

Sustainability of Pension Systems in the New EU Member States and Croatia

Coping with Aging Challenges and Fiscal Pressures

Leszek Kąsek
Thomas Laursen
Emilia Skrok



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Leszek Kąsek is an Economist in the Poverty Reduction & Economic Management sector unit of the Europe & Central Asia regional department of the World Bank. Thomas Laursen is a Lead Economist in the same unit. Emilia Skrok is an Economist in the same unit.

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The report is part of a series of studies on current issues in public finance reform in the new EU Member States which joined the European Union on May 1, 2004 (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, and Slovenia), those which joined the EU on January 1, 2006 (Bulgaria and Romania), and Croatia. These studies have been undertaken since 2005 and coordinated by Thomas Laursen, Lead Economist for Central Europe and the Baltic States in the World Bank. Marta Michalska provided excellent administrative and logistical support throughout the process of preparing these studies.

Overview of Current Pension Systems

Recent Pension Reforms in the EU10+1

Over the last decade, pension reform has been a major issue on the political agenda across Europe. All European countries are profoundly affected by aging populations resulting from lower fertility and increased life expectancy. In order to make pension systems more sustainable in light of prospective demographic developments, and in some cases to address current financing problems, EU10+1 countries have been reforming their pension systems since the mid-1990s. The reforms have combined measures to delay retirement, link benefits more closely to contributions, and diversify risk.

While all EU10+1 countries have made changes to their public pay-as-you-go (PAYG) system, some have gone further by diverting some of the pension contributions to fully-funded, privately-managed pension savings. In most countries, switching to the new mixed system has been mandatory for younger workers and new entrants to the labor market. All countries have also introduced voluntary, supplementary pension schemes.

PAYG reforms have included increases in retirement ages (including bringing the retirement age for women more in line with that of men), reducing possibilities and incentives for early retirement, scaling back privileges for special groups, revising benefit accrual formulas, changing indexation mechanisms, and increasing contribution periods or rates. Two countries (Latvia and Poland) have fundamentally reformed their PAYG systems through the introduction of individual Notionally Defined Contribution accounts that link benefits

directly to contributions and spread retirement benefits over the remaining life expectancy at the time of retirement.¹

Still, current retirement ages in all EU10+1 countries remain lower for women than for men and in some cases are dependent on the number of children raised, varying from about 54 years in Slovakia and Slovenia to 60 years in Poland (Table 1). For men, retirement ages vary from 58 in Slovenia to 65 in Poland. While no further changes are planned in Poland, all other EU10+1 countries have approved gradual increases in retirement ages for women and in some cases for men too: retirement ages for both women and men will generally increase to 62–65 years. Several countries have early retirement schemes allowing for retirement two or three years before the statutory age (in Latvia and Croatia, as much as five years). Some countries (such as Lithuania in 1995 and the Czech Republic in 1990–92 and 1995) have eliminated early retirement privileges for certain professional and social groups, while these remain in other countries (including Poland, Croatia, and Romania).

Poland, Hungary, Latvia, Estonia, Lithuania, Romania and Croatia and most recently Slovakia have introduced a second pension pillar through the diversion of part of the pension contributions to fully funded, privately managed pension plans (Table 2). The new, mixed systems are mandatory for at least all younger workers or new entrants to the labor market in all countries except Lithuania where participation is voluntary, even for new entrants.²

The introduction of such mixed systems has been motivated mainly by risk diversification (spreading of wage bill and political risk to include financial market risk), but also the provision of greater incentives to contribute through a closer link between contributions and benefits, increased individual choice, capital market development, and expected higher rates of return. It is also sometimes hoped that the inflow of pension funds' portfolio invested in private equities will boost aggregate investment rates, and improves prospects for economic growth rate in the future.

At the same time, the switch from pure PAYG to mixed systems involves greater individual risks (investment risk), potentially higher transaction costs (fees to fund managers), and transition costs to the PAYG systems as part of contributions are diverted to private savings and partially invested in non-governmental financial instruments³ while current pensioners must still be fully financed from the PAYG system.

The countries which have adopted mixed systems have sought to limit these transition costs through making the switch mandatory only for younger people and phasing in gradually higher contribution rates to the funded pillar. For example, Hungary began the funded pillar with a 6 percent contribution rate compared to the current 8 percent. Given the concern in the EU10+1 countries for maintaining fiscal discipline, none of the countries opted for an immediate or complete shift to the second pillar such as Mexico or Kazakhstan did.

Current PAYG Systems

Despite the reform efforts which have been undertaken, PAYG pension expenditures (as a share of GDP) have remained high and fairly constant until now (Figure 1). In 2004, Poland's expen-

1. Such a system was initially developed by Sweden, but has been followed by some other countries in Europe (for example, Italy).

2. In Hungary, where participation in the new system was mandatory for everyone, retirees who joined the new system less than 10 years before retiring and whose benefits from the second pillar are less than 25 percent of the PAYG benefits have recently been granted the option of moving back to the previous stand-alone PAYG system until 2012.

3. See more in Table 12.

Table 1. Retirement Ages in the EU10+1 in 2007					
	Retirement Age				Early Retirement
	Current Law	Years of Insurance	Planned		
				Introduction	
Hungary					
Women	62	1st pillar: 15 years 2nd pillar: no minimum period			Available to those involved in jobs allowing exemption by age. Entitlement to pension starts 2 years earlier to those who have worked in such activities for at least 8 years and pensionable age is further reduced by 1 year for every additional period of 4 years.
Men	62	1st pillar: 15 years 2nd pillar: no minimum period			Available to those involved in jobs allowing exemption by age. Entitlement to pension starts 2 years earlier to those who have worked in such activities for at least 10 years and pensionable age is further reduced by 1 year for every additional period of 5 years.
Poland					
Women	60	20—with guaranteed minimum pension. Without guaranteed min. pension: persons born before 1.1.1949—15; persons born since 1.1.1949—no min. period is required.			Persons born before 1.1.1949—55 and over with a 30-years qualifying period. Persons born since 1.1.1949—no provisions

(continued)

Table 1. Retirement Ages in the EU10+1 in 2007 (<i>Continued</i>)					
	Retirement Age				Early Retirement
	Current Law	Years of Insurance	Planned		
				Introduction	
Men	65	25—with guaranteed minimum pension. Without guaranteed minimum pension: persons born before 1.1.1949—20; persons born since 1.1.1949—no min. period is required.			Valid for both men and women born before 1.1.1949: totally incapacitated persons may receive pension 5 years early if they have fulfilled the qualifying period requirements; persons working in unhealthy conditions or performing a specified type of work (official list)—5 (e.g. rail workers), 10 (e.g. miners, steel workers, pilots) or 15 years early (wind instrument musicians). Persons born since 1.1.1949—no provisions
Czech Republic					
Women	56 to 60, according to the number of children raised	25 years of insurance; 15 years if aged 65	63 (without children) 59–62 (differentiated acc. to the number of children brought up) Increasing by 4 months annually or by two months annually once women reach the retirement age for eligibility for the old-age pension of men	2013	up to 3 years before the normal retirement age
Men	61.8		63 (increasing by 2 months annually)	2013	up to 3 years before the normal retirement age

Slovakia					
Women	56–60 (depends on number of children raised)	10	62 (increasing by nine months every calen- dar year)	2014	It is possible if min 10 years of membership and min. amount of benefit have been reached.
Men	62	10			
Estonia					
Women	60	15 years for 1st pillar; 5 contribution years for the 2nd pillar	63 (to be raised 6 months each year)	2016	Available up to 3 years before the legal retirement age
Men	63		—		
Slovenia					
Women	60 years 8 months	20 years of a qualifying period	61	2008	58 (38 years of service)
Men	62		63	2009	58 (40 years of service)
Latvia					
Women	61	10	62	2009	59 (30 years of insurance)
Men	62		60 (30 years of insurance)		
Lithuania					
Women	60	15 years for membership, 30 years for drawing full pension			55 (30 years of insurance period; at least 12 months registered as unemployed)
Men	62.5				57.5 (30 years of insurance period; at least 12 months registered as unemployed)

(continued)

Table 1. Retirement Ages in the EU10+1 in 2007 (Continued)					
	Retirement Age				Early Retirement
	Current Law	Years of Insurance	Planned		
				Introduction	
Bulgaria					
Women	59 and 93 points	15–25	60	2009	Persons who have worked 15 years under the 2nd category of labor and aged 52
Men	63 and 100 points	15–25			Persons who have worked 15 years under the 2nd category of labor and aged 57
Romania					
Women	58	10	60	2014	53
Men	63	10	65	2014	58
Croatia					
Women	58	17 (declining by 6 months per year until it is 15 in 2008)	60 (increasing by 6 months annually)	2008	53
Men	63	17 (declining by 6 months per year until it reaches 15 in 2008)	65 (increasing by 6 months annually)	2008	58

Notes:

Hungary: Early retirement with 38 years of service; a reduced pension is paid with at least 33 years of service.

Poland: Noncontributory years may not exceed 1/3 of contribution years.

Slovakia: Early pension can be taken only from the individual funded account and if the amount in the account can buy an annuity of 120 percent of subsistence level; the public part is only available at normal retirement ages.

Latvia: Early retirement with 30 years of insurance.

Lithuania: Early pension: up to 5 years before the normal retirement age with 30 years of insurance and after 1 year of unemployment (beginning July 1, 2004). Also, the person should not be a receiver of pensions or periodical compensation of any kind from the social insurance or state funds. Early pensions are not eligible for farmers.

Source: International Social Security Association (2004), *Social Security Programs Throughout the World: Europe 2004*. Republic of Slovenia, *National Strategy Report on Adequate and Sustainable Pensions, 2005*; European Commission, *Adequate and sustainable pensions, Synthesis report 2006*.

Table 2. Structure of Pension Systems in the EU10+1 Countries			
	Main Reforms	Statutory Schemes	
		Financed from Social Security Contributions and Taxes	Funded
Czech Republic	1993–1995, 2003	DB	None
Estonia	1993, 1999–2002	DB, similar to German system	Mandatory fully funded DC (2002)
Hungary	1998	DB	Mandatory fully funded DC (1999)
Latvia	1995, 1998, 2000	NDC based	Mandatory fully funded DC (2001)
Lithuania	1995, 2003–2004	DB, flat-rate & earnings-related part	Voluntary fully funded DC (2004)
Poland	1998	NDC based	Mandatory fully funded DC (1999)
Slovenia	3 pillar reform rejected 1999, existing pillar strengthened thereafter	DB	None
Slovakia	1993, 2004	DB, Points accumulation system	Mandatory fully funded DC (2004)
Bulgaria	2000	DB, individual point accumulation system	Mandatory fully funded DC (2002)
Romania	2001	DB, individual point accumulation system	Mandatory fully funded DC (planned)
Croatia	1999–2002	DB, earnings related (for those only in PAYG); DB, half of the benefit is flat, years service related & second half earnings related (for those in PAYG and second pillar)	Mandatory fully funded DC (2002)

Notes: DC = Defined Contribution. DB = Defined Benefit. PAYG = Pay-As-You-Go, i.e. financing current benefits out of current revenues. NDC = Notional Defined Contribution.

Source: Wagner Helmut (2004). *Pension Reform in the New EU Member States—Will a 3-Pillar Pension System Work?* Discussion Paper No. 372, December 2004; National Strategy Reports on Adequate and Sustainable Pensions, 2005. *Bulgaria, Croatia and Romania. Economic report*, World Bank Staff Working Paper, August 2005.

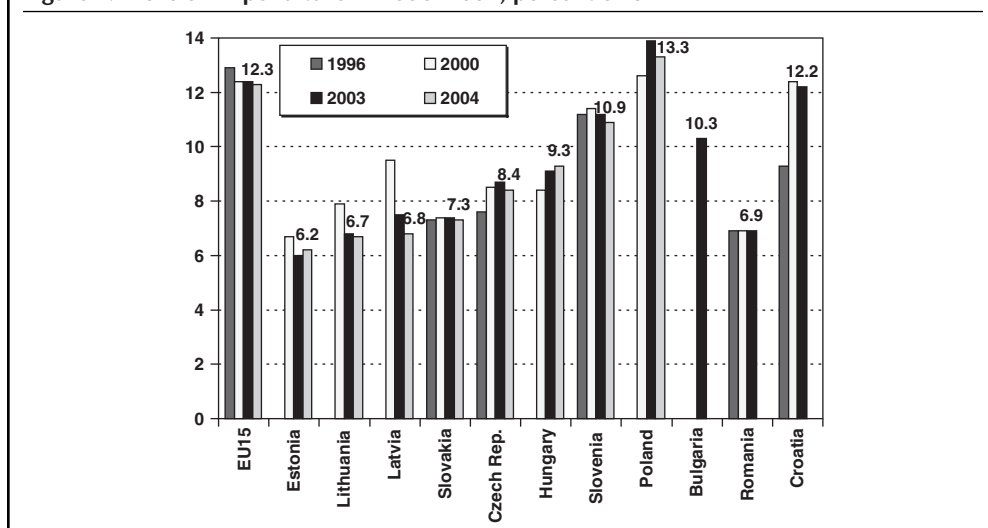
diture on pensions amounted to 13 percent of GDP, among the highest in the EU. Conversely, the Baltic countries and Slovakia allocated the lowest portion of GDP to pensions (less than 7 percent of GDP). Around the world, social spending tends to rise with per capita income. While many of the EU10+1 countries are clustered toward the bottom of the distribution, they spend relatively large sums on their pension systems given their income levels. Slovenia spends as much as the United Kingdom as a share of GDP, but has an income level less than 65 percent that of this country. In a similar vein, Lithuania and Slovakia spend twice as much as Ireland on pensions while their per capita GDP levels are less than 40 percent of Ireland's.

Table 3. Basic Characteristics of Mixed Old-age Pension Systems

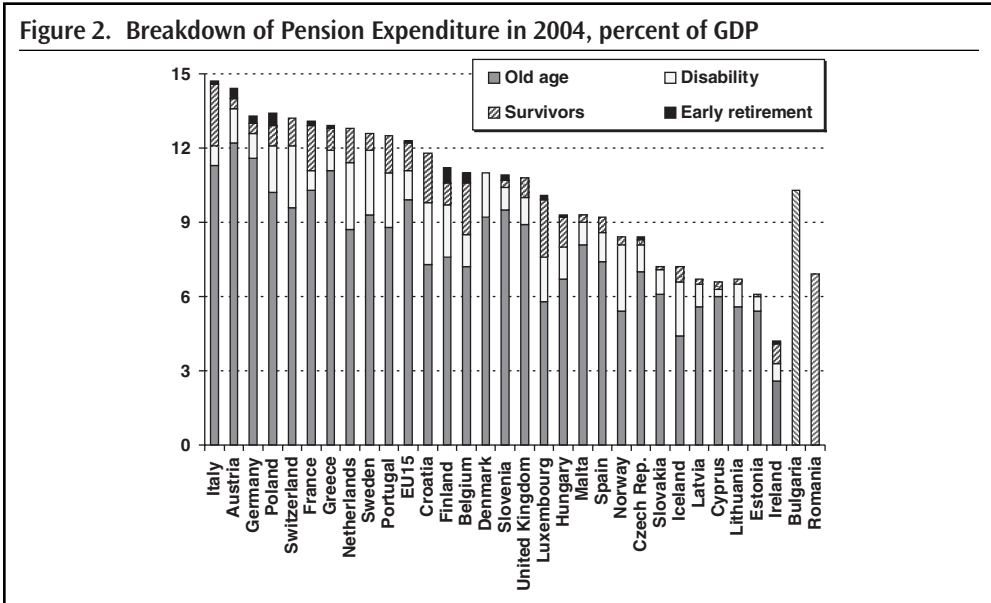
Country	Total Contributions	First Pillar	Funded	Starting Date	Type of Pension
Hungary	26.5	18.5	8.0	1998	Mandatory
Poland	19.52	12.22	7.30	1999	Mandatory (< 30)
Latvia	20.0	18.0, gradually decreasing to 10.0 by 2010	2.0, gradually rising to 10.0 by 2010	2001	Mandatory (< 30)
Estonia	22.0	16.0	6.0 (of which 4 come from PAYG contribution)	2002	Mandatory (< 18)
Lithuania	26.0	22.5, gradually decreasing to 20.5 by 2007	3.5, gradually rising to 5.5 by 2007	2004	Optional 2. pillar
Slovakia	18.0	9.0	9.0	2005	Mandatory (< 18)
Bulgaria	32.0	27.0	5.0	2002	Mandatory (< 42)
Romania	29.25	29.25	2.0 gradually rising to 6.0 by 2012	Expected in 2008	Mandatory (< 35)
Croatia	20.0	15.0	5.0	2002	Mandatory (< 40)

Source: World Bank; ILO; Goliaš(2005); “Bulgaria, Croatia and Romania. Economic report.” World Bank Staff Working Paper, August 2005.

Expenditure on old-age pensions topped the list of pension expenditure in all EU countries, but none of the EU10+1 countries were among the highest spenders in this area in Europe (Figure 2). However, several EU10+1 countries have high levels of disability spending relative to old age spending, most notably Poland, Croatia but also Hungary and the Czech Republic. Also, countries such as Slovenia, Poland and the Czech Republic

Figure 1. Pension Expenditure in 1996–2004, percent of GDP

Source: Eurostat. For BG, RO and HR—national agencies.



Source: Eurostat; based on LFS.

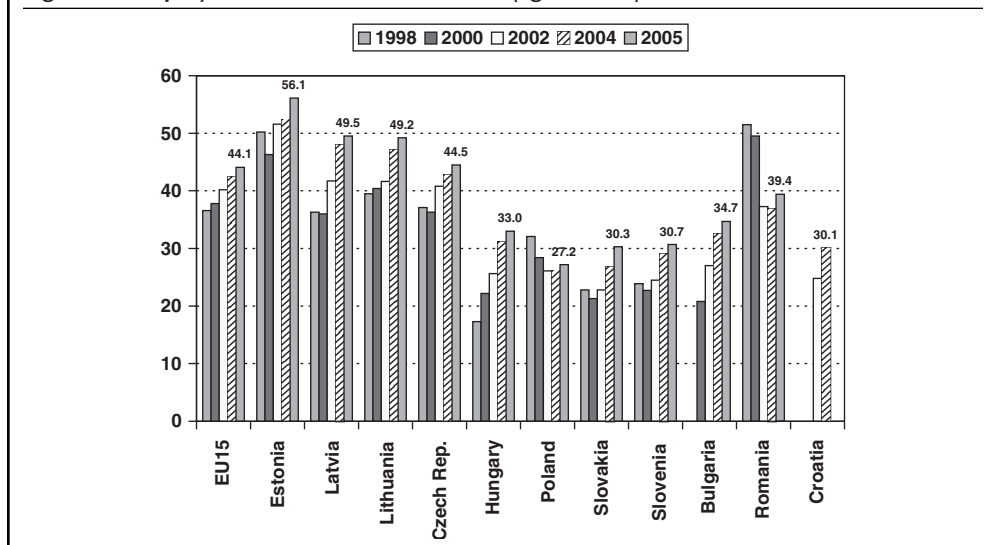
spend relatively large amounts on early retirement. Taking all forms of retirement into account, Poland spends more relative to GDP than the EU-15 average and Croatia is not far behind.

The gap between high- and low-spending countries results largely from factors other than differences in the age structure of the population. First, the EU10+1 countries generally still have low effective retirement ages. This is partly because of incentives to retire early and partly because of past labor market policies that intentionally allowed older workers to retire early in response to rising unemployment. Recently, however, employment of older workers (aged 55–64), especially women aged 55–59, has been increasing reflecting the extension of retirement ages and the payment of full pensions to working pensioners in some countries (for example, Estonia, Lithuania, and the Czech Republic; see Figure 3). Second, high pension spending arises because benefit levels, as measured by the replacement rate (the ratio of a person's pension to his or her income when working), tend to be generous. Third, the role of public pension spending tends to be larger in countries where public pensions receive little supplement from private schemes. Fourth, in most of the EU10+1, labor force participation rates were extremely high among both men and women pre-transition so almost all elderly have rights to a pension. In Western Europe, by contrast, aside from the Scandinavian countries, women's labor force participation rates are significantly lower than that for men, so that while almost all elderly families have access to a pension, not all individual elderly do. Let us now examine some of these factors in greater detail.

Retirement Age

The EU10+1 countries have relatively low effective retirement ages, although these tend to be rising in recent years (Figure 4). The lower retirement ages suggest that not only is the stock

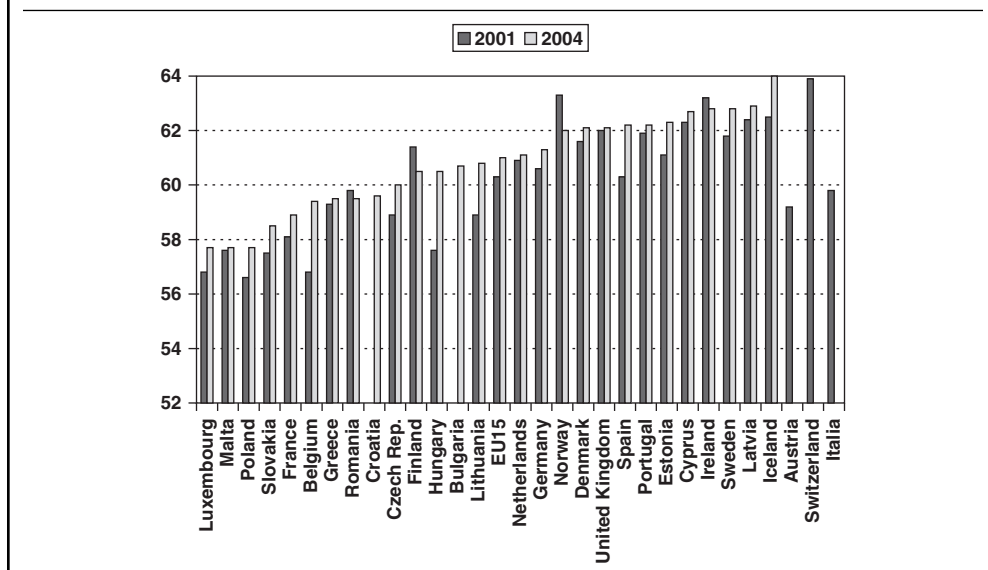
Figure 3. Employment Rate of Older Workers (ages 55–64)



Source: Eurostat; based on LFS.

of current retirees high, but future retirees in the EU10+1 will also be younger and eligible to collect pensions for a longer period of time than in the Western European countries (provided life expectancies in East Europe further converge to West European standards). The low retirement ages for women are particularly problematic because—contrary to the situation for males—the life expectancy of women is similar across Europe.

Figure 4. Average Exit Age from the Labor Force Weighted by the Probability of Withdrawal from the Labor Market



Source: Eurostat; based on LFS.

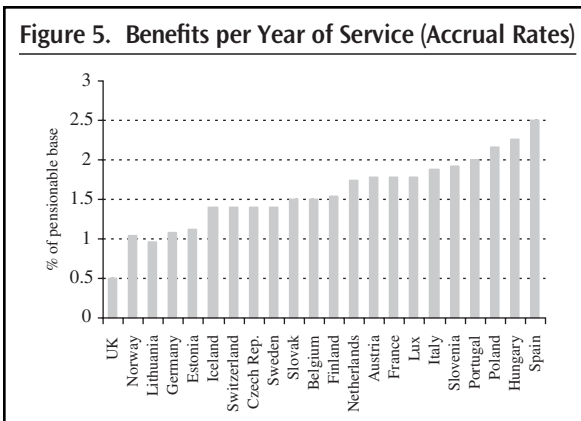
	Gross Replacement Rates			
	Year		Year	
Czech Rep.	48.6	1996	40.7	2005
Estonia	25.0	1995	28.8	2005
Hungary	57.9	1996	39.8	2005
Latvia	62.8	1994	33.1	2005
Lithuania	n.a.	—	30.9	2005
Poland (1)	55.4	1995	51.6	2004
Slovakia	42.5	1994	44.7	2005
Slovenia	68.7	1996	44.3	2005
Bulgaria	31.0	1995	42.9	2004
Romania	43.1	1994	27.6	2005
Croatia	48.6	1997	32.4	2005

(1) includes rural and urban pensions
Gross replacement rates calculated as a ratio of average old-age pension to average wage.
Source: For mid-1990s: Palacios Robert, Pallarès-Miralles Montserrat (2000). *International Patterns of Pension Provision*. Social Protection Discussion Paper No. 0009, World Bank. For mid-2005: CSOs, staff calculations.

Replacement Rates

Meanwhile, replacement rates have been declining in most of the EU10+1 countries, although they remain relatively high in some of them (Table 4). Many of the EU10+1 countries have taken measures to reduce gradually replacement rates under public pension schemes by strengthening the link between contributions and pensions in the first pillar, including through extending the period of an individual's earnings history that is taken into account when calculating the pension entitlement, limiting non-contributory periods, adjusting the formula used to calculate benefits, and linking indexation more closely to inflation rather than wage developments. Over the recent 10 years, gross replacement rates have risen in Bulgaria, Estonia, and Slovakia, while Poland, Slovenia, the Czech Republic, and Hungary still have replacement rates above the regional average. The trend towards less generous benefit rules has to some extent been countered, at the individual level, by the effects of longer careers (see Figure 5) and higher incomes.

Current replacement rates vary significantly across the region. The replacement rate is proportional to four parameters: life expectancy at the retirement age, career length, average income during career and internal rate of return in the PAYG system.⁴ As these parameters vary significantly between genders and countries (see Table 5), replacement rates also differ substantially. As far as differences between genders are concerned, not only is the life expectancy of women longer at age 60 in all EU10+1 countries (differences



Source: staff calculations. In the EU15 countries, calculations are based on a specific benefit formula; for EU8 the benefit formula when available and comparison of average benefit per year of service to average wage when the benefit formula is not available (e.g. Poland and Latvia).

4. Internal rate of return in PAYG depends on productivity and employment growth rates.

	Life Expectancy at Age of 60 (2003)		Average Exit Age from the Labor Force (2004)		Employment Rate 15–64 (2005)		Ratio of Estimated Female to Male Earned Income (HDR 2005)
	Men	Women	Men	Women	Men	Women	
Czech Rep.	17.3	21.4	61.3	58.9	73.3	56.3	0.64
Estonia	15.4*	21.3*	n.a.	n.a.	67.0	62.1	0.64
Hungary	15.9	20.8	60.3	60.7	63.1	51.0	0.62
Lithuania	16.2	21.9	n.a.	n.a.	66.1	59.4	0.68
Latvia	15.4	20.6	n.a.	n.a.	67.6	59.3	0.62
Poland	17.1	22.0	60.0	55.8	58.9	46.8	0.62
Slovenia	17.9	23.1	n.a.	n.a.	70.4	61.3	0.62
Slovakia	16.4	21.0	60.3	57.0	64.6	50.9	0.65
Bulgaria	16.1	19.9	62.1	59.5	60.0	51.7	0.67
Romania	16.3	20.0	60.4	58.8	63.7	51.5	0.58
Croatia	16.2**	20.7**	n.a.	n.a.	61.8***	47.8***	0.56

Note: Ratio of female to male earned income is estimated on the basis of data on the ratio of the female non-agricultural wage to the male non-agricultural wage, the female and male shares of the economically active population, the total female and male population and GDP per capita (PPP US\$).

Average exit age from labor force is weighted by the probability of withdrawal from the labor market.

*data for 2002; **data for 2000; ***data for 2004.

Source: Eurostat; UNDP, *Human Development Report 2005*.

vary from 3.7 years in Romania to 5.9 years in Estonia), but also their average career length is in most countries (except Hungary) shorter. Additionally, a significant gap between genders' income further lowers the expected replacement rates of women. The Visegrad countries, Bulgaria and Slovenia face the most urgent choice between lowering their replacement rates and increasing the tax burden to maintain current replacement rates.

Indexation Formulas

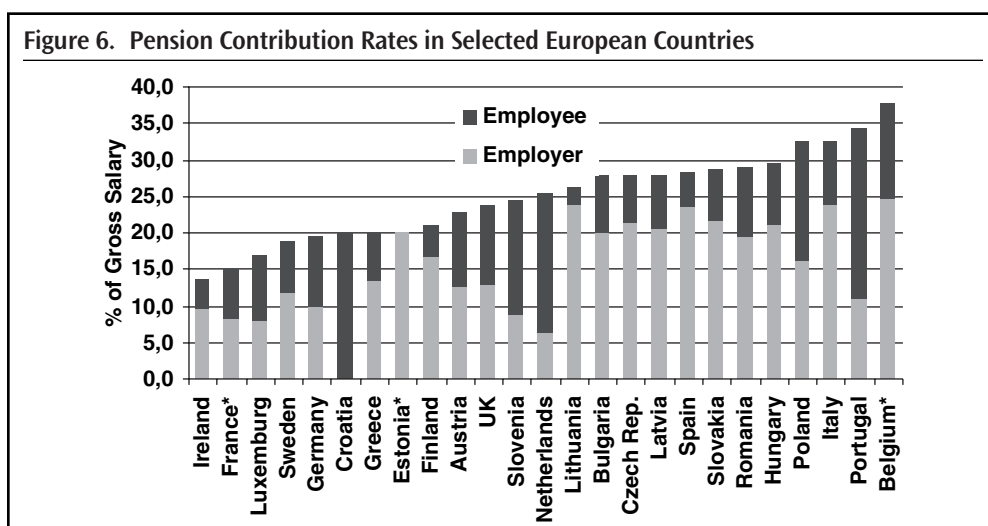
Most EU10+1 countries index post-retirement pensions to some combination of inflation and wage growth (Table 6). Indexation mechanisms are easier to compare across countries than benefits, although rules regarding indexation are changing as well. Indexation is a crucial parameter because it affects not only the newly retired but the entire stock of retirees, which in the case of the EU10+1 countries is both large and young. The feeling in these countries is often that the gain from expected rapid wage growth during the convergence process should be shared with those who did not have the opportunity to participate in the labor market and benefit directly. However, given the large stock of young pensioners, there is a major fiscal cost associated with sharing this gain across generations which undermines the sustainability of the pension systems. Therefore, some countries like Romania or Estonia have implemented pure inflation indexation. Poland, which adopted pure inflation indexation in

Country	Prices	Gross Earnings	Net Earnings	Mixed		Other
				Prices	Earnings	
Austria						Discretionary
Belgium	X					
Denmark						Discretionary
Finland				80	20	
France	X					
Germany			X			
Iceland						Min. of price or earnings
Ireland	X					
Italy	X					
Luxembourg	X					
Netherlands		X				No legal requirement
Spain	X					
Sweden						Gross earnings less growth norm of 1.6%
Switzerland				50	50	
United Kingdom	X					
Czech Republic*				100	33	
Estonia				50	50	
Hungary				50	50	
Latvia				50	50	
Lithuania**	X					Discretionary
Poland	X					Discretionary (from 2008 to be amended to mixed indexation)
Slovak Republic				50	50	
Slovenia			X			
Bulgaria				50	50	
Romania	X					
Croatia				50	50	

*For the earnings-related part of the pension, the indexation is a minimum. In practice, since 1995 when the new pension law was enacted, indexation has been 100 percent CPI and 60 percent of real wages.

**Mixed system: autonomous decision by the Government for the basic pension plus indexation to incomes for the supplementary part of the first tier.

Source: Whitehouse (2007); EU10+1—staff data; Palacios Robert, Pallarès-Miralles Montserrat (2000). *International Patterns of Pension Provision*. Social Protection Discussion Paper No. 0009, World Bank; National Strategy Reports on Adequate and Sustainable Pensions, 2005. Anusic, O'Keefe, Madzarevic-Sujster (2003), *Pension Reform in Croatia*; Social Protection Discussion Paper, World Bank. *The Pension System in Romania: The Challenges of Pursuing an Integrated Reform Strategy*. November 2004; Document of the World Bank.



Note: EU10+1 (2007); EU15 (2006).

Pension contribution rates include old-age, invalidity/disability, and survivors' pensions and other special contributions. In case of France and Estonia, the rate does not include invalidity pension (it is under overall contribution for sickness and maternity), while in case of Belgium the global contribution covers also employment injuries and occupational diseases and unemployment risk.

Luxemburg: plus state 8 percent; Ireland: Employer 8.5–12; Greece: for insured after 31.12.92, plus state 10 percent; Denmark: 223.25 DKK per month (ca 2 percent).

Source: MISSOC Database, *Adequate and sustainable pensions*. Joint report by the Commission and the Council, September 2003; National Strategy Reports on Adequate and Sustainable Pensions, 2005 and 2006.

2004, switched to combined price and (discretionary) earnings indexation in July 2005⁵. The share of earnings is a result of negotiations between government, entrepreneurs and trade unions. The EU15 countries are facing similar constraints. Germany, which moved from wage-based indexation to inflation indexation on a temporary basis several years ago, in 2005 suspended all adjustment in response to fiscal pressures. Similarly, after toying with wage indexation, Croatia has now returned to a mixed formula.

Contribution Rates

On the revenue side, pension contribution rates in most EU10+1 countries are quite high, especially in Bulgaria and Romania, compared with the EU15 and OECD (Figure 6). The combination of high contribution rates and low replacement rates (as in Bulgaria and Romania) is, of course, even more corrosive. High contribution rates not only discourage formal sector employment, but as wages in the EU10+1 converge toward EU15 levels will put increasing pressure on labor competitiveness.

5. From January 2008, the government plans to restore annual valorization instead of periodical adjustment on 1 March following the calendar year in which the CPI is at least 105 percent in comparison to the calendar year of the last adjustment. Moreover, indexation is supposed to be based at least in 1/5 on increase of wages in the national economy and in 4/5 on increase of consumer prices.

	Contribution Base	Minimum Contribution Base
Poland	Declared income	60% of average wage
Hungary	Taxable income	Minimum wage
Slovenia	Taxable income	Minimum wage
Czech Republic	Declared income	50% of average wage
Slovakia	Taxable income	50% of average monthly taxable income over the previous year
Lithuania 1) Working by licenses 2) other Self-employed	50% of basic pension Mixed (50% of basic pension plus 15% of declared income falling under the insurance category)	Proportional to the duration of the license (in days). 50% of basic pension.
Latvia	Declared income	Discretionary set by the Cabinet of Ministers (in 2006 LVL1.320 equal to €1.896)
Estonia	Taxable income	Amount of tax calculated from the rate established by the state in the annual state budget
Bulgaria	Taxable income	200% of minimum wage
Romania	Insured income	25% of average monthly wage
Croatia	Taxable income	40%–110% of average wage; varying by type of self-employed

Source: Fultz Elaine, Stanovnik Tine, eds. (2004). *Collection of Pension Contributions: Trends, Issues, and Problems in Central and Eastern Europe*. ILO 2004; Lithuania—State Social Insurance Fund Board of the Republic of Lithuania; *Social protection of the self-employed*, Report of European Commission, Directorate-General for Employment, Social Affairs and Equal Opportunities Unit E.4, 2006.

This problem affects in particular salaried workers. In contrast, the self-employed pay relatively low social security contributions reflecting more favorable contribution bases (Table 7). On average, the self-employed account for 10 percent of total employment in EU10+1 countries but provide only 6 percent of total social security contributions. This cross-subsidization by the salaried workers to self-employed is unfair, discourages contract employment, and undermines the financial viability of the pension systems (Table 8).

Implicit Individual Internal Rate of Return⁶ (IRR) of the Pension Systems

Expected internal rate of return of the pension system (IRR) is an important parameter for an individual facing a choice between entering the formal labor market or rather looking for

6. The internal rate of return is the interest rate corresponding to net present value of a series of payments amounting to zero. The MS Excel calculates it iteratively until the result is accurate within 0.000001 percent. The rate is changed until:

$$0 = \sum_{i=2}^N \frac{P_i}{(1 + \text{rate})^{(d_i - d_1) / 365}}$$

where: d_i = the i -th, or last, payment date. d_1 = the first payment date. P_i = the i -th, or last, payment.

	2003	2004	2003	2004	2003	2004
	Employers' Actual Social Contributions		Employees' Social Contributions		Social Contributions by Self- and Non-employed Persons	
% of Total SSC						
Czech Republic	69.7	69.2	24.4	24.2	5.9	6.7
Estonia	97.3	97.4	2.7	2.6	0.0	0.0
Latvia	73.3	71.1	22.4	24.8	4.3	4.1
Lithuania	90.0	89.8	8.7	9.0	1.3	1.3
Hungary	72.5	72.4	27.1	27.0	0.5	0.6
Poland	37.1	37.6	45.0	45.9	18.0	16.5
Slovenia	38.0	38.0	52.6	52.6	9.4	9.4
Slovakia	67.4	64.8	22.2	23.6	10.5	11.6
Bulgaria	73.0	72.0	19.0	19.0	5.0	5.0
Romania	65.0	n.a.	32.9	n.a.	2.1	n.a.
Croatia	n.a.	0.0	n.a.	92.0	n.a.	8.0
% of Total Employment	Employers		Employees		Self-employed	
Czech Republic	4.1	4.2	84.4	83.3	11.5	12.5
Estonia	2.7	2.9	92.4	91.4	4.8	5.7
Latvia	3.4	3.3	90.1	90.4	6.5	6.3
Lithuania	2.1	2.3	82.8	82.4	15.1	15.3
Hungary	5.3	5.2	86.7	87.1	8.0	7.7
Poland	4.0	4.0	76.0	76.9	20.0	19.0
Slovenia	3.7	3.3	88.3	89.6	8.0	7.1
Slovakia	2.4	2.8	91.4	90.3	6.1	6.9
Bulgaria	3.6	3.9	86.6	86.7	9.8	9.5
Romania	1.6	2.0	73.1	76.4	25.3	21.7
Croatia	5.0	5.3	78.8	78.6	16.2	16.1

Source: Eurostat; and staff calculations.

a job in the informal sector. Taking into account the current pension contribution rates and assuming future gross replacement rates as computed by Whitehouse (2007), we calculated implicit IRRs for a 20-year male worker earning a national average wage during his whole work career and exiting from the labor market at the normal age of retirement⁷. Having this data and using the appropriate earnings measures (mostly a lifetime average) we calculated the pension levels in the first year of retirement. For pensions in the subsequent years, we applied the indexation rules as presented in Table 6 (the other necessary data and assumptions are shown in Table 9).

Under this scenario, the IRRs vary strongly across the region, with the lowest and negative value in Romania (−2.33 percent), and the highest one in Hungary (1.15 percent),

7. We employed the same assumptions as in Whitehouse (2007), i.e. real wage growth of 2 percent and inflation of 2.5 percent per year.

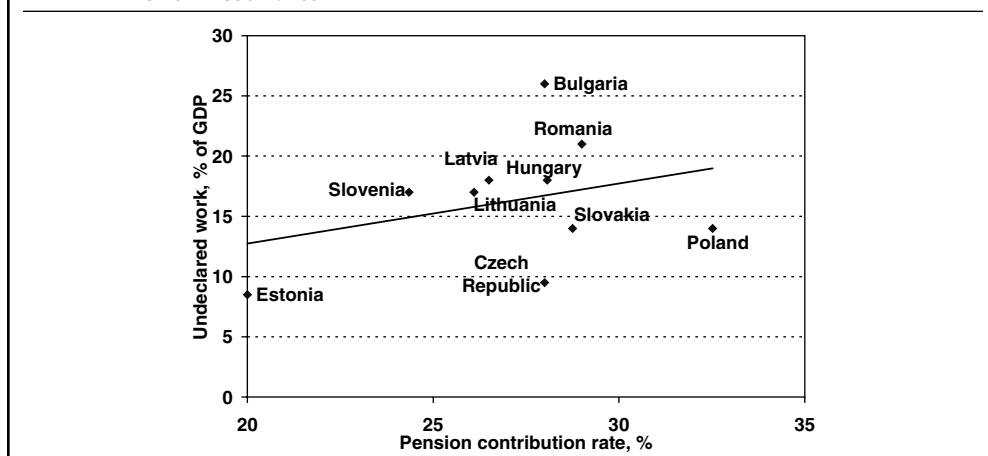
Table 9. Implicit Individual IRR of the Pension Systems in the EU10+1 Countries, 2006

Data	Czech Rep.	Estonia	Hungary	Latvia	Lithuania	Poland	Slovakia	Slovenia	Bulgaria	Romania	Croatia
Overall pension contribution rate, % (2006)	28,00	20,00	26,50	28,07	26,10	32,52	28,75	24,35	28,00	29,00	20,00
Normal pension age (men), years	63	63	62	62	63	65	62	65	63	63	65
Life expectancy at the retiring age (men), years	15	14	15	14	14	14	15	14	14	14	13
Anticipated replacement rates (Whitehouse, 2007)	44,4%	51,6%	75,4%	58,2%	53,4%	56,9%	48,6%	44,3%	49,7%	43,7%	38,4%
Assumptions											
Real earnings growth (per year)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Price inflation (per year)	2,5%	2,5%	2,5%	2,5%	2,5%	2,5%	2,5%	2,5%	2,5%	2,5%	2,5%
Real rate of return on defined-contribution pensions	3,5%	3,5%	3,5%	3,5%	3,5%	3,5%	3,5%	3,5%	3,5%	3,5%	3,5%
IRR	-0,48%	-0,04%	1,15%	-0,61%	-1,10%	-1,50%	-0,90%	-0,52%	-1,28%	-2,33%	-1,35%

Note: The overall contribution rates include old-age, invalidity/disability, and survivors' pensions and other special contributions. In case of Estonia, IRR is overestimated because the overall pension contribution rate does not include invalidity pension (it is under overall contribution for sickness and maternity).

Source: MISSOC Database, CSOs, Eurostat; Whitehouse (2007), and staff calculations.

Figure 7. Pension Contribution Rates and Shares of Undeclared Work in the EU10+1 Countries



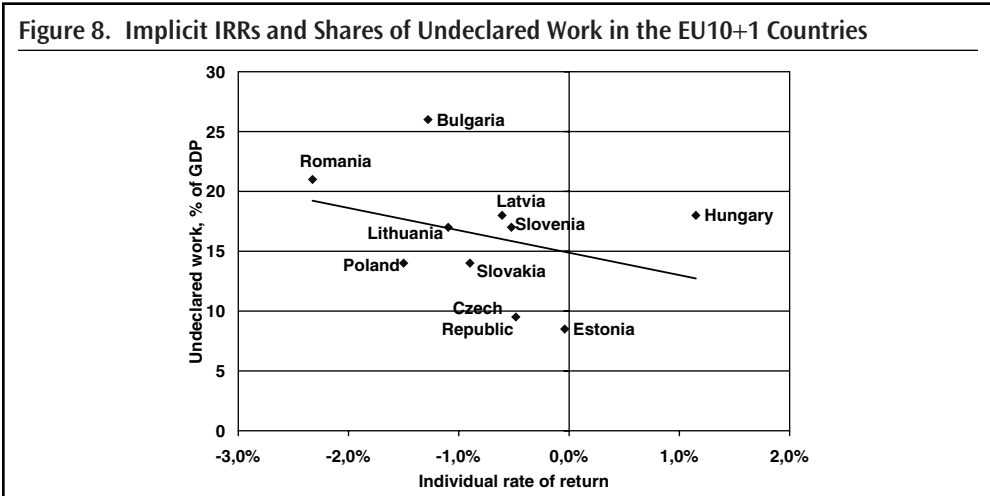
Source: EC (2004) for the shares of undeclared work (Croatia was not covered); CSOs; staff calculations.

which is the only positive IRR in the region. However, Hungary offers the highest anticipated replacement rate (75 percent) at a cost or a relatively high contribution rate (26.5 percent⁸). The IRR turned out negative but close to zero in Estonia, but it is obviously overestimated because the overall pension contribution rate does not include invalidity pension (it is under overall contribution for sickness and maternity). A negative IRR means that the investment of a “representative” individual in the pension system generates a loss, i.e. she/he puts into the system more than she/he gets out of it (taking into account the value of money in time). This result is particularly visible in Romania, as it has one of the highest pension contribution rates in the region, in tandem with one of the lowest replacement rates.⁹

The results above indicate that in several countries it makes little sense for an individual to participate in the formal labor market, because the pension insurance either generates losses (the highest in Romania, Croatia and Lithuania) or the expected returns are close to the break-even point (Estonia, Latvia, Bulgaria). This hypothesis is confirmed by the positive correlation between pension contribution rates and estimated share of undeclared work in the economy (EC, 2004) and the negative relationship between the individual IRRs and shares of undeclared work in the EU10+1 countries (Figure 7 and Figure 8). These facts suggest a quite rational behavior of labor market participants—they refrain from legal employment because it simply does not promise them adequate returns. It also calls for a strengthening the link between pension contribution rates and future replacement rates.

8. From 2007 the overall pension contribution amounts to 29.5 percent.

9. The anticipated replacement rate of 43.7 percent was not taken from Whitehouse (2007), because Romania was not covered by this study, but from internal calculations of the World Bank staff.



Source: EC (2004) for the shares of undeclared work (Croatia was not covered); CSOs; staff calculations.

Financial Solution of PAYG Systems

The combination of these factors has meant that the financial situation of the PAYG systems in the EU10+1 countries has generally not improved in recent years, in some countries related to the shift of part of pension contributions to a second pension pillar (see also below). Most EU10+1 pension insurance systems (the total of the basic old-age insurance fund and the basic invalidity insurance fund) have been in deficit since the mid-1990s. During the period 2000–2004, pension insurance systems were in deficit in every year in Poland, Hungary, Slovakia, Croatia and Bulgaria although to varying degrees (Table 10).

These deficits are due only in part to the introduction of new funded pillars. In Poland, a high and growing deficit in the Social Insurance Fund reflects a combination of factors, operating sometimes in opposite directions, including diversion of contributions to the second pillar since 1999, decline in the number of insured (in 2003, the number of insured was one of the lowest in the last decade), stabilization of the number of people receiving old-age and disability pensions at a high level, and an increase in the gross replacement rate to 56.7 percent in 2004, the highest level since 1998. Moreover, the growing deficit includes a big gap between revenues and expenditures of the pension scheme for farmers, whose pension scheme is strongly financed from general taxes (Table 11). Similarly, Hungary has been affected by the loss of revenues diverted to the mandatory private pension schemes, but in addition to this by a reduction in overall contribution rates (PAYG plus private) by 4.5 percentage points.

In contrast, in the Baltic countries, pension funds have been in surplus despite the introduction of second pillars reflecting rapid economic growth and buoyant social contribution revenues, better administration and control, and an increase in formal labor market participation. In Estonia, total PAYG reserves amounted to 1.4 percent of GDP at end-2004.

Meanwhile, in countries that did not introduce second pension pillars, the underlying pension finances were different. In the Czech Republic, parametric changes to the basic

Table 10. Social Insurance Balance,[†] Percent of GDP

	Social Insurance Balance					
	2000	2001	2002	2003	2004	2005
Czech Rep.	-0.8	-0.7	-0.8	-0.6	0.3	n.a.
Estonia	-0.3	-0.2	-0.3	-0.3	-0.3	-0.2
Hungary	-0.5	-0.9	-1.6	-1.4	-1.7	n.a.
Lithuania	-0.4	0.0	-0.4	0.3	0.4	n.a.
Latvia	-0.6	-0.2	0.0	0.3	0.7	0.5
Poland	-5.4	-6.2	-6.7	-6.8	-5.2	-4.9
Slovenia	-0.5	-0.2	-0.1	-0.1	-0.1	0.8
Slovakia	-0.2	-0.2	-0.2	-0.2	-0.5	n.a.
Bulgaria	-3.2	-4.4	-3.2	-2.6	-2.4	n.a.
Romania	-0.6	-0.6	-0.7	0.1	n.a.	n.a.
Croatia	-4.3	-5.4	-5.8	-5.2	-5.0	-4.7

[†]Czech Rep.—balance of the pension insurance system; Estonia—state pension insurance balance (contribution revenue—total pension expenditure); Hungary—balance of social security fund; Lithuania—balance of state social insurance fund; Latvia—state social insurance fund balance; Poland—balance of social insurance fund—FUS (contribution revenue—expenses on financial benefits from SIF) together with balance of social insurance fund for farmers (KRUS); Slovenia—balance of mandatory pension and disability insurance fund (revenue from contribution—mandatory expenditure); Slovakia—balance of pension insurance (total of the balance of basic old-age insurance fund and basic invalidity insurance fund); Bulgaria—balance of social security fund; Romania—balance of pension system; Croatia—balance of the pension insurance system.

Source: Social Insurance Agencies.

Table 11. Financial Indicators of Agricultural Social Insurance Fund (KRUS) in Poland in 2000–05

	Expenditures as % of GDP	Subsidy as % of GDP	Subsidy as % of Expenditures
2000	1.9	1.8	93.3
2001	2.0	1.9	94.9
2002	2.0	1.9	94.3
2003	1.9	1.8	93.1
2004	1.8	1.6	91.9
2005	1.7	1.5	87.2

Source: "Poland: Reform Options for the Agricultural Social Insurance Fund," Policy Note, The World Bank, June 2006.

pension insurance scheme have eliminated the deficit for the time being.¹⁰ In Slovenia and Romania, the smaller deficits or even surpluses have been obtained in more recent years on the back of relatively higher social contribution rates that have aggravated prevailing tax wedges on labor.

Experience with Second Pillar

Mandatory second pillars are only beginning to mature and it is still early to assess whether they will fulfill the hopes that have been placed in them and whether the benefits they bring are commensurate with the transition costs associated with the reforms.

Investment Portfolio

The second pillar pension funds are administered by private asset management companies. In essence, the second pillar is an individual savings scheme, where the size of the final pension depends on total contributions over the career and the rate of return of the pension fund. In 2005, *private* pension fund assets ranged from 8.7 percent of GDP in Poland to only 0.9 percent of GDP in Latvia. Investment portfolio managers have invested most of the entrusted funds in domestic government bonds and shares of listed companies in accordance with prevailing regulations (Table 12). In Poland, these two categories constituted more than 90 percent of the Open Pension Fund assets in mid-2005. The smaller EU10+1 countries have invested a larger share of savings abroad, because the domestic economies do not provide sufficient opportunity for risk diversion (Estonia and Lithuania have allowed foreign investment up to 90 percent and 81 percent, respectively). Typically, countries have initially invested a relatively large share of funds in government bonds, gradually moving to other financial instruments. Because most of the EU10+1 reforms are less than 10 years old, current asset allocations should not be viewed as evidence of either failure or success in achieving capital market development but rather as a milestone of where individual countries currently stand.

Transition Costs

The losses in revenues to the public system are directly proportional to three parameters: the percentage of contributors who joined the new system, the percentage of contributions diverted to the second pillar, and the proportion of GDP represented by the covered wage bill. Thus, Slovakia may have only around half as many switchers (in percent of working age population) as Latvia, but its switching costs *per annum* are higher because in Slovakia nine percentage points of the wage bill are being diverted to the private pension funds while in Latvia it is only two percentage points (Table 13).

10. Main changes included extension of statutory retirement ages, tighter early retirement eligibility criteria, reduction in the non-contributory period related to studies, and a gradual increase of the minimum assessment base for the determination of pension insurance contributions for self-employed persons.

Table 12. Asset Allocation of Private Pension Funds, 2004
(percent)

Country	Total Assets				Foreign Investment (% of total assets)
	Equities	Debt Securities	Bank Deposits and Cash	Other Investment	
Czech Rep.	5.70	81.09	9.39	3.82	36.70
Estonia	41.00	53.00	4.00	2.00	90.00
Hungary	16.39	75.02	0.83	7.76	7.90
Latvia	15.47	48.58	33.91	2.04	11.40
Lithuania	31.54	64.45	3.94	0.06	81.00
Poland	33.72	60.81	4.95	0.52	1.74
Slovakia	—	—	—	—	—
Slovenia*	4.30	74.55	21.15	—	14.08
Bulgaria**	8.12	74.00	16.48	1.4	1.24
Romania	—	—	—	—	—
Croatia	15.4	77.64	3.84	3.12	9.97

*) 2003; **) 2005.

Source: Pensions Supervision Authorities of respective countries.

In practice, it is only in Poland, Hungary and Croatia that the diversion of resources from the PAYG pillar has reached any substantial magnitude (8.6, 5.2, and 5.6 percent of GDP, respectively). Even in those cases, most of the revenue losses have been financed by the issuance of government securities to the new pension funds, thereby limiting the new drain in the public sector (to 3.2, 1.8, and 1.5 percent of GDP, respectively for the above countries). Loss of revenues to public PAYG system (state budget) is equal to the ratio of cumulated assets held by pension funds. Net loss to the public PAYG system is equal to ratio of assets held in non-governmental financial instruments (in Table 13 we calculate both measures).

The remaining transition costs have been financed in a number of different ways. In Estonia, the pension system reforms were sufficient to keep the PAYG system in surplus. Slovakia financed its initial transition costs through an increase in the contribution rate by 0.75 percent and through privatization revenues. Privatization revenues were also used to cover some of the transition costs in the case of Poland. Otherwise, transition costs have been financed mainly through borrowing.

Administration Fees

High administration fees in private pension funds have tended to depress the returns to contributors (Table 14). Most EU10+1 countries have regulated maximum permissible administration fees, and these are generally applied by funds in practice as there has been little real competition so far between funds.

Table 13. Switching to the Second Pillar and Revenue Losses to the PAYG System, 2005

Membership in Funded Pillar								
		Funded Pillar's Existence Period	Number of People in Funded Pillar in 2005 (thousands)	Percentage of Population (age 20–64)	Loss in Revenues to Public System		Net Loss to Public System	
					(% of GDP 2005)	(% of average GDP from the beginning of the reform)	(% of GDP 2005)	(% of average GDP from the beginning of the reform)
Estonia	Mandatory	2002–2005	481.3	65.8	1.52	1.82	1.44	1.72
	Voluntary		15.5	2.1				
Hungary	Mandatory	1998–2005	2500.0	39.7	5.17	7.08	1.76	2.41
	Voluntary		1300.0	20.6				
Latvia	Mandatory	2001–2005	803.5	57.4	0.92	1.22	0.60	0.80
	Voluntary		67.9	4.9				
Lithuania	Mandatory	2004–2005	686.0	33.5	0.58	0.62	0.53	0.56
	Voluntary		13.0	0.6				
Poland	Mandatory	1999–2005	11979.5	50.6	8.65	10.34	3.25	3.88
	Voluntary		n.a.	n.a.				
Slovak Republic	Mandatory	2005	1114.5	32.7	0.61	0.61	0.55	0.55
	Voluntary		505.6	14.8				
Czech Republic	Mandatory	—	—	—	—	—	—	—
	Voluntary		2963.7	45.0				
Slovenia	Mandatory	—	—	—	—	—	—	—
	Voluntary		161.1	12.6				

(continued)

Membership in Funded Pillar								
		Funded Pillar's Existence Period	Number of People in Funded Pillar in 2005 (thousands)	Percentage of Population (age 20–64)	Loss in Revenues to Public System		Net Loss to Public System	
					(% of GDP 2005)	(% of average GDP from the beginning of the reform)	(% of GDP 2005)	(% of average GDP from the beginning of the reform)
Bulgaria	Mandatory	2002–2005	2422.1	50.1	1.63	1.86	0.73	0.83
	Voluntary		549.9	11.4				
Romania	Mandatory	—	—	—	—	—	—	—
	Voluntary		—	—				
Croatia	Mandatory	2002–2005	1243.3	46.0	5.61	6.36	1.15	1.20
	Voluntary		47.6	1.8				

Note: Czech Republic (2004).

Source: Pensions Supervision Authorities of respective countries.

Table 14. Regulatory Administrative Charges to Second and Third Pillar Pension Funds, 2005

	Up-front Fee (% of contributions)	Management Fee (% of assets)	Returns Fee (% of returns)	Exit Fee (% of assets)
Czech Rep.	7.00	1.00		
Estonia	1.60	1.50		1.00
Hungary	5.00–6.00	0.60–0.70		0.20
Latvia		1.10		
Lithuania	10.00	1.00		a
Poland	7.00	0.54	b	c
Slovakia		0.84–0.96		
Slovenia	6.00	1.50		1.00
Bulgaria	5.00	1.00		d
Romania	3.50		10.00	
Croatia	0.80	1.20		0.00–0.80 ^e

Note: The table denotes maximum fees permissible under the law (except from Estonia). Actual fee levels may vary depending on annual ceilings and business decisions of pension companies.

a. after year 2006 mobility fee is 0.2–4.0 percent of assets;

b. the rate of return fee in Poland (called premium account fee) depends on relative fund performance and is subject to a maximum of 0.06 percent of assets per annum;

c. applicable to members transferring assets to other pension funds before 2 years of membership: 160 or 80 PLN (depending on the membership period);

d. the retirement insurance company may charge an additional fee not exceeding BGN 20 for each transfer of the resources accrued on the individual account from one fund to another;

e. every insured person will be allowed to join another mandatory fund free of charge after three years of membership of a particular fund have expired, whereas a fee of 0.8 percent determined for switching in the first year; 0.4 percent in the second and 0.2 percent in the third year.

Czech Rep. (2003); Estonia: actual fees calculated as market averages in 2004; up-front fee and exit fee are calculated from the net asset value of the unit; management fee is calculated from the total assets of a pension fund; Poland: the up-front fee is scheduled to fall to a maximum of 3.5 percent by 2014; Lithuania: actual fees amount to 1–2 percent of contributions and 1 percent of assets.

Source: Presentations from *Pension Restructuring in Central and Eastern Europe and Latin America: Recent Events and Trends*. Sub-regional tripartite seminar of the new EU member states of EU and accession countries, ILO, 9–10 December 2004, Budapest.

Returns

The performance of private (second pillar) pension funds in the EU10+1 countries has been mixed so far (Table 15). In Poland, Bulgaria and Croatia, pension funds have generated relatively high returns, while returns have been disappointing in the Czech Republic and Hungary (an average annual real net rate of return of only 1.1 percent over the period 1996–2004 in the Czech Republic and 1.5 percent in Hungary since the inception of the new system; unweighted averages have been somewhat higher reflecting the fact that larger funds have tended to show a poorer performance).

Czech Republic	non-weighted, net	1.1	1996–2004
Estonia	internal real rate of return	2.6	2002–2004
Hungary	non-weighted, net	2.9	1998–2004
	weighted, net	1.5	
Latvia	internal real rate of return	1.7	2001–2004
Poland	weighted	4.8	1999–2004
Slovakia	non-weighted	1.8	2005
Slovenia	non-weighted	0.9	2003–2004
Bulgaria	weighted	5.9	2002–2004
Croatia	weighted	6.6	2002–2004

Note: Rates of returns used here are real rates of return (nominal levels adjusted by the inflation rate; figures are not harmonized and may therefore not be comparable across countries. 3. pillar in the Czech Republic; 2. pillar in Hungary and Poland.

*) weighted = weighted by size of assets; net = net of asset management fees.

Source: Mora Marek (2005). *Pension reform in the Czech Republic: ageing rapidly, reforming slowly*. Country Focus vol. 2 (7) ECFIN April 2005; Orbán Gábor, Palotai Dániel (2005). *The impact of the fully-funded pillar on the Hungarian pension system*. Mimeo. A final version is forthcoming later this year; KNUIFE; Presentations from *Pension Restructuring in Central and Eastern Europe and Latin America: Recent Events and Trends*. Sub-regional tripartite seminar of the new EU member states of EU and accession countries, ILO, 9–10 December 2004, Budapest; Pensions Supervision Authorities of respective countries.

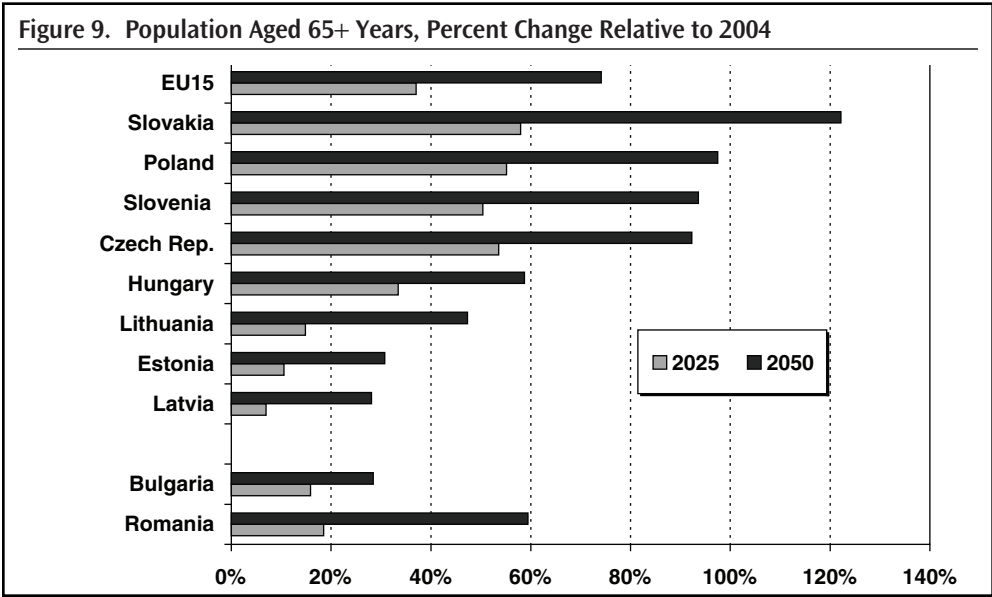
Medium-Long Term Sustainability of Pension Schemes

Whatever the successes of these early efforts, considerable challenges remain. Looking ahead, the EU10+1 countries will face a significant acceleration of demographic ageing. Three major forces drive the ageing process: increasing life expectancy, low fertility rates, and finally the baby-boom generation reaching retirement age. All these factors, even in countries where the system is currently fiscally balanced, will produce a major financial challenge for pension systems over the coming decades when the number of pensioners will rapidly increase and the size of the working-age population diminish. Although net inward migration may ease the ageing process, the magnitude of potential net inflows of workers in the region is likely to be limited in view of the sensitivities involved.

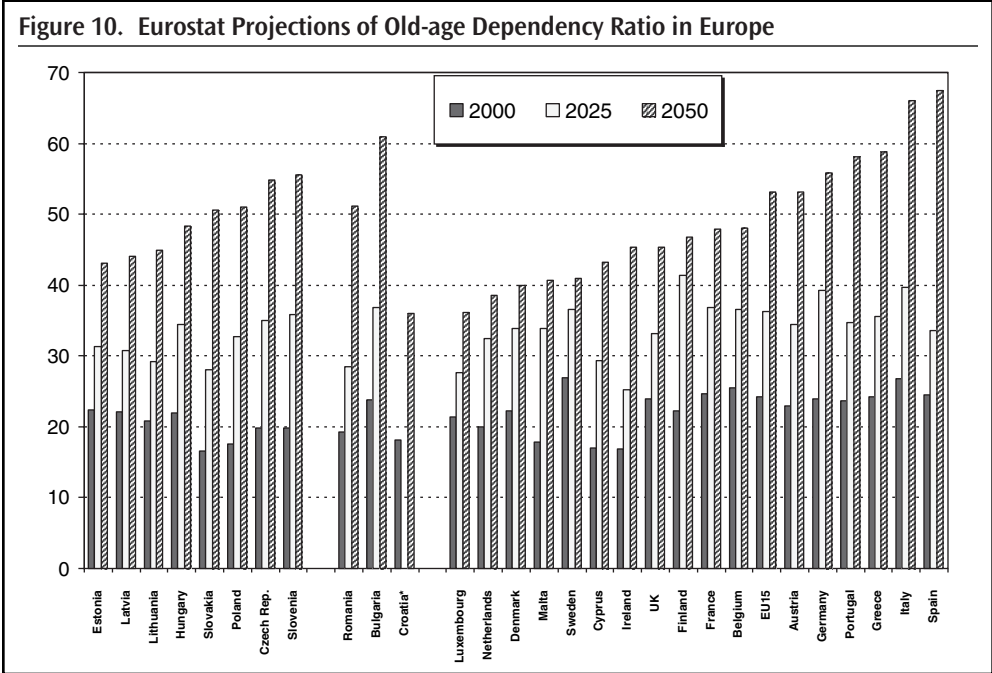
The population of people age 65 and above is projected to double by 2050 in several EU10+1 countries (Figure 9). Slovakia, Slovenia, Poland, and the Czech Republic would all see more or less a doubling of the number of people over the age of 65 by the middle of the century, while old-age population growth would be more modest in Hungary, Romania and the Baltic countries. Sizeable increases in this age group are projected already for 2025: in the case of the first mentioned group of countries, the group would swell by around 60 percent.

As a result, the old-age dependency ratio (number of people aged 65 years and above as a percentage of people aged 15–64 years) would rise strongly in all EU10+1 countries (Figure 10). The old-age dependency ratio is projected to rise by a factor 2–2.5 in the EU10+1 countries, with the largest increases in Bulgaria, Slovenia, the Czech Republic and Poland. The process of population aging (as measured by the dependency ratio) would peak approximately 20 years later in the EU10+1 than in most other EU countries.

Prospective demographic changes and population aging have raised important concerns about the sustainability of public pension systems in the EU10+1 (as in the EU in general).



Source: Eurostat (population projections)—Baseline scenario. Accessed from Eurostat’s homepage June 26, 2006.



Notes: The second bar for Croatia refers to 2040 and is based on Bank staff projections. Source: Eurostat.¹¹

11. The Eurostat projections of dependency ratios are based on assumptions concerning fertility, mortality, and net migration. Mortality and migration factor are fixed at “normal” levels, while alternative fertility assumptions are analyzed. We present the baseline scenario for total fertility.

In analyzing sustainability, it is useful to decompose pension spending (as a share of GDP) into the following four factors (Equation 1 below):

- A dependency or population-ageing effect, reflecting changes in the ratio of those 65 years and above to working age population (65+/15–64);
- An employment effect, driven by changes in the ratio of employed to population aged 15–64;
- An eligibility effect, corresponding to changes in the share of those receiving benefits in the 65+ age group;
- A benefit effect, related to changes in the average pension benefit relative to GDP per worker.

The last two factors measure the changing “generosity” of the pension system.

Equation 1

$$\frac{\text{Pension EXP}}{\text{GDP}} = (\text{dependency ratio}) \times \left(\frac{1}{\text{employment rate}} \right) \times \left(\frac{\text{pensioners}}{\text{population 65+}} \right) \times \left(\frac{\text{average pension benefit}}{\text{average productivity}} \right)$$

Note: Productivity is nominal GDP per employed.

Source: based on OECD Economic Survey Spain, 2005.

Table 16 extrapolates the impact of demographic projections (projected dependency ratios, discussed above) on pension expenditure assuming the other three factors would remain unchanged. The results of this very mechanical exercise illustrate the magnitude of the challenges ahead: “other things being equal”, pension spending would rise by 4.1 to 14 points of GDP between 2004 and 2050. The situation would be particularly alarming in the Czech Republic, Poland, Slovak Republic, Slovenia, and Bulgaria, where pension spending would inch towards 20 percent of GDP.

While the results of such a simulation need to be treated with caution (they are very mechanical exercises), they suggest that population ageing and increased dependency ratios are the key factors driving pension spending in the future.

As noted above, countries have not remained inactive towards this challenge. Indeed, many have taken measures that affect the parameters of the equation. Taking these measures into account, the long-term sustainability of public finances in general and public pension systems in particular was analyzed in the 2005 updates of convergence programs for the EU8 countries (Table 17).¹² These projections confirm that demographic shift will put pressure on public finances by driving up ageing-related expenditure over the coming decades (“current policies” scenarios). However, there are large differences between countries. Estonia, Poland and Latvia are the only EU8 countries where the

12. All calculations were made by experts in national administrations and based on a coordinated approach, including the assumption of no change in the pension systems, taking into account last available data and based on latest national or Eurostat demographic assumptions. However, despite a fair degree of consistency across the EU Member States, the projections need to be interpreted with caution as they are not completely comparable across countries because of differences in coverage.

Table 16. Old-age Pension Expenditure: Current Situation and Prospects

	Dependency Ratio		Employment Rate		Number of Pensioners/65+		Average Pension/Productivity		Old-age Pension Expenditures/GDP	
	2004	2050	2004	2050	2004	2050	2004	2050	2004	2050
Czech Rep.	19.7	54.8	64.2	64.2	1.3	1.3	14.7	14.7	6.0	16.8
Estonia	23.8	43.1	63.0	63.0	1.3	1.3	10.0	10.0	5.1	9.2
Hungary	22.6	48.3	56.8	56.8	1.0	1.0	13.3	13.3	5.5	11.8
Latvia	23.6	44.1	62.3	62.3	1.3	1.3	11.8	11.8	5.7	10.7
Lithuania	22.3	44.9	61.2	61.2	1.2	1.2	10.2	10.2	4.3	8.7
Poland	18.6	51.0	51.7	51.7	0.8	0.8	23.1	23.1	6.4	17.5
Slovakia	16.3	50.6	57.0	57.0	1.3	1.3	13.8	13.8	5.3	16.4
Slovenia	21.4	55.6	65.3	65.3	1.0	1.0	21.6	21.6	7.3	19.1
Bulgaria	23.8	60.9	54.2	54.2	1.7	1.7	11.3	11.3	8.6	22.1
Romania	19.3	51.1	57.7	57.7	1.5	1.5	8.5	8.5	4.2	11.2
Croatia*	24.0	36.0	54.7	54.7	0.8	0.8	14.7	14.7	5.0	7.5

Note: Productivity is nominal GDP per employed. * Projections for Croatia made for 2040.

The ratios of old-age pension expenditures to GDP in 2004 were calculated based on Equation 1 and may differ from actual figures.

Source: Eurostat; CSOs; and staff calculations.

Table 17. Long-term Sustainability of Public Finances

	Age Related Expenditure						Revenues					
	Pensions			Healthcare			Total Revenues			Of Which: From Pension Contributions		
	2005	2020	2050	2005	2020	2050	2005	2020	2050	2005	2020	2050
Czech Rep.	7.7	7.4	12.8	6.6	6.9	9.1	41.1	40.9	40.9	8.9	8.9	8.9
Hungary	9.8	9.6	12.6	n.a.	n.a.	n.a.	45.3	42.4	42.4	7.6	6.2	4.6
Estonia	6.2	4.6	3.7	4.8	4.6	4.4	41.2	36.5	37.9	11.5	11.0	10.5
Lithuania	5.7	6.0	7.7	4.2	4.5	5.0	33.5	33.0	33.0	6.7	6.1	6.1
Poland	7.9	4.5	n.a.	4.6	3.5	3.5	n.a.	n.a.	42.5	9.3	10.1	10.1
Latvia	6.4	5	8.3	5.2	5.4	5.9	35.3	36.5	36.2	7.9	5.6	5.4
Slovenia	11.2	12.5	18.5	6.7	7.3	9.6	44.9	n.a.	n.a.	9.9	10.9	10.9
Slovakia	7.2	5.3	7	4.8	5.1	6.1	37.3	36.4	36.4	13.1	12.8	12.8

(continued)

Table 17. Long-term Sustainability of Public Finances (*Continued*)

	Assumptions											
	Participation Rate (aged 20–64)			Unemployment Rate			Labour Productivity Growth			Real GDP Growth		
	2005	2020	2050	2005	2020	2050	2005	2020	2050	2005	2020	2050
Czech Rep.	76.4	81.9	79.8	7.9	6.5	6.5	3.8	3.0	1.7	4.8	2.5	0.8
Hungary	55.4	59.5	59.5	7.3	6.0	6.0	4.0	3.7	2.9	4.2	3.5	2.5
Estonia	78.7	83.3	81.7	8.9	7.0	7.0	5.5	3.6	1.7	6.3	2.7	0.6
Lithuania	79.7	84.4	83.0	11.2	7.0	7.0	6.3	3.6	1.7	6.7	3.0	0.4
Poland	71.4	76.7	76.1	18.2	9.9	7.0	4.2	3.1	2.7	3.3	3.2	0.4
Latvia	78.2	84.1	82.0	9.1	7.0	7.0	6.5	4.0	1.1	8.1	2.9	0.4
Slovenia*	68.8	73.6	73.5	6.0	5.4	5.4	3.5	3.0	1.7	3.4	2.4	1.1
Slovakia	80.7	78.2	78.0	18.1	9.7	7.0	5.0	3.4	2.3	5.0	3.3	1.5

Notes:

<2005 = Estonia, Hungary, and Lithuania (2000); Czech Rep. (2003); Poland (2004); Latvia and Slovenia (2005).

Czech Rep.: only old-age pension (the total pension ratio amounts to 8.6 percent of GDP in 2003, 8.8 percent of GDP in 2020, and 15.2 percent of GDP in 2050).

Hungary: pension expenditure of the mandatory pension insurance system including expenditure financed by the Health Insurance Fund is expected to drop from 9.3 percent of GDP in 2003 to 8.8 percent of GDP in 2050.

Poland: retirement pensions (old age pension without disability and survivor).

Estonia, Latvia: excluding contributions to second pillar.

Lithuania: social contributions for old age pensions.

Slovenia: revenue from pension (and disability) contributions.

Source: Convergence Programs—Updates December 2005; National Strategy Reports on Adequate and Sustainable Pensions, 2005.

share of pension spending in GDP is projected to decline despite rising old-age dependency ratios. Relatively stable pension expenditure levels are projected for Slovakia and Hungary, while a moderate increase is expected for Lithuania. In contrast, pension spending is projected to increase by about 5 percentage points of GDP in Slovenia and the Czech Republic, with spending on pensions in the former country potentially reaching 18 percent of GDP in 2050.

The different outcomes for pension spending between our illustrative scenario above (Table 16) and these projections reflect alternative assumptions about the other three sub-components of Equation 1 above. Almost all EU10+1 countries assume increasing employment ratios as a result of assumed higher female participation rates, lower unemployment or planned increases in average retirement ages. These effects all reduce the cost of pension systems, with the effect stronger in countries with currently low participation rates (Hungary and Poland) and/or high unemployment rates (Poland, Lithuania, and Slovakia). The projections above also imply reduced generosity of pension systems in line with recent reforms, although it is not entirely clear from the projections to what extent this reflects the eligibility or the benefit effect.

Nevertheless, the official projections are likely to imply declining replacement rates from the PAYG systems. Assuming, again for illustrative purposes, unchanged eligibility, we can deduct the implied change in average benefits relative to productivity (or replacement rates assuming that wages grow in line with productivity) using Equation 1 above (Table 18). These calculations for the EU10+1 countries show that substantial, sometimes drastic, declines in replacement rates would be needed in all countries (except Lithuania) if official targets were to be met. The prospects are particularly stark in Estonia, Bulgaria and Romania where replacement rates would need to be cut by half, to very low levels indeed.

These simulations imply that important reforms would be undertaken aimed at reducing benefit rates. Reforms undertaken include shifts in pension indexation from wages toward prices (Estonia and partly Poland), and shifts toward greater linkage between contributions and benefits, including actuarial adjustment for increasing life expectancy. In Hungary, Latvia, and Slovenia—the only EU10+1 countries that provide detailed information on pension projections—lower benefits are projected to save about 2 percent of GDP by 2050.

Lower replacement rates from the PAYG system may be at least partly offset by pension entitlements from the private pension funds, although not in all cases likely to be sufficient to preserve existing replacement rates (Table 19 and Figures 11 and 12). This assumes of course that private pension funds generate sufficient returns to contributors. As seen above, the recent experience suggests that this is not yet certain.

Table 18. Implied Replacement Rates (Illustrative)

	Dependency Ratio		Employment Rate		Number of Pensioners/65+		Average Pension/Productivity		Old-Age Pension Expenditures/GDP	
	2004	2050	2004	2050	2004	2050	2004	2050	2004	2050
Czech Rep.	19.7	54.8	64.2	64.2	1.3	1.3	14.7	11.2	6.0	12.8
Estonia	23.8	43.1	63.0	63.0	1.3	1.3	10.0	4.0	5.1	3.7
Hungary	22.6	48.3	56.8	56.8	1.0	1.0	13.3	8.5	5.5	7.6
Latvia	23.6	44.1	62.3	62.3	1.3	1.3	11.8	9.1	5.7	8.3
Lithuania	22.3	44.9	61.2	61.2	1.2	1.2	10.2	10.2	4.3	8.7
Poland	18.6	51.0	51.7	51.7	0.8	0.8	23.1	13.4	6.4	4.5
Slovakia	16.3	50.6	57.0	57.0	1.3	1.3	13.8	7.7	5.3	7.0
Slovenia	21.4	55.6	65.3	65.3	1.0	1.0	21.6	20.9	7.3	18.5
Bulgaria	23.8	60.9	54.2	54.2	1.7	1.7	11.3	4.4	8.6	8.6
Romania	19.3	51.1	57.7	57.7	1.5	1.5	8.5	3.2	4.2	4.2
Croatia*	24.0	36.0	54.7	54.7	0.8	0.8	14.7	9.8	5.0	5.0

Note: Projections of old age pension expenditures in 2050 for the EU8 were taken from their Convergence Programs. For Bulgaria, Romania and Croatia the projections were based on the assumption of unchanged ratio of old-age pension expenditures to GDP in 2050 as compared to 2004.

Source: Eurostat; CSOs; and staff calculations.

	Total Net Replacement Rate				Total Gross Replacement Rate			
	At 100% Average Earnings		Rising Earnings from 100% to 200% of Average		At 100% Average Earnings		Rising Earnings from 100% to 200% of Average	
	2005	2050	2005	2050	2005	2050	2005	2050
	2005	2050	2005	2050	2005	2050	2005	2050
Czech Rep.	79.3	70.0	48.8	42.6	60.7	53.5	35.2	30.7
Estonia	41.4	43.0	23.4*	31.3*	34.0	35.7	18.7*	25.1*
Hungary	101.7	100.4	91.4	79.7	65.6	79.0	50.7	59.3
Latvia	77.9**	71.8			60.5**	54.5		
Lithuania	41.0***	50.0			31.3***	42.0		
Poland	77.7	43.9	73.2	33.0	63.2	35.7	59.5	26.8
Slovakia	63.1	63.7	51.5	50.6	49.4	50.2	38.2	37.7
	I Pillar Gross Replacement Rate				II Pillar Gross Replacement Rate			
	At 100% Average Earnings		Rising Earnings from 100% to 200% of Average		At 100% Average Earnings		Rising Earnings from 100% to 200% of Average	
	2005	2050	2005	2050	2005	2050	2005	2050
	2005	2050	2005	2050	2005	2050	2005	2050
Czech Rep.	60.7	53.5	35.2	30.7	-	-	-	-
Estonia	34.2	16.8	18.7*	10.9*	0.0	18.9	0.0*	14.2*
Hungary	65.6	58.5	50.7	43.9	0.0	20.5	0.0	15.3
Latvia	60.5**	54.5			-	-		
Slovakia	49.4	50.2	38.2	37.7	0.0****	0.0****	0.0****	0.0****

[†]With a career length of 40 years full-time work at average earnings with contributions to first and second pillar pension schemes retiring at the age of 65.

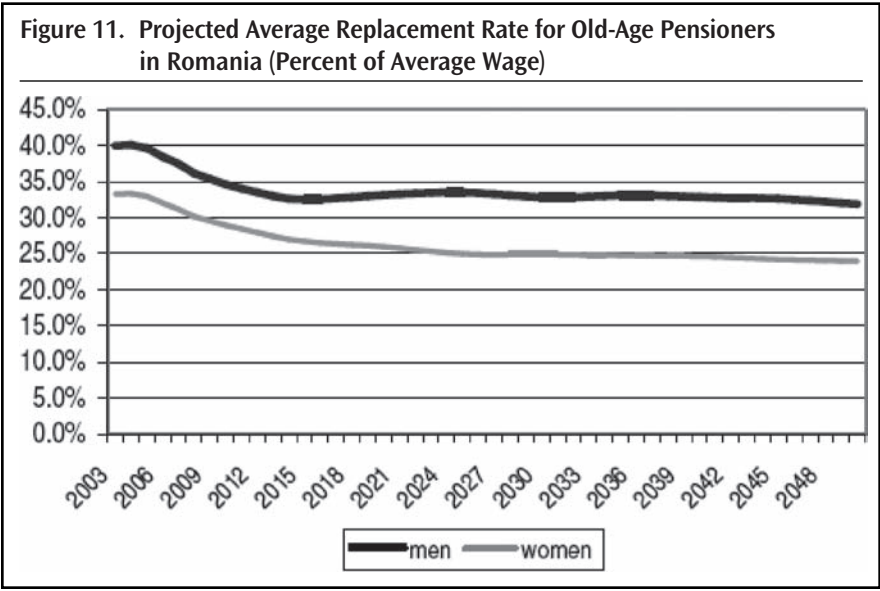
*at 200 percent average earnings.

**2010.

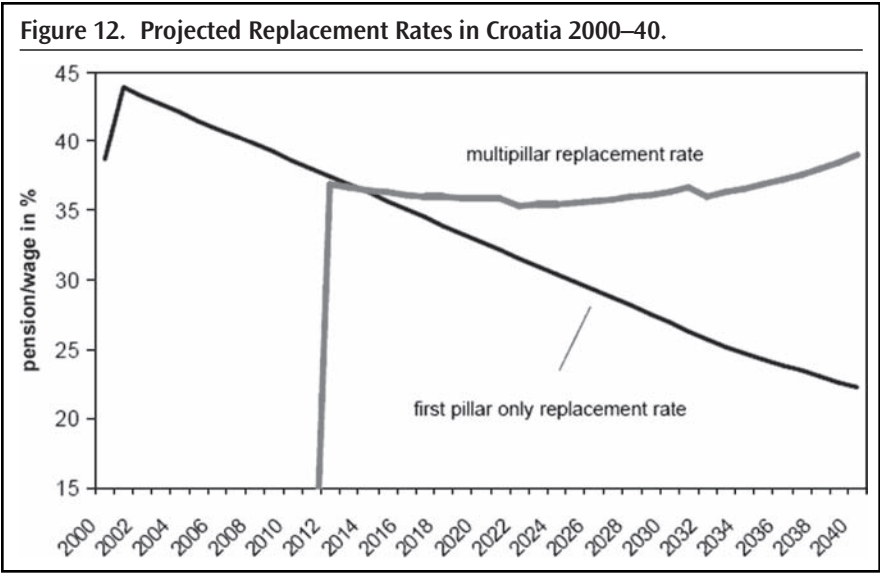
***2004.

****Pillar II, represents, in the ISG methodology, the mandatory occupational pension security, which plays only a marginal role in the Slovak Republic and is therefore not considered in the calculations. National calculations according to the method determined by the Indicators Sub-Group of the Social Protection Committee. Second pillar replacement rate depends on assumed net real rate of return.

Source: National Strategy Reports on Adequate and Sustainable Pensions, 2005.



Source: World Bank (2004), “The Pension System in Romania: The Challenges of Pursuing an Integrated Reform Strategy.”



Source: Anusic, Madzarevic-Sujster, and O’Keefe (2003), “Pension Reform in Croatia.” Social Protection Discussion Paper, World Bank, February.

Conclusions

Reforms in recent years have improved the efficiency and sustainability of pension systems in all EU10+1 countries, but in many probably not enough to ensure long-term sustainability given prospective population aging. Reforms have included parametric changes to PAYG systems, including increases in retirement ages (not least for women), changing benefit formulas, and changing indexation mechanisms. Some countries (Latvia and Poland) have further strengthened the link between contributions and benefits and sustainability of the PAYG system through the introduction of notional defined contribution accounts. Link between contributions and benefits is also strengthened by moving to point system which many of the countries have done. Several countries have further introduced a second, private pension pillar, funded through diversion of part of the pension contributions to this pillar, thus diversifying risk. However, some countries (in particular, the Czech Republic, Slovenia, and Romania) will need to do more to safeguard the long-term viability of their pension systems, and others face ongoing and future challenges in ensuring equitable pension systems and adequate living standards for all elderly people.

Further reforms efforts need to be tailored to individual country circumstances, but could include some combination of:

- 1) Further parametric reforms to PAYG systems, particularly adjustment of retirement ages in line with increases in life expectancy and move toward greater reliance on indexation of pensions to inflation rather than wages.
- 2) Further strengthening the link between contributions and benefits to change the perception of contributions as taxes in most countries, and minimize the wealth redistribution within the pension system.

- 3) Consideration of gradual equalizing of retirement age for men and women to avoid discrimination of women on the labor market and ensure a proper level of their future benefits, as their life expectancy is longer.
- 4) More equal treatment of salaried and self-employed workers.
- 5) Reduction in special retirement privileges for certain groups of workers (farmers, miners, and so forth) and review of disability pensions.
- 6) Further labor-market reforms, including tax and benefit systems, aimed at increasing labor force participation and employment, including among older workers and women.
- 7) General fiscal consolidation and reduction in public debt levels to make room for aging-related spending increases (especially in high-debt countries).
- 8) Consideration of greater reliance on general taxes (rather than pension contributions) to finance basic pensions in order to support lower labor taxes and employment generation (but caution needed to avoid unaffordable reductions in contribution rates).
- 9) Encourage greater competition between private pension funds to reduce fees and broaden investment opportunities for these while maintaining adequate prudential regulation.

In considering these options, EU10+1 countries may want to closely study the experience of Latin American countries that have implemented comprehensive pension reforms and the challenges they have faced (including in terms of coverage, fund performance, and governance). Also, lessons may be learned from EU15 countries that finance their pension systems mainly from general taxes (for example, the United Kingdom, Ireland, and Denmark) and appear to have been relatively successful in containing pension spending compared to countries that rely on social security contributions (for example, Germany, Italy, France, and Austria).

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Sustainability of Pension Systems in the New EU Member States and Croatia is part of the World Bank Working Paper series. These papers are published to communicate the results of the Bank's ongoing research and to stimulate public discussion.

This study finds that pension reforms in recent years have improved the efficiency and sustainability of pension systems in the new member states of the European Union and Croatia. However, for many countries, these probably have not gone far enough to ensure long-term sustainability, given the aging of the population. Reforms have included changes to Pay-As-You-Go (PAYG) systems, including increases in retirement ages (not least for women), new benefit formulas, and new indexation mechanisms. Some countries (Latvia and Poland) have further strengthened the link of contributions and benefits to the sustainability of the PAYG system through the introduction of notional defined contribution accounts. The link is strengthened also by moving to a point system, which has been adopted by many of the countries. Several countries have introduced a second, private, pension pillar, funded through diversion of part of the pension contributions, thereby diversifying risk. However, some countries (in particular the Czech Republic, Slovenia, and Romania) will need to do more to safeguard the long-term viability of their pension systems, while others face challenges to ensure equitable pension systems and adequate living standards for all elderly people.

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THE WORLD BANK
1818 H Street, NW
Washington, DC 20433 USA
Telephone: 202 473-1000
Internet: www.worldbank.org
E-mail: feedback@worldbank.org

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