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Ageing, pension reforms and capital market development in transition countries

Christiane Nickel and Johan Almenberg

Abstract

This paper gives an overview of demographic trends and their impact on public finances in transition countries. It also describes the pension reforms that have been carried out and the impact of multi-pillar pension reforms on capital market developments. We show that the transition countries face more severe demographic pressures than comparable emerging market economies, and that there is a cause for concern that they may 'grow old before they grow rich'. Their government finances therefore have to cope with a rising strain on public social security systems. We argue that multi-pillar pension reform is not a cure-all for this problem. Multi-pillar systems are costly to introduce, as pension contributions previously used to finance the public pension liabilities are diverted to the funded pillars. They also change the risk-profile of the pension schemes, as the intergenerational risk-sharing of the public system is replaced by risk-sharing through financial markets. Parametric reform to public pension systems continues to be a viable policy alternative. The necessity of parametric reforms is underscored by data on asset allocations of mandatory pension funds in the transition countries, showing that limited diversification of assets can undermine the actual impact of multi-pillar reform on fiscal sustainability.

Keywords: Ageing, Pension Reform, Pension Funds, Capital Markets

JEL Classification Number: G23, H55, P35

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INTRODUCTION

Since the mid-1990s, many transition countries have undertaken extensive pension reforms. All of them have introduced a multi-pillar model along the lines put forward by the World Bank in its seminal 1994 report “Averting the Old Age Crisis”.¹ The multi-pillar model is characterised by three basic elements: a mandatory pay-as-you-go “first pillar” that is to some degree linked to earnings; a mandatory funded “second pillar” that is essentially an individual savings account; and a voluntary funded “third pillar” that can take many forms (individual, employer sponsored, defined benefit, defined contribution).² The decision to reform pension systems in such a manner was usually motivated by the desire to reach long-run fiscal sustainability in the face of rapidly ageing societies. But other, auxiliary goals also played a role such as the desire to foster the development of domestic capital markets.

This paper gives an overview of demographic trends in the region and their impact on public finances. It also describes the pension reforms that were carried out and the impact of multi-pillar pension reforms on capital market developments. While earlier studies either concentrate on selected countries or only look at one aspect of pension reforms or funded systems, we aim at treating all of the above-mentioned aspects for all transition countries. With this rather broad scope we provide researchers and policy-makers with a work of reference for future research in this area.

We find that transition countries not only face a shrinking but also an ageing population and that these demographic trends are more pronounced than in other emerging market countries. To cope with the rising strain on social security systems many countries have introduced multi-pillar pension reforms. However, there are still many countries where reforms were introduced but may not have been far-reaching enough to prevent a potential fiscal collapse in the future. We also point out that multi-pillar pension reforms are not a cure-all solution. Multi-pillar reforms are costly to introduce, as pension contributions previously used to finance the public pension liabilities are diverted to the mandatory funded pillar. If the funded pillar mainly invests in domestic government bonds, then this effectively amounts to exchanging implicit obligations of the public pension scheme for explicit obligations in the form of bonds. Hence, in an extreme case, not much is gained in terms of fiscal sustainability from the introduction of a funded pillar. In addition the risk profile of the pension scheme changes with multi-pillar reforms, as the intergenerational risk sharing of the public system (where the current working-age population pays for the elderly) is replaced by risk sharing through financial markets. This implies that financial market regulation must be introduced that, on the one hand, protects the insured against exposure to excessive market risk, but on the other hand must also enable participants to reap the potentially higher returns, by not imposing too severe constraints on fund managers. It is not straightforward to get this balance right.

The paper is organised as follows: Section 1 reviews demographic developments in transition countries. Section 2 explains what impact the demographic developments have on public finances. Section 3 looks at the pension reforms that were implemented in transition countries, focusing on multi-pillar reforms. Section 4 looks at the impact of introducing mandatory funded “second pillars” on capital market development. Section 5 presents the policy conclusions of the paper. Annex 1 gives an overview of the pension systems of those 11 countries that have introduced multi-pillar systems.

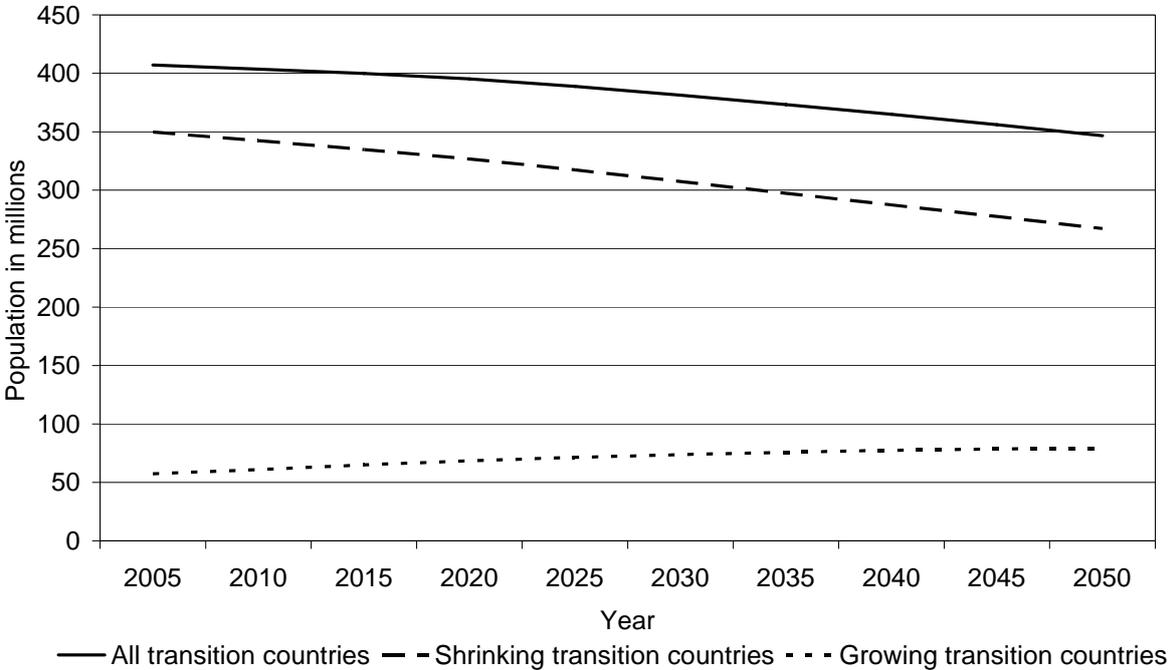
¹ In 2005 the World Bank has extended its multi-pillar pension model by two additional pillars: the tax-financed safety-net and other, mainly non-financial, means of support (World Bank, 2005).

² In a pay-as-you-go (PAYG) system, benefits are financed through current contributions. In a defined contribution scheme, there is a set contribution rate to the pension scheme but the size of future pension benefits is not known until retirement.

1. DEMOGRAPHIC TRENDS

According to UN (2005) projections, by 2050 the total population of the transition countries³ will have shrunk by 15 per cent, from 407 million currently to 347 million (see Figure 1). Some countries are projected to experience a much more dramatic decline in their population than the average. For example, the population of the Ukraine is projected to shrink by 43 per cent, Bulgaria by 34 per cent, Georgia by 33 per cent, Belarus by 28 per cent and Latvia by 27 per cent. In absolute terms, Russia is expected to experience the most dramatic decline, with a projected population decline of 30 million. By contrast, other countries, such as Albania, Azerbaijan, Kyrgyzstan, Mongolia, Tajikistan, Turkmenistan and Uzbekistan, are projected to record population growth until 2050. On average, they are projected to grow by 37 per cent until 2050. However, given their rather small size, their growth can not outweigh the reduction in the remaining countries. The population in the shrinking countries is projected to decrease by 23 per cent.

Figure 1: Total population in transition countries (2005-50)



Source: UN (2005).

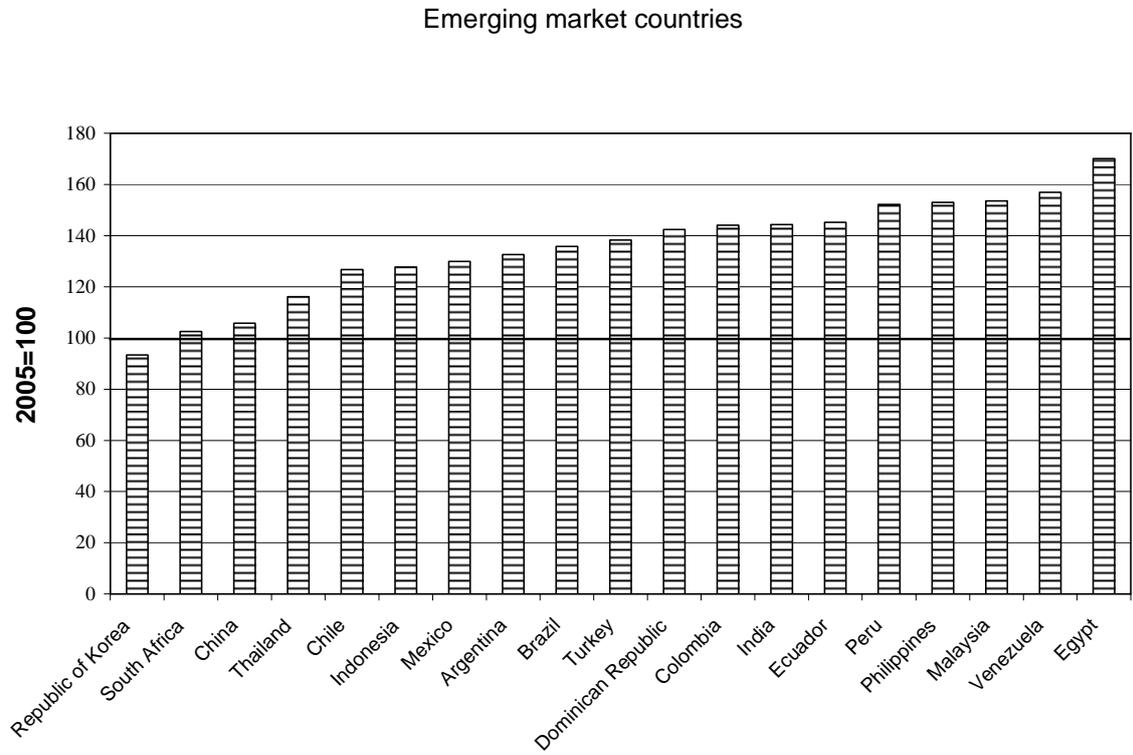
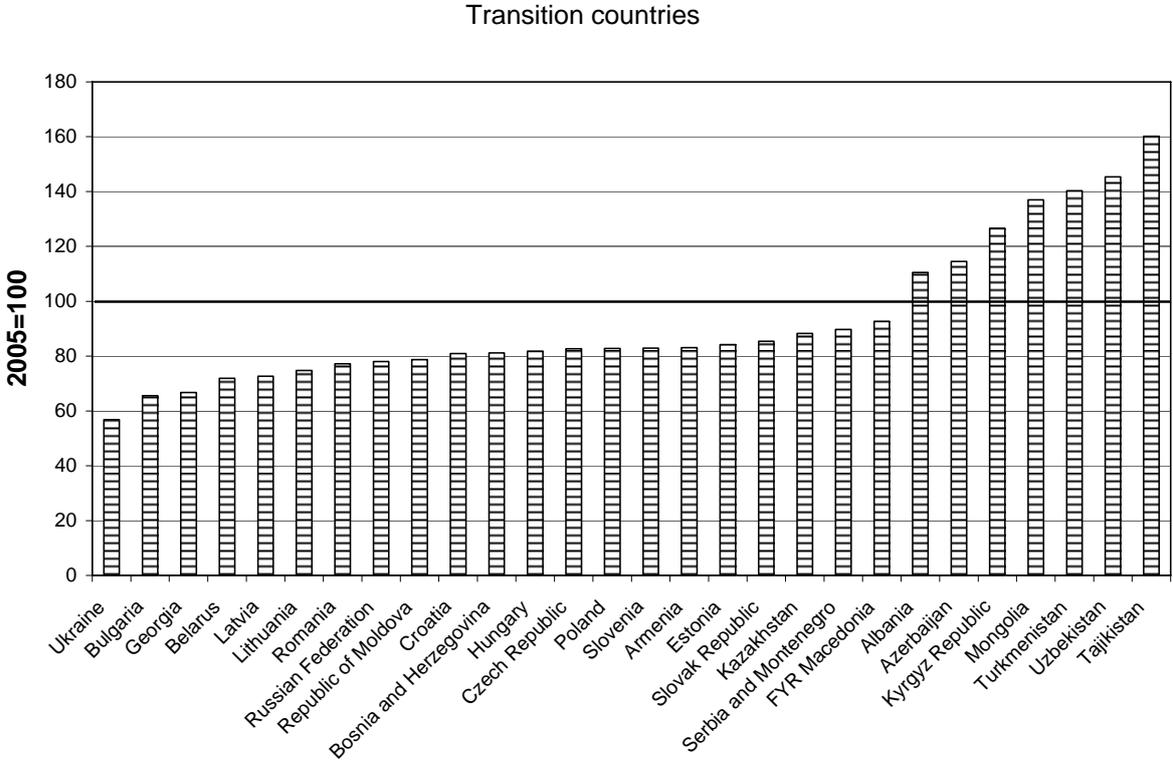
The decline of the population in most transition countries is particularly worrying if one compares it with other emerging market economies – countries with a similar level of development. In contrast to the transition countries most emerging market economies⁴ are expected to experience growing populations. In 2050 their populations are projected to be on

³ The countries under review are Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyz Republic, Latvia, Lithuania, Moldova, Mongolia, Montenegro, Poland, Romania, Russia, Serbia, Slovak Republic, Slovenia, FYR Macedonia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan. Because the legal separation of Serbia and Montenegro only happened during the time of writing in June 2006, it was not possible to analyse these two countries separately. Therefore, this paper still examines Serbia and Montenegro jointly.

⁴ The selection of emerging markets is based on the IMF’s World Economic Outlook and comprises Argentina, Brazil, Chile, China, Colombia, Dominican Republic, Ecuador, Egypt, India, Indonesia, Korea, Malaysia, Mexico, Peru, Philippines, South Africa, Thailand, Turkey, and Venezuela.

average almost 30 per cent bigger than in 2005. Figure 2 shows individual populations both in emerging market as well as in transition countries. While only seven transition countries are projected to have a higher population in 2050 than in 2005, almost all emerging market economies show growing populations.

Figure 2: Projected total population in 2050 as a percentage of the current population



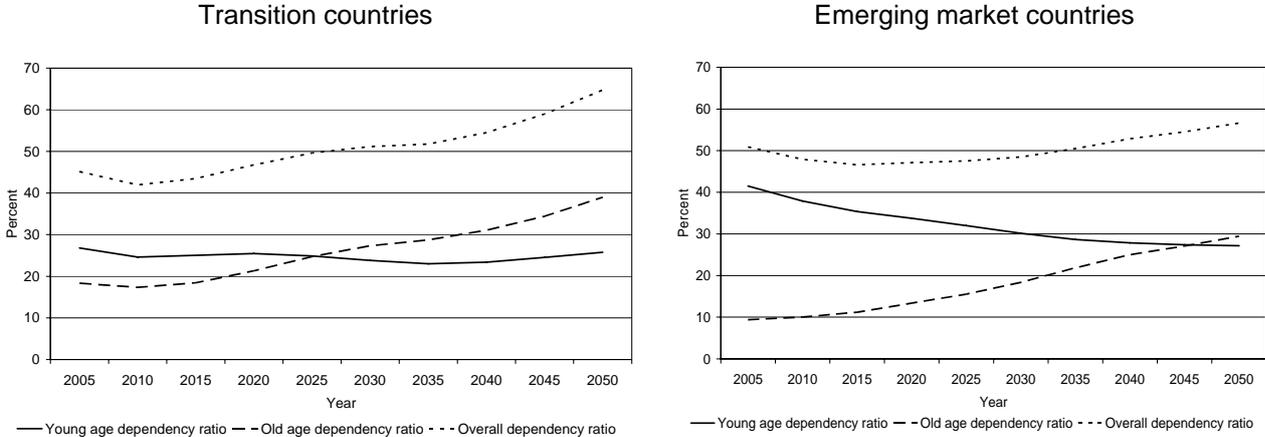
Source: UN (2005).

The population decline is not balanced across age groups but reflects mainly a shrinking working age population (defined as persons aged 15 to 64). The working age population is

projected by the UN (2005) to decline after 2015, at a rate of 2 to 3 per cent per annum in the period up to 2035, and at a rate of 4 to 6 per cent thereafter. At the same time, the number of persons not of working age is expected to remain constant up to 2035, and then increase at an average annual rate of 0.4 per cent until 2050.

The shrinking working age population together with the rising non-working age population implies a gradual rise in the overall dependency ratio and in particular a rise in the old age dependency ratio.⁵ The overall dependency ratio is projected to accelerate after 2020 reaching levels of over 65 per cent by 2050 from the current levels of about 50 per cent (see Figure 3). The rise in the overall dependency ratio is essentially due to a rise in the dependency ratio for those older than 65 years rather than those younger than 15 years. More precisely, the old age dependency ratio is projected to continue to increase, reaching a level close to 40 per cent by 2050 from the current level of less than 20 per cent, while the young age dependency ratio is expected to remain relatively stable at around 25 per cent throughout the period.

Figure 3: Dependency ratios in transition and in emerging market countries (2005-50)



Source: UN (2005).

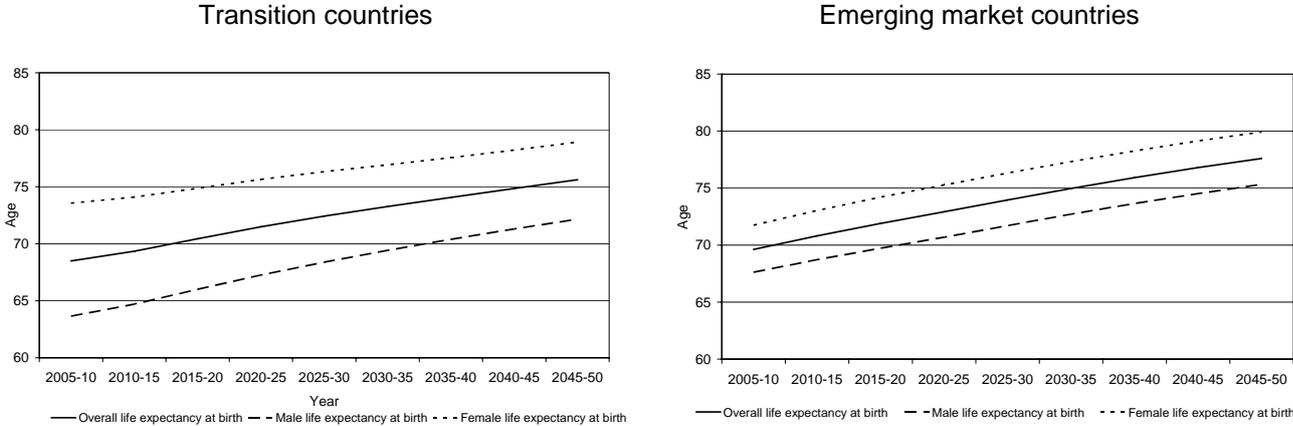
In emerging market economies, the rise in the overall dependency ratio starts later, is more gradual, and is not expected to reach such high levels as in transition countries. In transition countries the ageing of society is projected to start from about 2010, ten years earlier than in the emerging market economies. In addition, the future increase in the old age dependency ratio is cushioned by the high young age dependency ratio at present. The high number of the current young population will first become part of the working age population, ‘moving’ this cohort from the numerator of the dependency ratio to the denominator. After 50 years the cohort will become part of the old age population and move back to the numerator. Through this mechanism the current young age population will put an effective break on the rise in the old age dependency ratio. However, it is projected that the young age dependency ratio will decrease rapidly until 2050, from about 40 per cent today to below 30 per cent, while at the same time the old age dependency ratio will increase from about 10 per cent today to about 30 per cent in 2050. Nevertheless, by 2050 the overall dependency ratio will be lower in emerging markets than in transition economies.

The rise in the old-age dependency ratio is mainly driven by two phenomena: the lengthening of life expectancy and fertility rates below the replacement fertility rate of 2.1 children per

⁵ The dependency ratio is defined as the proportion of the old (65+) plus the young (0-14) to working age (15-64) population. The old-age dependency ratio is defined as the proportion of the old (65+) to working age (15-64) population. The young age dependency ratio is defined as the proportion of the young (under 15) to working age (15-64) population.

woman. In addition, migration plays a role. According to the UN (2005) projections, life expectancy in transition countries is expected to increase by six years, from 69 currently to about 75 years in 2050 (see Figure 4). Male life expectancy is expected to increase from about 64 years to 72 years, while female life expectancy would reach a level of about 79 years from the current 74 years. In other emerging market economies the pattern is similar. However it is noteworthy that the difference between female and male life expectancy is much higher in transition countries than in emerging market economies: 10 years versus 4 years. The difference between female and male life expectancy is highest in Russia (13 years) and Ukraine (12 years) and lowest in Serbia and Montenegro (5 years) in 2005. The difference between female and male life expectancy is projected to decrease in transition countries over time, while it is projected to remain at about 4 years in emerging markets. Reasons often cited for the big differences in life expectancy for males and females are smoking (almost two-thirds of Russian men are smokers, compared with typically 30 per cent or less in mature economies) and alcohol abuse that is more widespread among men than among women.⁶

Figure 4: Life expectancy in transition and emerging market countries (2005-50)

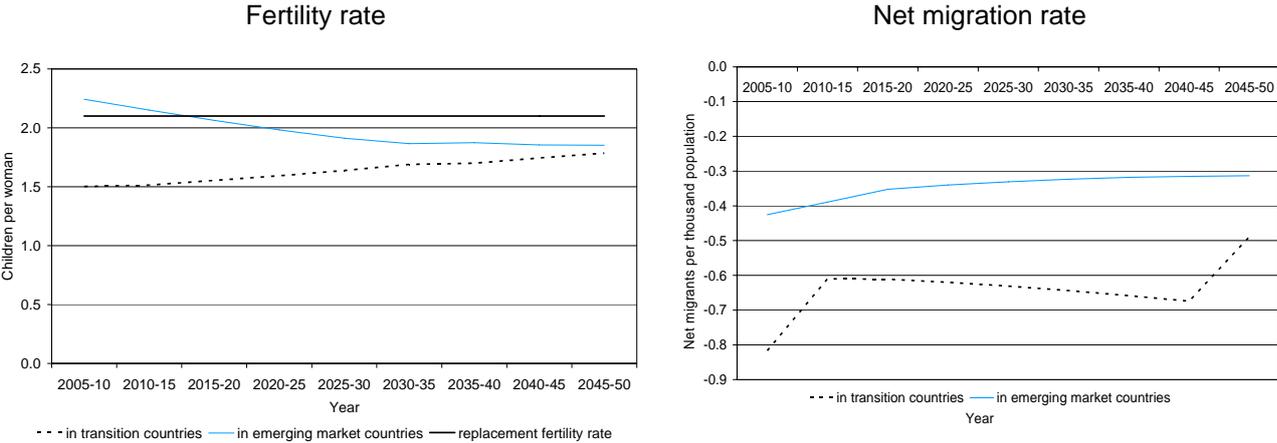


Source: UN (2005).

Fertility rates (that is, the number of children per woman) are expected to stay at rather low levels (see left hand chart). In 2005, the fertility rate was on average 1.50 (ranging from 1.15 in Ukraine to 2.5 in Turkmenistan). By 2050 the UN projections assume a gradual increase in the average fertility rate to around 1.85. Underlying this assumption is the idea of a gradual convergence of fertility rates: high fertility rates are assumed to decrease slowly to 1.85 while low fertility rates are expected to increase to approximately this level. This steady state level of 1.85 is itself a technical assumption based on the experience of many advanced (western) economies. Moreover, the assumption of a convergence of fertility rates is not uncontested. For example, projections by Eurostat (2004) for central Europe and the Baltic states do not exhibit this feature of convergence to the same extent. Eurostat assumes relatively unchanged fertility rates at the current level. Based on the convergence assumption fertility rates in emerging market economies are expected to gradually decrease from 2.2 in 2005 to 1.9 in 2050.

⁶ For smoking habits in transition countries see Budak *et al.* (2006). For gender differences in alcohol abuse in Russia, see Carlson and Vagero (1998), or Nilssen *et al.* (2005).

Figure 5: Fertility rates and net migration rates in transition and in emerging market countries (2005-50)



Source: UN (2005).

The mechanisms underlying changes in fertility rates over time are complex. Important economic determinants of fertility include a number of variables that affect household income, including labour force participation rates, employment levels, and real wage levels as well as gender differences in these measures. Other important determinants include family policy benefits, education levels, the mean age of women at first birth, and access to modern contraceptives, as well as other aspects of the spreading of new forms of family and reproductive behaviour. Temporarily depressed fertility rates have also been a common feature at times of increased hardship, for example protracted war or persistent economic depression (UNECE, 2000). Projecting future fertility rates for the transition countries poses a particularly difficult challenge. The drastic decline in fertility rates in many of these countries at the end of the twentieth century coincided closely with the disintegration of the Soviet Union. While it is evident that all of the determinants mentioned above have been greatly affected by the onset of transition, it may be too early to distinguish the short-term effects of the dramatic social and economic upheavals of the 1990s from underlying long-term developments.

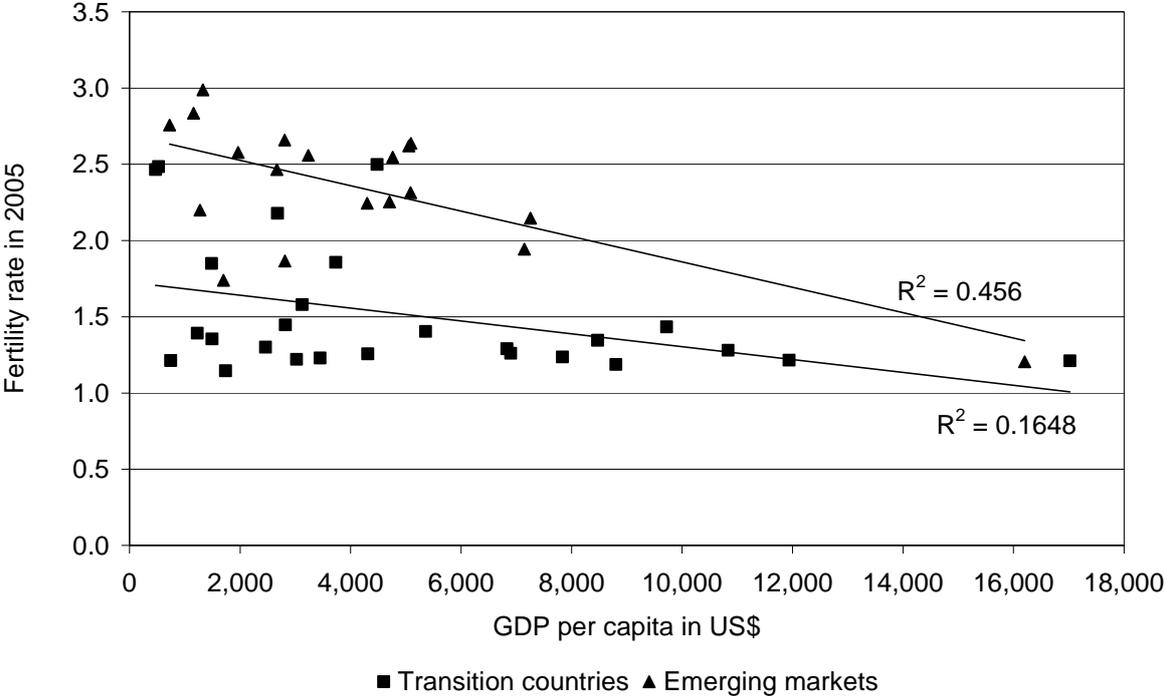
While in many advanced economies migration has a positive influence on dependency ratios, most transition economies are faced with a net outflow of people. The UN (2005) projections assume net outward migration from the transition countries in the period up to 2050 (see Figure 5, right hand chart), in line with recent history.⁷ The pattern is characterised by two breaks: The net outward migration rate drops from 0.82 to 0.61 migrants per thousand people from 2005 to 2010. Afterwards it stabilises at around 0.65 migrants per thousand people, until it drops again to 0.5 migrants per thousand people from 2045 to 2050. This result is largely driven by the assumption that the countries furthest from the mean in 2005 converge rapidly toward the mean in the first five-year period. The decline after 2045 is entirely driven by Ukraine. As with the fertility projections, the outcomes are highly sensitive to the set of assumptions and the modelling approach. Notably, the Eurostat projections of net migration for the EU-8 countries display significant co-movement but without the convergence seen in the UN (2005) projections.

It is conventional wisdom that rich countries usually record lower population growth, driven by lower fertility rates, than poor countries. However, looking at the relation between per-

⁷ It is questionable to what extent the migration flows of the 1990s can be extrapolated in this manner, since they were influenced by the abrupt changes of the early transition period. In particular, they were a response to the combination of political instability, ethnic conflicts, economic hardship and the opening of borders that followed the disintegration of communist regimes throughout the region.

capita GDP and fertility rates, Figure 6 shows that for the transition countries the negative correlation between per capita income and population growth is very weak compared to other emerging market countries.

Figure 6: Per capita GDP and population growth



Source: UN (2005).

In summary, the projected demographic developments in the transition countries are a major cause of concern. While demographic projections are sensitive to assumptions and long-run projections are inherently prone to large margins of error, the transition countries do appear to be a class apart from other emerging market economies. The transition countries are characterised by depressed fertility rates far below the replacement rate, net outflow of migrants, and increasing longevity. This leads to shrinking and ageing populations, a phenomenon usually associated with rich countries. In other words, there is a risk that the transition countries may grow old before they grow rich.

2. AGEING AND THE CONSEQUENCES ON PUBLIC FINANCES

The area where ageing of the population will be felt the most is in public finances.⁸ Public pension systems based on the pay-as-you-go (PAYG) principle, whereby current contributions are used to finance current pensions, will come under pressure as the ratio between the number of pensioners and the number of contributors rises. Public expenditure on health and long-term care is also set to increase as medical advances continue and the demand for services rises with the growing numbers of elderly people.

Population ageing also has a negative effect on the resource base which ensures fiscal sustainability. There is a broad consensus among economists that demographic change will reduce output growth and limit increases in economic welfare. The IMF estimated that the impact of demographic change on real GDP per capita growth is -0.5 per cent in central and eastern Europe from 2000-50, while other emerging market countries in Asia or Latin America will face a much lower reduction of around -0.2 per cent (IMF 2004). Unfortunately, separate calculations for the other (shrinking) transition countries do not exist from the same source but it can be expected that this reduction in real GDP per capita is even higher. All other things being equal, this reduction in the resource base will have a negative effect on the revenue from taxes on labour because of the shrinking working-age population. Abstracting from other possible effects (for example, the impact of a more experienced workforce on productivity) this decline in the workforce will also tend to reduce output in the economy.

The overall impact of these developments will be considerable, particularly on unreformed pension systems. Although there is no comprehensive research covering all transition countries, a study carried out by the Economic Policy Committee (EPC) and the European Commission (EPC/DG-ECFIN, 2006) for the eight CEB countries has estimated that the projected impact on public expenditure by 2050 from a change in pension, health care and long-term care provisions varies from a fall of 4.4 percentage points of GDP in Poland to a rise of 10 percentage points of GDP in Slovenia by 2050 (see Table 1). The forecast reduction in public expenditure for Poland is a result of the sweeping pension reforms undertaken since 1998. Slovenia and the Czech Republic will record the highest increases. While both countries have undertaken parametric pension reforms in the 1990s, the systems remain fully PAYG public pension schemes.

⁸ An overview of the effects of ageing populations on other economic variables (including labour markets, GDP, and productivity measures) is provided in IMF (2004).

Table 1: Projected age-related expenditure growth in the CEB countries as a percentage of GDP

	PENSIONS		HEALTH CARE		LONG-TERM CARE		TOTAL
	Level 2004	Change 2050	Level 2004	Change 2050	Level 2004	Change 2050	Change 2004-50
Czech Republic	8.5	5.6	6.4	2	0.3	0.4	8.0
Estonia	6.7	-2.5	5.4	1.1	na	na	-1.4
Hungary	10.4	6.7	5.5	1.0	na	na	7.7
Lithuania	6.7	1.8	3.7	0.9	0.5	0.4	3.1
Latvia	6.8	-1.2	5.1	1.1	0.4	0.3	0.2
Poland	13.9	-5.9	4.1	1.4	0.1	0.1	-4.4
Slovak Republic	7.2	1.8	4.4	1.9	0.7	0.6	4.3
Slovenia	11.0	7.3	6.4	1.6	0.9	1.2	10.1
EU-8	11.2	-0.8	4.9	1.4	0.3	0.3	1.0
EU-7	8.8	4.3	5.6	1.5	0.5	0.5	6.3

Source: EPC/DG-ECFIN (2006).

Notes: EU-7 is the EU-8 countries excluding Poland. Averages are weighted by GDP and correspond to those used by EPC/DG-ECFIN (2006). Poland was excluded from the EU-8 because its GDP weight is more than 40 per cent in the EU-8 aggregate, so that Polish data obscures the results for the smaller EU-7 countries.

Expenditure projections for the other EU countries from the same source show that reluctance to reform the pension system comes at a high price even for highly developed economies. Portugal and Cyprus are two EU countries that have yet to reform the pension systems (see Figure 7). For both countries, the cost of doing nothing will be severe. Portugal maintains a three pillar system but the second (mandatory funded) and third (voluntary funded) pillars are underdeveloped. Despite some parametric reforms in 2005, replacement rates in the defined benefit PAYG pillar are high.⁹ Based on the EPC/DG-ECFIN (2006) projections, Portugal will increase gross public spending on pensions from 11 per cent of GDP in 2004 to 21 per cent in 2050. In Cyprus the main source of pensions is the defined benefit PAYG system.¹⁰ In addition, there is a voluntary funded pillar, but participation rates are low. There is no mandatory funded pillar. According to EPC/DG-ECFIN projections, spending on pensions in Cyprus will increase from 7 per cent of GDP in 2004 to 20 per cent in 2050. In countries with reformed systems such an escalation of expenditures can more easily be avoided. For example, Sweden and Italy are expected to maintain gross public spending on pensions at a constant share of GDP. Both countries have introduced notional defined contribution (NDC) systems.¹¹ They are cited by the World Bank (2006) as model examples for pension reform.¹²

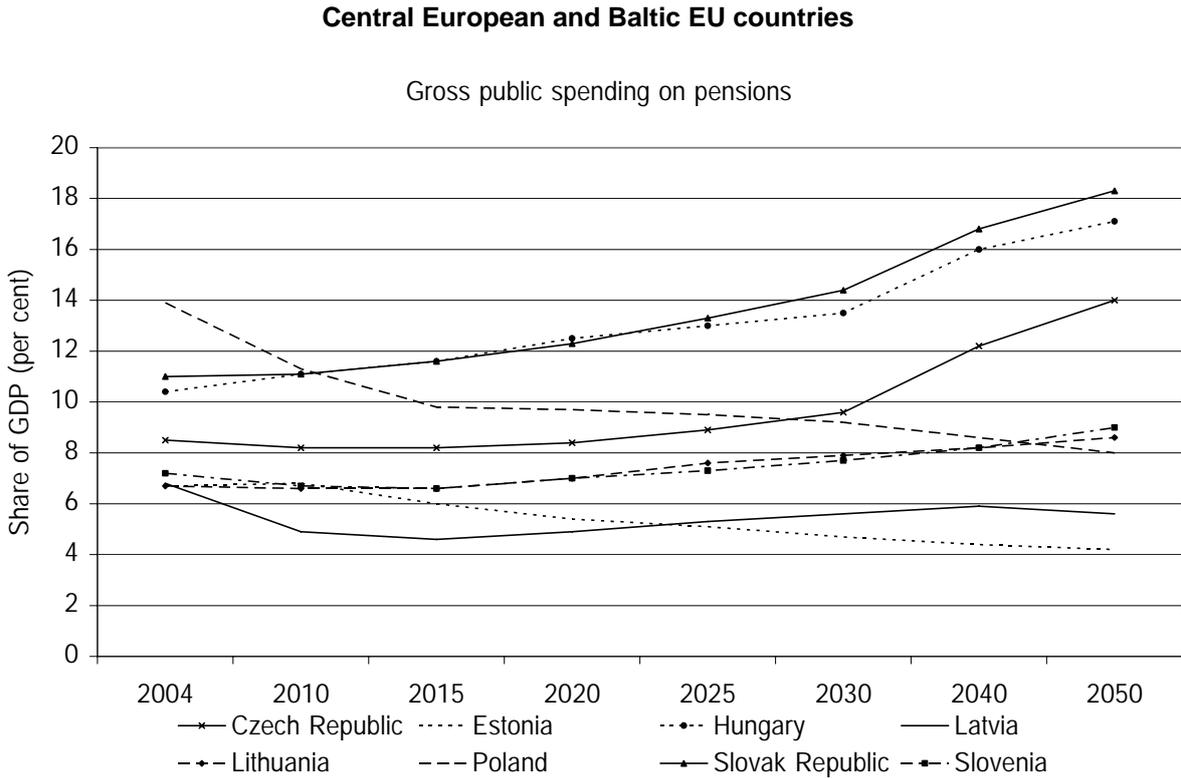
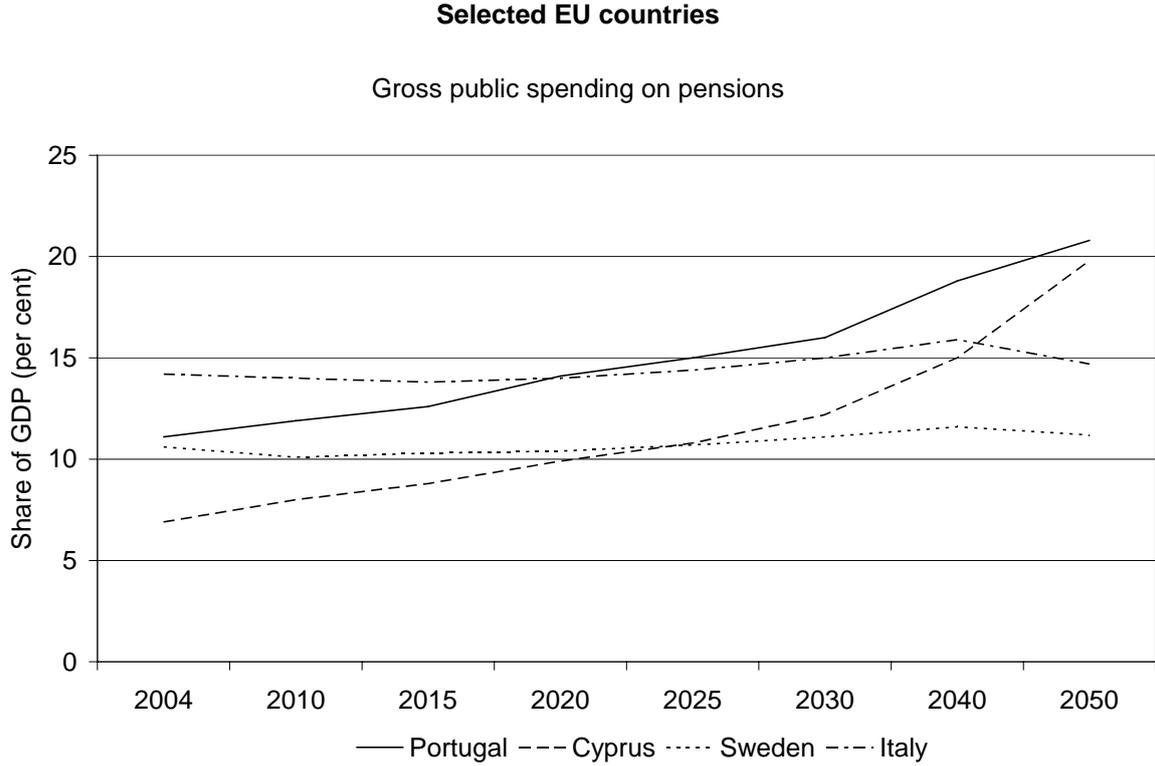
⁹ Parametric reforms of the PAYG system describe reforms that alter important parameters of this system, for example, raised retirement ages, lower benefits and higher contribution rates. The replacement ratio is the ratio of the pension benefit to some measure of individual earnings, for example final wage prior to retirement.

¹⁰ In a defined benefit scheme, the size of future pension benefits are known to the contributor in advance. Typically, the benefit is set at retirement age as a percentage of earnings.

¹¹ In a notional defined contribution (NDC) scheme, pensions are financed on a PAYG basis, but entitlements are calculated in an actuarial way and depend on contributions and investment returns. The pension is an annuity drawn from a fictitious accumulated capital sum. The latter is the sum of lifetime personal contributions (which are fictitious savings) and “returns” on these contributions. In contrast to private pension schemes the rate of return is set by the government. If the rate of return is equal to the growth of the contribution base, the NDC system is automatically balanced for any contribution rate in the long run because entitlements grow in line with the scheme’s revenues. For a more detailed analysis, see World Bank (2001).

¹² See World Bank (2006), p. 15.

Figure 7: Projected gross public spending on pensions in selected EU countries



Source: EPC/DG-ECFIN (2006).

The DG-ECFIN/EPC (2006) projections show that rising age-related expenditure can be addressed only through comprehensive reforms, otherwise there will be risks to fiscal sustainability in the medium to long term, which will be reflected by a deterioration in sovereign ratings even for the richest countries in the short term. Projections for creditworthiness by Kraemer and Mates (2006) on behalf of Standard and Poor's (S&P) point to the urgency of reforming age-related public expenditure. The authors look at 32 countries

and examine the fiscal implications of ageing populations.¹³ Under the “no policy change” assumption, the public sector as a per cent of GDP grows considerably over the coming decades, but is unable to cover growing pension liabilities. As a consequence, deficits and debt levels rise to levels incompatible with good credit ratings. Using budget balance trends as empirical long-term proxies for the sovereign creditworthiness, the authors project that with no policy change all but a few of the countries studied will have speculative grade sovereign ratings by mid-century.

In some respects the transition countries are directly comparable to richer countries, but in other respects their situation is even more challenging, and projections for mature economies are not entirely applicable to this group of countries. In the S&P study, the new EU members fare even worse due to particularly severe demographic pressures. Moreover, some of the transition economies with the most severe projected population declines, such as Russia or Ukraine, are not included in the S&P or EPC/DG-ECFIN studies.

There are several reasons why the expenditure projections may underestimate the challenges faced by the transition countries. First, they are based on fairly favourable assumptions about future labour market developments and the ability of the new EU members to converge to the economic standards in EU-15 countries. Second, the health expenditure projections focus only on the demographic impact, ignoring factors that have made an important contribution to the rise in the level of expenditure in the past (for example the impact of new medical technologies, rising per capita demand for health services and increasing relative prices of health-related goods and services). The impact of technological progress might be even higher in transition countries because they are catching up from relatively low technological standards to (much) higher ones.

Third, institutional weakness aggravates the challenge of ageing populations for fiscal sustainability in the transition countries, because large informal sectors entail low rates of tax compliance and hence low rates of participation in public pension schemes.¹⁴ When a large share of income is not declared, the effective dependency ratios of actual contributors to beneficiaries in PAYG systems pose a far greater challenge than would otherwise be the case. It has been estimated that contributions to the previous, unreformed PAYG system in Kazakhstan amounted to a mere 50 per cent of potential revenue, due to the underreporting of wages (Andrews, 2001). On the positive side, this means that in the medium term, rising compliance rates have the potential to offset some of the negative effects of ageing populations on public finances. On the negative side, many transition countries have been forced to resort to very high contribution rates for those who do participate in the system, in order to compensate for the low level of participation.¹⁵

In 2001, Albania maintained a contribution rate of 42.5 per cent of gross wages. Particularly high rates were also observed in the Kyrgyz Republic (32 per cent) and Bulgaria (29 per cent). It has been estimated that in 2001 a mere 37 per cent of the Albanian work force participated in the mandatory pension scheme system (Treichel, 2001). In the Kyrgyz Republic, Becker and Paltseva (2001) estimate that a contribution rate of 51 per cent would have been necessary to balance the pension system at the time of writing, due to the high level of tax evasion. High contribution rates raise the relative cost of joining the formal sector of the economy, in particular if individual contributions are not clearly linked to claims on future benefits and thus reduce the individual incentives to join the formal sector.

¹³ The countries covered by the S&P study are the EU-25 countries plus Australia, Canada, Japan, Korea, New Zealand, Norway and the USA.

¹⁴ For a broad discussion on the implications of this problem for the EU-10 countries, see Fultz (2003).

¹⁵ For a discussion of this problem in the early years of transition, see Kopits (1992), pp. 298-302.

Individual incentives to join the formal sector are also hampered by a lack of predictability regarding government adherence to the rules of the pension scheme, exemplified in recent years by the ad hoc indexation of pensions in many transition countries (for example, Armenia, Belarus, Kazakhstan, and Ukraine).¹⁶ In principle, indexation ensures that pensions do not lose their relative value over time, with regard to wage and price levels in the economy. However, many countries either do not have defined indexation rules or have indexation rules but do not adhere to them. Instead, pensions are indexed irregularly, by decree. Unpredictable indexation further weakens incentives to participate in the pension scheme, because uncertainty over the future value of pensions makes alternative investments more attractive. This uncertainty also makes it difficult to project future pension liabilities, although there have been some attempts. Using the World Bank's PROST simulation model, Asatryan and Jerbashian (2004) find that the Armenian pension system will be fiscally sustainable in the coming decades despite projected demographic challenges.¹⁷ They also find, however, that the current PAYG system is expected to yield a negative real rate of return for all but the very lowest income groups, and question the political viability of such a scheme. Hinz *et al.* (2005) present a positive picture of the future fiscal sustainability of the reformed Kazakh pension system, but emphasise that expected replacement rates are very low, around 20 per cent. They project that the future reductions in pension expenditure will largely be offset by an increase in social assistance. While *ad hoc* indexation might facilitate balancing the government budget, it is associated with highly compressed pension structures and low benefit levels, neither of which encourages participation in the system.

Box 1: Pension indexation

Many of the transition countries index their pension according to what is sometimes referred to as the Swiss formula, which adjusts pensions by the arithmetic mean of wage growth and inflation. With constant contribution rates and increasing real wages, indexation by this method allows contributions to grow faster than benefits as long as the population is not shrinking. When populations decline and dependency ratios increase this may no longer hold. The reason is that when younger cohorts decline in relative size the decrease in the ratio of contributors to beneficiaries can be large enough to reduce aggregate contributions, even though the size of individual contributions increase due to the real wage growth.

Indexing to a combination of wage growth and inflation implies some degree of adjustment to the current state of the economy, but does little to ensure stability in the face of demographic pressures. The Swedish pension system offers an alternative method of indexation that attempts to alleviate this. Since 2002, benefits from the NDC scheme are indexed to real growth minus 1.6 per cent. At the time of retirement, the calculation of the annuity value of the notional account takes into account future wage growth, in order to reduce the difference between last wage and initial benefit. The 1.6 per cent reduction is a way of compensating for this. When real wage growth is more than 1.6 per cent above inflation, the real value of pensions increases. This has been the case since the introduction of the system. If the economy contracts, and real wage growth falls to a lower level, the pension liabilities will decrease slightly and help offset the fiscal effects of the contraction. In addition, there is an automatic stabiliser in the indexing, such that the budget is always balanced. If liabilities grow faster than revenues in a given year, the effective indexation of pensions is reduced to offset the deficit. Similarly, if revenues grow faster than liabilities, there is a one-off increase in the indexation rate such that the pension system does not run a surplus. This way, real growth in pension benefits is guaranteed to be higher when the economy is doing well, and lower when the economy is doing poorly.

¹⁶ To the extent that ad hoc indexation reflects a concentration of power and a failure to protect property rights, this might also undermine support for pension reforms. See Desai and Olofsgard (2006) for a discussion on how credible commitment to constitutionalism can boost public support for economic reform in the transition countries.

¹⁷ See World Bank (2000) for a description of the PROST simulation model.

This section has shown that the impact of an ageing (and shrinking) population on public finances is considerable and unreformed pension systems will be hit especially hard. Given that the projections cited above are based on fairly optimistic assumptions and because institutional weaknesses, such as large informal sectors, aggravate the challenge of an ageing population, the ageing-related expenditure increases of 8 to 10 per cent of GDP in an unreformed pension system need to be considered as a lower boundary. Against this backdrop the only way to avoid a fiscal disaster is to implement comprehensive pension reforms.

3. COMPREHENSIVE PENSION REFORMS

In the communist era, pensions were financed on a PAYG basis through taxes and – mostly employers’ – social contributions. The link between wages and benefits was loose. In general, workers could receive their pension at an early age, as statutory retirement ages were low and early retirement was common. As a consequence, pension system dependency ratios (number of pensioners for each worker contributing) were high: between 30 and 45 pensioners per 100 workers in the late 1980s, whereas at the same time there were only 20 pensioners per 100 workers in the large EU countries (Kopits 1992). In the early- and mid-1990s, the transition process and the simultaneous contraction of employment severely strained pension systems and public finances. Revenues declined with the shrinking number of contributors and the expansion of the informal sector. At the same time, governments opened up disability and early retirement provisions to alleviate the impact of large-scale layoffs. As a consequence dependency ratios soared.¹⁸

Against this backdrop, many countries in the region (Bulgaria, Croatia, Estonia, FYR Macedonia, Hungary, Kazakhstan, Latvia, Lithuania, Poland, Russia and the Slovak Republic) decided to undertake dramatic pension reforms. They introduced multi-pillar pension systems, which are usually characterised by a combination of three elements: a PAYG system, mandatory funded arrangements and voluntary funded arrangements. Despite the country differences, the pension reforms carried out by these 11 countries reveal some remarkable similarities. One reason for this finding is that the transition countries – often with guidance from the World Bank – modelled their new pension system after the Scandinavian pension systems. This section concentrates on the 11 countries mentioned above and gives an overview of the pension reforms that they carried out. We concentrate on multi-pillar reforms (and not so much on parametric reforms of the PAYG pillar) because the goal to foster the development of the domestic capital market, which we will discuss in section 4, is connected to the introduction of a mandatory pillar.

3.1 THE INTRODUCTION OF MULTI-PILLAR PENSION SYSTEMS

In all eleven countries, structural pension reforms were undertaken only towards the end of the 1990s or even later. The pension reforms carried out in the transition countries reflect three separate dimensions that are crucial in defining any pension scheme. First, the system can be more or less redistributive, ranging from an entirely flat benefit structure to benefits strongly linked to individual contributions. Second, the risk can be borne largely by the insured or by the insurer. A defined benefit (DB) scheme transfers individual risk onto the insurer, for example the employer or the state, who incurs future liabilities without knowing what resources will be available at the time of payment. Defined contribution (DC) schemes, by contrast, transfer the risk onto the insured individuals, who face increased uncertainty over future benefit levels. Third, the assets used for paying pension benefits can be taken out of current contributions (PAYG), or covered by accumulated savings (fully funded). In addition, when individual savings are used to cover some part of pensions, the assets can be placed under private or public management. Change along these three dimensions has considerable implications for both the social equity and fiscal sustainability of a pension system. While some changes are frequently correlated, such as strengthening the link between contributions and earnings when introducing a fully funded pillar system, these are fundamentally different parameters of a pension system. This has allowed for considerable variation in the reforms carried out in the transition countries, despite the common element of the introduction of a mandatory funded pillar.

¹⁸ For a relatively recent overview study on pension reforms in EU accession countries, see Dupont (2004). Demirguc-Kunt and Schwarz (1999) survey pension reforms all around the world. Kopits (1992) provides an overview of the social systems in transition countries in the communist era and the early years of transition.

All countries except Kazakhstan have kept a – reformed – public PAYG earnings-related scheme (see Table 2).¹⁹ This marks a noticeable difference from some Latin American countries that have undertaken pension privatisations, such as Chile and Mexico. Most countries have undertaken parametric reforms of their DB systems, that is they changed important parameters of the system such as the retirement age, the benefits and contributions. Whereas Latvia, Poland, Croatia, Kazakhstan, and Russia²⁰ have transformed their public systems from DB schemes into NDC schemes.

Table 2: Overview of reformed pension systems

	Public PAYG	Mandatory funded pillar	Voluntary funded schemes
Hungary	DB	1998	1994
Kazakhstan	na ¹	1998	1998
Poland	NDC	1999	1999
Latvia	NDC	2001	1998
Croatia	NDC	2002	2002
Estonia	DB	2002	1998
Russia	DB	2002	2002
Lithuania	DB	2004	2004
Bulgaria	DB	2005	1994-95
Slovakia	DB	2005	1996
FYR Macedonia	DB	2006	na

¹ In Kazakhstan, the PAYG system will be entirely phased out by 2040. Currently, it is operating as a NDC scheme.

Note: DB = Defined benefit; NDC = Notional Defined Contribution.

Source: EBRD and National Sources (see Annex 1 for more details on the pension systems).

In addition, many of the countries who have not introduced a multi-pillar system have still carried out parametric reforms of their PAYG systems. There have been significant reforms in Armenia, the Czech Republic, Montenegro, Moldova, Serbia, and Slovenia, as well as basic reforms in Azerbaijan, Bosnia and Herzegovina, Kyrgyz Republic and Turkmenistan.

3.2 COMMON ELEMENTS IN THE REFORMS OF THE PAYG PILLAR

All parametric reforms combined some or all of the following three elements: increasing the retirement age, lowering benefits and increasing contributions. In virtually all countries, the main thrust of the reforms was to achieve a stronger link between individual contributions and pensions received. The link between contributions and pensions is especially tight in NDC schemes where benefits depend on the individual contribution history over an entire working life. In such systems, redistribution towards workers with low-income or discontinued careers is largely eliminated. In countries that have retained a defined benefit PAYG system, the relation between lifetime earnings and pensions has been strengthened: Benefits often take into account longer minimum contribution years and pension formulas are increasingly linear. Before the reform, accrual rates²¹ were frequently much higher for low-income earners than

¹⁹ In Kazakhstan, accruals to the old PAYG system ended overnight when the mandatory funded pillar was introduced in 1998. The government recognizes remaining pension rights earned previously under the PAYG system, which is expected to be fully phased out within 40 years.

²⁰ Russia has retained elements of its old defined benefit pension system, through the basic portion component of its first pillar, which awards a pension dependent only on age and disability.

²¹ In a DB system, pensions equal a percentage of the reference earnings for each working year (for example 2 per cent of end-year earnings). This percentage is called the accrual rate.

for middle- or high incomes. The reformed pension system enacted in Hungary, for example, introduced a uniform accrual rate for all income groups.

Although most reformed systems still include redistribution rules such as a minimum guaranteed pension or entitlements for certain periods of non-contribution (unemployment, maternity leave and so on), these elements are generally financed out of the government budget so that pension contributions respond strictly to an insurance objective. Hence, redistribution is more transparent.

In the transition countries, one of the reasons for partly shifting the payment of contributions from employers to employees and for strengthening the link between contributions and entitlements was to improve the collection of contributions. Many countries have undergone severe problems with non-payment not only because of illicit employment but also because the willingness to pay was low. In reformed systems, pensions depend strictly on contributions paid (in NDC) or on declared earnings (in DB schemes), and hence incentives to declare actual earnings have improved.

Because the build-up of confidence in the new system requires long-lasting and predictable rules, the reformed pension systems aim to limit the scope for discretionary changes. This can especially be seen with respect to the indexation of pensions. The advantage of automatic indexation is to limit the possibilities for governments to change the real value of pensions for political or short-term economic reasons. In addition, the strengthening of the weight of inflation indexation has a beneficial effect on long-term sustainability. Pension benefits will thus only develop in line with inflation but are decoupled from wage developments, which can increase at higher rates especially in times of an economic upswing.

In most countries, the replacement ratios provided by the public pension systems have been lowered. In DB schemes, this has been achieved not only through lower accrual rates but also by longer minimum contribution years. In NDC schemes, the decline in replacement ratios will be the result of a declining labour force and an increasing life expectancy.

Table 3: Statutory retirement age after reforms

	Men	Women
Bulgaria	63.0 ^a	60.0 ^a
Croatia	65.0 ^b	60.0 ^b
Estonia	63.0	63.0 ^c
FYR Macedonia	64.0	62.0 ^d
Hungary	62.0	62.0 ^e
Kazakhstan	63.0	58.0
Latvia	62.0	62.0 ^f
Lithuania	62.5	60.0
Poland	65.0	60.0
Russia	60.0	55.0
Slovakia	62.0	62.0 ^g

Source: EBRD and national sources.

Note: Many countries are in the process of increasing the retirement ages incrementally, often by 6 months per year: a) in 2009 b) in 2008 c) in 2013 d) in 2007 e) in 2009 f) in 2008 g) in 2015.

The raising of the effective retirement age was a reform objective in all pension reforms (see Table 3). This was achieved by a gradual increase in statutory retirement ages and by introducing incentives for postponed retirement together with disincentives for early retirement. The increase in statutory retirement ages ranges from two to three years for men and from three to six years for women, who generally could retire earlier in the old systems. However, statutory retirement ages in the transition countries will still be lower than in

many other countries. For example, in the “old” EU member states the legal retirement age is (or is being progressively increased to) 65 for both men and women. The postponement of retirement leads to higher benefits in all countries. In Hungary, for example, the incremental rise in benefits amounts to 0.5 per cent for each additional service month beyond the statutory age; in Estonia the incremental benefit rise is 0.9 per cent for each additional service month. Under the new pension systems, early retirement usually entails reduced benefits and is therefore discouraged.

3.3 FUNDED SCHEMES

All countries introduced both mandatory funded pension pillar and voluntary private schemes alongside their reformed PAYG system. This implies that instead of paying pensions exclusively out of current transfers from labour income, they are also financed from capital previously accumulated via pension funds. The major benefit from strengthening funded pension arrangements derives from the diversification of funding sources. PAYG arrangements are especially vulnerable to demographic shifts because any additional burdens have to be borne fully by current workers. By moving part of pension financing to funding, the exposure of the overall pension system to this risk is reduced: human capital, which is becoming scarcer owing to population ageing, is replaced by real capital.

When introducing the new funded schemes, individuals were given the option to choose between staying in the reformed entirely unfunded PAYG scheme and shifting to the multi-pillar system depending on their age. Older workers (over 50) were usually not given the option to join the new mixed PAYG/funded schemes. Younger workers with a contribution history in the PAYG system were typically given the choice to stay in the PAYG or to move to the mixed system. Participation in the new system was mandatory for new labour market entrants. In Hungary and Poland, the numbers who joined the partially private system significantly exceeded governments’ expectations.²² On average about two-thirds of the eligible labour market participants are taking part in the mixed system.

²² For example, in Poland initial estimates showed that about 50 per cent of the eligible work force would opt for the mixed system. By 2002, 93.2 per cent of the labour force moved to the new system.

4. THE IMPACT OF PENSION REFORMS ON CAPITAL MARKETS

A mandatory funded pillar will increase aggregate savings, boosting the liquidity of fledgling capital markets, increasing demand for fixed income securities in particular, and possibly affecting asset returns in the long run. This will be a counteracting force to the reduction in aggregate savings associated with population ageing, when an increasing share of the population draws on their savings to support themselves in retirement. This section examines the impact of the introduction of mandatory funded pillars on capital markets and looks at the experience so far.

4.1 THE EFFECT ON AGGREGATE SAVINGS AND THE ALLOCATION OF ASSETS

Under a PAYG system, pensions are financed through current contributions, providing weak incentives to save privately for retirement. A mandatory funded pillar, by contrast, forces individuals to save for their own retirement. The life-cycle model of consumption suggests that, in the absence of credit constraints, the introduction of forced savings would be offset as households incur more debt to finance current consumption, thus making up for the reduction in disposable income. If, however, households are credit constrained or capable of only limited forward-looking behaviour, then aggregate savings can be expected to increase as a result of such reform.²³ In addition, behavioural evidence points to an “awareness effect” when the introduction of forced savings increases awareness of the need to save for retirement, spurring further savings.²⁴

Introducing mandatory pension funds will affect the allocation of savings between different assets, even if aggregate savings were to remain unchanged. A higher share of savings will enter the capital markets, increasing the demand for securities in general and fixed income securities in particular, as discussed in Boersch-Supan and Winter (2001). As shown in Table 4, the assets under management in the mandatory pension funds, while still quite small, are growing rapidly. Currently, total assets under management amount to approx US\$ 46 billion for all the countries. On average, the assets in the mandatory funded pillar already amount 3 per cent of GDP, and they are growing rapidly, at an average rate of more than 50 per cent per year in 2005.

²³ See Feldstein (1974) or Boersch-Supan and Winter (2001) for a discussion on the life-cycle model and saving for retirement. The empirical evidence on increased savings is mixed. For example, Granville and Mallick (2003) do not find firm econometric evidence that funded pensions schemes increase savings in the UK. Attanasio and Rohwedder (2003), looking at earnings-related pensions, find results closely in line with the predictions of Feldstein (1974), that is that pension savings and financial wealth are close substitutes. For a broad survey of the literature on pension reform and aggregate savings, see Kohl and O’Brien (1998). For a survey of the literature on implications of age-related changes in aggregate savings on asset returns, see Mitchell *et al.* (2006).

²⁴ See Lusardi (1999) or Venti (2006) for a comprehensive survey of the behavioural research on pensions and saving behaviour.

Table 4: The volume and structure of assets in second pillar pension funds

	Year of introduction of second pillar	Total assets under management as of Dec 2005, million US\$	Total assets as percentage of nominal GDP 2005	Percentage of assets in foreign currency	Asset allocation by category as percentage of total assets				
					Bank deposits	Bonds	Stocks	Investment funds	Other
CEB									
Estonia	2002	375	2.8	90.0	4.0	48.0	37.0	9.0	2.0
Hungary	1998	5,717	5.2	5.3	1.0	81.5	7.7	not available	9.8
Latvia	2001	138	0.9	28.4	30.4	50.3	6.6	12.8	0.0
Lithuania	2004	147	0.6	80.6	1.0	62.0	9.0	28.0	0.0
Poland	1999	26,394	8.7	0.9	3.8	63.7	32.1	0.0	0.4
Slovak Republic	2005	283	0.6	4.3	80.8	10.9	7.8	0.0	0.6
SEE									
Bulgaria	2000	266	1.0	1.5	17.0	75.3	7.0	not available	1.7
Croatia	2002	1,924	0.8	11.0	4.1	79.0	3.9	9.8	3.2
CIS									
Russia	2002	6,128	0.8	0.0	16.8	82.6	0.6	0.0	0.0
Kazakhstan	1998	4,849	8.6	7.5	19.5	70.5	9.8	0.1	0.2
Total/Average		46,222	3.0	22.9	17.8	62.4	12.1	7.5	1.8

Sources: National sources

Note: In FYR Macedonia the mandatory funded pillar was introduced in January 2006 and thus no comparable data exist.

The size of the accumulated funds will have a considerable effect on the liquidity of these fledgling capital markets, in particular when there are regulatory limits to international portfolio diversification as is the case in many of these countries. The countries with the most severe limitations on investment in foreign securities are Croatia (15 per cent of net assets), FYR Macedonia (20 per cent) and Russia (20 per cent). For full details on investment restrictions, see Annex 1. In the Slovak Republic, where the multi-pillar system has only been in place since 2005, the main beneficiary so far is the existing banking sector, which held over 80 per cent of the assets at the end of 2005. If the other reforming countries are an indication, however, portfolios can be expected to become more diversified with time.

The additional funds channelled to capital markets will in part be increased savings, but there will also be a displacement of personal savings that would otherwise have been invested elsewhere. Private savings – including those of friends and family – are a common source of financing for small and medium-sized enterprises in transition countries (see, for example, Volz, 2004). If entrepreneurs are otherwise credit constrained, the institutionalisation of a large share of private savings might have detrimental effects on the level of entrepreneurship in the economy. Davis (1999) points to the policy challenge of making up for this reduction, in particular through stimulating other channels such as venture capital and private equity funds that target entrepreneurs more directly.

4.2 PORTFOLIO DIVERSIFICATION

In some of the transition countries, the low level of capital market development, coupled with severe restrictions on investments (see Annex 1), makes it difficult to construct well-diversified portfolios. This implies that capital market development stimulated by growing pension funds comes at the expense of risk borne by the workforce. For this reason, Becker and Paltseva (2001) argued that, at the time of writing, capital markets in countries like the Kyrgyz Republic were not yet sufficiently developed to allow for the introduction of mandatory funded pensions. Their argument suggests that there is a threshold below which the increased risk is not warranted by the contribution to the development of capital markets, but above which the development of pension funds and capital markets become mutually reinforcing. Such co-development of mandatory pension funds and local capital markets is described as “symbiotic finance” by Vittas (1999), who suggests that pension funds promote the development of other institutional investors. Insurance companies benefit from the increased demands for life insurance and annuities, and mutual funds benefit from increased familiarity with collective financial investments and increased demand for skilled fund management.

The exposure to foreign currency-denominated assets differs greatly between

the countries, as Table 4 shows. In the Baltic countries, where small capital markets provide a limited number of investment opportunities and euro adoption is a medium term objective, pension funds have gone the furthest in diversifying their portfolios internationally. This is especially the case in Estonia and Lithuania, where the majority of assets held are denominated in foreign currency, mainly in euro. This is a positive strategy for risk diversification but not necessarily for domestic capital market development. In the other countries, the degree of international diversification is very small. In Russia, while about 11 per cent of assets were invested in foreign currency-denominated assets, more than 9 percentage points of this consisted of foreign currency-denominated Russian government bonds.

Whether there should be restrictions on international diversification is an issue under debate. While limiting the outflows of pension fund assets, the accumulation of funds has greater potential to contribute to the development of local capital markets. On the other hand, it has been argued that such capital market development then occurs at the expense of the workers who bear the increased risks of under-diversified portfolios. Kotlikoff (1999) argues vehemently against restrictions on international diversification, describing the World Bank's focus on promoting domestic capital markets as "financial mercantilism".²⁵ In Kotlikoff's view, countries like Russia and Kazakhstan lack a comparative advantage in operating securities markets, and, for that matter, pension funds companies, and would be better off opening up their capital markets and diversifying pension fund portfolios internationally. Failing to do so, results in excessively high transaction costs and under-diversified portfolios.

In this connection, the EBRD's local currency issues could provide an opportunity for diversification in the portfolios of mandatory pension funds.²⁶ The EBRD's local currency issues would – all other things being equal – increase the availability of long-term debt with high credit ratings and would thus make it easier for pension funds to diversify away from sovereign debt. To the extent that the funds raised by the EBRD through such issuance is channelled toward SME financing, there is a further beneficial effect as this helps offset the reduction in capital available for entrepreneurial finance that may come as a result of the introduction of mandatory institutionalised savings, as discussed in section 4.1 above.

4.3 THE "ELABORATE SHELL GAME"

In some cases, it is questionable whether the mandatory funded pillar really represents a departure from the PAYG system. Table 5 shows that while some countries are diversifying their fixed income holdings across countries and sectors, all but a few are investing a large share of assets in domestic government bonds.

²⁵ Kotlikoff (1999), p. 10

²⁶ The EBRD regularly issues bonds in the currencies and markets of its countries of operations as part of its mandate to stimulate and enlarge the development of capital markets.

Table 5: Allocation of assets between different bond categories

	Bonds as percentage of total assets under management at end-year 2005	of which (in percentage points)			
		Domestic govt	Foreign govt	Domestic corporate	Foreign corporate
CEB					
Estonia	45.6	0.1	26.1	4.2	15.2
Hungary	81.5	73.5	0.3	7.0	0.7
Latvia	50.3	29.2	3.5	7.1	10.5
Lithuania	62.0	9.9	45.9	2.8	3.4
Poland	63.7	62.5	0.0	0.5	0.6
Slovak Republic	10.9				
SEE					
Bulgaria	75.3	55.6	0.5	18.3	0.9
Croatia	79.0	73.1	1.7	3.7	0.4
CIS					
Russia	82.6	82.0	0.0	0.6	0.0
Kazakhstan	70.5	32.8	4.1	32.5	1.1

Source: EBRD and national sources.

Note: "Corporate" includes securities issued by financial and credit institutions.

In Russia, where currently more than 80 per cent of assets are invested in Russian government bonds – and the figure is rising – the second pillar amounts by and large to an exchange of tax contributions today for claims on fiscal revenues in the future. Similar examples, though less extreme, are Hungary, Poland and Croatia. In all three countries, the share of domestic government bonds in total bonds is over 90 per cent.

In terms of fiscal sustainability, the implicit obligations of a PAYG scheme are replaced by explicit obligations in the form of bonds. From a stakeholder perspective, this might be beneficial if it is harder (more costly) for governments to renege on explicit obligations. Indeed, a recent World Bank research paper suggests converting implicit PAYG debt into GDP-indexed government bonds as a way of improving the sustainability of PAYG systems that have accumulated large deficits (Robalino and Bodor, 2006). If the bonds are subsequently allowed to be traded, this may also facilitate the transition to a funded system. Nonetheless, tables 4 and 5 show that the introduction of a funded pillar can be partially undone through the manner in which assets are allocated. Referring to the general case, Kotlikoff (1999) describes this process as an “elaborate shell game”, in which mandatory savings amount to little more than a PAYG system in disguise.

4.4 REGULATORY CHALLENGES

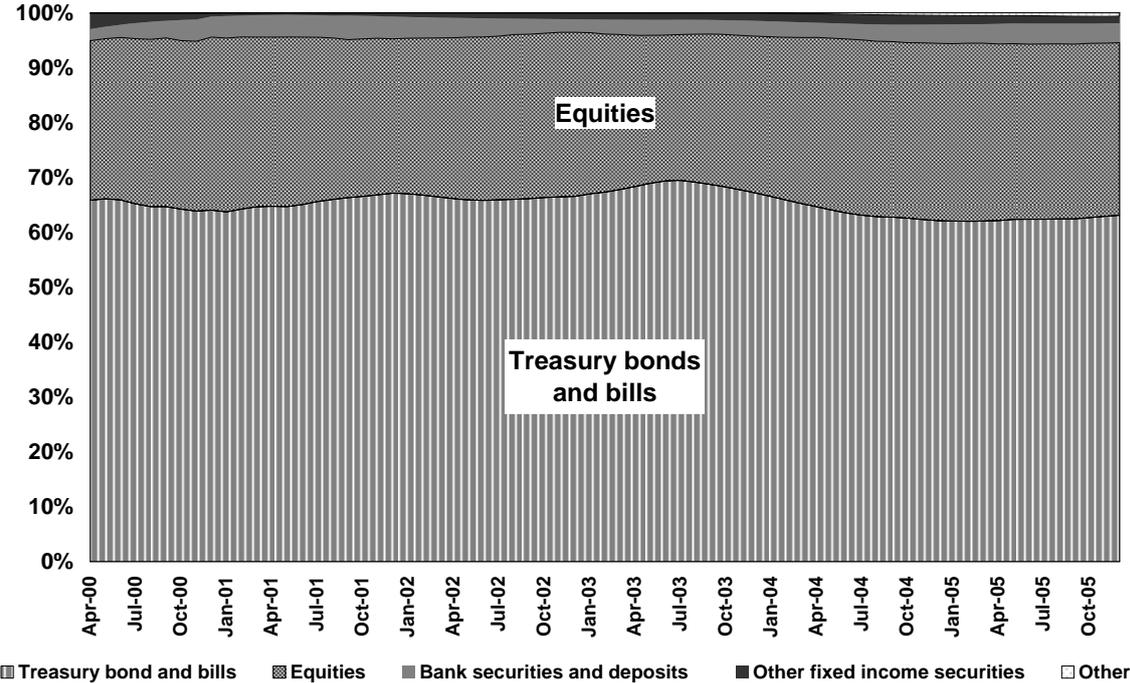
The transition to a multi-pillar system entails a number of regulatory challenges that need to be addressed. The following two issues will be discussed:

- First, while regulation must protect the insured against exposure to excessive market risk, it must also enable participants to reap the potentially higher returns by not imposing too severe constraints on fund managers. In this context, the effect of fund performance benchmarking and relative return guarantees must be taken into account when considering this trade-off.
- Secondly, when the pension scheme contains some element of individual choice, it must be recognised that basic design features such as default options can have significant effects on the individual savings behaviour and thus the allocation of funds within the system. Such effects must be taken into consideration when regulating the interactions between the insurers and the insured.

Regarding the first point, it is important to bear in mind that the transition from PAYG to funded pensions, while potentially offering higher returns from investments in financial assets, also entails increased risk on behalf of the insured. While it is possible that the increased risk can be mitigated through the design of the insurance scheme (Miles and Timmermann, 1999), it is clear that evaluating the welfare gains of social security reform requires an assessment of this corresponding risk-return trade-off (Krueger and Kubler, 2006). Under-diversification exacerbates the problem of increased risk. Shah (1997) shows how in a standard Markowitz portfolio choice framework, excessive restrictions on investment of pension fund assets ‘bend back’ the efficient frontier, thereby increasing the amount of risk required to attain any given return. While in theory, optimal regulation would maximise the probability that portfolios are allocated optimally (that is along the frontier), Shah argues that it is extremely unlikely that regulators will be able to do so in a satisfactory manner, compared to fund managers allocating investments in the absence of such constraints.

The regulation of pension funds might also provide perverse incentives for fund managers. In Poland, the large share of assets invested in government bonds appears to be more than a transitory phenomenon. Figure 8 shows that the Polish mandatory pension funds have maintained the same proportion (almost two-thirds of assets) of government bonds since the inception of the system in 1999.

Figure 8: Asset allocation of the mandatory pension funds in Poland, 12-month moving average



Source: KNUiFE.

Tracking individual pension funds in the second pillar in Poland, Kominek (2006) finds significant evidence of herding behaviour and attributes this to the penalties for underperformance (relative to the group) imposed by the Polish pension fund regulator.

Regarding the second issue, it is also important to recognise that the design of a pension scheme can have unexpected effects on individual savings behaviour. There is a growing body of behavioural evidence that shows that individuals are highly responsive to institutional features of a pension scheme. Madrian and Shea (2001) found that participants in 401(k)

schemes in the US²⁷ increased from 37 to 86 per cent when the default option was changed from non-enrolment to enrolment. In Russia, participants in the second pillar are able to choose a pension fund to manage their savings, from a wide range of providers. Yet, in 2005, more than 96 per cent of assets were managed by the State Trust Management Company (appointed by the government, currently Vnesheconombank), which is the default option if no active choice is made. Clearly, design features of the pension system such as default options, while in theory not affecting the economic decision at hand, may turn out to have considerable effects on the allocation of assets. For the sake of transparency, such effects must be taken into consideration when regulating, for example, the interactions between pension funds and their participants.

²⁷ The 401(k) plan is a type of employer-sponsored retirement plan named after a section of the United States Internal Revenue Code. A 401(k) plan allows a worker to save for retirement while deferring income taxes on the saved money or earnings until withdrawal.

CONCLUSION

In this paper, we have highlighted the numerous and complex issues a policy-maker must consider with regard to pension reform. A pension system has three key dimensions: the relationship between contributions and benefits, the allocation of risk-bearing between insurer and insured, and the method of financing current benefits. These are not the objectives of the pension system. Rather, they represent the tools available for achieving those objectives. Countries differ considerably in their pension system objectives, hence there is no one-size-fits-all recipe for reforming a pension system. Policy options range from the complete switch to a funded system in Kazakhstan to the cautious version of the multi-pillar system launched in Hungary, where the existing PAYG system continues to bear most of the responsibility for financing pensions.

Regardless of objectives, there is no substitute for parametric reform – adjusting the details of existing systems, such as retirement age or contribution periods – for policymakers seeking to achieve the objectives while maintaining fiscal sustainability. But the scope of parametric reform is limited by political and economic constraints. For example, in a country like the Kyrgyz Republic, contribution rates cannot be raised to any level without incurring significant costs as this can aggravate the already severe problem of tax compliance. There are also other important, related, areas of reform which will have a direct impact on fiscal sustainability in the face of ageing populations. As emphasised by the EU, parallel reforms in the labour markets, the reduction of government debt to save on interest payments, and reforms of health and long-term care sectors are also necessary to meet this challenge (see Council of the European Union, 2001).

The introduction of a multi-pillar pension system is not a cure-all solution and the transition cost is substantial. It is costly to introduce, as pension contributions previously used to finance PAYG liabilities are diverted to the funded pillars. If the resulting deficit is financed by increased borrowing in capital markets, and if the mandatory pension funds are large buyers of these domestic government bonds (as is currently the case in Russia and Poland in particular) then purported multi-pillar reform may simply amount to exchanging implicit liabilities for explicit ones. The data presented in this paper show that for a number of the reforming countries this is a cause for serious concern.

The risk-profile of the pension scheme changes, as the intergenerational risk-sharing of the PAYG system is replaced by risk-sharing through financial markets. In some regards, individuals will face higher risks. All other things being equal, if returns in financial markets (for which we can take the interest rate as a proxy) are higher than the growth in wages, a funded pension scheme achieves a higher replacement rate than a PAYG system. But as has been pointed out by for example Mora (2005) it is not evident that a fully-funded system earns a higher risk-adjusted return, in particular if portfolios are not invested efficiently. Local capital markets get a boost when increased aggregate savings are channelled into domestic assets, in part reflecting extensive restrictions on international diversification of mandatory pension funds. But if local capital markets are underdeveloped, this will further increase the amount of additional risk borne by the individuals contributing to the system. Furthermore, markets may under-perform for long periods of time. In Russia, where investment regulation permits no more than 20 per cent in foreign securities, the pension funds are highly exposed to the cyclical developments of the Russian economy. While in principle the funded pillars shift risk away from the public sector onto the individuals themselves, it is questionable whether governments will be able to resist political pressure to bail out mandatory pension funds that come up short.

Against this backdrop, all the countries examined here have put investment regulations in place and have strengthened the supervision of their financial systems. For the mandatory pension funds, investment restrictions in the reforming countries are numerous and diverse, including (but not limited to) restrictions on asset classes (Latvia, for example, permits no more than 30 per cent to be invested in equity or investment funds), minimum limits on the

share capital and membership of the funds (for example, Croatia), and minimum return guarantees (as in Poland or the Slovak Republic). The shift towards funded systems and the change in the risk profile requires efficient regulation in order to avoid overly risky investment strategies of pension funds and to safeguard the life savings of individual investors. Although as the case of Poland shows, perverse incentives created by regulation can also lead to too little risk being taken on. Investing retirement funds in potentially volatile financial assets would expose large parts of the population to asset market risks. The risks are even greater in the later stages of contributors' lives when they are particularly vulnerable and have fewer opportunities to smooth out fluctuations in wealth and income. Proper regulation must ensure that such risks are allocated efficiently and that individuals are aware of their specific risk situation.

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ANNEX 1: OVERVIEW OF PENSION SYSTEMS HAVING INTRODUCED A MANDATORY FUNDED PILLAR

	Bulgaria	Croatia	Estonia	Hungary	Kazakhstan	Latvia	Lithuania	FYR Macedonia	Poland	Slovakia	Russia
First pillar (public PAYG)											
Type	Defined benefit	Defined benefit	Defined benefit	Defined benefit	Defined benefit	Notional defined contribution	Defined benefit	Defined benefit	Notional defined contribution	Defined benefit	Notional defined contribution
Financial inflows											
Contribution rates of employees and employers	Pension contributions to first pillar split between employer and employee. At time of reform (Jan 2000) 80:20, changed gradually to 50:50. Currently (in 2006): 65:35	Older than 50 as of July 2000: 20 %. Below 40: 15% to first pillar (and 5% to second pillar). 40-50: free to choose either way. Pension contributions to first pillar: employees 20%	Entirely financed by employers, who pay a 20% tax on payroll (funds all state pensions: old-age, disability, survivors, national). As 4% on the payroll of those who participate in the second pillar are transferred to this pillar, the tax rate will decline to 16% in the long run.	(in 2005) Employers: 18%; employees: 8.5% (8% of which goes to the second pillar for those in the mixed system)	Employer pays 18% of gross wage as Social Insurance Tax, which was originally earmarked for pensions, social assistance and so on. Today the tax simply goes to the general government budget, from which the PAYG system is financed.	Total social insurance rate is 33.09% of gross wage (of which 9% is paid by the employee and the rest by the employer), of which 20% is earmarked for pensions. For participants in the second pillar, the PAYG contribution rate is 18% in 2001-2006, gradually decreasing to 10% by 2010, while contributions to the second pillar are increasing.	Employers: 23.6% of the gross salary Employees: 2.5% of the gross salary	If not covered by second pillar: 21.2% of gross salary, paid entirely by the employer. If also covered by second pillar: 13.78% (the remaining 7.52% is contributed to the second pillar instead), also by the employer.	19.52% of the gross salary, contributed equally by the employer and the employee.	(Since 2005, in % of gross wage, but maximum from 300% of average gross wage from the year t-1). For those who participate also in second pillar: employee: 4%, employer: 5%. For those who participate only in PAYG: employee: 4%, employer: 14%	Employers contribute 6% of the gross salary to the basic (defined benefit) portion and 10% to the insurance (defined contribution), to be lowered to 8% in 2008. Individuals born before 1967 are not covered by the second pillar, so the employer contributes an additional 4% (6% from 2008) to the insurance portion of the first pillar. Self-employed contribute a fixed amount.
Financial outflows											
Average replacement rate for old age pensioners	41.4% of gross income. 52.9% of disposable income.	41.45% (in 2006)	38.3% (in 2004)	Ratio of pensions in first year of retirement to earnings in year prior to retirement: 84.6%. Ratio of average benefits of current pensioners to average earnings of current workers: 64.3%. Both figures are for 2005 and include 13th month pensions.	The basic pension payment is pegged to the minimum subsistence level. For the earnings-related part, the average replacement rate is 32% for men and 42% for women.	34% (in 2004)	36% (in 2004)	For individuals with full years of service: 80%. Will be lowered to 72%. Average replacement rate: 59.3% (in 2004).	Not available.	47.4% for men 41.5% for women	Not available.

	Bulgaria	Croatia	Estonia	Hungary	Kazakhstan	Latvia	Lithuania	FYR Macedonia	Poland	Slovakia	Russia
Computation of benefits	Insured income (derived from lifetime earnings) multiplied by 1% for every year of contributions. Bounded by a minimum pension and a ceiling on pensions.	Parametric reform in 1998 introduced "German point formula". Points reflect individual earnings relative to national average. Benefit consists of point-based component multiplied by the actual value of pension multiplied by the number of years of service. Minimum (for qualifying period up to 30 years) 0.825% of average gross 1998 wage for each year of service. 0.4125% for qualifying period exceeding 30 years. Maximum 3.8 average personal points per year. Min, max only applicable if not covered by second pillar.	Fixed basic component [around 11% of current average domestic wage] + employment-related component [lump sum * length]+ (since 1999) earnings-related component [lump sum * sum of implicit years of personal insurance] Minimum national pension (for those not entitled to a work-related pension): around 15% of current average domestic net wage	For those who are fully eligible: combination of average past earnings and number of service years. The earnings of last years are less valorized than past earnings. Until 2013: replacement rate = 43% after 15 service years. Between 16 and 25 service years, increment is 2% per year. As from 2013: benefit for those in PAYG only = 1.65% of the retired person's average wage * number of service years; the accrual rate is only of 1.22% for those in the mixed system	The basic pension is an identical benefit to all pension recipients regardless of seniority or contributions. For the earnings-related part, benefits are 60% of the income for any three consecutive years, capped at 15 times the minimum subsistence level.	Annual pension (P) = individual pension capital accumulated in the notional account (K) divided by the number of years of projected life expectancy at the date of retirement (G) (with no gender differentiation). Pension during transition to the full operation of the NDC: $P=(KS+K)/G$ where KS is started (credited) capital, based on the insurance period (job record) until the year 1995 (inclusive) and the average individual contribution in 1996-1999.	Basic pension (contingent on having 30 years of contributions) + supplementary, earnings-related component ($0.005*S*K*D$, where S: years of contribution, D: average insured income, K: the worker's individual insured wage coefficient, which is a weighted average of the ratio of the individual's wage to the average insured income over 25 years)	Benefits calculated as a fraction of average wage earned by the individual, in relation to the average wage in the country during the individual's years of service. Benefit is multiplied with a percentage that adjusts for gender and length of service. For those who remain in the first pillar only, each year of service prior to January 2003 adds 2.33% for men and 2.60% for women. After January 2003: 1.80% for men, 2.05% for women. For those who also join the second pillar each year of service is worth 0.75% for men and 0.86% for women after the date when the individual joined the second pillar.	Minimum pension: lump sum. Earnings-related benefit: (initial capital + contributions upgraded by a notional interest rate [accumulated notional capital]) divided by g-value. Initial capital: pension rights accrued in the former DB system by those born after 1949. Notional interest rate: inflation + 75% of the growth of the real covered wage bill. g-value: average life expectancy at retirement age. Ceiling to pensionable earnings: 250% of average salary for a given year.	Benefit = Average Personal Wage Point * Actual Pension Value * number of working years, where APWP = individual gross wage/average gross wage in the economy (ceiling for APWP: 3) and APV = value of wage point (set by law, providing 50% replacement rate in the first year after the reform). Minimum pension abolished in 2004, but low pensionable earnings are lifted to the subsistence minimum	Basic portion: defined benefit, same amount to everyone who has at least five years of contributions. Insurance portion: defined contribution (notional accounts), benefit linked to wages for everyone with at least five years of contributions.
Indexation of benefits	Swiss formula: simple average of inflation and wages (from January 2007).	Swiss formula: simple average of inflation and wages, calculated every 6 months.	1990s: indexed to the minimum wage Since 2002: indexed to CPI and wages: index = simple average of change in CPI and yearly increase in collected social tax wages. No indexation if index <1.	Swiss formula: simple average of inflation and wages (since 2001)	Ad hoc indexation of the basic pension reflecting increases in the minimum subsistence level, and ad hoc indexation of the earnings-related benefit to reflect changes in CPI.	CPI only until 2002 2002-2004: CPI and 25% of the real growth of contribution wage sum (a function of wage and employment levels) since 2004: CPI and 50% of the real growth if contribution wage sum	No automatic indexation rule. In practice, the government indexes the basic pension and the average insured income to wage growth.	$0.8 * \text{change in CPI} + 0.2 * \text{growth in net wages}$. Currently, as a temporary measure, pensions are only indexed by half of this rate.	Before 2004: weighted average of inflation (80%) and wage growth (20%). As from 2004: at least inflation, the Tripartite Commission (government, employers and trade unions) or the Parliament may choose to raise benefits by more	Actual pension value (part of benefit calculation formula) annually indexed to average nominal wage growth; pension benefits indexed annually to inflation and wages growth	Both the DB and NDC components of the PAYG are linked to inflation. For NDC component, wage growth is also taken into account, but indexation is arbitrary. There is no guaranteed rate of return.

	Bulgaria	Croatia	Estonia	Hungary	Kazakhstan	Latvia	Lithuania	FYR Macedonia	Poland	Slovakia	Russia
Safety-net/minimum pension arrangements	Minimum pension. Set each year by parliament (when it adopts the budget of the National Social Security Institute).	Minimum pension (see above).	Basic pension. Supplemented by an employment-related pension and an earnings-related pension.	Minimum pension for those with at least 20 years of service, to be abolished in 2009. For all others, means tested social assistance.	Minimum pension	Minimum pension which depends on the state social security benefit	Social assistance	Minimum pension	Minimum-pension (employment- and earnings-tested) within an earnings-related plan	Social assistance. The minimum pension was abolished in 2004.	State social pension available to disabled citizens or those aged 65/60 (m/w) not entitled to other pension. Also, survivor pensions. By the end of 2004, there were 4.4 million disabled pensioners, 1.7 million Social pensioners, and 2.9 million survivors.
Participation in PAYG											
Groups who contribute into the system	All workers under contract, self-employed and so on	Socially insured persons (for some groups of persons contributions are made by the state). Self-employed contributions based on insured earnings, at same rates.	N/A	Socially insured persons, including the unemployed.	Socially insured persons.	Socially insured persons (for some groups of persons contributions are made by the state)	All employees and self-employed persons except farmers and their family members, and voluntarily insured persons. For some groups of persons contributions are made by the state.	All employees and self-employed.	The system covers all employees and self-employed, with the exception of farmers and their families, appointed judges and prosecutors, military, police and the government fire service.	Employees, employers, self-employed persons, voluntarily insured persons (unemployed, students), state (on behalf of selected groups of persons)	Employed and self-employed population, and independent farmers
Groups who benefit without having contributed	Disabled.	Veterans.	na	Motherhood. The government covers the employer's contribution (mothers still contribute the employee's share out of the childcare benefit).	na	na	Conscripted soldiers, people who take care for children until 3 years, the disabled, priests.	na	None.	Conscripted soldiers, disabled people, people who take care for small or disabled children	Disabled, survivors, and recipients of the social pension.
Statutory retirement age											
Men	63 in 2006, up from 60 in 2000	65 by 2008, up from 60 in 2000	63	62	63	62	62.5	64	65	62 (in 2006)	60
Women	60 by 2009, up from 55 in 2000	60 by 2008, up from 55 in 2000	59 (will be raised to 63)	60 in 2005, 62 in 2009	58	62 (in 2008)	60 (in 2006)	Raised in increments to 62 (in 2007)	60	62 (in 2015)	55

	Bulgaria	Croatia	Estonia	Hungary	Kazakhstan	Latvia	Lithuania	FYR Macedonia	Poland	Slovakia	Russia
Early retirement	Until December 31, 2009 for workers in specific conditions. After that date early retirement pensions will be available through the second pillar.	60 (men) and 55 (women) by 2009, gradual increase from 55, 50. Requires 35 years of service for men and 30 for women. Annual decrement rose to 3.6 % (from 1.33) per year of early retirement.	As from 60 for men and 56 for women, with reduced benefits	Until 2009: at 60 (men) and 57 (women) if 38 years of contributions, or with fewer years of service but with reduced benefits. As from 2009: 3 years before statutory age if 37-40 service years, and with reduced benefits.	If pension accruals are adequate, workers can retire at 55 using voluntary contributions (50 if using voluntary occupational contributions) but not the mandatory contributions.	Until July 2008: 2 years before statutory retirement age, if at least 30 years of contribution. Benefits reduced by 20% until statutory age.	If unemployed no less than 12 months, less than five years from statutory age, no insurable income and 30 years of contributions; benefits reduced by 0.4% for each month of missed contributions until statutory age.	For some occupations, each year worked counts as more than one year of service. The retirement age is adjusted (lowered) accordingly.	Abolished from 2008 onwards.	Eligibility: 10 years of contributions and if pension benefit is higher than 1.2 times the official subsistence minimum. Benefits reduced by 0.5% for each month of missed contributions until statutory age.	Earlier retirement age for persons who have worked in certain regions and professions and to mothers who have five or more children.
Postponed retirement	Voluntary, no limit on pension to employed pensioners.	Voluntary, no limit on pension to employed pensioners.	Voluntary; increased benefits by 0.9% for each month of postponement.	Bonus of 0.5% for each additional service month.	Workers above retirement age do not have to contribute to the PAYG system.	Voluntary. No limit on pensions to employed pensioners. Future benefits increase as accumulation of individual pension capital continues.	Voluntary, no limit on pensions to employed pensioners. Benefits increase by 8% for each additional year of postponement.		Possible, with increased benefits (due to higher notional capital and lower average life expectancy at retirement).	Bonus of 0.5% for each additional service month.	Working above the retirement age is entitled to full pension.
Effective retirement for old age pensions	59.8 (men); 57.6 (women)	Not available.	61	Men: 60.1; Women: 57.7 (in 2005)	Not available.	Men: 61.4; women: 58.3 (in 2004)	Men: 62.4; women: 58.9 (in 2005)	61.5 (men), 56.5 (women)	Men: 58.4; Women: 56 (in 2005)	Not available.	Not available.
Years of contributions	Minimum 15 years, then increased pension score for additional contribution years, capped at a total of 40 years for men and 35 for women.	Gradual increase from ten best consecutive years (extrapolated to the whole period) in 2000 to full career by 2008.			18 (3 best consecutive years determine benefit, 1% for each additional year worked, but capped at 15 times the minimum subsistence level.			Entire contribution period since 1970.			
Minimum contribution years to receive full benefits	Score system which takes into account age and length of contribution period. Requirements raised in increments until 2009.	15	15	20 for full pension eligibility, 15 for partial eligibility (only until 2009).	25/20 (men/women)	10	Minimum contribution required: 15. Contribution years required for full benefit: 30.	Minimum contribution required: 15. Contribution years required for full benefit: 35 (women) and 40 (men).	For minimum pension: 25 for men, 20 for women, and if the sum of first- and second pillar benefits is below the minimum pension.	10	For minimum pension, 5 years.

	Bulgaria	Croatia	Estonia	Hungary	Kazakhstan	Latvia	Lithuania	FYR Macedonia	Poland	Slovakia	Russia
Second pillar (mandatory, funded)											
Start year	2000	2002	2002	1998	1998	2001	2004	2006	1999	2005	2002
(Short description of system: benefit calculation, contribution rates and so on)	Funds are privately managed. Benefits depend on accumulated returns to investment.	Contributions to second pillar (5% of gross salary) entirely from employee. Privately managed pension funds. Account converted to lifetime annuity at time of retirement. Guaranteed rate of return: 1/3 of market-share-weighted average return of pension funds.	Workers' contribution: 2% of their gross salary. Employers' contribution: 4% of gross salary	Contributions: the mandatory 8% contribution (in 2004). first-pillar benefit for those in the mixed system: before 2013, 75% of PAYG-only benefit; as from 2013, 1.22% of earnings for each year of service (still subject to a contribution ceiling).	Contribution rate: 10% of gross wage, paid by employer or self-employed Note: this is in addition to the Social Insurance Tax (21%) used to finance the PAYG.	Contribution rate: 2% of gross wage gradually increasing to 10% as from 2010.	Contribution rate: 2.5 % in 2004 and additionally 1.0 % each year, up to 5.5 % in 2007. Benefit: a supplementary pension part will be decreased according to the proportion between the accumulative contributions and contributions for the social insurance supplementary pension part.	Contribution is 7.12%, offset by a same size reduction in the contribution to the first pillar. Benefits depend on contribution history, accumulated returns, and retirement age. Can be paid out as life annuity or scheduled withdrawals. Individuals can choose between two different funds, both privately managed.	Contribution by the employee: 7.3% of the gross salary. Benefits indexed to inflation only.	Contributions by employer: 9% of gross wage	Contributions by employer: 4% of gross salary, will be raised to 6% in 2008. Contribution rate is regressive, 2% above a threshold. Individuals can choose (once a year) to have their assets managed by public or private pension funds.
Switching arrangements (for example age brackets)	The contribution to the general fund is 4% (in 2006) up from 2% in 2002. Participation is mandatory for those born after December, 1959.	Mandatory if below 40 as of July 2002. Optional if 40-50. Not available if above 50 as of July 2002.	Mandatory for persons born in 1983 or later, voluntary for those born in 1942-1982	Mandatory for new labour-market entrants. Voluntary for the others (choosing between pure PAYG or mixed system) until September 1999. Still voluntary for those under 30. Backing out into PAYG-only possible until 2012 for those with less than 10 years of participation.	Mandatory for all workers after Jan 1998.	Mandatory for those born after 1971, voluntary for those born in 1952-1971. Those born before 1952 are not included in the new system.	Voluntary, but irrevocable.	Mandatory for all new entrants into the labour market after 1 Jan. 2003. Voluntary for other groups.	Mandatory for those born after 1969; voluntary for those born in 1949-1969 (but irrevocable)	Voluntary but irrevocable. Mandatory for those who had never contributed to the pension system before January 2005, that is secondary school students, new labour-market entrants and the self-employed	>Only for citizens born in 1967 or later. For citizens born before 1967, this contribution is added to the insurance component of the first pillar (defined contribution PAYG).
Expected number of participants (share of working population)	78% in 2005	56% by April 2002 (of which 9/10 mandatory), expected to reach 100% by 2025.	3/4 of the working population in May 2005	2.4 million participants in 2005	82% by 2006.	45.3% in 2004. Full participation expected by 2034.	As of 2006, 63% of those insured for full old age pension have joined the system. According to BoL staff estimates around 80% of total employment will join the second pillar. 10 year transition is expected).	Expected: 25% in the first year of implementation.	Not available.	1.4 million participants (in 2006). 65% of the working population.	Approx 33% depending on time period.

	Bulgaria	Croatia	Estonia	Hungary	Kazakhstan	Latvia	Lithuania	FYR Macedonia	Poland	Slovakia	Russia
Investment regulation for pension funds (for example limits on asset structure)	<p>Currently approximately 90% held in government securities due to limited opportunities for investing in other investments.</p> <p>Investment regulation to be eased upon EU membership.</p> <p>The key restrictions will be: max. 30% of assets in non-Euro foreign currency denominated investments, max. 10% in real estate. Max. 10% in securities issued by one company.</p>	<p>Minimum share capital paid by manager of mandatory pension fund is 40 million Kuna. Minimum number of members is 80,000 by the third year of operations. Investments may be in domestic or OECD country sovereign/local govt long term bonds, corporate bonds, or stocks (with some restrictions on OECD country stocks). No private equity investments, derivatives, real estate, or other assets not traded in financial markets (art, antiques). Restrictions on allocation include foreign investment capped at 15 %, and at least 50 % held in domestic sovereign bonds.</p>	<p>At most 50% of assets in stocks, no restrictions for investing in foreign assets</p>	<p>Maximum 50% in investment fund shares, 25% in mortgage bonds.</p>	<p>Minimum 15% in domestic sovereign securities, and maximum 40% in foreign securities. Up to 50% in domestic shares if "Class A" (listed in KSE and with at least one year of audited financial statements in accordance international standards and up to 5% in bonds and investment fund shares if these are listed on the KSE. Up to 20% in domestic mortgage bonds, up to 5% in refined gold, up to 15% in infrastructure bonds, up to 5% in Kazakhstan development bank bonds.</p>	<p>Pension fund assets are invested in debt securities, stocks, time deposits, investment funds, derivatives. Total investments in equity and investment funds may not exceed 30% of total assets.</p>	<p>Pension funds should not:</p> <ol style="list-style-type: none"> invest more than 5% of the assets in securities of a given issuer acquire more than 10% of voting (or non-voting) shares of a given issuer acquire more than 30% of debt securities of a given issuer invest more than 30% of the assets in securities of the same issue, issued or guaranteed by the central or local government invest more than 10% of the assets in the securities of a given issuer, and the aggregate sum of such investments should not exceed 40% of the total value of the assets. 	<p>No more than 80% in domestic government securities, 60% in deposits or securities issued by local banks, 40% in local corporate bonds. No more than 30% in local equity. No more than 20% in local investment funds. Maximum 20% in foreign assets of which max. 5% in foreign stocks or mutual funds and max. 5% in foreign corporate bonds.</p>	<p>Treasury securities: no limit</p> <p>Stocks traded on regulated stock exchanges: 40%</p> <p>Bank deposits: 20%</p> <p>Stocks traded on regulated over-the-counter markets: 10%</p> <p>Investment certificates issued by open- and closed-end mutual funds: 15% and 10%, respectively</p> <p>Municipal bonds: 15% if publicly traded, 5% if not</p> <p>Corporate debt instruments: 5%</p> <p>Real estate: None</p>	<p>Relative rate of return guarantee: the value of assets is not allowed to fall below a benchmark reflecting the average performance of competitors.</p> <p>Three types of funds (growth fund, balanced fund, conservative fund) with different investment limits, different risks, and different rates of return.</p>	<p>Maximum 20% invested in foreign securities, including foreign currency holdings. Maximum 20% held in bank deposits. Maximum 20% invested in foreign assets, including foreign currency holdings. Investment in foreign-issue securities only permitted through foreign index investment funds. No maximum for federal govt securities, no minimum for any asset class. A number of further limitations are set by the government, most recently in the Government Resolution 379 of 30.6.2006.</p>
Third pillar (private, voluntary)											
Start year	1998	2004	1999	1996	1998	1998	2004	n.a.	1999	1996	1998