, which in turn added to the build up of public debt. The burden of public debt, together with ailing economic

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\(^15\) On the impact of aging on asset prices see Takáts (2010) and Nishimura, Takáts (2012). See also Vogel, Ludwig, Börsch-Supan (2012).

\(^16\) Similar observations are valid for a number of countries, see for example World Bank (2013b).
performance, turned into the EU-debt crisis in a few Euro-zone members, also posing new challenges for the European Union.

19. **The financial crisis has had serious implications for the banking sectors in Central, Eastern and Southeastern Europe, with foreign banks rebalancing their funding away from parent bank financing toward domestic sources**. Foreign banks, mainly from EU15 countries, have played an important role in the banking systems of Central, Eastern and Southeastern Europe (CESEE), both in terms of ownership and funding, which to a large extent was a legacy of economic transition (when banks were privatized to strategic foreign investors to quickly introduce modern banking practices and secure financial stability). However, a side effect has been a significant exposure of the region’s economies to the large swings in funding from foreign banks (“centralized” bank funding model). During 2003-08 most CESEE countries experienced a foreign-funded credit boom that led to very high domestic demand and GDP growth. With financial crisis hitting in late 2008, earlier inflows of bank funding reversed with about a third of the boom-time inflows from banks unwound during 2008–12. Since then banks have been rebalancing their funding toward domestic sources. Further impetus is coming from the global regulatory reform agenda, aimed at strengthening consolidated bank balance sheets and improving the resolvability of large cross-border banking groups, as well as new guidance from western regulators against high loan-to-deposit ratios in subsidiaries. This process is well under way in the region.

**Need for a new growth model facilitated by national saving**

20. **The financial crisis and the resulting economic slowdown have exposed important weaknesses of the growth model in Poland, with further challenges appearing ahead.** The weakening of economic performance following the financial crisis reflects the vulnerabilities of the adopted growth model – a high level of domestic consumption fuelled by borrowing, a high reliance on the EU15 for exports and capital inflows, and inadequate levels of national saving to fund investment (McKinsey Global Institute, 2013). Poland, which avoided recession, has been experiencing relatively robust growth, while most other CEE economies following a similar model are struggling to restart sustainable growth. But even though the Polish economy has been relatively more resilient during the global financial crisis, important challenges for its long-term growth prospects are visible on the horizon – potentially slower productivity growth, economic and social implications of population aging, and tighter global financial conditions undermining further capital deepening. All this calls for a new model of growth in Poland – one facilitated by national saving, firstly to support investment in productive capacity of the economy and thus economic growth and secondly to ensure adequate retirement income for growing elderly population.

21. **The growth model in Poland so far has been based on domestic demand, notably consumption, rather than on foreign demand.** Vibrant economic growth was heavily dependent on consumption, which contributed almost 3 percentage points to Poland’s GDP growth from 2000 (Figure 2.5, Figure 2.6). Consumption averaged 80 percent of GDP in 2004-08, comparable to levels in the EU15 but much above other developing countries. It was fueled in part by rising incomes, but more importantly by strong and mostly foreign-financed credit growth. Fixed investment was also a growth factor, though its contribution was only a quarter that of consumption (Figure 2.5). The contribution of investment was particularly strong in the years immediately following the EU accession, with public investment also boosted by EU transfers. Meanwhile, foreign demand has been of relatively lower importance. Such a model – with the focus on domestic consumption – undervalued national saving, which, as evidenced later has been relatively low in Poland.

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17 For a thorough analysis see IMF (2013a).
18 See also IMF (2013b).
19 A relatively stronger performance of the Polish economy can be probably linked to a combination of factors: an independent monetary policy, countercyclical fiscal moves, stable domestic demand and close ties to the German economy.
22. **Investment in Poland has been relatively low.** Poland is a laggard in terms of investment (and also capital stock) among European countries with similar GDP per capita. Between 2001 and 2012 investment accounted for 20 percent of GDP, below Poland’s peers—the Baltic States, Slovakia, the Czech Republic, and even slow-growing Hungary (Figure 2.7). Changes in Poland’s total investment over the past decade were largely driven by changes in private investment (Figure 2.8), which was less than in its peers. Public investment, helped by EU transfers, has started to play a more important role after 2006, between 2001 and 2012 accounting for about 4 percent of GDP.

23. **Poland saves less than one-fifth of its GDP, which is clearly quite low.** National saving decreased from 20 percent of GDP in 1995 to 14.8 percent in 2004 and later fluctuated between 14.5 percent and 18.5 percent. This is low by international standards. Moreover, in the last decade domestic savings in Poland were not only lower than in most European and OECD countries, including its peers, the Czech Republic, Estonia, and Slovakia (Figure 2.9), but also lower than in developed EU countries when controlling for the level of development (saving rates are calculated for these countries for the period when they were at the similar level of development as Poland in the last decade, measured by GDP per capita; Figure 2.10). Furthermore, the saving rate has remained stable over the last decade, with little variation over the economic cycle (Figure 2.11).
24. The national saving rate has been relatively stable for the last decade but the structure of saving has changed dramatically, with declining household saving (the share being one of the lowest in the EU) offset by rising (non-financial) corporate saving\textsuperscript{20}. The household saving rate has trended down, reaching 3 percent of GDP and a bare 6 percent of total gross saving in 2012. The voluntary saving of households\textsuperscript{21} (not counting mandatory pension funds) has
fallen even more, to 0.2 percent of GDP in 2012. In stark contrast, corporate saving has shot up from 55 percent of total saving in the early 2000s to about 85 percent today (see Figure 2.11). These trends suggest that household and corporate saving decisions may be inherently linked, as will be discussed in detail later (see Chapter 3). A similar trend of an increasing share of the nonfinancial corporate sector in total gross saving was observed in most countries after the financial crisis.

Figure 2.11. Saving rate in Poland (percent of GDP)

![Graph showing saving rate in Poland](image)

Note: Calculations based on SNA/ESA95 for Poland, 1995-2011.
Source: GUS.

Figure 2.12. Investment and saving rates in Poland (percent of GDP)

![Graph showing investment and saving rates](image)

Source: AMECO.

25. The gap between investment and national saving has been financed with net foreign saving (mirrored in current account deficits). In 2000-12 national saving remained below gross fixed capital formation and the difference was covered with foreign saving, which over the period varied from 2 to 6 percent of GDP (Figure 2.12). However, Poland relied less than its peers on foreign saving to finance its investment (see Box 2.2), with almost 90 percent of the stock of tangible capital supported by actual national saving. This rate has remained relatively high and stable over recent years, in line with the mean for developing countries in the 1990s.
Box 2.3. Self-financing ratio – to what extent the stock of capital is self-financed in Poland?

The self-financing ratio is a simple measure which indicates the autarky stock of tangible capital supported by actual domestic saving relative to the actual stock of capital (supported by both domestic and foreign saving). The measure, proposed by Aizenman et al. (2007), can be calculated as follows. Let gross saving and gross investment at time $t$, in constant prices, be $S_t$ and $I_t$ respectively. The actual capital stock ($K$) is defined recursively from time $t_0$ to:

$$K_t = K_{t_0} + n$$

while the “hypothetical autarky stock of capital” ($\overline{K}_t$) can be calculated from the similar formula:

$$\overline{K}_{t_0} = kY_{t_0}, \quad \overline{K}_{t+n} = \overline{K}_t + (1 - d) + S_t, \text{ for } t_0 + n \geq t \geq t_0,$$

where $Y$ is real GDP, denotes the depreciation rate and $k$ is the initial capital to GDP ratio. The self-financing ratio at time $t = t_0 + n$, calculated using an $n$-periods horizon, is defined by

$$f_{t,n} = \frac{\overline{K}_{t,n}}{K_{t,n}}$$

Thus, the higher the ratio, the more the stock of capital is self-financed by national saving of the economy.

Based on this approach the ratios (10-year average starting from 2004) were calculated for selected countries from Central and Eastern Europe (CEE), including Poland. The depreciation rate was set to 0.1 while the initial capital to GDP ratio was fixed at 2, in line with the mean from the estimates of the stock of capital reported in Gradzewicz et al. (2013).

The self-financing ratio for Poland and selected CEE countries, 10-year average

![Graph showing self-financing ratio for Poland and selected CEE countries](image)

The self-financing ratio for Poland was between 0.86 and 0.89 during the period 2004-2011, slightly below the ratio for the Czech Republic but above the ratio for Hungary and Slovakia.

The ratio for Poland was only slightly below the mean (0.9) for developing countries in 1990s presented in Aizenman et al. (2007). The average for high income OECD countries was even higher, estimated by the authors at between 0.98 and 1.04 during the 1990s.

Note: 1.0 would mean autarky (a fully self-financed economy).


26. Although the current account deficit in Poland has remained relatively modest in recent years, the economy has accumulated a significant amount of net foreign liabilities. Financing investment with foreign saving is not negative per se. It may be beneficial for a converging economy like Poland – as a more efficient way of expanding and upgrading productive capacity of the economy, especially when foreign financing comes with significant positive externalities. However, external financing comes at a cost of creating vulnerability to external shocks, as was the case in the banking
sector in Poland and many CEE countries during the financial crisis. Even recording a relatively modest current account deficit, Poland has accumulated a relatively large negative net international investment position (NIIP, net foreign liabilities) over the years, in 2012 reaching 67 percent of GDP. It is important to note that this reflects, not only the accumulated current account deficits, but also changes in valuation of assets held by non-residents in Poland and by Polish residents abroad (Figure 2.13).

Figure 2.13. Current account deficit and net international investment position in Poland, 2000-12 (Percent of GDP)

![Chart showing current account deficit and net international investment position in Poland, 2000-12 (Percent of GDP)](source: NBP, staff calculations)

27. The structure of current account financing has changed. Before 2008 the current account deficit in Poland was almost entirely financed with FDI, perceived as a stable source of financing, bringing also significant positive spillovers for the whole economy. However, in 2007-08, before the financial crisis, FDI flows started to weaken, while stronger financing flows came as short-term loans and deposits, in large part through the banking sector (other investment). From 2009 onwards this was replaced by portfolio investment flows, mainly in debt instruments, which currently, together with EU-related capital flows, remain a key source of financing of the current account in Poland.

Figure 2.14. Current account and its financing, 2000-12 (Percent of GDP)

![Chart showing current account and its financing, 2000-12 (Percent of GDP)](source: NBP, staff calculations)

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22 The sector dominated both in terms of ownership and funding by foreign banks has relied on “centralized” funding provided by parent banks during boom years of 2003-08. However, the financial crisis hitting in late 2008 triggered a reversal of earlier inflows with about a third of the boom-time inflows from banks unwinding during 2008–12 (see IMF, 2013a).
28. The high negative net international investment position significantly exceeds the target of 35 percent of GDP specified in the EU Macroeconomic Imbalance Procedure (MIP). On a gross basis, foreign liabilities of the Polish economy reached almost 110 percent of GDP in 2012. Almost half was in equity instruments (mostly FDI), but also portfolio investment in equity. More than 55 percent of GDP was in debt instruments – portfolio investment and other investment (the latter consisting mainly of loans received and deposits taken, mostly in the banking sector, but also in the form of intercompany lending). Meanwhile, assets of the Polish economy abroad (totaling 43 percent of GDP) included mainly official reserve assets (almost 22 percent of GDP), followed by FDI abroad (11 percent of GDP). All in all, negative NIIP stood at 67 percent of GDP in 2012, significantly exceeding the target of 35 percent of GDP specified in the EU Macroeconomic Imbalance Procedure. This may be a source of concern especially in view of deteriorating external environment following the financial crisis. On the other hand, although the level of NIIP is high, reducing it to the target specified in MIP (i.e. by a half) may have significant growth-dampening effects.

Figure 2.15. Net international investment position of Poland, structure of assets and liabilities, 2012 (Percent of GDP)

Source: NBP, staff calculations.

29. Recent economic performance of the Polish economy and the challenges facing it call for redesigning the growth model in favor of a growth agenda facilitated by saving. The current growth model created significant vulnerabilities – a high level of domestic consumption fuelled by borrowing, a high reliance on the EU15 for exports and capital inflows, and inadequate levels of national saving to fund investment. These are also the source of potential risks in light of long-term challenges facing the Polish economy in the next decades – likely slower productivity growth, economic and social implications of population aging, and tighter global financial conditions undermining further capital deepening. To address these challenges Poland should adopt a new model of economic growth – one facilitated by national saving, firstly to support investment in productive capacity of the economy and thus economic growth, and secondly to ensure adequate retirement income for growing old-age population.

23 High and negative level of NIIP is a cause for concern as: i) it makes Poland vulnerable to sudden shifts in international market sentiment, which can cause financial shocks and serious economic and social disruption; ii) it limits the country’s capacity for additional borrowing and options for dealing with unexpected or emerging problems (an aging population, climate change, technology change, low productivity, slow growth, increasing trade competition); iii) the burden of servicing the liabilities lowers income available for other uses.
Saving for investment – is the Polish economy saving enough to finance its growth?

30. To illustrate the relationship between saving and economic growth in Poland a simple theoretical model is used to perform simulations of the evolution of the economy until 2030 under various scenarios. The model was constructed and calibrated mapping available data for Poland into the structural parameters of the model. The purpose of the analysis is to determine the rate of economic growth that can be financed from a given path of the national (and public) saving rate or – changing the perspective – the necessary level of national (and public) saving to generate a given rate of economic growth. Recognizing that private saving is not directly a policy lever, it is assumed that the private sector saving rate responds endogenously to the variations in the public saving rate (the main policy variable) and in the other fundamental variables of the economy. The linkages between public and national saving, productivity, and economic growth can be used to present possibilities and limits of a saving-based growth agenda in Poland. For all simulations, the corresponding Solow growth decomposition is reported in order to understand the roles played by factor accumulation and productivity advances in the process of economic growth.

31. Model simulations are performed under various assumptions concerning productivity growth, the level of NIIP, the projected fiscal path, and the impact of aging on the saving rate. Assumptions of the baseline scenario include relatively robust TFP growth (averaging over 2 percent over the simulation horizon, in line with the average TFP growth rate in Poland over last 2 decades), unchanged level of NIIP relative to GDP, the baseline projections of the fiscal deficit, and a relatively low impact of the old-age dependency ratio on the saving rate (derived from the regression estimated for Poland). Against this baseline a number of alternative scenarios are considered – each of them assuming an alternative, less favorable development of some key parameters of the model (see Table 2.1 and Figure 2.16 for an overview of assumptions): slower productivity growth, the need to gradually reduce high negative NIIP relative to GDP, and a more ambitious fiscal path, assuming considerable fiscal consolidation to meet the medium term budgetary objective (MTO) in 2016.

24 The model outlined in Annex 1 was calibrated and applied to the Polish economy. The model is neoclassical in the sense that the factors of production—labor and physical and human capital—are subject to decreasing marginal returns. In case of an endogenous growth model with constant marginal returns to capital, changes in the rate of capital accumulation would have had permanent effects on long-run growth, a result not supported by the evidence (see Bernanke and Gürkaynak 2002, Caselli 2005, Easterly and Levine 2001, and Hall and Jones 1999). Moreover, methodologically it is more straightforward to examine both the limitations of a saving-based growth agenda and the role of productivity improvements in the context of the neoclassical than the endogenous growth model. For details see Hevia (2013).

25 In particular, calibration implies setting the parameters of the model so that the behavior of the model economy matches certain features of the Polish economy in as many dimensions as there are unknown parameters in the model. In the cases where such matching cannot be done, due to, for example, the lack of the relevant data, the remaining parameters were obtained from the empirical literature or set to values widely accepted in the academic literature.

26 Optimality of saving behavior can be posed from different angles. The most common in the academic literature is the perspective of optimal saving as the behavior that maximizes a consumer welfare function. This, however, may be too abstract for the needs and objectives of policy practitioners. For this reason, the problem of optimal saving is posed from the perspective of financing a given rate of economic growth while simultaneously achieving external sustainability.

27 The assumed alternative fiscal path was based on Convergence Program 2013 Update published in April 2013.
Table 2.1. Baseline and alternative assumptions for the key parameters of the model

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Alternative</th>
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</thead>
<tbody>
<tr>
<td><strong>TFP growth</strong></td>
<td>Averaging over 2% during 2014-2030 (with a peak of 2.22% in 2016)</td>
<td>1.5%</td>
</tr>
<tr>
<td><strong>NIIP relative to GDP</strong></td>
<td>Constant at 2012 level (67% of GDP)</td>
<td>Gradual reduction to about 50% of GDP (towards the limit of 35% of GDP specified in MIP)*</td>
</tr>
<tr>
<td><strong>Public Saving/GDP</strong></td>
<td>Structural deficit to decrease from 3.9% of GDP in 2012 to 2.5% of GDP (in 2015-20) and later to widen again to 3% until the end of the simulation period</td>
<td>Considerable fiscal consolidation to meet MTO (structural deficit of 1% of GDP) in 2016 (following the European Council recommendations) **</td>
</tr>
<tr>
<td><strong>Impact of aging on the saving rate</strong></td>
<td>-0.047 (regression coefficient estimated for Poland)</td>
<td>-0.29 (regression coefficient estimated for already aging EU countries)</td>
</tr>
</tbody>
</table>

* The reduction of NIIP is assumed to follow the same rule as for the reduction of public debt required from the EU members whose public debt exceeds the 60% reference value, i.e. the debt brake rule of the Fiscal Compact (formally, the Treaty on Stability, Coordination and Governance in the Economic and Monetary Union; also referred to as TSCG or more plainly the Fiscal Stability Treaty). Under the debt brake rule the public debt should be reduced at an average rate of at least one twentieth of the exceeded percentage points per year as a benchmark.

** The alternative fiscal scenario was based on Convergence Program 2013 Update published in April 2013. Since then economic environment, fiscal prospects and EC recommendations have changed and the target date for achieving MTO was postponed to 2018. However, as the data cut-off date applied in this report was end-December 2013, the 2013 update of the Convergence Program was used. Please note that these assumptions are relevant only for the alternative scenario – in the baseline scenario the assumed path of structural deficit is below the one from both 2013 and 2014 Updates of Convergence Program.

Note: Public saving is defined as the sum of the fiscal surplus and public investment. Public investment in Poland increased from about 3.5 percent of GDP during the first part of the 2000s to about 5 percent of GDP since 2008. Part of that increase could be due to a countercyclical response of the government to the financial crisis (but also to the availability of EU funds which were matched by public resources). To be conservative, the simulations assume that public investment will be 4.5 percent of GDP until 2020, and then gradually decline to 3.5 percent by 2025. In the simulations private saving is allowed to change endogenously in response to changes in public saving, demographic characteristics, and income growth. The impact of aging on the saving rate refers to the coefficient of the old-age dependency ratio in the saving rate regression. In the baseline scenario the coefficient was derived from the regression estimated for selected OECD countries including Poland (-0.047). In the alternative scenario the coefficient was derived from the regression estimated for European countries only, excluding CEE, where the negative impact of old-age dependency ratio on the saving rate is significantly larger.
Why Does National Saving Matter for the Polish Economy?

Figure 2.16. Baseline and alternative scenarios for TFP growth, NIIP/GDP, and Public Saving/GDP

TFP growth

NIIP/GDP

Public Saving/GDP

Source: Hevia (2013)

32. In the baseline scenario the assumed public saving would translate into economic growth per capita jumping from about 2 percent to over 4 percent in 2016-20, and later trending down to 3.2 percent in 2030 (Figure 2.17.). In the baseline scenario public saving is assumed to increase from the current 0.7 percent of GDP to about 2 percent of GDP in 2015 before trending down to 0.5 percent of GDP in 2024. In this scenario national saving increases for two reasons: first, due to the projected increase in public saving and second, due to the endogenous increase in private saving. In effect, national saving is projected to increase to about 22 percent of GDP (from the current level of just below 18 percent) by 2019 and then to stay roughly constant until 2030. Such a path of public saving would translate in the model into per capita GDP growth increasing to over 4 percent over the period 2013-2020. Since then, GDP growth per capita is projected to decline steadily to about 3.2 percent of GDP by 2030. As the Solow decomposition shows, the contribution of TFP growth would account for 54 percent of GDP growth until 2030 followed by the capital input, with a share of 45 percentage points. The remaining 1 percent would be contributed by the labor input.28

Figure 2.17. Baseline Scenario – projected per-capita GDP growth under the baseline public saving*

Saving rate

Per-capita GDP growth

Growth decomposition

Note: *Assuming also baseline TFP growth, baseline NIIP/GDP, and baseline impact of aging on the saving rate.
Source: Hevia (2013)

28 There are two counteracting forces in the labor input measure. First, human capital is projected to increase, which, everything else constant, increases effective labor per capita. But, at the same time, the labor force is projected to decline. The net impact is the modest 1 percent contribution of the labor input component to per capita GDP growth.
33. Comparing projected per-capita GDP growth rates under a number of alternative scenarios confirms the key role of TFP growth in determining economic growth (Figure 2.18). Assuming higher public saving (more ambitious fiscal path; with baseline assumptions for other key parameters of the model) results in only slightly higher per-capita GDP growth rate as compared to the baseline scenario. Similarly, assuming an alternative scenario only for the NIIP/GDP ratio (gradual reduction to about 50 percent of GDP) would have a relatively small cost in terms of reducing per-capita GDP growth as compared to the baseline. Significantly lower economic growth over the simulation horizon would be achieved if alternative (lower) TFP growth is assumed. In that case, assuming also alternative scenarios for all other key parameters of the model does not change the simulation path significantly. This implies that even significant fiscal consolidation could not offset the high negative impact of lower TFP growth.

Figure 2.18. Projected per-capita GDP growth rates under various alternative scenarios.

Note: *Alternative all includes alternative assumptions on TFP growth, NIIP/GDP, public saving and alternative (higher) impact of aging on the saving rate.
Source Hevia (2013)

34. In the alternative scenario of less favorable development of all key variables, the projected per-capita GDP growth is significantly lower, decreasing to 2.2 percent in 2030 (Figure 2.18). This alternative scenario assumes lower TFP growth, a reduction in NIIP/GDP, a more ambitious fiscal path, and a larger negative impact of the old-age dependency ratio on the saving rate. Public saving is assumed to increase significantly (up to 3.5 percent of GDP in 2016, then trending down to 2.5 percent of GDP in 2024), reflecting the lower fiscal deficit over the simulation period. In this case national saving is to increase to about 23 percent of GDP around 2020. However, the effect from higher public saving is partially offset by some reduction of the private saving rate due to the Ricardian effect (see Chapter 4 for details) and the negative impact of population aging – as a result the national saving rate would fall again to below 20 percent of GDP in 2030. The private saving rate is also lower due to the assumption of a more negative impact of aging on the saving rate. As a result – also assuming lower TFP growth and the need to reduce the high negative NIIP/GDP ratio – a lower national saving rate translates in the model into significantly lower per capita GDP growth, peaking at 3.2 percent in 2017 and declining steadily to 2.2 percent in 2030.

29 Such a reduction is however significantly smaller than the one specified in MIP, which would potentially have larger growth-dampening effects.
Figure 2.19. Alternative Scenario – projected per-capita GDP growth under higher public saving (and alternative assumptions on all key variables of the model)*

<table>
<thead>
<tr>
<th>Saving rate</th>
<th>Per-capita GDP growth</th>
<th>Growth decomposition</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>2015</td>
<td>2018</td>
</tr>
<tr>
<td>National Saving</td>
<td>2%</td>
<td>3%</td>
</tr>
<tr>
<td>Private Saving</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>Public Saving</td>
<td>0%</td>
<td>1%</td>
</tr>
</tbody>
</table>

Note: *Assuming alternative public saving/GDP, alternative TFP growth, alternative NIIP/GDP, and alternative (higher) impact of aging on the saving rate.
Source Hevia (2013)

35. From another perspective, sustaining per-capita economic growth at 3.5 percent annually in the baseline scenario would require the national saving rate to increase gradually from its current level of just below 18 percent to reach 23 percent in 2030, with the effort to be concentrated on the private sector. In this set of simulations the perspective is changed – the model is used to determine the necessary level of national (and public) saving to generate economic growth (GDP per capita) at 3.5 percent annually for the period 2013-2030. This is somewhat lower than the per-capita growth rate observed over the period 1995-2012, but is still an ambitious target. To achieve this goal, national saving would need to stay at approximately the current level until 2020 (besides an initial jump in 2013 due to the low predicted TFP growth rate in that year), then to rise to about 20 percent of GDP until 2024, and to keep rising steadily to the level of 23 percent of GDP by 2030 (Figure 2.20). Most of the increase in national saving is to be driven by private saving, while the required public saving rate between 2015 and 2028 is actually negative. As the Solow growth decomposition shows, TFP would contribute a vast 57 percent to GDP per capita growth, while capital accumulation would contribute about 42 percent to that growth.

Figure 2.20. Baseline Scenario – national saving required to sustain per capita GDP growth at 3.5 percent annually

Note: Assuming baseline scenarios for all structural parameters.
Source Hevia (2013)
Alternative scenarios would require even larger national saving increases than in the baseline to sustain the per-capita GDP growth rate at 3.5 percent (Figure 2.21).

- Under the **alternative scenario of the NIIP/GDP ratio** – a need for gradual reduction to about 50% GDP (with baseline assumptions for other key parameters of the model) – national saving would need to be about 1 percentage point higher throughout the simulation period as compared to the baseline.

- National (and public) saving would need to rise even more under the **alternative scenario of slower TFP growth** (with the other model parameters at their baseline levels). In this case the required capital accumulation to attain the target growth rate is much larger than in the baseline scenario, which benefits from a stronger rate of TFP growth (allowing GDP per capita to grow substantially without very large increases in national and public saving). To support rapid capital accumulation, the national saving rate would need to jump immediately to 22 percent of GDP and then continue increasing to over 35 percent of GDP by 2030 (Figure 2.21). This would imply an enormous increase in public and private saving.

- The required national saving would be even higher if, additionally, the **impact of aging on saving** in Poland is assumed to follow the **pattern observed in other already aging countries** (‘Alternative all’ scenario). But in this case a very much larger share of the burden would fall on the public sector, which would need to increase its saving by 15 percentage points of GDP to offset the negative impact of aging on the private saving rate (for more detailed discussion on the feasibility of increasing public saving see Chapter 4).

**Figure 2.21. National saving rate required to sustain per-capita GDP growth rate of 3.5 percent under various alternative scenarios***

![Graph showing national saving rate required to sustain per-capita GDP growth rate of 3.5 percent under various alternative scenarios.](image)

*Note: *Alternative all includes alternative assumptions on TFP growth, NIIP/GDP, and alternative (higher) impact of aging on the saving rate. Source: Hevia (2013)*

**Saving for retirement – are the Poles saving enough to ensure adequate retirement income?**

36. **First and foremost, aging concerns individuals** – the challenge would be to make them healthy, active and prosperous*. First, Poland’s population, like that of many countries in the region, is currently less healthy as it grows older than that of Western European countries. (Life expectancy at 50 is much higher than the number of healthy life years left at the same age, and the gap is much wider than in wealthier EU countries, with excess morbidity driven by cardiovascular and other non-communicable diseases.) This means that an older population will spend more time in sickness, disability and dependency on others for daily activities, which in turn undermines active participation in the labor market, social life and, more generally, well-being in old age. Second, given the projected labor force decline, Poland needs to take full advantage...
of its human capital stock by prolonging working lives of its workers (currently employment rates among older workers remain low), with another challenge being to maintain and even increase older workers’ productivity. Finally, the challenge would be to make aging prosperous – to ensure a decent standard of living for the old and in particular keep them from poverty. The issue would be to share the fiscal burden of aging (increasing expenditure on healthcare, long-term care and pensions and decreasing tax revenues due to a declining workforce and private saving) across generations in an equitable way, allowing for an acceptable standard of living for the old without excessively infringing the financial prospects of the younger generations.

37. Prospects for prosperous aging can be also undermined by the burden of care responsibilities, which are likely to increase with population aging, and which can potentially have detrimental effects on female lifetime earnings and pension incomes. Current care arrangements prevailing in Poland involve significant exchange of time and resources between generations. In the absence of quality and affordable child care and elder care services, older household members are expected to provide informal child care while working-age members (mostly women) provide informal care for the disabled and elderly ones. These arrangements, while often following traditional social norms and bringing fulfillment and satisfaction to grandparents, undermine the incentives of older workers to participate actively in the labor market. On the other hand, caretakers for the elderly are usually women at their prime working age, who find themselves in a ‘sandwich’ – burdened with both the child and elder care. Care responsibilities can take them out of the labor force for several years, which can affect their lifetime earnings and accumulated pensions.

38. Pension adequacy in Poland currently appears relatively high, with income distribution considerably more equal for those over the age of 65 than for those below (European Commission, 2012). However, while making the assessment of pension adequacy in Poland one should keep in mind that the country experienced a structural pension reform in 1999 with further changes introduced in 2013. The pension benefits now being paid are still based on the old defined-benefit formula (and best earnings), which made the old pay-as-you-go system highly redistributive. The link between contribution and benefits in the system was relatively weak, i.e., shorter careers or low income did not lead to inadequate pensions. Two dimensions of pension adequacy: poverty reduction and income replacement are measured by two indicators: the at-risk-of-poverty rate (indicator of relative income poverty) and theoretical replacement rates (a proxy for the standard of living that people can achieve in retirement compared to their situation when working) respectively (for more detailed discussion of adequacy see Chapter 3). In 2010 the at-risk-of-poverty rate for people aged 65 and more in Poland was 14.2 percent, much lower than both the rate for the EU27 (15.9 percent) and for people under the age of 65 in Poland (18.1 percent). Similarly, the aggregate replacement rate in Poland (57 percent) was higher than in the EU27 (53 percent). Thus the old system, while ultimately unsustainable, managed to protect pensioners from income poverty and guarantee a relatively high income replacement rate.

39. However, the adequacy of pensions may become a serious issue in the future, when the new pension system matures. The pension system reform starting in 1999 introduced important measures to address its long-term sustainability by replacing the pay-as-you-go, defined-benefit (DB) system with a mixed, defined-contribution (DC) one (the first ‘pillar’ being an unfunded, publicly administered notionally-defined-contribution (NDC) scheme and the second ‘pillar’ a fully funded, privately managed scheme of open pension funds; the latter was substantially amended in 2013). In the new system the link between contributions and benefits is considerably strengthened, so that people with short working lives (which concerns in particular women) and low wages risk receiving inadequate incomes in old age. Poland stands out in the OECD as a country with one of the lowest projected replacement rates for low income earners, thus this group faces the highest risk of old age poverty due to expected decline in replacement rates (see Figure 2.23). Moreover, pension replacement rates will decrease substantially (as the pension entitlement will be based on life-time earnings instead of the highest earning years as under the old system), increasing the risk of poverty in old age. Recently several studies discussed the extent of a possible decline in replacement rates in the EU and OECD countries (EC, 2012b, OECD, 2013d), and also in Poland (see Jablonowski and Müller, 2013). The net theoretical replacement rate for a male worker retiring at 65 after a 40-year career (the “base-case” scenario) is projected to decrease from 75.5 percent in 2010 to 43.3 percent in 2050 (Figure 2.22). While all

31 For an overview of the pension system policies and outcomes across OECD countries see also OECD (2013d).
32 All European Union countries excluding Croatia.
33 The universal pension coverage of the labor force, full employment and non-existence of open unemployment in the communist period, when most entitlements to current pensions have been earned are additional reasons for relatively high pension adequacy (European Commission, 2012).
but a few EU member countries will experience a decline in replacement rates, the decline in Poland is among the sharpest. Although the recent reform achieved great advances in the sustainability of public pensions, it was achieved through reductions in future pension adequacy, which can to some extent be offset by changes in people’s retirement and long-term savings behavior (EC, 2012b).

**Figure 2.22. Trends in net and gross Theoretical Replacement Rates (TRR) 2010-2050, the “base-case” scenario (percentage point changes in net TRR)**

Source: EC (2012b).

**Figure 2.23. Gross pension replacement rates: Low and high earners**

Source: OECD (2013d).

40. **Looking at the adequacy of retirement incomes from a wider perspective does not look promising either.** Pensioners receive their incomes from different sources: in addition to pension entitlements, there are also capital incomes (especially from private pension schemes) and labor income. Living standards in retirement are also influenced by a range of other factors, including housing wealth, financial wealth, and the value of publicly-provided services. However, according to the OECD (2013d)\(^\text{34}\), which looked at the adequacy of retirement incomes from this wider perspective, public transfers in

\(^{34}\) In particular Chapter 2 examines the role of housing wealth, financial wealth, and the value of publicly provided services for the adequacy of retirement incomes.
Poland makes up the bulk of retirement incomes, with only a minor contribution from capital income (Figure 2.24). Moreover, the report notes that in most OECD countries low-income pensioners rely almost exclusively on public pensions and other income transfers. This is not particularly surprising – as already noted above, Poland’s population is getting old before it gets rich – also because wealth accumulation in Poland has been complicated both during the socialist period and during the economic transition. Wealth accumulation depends on the level of national savings on one hand and on the other on the choice of assets (bringing various returns to savings) – the latter was especially limited during the socialist times. Also, the consumption needs of a converging economy have been significant, limiting national savings rates.

Figure 2.24. Sources of incomes of the 65+ population, late 2000s.

Source: OECD (2013d).

41. All in all, funding an acceptable standard of living for the elderly may be a challenge in future. Pension adequacy may be a challenge in Poland (like in many other OECD countries) – in order to maintain a similar standard of living after retirement, the average individual will need to complement public pension benefits with additional income sources (private pensions and other savings). Based on current pension rules such a problem will concern an average individual in at least two thirds of OECD countries. To ensure that elderly people have decent standards of living it would be important to encourage household savings in the medium term. This would involve further increasing the retirement age, encouraging supplementary voluntary pension insurance, and supporting the provision of financial information. Another challenge (common for many countries worldwide) is the concentration of saving and wealth within restricted population segments. This may create inequality traps with negative implications for economic mobility and thus for the political and social consensus essential for growth (World Bank, 2013b).

35 For more details on the private pension systems in OECD countries see Antolin, Payet, Yermo (2012).
CHAPTER 3
MOBILIZING PRIVATE SAVINGS: WHERE HOUSEHOLDS AND COMPANIES FIT IN
Determinants of households saving

42. **Income, relative prices, and personal preferences drive household consumption and saving.** From an individual perspective, saving involves consuming less out of one's income today in order to consume more in the future. The standard economic models suggest that there are three main determinants of consumption, and therefore saving, in different points in the life cycle (New Zealand Treasury, 2007):

- **Income** – the total of a person's wages, salary, self-employed income, interest, dividends, and rents. Some definitions also consider capital gains (e.g., from rising asset prices) as income.

- **Relative prices** – the key determinant here is the return on savings: the higher the return, the more future consumption a given amount of savings today will buy (the return is affected by interest rates and taxes).

- **Preferences** – different people have different views about whether consuming today or later is a good thing. Generally, people are impatient and will tend, all else being equal, to prefer spending today, but the extent of impatience varies. At one extreme some people cannot spend all their income quickly enough; at the other some cannot tolerate the idea of spending any money today. What determines people's preferences is complex. They can be influenced, among other things, by upbringing, social mores, and the level of risk and uncertainty.

Despite variation in preferences there are also generic motivations: An individual's saving can typically be placed in one or more of the following three categories: lifecycle saving (to meet certain long-term objectives); precautionary saving (to protect themselves and their families against unexpected events); and bequest saving (to accumulate an estate to leave to their heirs). Thus at the micro level, households save out of disposable income to smooth consumption over the life cycle (before and after retirement), insure against negative shocks to income or to expenditure, and accumulate assets to be passed on to future generations.

43. **Behavioral economics explains a lot of microeconomic behavior.** The standard economic theories of saving assume that people have stable preferences and they make decisions that are consistent with these preferences over time. It is a model of rational behavior. However, there is an emerging literature of ‘behavioral economics’ that suggests that people do not always act rationally. It draws on the insights of psychology and takes as its point of departure the possibility that individuals’ preferences are not always maintained consistently over time, particularly when long horizons are involved (New Zealand Treasury, 2010a). Behavioral economics recognizes that people sometimes find it difficult to initiate actions that have high up-front costs and distant benefits, and to adhere to long-term plans. This produces a range of observed behavior such as procrastination, and difficulties with maintaining a level of commitment.

44. **Both rational and behavioral models guide selections of variables that may explain household saving and consumption decisions in empirical work.** The determinants of consumption and savings motives presented above, in turn, suggest a large number of variables that may influence household decisions. Among the variables most commonly used in the empirical studies are government and corporate saving, growth and income fluctuations, demographics, household wealth, the real interest rate and proxies for financial sector development. This section focuses on macroeconomic determinants that help to explain why aggregate household saving can vary over time (IMF 2011):

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36 Most theoretical models of individual saving behavior are founded on the lifecycle/permanent income model (PIH) (Modigliani and Brumbert (1954), Ando and Modigliani (1963), Barro (1974), Browning and Lusardi (1996), Hurd (1987), Kennickell and Lusardi (2004), Attanasio (1999), Kopczuk and Lusardi (2005)). A number of studies have tested the implications of PIH using national-level data, but the empirical evidence to date has been mixed at best – for a review see GAO (2012), Diekman et al (2006).

37 Based on the review of the literature on private and household saving presented in Annex 2
• **Temporary income fluctuations:** The permanent-income model\(^{38}\) has clear implications for saving behavior. If income is higher now than it is expected to be in the future, households will save today. If it is lower now than it is expected to be in the future, households will dis-save by selling assets or borrowing. For example, in an economic downturn when current incomes temporarily fall below future incomes, households will run down their savings to support current consumption (smooth consumption). From an economy-wide perspective, the implication is that aggregate household savings should rise during cyclical booms and fall during downturns. Such cyclical economy-wide fluctuations in income could be proxied by such variables as the unemployment rate or the estimated output gap.

• **Current real income:** A positive impact of an increase in income on private saving results from the fact that richer individuals tend to save more. This is especially evident for poor countries, where a significant acceleration in income enables individuals previously at their minimum income level to smooth consumption by accumulating saving. If people expect growth to continue, however, they may reduce saving.

• **Demographics:** The consumption smoothing implied by lifecycle/permanent-income models of consumer behavior suggests a link between demographic trends and national household saving. The model predicts that households should borrow when they are young and their incomes are relatively low, save for retirement during middle age when incomes are higher, and then run down that saving during retirement (Modigliani, 1986). Hence, the higher the share of the population that is elderly or young, the lower the household saving rate should be. However, lifecycle patterns obtained from micro-level data fail to detect some of the predictions of standard lifecycle models, i.e., a “retirement puzzle” (the lack of dis-saving in old age) and also saving rates differ greatly between countries.

• **Real interest rate:** The risk-free real interest rate is a key determinant, although with ambiguous effect, of the amount of real spending that a household can achieve in the future by forgoing consumption today and saving. A higher real interest rate encourages consumers to postpone consumption because it increases the real return on saving (and the real cost of borrowing). But it also raises the income from wealth and may thus increase consumption through wealth effects. In addition, rising interest rates redistribute income from borrowers to savers. If savers are less likely to spend their income than borrowers, this could also push down aggregate spending and increase the saving rate. Eventually, whether the net effect of interest rates on saving is positive or negative depends on whether the substitution or the income effect dominates.

• **Credit constraints:** Rising interest rates can impact savings through the price of (dis)saving. In addition, quantitative limits—credit constraints—on borrowing may be important. Some households, if considered not creditworthy, may not be able to borrow as much as they want to finance their desired consumption. If credit becomes more difficult to obtain, there will be less borrowing and spending, so aggregate saving will be higher. That means that changes in the quantity of credit may be important drivers of the aggregate saving rate, in addition to changes in the real interest rate.

• **Fiscal policy (public sector saving):** The theory of Ricardian equivalence, dating back to the work of Ricardo (1820), suggests that households view their own saving and government saving as perfect substitutes. Forward-looking households are fully aware that current government borrowing will eventually be financed by deferred taxation.\(^{39}\) Lower government saving (or higher government borrowing) should therefore be offset by higher household saving. In practice, while government saving are likely to influence household saving, they are unlikely to be perfect substitutes (Röhn, 2010).\(^{40}\)

• **Uncertainty:** Uncertainty about future income streams might be one reason why risk-averse households save part of their income as a precaution against future drops in income and associated consumption (Carroll 2001). Past studies attempt to capture such uncertainties using variables that measure macroeconomic volatility, such as the inflation rate or the volatility of real GDP growth (Mody, Ohnsorge, Sandri, 2012).

38 Following the work of Friedman in the 1950s, modern consumption theory has been built on the lifecycle/permanent-income model in which households base current spending decisions on their “permanent” income, the income they would expect to receive on average over their entire lifetimes. This approach recognizes that households are to some degree forward-looking and would prefer a smoother to a more variable consumption path.

39 If government borrows to fund a tax cut, households should anticipate that this will require higher taxes in the future for unchanged government spending. They will save the tax cut to pay for the future increase in taxes and maintain a smooth profile for consumption.

40 In empirical models, Ricardian equivalence is difficult to prove because in the real world many propositions underlying the Ricardian theoretical model do not hold (perfect generational linkages, non-distortionary taxes, perfect rationality). Apart from lack of evidence of Ricardian equivalence, it is not clear that government debt ever has to be paid off from taxation if the government is long-lived.
• **Wealth**: Together with income flows, financial wealth represents a part of household resources that can finance consumption. All other things being equal, an increase in wealth is therefore likely to increase consumption today and lower the household saving rate. Tangible wealth, a large part of which consists of housing, represents the remaining part of household wealth. Housing assets are different from financial assets because households also obtain a stream of housing services from them. As Benito et al. (2006) highlight, declines in house prices make some people better off (those expecting to trade up or potential first-time buyers) and some worse off (those expecting to trade down). It is thus not clear that changes in the value of housing assets should have any impact on aggregate consumption through an ordinary wealth effect. However, there are at least three reasons why higher housing wealth might increase consumption and reduce savings: liquidity constraints, a shift to non-housing consumption, and the wealth illusion (for details see IMF 2011).

• **Corporate savings**: Households are also likely to be influenced by how much the corporate sector is saving (e.g., via higher dividends). The relationship between household and corporate saving is likely to be affected by the ownership of companies. Much of the corporate sector is owned directly or indirectly by households (e.g., through pension funds), and ownership is unevenly distributed. Furthermore, there are companies in which both overseas investors and Poles, directly or indirectly, own shares. That could mute the response of household saving to changes in corporate saving.

• **Terms of trade**: According to the Harberger-Laursen-Metzler hypothesis, an improvement in the terms of trade raises a country’s real income and part of the increase in real income will be devoted to saving, provided that it is perceived to be temporary, as consumers attempt to smooth their consumption profile over time (Ostry and Reinhart, 1991). Other factors – such as the productivity/income growth rate or social processes (e.g., urbanization) may also influence the household savings.

45. Different definitions of “saving” reveal different economic aspects of “saving”. First saving is the flow concept of income-not-spent and savings are the stock concept of accumulated net wealth (see Box 3.1). Conceptually, changes in savings (the stock measure) should be consistent with saving (the flow measure). In practice, however, the two may differ because changes in the stock measure also reflect valuation changes that are not reflected in the flow measure. Second, gross saving rates include depreciation which net saving rates exclude.

46. Since saving is typically defined as residual, any statistical analysis will have wide error bands. Saving is typically calculated as the residual between income and current expenditure (two large numbers). Hence any errors or omissions — including decisions on classification as consumption or investment— in accounting for these two aggregates are carried over into, and magnified in, the measure of saving. Moreover, because national product and income accounts only partially capture illegal and hidden economic activities, saving rates as measured in national accounts data are probably biased downward. In contrast, saving rates as measures in budget surveys are typically biased upward (often because of underreporting of consumption expenditures).

**Box 3.1. Defining and Measuring Saving**

National saving is the amount not consumed out of the incomes of three sectors: government, households, and businesses (including nonprofit institutions). In a national accounts–based framework, saving is measured in terms of flows, that is, the difference between current period income and current period consumption. An alternative measurement method is to treat saving as the difference between beginning- and end-of-period net wealth, where net wealth is the difference between assets and liabilities.

Saving versus savings: In the national accounts produced by Poland’s Central Statistical Office, “saving” is defined as the part of disposable income not spent on consumption. In contrast, net wealth (“savings”) is a stock measure built up from the saving in each period plus changes in the value of the assets held. The usual convention in economics is to refer to the flow measure as saving and the stock measure as savings (Savings Working Group, 2011). This convention is applied throughout this report.

41 Wealth variables—both financial and tangible (housing)—might also partly capture credit condition effects, since rapid asset price growth is likely to lead to loose credit conditions, and vice versa.

42 On the one hand, productivity growth positively affects private saving because its beneficiaries (workers) tend to save more. On the other hand, if agents are able to shift consumption intertemporally and productivity increases permanently, they might be tempted to borrow against future (higher) income, which results in lower savings.
Gross versus net saving: Gross saving is the sum of net saving plus consumption of fixed capital (i.e., depreciation).

Saving can be measured in different ways. The first two relate to the sources of data:

- Macro sources (the flows and stock of savings at the national level and for each of the sectoral components of national saving—households, businesses, and government—from national accounts (the United Nations System of National Accounts [SNA]) and other aggregate data), or

- Micro sources (the flows and stock of savings based on individual-household data from surveys).

Another two approaches relate to whether saving is conceived as a flow or a change in the stock of savings:

- The more conventional flow measure refers to income not spent on current consumption.

- The stock measure (net worth) is the change in the stock of wealth; i.e., the change in the difference between assets and liabilities between the beginning and the end of a period.

The main difference between these two measures is that asset revaluations are incorporated into the stock measure but not the flow measure. In Poland there are relatively few sources of data about savings at the micro level and virtually no sources of data on wealth.

Table B.1.1 Data Sources for Saving and Wealth in Poland, New Zealand, and the United Kingdom

<table>
<thead>
<tr>
<th>Flow: Income less Expenditures</th>
<th>Stock: Change in Net Worth</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Poland</strong></td>
<td><strong>NZ</strong></td>
</tr>
<tr>
<td>- Polish Household Budget Survey (PHBS)</td>
<td>- Household Economic Survey</td>
</tr>
<tr>
<td>- Household Income and Outlay account - National Accounts</td>
<td>- National Bank of Poland household financial assets and liabilities</td>
</tr>
<tr>
<td><strong>Macroeconomic aggregates</strong></td>
<td></td>
</tr>
</tbody>
</table>

1 The Polish household budget survey (HBS) collects detailed information every month on individual incomes and expenditure information in almost 400 separate categories at the level of the household. Saving is calculated as the difference between household current disposable income and household expenditures. Household disposable income includes pension receipts and imputed rent from owner-occupied housing and excludes mandatory social security contributions. Consumption expenditure consists of all non-durable expenditures by households. Thus the derived monthly household saving rate includes any difference between disposable income and consumption (such as a positive income shock), as well as expenditures on consumer durables.

Households saving trends in Poland

47. Based on national accounts data, household savings have contracted considerably due to the rapid growth in consumption, which reflected easing access to credit in an environment of economic stabilization. The decline in household savings and growing household debt occurred as the financial sector was deepening and interest rates were falling. This meant that for households access to credit was much easier, so debt went up. Borrowing became more affordable as development of financial markets coincided with the plunge in nominal interest rates from an all-time high of 24 percent in 1998 to 4.25 percent in 2012. Access to credit has also allowed households to smooth actual and anticipated consumption. An increase in credit availability as well as economic stability might also have meant that households felt less need to accumulate precautionary savings as a buffer against future adverse shocks. As a result consumption growth was faster than income growth (see Figure 3.1) leading to a sharp decline in household savings. This is evidenced by the household debt-to-income ratio, which has tripled since beginning of 2000s (Figure 3.2).

Figure 3.1 Household income and consumption trends, and saving rate

Source: Central Statistical Office (CSO).

Figure 3.2 Household saving and debt

Source: Eurostat.

48. The rise in household wealth may be another reason for the decline in household saving. Through 2007 the decline in household saving was accompanied by rising net household wealth. An obvious explanation is that wealth was going up with asset prices (in particular, house prices) that brought in sizable capital gains. Thus household net worth reached nearly 180% of disposable income despite increasing debt. The capital gains in the wealth measure are not included in the income component of the household saving ratio, but still encourage greater consumption. Thus, it is probable that the lack of saving in a flow sense partly reflects a wealth effect (when people feel wealthier, they consume more, for example, through borrowing more against their assets). Hiebert (2006) attributes the downward trend in household savings observed in several OECD countries to the wealth effect.

43 Easing of credit constraints has enabled today’s young households to increase consumption and reduce saving relative to older households at the same point in their lifecycle.

44 Data after 2007 are not available.
49. **As in other countries, Poland’s household wealth is predominantly in the form of housing.** In 2005 about 55 percent of household gross wealth was invested in housing while only a small proportion (about 10 percent) was invested in life insurance and pensions. Households held twice as much currency and deposits as equities. However the predominance of housing in household portfolios has decreased in recent years, probably due to some correction of house price rises, while at the same time there has been a small increase in holdings of equities, insurance, and pension funds (Figure 3.5). The share of currency and deposits in household wealth has not changed much since 2005.

50. **In contrast to the drop observed in the aggregate data on household savings derived from national accounts, household budget surveys show a rise (Figure 3.6).** Since 2004 there has been a substantial increase in the household saving rate derived from these data. Figure 3.8 shows a marked increase in age-specific average savings and savings rate between 2005 and 2010, especially for young households. Combining data from 2005 to 2010 for households with heads aged 20-80 years, there is a steady upward shift in age-specific disposable income, consumption, and saving from 2005 to 2010 (Figure 3.7, Figure 3.8). The peak savings rate is achieved by 30-40 year olds – their saving rate increased from 5 percent in 2005 to nearly 15 percent in 2010.
Figure 3.6 Current macro household voluntary savings (without pension funds) and micro savings from household disposable income in Poland


Figure 3.7 Trend in income, consumption in Poland, 2005-2010

Note: Deflated to June 2005 prices.
Source: Myck and Morawski (2014).

Figure 3.8 Trend in savings, 2005-2010

Source: Myck and Morawski (2014).
51. The reasons for the disparity between macro and micro saving data are not fully understood. The difficulty of reconciling macro and micro (survey) saving data is not unique to Poland (Barrett et al. 2012). In most countries, survey data suggest household saving rates are higher than those recorded using macroeconomic statistics, although the direction of change is usually the same. The reasons for the disparity are not fully understood, but most experts think micro studies overstate saving (Scobie et al. 2013) and macro analyses underestimate it. Box 3.2 shows that the measurement issues associated with each type of study are significant. Until more work is done to reconcile the saving series derived by different approaches, there will continue to be uncertainty about true household saving. Still, assuming that biases remain fairly constant over time, using different data sources can help us both understand the saving processes at the household level and project likely saving in the future. For instance, survey data enables us to measure saving rates of individuals at different points in their lives, which is critical for assessing savings in an aging society. Thus we use both macro and micro data to study determinants of household saving and its likely future trajectory.

Box 3.2. Differences between macro and micro measures of household saving

There are several good reasons why macro and micro saving data differ.

Issues Related to macro data (National Accounts [SNA]).

Conceptual Issues:

• Because saving constitutes a balancing item in the disposable income account, it is affected by statistical discrepancies of both the income and consumption expenditure accounts.

• Disposable income of households in national accounts includes imputed rents for house ownership, the estimated unpaid value-added tax for goods bought in the untaxed economy, and the indirectly measured value of financial services not paid directly to financial intermediaries. In Poland these three items together constitute almost 10 percent of household disposable income. Increasing household disposable income lowers the household saving rate.

Statistical Issues:

• Institutional sectors in SNA are not precisely separated. Some income and expenditure may be allocated to households instead of other sectors. For instance, nonprofit institutions serving households are usually added to household accounts in SNA but not in survey data. On the other hand, some households run small businesses, and income stemming from them is often classified as household income.

• Furthermore, the financial accounts of the institutional sector are usually not consolidated, e.g. they cover not only the transactions between agents in different sectors but also between agents within a sector.

• The household saving rate is calculated as a mean (the gross savings of the household sector divided by total disposable income of households). This is a ‘plutocratic’ measure of saving (Barrett et al. 2012), because the saving rate depends positively on unequal distribution and polarization of household income.

Issues Related to micro/survey data

Conceptual Issues:

• Saving rates are difficult to observe from household surveys. The Household Expenditure Survey is not designed to derive either household or individual saving rates, so caution is needed when attempting to derive a saving residual from the data.

• Whether expenditures are classified as consumption or investment is not trivial (e.g., in Poland spending on durables is considered current consumption).
Statistical Issues:

- Survey data on household income and expenditures are subject to all the shortcomings of household surveys generally and are sensitive to errors or omissions in data provided by respondents. Typical problems are: insufficient participation of more affluent households in surveys; lack of response to some questions, especially on income; and under-reporting of sensitive expenditure. Together these lead to declining coverage of the survey data in specific categories and to unbalanced records within households.

- The saving rate of households based on micro survey data is normally calculated as a median, because the mean is quite sensitive to outliers. Nevertheless, the micro household saving rate is also affected positively by unequal distribution of income among households.

In addition, macroeconomic (GDP growth patterns), demographic (age distribution of the population), and institutional factors (e.g., access to consumer credit, capital markets imperfections, public pension schemes, inflation) interact (in different directions) with individual households’ savings and consumption choices to shape the aggregate savings ratio calculated from national accounts. See two examples below:

- In a growing economy, demographic factors will also shape aggregate savings. An increase in life expectancy should increase household saving rates because time spent in retirement is expected to rise. An increase in the retirement age will have the opposite effect because households will have longer time to accumulate savings needed for retirement phase, which will itself be shorter. A changing age distribution due to population growth will affect the overall savings rate because of the effects on the proportion of “savers” and “dis-savers”. This demographic relationship is used below to simulate the impact of Poland’s aging population on the adequacy of savings.

- A number of institutional factors such as the nature of the capital market (which in turn affects the availability of consumer credit and rate of return on savings), presence of mandatory public pension schemes, inflation, and taxes, can work to counteract the savings implications of economic and population growth described above, because they can alter households’ savings response and affect the accounting of disposable income and consumption in national accounts. For example, mandatory pension schemes can crowd out households’ private savings behavior. In addition, they will affect measured aggregate savings from national accounts because public pension fund contributions are deducted from disposable income while benefits are added disposable income. This means that aggregate household saving ratio will decline for pre-retirement household and increase for retired households and the net effect on aggregate savings rate will depend on the relative shares of each types of households in the population.

What has been driving household saving in Poland?

52. **In order to understand household saving trends in Poland and assess their future development a multilevel strategy has been employed.** First, factors influencing Polish households’ saving rates at the macro level, from both the cross-country and time-series perspectives were examined. The analysis starts by comparing Poland’s saving rate to the saving rate predicted by the cross-country model. The cross-country results provide a good point of departure for time-series analysis for Poland, which is performed in the second step. In addition, the latter results are compared to results of time-series analysis of household saving in the Czech Republic to show the differences between Poland and its peers in Central Eastern Europe. Finally, micro saving data is used to understand the consequences of demographic changes in Poland for both the level of savings in aggregate and also for groups of households.

53. **Household saving rates in the OECD countries are driven by temporary income fluctuations, uncertainty, and interest rates, as well as by government and corporate savings.** Household saving in 28 OECD countries was found to be positively related to terms of trade, GDP volatility and the real interest rate. In contrast, public saving, the unemployment rate, the corporate saving rate, and the old-age dependency ratio had a significant negative impact on the household savings rate (Box 3.3). At the same time, the household net wealth-to-income ratio, the domestic credit-to-income ratio, price growth, real income, productivity growth, and the urbanization ratio are not significantly related to household saving. Fluctuations in unemployment, the real interest rate, and government and corporate saving seem to be the most potent sources of variation in OECD household saving (see Table 3.1). Finally, households in OECD countries are not able to pierce either the corporate or the government veil. The substitutability between household savings and corporate/public saving is only partial. The household saving rate is estimated to increase by only 0.078 percentage points if the corporate saving rate increases by 1 percentage point. Similarly, households offset a very tiny part of fiscal dis-saving through increased saving. Earlier estimates of the latter offset for OECD countries ranged from 0.1 to 0.5 in the short run to about 0.3 to as much as 0.9 in the long run.

**Box 3.3. Empirical analysis of saving determinants in OECD countries**

Recent studies on saving determinants covered very few if any East and Central European countries. This analysis uses panel data for 28 OECD countries, including 6 post-communist economies (the Czech Republic, Estonia, Hungary, Poland, Slovakia, and Slovenia). The choice of countries is driven by data availability. Due to limited availability of fully comparable data, the panel was unbalanced; the average time dimension is 14 years (mostly 1995–2011).

The choice of explanatory variables is guided by both theories aimed at explaining household saving behavior empirical findings recorded in the literature. In particular, the variables shown in Table below are used to capture the effects of economic forces underlying household saving behavior and form a list of explanatory variables in the model.

As in Loayza et al. (2000a), the GMM dynamic system approach was used, where all but the old age dependency ratio, urbanization rate, and terms of trade were treated as endogenous variables. Dependent variables, which were either private or household saving rates, were related to private/household disposable income and measured on a net basis.

Data sources and definition of variables are presented in Annex 2.

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45 To examine the importance of an individual exploratory variable the methodology proposed by Bulíř and Swiston (2006) was applied. A simple measure of the relative contribution of a given variable to the private saving rate was calculated, i.e., the product of its standard deviation calculated for the whole sample of countries and the associated coefficient obtained from the regression. In the model, fixed effects capture the differences in levels of explanatory variables between countries. The interpretation of the results from Table 3.1 is straightforward: for example, if a country has a public saving ratio one standard deviation above the cross-country mean in 1995–2011, the model projects that its households saving ratio would be 2.8 percentage points of GDP lower than the cross-country mean.

46 Piercing the corporate veil essentially means disregarding the separation between entities organized in corporate form and their beneficial shareholders.

47 In theory, government liabilities must ultimately be paid for by individuals, so government decisions should be neutral with respect to households saving and wealth.

48 The public-private offset (substitution) coefficient takes value 1 if a decrease in public sector savings is fully offset by an increase in private savings.
The estimated coefficients as reported in Table below largely confirm the results of other empirical studies. The baseline case is presented in column 3.

**Table B3.1. Household saving rate regression, panel estimates**

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous period saving</td>
<td>0.786 (33.71)</td>
<td>0.757 (33.17)</td>
<td>0.733 (35.82)</td>
<td>0.753 (29.33)</td>
</tr>
<tr>
<td>Log of terms of trade</td>
<td>0.015 (2.13)</td>
<td>0.016 (2.32)</td>
<td>0.025 (3.97)</td>
<td>-0.005 (-0.50)</td>
</tr>
<tr>
<td>Log of labor productivity growth</td>
<td>-0.047 (-1.07)</td>
<td>-0.037 (-0.87)</td>
<td>-0.008 (-0.16)</td>
<td>-0.008 (-0.16)</td>
</tr>
<tr>
<td>Urbanization rate</td>
<td>0.016 (1.04)</td>
<td>0.034 (2.26)</td>
<td>0.009 (0.59)</td>
<td>0.077 (4.67)</td>
</tr>
<tr>
<td>Old age dependency ratio</td>
<td>-0.008 (-0.27)</td>
<td>-0.046 (-1.65)</td>
<td>-0.043 (-1.50)</td>
<td>-0.156 (-3.58)</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>-0.165 (-4.64)</td>
<td>-0.159 (-4.72)</td>
<td>-0.227 (-7.04)</td>
<td>-0.148 (-4.07)</td>
</tr>
<tr>
<td>Log of real interest rate</td>
<td>0.206 (5.27)</td>
<td>1.505766 (3.93)</td>
<td>1.149 (4.20)</td>
<td>0.126 (2.82)</td>
</tr>
<tr>
<td>Log of growth in consumer prices</td>
<td>0.024 (0.68)</td>
<td>-0.001 (-0.01)</td>
<td>0.056 (1.62)</td>
<td>-0.036 (-0.98)</td>
</tr>
<tr>
<td>GDP volatility</td>
<td>0.003 (6.49)</td>
<td>0.0025 (6.06)</td>
<td>0.003 (7.63)</td>
<td>0.003 (5.67)</td>
</tr>
<tr>
<td>M2 to household income</td>
<td>0.003 (1.88)</td>
<td>0.004 (2.52)</td>
<td>0.001 (0.98)</td>
<td>0.003 (1.26)</td>
</tr>
<tr>
<td>Log of real household disposable income per capita</td>
<td>0.000 (0.37)</td>
<td>-0.001 (-1.33)</td>
<td>0.001 (0.38)</td>
<td></td>
</tr>
<tr>
<td>Domestic credit to private sector to household income</td>
<td>-0.003 (-1.47)</td>
<td>-0.001 (-0.87)</td>
<td>-0.002 (-1.01)</td>
<td></td>
</tr>
<tr>
<td>Household financial net wealth to household income</td>
<td>-0.002 (-0.96)</td>
<td>-0.001 (-0.49)</td>
<td>0.000 (0.09)</td>
<td></td>
</tr>
<tr>
<td>Government saving to household income</td>
<td>-0.084 (-5.58)</td>
<td>-0.078 (-5.41)</td>
<td>-0.099 (-6.96)</td>
<td>-0.063 (-3.83)</td>
</tr>
<tr>
<td>Corporate saving to household income</td>
<td>-0.101 (-5.19)</td>
<td>-0.078 (-4.16)</td>
<td>-0.148 (-6.38)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-0.070 (-1.97)</td>
<td>-0.046 (-1.36)</td>
<td>-0.089 (-2.84)</td>
<td>0.027 (0.56)</td>
</tr>
</tbody>
</table>

Sargan test (Prob > chi2) 0.1783 0.1226 0.0671 0.1895
Number of observations 376 376 408 289

z-statistics in brackets, method: GMM system estimator

1 For details please see Annex 2

2 Some recent studies (e.g. Hufner and Koske, 2010; Salotti, 2010) have also used a cointegration analysis to account for the non-stationary time series and hence have distinguished between long and short time effects. This exercise did not however follow this methodology, mainly due to the relatively short time dimension and unbalanced panel.

Table 3.1. The relative contribution to OECD household saving of explanatory variables (percentage points)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Standard Deviation $\ast$ Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government saving to household income</td>
<td>-0.28</td>
</tr>
<tr>
<td>Log of consumer prices growth</td>
<td>0.16</td>
</tr>
<tr>
<td>GDP volatility</td>
<td>0.01</td>
</tr>
<tr>
<td>Urbanization rate</td>
<td>0.03</td>
</tr>
<tr>
<td>M2 to household income</td>
<td>0.00</td>
</tr>
<tr>
<td>Log of terms of trade</td>
<td>0.07</td>
</tr>
<tr>
<td>Old dependency ratio</td>
<td>-0.12</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>-0.64</td>
</tr>
<tr>
<td>Log of real interest rate</td>
<td>0.42</td>
</tr>
<tr>
<td>Corporate saving to household income</td>
<td>-0.22</td>
</tr>
</tbody>
</table>

Note: Based on the specification (3) from the table in Box 3.3.

54. Poland has been saving somewhat less than predicted by the cross-country model for OECD countries. Compared to the OECD group the main drags on Poland’s household saving rate were higher unemployment (indicating higher household income fluctuations), higher corporate saving rates and, during the crisis, lower GDP volatility (that reduced the precautionary motive for saving), see Figure 3.9. When the cross-country model is used to explain changes in Poland’s household saving rate between 1996 and 2010, it shows that such changes were driven mainly by temporary income fluctuation (proxied by the unemployment rate), uncertainty (proxied by GDP volatility), and changes in the return to savings (changes to the real interest rate), as well as government saving (see Figure 3.10). On a positive note, Poland’s higher public dis-saving than the OECD average and comparatively high real interest rate supported the level of household saving in Poland more than in other OECD countries. It is worth noting that the cross-country model does not fit Polish data very well (compare the fitted and actual saving rates in Figure 3.10). This is because the factors that were influencing Polish saving between 1995 and 2010 were somewhat different from those in the “average” OECD economy discussed in the preceding paragraph.

Figure 3.9 Fitted Household Saving Rates for Poland as compared to OECD sample, contribution to the difference (Percentage Points) $\ast$

$\ast$ Based on real values and the average values of explanatory variables from the sample except Poland.
Note: Based on the specification (3) from the table in Box 3.3.
55. **Time-series analysis stresses the role in determining savings of a stable macroeconomic environment, income convergence, and the development of the domestic financial system in Poland.** In the most recent period, there have been several developments that may have affected saving behavior in Poland, including a more stable macroeconomic environment with low inflation and a low interest rate, development of the domestic financial system (which increased access to credit), and also progress on real income convergence. While most of these developments tended to reduce saving, the growth of household income had the opposite effect. Greater uncertainty (proxied by consumer prices) and higher return to savings (proxied by the real interest rate) pushed up the saving rate until 2004. Later, uncertainty eased and became unimportant, while low real interest rates reduced both the return on saving and the cost of borrowing, which encouraged households to consume (see Box 3.4). Increasing consumption (and decreasing savings) was supported by the new dynamism of the domestic financial sector. Finally, the results do suggest that the growth of real income (from which the richer part of population have benefited more) boosted household saving throughout the period of analysis (the distribution of income probably played a large role here). Figure 3.9 shows factors contributing to changes in the households saving rate in Poland.

56. **Some degree of substitution between public and private saving is found in Poland.** Time series analysis of households saving in Poland shows that large fiscal deficits in 2001–04 and in 2009–11 during the crisis seemed to support households savings (it seems that Polish households view their own saving, to certain extent, as a substitute for government saving). Time series regressions for Poland show that the households saving offset is estimated to be about 25 percent in the case of public dis-saving (Table in Box 3.4), which is also consistent, though at the lower end, with other empirical research (Röhn 2010). The offset in Poland might have been lower than in the OECD country group because it has less government debt and a less developed financial market, but also because of a different composition of changes in public saving. (The literature on Ricardian equivalence shows that the offset to changes in current spending is smaller than to changes in current revenue). Finally, the reduction of household saving in recent years has been related to an increase in

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49 It is worth to note that the coefficient for interest rate stays significant but changes its sign from positive to negative when regression is performed in two sub-periods. It would suggest treating the results with caution, in addition because empirical literature is ambiguous on the effect of interest rate on savings.

50 Certainly, the causality may be the other way around.

51 It is also similar to the public/private saving offset found in other Central European Countries, such as the Czech Republic (see Annex 4).
corporate savings. In particular, since EU accession, the substitutability of household and corporate savings has increased noticeably (the corporate-household substitution coefficient increased from 0.1 to 0.2 in 2004–12). Again, results for Poland are not much different from other CEE countries. In the Czech Republic the substitution coefficient is 0.2 (Annex 4), which means that a 1 percentage point increase in corporate saving results in 0.2 percentage point decline in household saving. Lastly, there are reasons to believe that the relationship between household and corporate savings may be structural, while that with government savings is probably conjunctural.

**Box 3.4. Empirical analysis of households saving determinants in Poland**

Saving regressions for Poland were estimated using quarterly data from the Non-Financial National Accounts covering the period 1Q1999-4Q2012. Wherever possible, for the sake of comparability we chose a similar set of determinants, as in the case of the panel regression. The estimation method relied on OLS technique. We also considered the cointegration analysis and therefore tested for the existence of a unit root. This could not be rejected for the household voluntary saving rate, but was strongly rejected for total private savings. Since the time dimension was limited, and in order to have the same approach in all regressions, it was decided not to take the cointegration approach.

At the beginning of 1999 the saving rate, growth in consumer prices, and the real interest rate were all relatively high and then through 2003 experienced a significant decline. This process might be associated somehow with the transformation of the economy and its convergence to levels observed in more developed countries.

52 For a detailed description of data sources and estimation issues see Annex 2.
Table B4.1 Household saving rate regression, time series regressions for Poland

<table>
<thead>
<tr>
<th></th>
<th>1Q1999-4Q2012</th>
<th>1Q1999-4Q2004</th>
<th>1Q2004-4Q2012</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.136 (-0.2)</td>
<td>0.061 (3.7)</td>
<td>0.146 (4.7)</td>
</tr>
<tr>
<td>Household saving rate (-1)</td>
<td>0.465 (3.5)</td>
<td>0.485 (4.8)</td>
<td>0.33 (2.6)</td>
</tr>
<tr>
<td>Household saving rate (-2)</td>
<td>0.066 (0.4)</td>
<td>0.065 (0.6)</td>
<td>0.059 (0.4)</td>
</tr>
<tr>
<td>Household saving rate (-3)</td>
<td>-0.08 (-0.5)</td>
<td>-0.076 (-0.6)</td>
<td>-0.085 (-0.6)</td>
</tr>
<tr>
<td>Household saving rate (-4)</td>
<td>-0.199 (-1.3)</td>
<td>-0.142 (-1.3)</td>
<td>-0.203 (-1.7)</td>
</tr>
<tr>
<td>Dependency ratio</td>
<td>0.175 (0.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log of terms of trade</td>
<td>0.008 (0.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log of real interest rate</td>
<td>0.512 (3.1)</td>
<td>0.44 (4.6)</td>
<td>-0.424 (-1.7)</td>
</tr>
<tr>
<td>Log of consumer price growth</td>
<td>0.119 (1.5)</td>
<td>0.161 (3.2)</td>
<td>-0.208 (-1.3)</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>-0.103 (-0.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDP volatility</td>
<td>-0.001 (-0.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log of real HSH disposable income</td>
<td>0.018 (0.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log of real private HSH income growth</td>
<td>0.129 (1.9)</td>
<td>0.157 (3.3)</td>
<td>0.13 (2.4)</td>
</tr>
<tr>
<td>Log of labor productivity growth</td>
<td>0.076 (0.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M2 to HSH disposable income</td>
<td>-0.036 (-1)</td>
<td>-0.01 (-1.8)</td>
<td>-0.022 (-2.7)</td>
</tr>
<tr>
<td>Credit to private sector to HSH disposable income (DI)</td>
<td>0.004 (0.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household financial net worth to HSH DI</td>
<td>-0.003 (-0.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government savings to HSH DI</td>
<td>-0.255 (-1.8)</td>
<td>-0.277 (-5)</td>
<td>-0.249 (-4.6)</td>
</tr>
<tr>
<td>Nonfinancial corporate savings to HSH DI</td>
<td>-0.117 (-0.8)</td>
<td>-0.132 (-1.6)</td>
<td>-0.202 (-2.2)</td>
</tr>
<tr>
<td>Adjustment in pension funds to HSH DI</td>
<td>0.026 (0.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Method</td>
<td>ols</td>
<td>ols</td>
<td>ols</td>
</tr>
<tr>
<td>Number of observations</td>
<td>52</td>
<td>52</td>
<td>36</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.960814</td>
<td>0.967425</td>
<td>0.911762</td>
</tr>
</tbody>
</table>

Is the saving of the typical household in Poland consistent with the life cycle hypothesis?

Polish households behave like life-cycle/permanent-income consumers and savers. The life-cycle model predicts that individual households accumulate savings prior to retirement and dis-save in retirement, so that they smooth consumption (holding marginal utility of money constant) across stages of life. Such behavior is expected to result in a hump-shaped income, consumption, and savings profile as a household ages. Figure 3.12 shows that while the cohort averages in Poland follow a distinct hump shape over the life cycle, households still maintain positive levels of saving after retirement, which might call in question either the conclusions of the life-cycle/permanent-income model (PIH) or the rationality of Polish household behavior. The picture changes distinctly, however, when a more appropriate measure of income is used. Following a methodology proposed by Jappelli and Modigliani (1998), disposable income of Polish households was adjusted to account properly for social security contributions (i.e., savings for retirement) made by younger households (augmenting disposable income) and social security receipts by retiree households (pension benefits subtracted from disposable income, which are treated as dis-savings from pension wealth), see Annex 5. Of course this approach does not change the fact that older households still have positive levels of private savings, and one might still wonder about the rationality of the associated decisions – the so-called “retirement consumption puzzle” (panels E and F of Figure 3.12). The empirical literature review shows that the existence of the “retirement consumption puzzle” depends on a number of factors, including whether households view pension and non-pension wealth to be substitutes, the importance of bequests, and in particular precautionary savings needs during retirement.

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53 The figure shows cohort averages of income, and savings rate obtained by constructing a pseudo-panel of birth cohorts based on the head’s birth year, by averaging over household heads belonging to same age cohort, Figure 4.12 (panel A, B, E, F).

54 A drop in consumption at retirement, which calls into question the standard rational expectations life cycle model.
Figure 3.12. Life-cycle income, consumption, and savings based on cohort averages

A. Average income by cohort

B. Average consumption by cohort

C. Income and Consumption

D. Total savings in the economy (million PLN)

E. Average savings by cohort

F. Average savings rate by cohort

The graphs plot the cohort’s average for the variable of interest against the age of the head, and so the age profile of the cohort is obtained by connecting the different points in time when the cohort is observed. Unfortunately, the Household Budget Surveys cover only a period of about five years, so cohorts can only be followed for small portion of their life cycles. But this construction allows different cohorts to be observed at the same age.

Source: Myck and Morawski (2014).
Which households save?

58. **Younger cohorts, higher income households, and households with fewer dependents tend to have a higher savings rate.** Analysis of the cohort-level savings rate suggests that characteristics such as the household head's age and gender, education and income, and age composition of household members are important determinants. First, the saving rate increases with household income, as well as pension income, which is consistent with the life-cycle motivation for savings, which important in assessing the impact of the aging process on saving. Estimates suggest that the saving rate grows by about 7 percentage points for every 1000 PLN of monthly household disposable income (conditional on other characteristics). The corresponding effect for the change in pension income from 1000 to 2000 PLN is about 8 percentage points. Comparing average savings rate for better off households with that for less well-off households confirms that the savings rate increases with income (Figure 3.13). In addition, between 2005 and 2010 the rate of savings increased much faster for the upper half of the income distribution. (The pattern of savings by income quartiles is presented.) Similarly, descriptive analysis suggests that the average savings rate increases with the level of education of the household head. Second, the savings rate diminishes with the number of children in the household. Figure 3.14 shows that the life cycle of family size in Poland also has a humped shape similar to that of consumption. In addition it shows relatively small changes in household size. Third, female-headed households have higher savings rate than male-headed households. Finally, when taking into account only age, year and the head's birth cohort, younger cohorts seem to have a greater propensity to save than do older cohorts.

**Figure 3.13. Savings and household income**

A. Households below median income

B. Households above median income

Source: Myck and Morawski (2014).

---

55. Detailed analysis of the determinants of the saving rate showed that reliable identification of age and cohort effects is impossible with the data available. The regressions conducted control for age, cohort, and time effects, and this allows for conditional interpretation of coefficients on such other characteristics as income, education, household size etc., see Annex 7. A simple multiple regression model is used where age enters as a polynomial function, cohort effects are controlled through five-year cohort dummies, and time through year-specific dummy variables.

56. Results described here are based on specifications OLS3 and OLS4 in table 1, Annex 7.
59. **Changes to the pensions system in Poland might have had an impact on household saving.** A number of studies in the literature have shown that the level of expected public pensions has a strong and significant effect on private savings. Early results from Lachowska and Myck (2014) demonstrate that public pension systems in Poland have a displacing effect on private saving. They show that a one unit reduction of pensions wealth leads to an increase of between 0.3-0.6 in the level of private saving. In addition the study demonstrates how changes introduced in 1999 (a switch from defined contribution to defined benefit system) have impacted the level of household saving. Lachowska and Myck (2014) found complete crowding-out of saving for older and middle-aged cohorts, while the crowding-out for younger cohorts (receiving pensions based on a new system) is about one-third. For older households, pension wealth and private saving are nearly perfect substitutes. These results are still at an early stage but the early findings suggest that, given the growing awareness of future low levels of public pensions, which results from the switch to a defined contribution system, households are more likely to increase their private assets over the coming decades. Recent discussions concerning the low level of public pensions expected in the future should play an important role in increasing the level of discretionary savings.

60. **Micro data analysis helps in formulating a hypothesis concerning the future development of household savings.** Aggregate household saving is likely to increase if income convergence (in particular for medium and high earners) and/or the level of education continues to increase (increased level of education leads to a higher income). On the other hand, population aging should act in the opposite direction – reduce the future level of household savings - because it changes the share of savers and dis-savers in the economy. To quantify the impact of demographic change and the likely increase in education/income level microsimulation analysis was used (Myck and Morawski, 2014), which employed a data re-weighting technique (See Annex 9 for more details on the methodology).

61. **Population aging, when combined with the projected education trends, will have a positive impact on overall household total savings.** Households saving projections for 2030 and 2060 were carried out in two stages to account for changes in the age structure and in the population composition with respect to the level of education: i) weights were adjusted to correct for age distribution only (scenario 1); ii) weights were adjusted to correct for age distribution and cohort-specific education attainment, which also reflects earnings potential (scenario 2). The expected changes in the population

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58 Pension wealth is based on the forecast of lifetime earnings profiles for both spouses and pension specific assumptions for labor supply decisions and the pension legislation before and after the reform (see details in Lachowska and Myck, 2014).
59 This negative effect could be somewhat offset by an expected decline in the size of households (in line with expected decline in fertility rate) that should have a positive impact on household saving.
60 This approach uses population projections to adjust the population structure of the data, assuming that other things, such as household composition, incomes, consumption (and thus savings) remain unchanged. Sample households are simply given new population weights to reflect projected changes following Creedy (2004) and Gomulka (1992). This is a very limited approach, since it ignores migration and the impact of the pension reform on replacement rates, but its simplicity enables a clear specification of the assumptions made in the analysis and it still provides some valuable insights into potential future developments of savings in Poland.
structure would leave the aggregate household saving level almost unchanged by 2030 as compared to the household saving level in 2010, but would reduce it by about 15 percent by 2060 as compared to 2010. When accounting for changes in age and education, however, the total savings under the 2030 scenario grows by 17 percent from the 2010 level, and is still 6 percent higher than in 2010 by 2060. In particular the level of savings is projected to grow substantially among the retired population, which on the one hand grows in numbers due to population changes, but also has higher incomes when education trends are factored in (see Figure 3.15.)

**Figure 3.15. Saving simulations based on re-weighting technique**

A. Reweighting with respect only to the projected age changes

B. Reweighting with respect to age and education changes

Source: Myck and Morawski (2014).

### Saving for retirement

62. **Low household saving and expected reductions in retirement benefits raise concerns about whether households are adequately prepared for retirement.** Public pensions in Poland have shifted away from defined benefit (DB) plans to defined contribution (DC) plans, which increases their fiscal sustainability largely by reducing expected benefits. Private pension plans do not function well (the coverage ratio is very low; see Chapter 5), which raises concerns about the adequacy of pension income to finance retirement. Household saving has also plunged dramatically in recent years, according to the macroeconomic accounts. Concerns generated by these aggregate trends have been increased by our microeconomic study, which points to very low saving rates for low-income earners. Finally, there is no comprehensive data on individual wealth to assess whether wealth accumulation patterns for today’s working-age households will be enough for them to maintain their current living standards in retirement. These changing prospects for retirement income security raise a host of policy-related issues. They concern the stability and direction of the nation’s retirement system, prospects for the living standards of future retirees, and the extent to which lack of financial preparation will translate into the need for increased government assistance. It is thus critical to assess the adequacy of household saving.

63. **Assessing the adequacy of saving for retirement is far from straightforward.** The first question is what constitutes adequate retirement income. The replacement rate—retirement income relative to final salary at the time of retirement—is the most common measure used to assess the adequacy of retirement income. Scobie, Gibson, and Le (2004) outline alternative possible measures of adequacy (for the review of other concepts that have been put forward, see Box 3.5). All these definitions of adequacy are rooted in the life-cycle hypothesis. In the absence of micro data on wealth, we assess adequacy using the replacement rate and the elderly income poverty rate. Analysis of the replacement rate gives us a rough indication of the annual and total savings necessary to keep replacement rates constant for current contributors. The estimations are based on generational accounts that show the average expected net tax payments of each cohort over the rest of their life cycle. Annex 8 outlines the calculation of necessary savings and the assumptions chosen. In addition we simulate the potential level of income poverty among older individuals in future years and compare them to the current level of old age poverty (Myck and Morawski, 2014).
A range of measures can be used to measure the adequacy of retirement savings, among them (Scobie, Gibson, and Le 2004):

- **Replacement rate**: post-retirement income as a proportion of pre-retirement income
- **Absolute poverty**: a level of income necessary to attain an acceptable minimum standard of living
- **Relative poverty**: a level of retirement income that is relative to the median income of some reference group of retirees or the income of the current working population
- **Consumption-smoothing**: retirement income should allow people to sustain their pre-retirement level of consumption, thus avoiding a drop in their living standards. A variant of this is to allow for an acceptable change in the level of consumption (e.g., post-retirement consumption should be at least 80 percent of pre-retirement consumption)
- **Marginal utility of consumption over time**: a level of income that allows an individual to have the same marginal utility of consumption over time


Currently working cohorts aged 20–50 will have to save about 10 percent of their annual earnings to guarantee them current replacement rates. The average stocks necessary to guarantee current replacement rates vary by age (see Table 3.2). In general, younger cohorts have to set aside a larger amount of money today to guarantee them the current level of replacement rates; their expected replacement rates are significantly lower than those of current retirees. On the other hand, annual savings necessary to guarantee current replacement rates are more similar across cohorts. Currently working cohorts aged 20–50 have to save about 10 percent of their earnings to guarantee them current replacement rates. This corresponds to about 4000 PLN a year in 2010. For this calculation it is assumed that the annual saving amount is adjusted each year in line with the average earnings growth. Younger cohorts can save for longer period and benefit from compound interest rate effects, since they are expected to retire in the remote future. As a consequence, savings in terms of annual earnings are more equal across cohorts than the stock figures in Table 3.2.

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61 Annex 8 outlines the calculation procedure used for assessment of saving adequacy as well as the main assumptions chosen.

62 The results should be interpreted with caution. They are based on an average person having an NDC account. The results would clearly vary if we differentiate by gender, occupation, employment status, and income groups as well as retirement age. Furthermore, the figures are sensitive to the assumptions chosen about wage and employment growth and the interest rate. Last, but not least, we could not compare our estimates with existing savings due to a lack of consistent data. Future research should analyze more thoroughly existing and required savings for old age provision in Poland based on detailed micro data. For that, however, micro data on wealth (or asset accumulation) would be needed.
Table 3.2 Average Stock and Annual Saving Necessary to Guarantee Current Replacement Rates

<table>
<thead>
<tr>
<th>Age in 2010</th>
<th>20</th>
<th>25</th>
<th>30</th>
<th>35</th>
<th>40</th>
<th>45</th>
<th>50</th>
<th>55</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average stock required to keep replacement rates, per scheme member in 1000 PLN</td>
<td>185.3</td>
<td>176.2</td>
<td>170.9</td>
<td>131.1</td>
<td>105.2</td>
<td>84.5</td>
<td>66.2</td>
<td>12.4</td>
</tr>
<tr>
<td>Average annual savings relative to average earnings</td>
<td>10%</td>
<td>11%</td>
<td>12%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
<td>12%</td>
<td>4%</td>
</tr>
<tr>
<td>Average savings in 2010, in prices of 2010, per scheme member in 1000 PLN</td>
<td>3.8</td>
<td>4.1</td>
<td>4.5</td>
<td>4.0</td>
<td>3.9</td>
<td>4.0</td>
<td>4.5</td>
<td>1.6</td>
</tr>
</tbody>
</table>

Source: Jabłonowski and Müller (2014).

65. **The decline in levels of public pensions is likely to lead to an increase in relative poverty.** The re-weighting exercise conditional on the same simplifying assumptions can also shed light on the potential level of income poverty among older individuals in future years. If the re-weighting exercise is performed using unchanged 2010 income and consumption levels, the expected changes in the population structure in the coming years will have a small effect of limiting the level of relative poverty, which falls from 14.9 percent in 2010 to 12.4 percent under the 2060 population structure (see Annex 10). This reduction in relative poverty is much greater when changes in the education structure are also taken into account (with a reduction in poverty to 8.7 percent under the 2060 scenario). It is unlikely that the income levels for households belonging to different age cohorts will be unchanged, given the expected reduction in levels of public pensions (and replacement rates). Therefore the re-weighting exercise is repeated, assuming a reduction in the level of pension first by 10 percent and then by 20 percent. In the second case, however, the reduction of pension is constrained by the level of minimum pension. The level of relative poverty increases only in the scenario with larger pension reduction. In this scenario using the 2060 population structure, the relative poverty rate increases to 22 percent from 20.7 percent in 2010. Overall, however, the income distribution is projected to become more equal.

66. **Naturally the actual levels of income poverty in the future will depend on many other developments.** These include the way in which incomes of the working generations will develop, the changes in the rates of return to education, public policy regarding taxes, pensions and other benefits, etc. It is also worth noting that income poverty per se may not be a relevant measure of financial circumstances among older people, and their overall well-being may be poorly approximated by their level of income (e.g., Adena and Myck, 2013). The welfare of future pensioners will also depend on a number of other factors, among which is the stock of private assets they will accumulate to supplement current incomes.

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63 Guaranteed minimum pension in Poland is paid if the total amount of the NDC old-age pension and the annuity from the individual account is less than the legal minimum old-age pension.
Corporate sector
Explaining the corporate saving puzzle\textsuperscript{64}.

67. The corporate sector has an important role in the saving and investment process. It is true that the business sector is ultimately owned either by households or the government, so a significant number of issues related to its saving will be addressed elsewhere. However, since, in the simplest sense, business saving is based on business profits (Box 3.6), the more that can be done to enable businesses to work efficiently, the greater will be the funds available for distribution to the owners or for investment, and hence the higher national saving and growth might be. Since business losses directly reduce business saving, anything that reduces the extent of losses will improve saving. However, if the higher profits come from driving labor income down, there will be an offset from lower household savings. Finally, corporate saving must be channeled into productive investment if a country is to further its development. Thus, any increase in corporate saving needs to be accompanied by a simultaneous and matching effort to stimulate productive investments, and to channel savings into them.

Box 3.6. Corporate Saving from a Theoretical Perspective

Households and firms are very different economic entities with very different functions; households consume in order to maximize their utility, while firms invest in plants and equipment, using them to produce goods and services and make profits. However, there are still many similarities between the two types of economic entities. For example, just as households save in order to finance future consumption, firms save in order to finance investment. Moreover, just as households have a choice between financing consumption by borrowing or by drawing down previously accumulated saving, firms make the same choice when financing investment. Furthermore, just as borrowing constraints and borrowing costs influence household decisions about how to finance consumption, they also influence corporate decisions about how to finance investment.

From an accounting perspective, firms earn profits from selling goods and services for more than it costs to produce them and, after paying taxes on those profits, either retain the after-tax profits within the firm or distribute them as dividends to shareholders. The firm uses retained profits either to finance (physical) investment in plant and equipment immediately or to be saved in the form of liquid assets to be used to finance future investment in plant and equipment. It might also be saved in order to avoid tax on distribution. As the firm’s value increases with the size of the savings, the owners get income in the form of unrealized capital gains.


64 “Corporate Saving Puzzle” is defined here as persistently high corporate saving rate for which reasons are not well understood in existing theoretical and empirical literature.
68. **The literature on the economic determinants of corporate saving both in an individual country and across countries is minimal.** Corporate saving behavior has been under-researched in the economic literature due to difficulties in defining and measuring the very concept of corporate saving. The main complications come from (a) a blurred distinction between corporate and households saving (“piercing the corporate veil,” see Box 3.7); (b) the existence of different forms of company savings (money, deposits, and different fixed assets, Box 3.7); and (c) inadequate statistical information on saving and its determinants (for instance, in Poland the CSO does not publish cash flow and dividend statistics).

### Box 3.7 Corporate Saving: Definitions and Measures

The boundary between the savings of households and firms is blurred.

From economic theory, since households own corporations, they should adjust their saving plans—“pierce the corporate veil”—to offset the saving corporations are doing on their behalf (Poterba, 1987; Auerbach and Hassett, 1991). However, a variety of constraints on household and corporate financial behavior in practice make personal and corporate savings imperfect substitutes (Bernheim, 2002). In particular:

- Households may have a lower marginal propensity to save out of an increase in wealth than out of disposable income (which would increase if retained earnings were distributed as dividends). For example, they may be liquidity-constrained or they may consider capital gains to be transitory.

- Even without liquidity constraints and myopic behavior, and with individuals successfully piercing the corporate veil, exogenous shocks that redistribute wealth from individuals to corporations may increase aggregate savings if shareholders have a higher propensity to save than other households have.

- The value of the firm may not change in line with retained earnings, reflecting problems in corporate governance and imperfect observability of new investment projects. For example, if managers invest retained earnings in projects yielding below-market returns, share values will grow by less than the increase in retained earnings (Jensen, 1986).

From a definitional standpoint, there are questions about the demarcation between household and corporate saving in the national accounts, and several available alternatives could be more appropriate for economic analysis (Gale and Sabelhaus, 1999).

At least three adjustments need to be considered to make SNA data economically more meaningful:

1. **Micro firms (the self-employed),** which the national accounts now include in the household sector, could be moved to the corporate sector (the issue is very country specific so the proposed shift for Poland may not apply for other countries i.e. UK).

2. **Retained earnings do not include inflationary gains on nominal debt,** which could be large when inflation is high. In particular, part of nominal interest payments is effectively a repayment of principal (reflecting the inflation-driven erosion of the real value of interest-bearing assets), it could be argued that this should be included in corporate saving (Auerbach, 1982; Poterba 1987).

3. **While both dividend payments and share repurchases involve channeling funds from the corporate to the household sector,** the national accounts treat only the former as a form of corporate dis-saving (for more discussion see IMF (2006), pp. 138–39).

Research studies have used several methods to measure corporate saving (see table below).
Table B7.1: Methods of Measuring Corporate Savings

<table>
<thead>
<tr>
<th>Macro level:</th>
<th>Micro level:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gross corporate saving = Profits after tax – Dividends paid</strong></td>
<td>Corporate saving(CS) = Cash flow (CF) – Dividends</td>
</tr>
<tr>
<td>Profits after tax = Profits before tax – Direct taxes paid = Profit or loss after tax</td>
<td>CS = Cash/Changes in cash</td>
</tr>
<tr>
<td>Profits before tax = Operating profits – Net interest paid + Net property income received (excluding net interest paid and dividends paid) + Net other current transfers received = Profit or loss before tax</td>
<td>CS = Deposits/Changes in deposits</td>
</tr>
<tr>
<td>Gross operating surplus = Operating profits = Gross value added (at basic prices) – Compensation of employees – Taxes less subsidies on production = Operating profit or loss</td>
<td>CS = Financial assets – Liabilities</td>
</tr>
<tr>
<td>Net lending = Gross saving + Net capital transfers received – Gross fixed capital formation – Other capital expenditure</td>
<td></td>
</tr>
</tbody>
</table>


69. **A host of micro and macro factors influence corporate saving** Fundamental micro and macro drivers of corporate savings (retained profits/cash) have been found to be profitability, Tobin’s Q, the share of intangible assets, firm size, sales growth/volatility, leverage, export orientation, and the business cycle (see Opler et al. (1999), Özmen et al. (2012), IMF (2006), IMF (2009) and ECB (2013)). Using firm-level data, this section relates the nonfinancial corporate savings rate (net profits to assets) to a series of variables that have generally been shown to affect corporate saving (the expected sign of the causality direction is in parentheses):

- **Size/Age of firm (+/-)**: Bigger and older firms should generate higher profits. If profits are held in cash, however, large firms are expected to keep less than smaller firms because they have easier access to external financing.
- **Tobin q (+)**: Firms with a higher Tobin q need more savings to finance new investment opportunities.
- **Dividend pay-out ratio (−)**: The higher the dividends paid out of net profits, the lower firm savings, which equal retained profits.
- **Sales to assets (+)**: Firms with higher sales from assets are expected to obtain higher profits (or have higher profitability) and saving.
- **Sales growth/ GDP growth/ output gap in a country (+)**: Firms facing stronger demand (e.g., during a cyclical upturn) should have higher profits and saving.
- **Sales volatility (+)**: Firms with more uncertain sales revenue (e.g., those in more competitive industries) should build up buffers because they are likely to suffer from cash shortages.
- **Intangible fixed assets to tangible fixed assets (+/-)**: Firms that have more intangible assets (e.g., patents and goodwill) than tangible fixed assets may have lower profits because of more risky investments (e.g., in new technologies), but they are expected to hold more cash for this type of investment, for which it is more difficult to get external financing.
- **Tangible fixed assets to total assets (−)**: Firms with a high share of tangible fixed assets in total assets may have less incentive to save for new fixed investment.
• Gearing, the ratio of debt to equity (−/+): The sign depends on what is more costly to issue debt or equity and also on the relation between debt and equity to profits. There is evidence that more indebted firms are likely to have lower profits than firms less indebted in relation to their equity.

• Financial leverage (−): Solvent firms save more; indebted firms save less. More leveraged firms have higher costs of debt and are less likely to have high profits.

• Export turnover (+/−): Exporting firms are more likely to have external competition, which may reduce profit margins and the savings rate. However, they have more chance to access external finance, which reduces the need for internal funds.

What has been driving corporate profits in Poland?

70. Since the global crisis, corporate net lending in Poland has shot up. Since 2000 there have been three phases in development of corporate net lending65 (Figure 3.17). A significant moderation of investment coupled with an increase in corporate saving led to a major increase in corporate net lending (or a reduction in corporate net borrowing) between 2000 and 2005. However, during the pre-crisis boom years, driven by the increase in investment, there was some increase in Poland’s corporate saving–investment gap, which amounted to about 2.3 percent of GDP on average for 2006–08. Still, that was low compared to 5 percent of GDP in Latvia, Spain, Slovenia, and Bulgaria, though smaller than in Finland, Sweden, or the UK, which were characterized by a surplus of saving over investment. The saving–investment gap led to a small increase in corporate debt in Poland, but once the global crisis hit, Polish firms managed to narrow the gap substantially. Part of the improvement in corporate net lending was the result of a drop in investment. Another was the improvement of corporate saving—the result of an increase in profitability.

71. Growing profits stand behind the increase in corporate saving in Poland. Between 2000 and 2012 the rise in profits was broadly similar to the rise in corporate saving (Figure 3.18). Closer examination reveals that profits went up mainly because of a rise in gross operating surplus rather than lower tax and interest payments. Both a substantial rise in corporate sector value added and a reduction in employment costs boosted operating profitability (Figure 3.19). Net interest payments declined only recently, due to much lower interest rates. Property income remained volatile, driven by changes in net reinvested earnings on foreign direct investment. At the same time, higher dividends from both national and foreign sources as well as higher current transfers (e.g., non-life-insurance claims) were offset by higher withdrawals from the income of quasi-corporations. Finally, because dividends generally did not rise in line with profits, they have also contributed to the increase in gross corporate saving.

Figure 3.17 Nonfinancial corporate savings, net lending, and gross fixed capital formation, percent of GDP

Source: Eurostat.

Figure 3.18 Nonfinancial corporate savings: gross operating surplus, profits, and saving, percent of GDP

Source: CSO.

65 Corporate net lending is defined as corporate saving minus corporate investment.
72. **In Poland, small firms have been the most profitable, though large companies have recently caught up with them.** The enterprise sector in Poland is disproportionately composed of microenterprises\(^66\) with fewer than 10 employees compared to other countries in the EU. Though Poland has a significant number of large firms, it has relatively few intermediate size, especially those with 10–49 employees. Small and micro firms generate slightly more than 50 percent of corporate sector profits, but their share has been declining. The finances of small firms are intermingled with those of households. It is not clear that one can separate them very easily. Thus, the increase in profitability and undistributed profits of small firms may really indicate higher household savings. It is thus possible that some of the decline in the household saving rate is illusory. More than 30 percent of profits come from large firms. Manufacturing, wholesale and retail trade, and energy supply make most of the profits. Until the crisis, small firms had the most savings (net profits) in relation to their assets and capital, more than medium and large firms (Figure 3.20, Figure 3.21). However, the profitability of large firms increased during the global financial crisis, in line with an increase of retained profits in the energy and information and technology sectors.

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\(^{66}\) Statistical analysis of nonfinancial corporate sector savings (net profits, i.e., P/L after tax) is based on Central Statistical Office (CSO) data for 726 subgroups of nonfinancial firms in Poland for 2005–11 (without agriculture). In Polish statistics micro firms employ up to 9 employees and are often forms of self-employment (SNA accounts put micro firms in the household sector). Small enterprises employ 10–50 people, and large ones more than 250.
73. **So far fixed investment in Poland has been driven by large firms and financed mainly from their own resources.**

The large companies account for about 50 percent of investment outlays and small enterprises (including micro companies) about 29 percent. This is confirmed by the ratio of their investment to assets, which is much higher in large and medium than in small firms. All firms finance investment mainly from their own resources (profits and transfers from public sector) and much less from credit. Interestingly, the large firms are the most reliant on their own resources, which finance more than 80 percent of their investment. Finally, small and medium firms use domestic credit much more than foreign credit.

**Figure 3.22 Nonfinancial corporate investment to assets in Poland**

**Figure 3.23 Sources of investment finance (million PLN), average 2005-11**

Source: Liberda, Smyk and Hardy (2014).

74. **The high corporate savings rates in Poland are part of a global phenomenon, in many EU countries corporate savings have gone up in the last 10–15 years (Figure 3.24).** JP Morgan Research (2005) and the IMF (2005) both noted that corporations in G-7 economies have all shown a rise in undistributed profits. Bates, Kahlec, and Stulz (2009) stated that in 2005 a typical firm in the United States was holding so much cash that it could pay off its entire corporate debt and still have cash left over. Finally, corporate saving has always been important, but for the past two decades it has been trending upward substantially in many, if not most, the developed and Asian economies (Karabarbounis and Neiman, 2012). The reasons for this rise in corporate saving are not fully understood.

67 A large part of the profits of micro firms is retained by their owners, e.g., households; only about one fourth is invested.
75. **A variety of factors have contributed to the surge in corporate savings in high-income countries.** The literature does not presume that high corporate savings per se reflect inefficiency or corporate misgovernance. Indeed, Bates et al. (2009) hypothesize that it could be a rational (optimal) response to rising corporate working capital needs. Moderation of wages; a rise in net profits (mainly from property income); declines in corporate taxes as a percent of GDP; interest rates; and transaction costs associated with globalization and technological change may be driving the surge in corporate savings in OECD countries (OECD 2007). Much recent research suggests that the shift in income distribution toward profits can be ascribed to globalization, technological change, and wage moderation, the last being at least in part linked to the former two influences (Molnar et al. 2007; IMF 2007; and Hornstein et al. 2007). Firms also keep cash holdings for precautionary reasons in case of operating losses, sales volatility, new investment opportunities, the increasing role of intangible assets, and the high risk of new research and development investment when technology is changing fast (Opler et al., 1999; IMF, 2006; Pinkowitz et al., 2013). In addition, Landau (BIS, 2014) notes that far from deleveraging, globally non-financial corporates are actually issuing new debt – including high yield – in significant amounts, and they are using a substantial part of the proceeds (around two thirds) either to retire existing debt or to make payouts to equity holders via dividends and share buybacks (Stein (2013)). So, while financial intermediaries are truly deleveraging, non-financial corporates, as a whole, are simultaneously issuing debt and hoarding cash, behavior that is symptomatic of a very strong preference for liquidity.

76. **Corporate saving rises for precautionary reasons, but also when the financial sector is underdeveloped.** For developing countries recent studies of corporate saving have proposed two main explanations for excess corporate saving: (1) emerging markets have a limited supply of financial assets and are financially constrained (see, for example, Dooley et al. 2005; Matsuyama 2007; Ju and Wei 2006, 2010; and Caballero et al. 2008). In their view an underdeveloped financial sector serves as the main driver of corporate saving.68 (2) Excess saving, and thence net capital outflows, result from precautionary saving arising from idiosyncratic risk (see, for example, Mendoza et al. 2009; Sandri 2010; and Benhima 2010). In precautionary saving models, rising uncertainties are associated with a decline in corporate investment.

77. **The phenomenon may be related to stagnation of all but the highest real incomes.** The beneficiaries of corporate earnings are predominantly at or near the top of the income distribution. Effective taxation of corporate income has been falling, and ways to keep such income off-shore or untaxed have been growing. Beneficial owners may prefer to keep corporate net earnings undistributed, since it keeps them out of the tax net, and benefits accrue to them in the form of capital gains. Whether the evidence supports this argument is not known, and whether it would apply in Poland is also....
Mobilizing Private Savings: Where Households and Companies Fit in

unclear. But for smaller businesses, the relative taxation of corporate earnings and individual distributions may very well be significant.

78. Again a step-by-step approach was used to find determinants of corporate saving, and assess its sustainability in Poland. Similarly to the approach adopted in analyzing the determinants of households saving, a two-step methodology was applied to identify the drivers of corporate saving. First, a cross-country regression was used to find determinants of corporate saving in selected European countries, which was later used to predict Poland’s corporate saving rate. Second, a Poland-specific regression for corporate saving regression was performed.

79. Profitability was the main driver of corporate saving in European countries. The ratio of sales to assets was found to be the most important determinant of corporate saving for companies in those European countries (including Poland) for which firm level data was available. Demand and cyclical conditions also stimulated saving, and saving was higher when output growth was closer to its potential. That seems to be consistent with the accelerator model of investment (Fazzari, Hubbard, and Petersen 1998). In addition, firm saving seems to increase with firm size and the tangibility of assets and to decrease with the leverage ratio (Box 3.8, table B8.3). Firms with a sounder financial position and lower debt have higher corporate savings. Finally, the sign of the coefficient of the tangibility ratio is opposite to what would be expected, because firms with a high tangibility ratio tend to save less because they have less room for fixed investment. Poland’s saving rate was lower than the cross-country model predicted (based on selected European countries), mainly due to the lower value of sales to assets (Figure 3.25).

Box 3.8. Determinants of corporate savings

The estimation analysis in this section consists in examining the responsiveness of corporate saving to changes in both firm-specific and macro variables that studies have suggested influence corporate behavior. The results of the regressions presented in this report highlight the need for further investigation and more data to provide sufficiently clear diagnostics of the (potential) drivers of corporate savings.

Corporate savings are measured by (1) net profits to assets (cross-country regression); and (2) retained profits to assets (Poland-specific regression).

To investigate determinants for corporate saving in Poland two data series were used:

• Amadeus firm-level data for 10 European economies, for which complete data were available, Poland being one. The number of observations per country, which varies with different regression specifications, totals 9 million for the whole sample used.

• Central Statistical Office (CSO) data for the nonfinancial corporate sector for Poland is for 2005–11. The CSO data are fully representative of the corporate sector in Poland and cover firms employing at least ten people. For 2005–11. The number of firms each year varied from 45,000 to 52,000. However, for statistical privacy the data are grouped by 242 detailed NACE categories and by three firm size categories (small, medium, and large), which together produce a matrix of 726 groups of firms.

The size of companies is defined differently by Amadeus and CSO data (see tables below). Amadeus classifies many small firms as medium or large. The Amadeus database is not as representative of the Polish corporate sector as the CSO data are; medium and large firms are overrepresented in Amadeus. It does, however, include micro firms of self-employed, which is not true of the CSO data (CSO classifies them as households).

69 An improvement in macroeconomic conditions increases profits (savings) and thus investment.

70 The regression results are used to compare the actual nonfinancial corporate saving rate (net profits to assets) for Poland with the fitted hypothetical corporate saving rate for Poland when all explanatory variables are set at the average values for all countries analyzed except Poland.
Tab B8.1. “Size” category definition in Amadeus

Companies are classified into groups based on three values: operating revenue, total assets, employees (at least one variable has to meet the threshold value.)

<table>
<thead>
<tr>
<th></th>
<th>Very Large</th>
<th>Large</th>
<th>Medium</th>
<th>Small</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Revenue</td>
<td>≥ 100 mln EUR</td>
<td>≥ 10 mln EUR</td>
<td>≥ 1 mln EUR</td>
<td>Other</td>
</tr>
<tr>
<td>Total Assets</td>
<td>≥ 200 mln EUR</td>
<td>≥ 20 mln EUR</td>
<td>≥ 2 mln EUR</td>
<td>Other</td>
</tr>
<tr>
<td>Employees</td>
<td>≥ 100</td>
<td>≥ 150</td>
<td>≥ 15</td>
<td>Other</td>
</tr>
</tbody>
</table>

Tab B8.2 “Size” category definition in CSO

Companies are classified to groups based on employment size

<table>
<thead>
<tr>
<th></th>
<th>Large</th>
<th>Medium</th>
<th>Small</th>
<th>Micro</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employees</td>
<td>≥ 250</td>
<td>50 - 249</td>
<td>10 - 49</td>
<td>1 - 9</td>
</tr>
</tbody>
</table>

Cross-country regression:

Table B8.3 Regression Results for Nonfinancial Corporate Saving Rate (Net Profits to Assets), 10 countries, 2000–08, Amadeus data

<table>
<thead>
<tr>
<th>Variables</th>
<th>Net profit / Total assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales / Total assets</td>
<td>0.0622*** (967.8)</td>
</tr>
<tr>
<td>Tangible fixed assets / Total assets</td>
<td>0.0102*** (6.047)</td>
</tr>
<tr>
<td>Size: Medium</td>
<td>0.0173*** (13.91)</td>
</tr>
<tr>
<td>Size: Large</td>
<td>0.0227*** (17.91)</td>
</tr>
<tr>
<td>Size: Very Large</td>
<td>0.0238*** (17.25)</td>
</tr>
<tr>
<td>Leverage</td>
<td>-0.000524*** (-7.495)</td>
</tr>
<tr>
<td>Output gap</td>
<td>0.00627*** (16.28)</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.0576*** (-4.295)</td>
</tr>
</tbody>
</table>

Observations: 6,485,058
R-squared: 0.127

T-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1
Note: OLS regression for Net profit to Total assets (countries pooled). Dummies for 9 countries (UK dropped due to missing data) and 21 main NACE categories included but not reported.
Note: OLS chosen due to the lack of appropriate instruments for a GMM approach.

**Poland-specific regression:**

Table B8.4 Regression Results for Nonfinancial Corporate Saving Rate (Retained Profits to Assets), Poland, in 2005–11, CSO Data

<table>
<thead>
<tr>
<th>Variables</th>
<th>Retained profit to assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales to assets</td>
<td>0.00890***</td>
</tr>
<tr>
<td></td>
<td>(5.504)</td>
</tr>
<tr>
<td>Tangible assets to total assets</td>
<td>-0.0718***</td>
</tr>
<tr>
<td></td>
<td>(-8.583)</td>
</tr>
<tr>
<td>Export revenues to sales</td>
<td>-0.0170**</td>
</tr>
<tr>
<td></td>
<td>(-2.045)</td>
</tr>
<tr>
<td>Leverage ratio (domestic debt to assets)</td>
<td>-0.0544**</td>
</tr>
<tr>
<td></td>
<td>(-2.431)</td>
</tr>
<tr>
<td>Leverage ratio (foreign debt to assets)</td>
<td>-0.0600***</td>
</tr>
<tr>
<td></td>
<td>(-4.563)</td>
</tr>
<tr>
<td>Output gap</td>
<td>0.00446***</td>
</tr>
<tr>
<td></td>
<td>(4.592)</td>
</tr>
<tr>
<td>Medium</td>
<td>-0.0161***</td>
</tr>
<tr>
<td></td>
<td>(-7.791)</td>
</tr>
<tr>
<td>Large</td>
<td>-0.0184***</td>
</tr>
<tr>
<td></td>
<td>(-6.440)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.128***</td>
</tr>
<tr>
<td></td>
<td>(14.07)</td>
</tr>
<tr>
<td>Observations</td>
<td>3,931</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.208</td>
</tr>
</tbody>
</table>

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Baseline: size – small; NACE categories included but not reported
Method: OLS regression; one observation concerns a group of firms in NACE sections; observations are weighted by their shares in the total number of firms in the Polish economy; firms have been grouped by Central Statistical Office in order to fulfill statistical secrecy on the 4-digit or 3-digit level of NACE classification in sections F, G, H, I, Q and 2-digit level in NACE sections A, B, C, D, E, J, K, L, M, N, P, R, S; in total there were 726 observations used.

1 Austria, Belgium, Czech Republic, Germany, France, Spain, Sweden, Hungary, Poland, and the United Kingdom.

80. The country-specific regression confirms that profitability, demand conditions, the tangibility ratio, and leverage were important determinants of corporate saving in Poland in 2005–11. Again, profitability (defined as sales to assets) was found to be a driver of corporate saving—though for Poland the impact of increased profitability seems to be lower and the effect of the leverage ratio higher than in the cross-country regression. In contrast, the Poland-specific regression found a negative impact of the tangibility ratio on corporate saving, which is what would be expected. In Poland smaller firms also save more than bigger firms (again this could be related to low household saving), which is consistent with the descriptive statistics presented earlier. Finally, Polish exporting firms apparently face external competition, which reduces their profit margins and saving rates. For large firms, however, an export orientation was found to have a positive impact (see Annex 11), perhaps because large firms act more globally and thus are more export-oriented in competitive industries, so the impact of export orientation on their profits and saving is positive. The figure below confirms that the nonfinancial corporate saving rate changes in Poland were caused mainly by changes to sales, leverage ratios (especially during 2008–11), and the tangibility ratio. For instance, when the global financial crisis hit Poland in 2009, corporate saving fell because of a drop in the sales-to-assets ratio and deleveraging.

Figure 3.26 Nonfinancial Corporate Saving Rate (Retained Profits to Assets) and Contributions to Changes (Percentage Points), 2005–11.

Note: Based on CSO data.
Source: Liberda and Kolasa (2013)
81. **Corporate and other saving must be channeled into productive investment if Poland is to grow.** Thus for Poland, the most interesting question that concerns the corporate sector is why its high profitability does not translate into high investment. The answer to this question is not a trivial one. The low level of corporate investment seems to result from both low needs for replacement of depreciated fixed capital and the limited scale of new investment (new production). The labor-intensive nature of Polish production reduces the need to upgrade production facilities and replace physical capital. The low scale of new investment projects may come from an insufficient number of projects that would offer a high return (as compared to other forms of investment, e.g., government bonds) as well as the inability to attract FDI into knowledge/capital intensive sectors. At the same time, SMEs reported that limitations to their investment activities between 2006 and 2007 resulted from: lack of access to capital for investing (33 percent); high risk of legal changes and resulting instability (27 percent); and lack of market demand (24 percent) (PARP, 2008). Lack of access to capital for investment seems to be a factor only for new firms (start-ups) that face difficulties in getting credit (PARP, 2010). Finally, tax and accounting rules (i.e., taxation of reinvested profits or depreciation rules, etc.) may not encourage the reinvestment of corporate profits (OECD, 2003). Certainly, the investment performance at the aggregate level seems to reflect heterogeneity among companies.

82. **As evidenced earlier, in Poland medium and large firms invest more than small firms.** Corporate investment in Poland was found to be sensitive to the availability of internal funds, in particular for medium and large companies (for details on the investment regression, see Annex 11). Large and medium companies, which are responsible for almost all investments in Poland, rely more on foreign credit than small ones. At the same time, the availability of credit (the extent to which firms can use domestic and foreign credit) is most critical for the investment of small firms. Investments of all firms are sensitive to changes in demand and cyclical conditions. Although retained earnings were the main driver of corporate investment, cyclical conditions and the availability of domestic bank financing stood behind recent developments of corporate investment (Figure 3.27). For instance nonfinancial corporate investment recently declined mainly because of reduced access to domestic credit and the economic slowdown.

**Figure 3.27 Corporate Investment Ratio,\(^a\) Poland, and Contributions to Changes (Percentage Points), 2005–11**

\(^a\)Investment to tangible fixed assets.

Based on CSO data.

Note: Estimate is based on Poland’s specific regression presented in Annex 11.

Are current trends in household and corporate savings sustainable?

83. **Sustained growth of household savings requires policy action.** In the short term, household saving in Poland will be supported by the cyclical rebounds and relaxation in the supply of credit. However, reduced uncertainty, continued fiscal consolidation, and low interest rates are likely to act in the opposite direction. In the long term, downward pressure on household savings will come from an aging population. Therefore, a sustained increase in household saving would require Polish policymakers to create an environment that would support the growth of disposable income (and higher education levels) and make it easier to save. Broad areas of government policy could be labor market and education policies, subsidies and tax incentives for private saving and changes in financial sector operation and regulation. A rise in the budget deficit is not a viable option. If the proposed policy measures result in a wider fiscal deficit, this will offset a part of the increased household savings, since Ricardian effects of the increased deficit will only induce very little additional household saving. Thus total national savings will be reduced from the initial response by virtually the entire fiscal cost of the measures.

84. **Sustaining an increase in corporate saving may be difficult if there are pressures to increase wages.** A major question is whether the increase in corporate saving is largely a temporary phenomenon that is likely to be reversed in the next few years or whether it represents a fundamental change in corporate behavior. Here the profit outlook is critical. In the case of Poland, part of the increase in corporate profitability may not be temporary; corporate profits have greatly benefited from a rise in gross operating surplus rather than from such temporary factors as low interest rates, a cyclical upturn, or reductions in corporate tax payments. Thus if the healthy growth in the corporate sector value-added is sustained while wage growth remains under control, corporate saving is likely stay high. As society ages however, wages are likely to rise, as labour becomes scarcer. This may reduce corporate saving but is likely to push up household and government saving. And there will be nothing wrong about this, as the corporate savings are only useful in an aging society if some way is found of investing them for the benefit of the old. Either pension funds have to acquire these savings or the government has to tax the earnings on them and redistribute them as pensions.

85. **There are other ways to enhance business profitability than cost reduction.** To increase corporate profitability in a sustainable way, the government would need to take a strategic approach to further improving competitiveness: ensure that labor markets remain flexible (e.g., reduce barriers to entry to the labor market); reduce business compliance costs (by improving the business environment; adopting a positive migration policy; ensure that state-owned businesses are operating as efficiently as possible; if necessary looking to heightened levels of private provision of services; and finally keep capital and goods markets open.

86. **There is a role for the financial sector in channeling funds more efficiently to the right users and uses.** The structure of Poland’s business sector has an impact on investment. A corollary to the dominance of small enterprises is lower and probably less efficient investment than could be the case. Small companies invest very little, despite their ability to generate savings. While the large companies have access to Polish and foreign capital markets, small and medium enterprises tend to rely for their needs on the banking system or on family members and retained earnings. Well-funded banks, offering local currency credit on reasonable terms, are probably vital for this sector’s prosperity. Demand for such borrowing and for longer maturities should rise if interest rates on zloty loans can be kept at or below the current levels. But ensuring that the banks have funds to lend is partly a function of private sector savings. A core function of Polish financial system—to efficiently match savings with long-term investment opportunities—should be strengthened.
CHAPTER 4
MOBILIZING SAVING – THE ROLE OF THE PUBLIC SECTOR
Mobilizing Saving – the Role of the Public Sector

87. Some government policies may function as disincentives to private saving. Many policies will have unintended impacts on individual saving choices. So should the government change any policies to support, rather than hinder, good saving decisions by individuals, households, and businesses?

Poland’s tax structure from a savings perspective

88. Poland taxes income from labor and capital as it is earned or realized, but does not tax retirement savings. In Poland both labor and capital income (interest, dividends, capital gains, etc.) are subject to the personal income tax (PIT). Capital gains are taxed when they are realized, interest and shareholder income by final withholding. Thus the system for taxing savings can broadly be described as a taxed-taxed-exempt (TTE) system. That is, the initial deposit or contribution to a fund is made from after-tax income (the first T), accumulation on the contribution is taxed (the second T), and the final distribution is exempt from tax (the E). Expenditure tax treatment applies, however, to voluntary private retirement savings (through either EET or TEE arrangements, see in Box 4.1).

Box 4.1. Taxes and saving: a brief overview

Typically, savings can be taxed at three stages: the moment that the contribution is made, when returns materialize (when investment income and capital gains accrue to the fund), and when funds are withdrawn or distributed. Taxation at any stage can be defined as T (full tax), t (partial tax—for instance when there is an offsetting tax credit), and E (exempt). The classical “comprehensive” tax model would apply a TTE rule to tax deposits, contributions, and earnings, but not withdrawals. Variations of this rule may cause substantial changes in returns to savings.

Most countries use a combination of three main types of tax regime:

- General income taxes, which apply to income from labor and certain forms of capital income (TTE)
- Payroll and social security taxes, which apply only to income from labor (TEE).
- Expenditure taxes (EET), such as value-added or excise tax

A major difference between income and expenditure taxes is that with the latter, income from saving (capital income) is allowed to compound through time before it is taxed, whereas if there is an income tax, it is taxed as it accrues. For this reason, with an expenditure tax, the after-tax return to savings is higher than with income tax. Moreover, in comparison with an income tax where certain forms of capital income are not taxed (e.g., capital gains, returns on owner-occupied housing) or are taxed at different rates (income from offshore investments, real interest income), expenditure taxation is applied equally to all forms of spending out of capital income and thus there is less incentive to invest in one form of capital rather than another because of differential tax treatment. In principle, expenditure tax treatment of savings would make the tax system neutral in decisions about consumption now or consumption later (Savings Working Group, 2011).

By contrast, an income tax (TTE) regime effectively imposes a higher tax on future than on current consumption.

There are two ways of achieving expenditure tax treatment of savings:

- Exempt-exempt-taxed (EET). Contributions are deductible, earnings are not taxed as they accrue, but distributions are taxed.
- Taxed-exempt-exempt (TEE). Contributions are not deductible but earnings are not taxed on accrual and distributions are exempt.

If tax rates are flat and constant through time, EET and TEE systems will both produce the same outcome. They would provide for expenditure tax treatment of saving and limit double taxation of income. In a progressive tax system, an EET system is in
practice likely to be more generous to the saver. Contributions are deductible at a person’s marginal rate. Withdrawals may be
taxed at lower rates, depending when they are made. This is particularly true for long-term savings; incomes are typically lower in
retirement.

Table B1. EET and TEE Post-tax Retirement Income Compared 1

<table>
<thead>
<tr>
<th></th>
<th>EET</th>
<th>TEE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-tax contribution (A)</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Tax (B)</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Post-tax initial asset (C=A-B)</td>
<td>100</td>
<td>75</td>
</tr>
<tr>
<td>Net accrued income (D)</td>
<td>33.1</td>
<td>24.8</td>
</tr>
<tr>
<td>Asset at retirement (E=C+D)</td>
<td>133.1</td>
<td>99.8</td>
</tr>
<tr>
<td>Tax on withdrawal (F)</td>
<td>33.3</td>
<td>-</td>
</tr>
<tr>
<td>Net pension income (G=E-F)</td>
<td>99.8</td>
<td>99.8</td>
</tr>
</tbody>
</table>

* memorandum: Net present value of total tax² 25 25

1 Assumptions: 10% pre-tax rate of return, 25% marginal tax rate, 3 years of investment.
2 Assumption: discount rate equals the rate of return.

89. Taxation of different forms of savings in Poland is uneven, which may sway preferences for one form or another.
In Poland, individuals carrying out business activities may opt for a 19 percent flat tax rate or have business income taxed using the progressive PIT regime.72 Royalties are also subject to the progressive PIT rate. Investment income, such as dividends, interest, and proceeds from sale of shares, is usually subject to a flat 19 percent withholding rate rather than the progressive rates, as are capital gains. Gains derived from the sale of real property, which in Poland is treated as a separate source of income from capital gains, that has been held for more than five years from the end of the year when it was purchased or built is exempt (Table 4.1). Investing in real estate has additional tax privileges because income from renting real estate may be taxed at a reduced rate of 8.5 percent on gross rental income.73 Preferential tax treatment for investment in real estate over other forms of saving may have incentivized Polish households to hold a larger proportion of their assets in houses than they would otherwise and may own several dwellings. Yet it is difficult to find good economic arguments for preferential tax treatment of one asset classes over another. A tax system that is not neutral with respect to the type of asset owned may encourage unproductive investment and create inequities. Two taxpayers earning the same amount of income on capital invested in different asset types may have very different tax burdens, and wealthy individuals may shield income by investing in tax-favored assets.

Table 4.1. Tax Rates on Income from Capital, Poland, 2012

<table>
<thead>
<tr>
<th>Main income taxes applicable to individuals in Poland</th>
<th>Dividend</th>
<th>Interest</th>
<th>Capital gains</th>
<th>Real Estate</th>
<th>Royalties</th>
<th>Rental income</th>
<th>Business income</th>
<th>Special expatriate regime</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>19%</td>
<td>19%</td>
<td>19%</td>
<td>0%</td>
<td>18%, 32%</td>
<td>8.5% or 18%; 32%</td>
<td>19% or 18%; 32%</td>
<td>20%**</td>
</tr>
</tbody>
</table>

* The lump sum tax is 8.5 percent.
** Only selected sources of income.
Source: Deloitte (2014), MoF.

72 Polish personal income tax rates are progressive; rates range from 18 to 32 percent.
73 Otherwise rental income is taxed at the progressive rates of 18–32 percent on net profits after costs.
90. While capital income is generally taxed in Poland at a lower rate than the OECD average, the rate is still higher than in other Visegrad countries. Tax rates on interest income from a deposit in OECD countries range from 50 percent in the United Kingdom to none in Estonia. Poland’s 19 percent rate is far below the OECD simple average of 27 percent. Ireland taxes dividends and capital gains on shares at the highest statutory rate in the OECD; Poland’s rate is close to the OECD average. However, capital income in Slovakia, the Czech Republic, and Hungary is taxed at lower rates (see Figure 4.1). At the individual level, Greece, New Zealand, and Switzerland do not tax capital gains on either shares or real property except in particular circumstances, such as on assets bought for the purposes of resale. Belgium, Korea, and Mexico do not tax gains on shares realized by individuals.

91. Several OECD countries apply a holding period test that reduces or eliminates taxation of capital gains on an asset that has been held for at least a specified period. The length and nature of these tests differ considerably between countries. The most common impact of a holding period test is that capital gains on assets held for longer than the fixed period are exempt from taxation. Other OECD countries give more favorable tax treatment to gains on assets that are realized after the holding period expires, removing penalty rates that applied earlier or applying a reduced rate. In Poland, the holding period applies only to real property, but is relatively short (5 years) compared to other countries (e.g., 15 years in Hungary, 20 years in Slovenia, 30 years in France).

Figure 4.1. Tax Rates for Individuals on Capital Gains, Dividends, and Interest, OECD, 2012

92. Poland has different methods of taxing retirement savings depending on the choice of savings vehicle. The system applies an exempt-exempt-taxed (EET) scheme to second pillar pensions and to two third-pillar pension schemes (employee pension programs, PPEs, and individual pension security accounts, IKZEs). For these schemes there are different exemptions for contributions and different tax rates applied at the withdrawal stage (see Table 4.2). In contrast, individual pension accounts (IKEs) get prepaid expenditure tax treatment (TEE). These are savings out of income already taxed, but there is no tax on the fund’s investment return and on withdrawals. In the TEE system a post-tax rate of return on saving may not be the same as the pre-tax rate if an individual pays different marginal rates while working and in retirement.

---

74 Gains on shares are taxed if held for less than six months in the Czech Republic and Luxembourg; one year in Australia, Chile, Turkey, and the United States; five years in Hungary; ten years in Finland, and twenty years in Sweden.

75 Partial inclusion of gains from long-held assets: In Australia, gains on assets held for at least a year qualify for a partial exemption from taxation. Gains on assets held for less than a year are fully taxable at marginal rates.

76 The new Polish social insurance system is composed of three pillars. Each has different characteristics:

- First pillar: obligatory, common, based on the pay-as-you-go (PAYG) principle, administered by the state (Social Insurance Institution, ZUS); Second pillar: obligatory, common capital, managed by private entities (open pension funds); Third pillar: additional, voluntary capital, managed by private entities (individual retirement accounts and employee pension schemes).
Table 4.2 Tax Treatment of Private Retirement Schemes (PPE, IKE, and IKZE), Poland

<table>
<thead>
<tr>
<th>When contributing to scheme:</th>
<th>PPE (EET)</th>
<th>IKE (TEE)</th>
<th>IKZE (EET)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employer contributions are tax deductible up to 7% of employee salaries; individual additional contributions are also tax-deductible.</td>
<td>Contributions are made from income already taxed. There is an annual cap (300% of average monthly gross salary in the economy) on contributions entitled to tax exemption on investment income and pension pay-out.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>When investment returns are earned if income is not withdrawn from scheme:</td>
<td>Exempt</td>
<td>Exempt</td>
<td>Exempt</td>
</tr>
<tr>
<td>When savings are encashed/money withdrawn/pensions are paid:</td>
<td>Standard PIT tax rates, 18% -32%, apply.</td>
<td>Exempt if withdrawal is by a woman aged at least 55 or a man aged at least 60. For earlier claims (partial withdrawals available after 2009) standard PIT 18–32% tax rates apply.</td>
<td>10% for lump sum pay-out and for instalment or lifelong pay-outs for people aged at least 65. For earlier withdrawals, standard PIT 18–32% tax rates apply.</td>
</tr>
</tbody>
</table>

\(^1\) Until 2013 the annual cap on contributions paid in IKZE pension account was 30 average monthly gross wages in the economy.


93. In most European and other OECD countries, tax treatment of retirement savings is EET. A large majority of OECD countries apply some variant of an expenditure tax regime to retirement saving. As shown by Yoo and de Serres (2004), EET schemes dominate, having been adopted by 22 of the 30 countries studied. Since 2004 the situation has not changed much: in Europe EET is the main tax treatment whether for occupational pension schemes or for private life insurance (CEA 2007).

94. Most instruments created to encourage non-retirement saving only tax contributions and block funds for relatively long periods. Maffini (2007) documents the type of taxation for different non-pension savings instruments in 10 OECD countries (see Table 4.3). These non-pension programs are often designed to encourage long-term saving (for instance, education and child accounts) and to insure against certain shocks (unemployment, illness, or death). Some of them target specific income groups, such as the UK’s Saving Gateway, which offers matching funds for low-income savers. Though some of the programs no longer exist (for instance, the Netherlands’ Premium Saving Scheme, Norway’s tax-favored savings in shares, and the UK’s Personal Equity Plans (PEPs) and Tax-exempt Special Savings (TESSAs)), the Maffini study offers an interesting insight into how people respond to such programs, who benefits from them more, and how much they cost. As the table summarizes, most countries apply the TEE rule, taxing contributions but not capital gains or withdrawals. Moreover, in most cases funds are blocked either for a set period (3 months to 7 years), or until a particular event takes place (for education and health accounts, and life insurance). Finally, several countries offer additional direct state support for individual non-pension savings (e.g., Germany, Austria, Canada, and the UK).
Table 4.3. Basic Features of Tax-favored non-pension accounts, 10 OECD Countries

<table>
<thead>
<tr>
<th>Country instrument</th>
<th>Taxation Rule Blocks on Accounts</th>
<th>Income Caps</th>
<th>Matching Contributions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Belgium</strong>&lt;sup&gt;a&lt;/sup&gt; Tax-preferred deposit accounts</td>
<td>Contributions</td>
<td>Earnings</td>
<td>Withdrawals</td>
</tr>
<tr>
<td>Belgium</td>
<td>T</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td><strong>Canada</strong> Registered Education Savings Plans (RESPs)</td>
<td>T</td>
<td>E</td>
<td>t&lt;sup&gt;(1)&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Denmark</strong> Savings accounts for children/ grandchildren</td>
<td>T</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td><strong>Germany</strong>&lt;sup&gt;a&lt;/sup&gt; Employee savings bonus</td>
<td>T</td>
<td>T</td>
<td>E</td>
</tr>
<tr>
<td><strong>Ireland</strong>&lt;sup&gt;b&lt;/sup&gt; Special Savings Incentive Accounts (SSIAs), Special Savings Accounts (SSAs), Special Terms Accounts (STAs)</td>
<td>T</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td><strong>Italy</strong> Life insurance contracts</td>
<td>T</td>
<td>E</td>
<td>T</td>
</tr>
<tr>
<td><strong>The Netherlands</strong> Premium saving schemes, Payroll saving schemes</td>
<td>T</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td><strong>Norway</strong> Tax-favored savings in shares</td>
<td>T</td>
<td>t&lt;sup&gt;(2)&lt;/sup&gt;</td>
<td>E</td>
</tr>
<tr>
<td><strong>UK</strong>&lt;sup&gt;a&lt;/sup&gt; Tax-exempt Special Savings (TESSAs), Personal Equity Plans (PEPs), Individual Savings Accounts (ISAs), Saving Gateway (SG), Child Trust Fund</td>
<td>T</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td><strong>USA</strong>&lt;sup&gt;c&lt;/sup&gt; Coverdell Educational Savings Accounts (ESAs), 529 plans, Tax-preferred life insurance contacts</td>
<td>T</td>
<td>E</td>
<td>E</td>
</tr>
</tbody>
</table>

Notes:
- Excluding life insurance contracts
- Excluding investment savings accounts
- Excluding health savings accounts
- (1): Withdrawals are taxed at the student’s income tax rate (2): Earnings receive a tax credit of 15%
Can tax changes increase national saving?

95. It is hard to measure how changes to net returns on saving—either through lowering the tax on capital income or introducing tax-favored accounts—will affect saving behavior. Tax on capital income reduces the after-tax rate of return on savings. It is well known that the direction of changes in private saving in response to changes in the after-tax interest rate cannot be determined theoretically. Savings could either rise or fall after the tax rate on them is reduced because of offsetting substitution and income effects. The extent to which savings would be affected by the tax would normally depend on the interest elasticity of savings. Unfortunately, empirical estimates of elasticity have ranged widely, from almost zero to relatively high values, raising doubt about where the true value might lie. Even if the true interest elasticity of savings is low, it would not necessarily follow that the efficiency cost of taxing capital income would be low, because again the substitution and income effects might offset each other. While savings could be reduced by the tax-induced lowering of the after-tax rate of return on savings, the saver is rendered poorer by the tax, and for this reason alone could decide to save more to provide for the same amount of consumption in the future. The observed net impact on savings may thus be small, even though the substitution effect—and the efficiency cost—of the tax could well be large.

96. The total effect on saving depends on the saver’s personal characteristics (such as impatience) as well as on the interaction between returns on saving, the taxation system, and the income thresholds for accessing public safety nets. For instance, if an account offers higher returns (via a tax credit, for example) on a capped contribution amount, but an individual is willing to save at least an equal amount without such a policy, the income effect will dominate since the individual’s total income will be higher even if he or she does not save more. If, in contrast, higher returns are offset by a higher tax on pension income, thus leaving lifetime income unchanged, the substitution effect would dominate and savings would increase. Moreover, the choice of saving instrument also depends on the tax rate that applies to individuals at different points in the lifecycle. A high-income worker with a high marginal tax rate might prefer to save in a tax-favored pension account if the marginal tax rate at retirement is lower, thus smoothing the rates between active and retirement years. Finally, eligibility for social programs is likely to influence the decision to save, depending on how means-tested programs take savings into account. If returns on savings increase total measured income and reduce the entitlement for benefits, such programs actually create disincentives to save, while, if savings are excluded from income calculations, there might be more incentives to save. For example, in the UK, employer pension contributions are excluded from income measures that determine social security and tax credit entitlements as well as for housing and council tax benefits (Crossley, Emmerson and Leicester, 2012).

97. Although assessing the impact of tax-favored instruments is difficult, a few observations can be found in the literature. For instance, participation in tax-favored accounts is positively related to household income. Maffini (2007) compared the plans offered in Belgium, Canada, Italy, the Netherlands, the UK, and the US and found that, although the instruments differ considerably (see Table 4.3), all participation rates increase with income. However, in Italy (life insurance contracts) and in the UK (Individual Savings Accounts), a large number of middle-income individuals participated.

98. Furthermore, Maffini (2007) found that while absolute contribution amounts increase with income, contributions as a share of total income decrease. This is the case in Belgium, Canada, Italy, the Netherlands, Norway,

77 Because an increase in the after-tax interest rate increases the incentive to save, people will tend to substitute away from current consumption toward savings. At the same time, it makes those who save able to afford more consumption in all periods, and this income effect will tend to encourage them to increase current consumption—which will reduce savings. The net effects of a decrease in taxes on private saving will depend on these offsetting income and substitution effects and on the time profile of an individual’s earnings.

78 An often-cited early study that found a high interest elasticity of savings was by Boskin (1978); Blinder (1975), however, found a low elasticity. Reviewing the empirical evidence, Auerbach and Slmom (1997) argued that the elasticity is probably close to zero. Tanzi and Zee (2000) provided statistically significant evidence on the impact of taxes on household savings behavior in a large sample of OECD countries. Two years later Bernheim (2002) argued that the elasticity lies somewhere between 0 and 1, but later Attanasio and Wakefield (2010) found the range to be between 0.4 and 1 (the higher the number, the more people save in response to changes in the after-tax interest rate).

79 See Summers (1981) for a well-known study on the dynamic effects of taxing capital income.
and the UK. As he explained, the positive relation between income and participation can be the result of several factors: (1) Low-income individuals are taxed at a lower rate, so tax exemptions and credits represent a lower marginal gain for them than for those with higher incomes. (2) Liquidity constraints typically prevent low-income individuals from reducing their consumption in order to save more. (3) Since many of the programs analyzed are offered through employers, low-income individuals working for small firms or in temporary jobs might not have access to them. Nevertheless, low-income individuals tend to contribute higher shares of their income than higher-income individuals. (4) Finally, low-income individuals tend to consume all their income. It may be that the richer have other vehicles for their savings, and what is being observed is just contributions to particular tax-favored schemes.

99. The question of who participates in these programs—and thus who benefits from them—is important for at least two reasons: (1) Such tax benefits represent a cost to the public sector in terms of tax revenues foregone. As a result, participation by higher-income individuals represents a much larger loss of tax revenues than participation by those who would pay less tax anyway because they earn less. (2) Because higher-income individuals are more likely to save without any incentives, creating special instruments for encouraging savings will not necessarily increase aggregate saving if those who participate have higher incomes. Moreover, such incentives will not help to protect low-income individuals from income risk (unemployment, illness) or from old age poverty, which would place the financial burden on the state. Finally, because participants are more likely to be educated and have higher incomes, education savings funds might not accomplish their goal of increasing access to higher education for low-income families.

100. Regarding the efficiency of these programs, Maffini (2007) found that the cost of implementing them varies widely, primarily depending on the type of incentive offered. Although it is difficult to compare these programs because their features differ so much, there are a few common threads. For example, programs that offer tax credits (as in Belgium, Italy and Norway) have the highest expenditure per person. The savings bonuses offered in Canada in the Registered Education Savings Plans (RESPs) are quite generous (on average Can$221 per account, though they decrease with income) and the cap on contributions is relatively high (Can$4,000 per year or Can$42,000 total). In Germany, on the other hand, the government offers the program only to low-income individuals, caps for contributions eligible for the match are low (€470 for housing and €400 for equity), and the matching rates are reasonable (9 percent and 18 percent). Moreover, earnings realized are taxable.

101. In Poland tax spending on private pensions is small. Tax exemptions offered in Poland to support private pension programs (PPE, IKE, and IKZE) amount only to 0.015 percent of GDP annually (Table 4.4), largely because the use of these schemes is so small (see below). The costs of tax preferences designed to mobilize private pension saving are much higher in other EU countries. In the Czech Republic and Germany (Riester-pension), tax expenditure on supplementary private pension plans costs about 0.15 percent of GDP but in Sweden, the UK, and Finland state support for private pension plans exceeds 0.5 percent of GDP. In these cases, however, public support also includes direct subsidies in the form of matching or lump-sum contributions.

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80 For instance Gale and Scholz (1993) found for the US that the median net worth in 1986 of households holding Individual Retirement Accounts (IRAs) was four times larger than that of households not holding IRAs.
### Table 4.4. Costs of tax exemption for private pension programs, Poland

<table>
<thead>
<tr>
<th>Year</th>
<th>PPE</th>
<th>IKE</th>
<th>IKZE</th>
<th>Total Voluntary Pension Programs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2011</td>
<td>2012</td>
<td>2012</td>
<td>PLN million</td>
</tr>
<tr>
<td>Contributions paid within a year</td>
<td>1,072</td>
<td>666</td>
<td>47</td>
<td>1,785</td>
</tr>
<tr>
<td>Total assets</td>
<td>6,598</td>
<td>3,530</td>
<td>53</td>
<td>10,181</td>
</tr>
<tr>
<td>Exemption from tax on earned income (PIT, CIT)</td>
<td>204</td>
<td>0</td>
<td>8.5</td>
<td>212</td>
</tr>
<tr>
<td>Exemption from tax on capital gains</td>
<td>6.5</td>
<td>3.5</td>
<td>0.0</td>
<td>10.0</td>
</tr>
<tr>
<td>Total tax expenditure (PLN million)</td>
<td>210</td>
<td>4</td>
<td>8</td>
<td>222</td>
</tr>
<tr>
<td>Total tax expenditure (% GDP)</td>
<td>0.014</td>
<td>0.000</td>
<td>0.001</td>
<td>0.015</td>
</tr>
</tbody>
</table>

**Notes:**
- Data on PPE are from 2011 and for IKE and IKZE from 2012.
- Amount of tax relief on capital gains applied to PPE and IKE accounts come from “Tax Exemption in Poland in 2011,” published by the MoF. The amount of exemption from tax on capital gains depends heavily on returns from the financial assets and thus can vary considerably from year to year.
- In calculating the tax exemption on PPE contributions paid by employers, the standard CIT tax rate of 19 percent was applied.
- In calculating the tax exemption on IKZE contributions paid by employees, the lower PIT tax rate of 19 percent was applied. This is a lower band of actual tax relief since annual earnings of at least some owners of IKZE pension accounts can exceed the first PIT threshold and in effect be subjected to the higher 32 percent PIT tax rate.

**Source:** Based on Polish Financial Supervision Authority (KNF) and MoF.

102. **The evidence on whether tax incentives increase aggregate savings is quite mixed.** At the macro level, Loayza, Schmidt-Hebbel, and Servén (2000b) looked at the drivers of private saving behavior across countries and found that “the real interest rate has a negative impact on the private saving rate, suggesting that its income effect outweighs the sum of its substitution and human-wealth effects.” In addition, our empirical results, based on selected OECD countries and Polish time series (presented in Chapter 3) confirm the negative impact of the real interest rate on the private saving rate. Since tax incentives are functionally equivalent to a higher real interest rate, in order to generate new saving, savings instruments with additional incentives need to offset the income effect. A few micro-level studies have attempted to gauge the extent of new savings created by tax-favored instruments like retirement pensions and special savings accounts. Because of data availability problems elsewhere, they mostly look at the US and the UK. As discussed earlier, this assessment is complicated by the fact that higher savings for a particular instrument could result from either overall higher saving or from a reallocation of savings with no additional saving. In the absence of a valid counterfactual, it is difficult to know whether these instruments have a causal effect on saving behavior, since many individuals who are eligible and participate in such programs might display different saving behavior than those who do not participate. As a result, most studies suffer from potential biases due to an inability to control for unobservable factors. Without being exhaustive, this review highlights a few common findings that provide some insight into the likely effect of these instruments.
103. **So far, saving incentives have not been effective in motivating Polish households.** Ten years after the first private voluntary pension scheme was established, total assets of all Polish voluntary private pension accounts together amounted to only PLN 11.9 billion, the equivalent of 0.75 percent of GDP (see Figure 4.2). The low participation rates in such schemes are confirmed by both the low coverage rate of existing tax-preferred voluntary pension schemes (coverage of economically active people in IKE is now less than 5 percent; see Chapter 5, Figure 5.16) and the low share of regular contributors to IKE and IKZE accounts. The main reasons for the poor performance of the third pension pillar are discussed in more detail in Chapter 5.

**Figure 4.2. Poland: Assets of all voluntary pension plans, accumulated 2002–12 (PLN bln)**

Source: Polish Financial Supervision Authority.

104. **How a saving program is designed may influence its acceptance.** Tax preferences often come with contribution limits. These may be attractive in distributional and fiscal terms because they restrict benefits for better-off households, but they can also undermine both incentive and efficiency effects (New Zealand Treasury, 2010a). In particular, when there is a contribution limit, marginal incentives for those saving at or above the limit are unchanged. For this group, mainly better-off households, there is simply a windfall gain—an income effect but no substitution effect. This group may simply shift existing investments into the tax-preferred forms. Indeed, a reasonable response would be to save less, since a given level of future consumption can be funded with a lower rate of saving.

105. **There is some evidence that tax-favored instruments generate new saving only at lower income levels.** A few studies, starting with Poterba, Venti, and Wise (1996) and Engen, Gale, and Scholz (1996), have looked at how 401(k) accounts in the US affect overall saving. Poterba, Venti, and Wise (1996) took the fact that access to these plans depends on the employer as the basis for claiming that eligibility for the plans is exogenous. They found a positive correlation between being eligible for a plan and total financial wealth, but no correlation between being eligible and non-401(k) financial wealth; they therefore concluded that having access to 401(k) plans results in new saving. However, Engen, Gale, and Scholz (1996) questioned the exogeneity claim and attempted to compare more similar groups of eligible and ineligible individuals; they restricted the control group sample to those who do not have 401(k) plans but do have Individual Retirement Accounts (IRAs). Restricting the sample to comparable individuals yielded very different results: the trend in financial wealth accumulation for eligible individuals is negative, whereas it is positive for ineligible individuals.81 Using a similar approach, Benjamin (2003) and Chernozhukov and Hansen (2004) find that a fraction of the increase in a 401(k) contribution by low-income individuals does represent new saving (about one quarter, according to Benjamin 2003), whereas higher-income individuals merely transferred funds from other accounts into 401(k)s. Attanasio and DeLeire (2002) also looked at patterns in spending growth for individuals who open an IRA and those who already have one and found no significant difference between the two, which suggests that no new saving takes place. For the UK, Attanasio, Banks, and Wakefield (2005) looked at the impact of Tax-exempt Special Savings (TESSAs) and Individual Savings Accounts (ISAs); and Disney, Emmerson, and Wakefield (2010) looked at the 1999 pension reform. Both found that the instruments create incentives for portfolio reallocation but do not

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81 The study is also affected by a potential bias due to a change in eligibility for IRAs that took place in 1986.
increase overall saving. Finally, for Canada, Milligan et al. (2003) found that an increase in the pension fund contribution limit actually decreased saving for younger cohorts, possibly because people prefer to save larger amounts as they get closer to retirement age.82

106. Although taxes tend to have more impact on how people save than on how much, tax changes can promote increased and more efficient national saving. International evidence suggests that tax is likely to have only a modest impact on how much people save and invest but can have a very significant impact on how they do so. In addition, there is also the impact of the tax expenditure on government savings, another component of national saving. It may cost more to give the incentive than it generates. Poland’s policy makers should therefore review current taxation of capital gains and also evaluate how effective and efficient state support of retirement saving schemes is in delivering the expected results. Introduction of a holding test for gains on shares and an extension of the test for gains on real property should be considered. The authorities should also investigate why private retirement savings in Poland are low, considering that the low replacement rates should be an incentive, and based on the result redesign public support to third-pillar pension schemes. The obstacles to growth of the third pillar must be more than the low tax incentives offered. There are at least three groups of questions that need to be asked.

1. Does tax relief actually work as an incentive? Is there evidence that it encourages people to begin to save, or to save more? Or would the people who receive it have chosen to save in any case?

2. Does tax relief incentivize the right people to opt into the right forms of saving? Does it have any positive effect on people who are currently not saving enough for retirement? And does it encourage people to save in forms that are appropriate for their needs?

3. Are the incentives fairly distributed? To what degree should those on low and average incomes benefit from incentives compared with wealthier individuals?

4. And finally, what is the best way to deal with ‘pension poverty’? To what extent should a government support this group through incentives for higher savings rather than larger fiscal transfers? What is the relative cost of doing the former as compared to the latter?

Do transfers and public services create disincentives to private saving?

107. In Poland transfer payments and publicly provided services seem not to create major disincentives to private saving. Some areas of government expenditure could reduce household saving for lifecycle (the pension system) or precautionary reasons (the social safety net or health services). Because households generally build up and draw down savings over long periods of time, the largest impact on household saving is likely to come from policies that affect lifecycle saving. The design of the public pension system and public health system should help encourage households to save. The pension reform since 1999, which brought a switch from defined benefit to defined contribution and thus reduced the expected final-salary replacement, has incentivized individuals to save to fund retirement. Lachowska and Myck (2014) found that after the 1999 reform the pension system crowded out savings to a lesser extent than had been the case before the reform.83 This is confirmed by surveys investigating the saving motives of Polish households. Providing for old age is one of the most important motives, but almost equal to that is accumulating money in order to be able to afford necessary medical treatment (Figure 4.3). This is not surprising considering that the Polish health-care system is characterized by low public spending, heavy out-of-pocket payments, and long waiting lists that generate inequalities in access to care.

82 Indeed, saving instruments like pension funds and other long-term deposit accounts (or assets like housing) would not be preferred vehicles without tax advantages because they are less liquid than other forms of saving.

83 Myck found considerable crowding-out effects (one additional Polish zloty, or PLN, of pension wealth crowds out about 0.30–0.60 PLN) in household saving. The responses were also heterogeneous: he found complete crowding-out of saving for older and middle-aged cohorts while the crowding-out for younger cohorts affected by the 1999 reform was about one-third. His findings suggest that for older households still under the defined benefit pension system, pension wealth and private saving are nearly perfect substitutes.
**Government as saver**

108. **Although the quickest way for government to improve national saving would be to increase how much it saves, this should not be a goal in itself.** The recent global financial and sovereign debt crisis has shown that fiscal policy is crucial to stabilizing the economy through the operation of automatic stabilizers in exceptional circumstances where monetary policy alone cannot respond fast enough or forcefully enough. The government’s fiscal stimulus during the crisis is a prime example of this. The government stepped in to support aggregate demand when the private sector retreated, and has a credible strategy for returning the budget to surplus as the economy recovers to trend growth. Another crucial objective of fiscal policy is fiscal sustainability. This is particularly important at this time of continuing global economic uncertainty and when fiscal deficits and high national debt have been a proximate cause of distress in many countries. Fiscal sustainability is also essential to keeping the economy stable, reducing economic vulnerabilities, and achieving sustained growth in living standards. Finally, government activity affects the economy in many ways. For instance, it contributes to economic output when it provides services to the public and when it invests, as well as affecting the economy through taxes and incentives for various business activities. Last but not least, government affects the economy through its own saving.

109. **The government has been dis-saving for some time, although fiscal deficits are forecast to decline in the next few years.** Assuming that public investment is not likely to increase much from its current high level, a better fiscal position should lead to more government saving (definitions of government saving are presented in Box 4.2). If the government adjustment plan is implemented, a significant and enduring increase in public saving is likely to materialize that will ultimately stabilize the level of public debt. Over the long term, however, Poland’s fiscal challenges will become more formidable. An aging population will put pressure on the fiscal position if age-related spending is not contained or offset. Policies chosen to improve the fiscal and saving positions may also affect economic growth. Reductions in spending in growth-enhancing areas (e.g., investment) or income tax increases would be likely to slow growth, and income convergence, and thus have an impact on private savings. It is good to keep in mind that the tax increases which may be needed as a mechanism for transferring income within society from the young to the growing number of old could also reduce private savings.
Box 4.2. Measures of Government Saving

Gross government saving equals general government disposable income minus its final consumption. It also equals general government current receipts minus current spending (except depreciation).

Net lending or borrowing equals the net operating balance minus the net acquisition of nonfinancial assets. It is also equal to the net acquisition of financial assets minus the net incurrence of liabilities. Net lending means that government is providing financial resources to other sectors and net borrowing means that other sectors are providing financial resources to the government.

The gross operating balance equals revenue minus expenses other than consumption of fixed capital. It is comparable to the national accounting concept of saving plus net capital transfers receivable. The net operating balance equals revenue minus expense (see Annex 12 for more definitions).

1) The net acquisition of nonfinancial assets (net capital investment) measures the change in government’s stock of non-financial assets due to transactions. As such, it measures the net effect of purchases, sales and consumption (for example, depreciation of fixed assets and use of inventory) of non-financial assets during an accounting period. Net acquisition of non-financial assets equals gross fixed capital formation, less depreciation, plus changes (investment) in inventories, plus other transactions in non-financial assets.

Why has the government not been saving?

110. Except for 2006–08, the Polish government has been dis-saving since 2000. The dis-saving reflects both effects of the economic cycle and policy-driven tax reductions and spending increases. In the periods of stronger GDP growth (1995–98 and 2005–08), the government saving position was positive (see Figure 4.4). In the period of cyclical slowdowns, deterioration of the saving position resulted from both the working of automatic stabilizers and discretionary, countercyclical policy action (i.e., increases in government spending and cuts in taxes). For instance, there was a sizable deterioration in the savings position, by about 4 percentage points of GDP, between 2008 and 2010, partly because of Poland’s sluggish economic growth, but also because there was a cut in the tax wedge coupled by increased government spending, including significant increases in public sector wages and generous indexation of pensions (Figure 4.5). The countercyclical response was strengthened by scaling up public investment, which pushed the government deficit to almost 8 percent of GDP in 2010. With the growth rebound in 2011, the government launched fiscal consolidation. Public saving was brought close to balance mainly through a combination of revenue and expenditure adjustments that was also helped by cyclical factors. However, the deterioration in the economic outlook and a significant, although possibly temporary, drop in revenues in 2013 have partly reversed the previous efforts.

84 The wedge was cut by introduction of a child tax credit in 2007, reductions in social security contribution rates in 2007–08 and simplification and lowering of PIT rates in 2009.

85 On the revenue side, the main measures were (1) a change in the pension system that shifted 5 percentage points of the contribution from the funded second pillar to the first pillar; (2) a 1 percentage point increase in the VAT statutory rate; (3) a 2 percentage points increase in the disability contributions paid by employers; (4) a new tax on copper and silver; and (5) revenues from the auction of CO2 emission rights. Growth in government spending was contained by (1) a temporary fiscal rule limiting increases in all discretionary expenditure items to 1 percentage point over the rate of inflation (CPI); (2) a nominal freeze of the budgeted wage bill; and (3) phasing out of early retirement schemes.
111. Despite the weak saving position the authorities have kept public investment growing above the rate of GDP growth. In recent years Poland has notably boosted public investment, from 3 percent of GDP in 2000 to over 5 percent in 2010–11. Helped by EU funds, Poland has recently invested much more than the average of EU-OECD countries, although in line with some other new member states such as Estonia, the Czech Republic, and Slovakia. Despite the recent growth of spending, however, the investment gap is still large, especially in infrastructure. The starting point of Poland’s capital spending was very low, with most going generally for maintenance and no new investment for many years, and even the spending on maintenance was not sufficient to avoid the degradation of existing infrastructure.

112. Negative saving coupled with high investment has pushed up government debt, although it is still sustainable. Because Poland borrowed to invest and cover the government saving gap, its debt went up from 49 percent of GDP in 1995 to 55.6 percent in 2012. If the debt is not managed carefully, it may become unsustainable, which would curtail the positive effects of public investment and further expose the country to external shocks. Poland does not appear to face a risk of fiscal stress in the short run; debt is projected to remain sustainable and the saving position should return to balance (the link between fiscal sustainability and government saving is discussed in Box 4.3). The deficit is projected to decline to about 3 percent of GDP in 2015, and the government is expected to pursue further fiscal consolidation to gradually reduce the structural deficit toward its medium-term objective (MTO) of 1 percent in the next few years. This should improve the savings position, assuming that the government holds public investment to the current level. As an effect of the planned fiscal consolidation, the transfer of pension fund assets (about 8.5 percent of GDP) from the privately managed pillar, debt will fall below 50 percent of GDP in 2015. However, the risk of fiscal stress could return if the structural and underlying balance revert to the lower values seen in the past, such as the average for 1998–2012 (EC 2012). Challenges to the sustainability of Polish public finances tend to be long-term. The government saving position is likely to deteriorate in the long term if increased age-related spending is not contained or properly offset. The next section discusses age-related pressure and their impact on fiscal sustainability and thus also the future savings position of the government.
Box 4.3 Defining fiscal sustainability and linking it to government savings

What is meant here fiscal sustainability? Here are several definitions:

- “The ability of the government to meet both current and future obligations” (Barker 2008)
- “Whether a country’s debt can be serviced without an unrealistically large future correction in the balance of income and expenditure” (IMF 2002)
- “Can the current course of fiscal policy be sustained, without exploding debt? Or will the government have to sharply increase taxes, decrease spending, have recourse to monetization, or even repudiation?” (Blanchard 1990).

One common and practical approach to assess fiscal sustainability is to use government debt at a given point as a benchmark to distinguish a sustainable fiscal position from an unsustainable one. Another approach is to look at government’s liability position. It is sustainable if, given the costs of financing it faces in the market, it satisfies the present value budget constraint without a major correction in the balance of income and spending. To portray the link between fiscal sustainability and the government saving position, the simplest approach was used to measure sustainability: the current primary fiscal balance is compared with what would be needed to maintain current debt levels. A standard debt-dynamics equation 2 is this:

$$b_1 = \left( 1 + \frac{n_t}{1 + g_t(1 + \pi_t)} \right) * b_{t-1} - x_t$$

where $n$ - effective interest rate, $g$ = real GDP growth, $\pi$ = inflation rate, $b$ = current government debt, $x = $ primary balance (total revenue less expenditure excluding gross interest payments (ei)) as a percentage of GDP; and $t = $ time.

Based on this the primary balance and government saving position that are compatible with a constant debt ratio can be calculated:

$$b_1 = \left( 1 + \frac{n_t}{1 + g_t(1 + \pi_t)} \right) * b_{t-1} - x_t = \left( 1 + \frac{n_t}{1 + g_t(1 + \pi_t)} \right) * b_{t-1} - ((rc_t - ec_t) - (rcap_t - ecap_t))$ + $ei_t$$

$$b_1 = \left( 1 + \frac{n_t}{1 + g_t(1 + \pi_t)} \right) * b_{t-1} - (s_t - (rcap_t - ecap_t) + ei_t)$$

where $s = $ government saving, $rc = $ current revenue, $rcap = $ capital revenue, $ecap = $ capital spending, and $ec = $ current spending as a percentage of GDP.

These equations show that positive government saving is needed to finance public investment and cover the cost of debt servicing in order to avoid endangering fiscal sustainability.

<table>
<thead>
<tr>
<th>if $(1+n) \geq (1+g)(1+\pi)$</th>
<th>if $(1+n) &lt; (1+g)(1+\pi)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$(s_t) - (rcap_t - ecap_t) + ei_t \geq 0$</td>
<td>$-((b_1 - \left( 1 + \frac{n_t}{1 + g_t(1 + \pi_t)} \right) * b_{t-1})) &lt; (s_t) - (rcap_t - ecap_t) - ei_t &lt; 0$</td>
</tr>
</tbody>
</table>

The government’s objective to achieve the MTO (consistent with the deficit below the Maastricht threshold of 3 percent of GDP) helps to ensure fiscal sustainability. Keeping the deficit below 3 percent of GDP in coming years will help to stabilize or even reduce the ratio of public debt to GDP (as long as the GDP growth rate is above 1 percent and the effective interest rate is no higher than 3 percent). This also implies that to keep government investment at the current level of 4.5 percent of GDP, the government will need to generate positive saving of about 1.5 percent of GDP. This illustrative example shows that government fiscal objectives under the Stability and Growth Pact translate into even more ambitious savings targets: In coming years current
spending will need to be comfortably below current revenues, which given looming age-related pressures will be increasingly difficult to achieve.

Clearly assessing long-term fiscal sustainability is much more complex than the simple exercise above would suggest. More sophisticated analysis takes into account demographic changes and spending dynamics. For instance, Hasanhodzic and Kotlikoff (2013) uses both fiscal gap accounting, which discloses the amount of adjustment needed to restore sustainability, and generational accounting, which looks at the impact of current and implied policy on specific generations. These methods will be used later in the chapter.

1 However, the theoretical literature focuses on whether current policy can be continued into a distant future without threatening government solvency, which does not necessary imply that debt has to be leveled off
2 This means that the debt path is determined by the path of overall fiscal balances (or primary balances and the interest bill). In particular, the formulas abstract from the use of privatization proceeds; off-budget operations; gains and losses on (below-the-line) financial operations; or valuation changes due to exchange rate moves.
3 Assuming: rcap=0 of GDP, eit=2.5% of GDP, ecap=4.5% of GDP.

Does an aging population reduce government saving and jeopardize the sustainability of public finances?

113. Increases in age-related spending that must be financed by a shrinking work force could severely reduce government saving and undermine public financial sustainability. Age-related pressures will take a toll on both current revenue and current spending, thus leading to deterioration of the savings position and possibly endangering financial sustainability. The budgetary pressures will come largely from spending on health and long-term care (LTC). Combined public health and LTC spending, currently about 5 percent of GDP, is projected to reach 7.2 percent in 2060 in a standard cost containment scenario in which policies are assumed to be more effective than in the past in reining in expenditure growth (see Figure 4.6). In a cost-pressure scenario, which assumes that there will be no stepped-up policy action, this type of spending could reach 11.6 percent of GDP (health care spending scenarios are described in Box 4.5). The cost of healthcare and long-term care will be partly offset by lower pension and education spending. Pension spending in Poland is expected to fall from about 13 percent of GDP in 2010 to just below 12 percent between 2030 and 2050. The estimated decreases in pension spending, however, come from a substantial decline in benefits. Demographic forces will also provide some cost relief in education with a lower ratio of students to working-age Poles. Education spending is likely to decline by 0.7 percent of GDP in 2060 as compared to the current level, assuming transfers per person by age group are kept constant. At the same time, demographic trends that could reduce economic growth would also reduce tax revenue.

89 The standard scenario (the cost-containment scenario) assumes that excess growth in the public health care sector can be limited to 0.5 percentage points above growth in GDP per capita.
Figure 4.6. Age-related spending, Poland, 2010 and 2050

Source: Jabłonowski and Müller (2014).

114. Continuing with the present fiscal policy would translate into considerable accumulation of debt. Explicit debt, which amounted to 54.8 percent of GDP in 2010, gives only a partial picture of total public debt. The implicit debt that might arise if current fiscal policy is carried over into the future years would add up to about 75 percent of GDP. Thus, the full sustainability gap amounts to 129.6 percent of GDP. Closing it requires that the primary balance be reduced by 1.4 percent of GDP. A cut of 0.6 percent of GDP in the primary budget balance is required to close the gap caused by explicit debt, but another 0.8 percent must be cut to close the gap caused by implicit debt. In other words, revenues and spending 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. To ensure fiscal sustainability, policymakers can increase all revenues by 3.4 percent to close the revenue gap or reduce all transfers by 3.3 percent to close the spending gap. (For a fuller description of the sustainability indicators, see Box 4.4.) If the cost pressure scenario for health spending (Box 4.5) materializes, however, the sustainability gap would reach more than 360 percent of GDP and closing it would require cutting the primary balance by almost 4 percent of GDP.

90 The present value in current zloty of all projected public non-interest spending, minus all projected public receipts, as opposed to explicit debt, which is commonly defined as the current public debt held by the public.

91 GA assumes infinite horizon, but due to data availability 2100 is the end date for fiscal forecast presented in this section.

92 The value of 1.4 percent of GDP refers to the primary budget gap (see Box 4.4). The primary budget gap is similar to the European Commission (EC) sustainability indicator - S2 Indicator.
Box 4.4. Sustainability Indicators Applied

The sustainability gap indicator is, like the debt quota, derived from the Maastricht Treaty; it measures public liabilities in relation to base year GDP. Unlike the Maastricht formulation, however, the indicator includes not only past debt accrued (explicit debt) but also future public debt (implicit debt = sum of future primary deficits), assuming that present fiscal policy is carried over into the future.

The revenue gap indicator outlines necessary immediate and durable adjustment of all taxes and contributions to close the sustainability gap in terms of revenues.

Its counterpart, the transfer (spending) gap indicator, shows the changes required in public transfers to close the intertemporal budget constraint in terms of transfers.

The primary budget gap indicator reflects the necessary immediate and durable adjustment of the primary budget balance as a percent of GDP to close the sustainability gap. It is similar to the European Commission (EC)'s S2 indicator. Like the S2 indicator of the EC, the primary budget gap aims at closing the intertemporal budget constraint. Thus, the entire sustainability gap is closed including the implicit and the explicit gap.

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 they are purely forward-looking, they can usually not be compared across living generations because they incorporate the effects of differential lifetimes. They may, however, be used to assess the intergenerational redistributional effect of fiscal reforms.

These indicators are valuable because they provide a comprehensive assessment of long-term fiscal stability and intergenerational redistribution.

For a full description of the indicators, see Jablonowski, Müller and Raffelhuschen (2011) as well as EC (2012a).

Source: Jablonowski and Müller (2014).

115. The long-term stability of public fiscal subsystems varies widely, with the health sector the least sustainable (see Figure 4.8). The Social Security Institution (ZUS) old age pension, disability fund, sickness, and accident system can in general be considered sustainable even under current rules. For instance, both the farming and the mining sectors in Poland have generous pension schemes heavily subsidized by the state budget, but these are expected to shrink because both sectors are expected to decline gradually in coming decades. Moreover, with fertility rates declining, current spending on 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 its recent growth is projected into the future, costs will severely compromise public finances. Moreover, the civil servant pension system will be negatively affected by increasing longevity and the resulting longer retirements. Although there is no reason to believe that it is optimal to make each subsystem independently sustainable, the analysis of each system’s sustainability helps pinpoint the fiscal pressures associated with today’s fiscal policy.

116. The subsystem sustainability gaps show the extent to which future contributions and taxes will be sufficient to cover future spending for each subsystem. The sustainability gap could also be an indicator of government dis-saving for each subsystem, in particular for those where public spending do not count for a large part of total spending (health, education or pension). A positive sustainability gap of an isolated subsystem does not need necessarily to be interpreted as problematic, because resources of other subsystems may be available to close the gap. The sustainability of a subsystem is assessed in two steps: (1) calculate whether contributions earmarked for a subsystem are sufficient to cover future spending; (2) analyze additionally current state budget transfers into that subsystem. For some systems, such as farmers or ZUS old age pensions, the resulting difference is substantial, because they are financed to a large degree by taxes. Some other systems, such as civil servant pensions or education, are completely funded by the state budget.

Figure 4.8. Sustainability of individual subsystems

Source: Jabłonowski and Müller (2014).

117. The Notional Defined Contribution (NDC) old-age pension system will stabilize in coming decades. It is clear that current earmarked contributions will not be sufficient to cover the spending likely in the next 20 years as the sizable cohorts born between 1950 and 1965 retire. Without further tax inflows the sustainability gap amounts to about 167 percent of GDP. Deficits will also arise because the Polish pension system is still in the process of 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 ZUS pension fund is about half of all Poland’s revenue intake. These huge tax flows will not be necessary in coming decades, as the negative sustainability gap with tax inflows (–73 percent of GDP) indicates. This will allow some of what is currently being spent on pensions to be used for other 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.

118. The disability fund seems sustainable under current rules. Its long-term fiscal stability improved significantly after the eligibility criteria were made more rigid. Stricter eligibility rules led to lower inflows into disability; in 2010 alone 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 soon reach statutory retirement age and leave the disability system. Additionally, fewer will enter in coming years as the cohort sizes with the highest disability risk (age groups

93 This holds if expenditure excludes (net) investment, but in case of social spending which are in focus investment does not count for a large part of total spending.
50-64) will shrink. In addition, the influx in recent years is not likely to be repeated as it reflected an administrative response to the ending of early retirement schemes; those are now mainly gone. Finally, raising contribution rates from 6 to 8 percent of wages has improved the long-term stability of the disability fund. However, it must be noted that its sustainability is reduced to some extent by increasing the retirement age to 67, because that prolongs the duration of disability and consequently increases disability expenditures. However, the disability fund remains sustainable also after this recent reform.

119. The education system generates the highest implicit asset in the tax inflow scenario—a total of 113 percent of GDP. Because of the low fertility rates, this is the only subsystem that is affected positively by the changes in the age distribution of society. This assertion is based, however, on the optimistic assumption that age-specific per capita transfers will not change: the number of pupils per class remains constant, and if there are fewer pupils schools can be easily shut down and the number of teachers smoothly reduced. This requires that the government make constant adjustments to maintain pupil-teacher ratios. Thus, the highly positive sustainability projection for the education system—and its impact on public finances as a whole—should be taken with caution.

120. The civil servant pension system, however, is likely to be negatively affected by population aging with its accompanying increases in the duration of retirement. The sustainability gap for this subsystem amounts to about 42 percent of GDP. The increase in retirement ages for civil servants legislated in 2012 lowers that gap by about 10 percent. The projection for this isolated scheme, however, can only be tentative because the precise number of active civil servants cannot be ascertained.

121. The two pension systems with the highest mismatch between contributions paid in and transfers out are those for farmers and miners. Contributions cover only about 10 percent of spending on farmers and 20 percent on 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 pension system for miners. The sustainability gaps with taxes, however, indicate that the current high inflow from the state budget will most likely not be necessary in future years for either subsystem. In fact a gradual decrease of these two sectors can be expected in coming decades.

122. The main driver of the sustainability gap in Poland is the public health care system. If current tax inflows into the system are prolonged, the sustainability gap would amount to 140 percent of GDP; without any tax inflows the gap would reach 228 percent of GDP. The baseline scenario assumes that up to 2050 governments will be able to limit the growth of health care spending (HCS) to 0.5 percentage points more than the growth of GDP per capita. This assumption is relatively optimistic, considering that in the past the growth of HCS in Poland has on average exceeded GDP per capita growth by 1.7 percentage points. The result is sensitive to a number of assumptions about future health status, demography, and cost development (discussed in detail in Jabłonowski and Müller (2014)).

123. Potential increase in health and pension spending due to aging process constitute the largest treat for government’s saving position as well as long term sustainability. In case of health care, the main challenge will be to contain the upward pressure on public spending while maintaining accessible and quality care. This will be complicated by future changes in demand being difficult to anticipate, requiring a sufficiently flexible health supply to adapt timely. If the health related spending pressures are not contained the government saving position will deteriorate importantly, while fiscal sustainability of health care will be put into question. Pension spending is another important age related spending category as it comprises a significant share of total public spending. In case of pension, the upward pressure on spending seems to be contained by sizeable reduction in future benefits. The latter, however, is likely to undermine the ability of public pensions to alleviate poverty among the elderly and thus increase political pressure to reverse NDC reform. Such reversal would immediately lead to sizeable reduction in government saving. Given their importance for government saving and fiscal sustainability potential developments of both health and pension are analyzed in details.

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94 It also assumes no change in the prevalence of tertiary education.
95 Because the baseline assumes a gradual transformation of the farming sector in line with EC projections, it is also assumed that there will be an inflow of members into the general pension scheme and a decrease of contributors and future pensioners in the KRUS pension scheme. For miners the base year probabilities of contributions to this system are kept constant over time, which leads to fewer future pensioners in the system.
96 There is a clear association between replacement rates and old-age poverty. Controlling for other factors, regression analysis suggests that a 10-percentage point decline in replacement rates increases those at risk of old-age poverty by 0.9 percentage points (IMF, 2012).
124. A sensitivity analysis shows that the public health care system still has a significant sustainability gap. To evaluate the robustness of the baseline results, four alternative scenarios were analyzed (see Box 4.5). The sensitivity of the baseline result in terms of these scenarios is shown in Figure 4.9, which outlines the sustainability gap of the public health care sector: The changing population structure alone (pure demographics scenario) would cause a sustainability gap of about 94 percent of GDP. The gap would, however, be much lower in the scenario where lifetimes are longer and healthier (healthy longevity scenario). In contrast, expansion of the public LTC system may affect fiscal sustainability. The convergence scenario that assumes a gradual increase in LTC prevalence rates in Poland to current German levels puts the sustainability gap at 154 percent of GDP. If the growth of HCS in Poland follows past trends, exceeding growth in GDP per capita by 1.5 percentage points, the sustainability gap would reach no less than 365 percent of GDP. Unfortunately, that scenario is not unrealistic. Changes in medical technology may lead in future decades to excessive growth in costs. Furthermore, labor costs in the public health care sector, especially wages of qualified medical personnel, are likely to grow in line with economy-wide labor productivity growth, which will be higher than growth in GDP per capita in future decades.

Figure 4.9. Sustainability of public health care in various scenarios

Source: Jabłonowski and Müller (2014).

125. If growth in HCS is unavoidable, a major increase in health contributions would be needed to balance the system. By law the NFZ budget plan has to be balanced, so an additional sustainability indicator was identified: the contribution to the NFZ needed to keep the fund in balance in the scenarios tested. The results suggest that if excess growth in HCS is not avoided, contributions will need to be doubled, so that instead of paying 9 percent of salary the employee would pay 18 percent in the long term (see Figure 4.10).

97 The cost-pressure scenario would worsen the primary budget gap indicators significantly, from 1.44 percent to 3.94 percent of GDP.
Box 4.5. Health Care Scenarios

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

• The first scenario, pure demographics, is based on time-invariant age and gender-specific profiles for all categories of healthcare treatment. Because health care costs are assumed to track GDP per capita, this scenario only reflects the impact of a changing population structure on future expenditures and revenues.

• The second scenario, healthy longevity, assumes that future gains in life expectancy translate fully into more years spent in 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 third scenario, convergence of Polish prevalence rates, assumes that long-term care (LTC) prevalence rates in Poland converge to Western Europe standards. It is reasonable to expect that LTC of Polish elderly is likely to increase from its very low level. While in Poland the probability of needing LTC amounts to about 6 percent in those aged 80+, the prevalence is much higher in Western economies. Germany, for example, shows prevalence rates of about 30 percent in this age group.

• Finally, the cost pressure scenario assumes that health care spending grows faster than GDP per capita. It embodies excess cost growth of 1.5 percent through 2050. The scenario is backed by the findings of a number of current studies that past rises in health care expenditures were largely determined by nondemographic drivers, such as progress in medical technology.a On this hypothesis, in recent decades costly product innovations to cure diseases seem to have dominated cost-saving process innovations.

a The IMF (2010) calculates excess cost growth of 1.2 percent (1.5 percent) for 27 advanced economies in the period 1980–2008 (1995–2008). The OECD (2013e) quantifies excess cost growth of 1.5 percent (1.7 percent) for OECD countries (including Poland) from 1995 through 2009.

Figure 4.10. Trajectory of contribution rates in various scenarios

Source: Jabłonowski and Müller (2014).

126. The subsystems discussed do not cover a considerable part of the public budget. That part falls under “all other government systems” (see Figure 4.8.). On the spending side, the category covers, among other areas, spending on infrastructure investments in research and development, military and police. On the revenue side it covers valued-added
(VAT), personal income (PIT), and excise taxes as well as other current and capital revenues. If none of these taxes were transferred to other subsystems the “all other” system would be over-financed, with implicit assets amounting to about 380 percent of GDP. Taking into account, however, the base year tax inflow into other subsystems, such as the ZUS pension fund, the “all other” category generates an implicit liability of about 178 percent of GDP. To close this sustainability gap it may require more revenues (namely taxes) for this subsystem or fewer expenditures.

127. **Poland has already made considerable progress in implementing sustainability-enhancing measures.** To mitigate the impact of an aging population,

1. Future costs related to aging have been curbed by replacing the defined-benefit system with a defined contribution system98, limiting early retirement options; and more recently increasing the official retirement age. These measures reduce the future cost to the government of an aging population and do not greatly affect the government budget now.

2. To improve the current budget, thereby increasing savings, the government has shifted funded contributions to the pay-as-you go pension scheme and as of 2014 further cut the funded pension pillar. These measures will also improve future public finances because interest payments on government debt will fall.

3. Finally, the future budgets have been improved by increasing labor force participation through changes to early retirement and retirement ages.

128. **The most recent reforms have made an important contribution to restoring the long-term sustainability of public finances.** Since 2010 government reforms have helped to reduce the sustainability gap by more than 80 percent of GDP—the increase in disability contribution rates alone accounted for more than half of that. The permanent transfer of part of second-pillar contributions to the first-pillar 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. The reforms did raise future pension spending (or more precisely payment liabilities) but that is discounted in the present value calculations. 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 expenditures as the higher retirement age possibly prolongs the duration of disability (see Box 4.6 for details of the reforms).

**Box 4.6. Recent Major Pension Reforms**

**2011: Increase in the disability contribution rate.** Starting in 2012, the disability contribution rate was increased by 2 percentage points, from 6 to 8 percent of gross wages. This was a partial correction of the reduction in the contribution rate begun in 2007 that lowered the rate from 13 to 6 percent.

**2011: FDC cut.** In 2011 the government decided to change the balance between the notional and the 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 were held at 12.22 percent of gross salary/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 to 2.3 percent and split the NDC part into two subaccounts, NDC 1 and NDC 2. The indexation rules for NDC 1 remain unchanged (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, the possible maximum FDC contribution fees were cut from 7 to 3.5 percent. The limits on investment of FDC funds are also being changed gradually, from 40 percent currently to 90 percent in 2034.

**2012: Increase in the legal retirement age to 67.** With the reform passed by Parliament in May 2012, the retirement age for Poles insured in the general public old-age pension system (NDC/FDC) will gradually increase by three months a year, for women

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98 A defined benefit system sets pensions as a percentage of final salary at retirement; defined contribution pensions are based on the accumulated value of contributions during the pensioner’s working life.
from 60 in 2013 to 67 in 2040, and for men from 65 in 2013 to 67 in 2020. The reform leaves unchanged previous special privileges for, e.g., miners, bridging pensioners, teachers, and pre-retirement beneficiaries.

2013: Preparation for FDC cut 2. The temporary review of the sustainability of the pension system in early 2013 suggested a need to further improve how the funded pillar functions. The main points of the proposed reform as formulated through December 2013 (which has been approved by the Parliament but sent to the constitutional court for evaluation by the President) are as follows:

- The FDC contribution rate will be fixed at 2.92 percent with no changes thereafter.
- 51.5 percent of FDC assets, primarily government bonds, and the corresponding share of the liabilities will be taken over by the general government and recorded in NDC2 accounts.
- Government bonds taken over will be redeemed immediately.
- FDC will no longer be mandatory.
- A new mechanism for FDC-related pensions will be introduced (the “zipper”): in the 10 years before people reach the statutory retirement age, 10 percent of their FDC assets will be cashed in annually and gradually cumulated in their personal NDC2 account, out of which their FDC pension will be paid.
- The FDC may not purchase government bonds; portfolios must become more equity-oriented, mainly operating in the Polish stock exchange, but with limited possibilities to invest abroad.

Source: Jabłonowski and Müller (2014).

129. Shifting part of the contribution from FDC to the NDC has helped restore short and long-term fiscal sustainability. In 2010 in the ZUS old-age pension fund there was a large gap between contributions and expenditures, about 4 percent of GDP, which current taxpayers financed. It was caused to a large degree by the change to a two-pillar FDC/NDC system. During the transition the relatively generous pensions from the pre-1999 pure PAYG system needed to be financed from decreasing average contributions to the current NDC system, and the actuarially unbalanced miners’ pension scheme added to the ZUS deficit. The shift of FDC contributions to the PAYG system legislated in 2011 had an immediate impact on the revenue side. Total PAYG contributions have increased by about 1 percent of GDP between 2010 and 2012. The long-term effect is similar: Spending is almost unaffected by the shift of FDC contributions until 2025 because only a small share of cohorts retiring before 2025 participates in the FDC system. For younger cohorts, more of whom participate in the FDC system, the shift of FDC contributions to the NDC system translates into an increase in NDC pension entitlements. As a consequence, the legislated shift leads to a gradual increase in pension expenditures in ZUS after 2025 compared to the “no FDC cut” scenario.

130. The gradual increase in the legal retirement age to 67 for both men and women also stabilizes the long-term finances of the ZUS pension fund. Pension spending shrinks especially from 2015 through 2025. From a fiscal point of view the relatively rapid increase in retirement ages is well-chosen. The years from 2015 through 2025 are precisely the years in which fiscal pressure is relatively high due to the large inflow of baby-boomer generations into retirement. Thereafter, until 2040 the spending impact of the 2012 reform is less visible because of two effects that offset each other: On the one hand, women postpone their retirement until 2040 in line with the increase in retirement ages (postponement effect), which leads to a decrease in total spending. On the other hand, both men and women are retiring later and are therefore entitled to higher pension benefits than under the 2011 legal structure (entitlement effect), which increases total spending.

99 Presumably it is mostly the working age population that is financing the current deficit because they pay the highest taxes per capita. Besides the support of the elderly via tax and contribution payments, these young cohorts need to save for their own old age as future NDC pensions will be less generous. Therefore, there are often references to a double burden for younger cohorts who finance the transition from a PAYG to a (partially) funded pension system. Indeed it might be described as a triple burden, as they are financing the transition, their own pensions, and need to save more to cover the reduced replacement rates. The reform reduces the extent to which this generation has to finance the transition.

100 Average contribution rates are decreasing without the FDC cut reform as an increasing number participate in the FDC system.
After 2040, however, the entitlement effect determines the spending rise as more and more Poles whose benefits are higher than previous pensioners enter the retiree population. Finally, the increase in retirement ages brings in more revenue.

131. The most recent reform of the funded defined contribution system, “FDC cut2,” reduces both the current and the future deficit of the ZUS old age pension fund. If implemented as scheduled in mid-2014, this reform will lead first to a significant shift of FDC assets and liabilities to the general government (see Box 4.6), amounting to 51.5 percent of the FDC assets (about 8.5 percent of GDP). The impact of this on future public finances depends on how many people opt to switch back to the mono-pillar system. These people pay higher contributions to the NDC 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 Jabłonowski and Müller, 2014).

132. Besides the one-off transfer of FDC assets, the 2013 reform would lead to a gradual increase in ZUS revenues over the next three decades (see Figure 4.11, Figure 4.12). 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 19.52 percent instead of 16.42 percent of their earnings to the PAYG system). After 2014, the steady rise of revenues can be explained mainly by the “zipper” (explained in Box 4.6). In fact, the birth years affected by this mechanism over time show increasing FDC participation. Consequently, rising amounts of FDC pension funding are shifted before retirement to the NDC system. Upon retirement, after a time 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 cut2 improves the fiscal sustainability of the public pension system in the next decades because it would significantly reduce the mismatch between pension contributions and benefits.

133. Sustainability could be further enhanced by containing health spending or changing its financing. There are many possible cost containment options for the health sectors (see Box 4.7). Three potential reforms considered here assume introducing copayments, limiting coverage of the health system—a change in the mix of public and private funding of health care and a complete shift of the health care financing to general taxation. Both cost-containment reforms would improve the fiscal sustainability of the public health care sector. Introducing copayments leads to a narrowing of the sustainability gap that amounts to 31 percent of GDP (Figure 4.13). Exclusion of 33 percent of the selected budget

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101 It was also assumed that 50 percent of future entrants will choose to participate in the mixed pillar, NDC/FDC system.
102 The amount of FDC assets shifted each year via the zipper depends on the rate of return for FDC assets. The baseline assumes a rate of return of 3 percent in real terms.
103 The standard scenario—cost-containment—assumes that excess growth in public health care spending can be limited to 0.5 percentage points. The reform scenarios analyzed here are seen as additional tools to limit future growth in costs.
104 The scenario assumes a shift to a full tax financing of health care expenditures. While currently about one fifth of expenditures in Poland is funded from the general budget this proportion increases to 100% in 2014 in the reform scenario which is considered.
categories from the public health care catalogue narrows the gap by about 13 percent of GDP and exclusion of 50 percent narrows it by 19 percent. As a result of spending reductions in the NFZ, with copayments health contribution rates could shrink by about 0.9 percentage points over the long term. Exclusion of certain medical services would lead to a smaller but still important drop of contribution rates by 0.35 percentage points (33 percent exclusion) or 0.5 percentage points (50 percent exclusion). A complete shift of the health care financing to taxes would decrease the sustainability gap by about 36 percent of GDP. Thus, it shows a similar impact on the long-term finances as the introduction of a co-payment. Figure 15 makes clear that a real stabilization of the public health care system can (most likely) only be reached by a package of reforms. An implementation of e.g. all three discussed reforms proposals could diminish the sustainability gap by about 86 percent of GDP.

**Box 4.7. Policies to Contain Costs in the Health Sector**

Given the complexity and importance of the health system, there are no simple solutions to the expected growth in publicly financed health spending, and there is not enough space here to synthesize the vast range of studies that address this subject. The purpose here is not to propose firm recommendations for change but rather to highlight areas for further work and encourage wider debate about changes that might be needed to ensure the future of the Polish health system.

The main policies governments can use to moderate the projected growth in health spending are:

- Efficiency policies to ensure that maximum health gains are achieved for every zloty spent. This would need changes in how the health system is organized and managed and how services are prioritized. These might include more consistent assignment of responsibility across levels of government and better information for users on the quality and prices of health care services.

- Demand-side policies to reduce demand for health services by investing in people’s health early enough to prevent them from getting sick later and minimizing over-consumption of services. That might be achieved through preventive initiatives or use of copayments.

- Supply-side policies to maintain a firm and reasonable budget constraint on public health spending and make adjustments to health services coverage. This may address coverage in terms of breadth (share of the population covered), scope (which services are covered), or depth (the extent of cost to which services are covered).

The fiscal impact of two possible cost containment policies is assessed:

1) Copayments, a classic demand-side policy to limit the coverage of the public health care system

The Polish public health care sector already requires copayments for the purchase of drugs. For other health care services, however, patients do not have to cover any costs directly. In this sense Poland does not follow most European Economic Area (EEA) countries. In fact, 22 of the 30 EEA countries require copayments for hospital stays, doctor visits, and other treatments. A reform scenario prepared by Magda and Szczygelski (2011) is used to measure the impact of copayments on the sustainability of public health care. A copayment rate of 25 percent, which many authors see as optimal, is applied for both primary health care (PHC) and specialist treatment. For hospital treatment the rate is reduced to 10 percent. It is important to underline that copayments are not applied for treatment of chronic diseases or treatments that are very costly, such as for cancer, cardiovascular disease, and diabetes. Recipients of social assistance and children and young people until age 18 are exempted (as in reform variant no 2 of Magda and Szczygelski, 2011). Compared to the baseline, this scenario boosts revenue by 3.4 percent of total health care expenditures (HCE) and reduces spending by 4.8 percent of HCE.

2) Reduction of services covered by the public health care system, a supply side policy

A partial exclusion of three medical services from the public health care catalogue is considered: dental services, health resort services, and long-term care (LTC). There are two scenarios: In the first, public financing of all three services is reduced by one-
third, reducing costs by about 1.5 percent of HCE compared to the base year of 2010, and in the second by one-half, reducing total costs by about 2.2 percent.

Poland should also consider efficiency health care policies (OECD, 2013a) but these were not covered in this study.

See also Joumard et al. (2010).

Source: Jabłonowski and Müller (2014).

**Figure 4.13. Public Health Care Sustainability Gaps in Various Reform Scenarios**

Source: Jabłonowski and Müller (2014).

134. **It will be important to complete the reform of removing pension privileges for certain occupations, such as miners.**

The government should make pension schemes for the uniformed services (soldiers, police officers, etc.) and miners closer to actuarial fairness. One possible reform might be to gradually integrate the miners’ pension system into the general pension scheme. This would mean that newly hired miners would enter the common NDC/FDC system and meet its statutory retirement ages. Currently, a miner’s pension is based on both contributory and noncontributory periods. With these highly generous rules compared to the general pension scheme and effective average retirement ages of about 50, financing the system requires large subsidies. Currently, about 80 percent of its expenditures are financed from the budget. The proposed change to the pension system would enhance the long-term stability of the general pension scheme because of the inflow of new contributors and the lower benefits. Since the first miners covered by these rules would reach the average miner’s retirement age of 45–50 only in 25–30 years from now, the positive impact on public finances would be visible only in the relatively distant future.

135. **It is vital that the government resist pressures to reverse its defined contribution pension reform.** Because changes to the pension system that restore its fiscal sustainability are likely to result in large reductions in projected replacement benefits, political pressure may arise to restore the higher replacement rate. Such a reversal might be politically attractive in the short run to the sizeable cohorts of voters aged 45–60 and thus close to retirement. In the long run, however, spending would skyrocket if the system were to retain current average replacement rates, which currently amount to 52 percent of average earnings. An increase in pension spending to about 16 percent of GDP through 2060 with revenues unchanged would cause a huge

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103 This could be done through a return to a defined benefit formula or changes to pension indexation.
104 The value of 52 percent corresponds to the average replacement rates of retirees aged 62–65 in 2011. Differentiated by gender, the average replacement rate for men amounted to 61 percent and for women 43 percent.
sustainability gap for the ZUS pension fund—473 percent of GDP.\textsuperscript{109} To reduce the risk of reversing reform, replacement rate reductions should not undermine the ability of public pension systems to alleviate poverty among the elderly. The government is addressing the problem of old-age poverty in two ways: a system of minimum pensions and incentives for private pension plans. The current minimum pension is paid out of ZUS and covered by government contributions in cases where the actuarial ZUS pension falls below the minimum one. The government also provides tax-based incentives to encourage private retirement savings to supplement the limited public replacement rate. So far tax incentives have not led to a visible increase of retirement saving.

136. **The adequacy of future pension benefits would be very low, especially for the self-employed and minimum wage workers.** According to Müller and Jabłonowski (2013) pension adequacy ratios\textsuperscript{111} (AR) will decline significantly over the next decades. Without the legislated increase in retirement ages the AR of an employee declaring the average salary in the economy will be more than halved until the year of 2040 – to around 30-35 percent of average earnings. A large share of pension scheme members are, however, declaring lower earnings or are inactive due to unemployment and other reasons. As a consequence, their adequacy ratios will decline even more in the coming decades. Minimum-wage workers, e.g., might expect a drop to about 15 percent of average earnings in 2040. A similar drop is projected for self-employed who, generally, declare an income of only 60 percent of the average salary or lower. The increase in the retirement age to 67 for both men and women raises these adequacy ratios. This positive effect is more pronounced for women as their retirement ages rise more substantial from 60 to 67. After this retirement age reform an employee declaring the average salary in the economy can expect an AR of around 40-45 percent in 2040. With retirement ages of 67 minimum salary workers as well as self-employed could expect adequacy levels of around 20 percent and 15 percent respectively in 2040 which is far below the current minimum pension levels (22 percent of average earnings).

137. **The cost of topping up actuarial pensions to align them with minimum pension level could amount to around 1 percent of GDP annually.** In 2010 around 1 percent of new old-age ZUS pensioners fell below the minimum pension threshold. If current distribution of the contributions (salaries) was continued, in consequence, between 25 and 50 percent of all future pensioners would receive only a minimum pension in 2060, depending on its indexation (two levels of indexation were assumed: 20 percent and 100 percent of the average salary growth). Assuming that minimum pension is fully index to average salary growth, the minimum pension would remain around 22 percent of average wages in the economy. An indexation of 20 percent, on the contrary, would lead to a steady decrease in the minimum pension level from 22 percent to 12 percent of the average wage by 2060 (Müller and Jabłonowski, 2013). Assuming a higher indexation of the minimum pension, the majority of self-employed would be paid a minimum pension. Additionally, in this scenario a large share of minimum-salary employees would be entitled to get compensation from the government to align their pension to the level of minimum pension. Under the higher indexation minimum pension expenditures may rise from currently 0.1 percent of GDP to a level of 1-1.5 percent of GDP until 2060\textsuperscript{112}. In a scenario in which minimum pension is indexed at 20 percent minimum pension expenditures would grow less substantial to about 0.3-0.4 percent of GDP in 2060.

\textsuperscript{109} The projection assumes the average replacement rate from FDC and NDC pensions to be 61 percent for men and 43 percent for women from 2014 on. In other words, the government finances the residual between total replacement rates and NDC/FDC replacement rates. The analysis takes these replacement rates as exogenously given and neglects the benefit formula. The fact that cohorts may have different contribution rates in their careers is therefore ignored. Furthermore, retirement ages are increased to 67 as in the status quo scenario.

\textsuperscript{110} The future drop in replacement rates depends greatly on the retirement age chosen, the gender, and the occupation; see Jabłonowski and Müller (2013).

\textsuperscript{111} Defined by the authors as 1st and 2nd pillar initial pension benefits relative to average earnings in the economy.

\textsuperscript{112} This number represents a rough estimate carried out by Christoph Müller based on a projection of a 1% ZUS sample of contributors. It considers both the extent of the compensation paid by the public budget as well as the eligibility criteria to receive a minimum pension (i.e. sufficient contributory and non-contributory service periods).
138. **Tax increases and cuts in investment to restore fiscal sustainability should be avoided.** Policies chosen to improve the fiscal position may also affect economic growth. It seems that reductions in current spending could be more beneficial for economic growth in Poland than cuts in productive spending (investment) or distortionary tax (i.e. labour taxes) increases (Skrok (2013), Alesina et al. (2002)). Cuts in capital spending looks like an easy option, given that investment is the main component of non-mandatory expenditure (which amounts to about 25 percent of the budget). Cuts in public investment have typically been the first type of adjustment measures in case of budgetary pressures, which explains the strongly procyclical pattern of pre-2006 capital spending (Rutkowski 2009). But such cuts are also highly detrimental to the long-term growth on which fiscal sustainability ultimately depends.
Savings and the Financial System

Financial sector development in Poland

139. **Poland’s banking system is reasonably developed when compared with its peers.** Using the framework of Čihák et al. (2012), Łaszek (2014a) assesses the relative development of Poland’s banking sector along four dimensions: access (percentage of small firms with credit lines), depth (bank credit to private sector as percent of GDP), stability (buffers of the largest 11 banks compared with volatility of returns), and efficiency (net interest income as a proxy for costs of intermediation between savers and investors). Poland scores highly on stability and access, has an average result on efficiency, and is below regional peers in terms of depth.

![Figure 5.1: Poland, Development of banking sector](image)

Note: Income (median of income) for countries with similar income levels to Poland. The sample includes 26 countries: Lebanon, Iran, Argentina, Turkey, Antigua and Barbuda, Belarus, Mexico, Chile, Panama, Latvia, Russian Federation, Croatia, Lithuania, Poland, Hungary, Estonia, Slovak Republic, Trinidad and Tobago, Malta, Portugal, Cyprus, Bahamas, The Saudi Arabia, Czech Republic, Greece, Bahrain, Slovenia. This group partially overlaps with regional peers, but taking into account also other countries it is more visible. Which characteristics are more country specific and which are the result of the current level of development


140. **Financial markets are generally more developed than regional comparators, but exhibit more volatility.** Again following Čihák et al. (2012), Łaszek measures financial market development along four dimensions: access (or more accurately, market concentration) is proxied by the value traded of the top ten companies to total value traded, depth as stock market capitalization to GDP, stability by market volatility, and efficiency by the stock market turnover ratio, or value traded as a share of capitalization. The spider chart shows Polish financial markets are more efficient but substantially less stable (more volatile) than regional peers.

113 Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Romania, Slovak Republic, Slovenia.
**Figure 5.2: Poland, Development of financial markets**


141. **Total assets of monetary and financial institutions in Poland, however, are among the lowest in the region, reflecting the more intense credit boom in other countries.** Bank lending is skewed towards loans for house purchases and consumption credit, while the exposure to non-financial corporations is among the lowest in the region. This supports the argument that the banking sector is broadly consistent with Poland’s income level, but development needs to take place on the capital market side. Nevertheless, the World Bank Enterprise Survey showed that the access of Polish firms to credit, including the smaller ones, seems to be in line with its level of development.\(^\text{114}\)

### Table 5.1: Asset structure of Monetary and Financial Institutions (MFI), 2Q2013 for Poland and CEE, MFI assets as percent of GDP

<table>
<thead>
<tr>
<th></th>
<th>Households</th>
<th>Non-financial corporations</th>
<th>General government</th>
<th>Monetary and financial institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Households</td>
<td>Other*</td>
<td>Loans</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>112.0</td>
<td>11.0</td>
<td>10.7</td>
<td>1.2</td>
</tr>
<tr>
<td>Croatia</td>
<td>134.7</td>
<td>18.6</td>
<td>4.5</td>
<td>15.9</td>
</tr>
<tr>
<td>Czech R.</td>
<td>126.8</td>
<td>21.7</td>
<td>5.1</td>
<td>3.5</td>
</tr>
<tr>
<td>Estonia</td>
<td>103.8</td>
<td>31.4</td>
<td>3.2</td>
<td>2.2</td>
</tr>
<tr>
<td>Hungary</td>
<td>112.1</td>
<td>11.8</td>
<td>11.8</td>
<td>0.9</td>
</tr>
<tr>
<td>Latvia</td>
<td>122.6</td>
<td>22.6</td>
<td>2.1</td>
<td>2.1</td>
</tr>
<tr>
<td>Lithuania</td>
<td>68.0</td>
<td>17.0</td>
<td>2.0</td>
<td>2.6</td>
</tr>
<tr>
<td>Poland</td>
<td>88.8</td>
<td>19.8</td>
<td>7.2</td>
<td>6.0</td>
</tr>
<tr>
<td>Romania</td>
<td>63.1</td>
<td>6.1</td>
<td>8.8</td>
<td>1.5</td>
</tr>
<tr>
<td>Slovakia</td>
<td>82.4</td>
<td>19.8</td>
<td>5.1</td>
<td>2.1</td>
</tr>
<tr>
<td>Slovenia</td>
<td>142.9</td>
<td>15.1</td>
<td>6.9</td>
<td>4.3</td>
</tr>
<tr>
<td><strong>CEE median</strong></td>
<td><strong>112.0</strong></td>
<td><strong>17.8</strong></td>
<td><strong>5.1</strong></td>
<td><strong>2.1</strong></td>
</tr>
<tr>
<td><strong>Euro area</strong></td>
<td><strong>333.8</strong></td>
<td><strong>40.1</strong></td>
<td><strong>6.1</strong></td>
<td><strong>8.5</strong></td>
</tr>
</tbody>
</table>

*including loans for sole proprietors.

Note: Total assets are not the sum of the breakdown, as loans to other financial intermediaries, money market fund shares/units, holdings of shares/other equity, external assets, fixed assets and remaining assets are not shown in the table.

Financial sector, savings, and growth

142. **Would further financial development**\(^ {115} \) promote savings in Poland? There are a number of channels through which it might do. However, there are also aspects of financial market development that could reduce savings. From the theoretical point of view, the impact of financial market development is thus ambiguous. But empirically, the level of development of Poland’s financial markets is such that further financial deepening would promote saving, both directly and indirectly by increasing the growth rate.

143. **Financial development can help mobilize savings by offering savers instruments that are better attuned to their saving objectives.** A wider range of instruments will allow savers to choose investments that match their objectives in terms of risk and return. Thus such development should allow savers to purchase longer maturity instruments if savings need not be immediately available for use. Financial development should also increase the accessibility of the financial system and its ease of use. Up to a point, a wider range of options makes it more likely that savers will find the instrument that fits their needs, and thus make them more likely to save.

144. **A more developed and efficient financial sector may also be able to offer savers a more attractive return on their savings.** However, the literature seems to show that the saving decision is not strongly influenced by the return on savings. Indeed, as discussed elsewhere in this study\(^ {116} \), it cannot be ruled out that the effect of higher interest rates or a...

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\(^{115}\) “At a conceptual level, financial development occurs when financial instruments, markets, and intermediaries mitigate – though do not necessarily eliminate – the effects of imperfect information, limited (contract) enforcement, and transactions costs.” At a broader level, financial development can be defined as improvements in the quality of five key financial functions: (a) producing and processing information about possible investments and allocating capital based on these assessments; (b) monitoring individuals and firms and exerting corporate governance after allocating capital; (c) facilitating the trading, diversification, and management of risk; (d) mobilizing and pooling savings; and (e) easing the exchange of goods, services, and financial instruments.” (Čihák et al., 2012)

\(^{116}\) See Chapter 3 on the determinants of household savings.
tax subsidy on savings may be negative. A higher interest rate means that future consumption becomes more affordable relative to current consumption thus encouraging saving, but at the same time, it makes it possible to meet a given savings goal at a smaller cost in terms of current consumption thus discouraging saving.

145. On the other hand, the development of insurance markets makes it less necessary for individual household to save against major contingencies. The pooling of savings through premium payments means that the same level of security can be achieved with smaller aggregate savings. This may be seen as an improvement in the efficiency of savings, in that it becomes possible to meet a given contingency with a smaller amount of savings. And the reduction in the cost of meeting the contingency opens the possibility for lower-income households to protect themselves at a reasonable cost, which may encourage an increase in saving by that group.

146. The growth of consumer credit makes it possible to advance consumption rather than having to accumulate savings to make purchases. While access to consumer credit is normally welfare enhancing for the individuals who take advantage of it, an increase in consumer credit is normally associated with household dis-saving, and part of the decline in household savings rates during the run up to the crisis in Poland and elsewhere may be attributed to this.

147. Other developments in the financial system may also contribute to the more efficient utilization of existing savings, but not to their increase. Thus the development of annuity markets that would permit more effective pension plans also allows such instruments as reverse mortgages to be offered which make housing wealth more liquid. It would not be appropriate to discourage such financial market development, merely because of these possible adverse effects on the savings rate, unless it could be shown that the reduced savings rates in themselves involved welfare losses that offset the gains to individuals. And in any case, the scope for action by Poland to restrain the sales of financial products to consumers is limited by the European Union regulations governing the single market in financial products.

148. Recent research indicates that further financial development in Poland would be associated with increased saving. Several studies have found the relationship between financial development and savings to be negative (Loayza, Schmidt-Hebbel and Serven (2000b), Horioka and Yin (2010). A more comprehensive survey using a panel of 102 countries done by Wang, Xu, and Xu (2011), however, find an inverted u-shaped relationship, with peak savings rates associated with private credit to GDP ratios of somewhat over 100 percent. Their explanation of this finding is that the early stages of financial development are associated with the generation of investment opportunities that stimulate savings, while at the same time greater financial development may reduce household's reliance on savings for self-insurance or precautionary reasons. Another study of developing countries in Asia found that a more developed financial system increases saving up to a similar point, after which the availability of credit reduces such savings (Horioka and Terada-Hagiwara, 2011). Since Poland’s private credit to GDP ratio is well below 100 percent, these studies would put Poland among those countries where further financial development is likely to be associated with higher savings.

149. While the literature has long argued that financial sector development is beneficial for growth, this conclusion has recently come into question. A very comprehensive survey by Levine (2004) concluded that a “growing body of empirical analyses, including firm-level studies, industry-level studies, individual country-studies, time-series studies, panel-investigations, and broad cross-country comparisons, demonstrate a strong positive link between the functioning of the financial system and long-run economic growth.” But since the global financial crisis, this consensus has been modified. While the relationship between financial sector development and growth of aggregate productivity seems to hold at lower levels of development, beyond a certain point additional financial deepening does not seem to convey benefits in terms of growth. At lower levels of financial sector development, a larger financial does seem to help in providing firms with the financing they need and in lowering transactions costs, and is associated with higher productivity growth. Čihák et al. (2012) quote research indicating that improvements in financial markets tend to expand economic opportunities and reduce persistent income inequality. They conjecture that the financial system may influence long-term economic growth primarily by affecting the allocation of savings, not by affecting the aggregate saving rate.

150. The beneficial effect of financial sector development on growth appears to peak at the point where the level of private credit is approximately that of (annual) GDP. This is the level identified by Cecchetti and Karroubi (2012). Measuring financial development in terms of the share of the labour force working in the financial sector, Cecchetti and Karroubi put the peak of the inverted u-curve at around 3.5 percent. Work by Arcand et al. (2012) finds virtually the same
threshold in terms of private credit to GDP. They also find that the negative effects of a large financial system persist, even when correcting for output volatility, banking crises, low institutional quality, and differences in bank regulation and supervision.

151. **The reasons for the financial sector becoming a drag on growth after that point remain the subject of research.** It could be that the financial sector begins to compete with the non-financial sector for resources of both capital and labour, especially the most skilled labour, leaving less available to the rest of the economy or driving up their cost. A good part of the product of the most developed financial systems is connected with asset management, and it is unclear whether active fund management actually contributes to better investment decisions. (Greenwood and Scharfstein, 2012) There is also considerable doubt as to whether the additional leverage that has occurred in recent years within the financial sector has contributed to higher productivity. More generally the activities of the largest financial sectors may have become increasingly of a rent-extracting rather than a value-creating nature (see Turner, 2012).

152. In addition, the rapid growth of the financial sector, as distinct from the sector’s size, has been found to be independently detrimental to productivity growth. The probable cause is that the credit booms associated with such rapid growth are not only associated with growing financial instability but also involve the absorption of resources by the relatively low productivity construction sector (Cecchetti and Karrouri, 2012).

153. **Poland’s financial sector remains on the healthy side of the financial development inverted u-curve.** While the indicators derived by Cecchetti and Karrouri and by Arcand et al. for the maximum useful size of the financial sector are rough, Poland falls on the underdeveloped side of both, with private credit to GDP of about 54 percent in 2012, and financial sector employment at 3.15 percent of total employment. Thus Poland seems quite far from the point where financial sector development ceases to be beneficial.

154. **Further development of Poland’s financial sector should promote savings and growth.** It is intriguing that the threshold at which financial development (when measured in terms of private credit to GDP) has its maximum impact on savings is very similar to that at which it has its maximum impact on growth. This could be further evidence for the correlation of domestic savings with growth, even if it says little about causality. But the conclusion for Poland is that further financial sector development beyond the current credit penetration of 54 percent of GDP is likely to help both with generating savings and raising Poland’s growth rate.

**Role of domestic savings in promoting a sound banking system**

155. Higher domestic savings can strengthen the stability of the financial sector and make Poland less vulnerable. Higher domestic savings provide a stronger domestic currency financing base for the financial system, improving such vulnerability indicators as the loan-to-deposit ratio, the extent of foreign exchange funding, and the stable long-term funding ratio. It can thus strengthen the stability of the financial sector, as well as making Poland less vulnerable to sudden external funding stops that may interrupt growth.

156. The build-up to the crisis of 2008-9 was associated in Poland as in other CEE countries with a credit boom, a deterioration in domestic savings rates, increased funding of the banking system from abroad, and the extension of foreign currency loans to households. While the deterioration in Poland was not as large as for many other countries in the region, it was substantial compared with emerging markets elsewhere and created serious vulnerabilities. The extent of foreign currency indebtedness, with foreign currency mortgage lending reaching almost 70 percent of the total outstanding in 2008 and which may have been to some extent the result of the banks’ funding model, led to two problems: concern that excessive exchange rate depreciation would cause widespread distress among those who had borrowed in foreign exchange, which could have required monetary policy to inhibit further exchange rate depreciation, and that banks would not be able to roll over their foreign currency funding. Both concerns required policy intervention by the NBP.

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117 Some of the literature on the relationship between saving and financial stability is shown in Annex 13.

118 Foreign currency bank lending in Poland was only partly financed through lines from parent banks or external money market, with the rest being funded through domestic deposits, mainly in PLN. The resulting currency mismatch on the banks’ books was eliminated by short-term FX swaps, which themselves created another source of vulnerability as swap market conditions changed (Impavido et al. 2013).
157. **Following the failure of Lehman Brothers, there was a sudden stop in short-term capital inflows intermediated by the banking system.** While parent banks generally maintained their exposure to their Polish subsidiaries, it required action by the authorities to ensure this outcome. In addition, the shock was transmitted through large movements in gross exposures, a more relevant measure of vulnerability. (Impavido et al. 2013) The worsening of the balance of payments as export growth slowed, put downward pressure on the exchange rate. This had the advantage of stimulating the export sector and constraining imports, but risked worsening the balance sheets of those with exposure to foreign currency loans and, if not halted, might have resulted in widespread distress.

158. **The response of the authorities was threefold.** Firstly, parent banks were reminded of the obligations they had to support their subsidiaries. This was effective insofar as it made unnecessary a concerted exposure maintenance agreement such as the Vienna initiative organized for other countries. Secondly, as interbank funding dried up, reflecting the contraction of interbank assets and liabilities, the National Bank of Poland became the intermediary on the interbank market between financial institutions that were no longer willing to extend liquidity to each other. Thirdly, the depreciation of the exchange rate was inhibited by agreement with the IMF on a Flexible Credit Line in the context of strong macroeconomic policies. While these actions were successful in the circumstances, the need to take them illustrates the vulnerabilities that had developed in the pre-crisis period.

159. **Inadequate national savings in comparison with national investment are reflected in current account deficits, which in turn are the root of several of the main sources of macroeconomic vulnerability.** Among the indicators of vulnerability that have been particularly associated with financial crises are: the reserve coverage of external debt plus the prospective current account deficit; the current account deficit to GDP; external debt to GDP and to exports; private sector external debt; and public debt exposed to currency risk (IMF, 2010). All of these normally reflect immediate or prolonged current account deficits. Since the current account balance can be shown to be the difference between national savings and national investment, the reduction of a current account deficit requires either a decrease in investment, which may have undesirable long-term growth consequences, or an increase in national savings. Thus the strengthening of national savings is generally an important way to reduce a country’s vulnerability.

160. **Although a larger current account deficit is associated with higher external vulnerability, the deficit allows the country to utilize foreign savings and finance higher levels of productive investment.** But the form in which such savings are brought into the country is important, as different kinds of capital inflows are more or less volatile, and they are also associated with different structures of domestic investment. Turner (2014) documents that inflows of short-term bank claims are substantially more volatile than other forms of external financing, and that even inflows in the form of long-term cross-border bank claims are more volatile than equity, bond, or (most stable of all) FDI inflows. Indeed, short-term bank claims, especially when leveraged, are an important mechanism whereby financial shocks are transmitted across borders,
since they make the country vulnerable to sudden stops of capital (see World Bank, 2013b). In addition, there is considerable evidence that capital inflows through the banking system tend to finance consumption and real estate booms.  

161. **For a given level of use of foreign savings, financial stability requires that less be intermediated through the banking system, and more through equity and bond markets and in the form of FDI.** Banks therefore need to rely more on domestic funding than on external funding through parents or international money markets. And in any case, the funding model that prevailed before the crisis is no longer viable. Parent banks may not be able to provide same financing to subsidiaries in Poland because of the regulatory and market pressures that they are facing. At the same time, the terms under which Polish banks can raise financing themselves on international markets are less attractive than they were. And the new international liquidity standards governing banks’ funding structures (Basel III and CRD IV) will make longer-term and more stable funding compulsory.

162. **Countries where banks enjoy a higher deposit base have much lower levels of gross banking inflows.** Impavido et al. (2013) find that gross (as opposed to net) banking system inflows are closely associated with vulnerability to crisis, and countries with a higher deposit base have much lower levels of such inflows, particularly in the presence of a substantial foreign banking sector. Thus they argue that limiting banking sector leverage by promoting the growth of aggregate savings through macroeconomic policies that do not lead to internal and external imbalances, and through the development of domestic capital markets, is likely to increase economic resilience to external shocks. This argument also builds on the experience of Latin American and Asian countries.

163. **Higher domestic savings reduce the vulnerability of the financial system only if they are reflected in more stable funding of the banking system.** More stable funding may occur through a higher share of deposits on banks’ balance sheets. But higher domestic savings do not automatically bring about higher bank deposits. Savings may be held in the form of domestic or foreign securities if savers have the confidence to seek the higher returns that may come with longer maturity and diversification. If savers move out of bank deposits for such reasons, banks will either have to reduce their assets and lend less, or find alternative sources of funding, of which funding from abroad is an option. But the regulatory framework and local capital market development should allow them to replace deposits by stable local capital market funding, rather than increasing vulnerability by funding from abroad. Thus, to the extent that higher savings are reflected in increased deposits in the domestic banking system, they reduce the need for external funding. But if savers are to be offered more diversified assets, local capital markets need to be developed which in turn will offer banks a safe funding alternative to local bank deposits.

### Development of a local currency capital market

164. **The promotion of savings and their efficient use is bound up with the issue of developing a local currency capital market.** In Poland, as in most European countries, the financial system is dominated by banks and by bank credit. Unlike the United States, the extent to which companies finance themselves through the capital market is relatively small. Within the Central and Eastern European region, Poland has the most developed capital market, but it is still far from its potential. Development of the local currency capital market in Poland was the subject of a study by the EBRD in 2011 and was also discussed in connection with the IMF/World Bank FSAP in 2012 (IMF, 2013c).

165. **Local currency capital markets can provide savers with long-term investment instruments.** These can be tapped, either directly by individuals, or through collective investment vehicles, mutual funds or pension funds. Longer term local currency capital markets can also provide the more stable funding base for banks, which they will need as they implement the new Basel requirements. And a strong local currency capital market helps create a more stable financial system than one.

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119 Turner (2014) points out that most credit in advanced economies does not finance new capital investment, but instead finances consumption in excess of current income capacity or the purchase of already existing assets, in particular houses or commercial real estate, and the land on which they sit. He suggests that in the United Kingdom, only around 15 percent of bank lending finances new capital investment, an observation that is relevant when assessing the lending activities of Polish banks.

120 In the absence of developed local capital markets, the cost of funding through longer-term domestic borrowing was higher than combining relatively short-term international borrowing and using the foreign exchange swap market (Impavido et al., 2013).

121 For a discussion of the effect of higher savings in promoting more stable bank funding in Australia, see Freestone et al. (2011).

122 See EBRD (2013), p. 109, and also EBRD (2010), Chapter 3.
that is solely based on bank finance. A developed local currency capital market is not in competition with a strong banking system, but is complementary to it.

166. Among the general conditions for capital market developments are macroeconomic stability, a sound banking system, high institutional quality, and an adequate regulatory and supervisory framework (Rojas-Suarez, 2013), and these conditions are generally present in Poland (see IMF (2013c), World Bank (2014)).

- Macroeconomic stability is the foundation for sustainable economic growth and therefore for increasing private savings. It is essential for capital market development since it reduces the risks of sharp reversals of policy regimes and creates an environment in which interest rates can fall and investment horizons lengthen. Given the benchmark role that government bonds play on local currency capital markets, fiscal sustainability is essential so that yields on corporate bonds can be kept down and their maturity extended.

- Deep capital markets and a sound banking system are complements, not substitutes. Sound banks provide the liquidity needed by capital markets, including for financing brokers’ inventories. Credit monitoring by well-supervised banks helps provide the assurance to capital market investors that borrowers are sound. And as capital markets develop, bank deposits can be an important investment option for institutional investors, as well as providing an exit option for those holding other capital market instruments.

167. Poland’s financial and capital markets are among the most developed in Central and Eastern Europe. (See Chapter 3 in EBRD, 2010). Money markets are well developed and the stock exchange is well capitalized and liquid, Figure 5.5.

**Figure 5.5 Money market development index**

![Figure 5.5 Money market development index](image)

Source: EBRD (2010).

168. The most dynamic sector of the local currency bond market is the government bond market (Figure 5.6). This has attracted considerable foreign portfolio investment inflows over the period 2009-2012, with the stock of bonds in the hands of non-residents increasing from PLN 55 billion at end 2008 to PLN 190 billion at end 2012. In recent years, the maturities of government securities have lengthened, although not as much as in some other emerging markets. The average maturity of government bonds remains very short, at about four and a half years remaining maturity, but the yield curve extends to 30 years. Since Poland has the most liquid government bond market in the region, it can sell off when international investors try to reduce their exposure to the region, which accounts for some of the volatility of Polish capital markets visible in Figure 5.2 above.
While Poland has the most developed money market in the region, it does not function particularly effectively and, as mentioned above, dried up during the financial crisis. Most banks rely on their own deposit base as a domestic currency funding source and place surplus liquidity in NBP bills. Particularly since the crisis, the parent banks have tended to set tight interbank credit limits which constrain interbank lending. Banks tend to rely on the stickiness of the deposit base and the availability of parent company funding.

The report on capital market development in Poland prepared by the EBRD (EBRD, 2011) and the recommendations of the IMF/World Bank Financial Sector Assessment Program stress the importance of facilitating securitization. This is particularly important for providing banks with longer-term and more robust funding instruments, and both reports stress the usefulness of covered bonds in this context. The reports also emphasize the need for changes in the insolvency and creditor rights regimes, so that they adequately support collateralization and do not destroy creditor value when a debtor becomes insolvent. Such a reform would facilitate the transfer of collateral and allow the development of a tripartite repo market which could make money markets more liquid. Other measures to develop local capital markets recommended by the reports include changing the benchmarks for pension funds to encourage a longer-term investment horizon, allowing participants in pension funds to have a wider choice of portfolio options, and action to increase the issue of bonds by municipalities.

Banking system funding

Poland’s banking system is well capitalized and properly supervised (IMF, 2013c; World Bank, 2014). It is funded largely from deposits, and to a lesser extent from parent banks or from international markets. The main vulnerabilities of the banking system are exposure to foreign exchange risk and foreign investors, which in turn may pressure bank funding, especially in the absence of long-term domestic funding sources.

Complementing the deposit base of the banking system with diversified funding sources at longer tenors, such as long-term debt, was a major recommendation of the EBRD report on the development of a long-term capital market in Poland (EBRD 2011). Despite such calls, progress has been slow, since funding from deposits and from parents has been cheaper than funding from longer-term capital market instruments, and while the high level of liquidity persists, it is likely to remain so. However, prudential action requiring banks to contain maturity mismatches and to implement the new Basel III liquidity rules should put real pressure on banks to seek longer-term instruments, which should in turn foster local currency capital market development.

The Basel Framework has introduced new measures to ensure bank funding is robust. These are a Liquidity Coverage Ratio (LCR) governing the amount of liquid assets needed to cover a funding drought, and a Net Stable Funding Ratio (NSFR), which limits reliance on short-term funding. The LCR comes into effect at the start of 2015 and the NSFR at
the start of 2018. As of end June 2012, some 45 percent of European banks had stable funding at the required level, while the remainder faced an aggregate shortfall in required stable financing EUR 1.23 trillion (EBA, 2013). For Polish banks, in mid 2013, the PFSA estimated that the shortfall in long-term financing that Polish banks needed to meet the NSFR as of mid-2013 was over PLN 30 billion. The issuance of long-term bonds by these banks in the first half of 2013 was only PLN 300 million (Ramotowski, 2013).

174. **Lengthening funding maturities should be a priority to promote the stability of the banking system, according to the EBRD report of 2011.** The application of the Basel III liquidity requirement should give a major impetus to the demand for long-term funding, but it will need to be complemented by action to facilitate the supply of such instruments. The EBRD study considered whether senior unstructured bonds would be the most appropriate instrument for bank funding, and concluded that a secure and potentially liquid instrument, such as covered mortgage bonds, would have a stronger effect. Mortgage loans constituted 20.6 percent of the assets of the banking system or 18.2 percent of GDP, and thus an extensive base for securitization. Covered bonds can also provide a good substitute for government bonds to investors and savers looking for safe instruments. Nevertheless, in addition to a shortage of instruments, there is also relatively shallow domestic investor base, and regulatory constraints on the investment of pension funds (World Bank, 2014).

**Figure 5.8 Liability structure of the Polish banking system, 2012**

![Liability structure of the Polish banking system, 2012](image)


**Figure 5.9 Maturity mismatch of the Polish and Hungarian banking sectors**

![Maturity mismatch of the Polish and Hungarian banking sectors](image)


### Covered bonds

175. **A covered bond is a form of mortgage securitization that creates a highly rated long-term bond.** Unlike other forms of securitization, mortgages placed in a covered bond pool remain on the books of the issuing bank and are replaced by the bank if they fail. A holder of a covered bond has a claim on both the pool of mortgages and on the issuing bank, giving the holder unusually high security. All the reports on the financial sector and capital market development in Poland mentioned above have stressed the important role that a covered bond market could play and have made it central to their recommendations. The present report adds its voice to these recommendations, with the added motive that a covered bond market would help in the mobilization of savings.

176. **Covered bonds are a capital market instrument that provides an alternative investment with almost as high a rating as government securities.** The demand for such bonds comes from institutional investors and from other banks when looking for liquid assets. Issuing banks may also market these to individual savers who are looking for both safety and a yield pick-up over deposit accounts. Well-developed covered bond markets can be very liquid, and a study of Denmark quoted by Olszewski (2012) found that during the global financial crisis the market for such bonds remained almost as liquid as the government bond market. In light of its credit quality and its liquidity, a covered bond can be a cheaper source of financing than an unsecured bank bond, and it is not unusual for a covered bond to be rated higher than the unsecured credit of the issuing bank.
177. **A system of covered bonds can also contribute to the stability and quality of the underlying real estate markets.**

Those mortgages that enter the covered bond pool have to meet high standards and are subject to strict supervision. Speculative mortgage financing, or high loan-to-value or loan-to-income ratios are ruled out, isolating the speculative sector of the housing market (Kozak et al., 2012).

178. **As with most financial instruments, when covered bonds become a major form of funding for banks, they can create financial vulnerabilities.** In Sweden, for instance, they provide about half of all bank funding, the other half being deposits. While they are long-term instruments, they finance mortgages that have an even longer tenor, and are thus subject to roll-over risk in times of serious market stress. And while the market for such bonds may normally be so liquid that the banks themselves hold the covered bonds of other banks as a liquidity buffer, if all banks are facing liquidity problems, the secondary market for covered bonds may dry up. In those circumstances, the monetary authorities may have to take action to provide needed liquidity (Sandström et al., 2013). Despite this, the EBA has confirmed that covered bonds can be counted towards meeting the LCR and the NSFR.

179. **Covered bonds are a major source of bank funding in many European countries.** At the end of 2011, covered bonds financed 19.2 percent of German mortgages, 32.1 percent of Slovak mortgages, and 42.4 percent of Czech mortgages; in Poland the figure was 0.7 percent (Ramotowski, 2013). Poland also lags behind the other Visegrad countries in terms of the size of the covered bond market to GDP, although some other countries in the region, Bulgaria, Latvia, Romania and Slovenia, have also yet to see the covered bond market take wing. (Figure 5.10) It should also be noted that in Hungary and the Czech Republic, the expansion of the covered bond market was promoted with considerable tax subsidies and in the case of Hungary with subsidized interest rates. In Slovakia, initially mortgage bonds yields were tax-deductible.

**Figure 5.10 Outstanding covered bonds in CEE, 2012 (in percent of GDP)**

![Graph showing the percentage of outstanding covered bonds in CEE, 2012.](source: Łaszek (2014b)).

180. **Poland has both universal banks and a few specialized mortgage banks, with only the latter permitted to issue covered bonds under existing legislation.** The Polish mortgage market is large, and mortgages constitute 32 percent of bank loan books (IMF 2013). The market share of mortgage banks is very small at 2 percent, and universal banks have provided most mortgage loans. Mortgages are generally funded from deposits and from interbank loans, primarily from parents (World Bank 2014).

181. **The low share of mortgage banks in mortgage issuance is in part because the funding costs of universal banks in Poland have been lower than those of mortgage banks.** In a simulation covering the eight years 2005 -2013, the average interest rate on housing loans was 6.3 percent, while that on deposit funding was 4 percent. Indeed, the rate actually paid by banks may be lower than this when overnight rates are taken into account. A hypothetical funding through covered bonds would have had an interest rate over this period 180 basis points higher than bank deposits. This in turn
would have affected the affordability of housing for various income groups, in particular those in the sixth to eighth income decile (Łaszek, 2014b).

182. **An important proposal is that universal banks be permitted to issue covered bonds.** Current rules provide that only specialized mortgage banks may issue covered bonds. In practice, these mortgage banks are few and have not made a deep market in the bonds. Indeed, they have focused on commercial rather than residential real estate. The recommendations of the EBRD and FSAP teams is that legislation be amended to permit universal banks to issue such bonds, and this is also the position of the Association of Polish Banks (ZBP). One objection that has been raised is that this might result in a two-tier market for covered bonds, with those of universal banks being of lower quality than those of the specialized banks, and that pension funds would end up with instruments of different quality in their portfolios. It is in fact quite normal for the rating of a covered bond to reflect the creditworthiness of the issuing bank as well as that of the pool of mortgages. However, normally the dominant factor is the quality of the pool of conforming mortgages, and if standards for qualifying mortgages can be enforced, the small differences overall credit rating reflecting the creditworthiness of the issuer should not be difficult for investors to handle. Another objection has been that competition from universal banks would harm the financial stability of the specialized mortgage banks.

183. **There are a number of other changes needed to regulations that hamper the development of this market.** The insolvency law needs to clarify the situation in the event of the bankruptcy of the issuing bank. Certain tax issues need to be resolved, including the tax treatment of reserves for endangered credits freed by the sale of a portfolio of mortgages. The laws governing the transferability of mortgages between holders need to be amended, not least to clarify the status of bank secrecy in such operations. Finally the reports call for the amendment of PFSA Recommendation S that provides guidelines on how banks should manage their mortgage exposure.

184. **The main force for the development of the covered bond market is likely to be regulatory pressures for more stable bank funding.** Even with the removal of the other obstacles to issuing covered bonds, there is likely to remain a cost advantage to funding mortgages through deposits while current highly liquid conditions continue. But the advantages of such longer-term savings and investment instruments are such that it will be important to remove the remaining obstacles to their use. The regulatory pressure to apply the NSFR should be maintained, which will make it necessary for the banks to issue such instruments if they are to continue mortgage and investment lending. At the same time, action will need to be taken to ensure that certain segments of mortgage borrowers are not priced out.

### Corporate bonds

185. **Another important element in creating the instruments that can safely absorb savings is the corporate bond market.** While corporate bonds are not normally directly targeted at individual savers, they can form the backbone of the investments of pension and investment funds, which in turn serve savers' needs. A more developed corporate bond market can both help provide longer-term bank funding, as well as help Poland reduce reliance on the banking sector for its longer-term financing needs.

186. **Poland's corporate bond market is less developed than many of its peers, both within the region and outside it.** While the corporate bond stock in Hungary and the Czech Republic is well over 10 percent of GDP, in Poland it remains at the 2 percent level (Figure 5.11). Most corporate non-equity finance is in the form of bank loans, which amounted to 35.8 percent of GDP at end 2012, while outstanding corporate long-term and short-term bonds were only 2.0 percent and 1.2 percent of GDP respectively. (Figure 5.11) Liquidity is low, especially for smaller borrowers, and daily trading on the market is only around PLN 6 million, or 0.5 percent of daily Warsaw Stock Exchange turnover (Krasuski, 2013).
Savings and the Financial System

Figure 5.11 Corporate bond stock (percent of GDP, 2010)

![Graph showing corporate bond stock (percent of GDP, 2010)](image)


Figure 5.12 Corporate bond stock

![Graph showing corporate bond stock (PLN billion)](image)


Figure 5.13 Share of bank loans and corporate bonds in financing of non-financial corporations in Poland in years 2009-2012 (in percent of GDP)

![Graph showing share of bank loans and corporate bonds in financing of non-financial corporations in Poland in years 2009-2012 (in percent of GDP)](image)


187. Longer-term bonds are issued primarily by those few large companies which can raise capital in this way at a lower cost than from banks. Nevertheless, it is often more advantageous for the corporation to use retained savings or to borrow from the bank. Longer-term bonds are hard to price, so corporations often prefer to take shorter-term bank loans and bear the interest rate and roll-over risk (Impavido et al., 2013). For smaller borrowers, lack of liquidity is a problem, since most bonds are bought to be held to maturity. Most short-term corporate bonds are not traded on the regular bond market but are used for tax-saving liquidity management within corporate groups.

188. Some recent initiatives should help with the growth of the corporate bond market. The use of Catalyst trading platform has increased steadily, which has helped improve market liquidity and transparency. The decline in interest rates and the longer government yield curve should make pricing for longer-term bonds more attractive. Liquidity should be enhanced by the willingness of the NBP to relax collateral rules for repo operations (Bujnicki and Martewicz, 2013). The EBRD has launched a Financial Institutions Debt Capital Market Development framework for Poland, under which it will invest in medium to long-term senior bonds and structured finance products issued by banks and non-bank financial institutions over 2014-6 (EBRD, 2013). Finally, as the requirements of Basel III become more binding, banks will have a greater incentive
to finance themselves through the corporate bond market (in addition to the covered bond market) and other corporates should see the cost advantage of long-term bank loans gradually erode.

189. The near-term future of the corporate bond market is linked to that of the pension system. Several studies have argued that the regulation of pension funds has not encouraged longer-term investing, but has promoted an excessively short-term focus (Impavido et al. 2013, IMF 2013): a change in the relevant regulations is being considered. The prohibition on OFEs purchasing government debt, introduced as part of the recent reform, should enhance their demand for corporate paper, to the extent that this is not offset by reduced funds flowing into OFEs as participation becomes voluntary. The recommendations in this report for reinvigorating the voluntary (third) pillar of the pension system should also enhance the demand for corporate debt instruments.

190. There remain a number of recommendations outstanding to remove obstacles to the development of the corporate bond market in Poland. Proposals to amend the 1995 Bond Act were accepted by the Government in April 2013 but have still to be adopted by the Sejm; these would extend the list of entities able to issue bonds and simplify procedures. 123 The development of the market is also being held back by the absence of entities to buy so-called distressed assets and a bankruptcy law that makes it difficult to recover losses. Another proposal is for requirement for issuers to use a centralized bond depository, which would facilitate clearance and promote liquidity (EBRD, 2011).

**Funded pension schemes**

191. There are a number of outstanding recommendations concerning the future operation of the second pillar that have importance for the construction of effective savings instruments in Poland. This report is not the place for an extensive discussion of the reform to the second pillar (OFE) that came into effect in 2014. But some of the recommendations that have been made in the FSAP report concerning the future operations of OFEs also have implications for the more extensive use of third pillar pension vehicles in Poland. In particular, there are issues connected with the investment strategies and savings vehicles offered by the OFEs that are relevant to privately funded pension schemes. The impact of the recent reform on capital market development will depend on the change in the flow of funds into OFEs and private pension schemes, how this is offset, and how the portfolio mix of OFEs will adjust following the ban on holding government paper.

192. Capital market development in Poland relies on a strong institutional investor base, and since OFEs are a significant part of the market, adjustments in their operations are called for. The EBRD report regards the benchmarking system for measuring the performance of OFEs to have been a cause for the slow development of longer-term capital market instruments in Poland. The current system, which penalizes relatively small deviations from average performance, encourages a conservative herding strategy, and a buy-to-hold approach that does not contribute to market liquidity. It also raises costs by encouraging defensive strategies, when high fees are already a significant barrier to market acceptance. The FSAP recommends setting minimum durations of the fixed-income portfolios of pension funds, thus increasing demand for longer-term government securities and encouraging corporates to issue longer-term bonds.

193. Measures are also recommended to improve the product mix for savers. The main issue is to offer savers portfolios that better reflect life-cycle investment strategies. This might be done by offering standard portfolios with different risk/return characteristics, or offering a product that alters the bond-equity mix with the age of the saver. Greater incentives and transparency are essential to allow private agents to take informed decisions, especially against the background of low voluntary private savings and low expected replacement rates.

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Annuities

194. A pension is normally provided in the form of an annuity, a payment that is made at regular intervals after a person’s retirement during his or her life, or to a surviving spouse or dependent for their lifetime. National pay-as-you-go pensions systems (first pillar) have this characteristic, and in countries where private pensions funds dominate, pensions are normally paid in this form. To what extent is it necessary or desirable for a pension scheme to provide an annuity in its payout phase, and what are the obstacles to it?

195. The issue has arisen in Poland, since the OFEs have been unable to offer annuities to those participants reaching the payout phase, and can only offer regular payments for a limited period. To resolve this, OFEs are now required to transfer the accumulated contributions and earnings of a participant to the State Pension system, ZUS, over the ten years before the pension becomes effective (known as “the zipper”), and ZUS then pays the equivalent annuity to the retiree. But for third pillar pensions, this is not available, and no company currently offers annuity pensions in the third pillar.

196. For those saving for retirement, the purchase of an annuity may be a very important goal, since it protects them from longevity risk, the risk that they exhaust their savings well before they die. Thus the ability to offer an annuity at a competitive price can be an important factor stimulating retirement savings. Alternatively, if the pension plan pays the retiree a lump sum on retirement, or phased payouts at intervals thereafter and leaves the retiree to apply that money to whatever purposes the retiree wants, an annuity might represent a rational investment decision at that point.

197. However, annuities also have drawbacks that would lessen the attractiveness of a retirement savings scheme if it were the only alternative. Firstly, it is an irrevocable investment that uses the entire amount of the savings. It gives no flexibility to a saver who wants to have funds available to meet unexpected contingencies, or to purchase an asset. Nor does it allow the savings to be left as a bequest to the saver’s heirs. Since these are among the normal motives for saving, a retirement savings scheme that does not offer them will be less attractive than one that does.

198. The challenge is to devise a sensible mixture of payout options that meets the pensioner’s desire for flexibility in the use of the savings embedded in the pension scheme, while providing adequate insurance against longevity risk. The extent to which a second or third pillar needs to provide an annuity will depend on the extent to which the pensioner is already insured against longevity risk. Since the (first pillar) pay-as-you-go pension is already annuitized, it may not be necessary for the second or third pillar to be fully annuitized. But if additional pension savings are being promoted to deal with the potential problem of pension poverty, then some annuitization would be appropriate.

199. One possibility is to have phased payout plus partial deferred annuitization, say starting at age 85, as is common in Belgium, Denmark, and Germany (Antolín (2008) and Rusconi (2008)). This gives flexibility, and deals with the longevity risk, in that the annuity kicks at a point where the lump sum or phased payouts may have been exhausted. It is also uses a much smaller part of the accumulated assets to provide an annuity for the tail of the life expectancy distribution, while coping with the problem of myopia in relation to life expectancy (Wren-Lewis, 2014). If partial annuitization is mandatory, it deals with the adverse selection problem discussed below.

200. There are obstacles to the development of annuity markets. One problem is how the financial institution providing the annuity lays off the longevity risk it is taking. The increase in life expectancy over recent decades has taken the industry by surprise. And there is a shortage of natural counterparts that would benefit from longer general life expectancy and which would be in the position to take the other side of a hedge (BCBS, 2013). Another serious problem with annuity markets is that of adverse selection, in that those who have good reason to believe that their life expectancy is less than average have a smaller interest in purchasing an annuity, leaving the provider with a pool of longer-lived beneficiaries. Finally, there are problems of interest rate and other risks that are very similar to those that have made defined benefit pension schemes unviable.

201. The lack of development of an annuity market has not prevented countries from making at least partial annuitization mandatory as is done in Chile. This resolves the adverse selection problem at least. Strong regulation of the annuity market and competition in it can help ensure that annuities are provided on reasonable terms. While pension

124 A summary of national annuity schemes is contained in Annex 14.
funds can be mandated to provide annuities, it may be that they will contract with insurance companies to do this, since
the life insurance business is in some ways the mirror image of the provision of an annuity (Impavido et al. (2013)). And
the development of an annuity market may also make it possible for reverse mortgages to be offered, allowing people to
convert illiquid assets into retirement income.

Current third pillar arrangements

182. The vehicle with the greatest potential for compensating for the low expected replacement rates of retirees is
the third pillar of voluntary pension plans. Poland’s experience with such instruments has not been very encouraging,
and this report recommends a number of options that might be considered.

183. In Poland there are three types of tax-advantaged voluntary private pension schemes: employee pension programs
(PPE) established in 1999; individual pension accounts (IKE) established in 2004; and a modified version, individual pension
security accounts (IKZE) available from beginning of 2012. At the end of 2012, total assets accumulated on voluntary private
pension accounts in Poland amounted to only PLN 11.9 billion, equivalent of 0.75 percent of GDP (Figure 4.2, Chapter 4).

Table 5.2 Assets accumulated in voluntary pension plans in Poland (in percent of GDP) at the end of years
2002-2012

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<th>PPE</th>
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<td>2011</td>
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<td>2012</td>
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184. Employee pension programs (PPE) aim at mobilising supplementary private pension saving. In practice,
97 percent of all contributions are made by employers, and only 3 percent by employees. At the end of 2012 almost 360,000
individuals had PPE accounts, and regular contributions were being made to more than 80 percent of them. Total PPE assets
were PLN 8.3 billion as of the end of 2012 and the average balance on an account was almost PLN 24,000. PPE accounts
are administered by asset management companies, and are invested in specialist investment funds’ participation units
(40.8 percent), treasury bonds and bonds guaranteed by the state (37.5 percent) and equities (19.6 percent).
Figure 5.14. Number of participants and assets under management in PPEs in years 2002-2012


185. Individual pension accounts (IKE) are voluntary defined contribution pension programs that can be offered by insurance companies, investment funds (TFI), brokerage businesses, banks and, from 2012, by pension companies. (Their tax treatment is described in Chapter 4) The initial uptake of IKE accounts was rapid, growing to 900,000 by 2007, although the coverage rate of economically active people was only 5.4 percent. In the following years, the number of newly created IKE accounts fell and an increasing number of existing accounts were closed, with the total falling by 2012 to 813,000 and the coverage rate below 5 percent. The decline, which occurred before participants reached the point where they could reap tax advantages, reflected the economic slowdown and weaker labor market. The IKE coverage rate increases slightly with age and is a little higher for women than for men. IKE investment products have to be certified by Polish Financial Supervisory Authority.

After almost a decade, IKE assets amounted to only PLN 3.5 billion (0.25 percent of GDP) by 2012. Many accounts are inactive, with the share receiving individual contributions falling from 39.8 percent in 2007 to 31.7 percent in 2012. IKE accounts are used by those at the top end of the income scale, and annual contributions increased in 2012, reflecting a change in capital gains taxation on bank deposit interest. The low amounts saved in IKE pension accounts suggest that they have not become schemes that are likely to ensure supplementary regular income after retirement. Only 8,500 holders of IKE accounts have become eligible for tax-favoured pension payments from the accounts, and 99 percent of them were provided in form of a single lump sum payment. The main reason is that the average accumulated savings of these participants only amounted to PLN 8,700. Many more people close their accounts annually, the majority taking a single lump sum payment averaging PLN 4,700 in 2012.

Figure 5.15. Number of IKE pension accounts in years 2004-2012

A modified version of individual voluntary pension accounts, IKZE, was introduced in 2012. In the same manner as IKE, IKZE are voluntary defined contribution pension programs that can be offered by insurance companies, investment funds (TFI), brokerage businesses, banks and pension companies. The main difference between these two pension programs is the tax treatment of contributions and pension payments, with IKE being on a TTE basis and IKZE on an EET basis (see Chapter 4). From 2014 onwards payments from IKZE accounts are to be taxed at reduced 10 percent rate, provided that an individual’s contribution payment not exceed 1.2 times average monthly earnings. IKZE investment products have to be certified by Polish Financial Supervisory Authority. After one year, almost 500,000 Poles had opened IKZE accounts, but less than 7 percent of them made individual contributions. Total IKZE assets had only reached PLN 52 million by end 2012.

Increasing the coverage of private pension schemes

What makes for high use of private pension schemes? One factor is the adequacy of the state pension. In countries such as France and Belgium, where the state pension provides a high replacement rate, there is little demand for private pension schemes, but in the UK and Ireland, where the opposite holds, participation in private pension schemes is high. The 1999 pension reform in Poland will increasingly put it in the second group of countries. A second factor is whether contributions to private pension funds are mandatory, such as in the Nordic countries, or where contributions are the result of collective bargaining by sector (Netherlands, Denmark). In high-income OECD countries, the difference in coverage rates between countries with mandatory and voluntary private pension plans is as much as 30 percentage points (OECD, Pension Outlook 2012, p. 115).

There is evidence that mandatory saving schemes can be devised to make a net contribution to national savings. Many studies of the effectiveness of saving schemes assess whether a given scheme attracts savings, but it is much harder to assess whether there is a net increase in savings or merely a diversion from other forms of saving. Indeed, if rational savers are not liquidity constrained, have clear savings preferences, and can use their savings as they want, the expected effect of a mandatory savings scheme would be for them to maintain consumption and reduce their other saving one for one. For a positive effect on overall savings of such a scheme, one or more of the assumptions must be changed. If a positive effect on savings can be demonstrated, mandatory enrolment can be justified if individuals have difficulty committing themselves to a saving behavior that they know is ultimately in their best interest. A mandatory scheme also results in a more equal distribution of any tax benefits or incentives that are available. However, it can be difficult to spread the compulsory enrolment net wide enough to cover the informal economy or those economically inactive.

A summary table of interventions to encourage household saving is presented in Annex 15.
189. **Two studies of the effect of the mandatory pension scheme in Denmark on private saving found that it did add substantially to national savings** (Arnberg and Barslund (2014) and Chetty et al. (2013)). One problem with studies in this area is the need for data to document the counterfactual cases. Access to individual Danish data allowed this to be done for Denmark’s mandatory scheme, that requires employees to make compulsory contributions under industry-wide collective pension agreements. Arnberg and Barslund were able to see how an increase in the contribution rate to the compulsory scheme altered both the employee’s saving under voluntary schemes and the employee’s overall saving rate. The rate of crowding out was found to be quite modest, at between zero and 30 percent. The rate of crowding out was found to be slightly greater for those not liquidity constrained, and to rise with age. Chetty et al. find evidence that automatic savings could increase household savings much more effectively than tax subsidies. In 1999, Denmark sharply reduced the tax advantage to upper tax brackets for those pensions paid in lump-sum form (capital pensions), and Chetty et al. found that the reduction in savings in this form was almost completely offset by an increase in other forms of saving. However, the introduction of a mandatory pension system led to an increase in total savings almost equivalent to the new contributions.

190. **Savings behavior varies according to an individual’s place in the income distribution**. Chetty et al. (2013) conclude that people at the upper end of the income distribution plan their savings actively, broadly consistently with the life-cycle hypothesis, but therefore tend to respond to financial incentives by rearranging their savings, rather than by saving more. At the lower end of the income distribution, people are less swayed by tax incentives, and may actually face higher marginal rates when incentives result in the loss of other benefits. At this end of the scale, more people are likely to be employed by firms that are less likely to offer benefits, and people are borrowing constrained. Saving behavior at this end of the spectrum tends to be more passive.

191. **Financial incentives are hard to design so as to be cost effective in raising general savings rates**. Tax incentives affect the behaviour only of those who are paying tax. They tend to be more active in their saving decisions than the general public, and are prone to reshuffling their savings so as to take advantage of the tax benefits, rather than increasing their saving rate. For those at the lower end of the income scale, tax incentives are less effective, and there may be strong disincentive effects from the withdrawal of benefits as incomes increase. If the objective is to raise saving rates among the less well off, then flat rate subsidies can be a more effective incentive. Most studies show that the influence of tax incentives on savings are small which was earlier discussed in Chapter 4. In addition, as shown before there is also a fiscal cost to set against any increase in savings.

192. **Matching schemes would seem more promising, but again the evidence is mixed**. In the United States, Duflo, Gale, Liebman, Orszag and Saez (2007) found little impact of different incentives on take-up and contribution rates for IRAs, while an earlier (2006) study by the same group found a small increase in take-up rates when IDA (Individual Development Account) participants received matches, although they were unable to test whether this was offset by substitution. Another study by Mills, Gale, Patterson, Engelhardt, Eriksen and Apostolov (2008) also looking at IDAs found that matching led to an increase in home-ownership rates among renters, while non-pension wealth was actually reduced. A study of Saving Gateway accounts in the UK by Harvey, Pettigrew, Madden, Tu, Emmerson, Tetlow and Wakefield (2007) found some increase in low take-up rates and higher contributions from matching, especially among low-income groups, but concluded that most of the effect was from reshuffling of savings rather than new savings.

193. **Matching contributions may themselves be the origin of increased savings**. Given the evidence that most individuals are passive savers, employer contributions are not generally offset by the individuals saving less in other forms. The main drawback is that to the employer, the mandatory contribution raises labour costs, and could in principle result in some reduction in employment, and it may also reduce revenue from corporate income tax.

194. **OECD experience shows that the share of people making contributions to private pension schemes depends mainly on enrolment procedures**. The most effective method is compulsory enrolment. But in Poland, the first pillar, and until recently the second, relied on compulsory enrolment; if higher compulsory savings were needed, the authorities could just raise the contribution rate. The challenge is to find a way to make a voluntary system sufficiently attractive. Coverage rates tend to be relatively high and constant across age and income groups in countries where enrolment is mandatory or quasi-mandatory, while they tend to be low and increase with age in countries where enrolment is purely voluntary. Two of the more successful voluntary schemes, the German “Reister” pension and the New Zealand KiwiSaver scheme, are described in boxes.
195. **Private savings in voluntary pension schemes are likely to be higher with automatic enrolment** for employed people, while providing them with some possibility to opt out. This enrolment method relies on the inertia of individuals, or perhaps their tendency to procrastinate. Relatively few people opt out of well-designed schemes, and contribution rates tend to stay close to the default options. A number of studies have looked at the impact of automatic enrollment on the use of 401(k) plans in the United States. Madrian and Shea (2001) found that the continuing participation rate of one firm’s employees after three to fifteen months rose from 37 percent to 86 percent after the adoption of automatic enrollment, and contributions generally remained at the default level. Choi, Laibson, Madrian and Metrick (2006) found similar results, with 50 to 90 percent of new enrollees going for default contribution rates, while Beshears, Choi, Laibson and Madrian also found similar results in 2009.

196. **Another incentive to increased saving may be to make withdrawal procedures more flexible.** While a major saving motive may be retirement income, there are other important motives such as precautionary saving for an emergency or for acquiring a housing asset. Some schemes have become more attractive to savers when the possibility of using the accumulated assets without a substantial penalty is enhanced. The majority of Poles who save or plan to save (59 percent) state that flexibility of long-term pension products in terms of earlier withdrawal of saving is of great importance for them (Instytut Homo Homini, 2012).

197. **In principle, financial education could increase participation in savings schemes.** However, evidence (mainly from the US) of its effectiveness in generating sustained changes in saving behaviour is quite poor. The poor level of financial literacy in OECD countries is documented in Lewis and Messy (2012), which also covers various national financial literacy schemes. Fernandes et al. (2013) conducted a meta-analysis of the effects of financial literacy and of financial education on financial behavior in 155 papers covering 188 prior studies and found that interventions to improve financial literacy explain only 0.1 percent of the variance in financial behavior. Willis (2011) argues that the aims of increased financial education in terms of changing consumer behavior and enhancing consumer protection can be achieved more effectively through other tools. See also Olen (2014).

198. **In light of the evidence, there seems to be a strong case for introducing a new savings product to give new life to the third pillar of Poland’s pension system.** All employers might be obliged to offer a new scheme to their employees, who would be enrolled automatically, but with the possibility of opting out. Employee contributions would be matched by employer contributions, and the state might provide an additional flat payment to the account. The contributed amounts and earnings might be tax free, with income tax paid on distributions. The contributions would be invested in instruments approved by the KNF, and there might be a dynamic development of the portfolio backing this instrument with the share of bonds rising with the participant’s age. A part of the contribution might go to purchase a deferred annuity, starting at age 85, to ensure that the pensioner does not suffer poverty when the other payments run out. While the main objective would be to provide retirement income, accumulated savings, minus that part spent on the annuity, could be drawn for other specified purposes on particular occasions.

**Box 5.1. Riester pensions in Germany**

**In 2002 Germany introduced a heavily subsidised voluntary pension plan, the Riester pension**, named after Walter Riester, former German Secretary of Labor and Social Security. It is designed to compensate for a parallel reduction in the Statutory Retirement Insurance system, that is gradually becoming less generous. It can be purchased by anyone covered by the social insurance system and subject to full tax liability. Private contributions made to Riester pension plans can be deducted from earned income for tax purposes up to an annual limit of EUR 2,100. These private contributions are matched with government subsidy, whose level depends on the individual contribution rate and the number of children. In order to receive the full state subsidy, participants must pay in at least 4 percent of his or her previous year’s income, except for low-income households for which this minimum contribution level is not obligatory, but which must contribute at least EUR 60 a year. The basic annual government subsidy to a Riester plan amounts to a maximum of EUR 154 for a single persons, EUR 308 for married couples, and EUR 185 for every child. From 2008, annual government subsidy for every new-born child has been raised to EUR 300. If Riester savers do not contribute 4 percent of income, the government pay-out is reduced to the percentage that is paid into the account.

The flat government subsidy level and lower minimum pension contribution for low-income workers in Riester pension plans make these arrangements very advantageous for low-income households and households with children. On average every two
euros contributed by the saver to a Riester plan are matched with almost one euro paid in by the government. However, for low-earners with children, subsidies can exceed the personal contribution by a factor of four or more. While low-income earners receive a relatively high subsidy due to the matching basic subsidy, higher earners accrue additional subsidies from the tax deductions on account of the progressivity of income tax rates (Börsch-Supan et al., 2012). To encourage the participation of young people, since 2008 the government pays a bonus into the account of EUR 200 for those signing up before their 26th birthday. If the Riester contract is cancelled before the statutory age, all subsidies and tax savings must be returned to the government.

**Pay-out provisions have been made more flexible.** Until 2007, savings accumulated in subsidised Riester plans could only be used to purchase an annuity, with the possibility of paying out a maximum of 20 percent of capital as a lump sum. Subsequently the share of saving available as a lump-sum after reaching retirement age was raised to 30 percent. Since 2008 the full amount of Riester savings can also be used for building loan contracts or for buying real estate, providing the Riester saver personally uses the property. These amendments allowed for more flexibility in terms of use of the accumulated saving and, coupled with the attractive government subsidy, resulted in a substantial increase in coverage of Riester plans. All Riester pension products have to be certified by the German Federal Financial Supervisory Authority.

**The coverage rate was 26.7 percent of working age population at end 2010.** For households with two or more children the coverage rate was about 60 percent, more than twice that of childless households. Borsch-Supan et al. (2012) point out that between 2003 and 2010, the Riester pension coverage rate of people aged 18-34 increased from less than 10 percent to almost 50 percent. Contributions are close to the 4 percent minimum across the income spectrum. The coverage rate is also relatively equal across income groups, with especially good coverage rates for low-income households compared with other private pension plans.

**Matching private contributions with government subsidy involves some fiscal costs.** In 2012 the cost of direct subsidies to Riester pension plans amounted to more than EUR 3.0 billion (about 0.11 percent of GDP). The total fiscal burden was larger than this, as some budget income was foregone due to the ability to deduct Riester pension contributions from income for tax purposes.

**Figure B1. Riester pension plan coverage rate among economically active people in Germany in 2008 by age.**

*The coverage rate represents the percentage of households where at least one of the partners is enrolled in private pension plans, and in which the head is younger than 65 and at least one of the partners is in the labour force.*

Box 5.2. KiwiSaver

The KiwiSaver scheme was introduced in New Zealand in July 2007 following a long discussion on how to raise national savings. The scheme involves employers enrolling new employees automatically, while giving them two months in which they can opt out. Those in the scheme must make a minimum contribution of 2 percent of income (since raised to 3 percent) deducted from salary, matched by an untaxed employer contribution of 2 percent (since raise to 3 percent). The government kick-starts each new account with NZ$1,000 and it also matches an employee’s contributions, dollar for dollar, with a tax credit, since July 1, 2011 up to a maximum of NZ$521 a year. The employee may choose an investment plan, but if he or she fails to do so, one of six default providers is automatically selected. There are relatively liberal withdrawal rules, allowing use not only to finance a pension but also to acquire a first house or to draw on the funds in case of substantial financial problems as a result of a serious illness, accident, or disability. Existing employees can opt in to KiwiSaver on a purely voluntary basis.

As of June 2013, KiwiSaver had 2.15 million members, of which 830 thousand had enrolled automatically, 260 thousand had entered through their employer, and 1.06 million had been enrolled by providers. This amounted to about 60 percent of the working age population. The share of those opting out was about 30 percent, although the rate has been declining. The very widespread participation in the scheme seems to be the product of automatic enrollment, the matching contributions, and the liberal withdrawal provisions. The inertia in selecting the default contribution rate led the government to increase the rate as of April 1, 2013.

Fees and expense charges averaged across all KiwiSaver schemes are estimated in 2010 to have averaged 0.83 percent of assets, plus an average expense charge of $2.55 per member per month. Combining both figures, the total industry management and expense ratio (MER), defined as total expenses plus total fees expressed as a percentage of total assets, is 1.46 percent. It was hoped that this would come down over time to closer to 1.0 percent as economies of scale are realized (Ansley, 2010).

CHAPTER 6
THE ECONOMIC EFFECTS OF THE MAIN DETERMINANTS OF SAVING IN POLAND QUANTIFIED
The Economic Effects of the Main Determinants of Saving in Poland Quantified

199. To assess the impact of potential changes in the main determinants of savings on the performance of saving and economic growth in Poland, a large-scale Dynamic Stochastic General Equilibrium (DSGE) model was used, which was supplemented by the Generational Accounting Framework COSIMO. The latter tool is a model for cohort labor market projections. It utilizes the probabilities of entry/exit rates together with demographic forecasts to derive the future path of labor supply. The cohort approach was used since behavior of different cohorts had earlier been found to be important for saving developments. The modeling exercise covered only those determinants of saving identified in this report which are relatively easy to quantify. The analysis of saving determinants suggests that to boost saving it will be important to support income convergence, raise the propensity to save, and limit government dis-saving. That is why the modeling exercises focus on:

- changes in the labor supply as a way to boost income;
- changes in the propensity to save;
- limiting government dis-saving by controlling age-related spending at an early point.

Later on, in Chapter 7, concrete policy changes are identified that could lead to increased propensity to save and work and reduce government dissaving.

The modeling results need to be interpreted with caution, given the long time horizon in the model (up to 2060) and significant uncertainty resulting from potential behavioral changes which are difficult to capture in standard economic models.

Business as usual scenario Poland 2050/2060

200. The policy simulations were compared to the long-term baseline path. The baseline path (business as usual, BAU) is a hypothetical path of economic developments assuming a continuation of recent trends and no new policies (see Figure 6.2). This counterfactual business as usual scenario assumes constant probabilities of entry and exit from the labor market and a gradual convergence of productivity in Poland to the European Union levels. Following Bukowski et al. (2013), the labor supply scenario was based on the Eurostat fertility rates and mortality rates (Figure 6.3). Also, in line with the projection of the European Commission’s Ageing Working Group (AWG) (see EC, 2011 and EC, 2012c), the baseline scenario adopted constant probabilities of entry into and exit from the labor market by age cohort, allowing only for an adjustment due to the increase in the statutory retirement age, implemented in 2013. The details of the estimation method are described in Bukowski et al. (2013). The BAU scenario envisages a steep downward trend in male and female employment in the next half a century, which translates into a significant GDP growth decline (from above 4 percent in 2016 to about 1 percent in 2050), despite strong TFP growth (Figure 6.1).

127 The DSGE model includes a comprehensive labor market component with frictions, and wages negotiated through Nash bargaining, which makes it particularly suitable for analyzing the impact of changes in the population size and labor supply on the economy (see Annex 16 for a description of the model).
128 The WISE COSIMO is a model for cohort labor market projections. It utilizes the probabilities of entry/exit rates together with demographic forecasts to derive the future path of labor supply.
129 The DSGE model provides simulations up to 2050, while the labor supply model runs up to 2060.
130 The long-term assumptions for the growth of TFP as the main growth driver and of investment rates were harmonized with the projections of the Ministry of Finance and with the long-term projections of the European Commission. TFP growth is slightly above 2 percent per annum in the first decade of the projection window and converges almost linearly to 1.5 percent in 2060. The investment rate remains quite high through 2020; that is, as long as EU funds increase public investment. A standard Cobb-Douglas production function was applied, with a capital share of 36 percent and a capital depreciation rate of 5 percent per annum. The sectoral structure of the economy is assumed to converge towards the EU pattern, in line with Bukowski et al. (2012). The structure of employment in 2050 has 72 percent of workers employed in services, 22 percent in industry, while the remaining 6 percent still work in agriculture.
Figure 6.1. TFP and GDP growth in business as usual scenario.

Source: Bukowski et al. (2013).

Figure 6.2. Decomposition of GDP growth in business as usual scenario, cumulative growth by sub-period

Source: Bukowski et al. (2013).

Figure 6.3. Life expectancy by sex (left axis) and total fertility rate (TFR), in the baseline scenario

Source: Bukowski et al. (2013).

201. Labor supply projections were based on an innovative modeling approach that links probabilities of entry (exit) into (from) the labor market of a selected cohort to structural and policy-related factors. Future changes in the labor supply (LS) will result not only from demographic processes, but also from past and current policy changes as well as the ongoing transformation of labor demand. Thus, one can expect LS to react to improvements in health, increases in life expectancy, and changes in the net replacement rate or technologial progress, together with sectoral shifts. This calls for applying a forward-looking and dynamic assessment of LS changes to reflect the economic and demographic processes. Therefore, the assumption of constant, historical values of entry and exit rates from the labor market by cohort, used by AWG, was lifted because it assigns the same probability to the labor market exit of a 60-year old person who retires in 2050 and a person who retired at the same age in the early 2000s. For instance, the introduction of the notional defined contribution (NDC) pension reform of late 1990s and the projected fall in pension replacement rates should encourage people to work longer and thus reduce the probability of the labor market exit of a 60-year old in 2050. The new way of estimating probabilities of entry and exit rates from the labor market were based on extensive literature review and the WISE COSIMO model (see Bukowski et al. (2013) and Annex 17).

Scenario 1: Expanding labor supply (and income)

202. If income convergence is boosted by an increased propensity to work, GDP and saving in 2050 could be about 0.9 percent higher compared to the baseline BAU scenario. The increased propensity to work can have a sizeable positive impact on not only growth but also on saving. Future changes in LS will result not only from the demographic process, but also from past and current policy changes, as well as the ongoing transformation of labor demand. Compared to the baseline path, it is estimated that LS will expand by additional 600,000 workers by 2060 (i.e., around 4 percent) as a result of improvements in the health status, behavioral changes that would increase incentives to work longer due to declines in pension replacement rates, and the shift towards the service sector. An improvement in health drives LS, as rising wellbeing strengthens an individual’s ability to work. Pension regulations, in particular those governing replacement rates, affect the age-related likelihood of labor market withdrawals. Also, services offer more opportunities to work in physically less demanding conditions than in industry. If the above-mentioned changes occur together it brings a greater effect than a sum of them separately. Towards the end of the projection period, these interactions between the three changes translate into an additional 100,000 workers. Because the changes affect exit rates, the additional workforce consists of older workers, mostly of those aged 66-70 years. Participation rates for males aged 71-75 years reach 15 percent, three times more than in the baseline. For females in the same age group, the participation rate doubles compared to the baseline. The additional workers are recruited mainly from older men, because they are less engaged than women in activities such as grandchildren-rearing or parent care.

203. If an education system is reformed to facilitate successful transition from school to work the labor supply as well as growth and saving will increase. There are several reforms that could facilitate combining work and study, e.g. expanding enrolment capacities of vocational tertiary education, strengthening cooperation between schools and employers or improving the quality of teaching that could facilitate combining work and study. If the government were to introduce such changes to the education system to increase the participation rate of younger workers, it would bring an additional boost to LS and growth. Decreasing the effective age of labor market entry by 2030 for men from 21.1 (baseline scenario) to 20.9 and women from 23.0 (baseline) to 22.6 has the potential to boost LS in 2050 by 0.8 percent and 0.4 percent compared as compare to the baseline. It would also translate into slightly higher GDP growth (by about 0.09 percent compared to baseline).
Figure 6.4. Impact of increased labor supply due to policy and non-policy changes on growth, private consumption, and investment (=savings), deviation from the baseline in percent

Source: Bukowski et al. (2013a).

Scenario 2: Increasing the propensity to save

204. An increase in the propensity to save would have a positive impact on GDP growth in the long run. If the higher propensity to save of households produced a saving rate sufficient to cover the earlier estimated saving gap in Chapter 2, the long-term GDP could increase by 0.4-0.7 percent compared to the baseline scenario\textsuperscript{131}. This simulation was modeled as a positive behavioral shock (Box 6.1). In the model, an increase in the propensity to save pushes the economy towards a new steady state with a higher investment rate. Initially, an increase in the propensity to save leads to a small drop in consumption (see Figure 6.5), but in the new steady state GDP, private consumption and welfare are higher than in the baseline. The higher GDP stems partly from an increased motivation to work. Although the parameter determining the preference for consumption and leisure does not change, households choose to work more so they can save and consume in the future. The effect of an increased propensity to save on the economy is positive, but the result needs to be treated with caution. The model results rely on a strong assumption of effective channeling of savings into productive investment (which is important to minimize the impact on the relative price of investment goods). However, as employees work more to achieve their preferred level of consumption, their welfare - reflecting a combination of consumption and leisure - would decline compared to the baseline.

\textsuperscript{131} When the deviations from the baseline are cumulated, GDP growth in the period 2013-50 could be about 20 percent higher than in the baseline.
Box 6.1. Modeling increased propensity to save in the DSGE model framework

The increased propensity to save is modeled by ‘shocking’ the utility attributed to today’s situation compared to the utility in the future periods. The aggregated expected utility $V_t$, determined by work, consumption and leisure choices, and maximized by the households is given by:

$$V_t = E \sum_{k=0}^{\infty} \beta^{t+k} u_{t+k}$$

In the simulation, the parameter $\beta$ of the utility function is changed allowing for an increase in investment by 5 percent, which corresponds to around one percentage point of the observed investment rate. This is far less than the increase in investment required to offset the negative impact of ageing on growth. Initially, the $\beta$ parameter was shocked to correspond with an implied increase in investment by 3 percent, as recommended by Hevia (2013), but this led to irrational values of time preference parameter when looked at from a behavioral point of view.

Source: Bukowski and Gąska (2013).

Figure 6.5. Impact of the increase in the propensity to save on GDP, consumption, and investment, deviation from the baseline in percent

Source: Bukowski et al. (2013).

205. The impact of an increase in the propensity to save on the government’s saving position may also be positive. Revenues from corporate income tax grow because of better economic performance, while the collection of other taxes improves very slightly. If higher taxes and increased current revenue were accompanied by stable expenditure, the budget would reach surplus by 2024 which would increase to almost 2 percent of GDP by 2050. However, these results need to be treated with caution, as historical experience shows that public expenditures tend to rise with rising revenues, and that the budget balance – as a policy choice – remains unchanged.

Scenario 3: Preserving a sound fiscal position despite aging

206. Limiting government dis-saving could lead to higher national saving and GDP. The highest risk of government dis-saving in Poland comes from growth of age-related spending, in particular health care expenses, which need to be reduced or offset if the government saving position is to be preserved. As presented in Chapter 4, age-related spending increases
could be sizeable. How the government addresses this issue will have an important impact on national saving and GDP performance.

207. Of the four possible options for financing age-related spending—tax hikes, less public investment, higher debt, and cuts in transfers—the last option best balances benefits for saving and growth. When age-related spending on health is financed by cuts in transfers, growth increases by an additional 0.5 percent a year, while saving declines by about 4 percent annually compared to the baseline. Funding the additional health expenses from an equivalent reduction in social transfers—which are regarded as less productive—could even improve economic performance. In the model, a reduction in transfers motivates recipients to work more, which translates into higher GDP. In contrast, cuts in public investment would create a trade-off between building roads and spending on doctors and medicines. In the long run, depreciation of public capital would undermine labor productivity, and harm employment and growth potential. If tax financing is used, GDP could decline by about 0.2-0.6 percent annually and saving could be lower by 3-8 percent. But financing with labor taxes is regarded as the most distortionary measure, because higher labor taxes discourage employment due to an increase in the tax wedge. These results indicate that the expected increase in ageing-related spending will require active fiscal policy to protect growth and jobs.

**Figure 6.6. Employment rate by the method of financing increased health spending, deviation from the baseline in percent**

Source: Bukowski et al. (2013).

**Figure 6.7. GDP path by the method of financing increased health spending, deviation from the baseline in percent**

Source: Bukowski et al. (2013).
Scenario 4: Preventing government dis-saving early on

The cost of delaying the fiscal policy response to mounting age-related pressures is high – the saving position of government deteriorates, and public investment and GDP are lower. If the government acts today to moderate the projected growth in health spending and avoids abrupt adjustments when fiscal tensions cumulate (an early action scenario\textsuperscript{132}), the government saving position does not change, while the GDP growth rate in 2050 could be 1.5 percent higher than in the baseline (see Figure 6.8). In contrast, delayed policy action (cuts in social transfers are delayed by 15 years, while higher health expenses are initially funded by reduced public investment and a higher government deficit) results in GDP growth just 1 percent higher as compared to the baseline scenario. It is worthwhile to note that the “delayed action” scenario follows the rule ‘better late than never,’ and the positive reforms are assumed to be ultimately implemented in 2030. In sum, the GDP growth rate could be 0.5 percent higher in 2050\textsuperscript{133} if the government acts today instead of delaying adjustments by 15 years. In addition, “early action” produces a better fiscal position (higher public savings), and allows public investment to be protected. Compared with the ‘delayed action’ scenario, the government can afford to increase public investment by approximately PLN 30-50 billion (2005 prices) after 2030, which is equivalent to 1.5-2.5 percent of GDP.

Figure 6.8. GDP and employment rate in “early” and “delayed” action, deviation from the baseline in percent

Figure 6.9. Difference in public consumption and investment in “early” and “delayed” action, PLN2005 prices million

Source: Bukowski et al. (2013).

\textsuperscript{132} The costs of delaying fiscal adjustments are measured by comparing two scenarios: i) ‘early’ action, where the projected expansion of health expenditures is accompanied with immediate policies to curb other social transfers; ii) ‘delayed’ policy actions, where cuts in social transfers were delayed by 15 years, while higher health expenses were initially funded by reduced public investment and a higher fiscal deficit, thus by higher government dis-saving.

\textsuperscript{133} Over the forecast horizon, the cumulative difference between the two scenarios is very significant.
CHAPTER 7
CONCLUSIONS AND POLICY RECOMMENDATIONS
This study has shown that higher rates of saving are vital for Poland to cope with some of the issues facing it.

209. Growth of income over the longer run depends on increases in productivity, and these are embodied in investments that have to be financed. A sound growth model for Poland, with relatively undeveloped infrastructure and an aging population, will require substantial investment to equip the slow-growing labor force with more productive equipment. The two main drivers of growth should remain capital accumulation and total factor productivity (TFP). More capital accumulation (capital deepening) has to be financed by savings, and likewise higher TFP needs to be embodied in additional capital investment, which needs to be financed. If this higher level of investment spending is not to cause a dangerous worsening of the balance of payments and net international investment position, it needs to be financed with increased savings.

210. Higher savings are also needed to make the economy more resilient to financial shocks. The report has shown that smaller reliance on inflows of foreign savings in forms that are subject to sudden stops and reversal, especially short and medium-term interbank flows, will help make the economy less vulnerable to conditions outside Poland and thus less subject to interruptions in growth. A stronger current account (achieved though higher national savings and not through a reduction in investment) will allow Poland to build up the foreign assets that give resilience and policy independence, as well as improving the net international investment position.

211. Poland has benefited enormously from using foreign savings, not only those intermediated through the banking system, but also from European Union cohesion and structural funds. Poland has shown itself to be well organized in accessing such financing and to have applied it well. While the European Union has just agreed on a level of financing for the 2014-2020 period that is largely unchanged from the earlier septennium, after this period the amount of such funding that will be available to Poland is likely to fall, reflecting the more difficult financial positions of some of the stronger members of the EU, as well as Poland’s success in convergence. But this convergence still leaves Poland with a long way to go in upgrading its infrastructure and investing in its economy, and EU funds will need to be replaced with higher domestic saving.

212. Higher domestic savings can also provide longer-term funding for a banking systems that has hitherto relied on short-term deposits, supplemented with funding from parent banks or international money markets. The availability of such funding is now less than it was in the run up to the global financial crisis, and international regulatory changes are now making it more difficult for banks to finance credit expansion with such funding. So if the banking system is to continue to provide the credit that the economy needs for growth, longer-term domestic funding based on higher domestic savings will be needed. Such savings will not only fund bank lending, but should also allow the development of a more vibrant domestic capital market that can provide financing for the economy in less crisis-prone forms.

213. The rapid aging of the Polish population not only acts as a possible brake on growth, but also raises the issue of the mechanism by which national income can be transferred to the growing group of pensioners. The pension reform of 1999 made the pension system fiscally sustainable and fair in the sense that individual pensions would ultimately reflect individual contributions. But the cost of achieving this will be a substantial fall in the average replacement rate, to such an extent that a growing group of pensioners will face pensions below the statutory minimum. Additional transfers of part of national income to pensioners will be needed if old-age poverty is to be avoided and if incomes of different cohorts, those earning and those retired, are to be kept in proportion. One way of doing this would be the fiscal route, with either income or consumption taxed to provide a supplement to public pensions. But a less contentious approach would be possible if pensioners, either individually or collectively, had more income-earning assets and could supplement their state pensions with the earnings on these assets. Among the ways to achieve this is for individual saving and asset accumulation to increase.

214. Sustaining the growth rate in Poland requires increasing the saving rate and maintaining the strong productivity growth. If per-capita growth is to be maintained at 3.5 percent annually until 2030, a reasonable rate in light of demographic pressures, but not a particularly high rate when compared to that achieved in some Asian countries or that which would be required to close the income gap with richer European countries, this report recommends that the savings rate be raised by
5 percent to around 23 percent and sustained at that level, with most of the increase to be driven by private saving. Even higher increase in national saving – to over 35 percent of GDP by 2030 – would be needed if slower productivity growth is assumed.

215. The analysis of saving policy is challenging, thus recommendations for a policy package to promote saving must be tentative. The analysis of saving policy is difficult for three reasons: (1) high-quality data about saving in Poland (at both macro and micro levels) are elusive, especially for household saving; (2) international evidence about the effectiveness of possible interventions to lift saving is often ambiguous; (3) interventions that are effective in achieving one objective usually have downsides measured against other objectives; (4) the economic impact of saving policies is difficult to quantify. Given these challenges, any recommendations are bound to come with a considerable dose of caveats.

216. The bases of policy measures to mobilize savings and stimulate growth proposed in this report were a review of theoretical and empirical literature and the application of several sophisticated analytical tools. The analysis underlying recommendations used the following tools: i) to identify determinants of recent saving trends in Poland – a cross-country panel regression for OECD countries and a time series analysis based on quarterly national account data for Poland; ii) to examine the pattern of household savings and to understand the consequences of demographic changes in Poland – an analysis of micro-level data (Polish Household Budget Surveys) for 2005-10; iii) to analyze the long-term government saving position and fiscal sustainability in the context of population aging – a generational accounting approach; iv) to assess the impact of potential changes in the main determinants of saving and economic growth in Poland – a large-scale Dynamic Stochastic General Equilibrium (DSGE) model, supplemented by a model for labor market projections cohort by cohort.

217. A number of complementary policy changes are likely to be needed to achieve a significant and sustained increase in national saving in Poland. A package containing a number of the options outlined in this report could, over the medium to long term, add up to significant and desirable changes in the level and the structure of national saving. In forming such a package, government policy choices clearly form a key part of the environment that influences how individuals save. Similarly, there is no reason to believe that saving will increase in the absence of government action. Bearing this in mind, policies to mobilize national savings in Poland are proposed in five areas: i) Policies to support incomes and growth; ii) Policies to encourage households to save; iii) Policies to limit government dis-saving; iv) Policies to substitute for foreign savings; and v) Policies to develop a long-term local currency capital market. Therefore the recommended policy measures cover a wider range of measures, aiming at building up national assets held as claims on non-residents, strengthening the balance of payments, limiting fiscal dis-saving, encouraging banks to be more assiduous in soliciting deposits and domestic borrowings, improving tax treatment of assets, developing a more functional domestic capital market, and encouraging individuals to save more, for their own retirement or for precautionary purposes.

**Policies to support income and growth**

218. Income levels are a significant determinant of how much individuals save. If the Government wants to achieve a significant increase in national saving, the broader policy agenda should support income growth. Likewise, the Government’s saving policy package should have a positive impact on economic growth as well as boosting national saving. The main policies to increase national and individual income include an increase in labor force participation and employment, support to internal and intersectoral mobility, as well as improvements in the education system.

219. Increasing labor force participation and employment of women, the young, elderly, and low-skilled workers seem to be key for raising incomes. To this end, efforts to increase female labour market participation should be continued, in particular by investing in affordable quality childcare and pre-school education, by ensuring institutions have stable funding and qualified staff. The general pension reform should also be underpinned by measures promoting the employability of older workers. Reducing youth unemployment could be done, for example, through further deregulation of professions, increasing the availability of apprenticeships and work-based learning, strengthening cooperation between schools and employers, and improving the quality of teaching. Adjustments to taxes and benefits, such as those aimed at increasing labor market activity, could be also considered. It would be advisable to shift the tax system towards less reliance on social security contributions (SSCs) and thus to reduce the labor tax wedge, especially for low-skilled workers. Such
a reform should combine reducing tax rates and social security contributions (e.g., reducing SSCs for low-wage earners) with broadening the tax base (e.g., removing the preferential system for taxing agricultural income). There also needs to be a comprehensive review of the tax and benefit system provisions that apply to families with children in order to reduce disincentives for second earners to take up work.

230. Supporting internal and intersectoral mobility is also important for boosting employment. With a view to improving sectoral labor mobility, the government should take steps to reform the farmers’ social security scheme, KRUS, by phasing out the special pension system for farmers with a view to integrating them into the general scheme. In order to remove impediments to internal labor mobility, the functioning of the housing market should be further enhanced by addressing the lack of supply in the private urban rental market, making mandatory the release of zoning plans by municipalities, changing the taxation of housing purchases, and further relaxing rent controls and tenants’ protection (OECD, 2014).

231. Improvements in education will help Poles achieve better economic outcomes. Policies in the area of education should aim ensuring the school system improves over time the overall skill levels of its graduates, and that the tertiary system meets the skill needs of a growing economy. To do this the main weaknesses in the education system need to be addressed: low pre-school enrolment rates, poor functioning of the vocational tertiary education (VTE) system, and fragmentation of tertiary education, which distorts competition and skills mismatches. As suggested by the OECD (2014) tackling these flaws requires a wide array of policy actions, including the development of pre-school facilities, expansion of the enrolment capacity of VTE schools, and raising the quality of teaching; introduction of cost-related tuition fees in the public sector; allocation of academic positions on the basis of transparent and competitive procedures; and the systematic assessment of the quality of higher education institutions. On-the-job training and lifelong learning can also play a role in adapting workers’ skills to a rapidly changing technological environment and thereby in preventing the entrenchment of under-skilling. Enhancing job-matching services, including through better job-market information and fostering labour mobility, would also help to reduce skill mismatches.

Policies to encourage households to save

232. Higher personal saving should help Poles maintain their incomes in retirement. Over time, people are going to be increasingly aware of the lower replacement rates in the first and second pillar pension systems that the 1999 pension reform entails. They will adjust their behavior accordingly and the government would be well advised to take actions to facilitate this adjustment, rather than modifying the fundamental principles of the 1999 reform. Individual adjustments can take several forms. One is working longer, either by retiring later or, particularly in the case of women, by leaving the work force less frequently. Increased participation in the labor force has been discussed above. But another adjustment would be to save more, something the government can encourage. Poles will need to save 10 percent of their incomes if they are to enjoy replacement rates in the future similar to those they enjoy today.

233. Current schemes to stimulate greater voluntary retirement savings have not been effective. After ten years of operation, tax advantaged schemes (PPE, IKE, and IKZE) have total assets amounting to only about 0.75 percent of GDP, as participation in such schemes is very low. On the other hand, they have not cost the treasury very much either.

234. Reconsidering existing tax incentives for private pension savings is needed, since certain tax changes can promote increased and more efficient national saving. International evidence suggests that tax incentives are likely to have only a modest impact on how much people save and invest but can have a very significant impact on how they do so. In addition, the tax expenditures involved affect government savings, another component of national saving. It may cost more to give the incentive than it generates in new saving. In Poland existing tax incentives for the private pension pillar have had only a small fiscal cost, but also have not encouraged much saving. Policy makers should evaluate how effective and efficient tax support of retirement saving schemes has been in delivering the expected results. Tax incentives should avoid providing generous benefits to high income earners who are already saving, and will be most likely to simply switch between different forms of saving. Since most benefits of higher savings come from higher national saving, the fiscal cost of tax incentives or other subsidies involved in a scheme should not come at the expense of a major reduction in government saving. Thus the cost of such a scheme should by and large be funded within a fiscal plan that keeps to the current gross debt track.
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235. To meet the challenge of raising household saving rates substantially so that people are more likely to have the assets they need for retirement, a new national savings scheme is proposed. This would aim to strengthen individual incentives to save and breath new life into the third pillar of the pensions system. Studies show that only the better off are active savers, and in their case, tax or other incentives tend to result in a reorganization of savings to take advantage of the special treatment, rather than generating additional savings. For most of the bottom half of the income distribution, however, households are so liquidity constrained that active saving is impossible. The experience of Germany and New Zealand, among others, show that the passive savings of this part of the population can be increased through automatic enrolment schemes. Under such schemes, employees are given a window in which they can opt out or choose non-standard contribution rates: in practice, inertia leads to most staying with the system, and generally saving more, and this effect can be enhanced if the government give tax relief or provide a sign-on bonus. If such schemes are to generate significant additional saving for this group, an employer contribution is required.

236. A new national savings scheme should have the following characteristics: All employers should be required to enroll new staff in an approved savings scheme, into which a share of the employee’s salary will be paid regularly, as well as an equivalent contribution from the employer. The government may also make a contribution to seed the individual’s savings. The employee would have a relatively short period of time (for example two months) in which he or she could opt out of the plan. Contributions to the plan would be tax free for the employee and deductible as an expense for the employer, earnings of the fund would not be taxes, but payouts to the contributor would be taxed as income (an EET structure). Arrangements would be made to allow existing staff to enroll, and to provide an equivalent system for those not in employment, but who also wish to use this scheme. Plans qualifying for this scheme would be approved by the Polish Financial Supervision Authority, as would the instruments the plans could invest in and the products offered to savers. Payouts would occur periodically after retirement, although there would be provision for using some of the assets before that time for other specified purposes, such as acquiring a house or for medical or other emergencies. Part of the assets would be blocked for the purpose of acquiring a deferred annuity, to give a steady income stream after the retiree reached the age of 80 or 85, thus giving some protection against poverty at the point when the pensioner might have used up the proceeds from earlier payouts.

237. It is not recommended that the government embark on financial literacy campaigns, since they have been essentially shown not to produce results.

Policies to limit government dis-saving

238. Although the quickest way for the government to improve national saving would be to increase how much it itself saves, maximizing government saving should not be a goal in itself. The recent global financial and sovereign debt crisis has shown that fiscal policy is crucial to stabilizing the economy. Another crucial objective of fiscal policy is fiscal sustainability, which is essential for keeping the economy stable, reducing economic vulnerabilities, and achieving sustained growth in living standards. Finally, the government affects the economy through its own saving. However, if the proposed policy measures result in a smaller fiscal deficit (higher government saving), this could be partially offset by the decrease of household savings, thus total national savings will be increased less that improvement of fiscal position.

239. Taking into account all these objectives, the government should pursue a prudent, forward-looking fiscal policy, which should be mindful of growth. In order to avoid potential dis-saving and secure long term fiscal sustainability without harming growth prospects, this report recommends it i) stick to its short and long-term fiscal goals; ii) not delay the introduction of measures to moderate the projected growth in publicly-financed age-related spending; and iii) continue improving the quality of its expenditure.

240. Ensuring planned progress towards the termination of the excessive deficit procedure and reaching its medium term objective (MTO). In the short term, the main goal for the government should be to correct the deficit in a timely way to allow a sustainable exit from the excessive deficit procedure by 2015. After this, the government is advised to pursue the structural adjustment effort that will enable Poland to reach its medium-term objective in the next few years. The effective implementation of a permanent expenditure rule starting from in 2014 will be critical in delivering these results, but it will also require significant improvements in budgetary processes. The arrangements for setting and reflecting government
expenditure priorities beyond the short term are currently inadequate, and there is too much reliance on ad hoc budget adjustments. Thus the government may also consider establishing regular in-depth spending reviews at all levels of governments, which will help in the reduction of budgetary expenditures over a medium-term horizon, or their reallocation.

241. Moderating growth in age-related public spending. It is important for the government not to delay the introduction of measures to moderate the projected growth in publicly financed age-related spending, as this could cause a major reduction of government saving in the long term. Therefore, this report recommends it take further steps to improve the sustainability and adequacy of the pension system. It will be important to complete the reform by removing pension privileges for certain occupations, such as miners and the uniformed services (soldiers, police officers, etc.), bringing them closer to actuarial fairness. It is vital that the government resist pressures to reverse its defined contribution pension reform. To reduce the risk of reversing reform, replacement rate reductions should not be allowed to undermine the ability of public pension systems to alleviate poverty among the elderly. To address the problem of old-age poverty, the government should continue to guarantee minimum pensions and revamp incentives for private pension plans. Finally, the government should make an effort to contain the upward pressure on public health spending, while maintaining accessible and quality care. There are many possible cost containment options for the health sectors, but two potential candidates discussed in this report are introducing copayments and limiting coverage of the health system—in other words, changing in the mix of public and private funding for health care.

242. Improving the quality of public finances. Policies chosen to improve the government saving position may also affect economic growth. Reductions in current spending could be more beneficial for economic growth in Poland than cuts in productive spending (investment) or distortionary tax (e.g., labor taxes) increases. Thus, with a view to improving the quality of public finances it is recommended to minimize cuts in growth-enhancing investment, reassess expenditure policies to increase the cost-effectiveness and efficiency of current spending, which would lead to increase share of investment in public spending by reducing public consumption. In any case, government investment is part of government saving—in other words, cutting the deficit by cutting investment spending does not increase public saving. While increased government saving might in principle be offset by some decline in household or corporate saving, the size of such an offset is believed to be only around 25 percent in Poland.

Policies in respect of foreign savings

243. Macroeconomic policies to strengthen the balance of payments will support efforts to increase national saving. Since the current account of the balance of payments is the excess of domestic savings over domestic investment, higher savings will be associated with a stronger balance of payments position, unless investment rises pari passu. And likewise, action to strengthen the balance of payments will result in higher national savings, provided investment levels are not reduced. Stable and restrained demand management policies, on both the fiscal and monetary sides, should allow the balance of payments deficit to be reduced, which over time will also improve Poland’s net international investment position (NIIP). Demand management policies of this sort should not prevent a normal growth in consumption, a major element of domestic demand, but should ensure that exporting remains an attractive option compared with supplying the domestic market. The floating exchange (before euro adoption) rate should, in these circumstances, continue to provide sufficient support for exports, thus allowing Poland’s growth pattern to place more reliance on the external than the domestic market. The strategy should not reject the use of foreign savings, but try to ensure that such savings are attracted in the form of long-term direct and portfolio investment, instead of as relatively volatile short-term interbank and financial market flows. This set of policies should allow Poland to reduce its vulnerability to exogenous shocks.

244. New regulatory requirements for banks should increase their incentive to mobilize longer-term savings in Poland. International action to strengthen the regulatory rules governing banks includes measures to require more stable funding sources. Under Basel III and its EU implementation, CRD IV, a net stable funding ratio is being introduced, which will require banks to rely more on longer-term funding sources for their long-term lending. The funding model of Polish banks, relying on deposits and parent bank or money market finance and which was already under pressure, will need to be modified to meet the new requirements. Even though funding through longer-term capital market instruments is more expensive than current funding for Polish banks, if the regulatory authorities persevere in applying the new regulations on
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schedule, banks will be forced to seek longer-term funding. This should not only give a further impetus to the development of new PLN capital market instruments, but also improve the product mix and the price at which such instruments are offered to savers, thus stimulating saving. Since the adjustment is costly for banks both in Poland and elsewhere in Europe, it will be important for regulators resist pressures to delay the process significantly.

Policies to develop the local currency capital market

245. A deeper domestic currency capital market would bring Poland a number of benefits. It would allow the economy to rely less on more crisis-prone bank financing, as well as providing the corporate and infrastructure sectors with longer-term and more stable funding and providing savers with a range of more attractive instruments for them to invest in directly or indirectly. Although very large or rapidly growing financial markets have been shown to retard the growth of the real economy, the Polish financial system is still small enough that further development is likely to be associated with both higher savings and more rapid productivity growth. While the Polish capital market is among the most developed in the region, several reports (EBRD (2011), IMF (2013c) World Bank (2014)) have identified a number of actions that need to be taken if the market is to take a central place in Poland’s financial system.

246. The covered bond market needs to be reinvigorated. Covered bonds, a highly stable form of securitization of mortgages, have yet to become an important capital market instrument in Poland. In this, it is falling behind some of its regional peers, as well as failing to exploit a source of funding that is particularly important in a number of other European countries. But with mortgages constituting a large share of bank assets, the scope for a covered bond market is significant, and would provide savers with a long-term highly rated asset that would be an attractive saving vehicle. Earlier reports and this one identify a number of obstacles to the development of the market that should be removed. The first is that universal banks should be allowed to issue such bonds, not just the handful of mortgage banks. Setting and enforcing minimum standards for conforming mortgages would help ensure that the quality of covered bonds issued by different banks did not vary significantly. Legislation governing the transfer of collateral, including the matter of bank secrecy, needs to be modified to permit these bonds to work properly, and related taxation matters addressed. Since the safety of a covered bond depends on the holder’s claim on the underlying mortgage pool, the bankruptcy law needs to provide for the event of the failure of the issuing bank.

247. A number of actions to facilitate securitization, the issue of collateralized debt, need to be taken. The covered bond is one special form of securitization that creates a highly rated asset that is in itself a suitable savings vehicle. It also provides a highly liquid asset that banks can use to meet their liquidity requirements. But there is also an important place for other forms of riskier securitization, such as for consumer loans or loans to small and medium-sized enterprises. Such bonds can widen the spectrum of assets available to fund managers, who in turn provide services to borrowers. The main policy action needed to promote securitization is to strengthen the enforcement of security interests and judicial decisions, and to develop a modern securitization framework, which would involve reviewing the 1995 Bonds Act. The insolvency and creditor rights regime does not appropriately support collateralization, and the process for the transferability of collateralized loans needs to be simplified. The liquid operation of the securities market is integrated with that of the money market, and its development would be fostered introducing tripartite repos. Finally, the use of a central depository for debt securities could increase the liquidity.

248. Revising the guidelines governing the operation of pension funds and other savings funds could also increase the liquidity and dynamism of the capital market. The system of second pillar privately managed funds (OFEs) has recently been substantially modified to eliminate their ability to hold government bonds, and to give employees the possibility of opting out. But OFEs will remain quite large and could be joined by more effective third pillar private funds as suggested above. Hitherto, the investment strategies of the OFEs have tended to be excessively conservative and defensive, hardly justifying their relatively large management fees. These funds have also shown a herding instinct and a tendency to buy and hold, neither of which is conducive to market liquidity. These shortcomings are at least in part attributable to the performance guidelines governing these funds, which have measured performance against a benchmark portfolio and have penalized short-term losses that result from any deviation. It is proposed that a rather more flexible approach to deviations be adopted, and that a minimum duration be set for the fixed-income portfolios of such funds, thus increasing the demand
for longer-term securities, which in turn would encourage corporates to issue longer-term bonds. It is also recommended that the product mix for savers be improved by offering them portfolios that better reflect life-cycle investment strategies. This might be done by offering standard portfolios with different risk/return characteristics, or by offering a product that alters the bond-equity mix with the age of the saver.

249. Finally, the set of policies to increase saving in Poland needs to be complemented by the elimination of obstacles to their productive use. While it is beyond the scope of this study, saving must be invested well if it is not to be wasted. Poland’s future growth depends on both adequate funding of investment and the productive use of saving. The saving agenda needs to be matched by action to raise the return to investment by improving the business climate and reducing distortions and obstacles.
ANNEXES
Annex 1 Model Linking Saving and Growth in Poland

This framework considers a model of an open economy with a single sector that produces a unique final good labeled gross domestic product (GDP) or, simply, output. The economy evolves in discrete time and each time period, denoted by an index $t$, represents one year.

The economy has access to a technology to produce output by combining capital and labor inputs according to the production function

$$ Y_t = A_t K_t^\alpha L_t^{1-\alpha}, $$

where $Y_t$ denotes output, $K_t$ is the stock of physical capital, $L_t$ denotes the labor input, $A_t$ is a measure of the level of total factor productivity of capital and labor (TFP), and the technology parameter $\alpha \in (0,1)$ measures the relative contribution of capital to the production of output—in an economy operating under perfect competition, $\alpha$ measures the share of output distributed as payments to capital.

The model abstracts from distributional issues and assumes that all workers have the same level of human capital. Following Bils and Klenow (2000) and Hall and Jones (1999), assume that each worker has been trained with $z_t$ years of schooling, which deliver a productivity of $\exp(\phi z_t)$ efficiency units of labor per worker, where $\exp(\cdot)$ denotes the exponential function. Thus, $\phi z_t$ measures the relative efficiency of a worker with $z_t$ years of schooling relative to one with no schooling. Thus, if letting $E_t$ denote the working-age population, effective aggregate labor supply is given by

$$ L_t = \exp(\phi z_t) E_t. $$

Capital depreciates at a constant rate $\delta$ per year, but can be augmented through investment. In particular, the stock of capital evolves according to

$$ K_{t+1} = (1 - \delta) K_t + I_t, $$

where $I_t$ denotes aggregate investment.

Abstracting from valuation changes, the current account deficit at period $t$ $CAD_t$ is defined as the change in net foreign liabilities of the whole economy, or

$$ CAD_t \equiv B_{t+1} - B_t = r B_t + C_t + G_t + I_t - Y_t - TR_t, $$

where $B_t$ is the stock of net foreign liabilities due at period $t$, $r$ is the world interest rate, assumed constant for simplicity; $C_t$ denotes private consumption; $G_t$ denotes government consumption expenditures; and $TR_t$ denotes the flow of net external current transfers (worker remittances and official grants) that are not reflected as changes in the country's net foreign liabilities.

Letting $S_t^N = Y_t + TR_t - r B_t - C_t - G_t$ denote aggregate national saving, the previous equation can be rearranged into the familiar investment-saving gap identity of an open economy,

$$ I_t = S_t^N + CAD_t. $$

That is, domestic investment $I_t$ can be financed either through national saving or through foreign saving (i.e. through an increase in net foreign liabilities reflected in a current account deficit).

External solvency requires that the current value of foreign liabilities be no larger than the present value of net exports, and can be obtained by iterating forward on the current account identity (4); namely,

$$ \sum_{j=0}^{\infty} \frac{1}{(1 + r)^j} [Y_{t+j} + TR_{t+j} - I_{t+j} - C_{t+j} - G_{t+j}] = (1 + r) B_t. $$

This solvency condition imposes certain assumptions about the functioning of international capital markets that are difficult to reconcile with the experience of several countries. In particular, it fails to capture the financial frictions that are pervasive in many fast-growing countries that are still converging to the level of income of the rich, advanced economies. For this reason, this study follows Milesi-Ferretti and Razin (1996) and imposes a sufficient condition for current account sustainability that is also appealing in terms of its realism.
Hevia and Loayza (2011) assumed that the economy was required to maintain a constant ratio of net foreign liabilities to GDP. For the case of Poland, this might be too strong an assumption, given the requirements of the European Union regarding the maximum allowed level of net foreign indebtedness. Indeed, as shown in Figure 2.13, net foreign liabilities in Poland amounted to 67 percent of GDP in 2012, well above the maximum of 35 percent allowed by the European Union. If Poland is to satisfy that requirement, eventually it will have to reduce its foreign indebtedness. For this reason, this paper uses the approach developed in Hevia and Loayza (2013), whereby the ratio of net foreign liabilities to GDP is allowed to change through time according to

\[ \frac{B_t}{Y_t} = \beta_t \]

where \( \beta_t \) is an exogenous sequence. For example, if \( \beta_t \) increases for a number of years and then becomes constant, the economy is increasing its foreign indebtedness and, thus, the foreign participation in domestic capital formation. On the other hand, if \( \beta_t \) decreases through time, the economy is reducing its foreign indebtedness. The latter is the assumption to make in the case of Poland, as the current level of foreign indebtedness is well above the maximum of 35 percent allowed by the European Union. In any case, the paper will consider two scenarios, one in which the level of foreign indebtedness is kept constant at its current level, and a second scenario where Poland is required to reduce its foreign indebtedness to reach the goal of 35 percent in the long-run.

Using the definition of the current account, condition (6) imposes the following restriction on the current account deficit as a fraction of gross domestic output,

\[ \frac{CAD_t}{Y_t} = \frac{B_{t+1}Y_{t+1}}{Y_{t+1}} - \frac{B_t}{Y_t} = \beta_{t+1} \frac{Y_{t+1}}{Y_t} - \beta_t. \]

That is, the ratio of the current account deficit to the value of output depends on the net foreign liabilities as a fraction of GDP at times \( t \) and \( t+1 \) and on the growth rate of output, \( Y_{t+1}/Y_t \).

For quantitative purposes, it is convenient to rewrite all previous equations in per capita terms. To that end, let \( N_t \) denote total population at time \( t \) and, for any aggregate variable \( X_t \), let \( x_t = X_t/N_t \) denote the corresponding variable in per-capita terms. Thus, introducing the definition of effective labor (2) into the production function (1), and dividing the resulting expression by \( N_t \) gives the following expression for GDP per capita

\[ y_t = A_t k_t^{\alpha} \exp(\phi z_t) e_t^{1-\alpha}. \]

In general, the labor force variable \( e_t = E_t/N_t \) varies through time as the demographic characteristics of the economy changes.

Following the same approach, the equilibrium equations (3), (5), and (7) in per-capita terms can be written as

\[ k_{t+1} \Gamma_{N,t+1} = (1-\delta) k_t + i_t, \]

\[ i_t = s_t^N + cad_t, \]

\[ \frac{cad_t}{y_t} = \beta_{t+1} \Gamma_{y,z,t+1} \Gamma_{N,t+1} - \beta_t. \]

Here and throughout the paper, expressions like \( \Gamma_{x,t+1} = x_{t+1}/x_t \) denote the gross growth rate of any variable \( x_t \) between periods \( t \) and \( t+1 \).

The previous equations are now used to write a condition that relates national saving and growth. First, we use the production function in equation (8) at periods \( t \) and \( t+1 \) to write the gross growth rate in output per capita as

\[ \Gamma_{y,z,t+1} = \Gamma_{\alpha,zt+1} \Gamma_{k,z,t+1} \left( \exp(\phi (z_{t+1} - z_t)) \right) \Gamma_{\phi,zt+1} \]^{1-\alpha}\]

That is, the growth rate of output per capita \( \Gamma_{y,z,t+1} \) depends upon the growth rate of productivity \( \Gamma_{\alpha,zt+1} \), the growth rate of the stock of capital \( \Gamma_{k,z,t+1} \), the growth rate of human capital \( \exp(\phi (z_{t+1} - z_t)) \) and the growth rate of the labor force \( \Gamma_{\phi,zt+1} \).

Second, introducing the investment-saving equation (10) into the capital accumulation equation (3) and rearranging gives

\[ \Gamma_{k,z,t+1} \Gamma_{N,t+1} = 1 - \delta + \frac{i_t y_t}{y_t k_t} = 1 - \delta + \left( s_t^N + cad_t \right) \frac{y_t}{y_t k_t}. \]
This equation describes the growth rate of the stock of capital per person as a function of the growth rate of the population $\Gamma_{N,t+1}$, the depreciation rate $\delta$, the national saving ratio with respect to GDP $s_t^N/y_t$, the current account deficit as a fraction of GDP $cad_t/y_t$, and the degree of capital intensity in the economy $k_t/y_t$.

Imposing the sustainability condition (11) into the last equation, the evolution of the stock of capital becomes

$$
\Gamma_{k,t+1} = 1 - \delta + \left( \sigma_t + \beta_{t+1}\Gamma_{N,t+1} - \beta_t \right) \frac{y_t}{k_t},
$$

where $\sigma_t = s_t^N/y_t$ denotes the national saving ratio with respect to GDP.  

Finally, introducing equation (4) into the output growth equation (12) delivers an equation that links the growth rate of output per capita to the national saving ratio $\sigma_t$, the growth rate of productivity $\Gamma_{A,t}$, the growth rate of the population $\Gamma_{N,t}$, the growth rate of the labor force $\Gamma_{Lt}$, the growth rate in human capital $\exp(\phi(z_{t+1} - z_t))$, and the capital-output ratio $k_t/y_t$.

$$(15) \quad \Gamma_{y,t+1} = \left[ 1 - \delta + \left( \sigma_t + \beta_{t+1}\Gamma_{N,t+1} - \beta_t \right) \frac{y_t}{k_t} \right] \frac{\Gamma_{A,t+1}(\exp(\phi(z_{t+1} - z_t)))}{\Gamma_{N,t+1}}^{1-\alpha}.$$

Condition (15) is the key equation that associates the growth rate of GDP per capita with the national saving ratio $\sigma_t$.

**Endogenous Private Saving**

In the previous section we derived an equation that associates national saving with the growth rate of GDP per capita. The question remains, of course, as to how to actually achieve the desired level of national saving given the policy instruments that the government has access to. Any attempt to answer this question faces the immediate fact that private saving is not invariant to policy interventions and to the structural characteristics of the economy, like the ratio of old-age and young age population over working-age population, the level and growth rate of income, and the level of public saving—capturing Ricardian effects on aggregate saving. A standard way of tackling this problem is to posit a model of intertemporal consumption choice and evaluate how different policies affect the level of private saving. This approach, however, is not free of problems and requires a detailed description of the economic environment, preferences, the set of policy instruments available to the government, and how expectations about future events are formed. To simplify matters and to keep the discussion as straightforward as possible, this paper follows a different route and considers a reduced form equation for the private saving rate. Borrowing from Loayza et al. (2000b), we assume that the private saving rate depends on its own lagged value, on the old-age and young-age dependency rates, on the current and lagged levels of GDP per-capita, and on public saving. Loayza et al. (2000b) contains a detailed discussion about the determinants of saving and provide estimates of the aforementioned reduced form private saving equation based on a large cross-section, time-series dataset.

Consider decomposing the national saving ratio as the sum of the private and public saving ratios, $\sigma_t^p$ and $\sigma_t^g$, respectively, or

$$(16) \quad \sigma_t = \sigma_t^p + \sigma_t^g.$$

The functional form of the private saving rate at time $t$ is assumed to be,

$$(17) \quad \sigma_t^p = \zeta_1 \sigma_{t-1}^p + \zeta_2 \sigma_t^g + \zeta_3 \log y_t + \zeta_4 \log y_{t-1} + \zeta_5 od_t + \zeta_6 yd_t + \eta,$$

where $od_t$ denotes the old-age dependency rate, $yd_t$ is the young-age dependency rate, and $\zeta_{i}, i = 1, ..., 6$ and $\eta$ are constants. Thus, the private saving ratio depends on its own lagged value, on the public saving rate, on the current and lagged (log) levels of GDP per-capita, and the old-age and young age dependency rates. The constant $\eta$ is a country specific fixed effect which will be removed by differencing the previous equation. In particular, lagging the previous equation and taking the difference gives

1 Note that $s_t^N/y_t$ is neither the national saving rate nor the domestic saving rate as defined in the national accounts statistics. The national saving rate is defined as $s_t^N/y_t$, whereas the domestic saving rate is defined as $s_t^D/y_t$, where $s_t^D = y_t - c_t - g_t$ is domestic saving (per capita).
Inserting this equation into (15) gives the national saving ratio at time $t$ as a function of the public saving ratio at time $t$, the structural characteristics of the economy, and lagged private saving ratios,

$$
\sigma_t^p = \sigma_{t-1}^p + \zeta_1 \Delta \sigma_{t-1}^p + \zeta_2 \Delta \sigma_{t-1}^g + \zeta_3 \Delta \log y_t + \zeta_4 \Delta \log y_{t-1} + \zeta_5 \Delta \delta_t + \zeta_6 \Delta \delta_t^e.
$$

(19)

In this study, the parameters $\zeta_{i,t} = 1, ..., 6$ are set according to private saving regressions based on data for 28 OECD countries, among which six post-communist economies (i.e. the Czech Republic, Estonia, Hungary, Poland, the Slovak Republic and Slovenia). Of particular relevance is the coefficient $\zeta_5^g$ which measures the response of national saving to an increase in the old dependency rate. This is important as the old dependency rate is expected to increase in Poland in the coming years. The baseline regression of the private saving rate (with respect to Gross Private disposable income) delivers as estimated coefficient of just -0.047 on the old dependency rate variable. This number is comparatively very low relative to cross-country studies and in addition is not statistically significant. For that reason, the baseline calibration will consider the value of -0.047, and an alternative calibration will use an estimated coefficient of -0.29, obtained from an estimation of a panel regression using European Union countries (see table below).

Table A 1. Private saving regression, panel estimates

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>Only Europe</th>
<th>Without post communist countries</th>
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<tr>
<td>$s_{priv, t-1}$</td>
<td>.774 (.28)</td>
<td>.773 (.28)</td>
<td>.701 (22.83)</td>
<td>.804 (30.03)</td>
</tr>
<tr>
<td>log of terms of trade</td>
<td>.027 (3.31)</td>
<td>.028 (3.29)</td>
<td>.006 (0.53)</td>
<td>.046 (5.29)</td>
</tr>
<tr>
<td>log of labor productivity growth</td>
<td>.164 (3.09)</td>
<td>.186 (3.53)</td>
<td>.170 (2.96)</td>
<td>.220 (3.36)</td>
</tr>
<tr>
<td>urbanization rate</td>
<td>.053 (2.73)</td>
<td>.057 (2.77)</td>
<td>.102 (5.13)</td>
<td>.061 (3.42)</td>
</tr>
<tr>
<td>old dependency ratio</td>
<td>-.047 (-1.31)</td>
<td>-290 (-5.36)</td>
<td>-87 (-2.49)</td>
<td></td>
</tr>
<tr>
<td>unemployment rate</td>
<td>-.024 (-0.56)</td>
<td>.001 (0.02)</td>
<td>-122 (-1.26)</td>
<td></td>
</tr>
<tr>
<td>log of real interest rate</td>
<td>-.045 (-0.93)</td>
<td>.005 (0.09)</td>
<td>-125 (-1.88)</td>
<td></td>
</tr>
<tr>
<td>log of consumer prices growth</td>
<td>.086 (1.68)</td>
<td>.124 (2.53)</td>
<td>.159 (2.81)</td>
<td>-087 (-0.14)</td>
</tr>
<tr>
<td>GDP volatility</td>
<td>.001 (1.95)</td>
<td>.001 (1.62)</td>
<td>.001 (1.81)</td>
<td>.002 (2.20)</td>
</tr>
<tr>
<td>M2 to private income</td>
<td>.005 (1.28)</td>
<td>.004 (1.72)</td>
<td>-003 (-1.15)</td>
<td>.004 (1.60)</td>
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<td>log of real private disposable income per capita</td>
<td>.024 (3.46)</td>
<td>.030 (5.12)</td>
<td>.047 (2.07)</td>
<td>.0152 (2.26)</td>
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<td>domestic credit to private sector to private income</td>
<td>-.006 (-2.31)</td>
<td>-006 (-2.35)</td>
<td>-006 (-2.36)</td>
<td>-007 (-2.71)</td>
</tr>
<tr>
<td>household financial net wealth to private income</td>
<td>-.006 (-3.49)</td>
<td>-007 (-3.78)</td>
<td>-003 (-1.31)</td>
<td>-006 (-3.35)</td>
</tr>
<tr>
<td>government saving to private income</td>
<td>-.090 (-4.61)</td>
<td>-.093 (-5.23)</td>
<td>-.095 (-4.23)</td>
<td>-119 (-5.59)</td>
</tr>
<tr>
<td>const.</td>
<td>-.001 (-0.02)</td>
<td>.013 (-0.25)</td>
<td>.215 (3.04)</td>
<td>-129 (-2.28)</td>
</tr>
<tr>
<td>Sargan test (Prob &gt; chi2)</td>
<td>0.1762</td>
<td>0.1721</td>
<td>0.0521</td>
<td>0.2172</td>
</tr>
<tr>
<td>Number of observations</td>
<td>376</td>
<td>378</td>
<td>289</td>
<td>300</td>
</tr>
</tbody>
</table>

z-statistics in brackets, method: GMM system estimator
Source: Liberda, Kolasa (2013)

2 Due to limited availability of fully-comparable data, the panel was unbalanced with the average time dimension of 14 years (mostly from 1995 to 2011). Hence, the global recession of 2009 was covered by the data. Similar to Loayza et al. (2000), the GMM dynamic system approach was used, where all but the old dependency ratio, urbanization rate and terms of trade were treated as endogenous variables. Dependent variable (private saving rate) was related to private/household disposable income and measured on a net basis.
Calibration of the model’s parameters and alternative scenarios

Before the model can be used to simulate potential scenarios, we need to calibrate it with information specifically related to Poland’s economy. The parameters of the model are consistent with those used in the entire Poland’s project. The Cobb-Douglas production function (1) implies that the parameter $\alpha$ measures the fraction of total output that is distributed as payments to capital; the number $1 - \alpha$ is thus the fraction of output that is paid to labor services. The value used for the capital share in output is set at $\alpha = 0.35$. The stock of installed capital is assumed to depreciate at a geometric rate of 5 percent per year, which implies a calibrated value of $\delta = 0.05$. This value for $\delta$ is consistent with that used in several cross-country studies (e.g., Caselli, 2005). The ratio of capital to output in the year 2012 is estimated using the perpetual inventory method, which gives $k_{2012}/y_{2012} = 2.4$.

Consider now calibrating the annual increase in education $z_{t+1} - z_t$. This parameter is calibrated using the average number of schooling years in the adult population as a proxy for the level of education. Using Barro and Lee (2010) dataset over the period 1995-2010, the average annual increase in schooling is estimated to be 4.6 percent per year. Therefore, the quantitative exercises below assume $z_{t+1} - z_t = 0.046$. The other parameter related to the stock of human capital that needs to be calibrated is the annual return to education $\phi$. To be consistent with the measure of education used above, the parameter $\phi$ needs to be estimated using the average increase in labor productivity due to an increasing in the average number of schooling years in the population by one. For the group of OECD countries, Hall and Jones (1999) use an annual rate of return to education of 6.8 percent. Bernanke and Gürkaynak (2002) and Caselli (2005) use a rate of return to education of 7 percent in their development accounting exercises. For the particular case of Poland, Polachek (2007) estimates Mincerian regressions of the return to education and obtains an estimate of 9 percent per year for both men and women. Trostel, Walker, and Woolley (2002) estimate, in a series of regressions, rate of returns to education of about 7.5 percent for men, and between 10-16 percent for women, depending on the econometric specification used. These estimates suggest using a rate of returns to education somewhat larger than the 7 percent used in the cross country studies mentioned above. The return to education for Poland is thus set at 9 percent per year. Two additional components related to the labor input is the evolution of the population and of the labor force, represented by the parameters $\Gamma_{Ne}$ and $\Gamma_{Le}$. Projections for these estimated were specifically computed for the Poland’s saving project.

Regarding the projected evolution of productivity, $\Delta \tilde{y}$, this study considers two scenarios. The first scenario, labeled the Baseline, uses projected series of TFP constructed specifically for this project. The second, alternative, scenario, considers a projected growth rate of TFP equal to the estimated TFP growth rate over the period 2002-2012, which is a constant growth rate of 1.5 percent per year. The left panel of Figure 5 displays both projections for TFP growth.

An important element of the model is the evolution of the ratio of net foreign liabilities over GDP, which was denoted by $\beta_t$. The 2012 stock of net foreign liabilities in Poland was estimated to be 67 percent of GDP. This number is well above the maximum of 35 percent permitted by the European Union policy guidelines. This high ratio is not a temporary phenomenon; indeed, Figure 2.13 shows that net foreign liabilities increased consistently since 1995 and exceeded the maximum allowed value since the year 2003. It is reasonable, therefore, to consider projection scenarios where Poland is expected to comply with the European policy requirement of a maximum level of foreign indebtedness of 35 percent of GDP. Therefore, the paper will consider two scenarios. In the baseline scenario, the ratio of net foreign liabilities is assumed to stay constant at a level of 67 percentage points of GDP. An important element of the model is the evolution of the ratio of net foreign liabilities over GDP, which was denoted by $\beta_t$. The 2012 stock of net foreign liabilities in Poland was estimated to be 67 percent of GDP. This number is well above the maximum of 35 percent permitted by the European Union policy guidelines. This high ratio is not a temporary phenomenon; indeed, Figure 2.13 shows that net foreign liabilities increased consistently since 1995 and exceeded the maximum allowed value since the year 2003. It is reasonable, therefore, to consider projection scenarios where Poland is expected to comply with the European policy requirement of a maximum level of foreign indebtedness of 35 percent of GDP. Therefore, the paper will consider two scenarios. In the baseline scenario, the ratio of net foreign liabilities is assumed to stay constant at a level of 67 percentage points of GDP. In the alternative scenario, the adjustment toward the target of 35 percentage points of GDP is assumed to be done smoothly to avoid sudden adjustments in the current account. For example, the proposed adjustment assumes that, by 2025, the ratio of net foreign liabilities is reduced to 50 percent of GDP. The middle panel of Figure 5 displays the baseline and alternative scenarios for the evolution of Poland’s net foreign liabilities.

In the quantitative section of the paper we perform two sets of experiments. The first set of experiments answers the following question: What is the level of the national and public saving rates that are required to achieve a target growth rate of GDP per capita, recognizing that the private savings evolves endogenously as a function of the characteristics of the economy? The second experiment fixes a path of public savings and analyzes the endogenous evolution of GDP per capita and of the private saving ratio. Therefore, for the second set of experiments we need a projected path for public savings. The left panel of Figure A 1 displays the baseline and alternative paths for public saving as a fraction of GDP (the sum of the fiscal balance and public investment). The baseline scenario is a continuation scenario where the fiscal balance is expected to remain in a deficit of around 2.5 and 3 percent of GDP over the entire simulation period. The alternative fiscal path assumes a fiscal adjustment whereby the fiscal deficit is assumed to be gradually reduced to 1 percent of GDP by 2016 and stay at that level thereafter. Both scenarios use the projections for public investment obtained from the project’s team.
Figure A 1. Baseline and projected scenarios for TFP, NFL, and Public Saving
Annex 2 Households Saving: Definitions, Data and Estimation’s Techniques

Determinants of private and household savings – panel study

• Data sources and variable construction: household sector includes households plus non-profit institutions serving households.

• Private net saving rate - private net savings divided by private net disposable income, source: OECD’s Non-Financial National Accounts

• Household net saving rate - Household net savings divided by household net disposable income, source: OECD’s Non-Financial National Accounts

• Household voluntary net saving rate - Household net savings minus adjustment for the change in net equity of households in pension funds (received minus paid, if reported) divided by household net disposable income, source: OECD’s Non-Financial National Accounts

• Corporate net saving to net household disposable income - source: OECD’s Non-Financial National Accounts

• Change in pension funds to net household disposable income - adjustment for the change in net equity of households in pension funds (received minus paid) to net household disposable income, source: OECD’s Non-Financial National Accounts

• Government net savings to net private/household disposable income - source: OECD’s Non-Financial National Accounts

• Domestic credit to private sector to net private/household disposable income - source: World Bank’s World Development Indicators, the missing data for Austria, Belgium, France and Netherlands for 1998 were linearly interpolated.

• Household financial net worth to net private/household disposable income - source: OECD’s Financial Annual Accounts

• Log of labor productivity growth - source: OECD’s Database

• Log of consumer prices growth - source: OECD’s Database

• Log of real 3 month interbank rate - deflated by consumer prices growth, source: OECD’s Database

• Log of real net private (household) disposable income per capita - Nominal net disposable income is deflated by the consumer prices deflator, divided by population and converted into US$ using PPPs, source: OECD’s Database

• GDP volatility - The square root of the average annual instantaneous time-varying variance of quarterly data on year-on-year growth of real GDP based on a GARCH (1,1) estimation (G(0,1) for Slovakia, Poland and Spain) based on all available quarterly data on real GDP growth taken from OECD’s Non-Financial National Accounts. For the description of the variable see Mody et al. (2012)

• Old dependency ratio - Working Age (20-64) per Pension Age (+65), persons, source: OECD’s Database

• Urbanization ratio, urban population (% of total) source: World Bank Database

• Money and quasi money (M2) as a percentage of net private/household disposable income, source: World Bank Database

• Terms of trade – Logarithm of terms of trade index (2000 = 100), source: EIU

• Unemployment rate - source: IMF Statistics
**Data range**

<table>
<thead>
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<th>Country</th>
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<th>to</th>
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<tbody>
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<td>Australia</td>
<td>1989</td>
<td>2010</td>
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<td>1999</td>
<td>2011</td>
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<td>2011</td>
</tr>
<tr>
<td>United States</td>
<td>1989</td>
<td>2010</td>
</tr>
</tbody>
</table>

- Estimation technique: Method: Arellano and Bover/Blundell and Bond system estimator, one-step estimator
- Exogenous variables: old dependency ratio, urbanization rate, terms of trade
- Endogenous variables: log of real net private disposable income per capita, log of labor productivity growth, government net savings to income, domestic credit to private sector to income, household financial net worth to income, log of real 3 month interbank rate, log of consumer prices growth, GDP volatility, corporate savings to income, M2 to income, unemployment rate
- Maximum lags of instruments: 10
- Limitation of the results
- The estimates are quite sensitive to different subsamples and specifications. It might result from several things among which are: an unbalanced panel with a relatively short time dimension and specific period taken into analysis, which i.a.
included the 2009 economic crisis. Therefore, the figures must be treated with caution while driving conclusions and policy implications. In the main text emphasis is placed on those estimates of saving that either were confirmed by another studies or were quite robust over different specifications.

**Saving regression for Poland**

- Below the construction and the source of the variables used in both the private and the household voluntary savings regressions are presented:

  - Private saving rate – gross private savings divided by gross private disposable income, source: GUS Non-Financial Quarterly National Accounts and EUROSTAT

  - Household voluntary saving rate – gross household savings minus adjustment for the change in net equity of households in pension funds (received minus paid) divided by gross household disposable income, source: GUS Non-Financial Quarterly National Accounts and EUROSTAT

  - Real gross private and household disposable income – current values are deflated by consumer price index, source: GUS Non-Financial Quarterly National Accounts, EUROSTAT and Statistical Bulletins

  - Dependency ratio - the ratio of economically active workers compared to inactive, source: GUS, BAEL

  - Real interest rate – Warsaw Interbank Offered Rate, three months, deflated by consumer price index, source: money.pl and GUS Statistical Bulletins

  - Labor productivity - economically active to GDP in constant prices from 2000, source: GUS, BAEL and EUROSTAT

  - GDP volatility - the square root of the instantaneous time-varying variance of quarterly data on year-on-year growth of real GDP (1Q1996- 4Q2012) based on a GARCH (0,1) estimation, source: OECD’s Non-Financial National Accounts. For the description of the variable see Mody, Ohnsorge and Sandri (2012).

  - Other variables:
    - gross government savings, gross non-financial corporate savings, adjustment for the change in net equity of households in pension funds, gross domestic product, source: GUS Non-Financial Quarterly National Accounts and EUROSTAT
    - household financial net worth, source: NBP Financial Quarterly National Accounts
    - terms of trade, consumer price index, source: GUS Statistical Bulletins
    - money supply M2, source NBP, Monetary and financial statistics
    - bank credit to non-financial private sector, source: Bank for International Settlements database
    - unemployment rate, source; EUROSTAT (seasonally adjusted series)
    - Estimation based on quarterly data from 1Q1999 to 4Q2012. The following series: private/household/non-financial corporate/government savings, private/household disposable income and gross domestic product were seasonally adjusted using TRAMO-SEATS method with (0,1,1)x(0,1,1) model.
    - First the equations using the OLS were estimated. Then, the models were tested for endogeneity of selected variables (i.a. non-financial corporate savings to income, M2 to income), which may arise both from the construction of variables and the underlying economic processes. To do so, the same equations with the GMM using the lagged values of endogenous variables as instruments were estimated. However, the exogeneity assumption could not be rejected for any reasonable level of significance, which brought us back to the OLS approach as the preferred method.
Some recent studies have used the cointegration analysis while estimating the savings rate regressions. The existence of a unit root was tested for and it could not be rejected for the household voluntary saving rate, but it was strongly rejected for the total private savings rate. Since the time dimension was rather limited and for the sake of having the same approach in all regressions, it was chosen not to follow the cointegration approach.

**Savings and saving rates concepts according to SNA and ESA95 for Europe**

**National economy**

- Gross savings = gross disposable income – consumption expenditures
- Net savings = gross savings – depreciation (consumption) of fixed capital
- Gross saving rate for the economy = gross national savings/GDP

**Sectors’ savings and saving rates in relation to GDP**

- Private sector gross savings = Nonfinancial corporate sector gross savings + Financial corporate sector gross savings + Households sector gross savings + Nonprofit institutions serving households (NPISH) gross savings
- Private sector gross saving rate = private sector gross savings/GDP
- Nonfinancial corporate sector saving rate = nonfinancial corporate sector gross savings/GDP
- Financial corporate sector saving rate = financial corporate sector gross savings/GDP
- Government sector saving rate = government sector gross savings/GDP
- Nonprofit institutions serving households (NPISH) saving rate = NPISH sector gross savings/GDP
- Households gross saving rate = households gross savings/GDP
- Households voluntary savings = households gross savings – an increase of households net equity in pension funds
- Households voluntary saving rate = households voluntary savings/GDP

**Sectors’ saving rates in relation to disposable income**

- Private sector gross saving rate = private sector gross savings/private sector gross disposable income
- Private sector net saving rate = private sector net savings/private sector net disposable income
- Households gross saving rate = households gross savings/households gross disposable income
- Households net saving rate = households net savings/households net disposable income
- Households voluntary saving rate = households voluntary savings/households gross disposable income
## Annex 3 The Literature on Determinants of Saving

<table>
<thead>
<tr>
<th>Year</th>
<th>Author(s)</th>
<th>Title</th>
<th>Summary</th>
</tr>
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<tbody>
<tr>
<td>1974</td>
<td>David Scadding</td>
<td>“Private Savings: Ultrarationality, Aggregation, and ‘Denison’s Law’”</td>
<td>Examination of the behavior of the ratio of gross private saving to gross national product for the United States, 1898–1969. The gross private savings rate (adjusted for consumer durables expenditures and the imputed return on durables) has no trend over the period except for the two world wars and the Great Depression. This stability is explained by the ultrarationality of households subsuming corporate and government spending and saving in their budget decisions.</td>
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<tr>
<td>1983</td>
<td>Modigliani Sterling</td>
<td>“Determinants of Private Saving with Special Reference to the Role of Social Security: Cross-Country Tests”</td>
<td>The major determinants of inter-country variation in saving rates are differences in the rate of growth of per capita income, length of retirement, and demographic variables relating to the age structure of the population and the availability of support for older people through social security systems.</td>
</tr>
<tr>
<td>1984</td>
<td>Summers</td>
<td>“The After-Tax Rate of Return Affects Private Savings”</td>
<td>New evidence based on direct estimation of utility function parameters suggests that savings are likely to be highly interest-elastic.</td>
</tr>
<tr>
<td>1992</td>
<td>Schmidt-Hebbel Webb Corsetti</td>
<td>“Household Saving in Developing Countries: First Cross-country Evidence”</td>
<td>Income and wealth variables affect saving in accord with standard theories. Inflation and the interest rate do not show clear effects on saving. Foreign saving and monetary assets have strong negative effects on household saving, suggesting the importance of liquidity constraints and monetary wealth in developing countries.</td>
</tr>
<tr>
<td>1994</td>
<td>Carroll Weil</td>
<td>“Saving and Growth: A Reinterpretation”</td>
<td>Analysis of the relationship between income growth and saving using cross-country and household data. At the aggregate level, growth Granger-causes saving, but saving does not Granger-cause growth. Households with predictably higher income growth save more than households with predictably low growth.</td>
</tr>
<tr>
<td>1996</td>
<td>Edwards</td>
<td>“Why Are Latin America’s Savings Rates So Low?”</td>
<td>Per capita growth is one of the most important determinants of private and public savings. Social security systems run by governments affect private savings negatively. Public savings tend to be lower in countries with more political instability. Higher government savings crowd out private savings and higher levels of foreign savings are associated with lower domestic private and public saving rates.</td>
</tr>
<tr>
<td>1996</td>
<td>Paxson</td>
<td>“Saving and Growth: Evidence from Micro Data”</td>
<td>The paper examines whether the observed cross-country correlation between aggregate saving rates and economic growth can be explained by using time-series of cross-sections of household surveys from the U.S., Britain, Taiwan, and Thailand. It finds that higher growth will produce only small increases in aggregate saving rates.</td>
</tr>
<tr>
<td>Year</td>
<td>Authors</td>
<td>Title</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>---------</td>
<td>-------</td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td>Liberda</td>
<td>“Household Saving in Poland”</td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td>Liberda Tokarski</td>
<td>“Determinants of Savings and Economic Growth in Poland in Comparison to the OECD Countries”</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>Loayza Schmidt-Hebbel Servén</td>
<td>“Saving in Developing Countries: An Overview”</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>Loayza Schmidt-Hebbel Servén</td>
<td>“What Drives Private Saving across the World?”</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>Denizer Wolf</td>
<td>“The Saving Collapse During the Transition in Eastern Europe”</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>Bandiera Caprio Honohan Schiantarelli</td>
<td>“Does Financial Reform Raise or Reduce Saving?”</td>
<td></td>
</tr>
</tbody>
</table>

Results of time-series and cross sectional estimates for industrial and developing countries on determinants of private saving: a partial offset on private saving of changes in public saving and in foreign saving; demographics and growth are important determinants of private saving rates; interest rates and terms of trade have positive effects. Increases in per capita GDP increase saving at low income levels but decrease it at higher income levels relative to the United States.

Author estimates determinants of household saving in Poland for 1994–97. The saving profiles of households in Poland are partially in accord with the lifecycle theory. Estimation results show the negative effect on saving of age above 30 compared to age below 30 ([people under 30 save more?]}. This negative effect is weaker for ages 50–54 and above 65. The household saving rate is positively affected by the level of household income. The negative effect of ownership of durable goods on saving is an approximation of a negative wealth effect.

Authors estimate the saving function for the OECD countries for 1971–94 and use the results in investigating the rates of growth and of domestic saving in Poland in the 1990s. The model implies that, if factors determining the rate of domestic saving and rate of growth in Poland were similar to those of the OECD countries for 1971–94, the rate of domestic saving in Poland would be higher by 5 points and would equal 22% of GDP, and household saving rate would rise by 2–3 points to 12% of GDP.

Special attention is paid to the relationship between growth and saving and the impact of specific policies on saving rates.

Analysis of factors behind saving variation across countries and over time using a large cross-country and time-series data set. The results: Private saving rates show inertia; the level and growth of income and inflation affect private savings positively; demographic variables and public savings affect savings negatively; and real interest rates and credit availability exert a negative impact on private saving.

The collapse during the transition is explained by the elimination of involuntary saving or by a change in equilibrium saving after the transition. The predicted saving rates of market economies with the same fundamentals as the transition economies before the transition are computed to test for the presence of involuntary saving in transition economies. The results provide some support for the hypothesis of consumption smoothing. Greater liberalization is associated with less saving.

Authors construct 25-year time-series indices of financial liberalization for Chile, Ghana, Indonesia, Korea, Malaysia, Mexico, Turkey, Zimbabwe and employ them in an analysis of private saving. The results indicate that financial liberalization (in particular relaxing liquidity constraints) may be associated with a fall in saving.
<table>
<thead>
<tr>
<th>Year</th>
<th>Author(s)</th>
<th>Title</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>Attanasio, Picci, Scorcu</td>
<td>&quot;Saving, Growth and Investment: A Macroeconomic Analysis Using a Panel of Countries&quot;</td>
<td>Long- and short-run correlations among saving, investment, and growth rates are analyzed for 123 countries for 1961–94. The lagged saving rates are positively related to investment rates; investment rates Granger-cause growth with a negative sign and growth rates Granger-cause investment with a positive sign.</td>
</tr>
<tr>
<td>2000</td>
<td>Carroll, Overland, Weil</td>
<td>“Saving and Growth with Habit Formation&quot;</td>
<td>If utility depends partly on how consumption compares to a &quot;habit stock&quot; determined by past consumption, the standard growth model can imply that increases in growth cause increased saving.</td>
</tr>
<tr>
<td>2002</td>
<td>Denizer, Wolf, Ying</td>
<td>“Household Savings in the Transition&quot;</td>
<td>Analysis of household savings in Bulgaria in 1995 and Hungary and Poland in 1993 shows that the effects of standard determinants on savings are comparable for transition and market economies, except for the age profile. No support for a precautionary savings motive was found. The evidence on consumption smoothing is mixed, because education of the head of household is linked to saving but not employment characteristics. Ownership of durables is negatively correlated with savings.</td>
</tr>
<tr>
<td>2003</td>
<td>De Serres Pelgrin</td>
<td>“The Decline in Private Saving Rates in the 1990s in OECD Countries: How Much can be Explained by Non-wealth Determinants?&quot;</td>
<td>Besides a negative correlation between household saving and financial wealth in 15 OECD countries in the 1990s, private saving rates have been significantly influenced by basic determinants: public sector saving rates, the demographic structure, the growth rate of labor productivity, changes in terms of trade, and real interest rates.</td>
</tr>
<tr>
<td>2004</td>
<td>Athukorala, Sen</td>
<td>“The Determinants of Private Saving in India&quot;</td>
<td>As a high-saving developing country, India exhibits the standard effects of private saving determinants according to theory. The private saving rate rises with the level and the rate of growth of disposable income, the spread of banking facilities, interest rates on deposits, and the inflation rate. Public saving, as well as terms of trade and migrant remittances, crowds out private savings.</td>
</tr>
<tr>
<td>2005</td>
<td>Schrooten, Stephan</td>
<td>Private Savings and Transition</td>
<td>The main results of analysis for EU-15 and EU-accession countries are that saving rates are persistent, income growth increases saving, and public saving crowds out private saving. Domestic saving and foreign capital operate as substitutes. That indicates international financial integration. The long-run effects of income growth and public saving are larger in the EU-15 than in the EU-accession countries.</td>
</tr>
<tr>
<td>2006</td>
<td>Hondroyiannis</td>
<td>“Private Saving Determinants in European Countries: A Panel Cointegration Approach&quot;</td>
<td>The paper proves empirically the existence of a long-run saving function in European countries. The function for Europe is sensitive to dependency ratios, liquidity, public finances, real disposable income growth, the real interest rate, and inflation.</td>
</tr>
<tr>
<td>2009</td>
<td>Agrawal, Sahoo, Dash</td>
<td>“Savings Behaviour in South Asia&quot;</td>
<td>Savings in South Asia are mainly determined by income, access to banking institutions, foreign savings rates, and the dependency rate.</td>
</tr>
<tr>
<td>Year</td>
<td>Author/Co-author</td>
<td>Title</td>
<td>Summary</td>
</tr>
<tr>
<td>------</td>
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<td>---------</td>
</tr>
<tr>
<td>2009</td>
<td>Van Rijckeghem, Üçer</td>
<td>“The Evolution and Determinants of the Turkish Private Saving Rate: What Lessons for Policy?”</td>
<td>The decline in private saving in Turkey in the 2000s can be explained by the rapid increase in credit and soaring increases in housing prices.</td>
</tr>
<tr>
<td>2010</td>
<td>Röhn</td>
<td>“New Evidence on the Private Saving Offset and Ricardian Equivalence”</td>
<td>The private saving offset averages about 40% across countries in the short and the long term—lower than previous studies found. The estimates vary by country. Changes in current revenues are almost fully offset; offsets to current spending are lower. There is no offset for public investment, which makes it a potential policy tool.</td>
</tr>
<tr>
<td>2010</td>
<td>Salotti</td>
<td>“Global Imbalances and Household Savings: The Role of Wealth”</td>
<td>Using separate measures for financial and nonfinancial (tangible) wealth the author finds that only the tangible (housing) stock negatively influenced household saving in 18 OECD countries for 1980–2005. Only in the United States did wealth not affect household savings negatively. Government savings and population changes seem to better explain the decline of household and private savings over two decades in United States.</td>
</tr>
<tr>
<td>2012</td>
<td>Das Rey</td>
<td>“Does Developing Asia Save More? Evidence from a Panel of High-Saving Nations in Asia”</td>
<td>The behavior of saving in China, India, Indonesia, Malaysia, the Philippines, and Thailand for 1990–2007 was examined. High growth, low age-dependency, financial deepening, liquidity constraint, remittances, terms of trade shock, and human capital formation emerge as key determinants of savings.</td>
</tr>
<tr>
<td>2012</td>
<td>Matur, Sabuncu Bahçeci</td>
<td>“Determinants of Private Saving and Interaction Between Public and Private Savings in Turkey”</td>
<td>Fiscal policy might have an important role in supporting growth. Higher growth may lead to a reduction of savings in the short run, but increases in income will increase savings in the long term.</td>
</tr>
<tr>
<td>2012</td>
<td>Mody, Ohnsorge, Sandri</td>
<td>“Precautionary Savings in the Great Recession”</td>
<td>For a panel of advanced economies the paper finds that more uncertain labor income is significantly associated with higher household savings. The results are robust to controlling for other determinants of saving rates, including wealth-to-income ratios, the government fiscal balance, demographics, credit conditions, and global growth and financial stress. Two-fifths of the increase in household saving rates between 2007 and 2009 can be attributed to the precautionary savings motive.</td>
</tr>
<tr>
<td>Year</td>
<td>Author(s)</td>
<td>Title</td>
<td></td>
</tr>
<tr>
<td>------</td>
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<td>-------</td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>Yang</td>
<td>“Aggregate Savings and External Imbalances in China”</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>With a national savings rate of 53% of GDP and a current account surplus of 9%, China faces structural imbalances. The author examines policy factors that encouraged corporate, government, and household saving. These policies affected income distribution between sectors, incomplete social welfare reforms, and population control policies as well as investment and trade policies in China.</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>Alessie Angelini Van Santen</td>
<td>“Pension Wealth and Household Savings in Europe: Evidence from SHARELIFE”</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Authors estimate the displacement effect of pension wealth on household savings in 13 European countries, including Poland and the Czech Republic, in the 2000s. They found that €1 of pension wealth of male respondents is associated with a decline in non-pension wealth from 17% to 30%, depending on the estimation method (female pension wealth was not analyzed).</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>Chen MilesiFerretti Tressel</td>
<td>“External Imbalances in the Eurozone”</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>The authors uncover the impact on external balances of declines in export competitiveness and asymmetric trade developments of the Eurozone vis-à-vis China, Central and Eastern Europe, and oil exporters. The current accounts of euro-area deficit countries with the rest of the world were financed mostly by intra-euro-area capital inflows (purchase of government and financial institution securities and cross-border interbank lending), which permitted external imbalances to grow over time.</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>Jappelli Padula</td>
<td>“Investment in Financial Literacy and Saving Decisions”</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Analysis of the effect of financial literacy on wealth and saving in 13 European countries (SHARELIFE data) indicates that the stock of financial literacy early in life is a valid instrument in the regression of wealth on financial literacy.</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>Khan Gill Haneef</td>
<td>“Determinants of Private Savings: A Case of Pakistan”</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Analysis of household savings in Pakistan for 1975–2008 specifies that increased per capita income, expected age, deepening of financial system, and years of education of males and females are positively associated with higher household saving. The dependency ratio has a negative impact on saving.</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>Kool Muysken</td>
<td>“Cross-country Private Saving Heterogeneity and Culture”</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>In addition to standard macroeconomic variables, the authors added three cultural variables—thrift, trust, and religiosity—and found that they significantly help to explain cross-country saving heterogeneity for 30 OECD countries for during 1990–2010.</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>Sahoo Dash</td>
<td>“Financial Sector Development and Domestic Savings in South Asia”</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Financial sector development positively affects total and private savings in South Asia, along with per capita income, share of agriculture, and foreign savings. Results support the humped-shape relationship between financial development and savings.</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>Aizenman Noy</td>
<td>“Public and Private Saving and the Long Shadow of Macroeconomic Shocks”</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>For a sample of 23 high-income countries, the paper examined the impact of catastrophic shocks from 1900 onward (defined as a time period in which the cumulative decline in per capita income was larger than 10 percentage points) on patterns of saving in 1980–2010. The authors found evidence that more experience of past crises tends to increase household savings but decrease public sector saving.</td>
<td></td>
</tr>
</tbody>
</table>
Annex 4 Household Savings Regression for the Czech Republic Based on Quarterly data

<table>
<thead>
<tr>
<th>Sample</th>
<th>1Q1999 - 4Q2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>.103 (0.817)</td>
</tr>
<tr>
<td>household saving rate (-1)</td>
<td>-.127 (0.275)</td>
</tr>
<tr>
<td>household saving rate (-2)</td>
<td>-.035 (0.732)</td>
</tr>
<tr>
<td>household saving rate (-3)</td>
<td>-.061 (0.525)</td>
</tr>
<tr>
<td>household saving rate (-4)</td>
<td>.194 (0.113)</td>
</tr>
<tr>
<td>dependency ratio</td>
<td>1.473 (0.074)</td>
</tr>
<tr>
<td>log of real interest rate</td>
<td>-.016 (0.134)</td>
</tr>
<tr>
<td>log of consumer price index</td>
<td>-.391 (0.035)</td>
</tr>
<tr>
<td>unemployment rate</td>
<td>-.786 (0.029)</td>
</tr>
<tr>
<td>GDP volatility</td>
<td>.382 (0.004)</td>
</tr>
<tr>
<td>log of real HSH disposable income</td>
<td>.168 (0.100)</td>
</tr>
<tr>
<td>log of labor productivity</td>
<td>.430 (0.593)</td>
</tr>
<tr>
<td>M2 to HSH disposable income</td>
<td>-.019 (0.345)</td>
</tr>
<tr>
<td>credit to private sector to HSH disposable income</td>
<td>.024 (0.140)</td>
</tr>
<tr>
<td>government savings to HSH disposable income</td>
<td>.204 (0.001)</td>
</tr>
<tr>
<td>non-financial corporate savings to HSH DI</td>
<td>-.391 (0.035)</td>
</tr>
</tbody>
</table>

method  
observation no.  
adjusted R-squared  
Jarque-Bera test (probab.)  
Breusch-Pagan-Godfrey test (chi-square probab.)  
Breusch-Godfrey test (chi-square probab.)  
Cameron & Trivedi’s decomposition of LM-test (total)  
Heteroskedasticity (p-value)  
Skewness (p-value)  
Kurtosis (p-value)  

Annex 5 Household Income, Consumption, and Savings Measured in the Microdata

The definition of savings used is the difference between income and consumption reported by households:

\[ S_t = Y_t - C_t \]

This chapter uses a comprehensive measure of incomes and consumption that better reflects the economic interpretation of the two measures. This requires modifying the data included on income and consumption in the survey. The two main modifications include imputation of rent for home owners (see Myck and Morawski, 2014) and exclusion of durables from the measure of consumption, i.e., we exclude expenditure on such items as cars, boats, furniture, large instruments, jewelry, etc.). These durables then become part of savings. For the purpose of the paper consumption \((C_t)\) is thus defined as:

\[ C_t = \text{exp}_{t} + \text{irent}_{t} \]

where: \(\text{exp}_{t}\) is current non-durable expenditure and \(\text{irent}_{t}\) is imputed rent for house owners.

On the other hand current disposable income \((Y_t)\) is defined as:

\[ Y_t = y_t + p_t + \text{irent}_{t} + \text{rtA}_{t-1} + z_t \]

where \(y_t\) is net current income from work (employment/self-employment), \(p_t\) is net retirement pension income, \(\text{rtA}_{t-1}\) is capital income, and \(z_t\) includes other pensions, benefits, gifts, etc.

Durables in this approach are treated as assets. This means that on the one hand, that we exclude durables expenditure from the definition of consumption. On the other hand, in the case of housing we include the flow of consumption from this main durable in the level of both income and consumption. As these imputations are added to both consumption and income the level of savings will remain unchanged, but this treatment will change the computed rate of savings.

Introducing pension contributions and receipts

Jappelli and Modigliani (1998) point out: “the savings rates that are often computed on microeconomic data are based on a concept of disposable income that does not take into account the presence of pensions arrangements” (p.3). They introduce a concept of “earned income” which includes net earnings, capital income and social security contributions (SSC) towards retirement pensions, and on the other hand treat net pensions accruing to the individual as drawing from SSC wealth and not as “income produced”. Below is a redefined concept of income which accounts for (public) retirement wealth:

\[ Y_{-t} = y_t + \text{retSSC}_{t} + \text{irent}_{t} + \text{rtA}_{t-1} + z_t \]

where: \(Y_{-t}\) is current disposable income consistent with the permanent income hypothesis as it includes \(\text{retSSC}_{t}\), i.e. social security contributions to pension wealth and excludes retirement pension income. In the exercise Myck (2014) use CenEA's national microsimulation model SIMPL to estimate \(\text{retSSC}\) and pension income to compute the level of retirement pension contributions (both on the employee and employer side). Compared to the definition in equation 3 in this definition changes in pension wealth, namely the contributions over the working lives (\(\text{retSSC}_{t}\)) and retirement pensions after retirement (\(p_t\)) are considered as respectively retirement savings and dis-savings.
Annex 6 Saving Rates and Age by Income Level – Quartiles

Figure A 2. Saving rates and age by income level
## Annex 7 Estimation of Age and Cohort Effects on Savings

<table>
<thead>
<tr>
<th>Dependent variable: saving rate</th>
<th>DP</th>
<th>OLS1</th>
<th>OLS2</th>
<th>OLS3</th>
<th>OLS4</th>
</tr>
</thead>
<tbody>
<tr>
<td>dummies for years</td>
<td>DP</td>
<td>no</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>controls for income</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Age</td>
<td>0.0292***</td>
<td>0.0338***</td>
<td>0.0257***</td>
<td>0.0203***</td>
<td>0.0174***</td>
</tr>
<tr>
<td>Age²</td>
<td>0.0489***</td>
<td>-0.0525***</td>
<td>-0.0510***</td>
<td>-0.0479***</td>
<td>-0.0457***</td>
</tr>
<tr>
<td>Age³</td>
<td>0.0028***</td>
<td>0.0030***</td>
<td>0.0020***</td>
<td>0.0033***</td>
<td>0.0031***</td>
</tr>
<tr>
<td>Five-year cohort</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-1941-45</td>
<td>0.0030</td>
<td>0.0185***</td>
<td>-0.0182***</td>
<td>-0.0007</td>
<td>-0.0101*</td>
</tr>
<tr>
<td>-1946-50</td>
<td>0.0000</td>
<td>0.0307***</td>
<td>-0.0433***</td>
<td>-0.0110*</td>
<td>-0.0297***</td>
</tr>
<tr>
<td>-1951-55</td>
<td>-0.0022</td>
<td>0.0430***</td>
<td>-0.0671***</td>
<td>-0.0300***</td>
<td>-0.0576***</td>
</tr>
<tr>
<td>-1956-60</td>
<td>0.0079</td>
<td>0.0672***</td>
<td>-0.0788***</td>
<td>-0.0431***</td>
<td>-0.0795***</td>
</tr>
<tr>
<td>-1961-65</td>
<td>0.0194*</td>
<td>0.0934***</td>
<td>-0.0897***</td>
<td>-0.0533***</td>
<td>-0.0988***</td>
</tr>
<tr>
<td>-1966-70</td>
<td>0.0337**</td>
<td>0.1220***</td>
<td>-0.0980***</td>
<td>-0.0591***</td>
<td>-0.1140***</td>
</tr>
<tr>
<td>-1971-75</td>
<td>0.0643***</td>
<td>0.1682***</td>
<td>-0.0893***</td>
<td>-0.0563***</td>
<td>-0.1204***</td>
</tr>
<tr>
<td>-1976-80</td>
<td>0.0997***</td>
<td>0.2180***</td>
<td>-0.0736***</td>
<td>-0.0426***</td>
<td>-0.1163***</td>
</tr>
<tr>
<td>1981-85</td>
<td>0.1142***</td>
<td>0.2497***</td>
<td>-0.0828***</td>
<td>-0.0457***</td>
<td>-0.1295***</td>
</tr>
<tr>
<td>Data year:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-2006</td>
<td>-0.0207***</td>
<td>0.0080***</td>
<td>-0.0014</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-2007</td>
<td>-0.0091***</td>
<td>0.0240***</td>
<td>0.0029</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-2008</td>
<td>0.0056***</td>
<td>0.0440***</td>
<td>0.0058**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-2009</td>
<td>0.0083***</td>
<td>0.0511***</td>
<td>0.0076**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-2010</td>
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<td>0.0632***</td>
<td>0.0173**</td>
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</tr>
<tr>
<td>Market income</td>
<td></td>
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</tr>
<tr>
<td>Market income squared</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Retirement pensions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retirement pensions squared</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other income</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other income squared</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex of head of HH</td>
<td>-0.0121***</td>
<td>-0.0124***</td>
<td>-0.0120***</td>
<td>0.0086**</td>
<td>0.0087***</td>
</tr>
<tr>
<td>Number of children</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-one</td>
<td>0.0051***</td>
<td>0.0044**</td>
<td>0.0055***</td>
<td>-0.0247***</td>
<td>-0.0242***</td>
</tr>
<tr>
<td>-two</td>
<td>0.0054***</td>
<td>0.0047**</td>
<td>0.0061***</td>
<td>-0.0374***</td>
<td>-0.0367***</td>
</tr>
<tr>
<td>-three</td>
<td>0.0019</td>
<td>0.0008</td>
<td>0.0028</td>
<td>-0.0408***</td>
<td>-0.0400***</td>
</tr>
<tr>
<td></td>
<td>-four+</td>
<td>-two</td>
<td>-three</td>
<td>-four</td>
<td>-five</td>
</tr>
<tr>
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<td>-------------</td>
<td>-------------</td>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td></td>
<td>0.0176***</td>
<td>0.0168***</td>
<td>0.0189***</td>
<td>-0.0345***</td>
<td>-0.0336***</td>
</tr>
<tr>
<td>Number of adults:</td>
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</tr>
<tr>
<td></td>
<td>0.0643***</td>
<td>0.0643***</td>
<td>0.0646***</td>
<td>-0.0079***</td>
<td>-0.0076***</td>
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<tr>
<td></td>
<td>0.1252***</td>
<td>0.1254***</td>
<td>0.1253***</td>
<td>0.0170***</td>
<td>0.0173***</td>
</tr>
<tr>
<td></td>
<td>0.1400***</td>
<td>0.1403***</td>
<td>0.1400***</td>
<td>-0.0015</td>
<td>-0.0011</td>
</tr>
<tr>
<td></td>
<td>0.1634***</td>
<td>0.1637***</td>
<td>0.1633***</td>
<td>0.0008</td>
<td>0.0011</td>
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<tr>
<td></td>
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<td>-0.0362***</td>
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<td>-0.0255***</td>
<td>0.0339***</td>
<td>0.0323***</td>
</tr>
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<td>Education</td>
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<td>-0.0270***</td>
<td>-0.0273***</td>
<td>-0.0267***</td>
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<td>0.0578***</td>
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<td>0.0885***</td>
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<td>-0.0363***</td>
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<td>0.1024***</td>
</tr>
<tr>
<td></td>
<td>-200-500</td>
<td>-0.0027</td>
<td>-0.0026</td>
<td>-0.0028</td>
<td>0.0270***</td>
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<tr>
<td>Town size (th.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-100-200</td>
<td>-0.0046</td>
<td>-0.0049</td>
<td>-0.0050</td>
<td>0.0323***</td>
</tr>
<tr>
<td></td>
<td>-20-100</td>
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<td>-0.0017</td>
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<td>0.0386***</td>
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<tr>
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<td>-0.0168***</td>
<td>0.0340***</td>
</tr>
<tr>
<td></td>
<td>-rural</td>
<td>-0.0465***</td>
<td>-0.0463***</td>
<td>-0.0477***</td>
<td>0.0048*</td>
</tr>
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<td>Regional dummies:</td>
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<td>included</td>
<td>included</td>
<td>included</td>
<td>included</td>
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<td>-0.5110***</td>
<td>-0.7391***</td>
<td>-0.2526***</td>
<td>-0.3742***</td>
<td>-0.2376***</td>
</tr>
</tbody>
</table>

Source: Myck and Morawski (2014).
Annex 8 Rough Calculation of Savings Necessary to Guarantee Current Replacement Rates

The Annex outline the calculation procedure used for assessment of saving adequacy as well as the main assumptions chosen. For the estimation we can base on generational accounts which indicate the average expected net tax payments of each cohort over their remaining life-cycle. Under the reversal scenario (described in Chapter 5), which keeps replacement rates at its current level, generational accounts are considerably lower than in the status quo scenario due to the higher net pension wealth. The difference between the generational accounts in these two scenarios (see Figure A 3) indicates the stock of pension wealth per citizen necessary to set aside today (under the real interest rate of 3 %) to keep current replacement rates. As not every citizen is participating in the ZUS pension system we weight this stock with the age and gender specific probability to take part in ZUS.

**Figure A 3 Generational accounts of current contributors – status quo vs. reversal scenario**

Based on the base year present value of necessary savings PV we can estimate annual savings A for each age group x (in year 2010) to be paid over n periods until the future year of retirement. In this course, we consider the increase in retirement ages legislated in 2012. Annual savings are adjusted each year by the general earnings growth g. To simplify the formula (outlined in Eq. 1 below) we applied the average earnings growth (in real terms) of the period 2012-2040 – which amounts to 3.3 %. The long-term interest rate r amounts to 3 % in real terms. In other words, the annual savings correspond to a constant proportion of average earnings over the entire savings period. Average earnings in our starting year of 2010 amount to 38,700 PLN.

$$A_x = PV_x \times \frac{(r - g)}{(1 - (\frac{1 + g}{1 + r})^n)}$$

**Eq. 1**
Annex 9 Re-weighting Methodology and Results

The method of re-weighting used by us follows Gomulka (1992) and Creedy (2004) and relies on adjustment of household population weights. In the original data set household i is assigned a population weight \( w_i \). From the point of view of analyzing the age distribution of the population, the resulting contribution of this household to the grossed-up age distribution for the age group \( \lambda a \) is

\[
\lambda_i^a = N_i^a \cdot w_i
\]

where \( N_i^a \) is number of people in household \( i \) in age group \( a \). Thus the total number of people in age group \( a \) in the population is:

\[
\Omega^a = \sum_{i=0}^{H} N_i^a \cdot w_i.
\]

In the re-weighted data set this contribution changes through a change in the household weight:

\[
\tilde{\lambda}_i^a = N_i^a \cdot \tilde{w}_i
\]

and as a result the total number of people in age group \( a \) after re-weighting is:

\[
\tilde{\Omega}^a = \sum_{i=0}^{H} N_i^a \cdot \tilde{w}_i
\]

The exercise of household weight adjustment is done in such a way that \( \Omega \) reflect projected population changes as given in the World Bank population projections. The analysis is done using Creedy (2004) re-weighting procedures.

The re-weighting exercise is carried out in two stages to account for changes in the age structure and in the population composition with respect to the level of education:

- weights adjusted to correct for age distribution only;
- weights adjusted to correct for age distribution and cohort-specific education attainment.

In the second stage we re-weight "age-education" cells which reflect the combination of projected demographic changes with assumed cohort-specific changes in the composition of education. Thus each age group in the population projections is divided into three education-specific subgroups and the re-weighting is done to match this extended set of criteria. Education levels for currently observed cohorts are taken from the data, while for younger cohorts (for whom we still do not know the education levels) we assume education proportions of the youngest cohort in the 2010 data set (see Table A 2 for details). In Table A 3. and Table A 4., we present details of changes in the composition of households in the population by the age of the head of household.

For the interpretation of the results, in particular in the exercise which re-weights by age and education, it is important to note that the re-weighting exercise, by assuming unchanged levels of incomes, keeps also the relative value of incomes by education groups unchanged, i.e. assumes that the relative returns to education will remain unchanged despite the changing composition of education groups. This assumption is important as in the exercise education is essentially a proxy for income levels. As we saw in Table A 2, education has a positive effect on savings in the regression without controls for income, and it is clearly positively related to income. The re-weighting conducted in the exercise will assign higher savings to better educated households in a similar way to equation OLS2 in Table, Annex 7.

In the table below we present the effect of the re-weighting exercise on the level of total savings in four population scenarios. These include the baseline 2010 distribution using the original weights provided by the Central Statistical Office (HBS2010), and three other re-weighted population structures in 2010 (according to official demographic statistics) and in the projected scenarios in 2030 and 2060. The resulting total amount of savings in the two scenarios (re-weighing by age and by age and education) is presented in Table A 1.
### Table A 1. Future re-weighted total household savings by age of head of household

<table>
<thead>
<tr>
<th>Age Group</th>
<th>2010</th>
<th>2030</th>
<th>2060</th>
<th>2010</th>
<th>2030</th>
<th>2060</th>
</tr>
</thead>
<tbody>
<tr>
<td>25-29</td>
<td>171.0</td>
<td>87.2</td>
<td>81.6</td>
<td>181.9</td>
<td>92.0</td>
<td>81.1</td>
</tr>
<tr>
<td>30-34</td>
<td>218.2</td>
<td>140.2</td>
<td>111.0</td>
<td>219.8</td>
<td>146.3</td>
<td>113.5</td>
</tr>
<tr>
<td>35-39</td>
<td>191.6</td>
<td>184.6</td>
<td>121.4</td>
<td>199.8</td>
<td>205.4</td>
<td>137.0</td>
</tr>
<tr>
<td>40-44</td>
<td>157.6</td>
<td>200.3</td>
<td>127.0</td>
<td>159.5</td>
<td>249.9</td>
<td>152.3</td>
</tr>
<tr>
<td>45-49</td>
<td>166.3</td>
<td>214.3</td>
<td>124.7</td>
<td>174.5</td>
<td>283.2</td>
<td>170.1</td>
</tr>
<tr>
<td>50-54</td>
<td>183.5</td>
<td>176.1</td>
<td>115.6</td>
<td>185.0</td>
<td>229.7</td>
<td>152.0</td>
</tr>
<tr>
<td>55-59</td>
<td>131.2</td>
<td>114.0</td>
<td>83.6</td>
<td>144.3</td>
<td>163.2</td>
<td>196.2</td>
</tr>
<tr>
<td>60-64</td>
<td>98.1</td>
<td>92.0</td>
<td>88.2</td>
<td>96.2</td>
<td>97.7</td>
<td>111.3</td>
</tr>
<tr>
<td>65-69</td>
<td>49.5</td>
<td>75.9</td>
<td>82.1</td>
<td>46.1</td>
<td>78.2</td>
<td>108.8</td>
</tr>
<tr>
<td>70-74</td>
<td>45.5</td>
<td>78.7</td>
<td>70.7</td>
<td>37.5</td>
<td>70.6</td>
<td>94.1</td>
</tr>
<tr>
<td>75-79</td>
<td>56.6</td>
<td>93.3</td>
<td>117.4</td>
<td>48.0</td>
<td>88.2</td>
<td>141.0</td>
</tr>
<tr>
<td>80-84</td>
<td>71.5</td>
<td>112.8</td>
<td>171.1</td>
<td>50.0</td>
<td>94.4</td>
<td>183.7</td>
</tr>
</tbody>
</table>

Source: Author's calculations using PHBS and World Bank population projections.

### Table A 2. Future education structure by cohort

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Year of Simulation</th>
<th>2010</th>
<th>2030</th>
<th>2060</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>higher</td>
<td>second</td>
<td>primary</td>
</tr>
<tr>
<td>25-29</td>
<td></td>
<td>0.310</td>
<td>0.433</td>
<td>0.257</td>
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<tr>
<td>30-34</td>
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<td>0.302</td>
<td>0.375</td>
<td>0.324</td>
</tr>
<tr>
<td>35-39</td>
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<td>0.242</td>
<td>0.347</td>
<td>0.411</td>
</tr>
<tr>
<td>40-44</td>
<td></td>
<td>0.165</td>
<td>0.340</td>
<td>0.495</td>
</tr>
<tr>
<td>45-49</td>
<td></td>
<td>0.163</td>
<td>0.343</td>
<td>0.493</td>
</tr>
<tr>
<td>50-54</td>
<td></td>
<td>0.136</td>
<td>0.363</td>
<td>0.501</td>
</tr>
<tr>
<td>55-59</td>
<td></td>
<td>0.118</td>
<td>0.376</td>
<td>0.507</td>
</tr>
<tr>
<td>60-64</td>
<td></td>
<td>0.121</td>
<td>0.366</td>
<td>0.513</td>
</tr>
<tr>
<td>65-69</td>
<td></td>
<td>0.117</td>
<td>0.332</td>
<td>0.551</td>
</tr>
<tr>
<td>70-74</td>
<td></td>
<td>0.105</td>
<td>0.323</td>
<td>0.572</td>
</tr>
<tr>
<td>75-79</td>
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<td>0.103</td>
<td>0.327</td>
<td>0.570</td>
</tr>
<tr>
<td>80-84</td>
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<td>0.100</td>
<td>0.245</td>
<td>0.655</td>
</tr>
</tbody>
</table>

Source: Author's calculations using PHBS data.
## Table A 3 Future re-weighted household structure: age re-weighting

<table>
<thead>
<tr>
<th>Year of simulation</th>
<th>age 18-24</th>
<th>age 25-29</th>
<th>age 30-34</th>
<th>age 35-39</th>
<th>age 40-44</th>
<th>age 45-49</th>
<th>age 50-54</th>
<th>age 55-59</th>
<th>age 60-64</th>
<th>age 65-69</th>
<th>age 70-74</th>
<th>age 75-79</th>
<th>age 80-84</th>
</tr>
</thead>
<tbody>
<tr>
<td>WB 2010</td>
<td>380.570.3</td>
<td>866.236.0</td>
<td>1,122.153.0</td>
<td>1,197.922.0</td>
<td>1,122.905.0</td>
<td>1,198.614.0</td>
<td>1,395.335.0</td>
<td>1,344.466.0</td>
<td>1,175.021.0</td>
<td>776.867.3</td>
<td>790.782.5</td>
<td>667.943.5</td>
<td>108.424.8</td>
</tr>
<tr>
<td>WB 2020</td>
<td>383.176.5</td>
<td>1,048.137.0</td>
<td>1,298.581.0</td>
<td>1,230.470.0</td>
<td>1,101.089.0</td>
<td>1,190.369.0</td>
<td>1,378.498.0</td>
<td>1,263.793.0</td>
<td>1,010.868.0</td>
<td>689.892.9</td>
<td>704.068.9</td>
<td>675.853.3</td>
<td>128.315.8</td>
</tr>
<tr>
<td>WB 2030</td>
<td>249.309.7</td>
<td>795.406.6</td>
<td>1,223.577.0</td>
<td>1,479.719.0</td>
<td>1,441.374.0</td>
<td>1,267.824.0</td>
<td>1,077.003.0</td>
<td>1,064.838.0</td>
<td>1,254.564.0</td>
<td>1,287.022.0</td>
<td>941.209.8</td>
<td>602.928.8</td>
<td>144.713.0</td>
</tr>
<tr>
<td>WB 2040</td>
<td>216.618.0</td>
<td>530.677.4</td>
<td>830.574.0</td>
<td>1,118.725.0</td>
<td>1,328.124.0</td>
<td>1,507.794.0</td>
<td>1,389.804.0</td>
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<td>1,036.955.0</td>
<td>1,181.584.0</td>
<td>1,166.712.0</td>
<td>204.733.0</td>
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<tr>
<td>WB 2050</td>
<td>226.544.6</td>
<td>581.265.2</td>
<td>826.496.5</td>
<td>800.293.9</td>
<td>908.385.9</td>
<td>1,146.476.0</td>
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<td>1,357.006.0</td>
<td>1,206.298.0</td>
<td>1,181.584.0</td>
<td>1,146.527.0</td>
<td>1,100.093.0</td>
<td>281.891.5</td>
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<td>WB 2060</td>
<td>231.110.5</td>
<td>551.780.3</td>
<td>786.151.1</td>
<td>859.617.3</td>
<td>911.900.2</td>
<td>828.283.3</td>
<td>863.040.6</td>
<td>1,026.979.0</td>
<td>929.908.7</td>
<td>1,181.584.0</td>
<td>1,146.527.0</td>
<td>1,146.527.0</td>
<td>226.803.8</td>
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</tbody>
</table>

Source: Author’s calculations using PHBS and World Bank population projections

## Table A 4. Future re-weighted household structure: age and education re-weighting

<table>
<thead>
<tr>
<th>Year of simulation</th>
<th>age higher 25-29</th>
<th>age second 30-34</th>
<th>age primary 35-39</th>
<th>age higher 40-44</th>
<th>age second 45-49</th>
<th>age primary 50-54</th>
<th>age higher 55-59</th>
<th>age second 60-64</th>
<th>age primary 65-69</th>
<th>age higher 70-74</th>
<th>age second 75-79</th>
<th>age primary 80-84</th>
</tr>
</thead>
<tbody>
<tr>
<td>WB 2010</td>
<td>402.745.4</td>
<td>435.130.2</td>
<td>275.008.4</td>
<td>201.277.5</td>
<td>234.027.3</td>
<td>163.769.0</td>
<td>177.807.6</td>
<td>224.179.5</td>
<td>150.251.2</td>
<td>274.925.9</td>
<td>194.089.3</td>
<td>232.064.3</td>
</tr>
<tr>
<td>WB 2020</td>
<td>449.247.6</td>
<td>481.390.4</td>
<td>402.909.0</td>
<td>300.042.0</td>
<td>361.272.8</td>
<td>218.795.1</td>
<td>217.436.1</td>
<td>274.925.9</td>
<td>194.089.3</td>
<td>232.064.3</td>
<td>232.064.3</td>
<td>232.064.3</td>
</tr>
<tr>
<td>WB 2030</td>
<td>365.244.9</td>
<td>432.571.0</td>
<td>469.935.5</td>
<td>424.363.2</td>
<td>496.421.5</td>
<td>274.478.8</td>
<td>279.566.4</td>
<td>333.135.0</td>
<td>207.749.9</td>
<td>333.135.0</td>
<td>207.749.9</td>
<td>232.064.3</td>
</tr>
<tr>
<td>WB 2040</td>
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<td>383.245.5</td>
<td>533.193.3</td>
<td>491.729.7</td>
<td>587.848.6</td>
<td>333.995.2</td>
<td>297.473.1</td>
<td>368.798.1</td>
<td>218.621.2</td>
<td>368.798.1</td>
<td>218.621.2</td>
<td>232.064.3</td>
</tr>
<tr>
<td>WB 2050</td>
<td>263.084.3</td>
<td>409.178.4</td>
<td>563.314.7</td>
<td>612.261.0</td>
<td>641.410.4</td>
<td>370.303.8</td>
<td>356.684.3</td>
<td>387.308.5</td>
<td>232.064.3</td>
<td>387.308.5</td>
<td>232.064.3</td>
<td>232.064.3</td>
</tr>
<tr>
<td>WB 2060</td>
<td>259.384.2</td>
<td>537.328.9</td>
<td>661.638.9</td>
<td>549.424.1</td>
<td>555.700.4</td>
<td>432.183.4</td>
<td>349.894.8</td>
<td>431.020.2</td>
<td>238.342.1</td>
<td>431.020.2</td>
<td>238.342.1</td>
<td>238.342.1</td>
</tr>
</tbody>
</table>

Source: Author’s calculations using PHBS and World Bank population projections
Annex 10 Poverty Rates in the Re-weighted Samples

Table below presents simulated values for the level of income poverty using the reweighted samples discussed earlier. In each case - using the new set of weights the resulting level of the poverty line (set at 60% of median equivalized household income) is computed together with poverty statistics for the overall population and for specific age groups. In addition, the table reports the effect of the re-weighting exercise on the overall distribution of income as measured by the Gini coefficient.

A. Poverty rates in the re-weighted samples by age categories (constant level of income)

<table>
<thead>
<tr>
<th></th>
<th>Re-weighted by:</th>
<th>2010</th>
<th>2030</th>
<th>2060</th>
<th>2010</th>
<th>2030</th>
<th>2060</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age and education</td>
<td>Age and education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-4</td>
<td>0.150</td>
<td>0.156</td>
<td>0.171</td>
<td>0.173</td>
<td>0.148</td>
<td>0.156</td>
<td></td>
</tr>
<tr>
<td>5-9</td>
<td>0.172</td>
<td>0.161</td>
<td>0.178</td>
<td>0.205</td>
<td>0.156</td>
<td>0.174</td>
<td></td>
</tr>
<tr>
<td>10-14</td>
<td>0.195</td>
<td>0.173</td>
<td>0.180</td>
<td>0.218</td>
<td>0.150</td>
<td>0.155</td>
<td></td>
</tr>
<tr>
<td>15-19</td>
<td>0.251</td>
<td>0.205</td>
<td>0.215</td>
<td>0.267</td>
<td>0.186</td>
<td>0.184</td>
<td></td>
</tr>
<tr>
<td>20-24</td>
<td>0.217</td>
<td>0.150</td>
<td>0.159</td>
<td>0.180</td>
<td>0.138</td>
<td>0.132</td>
<td></td>
</tr>
<tr>
<td>25-29</td>
<td>0.119</td>
<td>0.115</td>
<td>0.113</td>
<td>0.126</td>
<td>0.116</td>
<td>0.111</td>
<td></td>
</tr>
<tr>
<td>30-34</td>
<td>0.113</td>
<td>0.114</td>
<td>0.111</td>
<td>0.119</td>
<td>0.099</td>
<td>0.095</td>
<td></td>
</tr>
<tr>
<td>35-39</td>
<td>0.144</td>
<td>0.134</td>
<td>0.140</td>
<td>0.147</td>
<td>0.102</td>
<td>0.105</td>
<td></td>
</tr>
<tr>
<td>40-44</td>
<td>0.162</td>
<td>0.145</td>
<td>0.144</td>
<td>0.178</td>
<td>0.113</td>
<td>0.110</td>
<td></td>
</tr>
<tr>
<td>45-49</td>
<td>0.165</td>
<td>0.148</td>
<td>0.151</td>
<td>0.171</td>
<td>0.108</td>
<td>0.111</td>
<td></td>
</tr>
<tr>
<td>50-54</td>
<td>0.164</td>
<td>0.147</td>
<td>0.152</td>
<td>0.160</td>
<td>0.110</td>
<td>0.099</td>
<td></td>
</tr>
<tr>
<td>55-59</td>
<td>0.155</td>
<td>0.141</td>
<td>0.144</td>
<td>0.140</td>
<td>0.111</td>
<td>0.082</td>
<td></td>
</tr>
<tr>
<td>60-64</td>
<td>0.113</td>
<td>0.099</td>
<td>0.085</td>
<td>0.102</td>
<td>0.086</td>
<td>0.049</td>
<td></td>
</tr>
<tr>
<td>65-69</td>
<td>0.091</td>
<td>0.085</td>
<td>0.082</td>
<td>0.086</td>
<td>0.071</td>
<td>0.039</td>
<td></td>
</tr>
<tr>
<td>70-74</td>
<td>0.090</td>
<td>0.085</td>
<td>0.076</td>
<td>0.099</td>
<td>0.076</td>
<td>0.039</td>
<td></td>
</tr>
<tr>
<td>75-79</td>
<td>0.076</td>
<td>0.072</td>
<td>0.065</td>
<td>0.080</td>
<td>0.064</td>
<td>0.032</td>
<td></td>
</tr>
<tr>
<td>80-84</td>
<td>0.105</td>
<td>0.098</td>
<td>0.093</td>
<td>0.101</td>
<td>0.070</td>
<td>0.042</td>
<td></td>
</tr>
<tr>
<td>85+</td>
<td>0.086</td>
<td>0.079</td>
<td>0.084</td>
<td>0.099</td>
<td>0.071</td>
<td>0.056</td>
<td></td>
</tr>
<tr>
<td>Overall:</td>
<td>0.149</td>
<td>0.131</td>
<td>0.124</td>
<td>0.151</td>
<td>0.108</td>
<td>0.087</td>
<td></td>
</tr>
<tr>
<td>Gini:</td>
<td>0.299</td>
<td>0.291</td>
<td>0.282</td>
<td>0.304</td>
<td>0.297</td>
<td>0.286</td>
<td></td>
</tr>
</tbody>
</table>
B. Poverty rates in the re-weighted samples by age categories (Scenario 1 assumes 10% of pension’s level reduction; Scenario 2 assumes 20% reduction in pension level)

<table>
<thead>
<tr>
<th>HCR</th>
<th>base income</th>
<th>simulated income 1</th>
<th>simulated income 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2010</td>
<td>2030</td>
<td>2060</td>
</tr>
<tr>
<td>0-4</td>
<td>17.32</td>
<td>18.08</td>
<td>19.71</td>
</tr>
<tr>
<td>10-14</td>
<td>22.70</td>
<td>20.29</td>
<td>20.96</td>
</tr>
<tr>
<td>20-24</td>
<td>19.32</td>
<td>17.26</td>
<td>17.38</td>
</tr>
<tr>
<td>40-44</td>
<td>19.28</td>
<td>17.66</td>
<td>17.79</td>
</tr>
<tr>
<td>45-49</td>
<td>18.50</td>
<td>16.65</td>
<td>16.89</td>
</tr>
<tr>
<td>50-54</td>
<td>18.54</td>
<td>16.56</td>
<td>16.81</td>
</tr>
<tr>
<td>55-59</td>
<td>17.47</td>
<td>15.96</td>
<td>15.93</td>
</tr>
<tr>
<td>60-64</td>
<td>13.55</td>
<td>12.00</td>
<td>10.34</td>
</tr>
<tr>
<td>70-74</td>
<td>11.28</td>
<td>10.82</td>
<td>9.91</td>
</tr>
<tr>
<td>75-79</td>
<td>9.83</td>
<td>9.51</td>
<td>8.75</td>
</tr>
<tr>
<td>80-84</td>
<td>12.44</td>
<td>11.71</td>
<td>11.35</td>
</tr>
<tr>
<td>85-</td>
<td>10.36</td>
<td>9.71</td>
<td>10.15</td>
</tr>
<tr>
<td>tot</td>
<td>17.23</td>
<td>15.37</td>
<td>14.51</td>
</tr>
<tr>
<td>gini</td>
<td>29.30</td>
<td>28.52</td>
<td>27.54</td>
</tr>
</tbody>
</table>
Annex 11 Corporate Sector Regressions

The responsiveness of nonfinancial corporate investment rate (investment to tangible fixed assets) to changes in savings (retained profits), availability of external financing (domestic and foreign credit), cyclical and demand conditions, firm characteristic (size, export orientation, NACE classification) was analyzed for Poland based on CSO data for 2005-2011, adopting approach used in the literature to estimate corporate investment function (Özmen et al. (2012), Martinez-Carrascal and Ferrando (2008)). Results are presented below.

Table A 5 Regression results for nonfinancial corporate investment rate (investment to tangible fixed assets) for Poland for 2005-2011, CSO data

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>investment rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>retained profits to gross tangible fixed assets in current value</td>
<td>0.0389*** (3.781)</td>
</tr>
<tr>
<td>domestic credits to gross tangible fixed assets (percentage points)</td>
<td>0.0131*** (14.92)</td>
</tr>
<tr>
<td>foreign credits to gross tangible fixed assets (percentage points)</td>
<td>0.00986*** (20.37)</td>
</tr>
<tr>
<td>output gap</td>
<td>0.00603*** (4.777)</td>
</tr>
<tr>
<td>sales growth</td>
<td>0.0169*** (3.928)</td>
</tr>
<tr>
<td>export to total sales</td>
<td>0.0293*** (3.369)</td>
</tr>
<tr>
<td>medium</td>
<td>0.0132*** (5.445)</td>
</tr>
<tr>
<td>large</td>
<td>0.0151*** (5.113)</td>
</tr>
<tr>
<td>NACE : [C]</td>
<td>-0.0200*** (-3.082)</td>
</tr>
<tr>
<td>NACE : [D]</td>
<td>-0.0537*** (-8.210)</td>
</tr>
<tr>
<td>NACE : [E]</td>
<td>-0.0253*** (-3.227)</td>
</tr>
<tr>
<td>NACE : [F]</td>
<td>0.000972 (0.131)</td>
</tr>
<tr>
<td>NACE : [G]</td>
<td>-0.00759 (-1.145)</td>
</tr>
<tr>
<td>NACE : [H]</td>
<td>-0.0234***</td>
</tr>
<tr>
<td>NACE</td>
<td>Coefficient</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
</tr>
<tr>
<td>[I]</td>
<td>-0.0322***</td>
</tr>
<tr>
<td>[J]</td>
<td>0.0200*</td>
</tr>
<tr>
<td>[L]</td>
<td>-0.0598***</td>
</tr>
<tr>
<td>[M]</td>
<td>0.00210</td>
</tr>
<tr>
<td>[N]</td>
<td>0.00722</td>
</tr>
<tr>
<td>[P]</td>
<td>-0.0201**</td>
</tr>
<tr>
<td>[Q]</td>
<td>0.0104</td>
</tr>
<tr>
<td>[R]</td>
<td>0.0150</td>
</tr>
<tr>
<td>[S]</td>
<td>-0.0172</td>
</tr>
<tr>
<td>Constant</td>
<td>0.0719***</td>
</tr>
</tbody>
</table>

Observations 3,288  
R-squared 0.685

Baseline: size – small; NACE – B

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1
Table A 6. Regression results for nonfinancial corporate investment rate (investment to tangible fixed assets) for Poland for small, medium and large firms, for 2005-2011, CSO data

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>SMALL investment rate</th>
<th>MEDIUM investment rate</th>
<th>LARGE investment rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>retained profits to gross tangible fixed assets in current value</td>
<td>0.0334*** (3.686)</td>
<td>0.0961*** (4.293)</td>
<td>0.0916*** (2.972)</td>
</tr>
<tr>
<td>domestic credits to gross tangible fixed assets (percentage points)</td>
<td>0.0123*** (36.64)</td>
<td>0.0149*** (7.948)</td>
<td>0.0111*** (12.92)</td>
</tr>
<tr>
<td>foreign credits to gross tangible fixed assets (percentage points)</td>
<td>0.00949*** (21.68)</td>
<td>0.0126*** (7.415)</td>
<td>0.0117*** (16.52)</td>
</tr>
<tr>
<td>output gap</td>
<td>0.0137** (2.325)</td>
<td>0.0121</td>
<td>0.0246*** (3.420)</td>
</tr>
<tr>
<td>sales growth</td>
<td>0.0762*** (3.668)</td>
<td>0.0253* (1.691)</td>
<td>0.0306*** (3.641)</td>
</tr>
<tr>
<td>export to total sales</td>
<td>0.00517*** (3.030)</td>
<td>0.00759*** (4.258)</td>
<td>0.00940*** (6.017)</td>
</tr>
<tr>
<td>NACE : [C]</td>
<td>-0.0317*** (-2.679)</td>
<td>-0.0172** (-2.229)</td>
<td>-0.0200*** (-3.542)</td>
</tr>
<tr>
<td>NACE : [D]</td>
<td>-0.0648*** (-5.448)</td>
<td>-0.0441*** (-6.485)</td>
<td>-0.0365*** (-5.627)</td>
</tr>
<tr>
<td>NACE : [E]</td>
<td>-0.0282** (-2.008)</td>
<td>-0.0266*** (-3.252)</td>
<td>-0.0294*** (-3.803)</td>
</tr>
<tr>
<td>NACE : [F]</td>
<td>-0.0136 (-1.113)</td>
<td>0.0110 (1.167)</td>
<td>0.0199** (2.162)</td>
</tr>
<tr>
<td>NACE : [G]</td>
<td>-0.0215* (-1.841)</td>
<td>0.00215 (0.278)</td>
<td>0.0286*** (3.215)</td>
</tr>
<tr>
<td>NACE : [H]</td>
<td>-0.0478*** (-3.784)</td>
<td>-0.00391 (-0.342)</td>
<td>-0.00206 (-0.287)</td>
</tr>
<tr>
<td>NACE : [I]</td>
<td>-0.0361*** (-2.858)</td>
<td>-0.0427*** (-3.853)</td>
<td>-0.00543 (-0.374)</td>
</tr>
<tr>
<td>NACE : [J]</td>
<td>0.0118</td>
<td>0.0157</td>
<td>-0.00776</td>
</tr>
<tr>
<td>NACE : [L]</td>
<td>-0.0676***</td>
<td>-0.0568***</td>
<td>-0.0643***</td>
</tr>
<tr>
<td>NACE : [M]</td>
<td>-0.00747</td>
<td>-0.00684</td>
<td>0.00715</td>
</tr>
<tr>
<td>NACE : [N]</td>
<td>-0.0124</td>
<td>0.00929</td>
<td>0.0284***</td>
</tr>
<tr>
<td>NACE : [P]</td>
<td>-0.0296**</td>
<td>-0.0400**</td>
<td></td>
</tr>
<tr>
<td>NACE : [Q]</td>
<td>0.00291</td>
<td>0.0154</td>
<td>0.0185</td>
</tr>
<tr>
<td>NACE : [R]</td>
<td>0.0105</td>
<td>0.0241</td>
<td>-0.0103</td>
</tr>
<tr>
<td>NACE : [S]</td>
<td>-0.0217</td>
<td>-0.0486***</td>
<td>0.0576**</td>
</tr>
<tr>
<td>constant</td>
<td>0.0864***</td>
<td>0.0649***</td>
<td>0.0661***</td>
</tr>
</tbody>
</table>

Baseline: NACE – B

Robust t-statistics in parentheses*** p<0.01, ** p<0.05, * p<0.1
Annex 12 Government Saving Definitions.

**Net operating balance** equals revenue minus expense.

**Cross operating balance** equals revenue minus expense other than consumption of fixed capital. It is comparable to the national accounting concept of saving plus net capital transfers receivable.

**Net acquisition of nonfinancial assets** equals gross fixed capital formation less consumption of fixed capital plus changes in inventories and transactions in other nonfinancial assets.

**Net lending/borrowing** equals the net operating balance minus the net acquisition of nonfinancial assets. It is also equal to the net acquisition of financial assets minus the net incurrence of liabilities. Net lending means that government is providing financial resources to other sectors and net borrowing means that it requires moving financial resources from other sectors.

**Gross public saving** equals disposable income minus general government final consumption (= current receipts minus current expenditure, except depreciation).

**Net lending of government** equals (a) gross saving plus net capital transfers (receivable minus payable) minus gross capital formation minus acquisitions less disposals of non-produced non-financial assets; (b) total general government revenue minus total general government expenditure; (c) net acquisition of financial assets minus net incurrence of liabilities.

**S1 Indicator**: The medium-term sustainability indicator, the S1 indicator (EC), shows the budgetary adjustment effort required, in terms of a steady improvement in the structural primary balance, to be introduced until 2020 and then sustained for a decade, to bring debt ratios back to 60% of GDP—the debt threshold in the Treaty—in 2030, including financing for any additional expenditure arising from an aging population until the end-point date. The timescale has been chosen to be long enough to allow the impact of aging to be analyzed in a meaningful way while still remaining within the sights of current taxpayers and policy makers.

**S2 Indicator**: The S2 indicator shows the adjustment to the current structural primary balance required to fulfill the infinite horizon intertemporal budget constraint, that is, current and future government revenue matches current (consisting of government debt already incurred) and future expenditure, including paying for any additional expenditure arising from an aging population. It therefore considers the projected changes in age-related expenditure over a considerably longer period (to 2060 and beyond). In contrast to the S1 indicator, no specific end-point value for debt is included in the definition of the S2 indicator, which is calculated over an infinite horizon. Therefore, it does not specifically take into account the required adjustment for high debt countries to reduce their debt below 60% of GDP in line with the rules of the Stability and Growth Pact (see EC, 2012a).

The long-term debt-stabilizing primary balance refers to the primary balance that, if reached, would stabilize the debt over the long term at its current level.
## Annex 13 Saving and Financial Stability

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Title</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Savings as indicator of financial system soundness</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evans, Leone, Gill and Hilbers</td>
<td>2000</td>
<td>Macroprudential Indicators of Financial System Soundness</td>
<td>In UK saving-investment balance is one of the indicators in analyzing financial stability. The following macroprudential indicators suggested by authors, focus on different aspects of relationship between savings and financial stability: Ratio of Deposits to M2 (which may signal loss of confidence and liquidity problems in the banking sector); Loans-to-Deposits Ratio (may give indications of the ability of the banking system to mobilize deposits to meet credit demand); Maturity Structure of Financial Institutions’ Assets and Liabilities (can uncover excessive maturity mismatches and highlight a need for more careful liquidity management).</td>
</tr>
<tr>
<td><strong>The impact of financial stability/prudential regulations on saving</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bandiera, Caprio, Honohan and Schiantarelli</td>
<td>2000</td>
<td>Does Financial Reform Raise or Reduce Saving?</td>
<td>Increased prudential regulation is likely to increase net household saving, additionally perception of banks as sound may encourage growth in intermediation; Such regulation can also have some negative impact on household saving by reducing upward pressure on deposit interest rates.</td>
</tr>
<tr>
<td><strong>The impact of savings on financial stability/sound banking system</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impavido, Musalem and Tressel</td>
<td>2001</td>
<td>Contractual Savings Institutions and Banks’ Stability and Efficiency</td>
<td>Contractual savings help to develop domestic sources of long-term finance, therefore increase in such saving could diminish the financial risk associated to the difficulty of emerging economies to borrow abroad in long-term; The banking system is more resilient to liquidity and credit risks when contractual savings institutions are more developed.</td>
</tr>
<tr>
<td>Freestone, Gaudry, Obeyesekere and Sedgwicke</td>
<td>2011</td>
<td>The Rise in Household Saving and Its Implications for the Australian Economy</td>
<td>Increased household saving, particularly in the form of increased deposits, has helped to increase the resilience of the Australian banking system to disruptions in short-term wholesale funding markets.</td>
</tr>
<tr>
<td>The Allen Consulting Group</td>
<td>2011</td>
<td>Enhancing financial stability and economic growth – the contribution of superannuation</td>
<td>In Australia stock market volatility was reduced by the introduction of compulsory superannuation system- because it promoted longer term investment;</td>
</tr>
<tr>
<td>Servén, Loayza and Schmidt-Hebbel</td>
<td>1999</td>
<td>Saving—what do we know, and why do we care?</td>
<td>A national saving rate which is in line with an economy’s investment rate reduces vulnerability to sudden shift in international capital flows driven by uncontrollable herd behavior of self-fulfilling investor expectations; However, as East Asia’s recent crisis shows, high saving alone does not provide complete insurance against the consequences of weak financial systems or unsustainable exchange rate policies;</td>
</tr>
<tr>
<td>Becker, et. al</td>
<td>2010</td>
<td>Whither Growth in Central and Eastern Europe</td>
<td>Low savings rates were the cause of severe imbalances in a number of CEE economies; Encouraging domestic saving would improve the loan/deposit ratio and thereby limit the potential for unhealthy credit booms to develop;</td>
</tr>
<tr>
<td>World Bank and IMF</td>
<td>2003</td>
<td>Financial Sector Assessment Program—Review, Lessons, and Issues Going Forward</td>
<td>Iceland’s low national savings rate and large current account deficit led to imbalances in the macroeconomic environment and made the country vulnerable to market and credit risks.</td>
</tr>
<tr>
<td>Year</td>
<td>Authors</td>
<td>Title</td>
<td>Key Points</td>
</tr>
<tr>
<td>------</td>
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<td>------------</td>
</tr>
<tr>
<td>2011</td>
<td>Frait, Geršl and Seidler</td>
<td>Credit Growth and Financial Stability in the Czech Republic</td>
<td>A sufficient base of deposits from domestic entities seems to be one of the prerequisites for a stability of the banking system- it makes the system resilient to sudden evaporations of resources from abroad or from financial markets; furthermore as the currency structure of borrowing is linked to the one of saving- it induces people to view borrowing in the domestic as natural.</td>
</tr>
<tr>
<td>2011</td>
<td>Cull, Demirgüc-Kunt and Lyman</td>
<td>Financial Inclusion and Stability: What Does Research Show?</td>
<td>Intermediation of greater amounts of domestic savings leads to the strengthening of sound domestic savings and investment cycles and thereby greater stability; More study of this relationship is recommended;</td>
</tr>
<tr>
<td>2013</td>
<td>Han and Melecky</td>
<td>Financial Inclusion for Financial Stability</td>
<td>(access to finance matters) 10% increase in the share of people that have access to bank deposits can mitigate the deposit withdrawal rates by 3-8%; Reasons behind this phenomenon: more diversification, inclusion of low income clients who typically act as continued source of funds, providing individuals with greater access to financial risk-managing tools enhances resilience and stability of the real economy and thus (indirectly) promotes stability of the financial system</td>
</tr>
<tr>
<td>2013</td>
<td>IMF</td>
<td>Belgium: Financial System Stability Assessment, including Reports on the Observance of Standards and Codes …</td>
<td>High saving rates ensure a very stable funding and help Belgian banks enjoy a comfortable liquidity position; However the importance of regulated savings deposits (a medium term liability) creates a mismatch between liabilities and its long-term assets making the banks vulnerable to an upward change in yield curve</td>
</tr>
<tr>
<td>2011</td>
<td>Kruszka and Kowalczyk</td>
<td>Macro-Prudential Regulation of Credit Booms and Busts: The Case of Poland</td>
<td>Medium- and long-term deposit base in Poland is less robust than in Western Europe; Nevertheless the liabilities' structure is quite diversified due to large involvement of foreign investors (there were investors from 17 countries in the banking sector in Poland and they hold around 65% of banking assets,) this makes the banking relatively resistant to economic events in particular countries and enhances stability of Polish financial system. During 2007-2008 the good economic performance of Poland helped to sustain soundness of the financial system as foreign investors did not transfer liquid assets from Polish subsidiaries and in 2009-2010 they actually increased their investment liabilities.</td>
</tr>
<tr>
<td>2011</td>
<td>Frait, Geršl and Seidler</td>
<td>Credit Growth and Financial Stability in the Czech Republic</td>
<td>Credit boom in pre-crisis years concentrated in household sector, increasing in lending was accompanied by increase in the base of local deposits (financed from domestic savings not foreign sources); local deposit base is predominantly in domestic currency- lending to households was done in domestic currency only; One way or another, the Czech financial sector came out of the crisis relatively untouched despite the economy inevitably slipping into a rather sharp recession and this can be partly attributed to the broad base of local deposits in Czech financial system</td>
</tr>
</tbody>
</table>
Annex 14 Annuities

OECD suggestions to guide discussion on the topics of longevity and annuities: improved mortality tables and forecasting (including information for different cohorts/segments of population); availability of adequate liability instruments (long dated bonds, index linked papers, longevity bonds); regulations that allow risk pooling mechanisms (for example group annuity purchasing); good regulation concerning the solvency and accounting (safe but not so strict as to discourage supply); product innovation to much various needs of customers (flexibility); need to encourage competition (maybe through allowing providers other than insurance companies); ensure adequate financial education of consumers as well as of financial intermediaries; consider tax incentives and mandatory annuitization. (Stewart, 2007).

The table below provides an overview of the performance of annuity markets in various countries - the value of the market, as well as a measure of price attractiveness of annuities, namely Money Worth Ratio (MWR=expected present discounted value / initial premium cost). Additionally, some of the conditions and circumstances that led to the observed state are mentioned.

<table>
<thead>
<tr>
<th>Country</th>
<th>Author</th>
<th>Year</th>
<th>Performance of annuities market</th>
<th>Conditions and developments that lead to such state</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chile</td>
<td>R. Rocha &amp; C. Thorburn</td>
<td>2007</td>
<td>• Chile had reasonably developed markets for retirement products, as shown by 320,000 annuity policies and 200,000 PWs, and about 17 life insurance companies providing annuities and managing assets of almost 20 percent of GDP. • Comparing average MWRs in Chile with those estimated for other countries suggests that Chilean annuitants have a better deal than annuitants in other countries, especially considering that Chilean annuities are indexed.</td>
<td>• Retiring workers can take a partial lump sum subject to strict conditions and can also choose among three basic retirement products: a phased withdrawal (PW), an annuity and a temporary withdrawal (TW) combined with a deferred annuity. • Expansion of the market was largely driven by the early retirement option: 70% of all annuities (early retirees are mainly the ones who have higher incomes so annuities are more attractive than phased withdrawals- better payout scheme) • Annuities were actively marketed by insurance companies (while PW were not promoted-one sided picture was presented to the public); brokers were biased towards annuities (as they earned commission).</td>
</tr>
<tr>
<td>USA</td>
<td>J. Poterba</td>
<td>1997</td>
<td>• Market for annuities was growing rapidly in 1930s. • Later individual annuity market expanded throughout the postwar period; growth in since 1960s, mostly concentrated in 1970s. • Group annuity business grew rapidly in 1940s and throughout 1950s. • Variable annuities were introduced in 50s and grew dynamically in late 80s and 90s</td>
<td>• Concerns about stability of financial system drove investors to insurance companies; on top of that annuities offered returns higher than other instruments available to small investors (though it turned out this led to losses of insurance companies, as they were wrong in their risk estimations); flexibility to redeem annuities was also valued by investors. • Group annuities were offered as occupational pension fund operating on the basis of defined benefits; co-financed by employer and employee. • The growth of group annuities continued as employment at firms which offered such pension plan increased in 50s and 60s. • Variable annuities increased mostly through purchases by individuals; the growth was stimulated by the opportunity to defer tax through this instrument.</td>
</tr>
<tr>
<td>Country</td>
<td>Authors</td>
<td>Year</td>
<td>Notes</td>
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<tr>
<td>-------</td>
<td>--------------------------------------------</td>
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<td>----------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>A. Webb</td>
<td>2011</td>
<td>• USA MWR is around 100%</td>
<td></td>
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<tr>
<td></td>
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<td></td>
<td>• In 2008 sales of variable annuities exceeded $155 billion and sales of</td>
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<td></td>
<td></td>
<td></td>
<td>fixed annuities were almost $110 billion</td>
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<tr>
<td></td>
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<td></td>
<td>• Deferred annuities make the majority of sales (both variable and fixed); immediate annuities accounted for only $8 billion in 2008</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• It seems likely that only a small percentage of deferred annuity holders will eventually exercise the annuitization option</td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>M. A. Milevsky &amp; L. Shao</td>
<td>2011</td>
<td>• The overall size of the Canadian annuity market is sizeable, accounting for over 30 billion dollars</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Canadian MWR is roughly around 100-105%</td>
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<td></td>
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<td>• For annuities purchased with non-registered funds deferred taxation on interest income can be applied. This advantage does not carry through to annuities purchased with registered or qualified funds;</td>
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<td></td>
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<td>• The Guaranteed Lifetime Withdrawal Benefit (GLWB) annuity was introduced in Canada in late 2007 and it works similarly to variable annuities in USA.</td>
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<td>• To the insurance companies GLWBs are viewed as a private sector replacement for defined benefit pensions and since early 2010, the large majority of sales of segregated funds include GLWB riders, which anecdotally have become central to the sales pitch and a key reason that consumers purchase this product.</td>
<td></td>
</tr>
<tr>
<td>Australia</td>
<td>H. Bateman &amp; J. Piggott</td>
<td>2010</td>
<td>• Annuities were introduced in 1980s together with mandatory defined contribution arrangements.</td>
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<td></td>
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<td></td>
<td>• Currently the market for annuities in Australia is very small but in the past it has fluctuated in response to policy change.</td>
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<td>• Annuities are not mandatory and retirement income can be taken as a lump sum, retirement income stream (term/lifetime immediate annuities or account-based pensions which are a form of phased withdrawal product) or as a combination of the two.</td>
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<td></td>
<td>• Shortly after annuities were introduced tax incentives were put in place to encourage lifetime annuities- as an effect of a small market of life annuities emerged in the 1980s and it grew throughout the 1990s.</td>
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<tr>
<td></td>
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<td></td>
<td>• After the removal of tax incentives in 2004 and 2007 the value of the market declined between 2007 and 2008 by 90%</td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>J. Sakamoto</td>
<td>2011</td>
<td>• In short, annuity products are not especially popular among Japanese as a way to provide retirement income.</td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
<td>• Nevertheless, the variable annuity market has grown steadily since its introduction in 1999 with new sales strategy of insurance companies.</td>
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<td></td>
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<td>• Among reasons for low popularity of annuities in Japan are: perception that commission on these products are expensive; lack of interest in life annuities- preference for lump sum benefits can be explained by fear of catastrophically expensive events; lack of trust in insurance companies (experiences with firms going bankrupt in the past); finally there are no tax incentives for it;</td>
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<td></td>
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<td>• Even though they offered low rates on annuities (around 1-1.5%) fixed annuity products brought losses to insurance companies due to extremely low interest rates prevailing in Japan in late 1990’s and early 2000’s. This experience has stimulated insurance firms to offer variable annuities;</td>
<td></td>
</tr>
<tr>
<td>Country</td>
<td>Author(s)</td>
<td>Year</td>
<td>Key Points</td>
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</tr>
<tr>
<td>Denmark</td>
<td>C. Andersen &amp; PSkjodt</td>
<td>2007</td>
<td>• Denmark has a large mandatory second pillar that operates on a defined contribution base (although with benefit guarantees) and has achieved a high degree of annuitization in the payout phase.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• The provision of annuities is decentralized—many corporate pension funds and insurance companies offering annuities and phased withdrawals;</td>
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<tr>
<td></td>
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<td></td>
<td>• Plans are operated by insurance companies and multi-employer pension funds and they offer both guaranteed minimum investment returns and guaranteed annuity conversion factors in the second and third pillars. Group annuities are used in order to reduce the occurrence of adverse selection in the decision to annuitize and lower the cost of annuities.</td>
<td></td>
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</tbody>
</table>

Quasi mandatory and mandatory annuities

<table>
<thead>
<tr>
<th>Country</th>
<th>Author(s)</th>
<th>Year</th>
<th>Key Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexico</td>
<td>G. Impavido</td>
<td>2007</td>
<td>• Pension annuity market penetration in Mexico increased from 0.1 % to 0.3 % of GDP between 1997 and 2001</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>• Under the new pension regulations workers have the choice to obtain their payout through programmed withdrawal or annuities (if they don't meet a minimum balance PW is mandatory); this system applies to new entrants to the workforce—those who started saving for retirement under old system have a choice (and most chose old scheme because it offers higher benefits);</td>
</tr>
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<td></td>
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<td>• Both cohorts have to comply to the new disability and death benefits, which require the disabled or the beneficiaries to purchase an annuity after the incident;</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>• Disability and death benefits are now (due to early stage of new system and no &quot;new entrants&quot; entering payout period) the main source of demand for annuities; hence the small size of the market</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>The dependence of the annuity market on disability and death benefits is reflected in a drastic fall in annuity market penetration ratio (to 0.05% in 2005) which followed the change in regulations regarding these benefits (including stricter rules for eligibility).</td>
</tr>
</tbody>
</table>

Switzerland | E.James & X. Song | 2001 | • In Switzerland some of the highest MRW are observed (voluntary market 108% and quasi-mandatory 120%);                                                                                                  |
<p>|            |                |      | • Upon retirement, funds accumulated in 2nd pillar are usually annuitized, in a form and at a price tightly regulated by the government—it specifies the actuarial factor that must be used when transforming the savings into a joint annuity; because of this conversion quasi-mandatory annuities offer 20% more than is available in the voluntary market (this implies subsidization by government); |
|            |                |      | • Lump sum withdrawals are also permitted, but tax incentives as well as favorable terms strongly encourage annuitization.                                                                                         |
|            |                |      | • Workers who desire additional annuitization can purchase it in the purely voluntary market (3rd Pillar)                                                                                                      |</p>
<table>
<thead>
<tr>
<th>Country</th>
<th>Authors</th>
<th>Year</th>
<th>Key Points</th>
</tr>
</thead>
</table>
| Switzerland | M. Büttler & M. Ruesch | 2008 | • Switzerland still has a very high annuitization rate within the second pillar (only approximately 20% of the accumulated capital is withdrawn as a lump sum)  
• High conversion rates compensate individuals for lower (than market) accruals during the contribution period;  
• Also, in the past privately run occupational system were almost exclusively annuity based.                                                                                                                                                                                                                                                                                              |
| Singapore  | E.James & X. Song     | 2001 | • Currently annuities constitute as much as 13% of new insurance premiums  
The annuity business is now growing rapidly in Singapore  
There is no 1st pillar of pension scheme in Singapore, instead system is based on 2nd pillar defined contribution scheme; at the age of 55 Singaporeans must set aside a lump sum to: i) buy deferred life annuity payable at age 62, ii) deposit it in a bank or iii) leave it at CFP and take out in gradual withdrawals;                                                                                                                                                                                                                                     |
| Israel     | E.James & X. Song     | 2001 | • Israel has a small but very complex annuity market;  
• The MWR for quasi-mandatory annuities was found to be 109% and for voluntary annuities it was below 95%.  
• There are voluntary and quasi-mandatory annuities in Israel. The first type is widely available but used mostly by managers who are not covered by labor unions (and thus obtain only 1st pillar support). The second is part of the pensions scheme for workers, whereby they are obliged to buy deferred annuities every year, and when they reach retirement age bits of these annuities are added up;  
• Quasi-mandatory annuities are subsidized by government- they have access to government bonds with above-market interest rates, which leads to their high MWR.                                                                                                                                                                                                 |
| Netherlands | E. Cannon, R. Stevens & I. Tonks | 2013 | • There is a small but mature annuity market in Netherlands, and it exists parallel to defined benefit pension;  
• The total value of the annuities is almost €36 billion (about 4% of GDP) and over €29 billion are in group insured contracts  
• The MWR fluctuated in the last decade around 95%.  
• Mandatory annuitization of defined contribution pension would suggest a potential for big market of annuities however, this pension scheme is voluntary and small;  
• The other source of annuities are third pillar voluntary pension insurance policies: under this arrangement individuals purchase a capital sum insured before retirement and then convert this to an annuity upon retirement.                                                                                                                                                                                                                     |
### Annex 15 Summary Table of Interventions to Encourage Household Saving

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Country</th>
<th>Intervention</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tax incentives</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Milligan et al.</td>
<td>2003</td>
<td>Canada</td>
<td>Registered Pension Plan reform increasing pension contribution ceiling.</td>
<td>Pension savings fell; no effect on total savings.</td>
</tr>
<tr>
<td>Attanasio, Banks and Wakefield</td>
<td>2005</td>
<td>UK</td>
<td>Tax-favored saving plans such as Personal Equity Plans, Tax Exempt Special Savings Accounts and Individual Savings Accounts (ISAs) all of which have an annual limit.</td>
<td>Shift of savings to tax favored accounts; no evidence of new saving.</td>
</tr>
<tr>
<td>Disney, Emmerson and Wakefield</td>
<td>2008</td>
<td>UK</td>
<td>Incentives to shift from public to private pensions (contribution rebates).</td>
<td>Strong effects of switching for younger employees, less so for other age groups (size of incentive linked to age group).</td>
</tr>
<tr>
<td>Disney, Emmerson and Wakefield</td>
<td>2010</td>
<td>UK</td>
<td>1999 Stakeholder Pension reform, including a simplified private pension product and higher contribution ceiling for individuals with low earnings.</td>
<td>Increased pension coverage among low income earners, but no effect for others.</td>
</tr>
<tr>
<td>Engen, Gale and Scholtz</td>
<td>1996</td>
<td>US</td>
<td>Retirement Accounts (IRAs); 401(k) accounts</td>
<td>No evidence of new saving.</td>
</tr>
<tr>
<td>Attanasio and Deleire</td>
<td>2002</td>
<td>US</td>
<td>Retirement Accounts (IRAs); 401(k) accounts</td>
<td>No evidence of new saving. Growth in spending was similar between new savers and control group.</td>
</tr>
<tr>
<td>Benjamin</td>
<td>2003</td>
<td>US</td>
<td>Retirement Accounts (IRAs); 401(k) accounts</td>
<td>About one quarter of the funds represent new saving.</td>
</tr>
<tr>
<td>Chernozhukov and Hansen</td>
<td>2004</td>
<td>US</td>
<td>401(k) accounts</td>
<td>At low end of wealth distribution accounts represent new saving; but significant substitution effect at higher wealth level.</td>
</tr>
<tr>
<td><strong>Matching</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Duflo, Gale, Liebman, Orzag and Saez</td>
<td>2007</td>
<td>US</td>
<td>Saver’s Credit for IRA contributions</td>
<td>Different incentives for different income levels have little effect on take-up and contribution rates.</td>
</tr>
<tr>
<td><strong>Matching-experimental evidence</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harvey, Pettigrew, Madden, Tu, Emmerson, Tetlow and Wakefield</td>
<td>2007</td>
<td>UK</td>
<td>Randomized trial of the Saving Gateway accounts. Matches between 20p and £1 for each £1 contributed (up to a ceiling).</td>
<td>Higher match rates associated to increased take-up and greater contributions to the matched savings account. However, overall take-up among the lower-income target group relatively low. Evidence suggests reshuffling of savings rather than new saving.</td>
</tr>
<tr>
<td>Duflo, Gale, Liebman, Orzag and Saez</td>
<td>2006</td>
<td>US</td>
<td>Study of the Individual Development Accounts (IDAs). Participants received no match, a 20% match or a 50% match on contributions to an IRA.</td>
<td>Higher match rates associated with greater take-up and greater IRA contributions. However take-up rates low in general. No test of new saving was possible.</td>
</tr>
<tr>
<td>Study</td>
<td>Year</td>
<td>Country</td>
<td>Intervention</td>
<td>Findings</td>
</tr>
<tr>
<td>-------------------------------------------</td>
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</tr>
<tr>
<td>Mills, Gale, Patterson, Engelhardt, Eriksen and Apostolov</td>
<td>2008</td>
<td>US</td>
<td>Randomized trial of Individual Development Accounts (IDAs)</td>
<td>Among renters, there was an increase in home ownership rates, non-pension wealth was actually reduced rather than increased.</td>
</tr>
<tr>
<td>Bennett, Chavez-Quezada, Lawton and Perun</td>
<td>2008</td>
<td>UK</td>
<td>Child Trust Fund (CTF) accounts that provide a savings voucher upon the birth of a child. Parents can invest the voucher to open a CTF account; and make limited contributions, with top-up payments made by the government at age seven. At age 18, the child gains unrestricted access to the account. Program abolished in 2010.</td>
<td>Low income families saving in CTFs save a larger proportion of their income than higher income families. No evidence on whether this is new saving.</td>
</tr>
<tr>
<td>Clancy, Grinstein-Weiss and Schreiner</td>
<td>2001</td>
<td>US</td>
<td>Individual Development Accounts (IDAs).</td>
<td>Regression analysis shows that financial education hours are associated with higher frequency and larger deposit amounts. Causality difficult to prove.</td>
</tr>
<tr>
<td>Bernheim, Garrett and Maki</td>
<td>2001</td>
<td>US</td>
<td>Consumer education provided in high schools</td>
<td>Self-reported saving rates higher for those who received the courses and whose parents had low saving rates.</td>
</tr>
<tr>
<td>Schreiner, Clancy and Sheridan</td>
<td>2002</td>
<td>US</td>
<td>Individual Development Accounts (IDAs).</td>
<td>Financial education of up to 8 hours increases average net deposits, controlling for selection effects.</td>
</tr>
<tr>
<td>Bernheim and Garrett</td>
<td>2003</td>
<td>US</td>
<td>Workplace financial education seminars</td>
<td>Survey data estimates suggest that being offered workplace financial education significantly increases participation in a 401(k) retirement plan by around 12 percentage points, and that the spouse of the respondent is also nine percentage points more likely to participate. It also raises the balances invested in the plan, (effects are not significant in the upper parts of the savings distribution and there are no significant effects on the balance held by spouses). There is no significant effect total wealth.</td>
</tr>
<tr>
<td>Lusardi and Mitchell</td>
<td>2005</td>
<td>US</td>
<td>Retirement planning seminars</td>
<td>Survey data estimates suggest that there is a positive impact on savings, especially for low income workers. On average total net worth was 20% larger for those having received financial education, and effects are larger at lower income levels.</td>
</tr>
<tr>
<td>Clark, D’Ambrosio, McDermed and Sawant</td>
<td>2006</td>
<td>US</td>
<td>Workplace financial education seminars</td>
<td>Self-reported effects include a small increase in the number of people who started a pension plan and in the contribution rates.</td>
</tr>
<tr>
<td>Federal Deposit Insurance Corporation</td>
<td>2007</td>
<td>US</td>
<td>Money Smart program offering financial education to low-income individuals who engage in financial transactions.</td>
<td>Effects self-reported by a sample of participants suggest a modest increase in bank account ownership (from 69% to 75%) in the medium term. Use of budgeting also reportedly higher (over 60% increase) and reported improvement in financial management (e.g., paying bills on time).</td>
</tr>
</tbody>
</table>
### Information and financial education – experimental evidence

<table>
<thead>
<tr>
<th>Source</th>
<th>Year</th>
<th>Country</th>
<th>Description</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Commission</td>
<td>2010</td>
<td>8 EU countries</td>
<td>Different modalities of presentation of returns on different investment choices.</td>
<td>No significant differences between most modalities; but adding irrelevant information affected the quality of choices made.</td>
</tr>
<tr>
<td>Duflo and Saez</td>
<td>2003</td>
<td>US</td>
<td>Financial incentive ($20) randomly offered to attend benefits information fair offered at university</td>
<td>Financial incentive increased likelihood of attendance, both to treated individuals as well as their department (not equally though). Small impact (less than 1.5 pp) on likelihood of opening a retirement account for individuals in treated departments.</td>
</tr>
<tr>
<td>Beshears, Choi, Laibson and Madrian</td>
<td>2009</td>
<td>US</td>
<td>Simplified vs. standard information packets on potential (fictional) investments.</td>
<td>No significant difference on investment choices, but recipients of simplified information spent less time making investment decisions.</td>
</tr>
<tr>
<td>Choi, Laibson and Madrian</td>
<td>2011</td>
<td>US</td>
<td>Information on how to use a matched retirement savings account provided randomly.</td>
<td>No significant effect on contributions.</td>
</tr>
</tbody>
</table>

#### Defaults

<table>
<thead>
<tr>
<th>Source</th>
<th>Year</th>
<th>Country</th>
<th>Description</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madrian and Shea</td>
<td>2001</td>
<td>US</td>
<td>Automatic enrollment in 401(k) plan (one firm study).</td>
<td>After the switch, 86% of those automatically enrolled continued to participate after 3–15 months, compared to a participation rate of just 37% after the same period for those who were not defaulted. Most people stayed with the default options for contribution rates and portfolios.</td>
</tr>
<tr>
<td>Choi, Laibson, Madrian and Metrick</td>
<td>2006</td>
<td>US</td>
<td>Automatic enrollment in 401(k) plan (4-firm study).</td>
<td>Participation rates 86–96% after six months; between 50 and 67 percentage points higher than those hired before the change. Among new hires, between 46% and 90% invested everything in the default fund.</td>
</tr>
<tr>
<td>Beshears, Choi, Laibson and Madrian</td>
<td>2009</td>
<td>US</td>
<td>Automatic enrollment in 401(k) plan (one firm study). Increase in default contribution rate.</td>
<td>After two years, participation rates are about 25 pp higher after the switch. The proportion contributing 3% (old default) after the change fell from 28% to 4%; and those contributing 6% (new default) rose from 24% to 49%.</td>
</tr>
<tr>
<td>Bronchetti, Dee, Huffman, and Magenheim</td>
<td>2011</td>
<td>US</td>
<td>Automatic placement of a portion of tax refund into US Savings Bonds. Experiment targeted low-income taxpayers.</td>
<td>No significant difference between opt-in and opt-out groups. Possible explanation is clear intentions about the use of the tax refunds.</td>
</tr>
</tbody>
</table>

#### Commitment accounts – experimental evidence

<table>
<thead>
<tr>
<th>Source</th>
<th>Year</th>
<th>Country</th>
<th>Description</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ashraf, Karlan and Yin</td>
<td>2005</td>
<td>Philippines</td>
<td>Commitment savings account (until a savings target is reached) and informative talk with marketer about savings, random assignment and 2 control groups (one receives only information, one receives nothing).</td>
<td>Take-up rate was 28% and treatment raised savings by 81% after 12 months (relative to baseline savings levels). Women with hyperbolic discounting were more likely to take up the offer and open the account.</td>
</tr>
<tr>
<td>Source</td>
<td>Year</td>
<td>Country</td>
<td>Description</td>
<td>Notes</td>
</tr>
<tr>
<td>------------------------</td>
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<td>-------------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Thaler and Bernatzi</td>
<td>2004</td>
<td>US</td>
<td>Save More Tomorrow (SMaRT) program. Workers pre-commit to raising their contribution rates over time (up to a maximum level) but are free to opt out at any time.</td>
<td>Low take-up rates (12%) for those not already contributing (in experimental setting). Contributions rose from 3.4% to 4.6% on average (5.3% to 6.8% for those who were already saving), significantly above control group contribution increases.</td>
</tr>
<tr>
<td>Framing</td>
<td></td>
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</tr>
<tr>
<td>Card and Ransom</td>
<td>2011</td>
<td>US</td>
<td>Increases in mandated employer or employee retirement contributions.</td>
<td>A$1 increase in employer contributions is only offset by around $0.20 to $0.40 of supplementary contributions, whereas a $1 increase in employee contributions is offset by $0.50 to $0.80.</td>
</tr>
<tr>
<td>Framing – experimental evidence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bernatzi and Thaler</td>
<td>2001</td>
<td>US</td>
<td>People were asked to allocate funds across two options: ‘stocks’ and ‘bonds.’ Then, one option was relabelled as ‘half stocks and bonds’ while the other remained unchanged.</td>
<td>On average, people allocated 50:50 between stocks and bonds in the first treatment, but when the funds are modified towards stocks or bonds, they do not reallocate to reach a 50:50 split between the two.</td>
</tr>
<tr>
<td>Saez</td>
<td>2010</td>
<td>US</td>
<td>Customers are offered incentives to invest in a form of Individual Retirement Account when they file their tax returns. They are randomly offered either a 50% matched contribution, a 33% ‘rebate,’ or no match at all. The 50% match and 33% rebate are equivalent.</td>
<td>6.4% of those offered the 33% rebate, and 10.2% of those offered the 50% match accepted to invest (against 3.3% in the control group). Those who took the rebate received an average total contribution of $672 compared to $820 for those who took the match.</td>
</tr>
</tbody>
</table>
Annex 16 Description of the DSGE model MEMO

The MEMO model that was used for simulating the impact of policies and structural changes is a large-scale Dynamic Stochastic General Equilibrium (DSGE) model. The scope of applications of such tool is very wide – they were used to analyze impact of policies related to adaptation to climate change and mitigation (e.g. Bukowski et al. 2013), labor market policies (e.g. Bukowski 2010), or the influence of EU funds on the economy. This report presents results of the possible impact of demographic changes on the economy.

The main building blocks of the model are households, firms and the government. These blocks are interconnected via capital, labor and goods markets. Households supply labor, decide on the level of their consumption, as well as for government bonds and firm stocks. They interact with producers on labor market where wages are negotiated and vacancies filled. This market is operated by a special intermediary firm that buys labor from households and sells it to firms in the production sector. In each sector, there are firms producing basic goods using capital, labor and materials as inputs. In exchange for they work and savings, they receive dividends and wages from firms, and interest payments from government, and pay taxes imposed by the government.

Figure A 7. Main building blocks of the DSGE model

Firms produce final goods that are consumed by households, re-invested by producers or utilized by government. As they own capital and have some monopolistic power, their profits are positive, allowing them to pay dividends to shareholders. Also, they pay income and value added taxes to the government. Government spends its tax revenues and EU funds on public investments, public consumption and social transfers to households for unemployment compensation and payments to retirees. Prices for consumption, investment and intermediate goods are set in the goods market. Firms purchase materials and investment
goods from other companies and utilize them as inputs in the production process. Investment goods may also be bought by the government. In the labor market, wages are set to equalize labor market and supply. The labor market is non-Walrasian, as a job search mechanism and centralized wage negotiations between employees and employers are implemented. The unemployment rate is therefore higher than zero. The capital market allows borrowing through the issue of bonds. Companies may share their profits with households paying out dividends and raise capital by issuing stocks. Thus the capital market allows for streaming financing resources from households to firms, smooth households’ consumption over time.

**The model is equipped with specific features that make it particularly suitable for the analysis of demographic changes and labor supply.** First of all, it contains a detailed description of the labor market, including labor market matching as in Mortensen and Pissarides (1994), dynamics of employed and unemployed, and negotiation of wages and work hours. Labor market frictions are allowed, which reflect the rigidity of the labor market and determine the amount of time needed for adjustment. Negotiation of wages and work hours is done through a Nash bargaining procedure, taking into account expected benefits from filled vacancies and the utility of households. Labor market dynamics allow the probability of separation and finding a job to be shocked. The Model structure is presented in Figure 1. Technical description and details may be found in Bukowski and Kowal (2010).
Annex 17 Literature review on empirical elasticities of labor force participation by age groups

Various drivers of labor force participation were considered in the literature review, which in general, work though increasing the propensity to work and save. The first structural change reviewed was an increase in life expectancy and an improvement in health status. The data reveals a robust correlation between life expectancy and healthy life expectancy that should translate directly into a decrease of exit rates and a rise in labor force participation. Second, technological change – which makes some jobs less burdensome and leads to a decrease in disutility of work – was considered. The last effect is linked to a decrease in future net replacement rates, as aging create a pressure to reduce the generosity of the pension system.

Despite the abundance of publications, it is difficult to calculate the exact elasticities driving labor supply by age cohort. This is because of the existence of different methods of estimation, samples and approaches to quantifying the impact of measures on labor supply. For example, the reaction of labor force participation to a higher net replacement rate may be different from the reaction to a lower net replacement rate. On health status, it may be measured by objective or subjective indicators. The link between technological change and sectoral changes in the economy and labor force participation is quite difficult to track. Also, education indicators were examined, but because they are closely associated with policies, their effects are not reported.

Replacement rate

The impact of changes in net replacement rate on labor force participation is the most extensively researched in the literature. However, the range of estimated elasticities is broad. Even though the literature on the relationship between net replacement rate and participation rate is abundant, there are few papers focused on the probability of exit from the labor market. Based on a cautious assumption with this respect, labor supply expands by 200,000 employees through 2060 compared the baseline scenario, as a result of declining replacement rates.

The expected reduction of net replacement rates of the pension system in Poland and a switch from the NDB to the NDC system in late 1990s will drive future participation rates. This is confirmed by the experience of Chile, where such a reform was introduced in early 1980s. In Poland, official projections suggest that, due to the pension system reform introduced in 1999, net replacement rates for 60 year olds may drop by 15 percentage points by 2030 and further 20 percentage points by 2050 (Ministry of Labor and Social Policy, 2005). Such a dramatic change must exert pressure on exit rates of elderly workers. Therefore, we may expect a significant decline of exit rates for older workers because they will be more reluctant to retire as retirement will be associated with a significant deterioration of quality of life.

Health status

Health status proved to be an important determinant of labor force participation, especially for older workers. This applies both for an increases in life expectancy and healthy life expectancy. The literature suggests, however, a substantially weaker relationship between life expectancy and labor force participation than with the net replacement rate, and estimates of elasticity of labor force participation or LM exit rates with respect to life expectancy are rare. Based on cautious assumptions, labor supply is to increase by approximately 200,000 by 2060 if the projected increase in life expectancy materializes.

Technological change

Projected structural changes will affect the labor supply of the older workers in the next few decades. Thanks to technological improvements, some jobs will become less tiring and burdensome as most physical work is mechanized or automatized. The economy shifts towards services, the sector in which accidents are less frequent and work conditions are more favorable. This is confirmed empirically by the data from the Polish Labor Force Survey (LFS) - those employed in services exit the labor force later than workers in industry. Also, technological change drives employment in occupations requiring higher skills.

The impact of technological change on the labor market was derived from the LFS data. A difference of roughly two years was identified between average LM exit age for workers in the services and the industry sector. Then, it was projected that the average age of exit from the LM in the service sector will be one year higher than in the baseline, under which 72 percent of employees are to work in services by 2060. Following these steps, the projected labor supply should increase by around 100,000 by 2060 in comparison to the baseline.
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