Session 3

PENSION REFORM, REDISTRIBUTION, MACROECONOMIC IMPACT

DISTRIBUTIVE EFFECTS OF ISRAEL'S PENSION SYSTEM

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This paper examines several aspects of Israel's restructured retirement benefits system, focusing on distributive effects. We characterize 10 stylized representative prototypes of Israeli households, reflecting common demographic, wage and employment profiles. These prototypes are used to examine the joint effects of tax benefits for pensions and the public Old Age Allowances program's contributions and disbursements on the lifetime income distribution, net replacement rates at retirement and lifetime consumption smoothing. We find that the system is neutral in terms of its effect on lifetime income distribution, except for the top income decile which gains less than the others. We also find that pension savings result in a net loss for many low-income households, unsmooth their consumption and lead to "too high" post-retirement net replacement rates. Furthermore, evidence from a unique dataset point to rational and active behavior of households with respect to these incentives, raising questions about the necessity of compulsory pension savings which were enacted in Israel recently.

1 Introduction

Israel's pension and social-security Old-Age-Allowance (OAA) systems have undergone substantial reforms since 1995 dealing predominantly with their solvency. The reforms, resembling those in many OECD countries (Salomaki, 2006; Dang *et al.*, 2001), included a rapid increase of the legal retirement age, substantial cuts in the terms offered by the defined-benefits occupational pension-funds for their existing members and closing these funds for new members. Additionally, new entrants to public-sector employment were moved from employer-fully-funded arrangements to defined contribution – unsubsidized – private pension funds.

After the solvency risks were alleviated, policy-makers' focus shifted to poverty among the elderly. The high and rising overall poverty rates in Israel drew attention to the large proportion (about 22 per cent) of old people living below the poverty line – in contrast to most OECD countries.[1] Additionally, the government was concerned with the fiscal costs of Social Security's means-tested income supplement program and wanted to ensure that retirees will be able to provide for themselves instead of relying on public funds; there also was a concern that retirees take advantage of the means-tested support.[2] The main factor pointed-out as responsible for the limited availability of own-resources to employees was too-small pension savings among those in the lower part of the income distribution (Table 1). Consequently, the structure of tax incentives for long-term savings was altered to support almost exclusively pension savings (defined as savings towards the payment of a retirement age annuity). Furthermore, against the background of pending legislative intervention, employers and the trade-unions agreed to adopt a national pension accord from 2008, which was extended by government decree to cover all the employees.

Pensions offer two key advantages for individuals: 1) consumption smoothing over a

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[1] Forster and Mira D'Ercole (2005) find that only in 7 OECD countries poverty rates among the elderly are higher than for the whole population.

[2] Part of this concern is that non-pension savings are not effectively accounted for in the calculation of the means-tested support, due to misreporting by applicants.

Table 1

Pension and Employment when Reaching the Retirement Age
(percent of the employees in each quintile)

Income Quintile in 2000*	Work and Pension Status in 2005			Status in 2007
	Does not Work and Has No Pension	Works and Does Not Collect a Pension	Collects a Pension**	Does Not Work and Has No Pension***
Working Men aged 60-65 in 2000				**Working Men Aged 64-66 in 2005**
1	44.8	29.8	25.5	37.0
2	31.3	38.0	30.7	24.9
3	24.1	39.3	36.6	18.3
4	19.9	30.3	49.9	14.4
5	15.5	26.5	58.0	15.8
Total	**25.8**	**31.2**	**43.0**	**22.1**
Working Women aged 55-65 in 2000**				**Working Women Aged 59-65 in 2005*****
1	48.0	42.0	10.0	36.9
2	27.5	48.0	24.4	21.7
3	16.2	38.6	45.2	12.1
4	14.1	35.7	50.2	9.4
5	14.1	37.0	48.9	9.8
Total	**27.3**	**40.3**	**32.4**	**19.0**

Source: calculations based on the tax records panel dataset for 2000, 2005 and 2007.
* The income quintiles are calculated for the entire population and not for each group separately.
** Either work or not.
*** Based on the income quintiles in 2005.
**** Excluding those over 60 who already received a pension in 2000.
***** Excluding those over 60 who already received a pension in 2005.

lifetime span, including insurance for longevity;[3] 2) potential financial gains due to direct government subsidies and tax breaks (financed by general taxation). With respect to the first advantage, it was argued that people may not save enough for retirement due to myopia about their needs at that age (Kotlikoff, 1987). This myopia can reflect either "wrong" discount rates or ignorance/passiveness regarding future needs.[4] On the other hand, mandatory savings can result in "too much" savings for various types of workers and in sub-optimal distribution of disposable income through life (e.g, as related to balancing pension savings and the costs of raising children and paying mortgages), especially if individuals are rational and informed (Martin and Whitehouse, 2008). Rational individuals are also expected to respond to the net financial benefits from pension savings reflecting the various tax and subsidy incentives. These incentives, however, may also generate "too much" savings and might significantly affect the cross-section lifetime income

[3] Insurance for longevity and its pricing is a major determinant of pension-benefits' value and a source for potential failures in the annuities market (Finkelstein and Poterba, 2002 and 2004).

[4] Beschears *et al.* (2006) and Choi *et al.* (2004) discuss the inertia and passiveness of individuals with respect to their pension savings.

distribution.[5] While the desired level of income redistribution is primarily a matter of social and political preferences it is important that decision-makers be aware of the consequences of various decisions, because in the case of pensions the results may not be fully visible.

This paper examines the distributive effects of Israel's pension system from several angles related to the individual's point-of-view, as related to the potential effects of "mandatory pensions". First, we estimate the distributive effect of the pre-legislation pension system by calculating the net lifetime financial gains from participating in the compulsory social-security OAA system and from choosing to join a pension fund (accounting for the interactions between them). To make the analysis as realistic as possible we focus on typical lifetime employment and income profiles depicted for prototypes derived from labor market and demographic data. This approach differs from various previous studies.[6] Then we point-out the potential effects of pension-savings on these net gains. Consumption smoothing is examined by analyzing pension replacement rates for various types of workers and the ratio of disposable income per "standardized' person in the household during the families' life. A unique dataset – containing a panel of randomly selected 300,000 Israeli tax payers (10 per cent of the population) in 2000, 2005 and 2007 – is used to examine the individual and household characteristics associated with the decision to save for retirement and the degree to which individuals and households responded to the changes in pension regulations in recent years. Specifically, one of the implications of moving to a fully-funded defined contribution system is that low-income individuals (those below the income-tax threshold) no longer have direct financial gain from participating in the system. Their response to this change can provide some insights as to whether individuals are indeed passive with respect to their pension savings.

The paper is organized in the following way. Section 2 provides a short description of Israel's pension system and of the changes implemented since 1996. Section 3 provides information on characteristics of the Israeli labor force that were used to generate wage profiles and behavior patterns for the different household types used in the analysis. In Section 4 we calculate the net financial benefits from participating in Social-Security's OAA and saving for pension. We then calculate the joint impact of the programs on the size and spread of lifetime income of various household types. Section 5 evaluates the arguments in favor of mandating pension savings and Section 6 concludes by discussing the potential impact of the "mandatory pension" decree and highlighting issues and options for policy adjustment.

2 Characteristics of the Israeli pension system

Israel's retirement income system is based on a universal social-security pillar, augmented by a means-tested income-supplement program, and on individual savings in pension funds. Until 2008 pension-fund savings were optional, but a government decree has now made such savings mandatory for incomes up to the average wage (an income level exceeded by roughly one third of all employees). This legislation complements an overhaul of Israel's pension system that began in 1995. To set the ground for the analysis this section briefly describes these changes and the current characteristics of the system.[7]

Until 1995 Israelis' retirement savings were concentrated in occupational pension funds which offered generous defined-benefit schemes. Public sector employees, as well as those in large organizations such as the banks and the utility companies, were offered similar benefits in

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5 Diamond (2009) points-out the need to account for the interactions between the tax and pension systems.

6 See, e.g., Martin and Whitehouse (2008), OECD (2005 and 2007) and Bank of Israel (2008).

7 This section relies to a large extent on Achdut and Spivak (2008).

employer-funded programs with no direct employee contribution. Individuals could also enjoy tax benefits for depositing a portion of their uncovered salaries into private savings accounts – provided that the amounts were not withdrawn for at least 15 years from the date the account was opened.

Government support for pension saving took two forms: tax allowances at the times of deposit and withdrawal and preferential yields for the deposited amounts. The pension funds received special non-tradable government bonds at above market yields (5.57 per cent plus indexation to the CPI) to cover 93 per cent of their deposits. Still, by the early 1990s it became clear that the generosity of benefits made the funds operations unsustainable – in line with developments in other developed countries (The World Bank, 1994; Martin and Whitehouse, 2008). Therefore, in March 1995 the funds were closed to new members and the rights of their existing members were somewhat reduced. New pension funds were launched which were required to be actuarially balanced. These funds still received preferential government bonds to cover 70 per cent of their deposits, although the yield was reduced to 5.05 per cent. The government also guaranteed a real return of 3.5 per cent for the remaining 30 per cent of their assets and assumed the risk of changes in longevity.

The 1995 reform was only a first step in the pension system's restructuring. Between 1995 and 2002 the government stepped away from the guarantee to the new pension funds' yields and for the risks associated with changes in life expectancy.[8] After 2001 new public sector employees were not eligible to participate in the employer-funded pension scheme and were placed in the new pension funds. These modifications were, however, only a prelude for the 2003 reform.

In 2003, as part of the fiscal consolidation program, the government significantly reduced the benefits for pension savings at all levels. First, the retirement age was raised from 65 to 67 for men (phased-in until 2009) and from 60 to 64 for women (to be completed in 2017). At the same time tax benefits for early retirement were reduced and the preconditions for receiving early pensions toughened. The "old" pension funds were nationalized, the benefits for their existing members were substantially reduced and their contributions increased. The share of special government bonds issued for these funds was lowered to 30 per cent of their assets, and instead the government offered a substantial one-off subsidy to cover the existing estimated actuarial deficits of the funds.[9] The government also removed its guarantee for the rights of the existing members.

The terms of pension savers in the "new" pension funds were also downgraded. The coverage of special government bonds was reduced to 30 per cent of the funds' assets and the yield was lowered. Combined with raising the management fees the preferential return in the funds was essentially eliminated. The funds were also transformed to a pure defined-contribution setting which implied that the only financial benefit for investing in the funds is due to tax incentives.

Another policy change implemented gradually since 2003 was the removal of tax benefits for long-term savings not directly designed towards retirement-age annuities. Since 2008 individuals are required to save in an annuity-oriented account a sufficient amount to ensure a pension equal at least to the minimum wage in order to qualify for tax benefits for additional savings towards a lump-sum payment upon retirement.

Finally (so far) in 2008 the trade unions and the employers' organizations agreed on "mandatory pensions". This agreement was extended by government decree to all the employees. It mandates that each employee working for at least 6 months with the same employer will be insured in a pension fund. Employees that already have an account with a pension fund will be insured after the 3rd month. Coverage under this decree applies to amounts up to the average national wage, and

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[8] The costs associated with this move for savers are discussed in Yosef and Spivak (2008).

[9] The actual payment will be phased-in over 35 years.

the legislation does not pertain to employees that were in a better scheme before the decree was issued. The contributions are set to rise gradually and reach 15 per cent (10 per cent by the employer and 5 by the employee) by 2013.

Following the various reforms the current benefits for pension savings by the young cohorts in Israel are composed of four tax incentives:

1) employer deposits into a pension fund or an employer-funded program up to 7.5 per cent of the insured salary are non-taxable for the employee. This provision covers salaries up to 4 times the average wage. These amounts are also exempt from social security contributions;
2) employee contributions on the portion of their salary for which the employer also deposited are eligible for a 35 per cent tax credit. This credit is provided for deposits of up to 7 per cent of the insured income, for incomes up to the average wage. A credit of 5 per cent is granted for the portion of income between the average wage and twice the average wage. Similar provisions exist for employees whose employers do not share in their pension savings;
3) the return on amounts deposited in pension funds is exempt from taxation;[10]
4) the annuity payments are taxed as regular income at the time they are disbursed with an additional exemption of 35 per cent of the annuity, up to a level of about 30 per cent of the average wage. Additionally, pensioners are eligible for a supplementary credit point (197 NIS monthly) if their spouse does not work and has no pension.

In addition to pension savings individuals are eligible for OAA from Social Security. The monthly contribution for these benefits is 0.22 per cent of incomes below 60 per cent of the average wage and 3.85 per cent for the portion of income above this threshold (capped at 5 times the average wage). Employers also contribute 1.45 per cent on wages up to 60 per cent of the average wage and 2.04 per cent on higher incomes. The benefits offered by the system include three components:

1) a monthly lump-sum amount of about 16 per cent of the average national wage for a single person and 24 per cent for a couple. The amounts are indexed to the CPI;
2) an addition of 2 per cent for each year of contribution – beyond the first 10. This addition is limited to 50 per cent of the basic amount. Couples of two workers are eligible for the benefit based on the sum of their individual rights;
3) a means-tested income-guarantee scheme providing a minimum income of 30 per cent of the average wage for individuals and 45 per cent for couples. The eligibility is not affected by pensions up to 13 per cent of the average wage for individuals and 20 per cent for couples.[11]

3 Typical income and employment profiles

An analysis of the lifetime effects of retirement savings and benefits on income distribution requires information on the income and employment patterns of individuals, on the persistence of their rank in the income distribution, on the typical household characteristics and on the incomes of other members of the household – particularly the spouse. To identify the most common prototypes we combine three datasets, each with a unique contribution:

1) the annual national Incomes Surveys which allow tracing changes in the wages of various *types* of individuals over time. Although the surveys do not follow a fixed panel they do facilitate a

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[10] The general tax rate on interest and capital gains for individuals is 15 per cent on indexed assets (on the real yield) and 20 per cent on non-indexed assets (on the nominal yield).

[11] The latest increase in the means-tested benefits for people over the age of 80, implemented since late 2008, is not accounted for in the calculations.

comparison of the wages of individuals with similar characteristics over long periods. The surveys also contain data on education, and additional household and demographic characteristics;

2) the Social Survey of 2002, which focused on pensions and lifetime employment, provides information about the number of years worked by individuals with various characteristics during their adulthood;
3) a dataset including a random sample of 10 per cent of all the tax payers in Israel in 2000, 2005 and 2007. This unique dataset was constructed to include the tax records of the same individuals in these years (provided that they worked or received a pension in at least one of them), as well as the tax records of their spouses. The data are augmented by additional variables from the official state registry such as the number and dates of birth of their children, including those who passed the age of 18. This facilitates tracing the pattern of births over the individual's life – particularly important data for identifying potential breaking points in female careers as well as per capita income of the household.

The key characteristics identified with the various datasets are the following:

1) working people are typically married. More than three quarters of all the working individuals in the tax dataset were married; this share is quite stable across age groups (Table 2). Therefore, meaningful analysis of pre-retirement income patterns and post-retirement standard of living has to center on couples;
2) more than 90 per cent of working adults between the ages of 40 and 65 have children (including those over the age of 18). More than 50 per cent have at least three offsprings (Table 2). The larger number of parents compared to married individuals is mostly accounted for by divorced parents and widows (Table 3);
3) more than 75 per cent of working men, and 89 per cent of working women have a working spouse. There is a positive correlation between own-income and the probability that the wife is working (Table 4);
4) the average age difference between male workers and their wives is about three years among couples in which both spouses work. Given the existing and planned official retirement ages this implies that married couples typically reach the retirement age at about the same time (Table 5);
5) from the Social Survey we find that men typically worked with few interruptions throughout their adulthood. However, those with low incomes experience somewhat longer breaks (Table 6A). A specific and quantitatively important sub-group is Arab (mostly manual) workers that tend to retire relatively early; this tendency is somewhat reflected in the persistently low share of work years among Arabs over the age of 40 (Table 6B). However, on average Arab men are likely to meet the 35-years minimum requirement for full tenure at social security because they can start working at age 18;
6) working woman tend to have much longer interruptions of their working life. This is correlated with having a large number of children (Table 6C) and with their income: those who reach monthly salaries of over 5,000 NIS work a proportion of their adult life that is only moderately lower than that of parallel men[12] – but they are less than a half of the working women (Table 6A). We also find the reverse phenomenon –the more experience women accumulated during their working lives – the higher their average income (Table 6D). Additionally a positive correlation exists between working years and education, but quite a few women with high education work part-time or quit the labor force for significant periods. Only a small fraction of Arab women works;
7) using the Incomes Survey we simulate the lifetime wage patterns of various individuals. We do that by examining the change in the prototypes' wages between 1988 and 2007 (looking at a

[12] Since the purpose of this examination is to identify common patterns the question of causality is not discussed here.

Table 2

Family Structure by Age Group and the Lifetime Number of Children Working Individuals in 2005

(percent of all working families)

Age	Married	With one child	With 2 children	With 3+ children	With Children under 18
25-29	53.7	16.7	10.7	6.2	33.6
30-39	75.6	17.3	27.9	29.6	74.2
40-49	79.9	9.9	23.7	57.7	78.7
50-59	79.5	10.6	22.7	58.1	32.3
60-64	78.7	9.7	19.6	58.9	6.5
65-69	74.2	12.7	14.8	47.7	2.1
70-74	72.7	11.7	17.4	45.6	1.1
75+	59.9	16.5	19.6	28.3	14.9

Source: Calculations based on the tax records dataset for 2005.

Table 3

Marital Status of Working Single Mothers*

(percent of all working women)

Age	Single	Divorced	Widowed
25-29	3.5	4.7	0.1
30-34	2.6	7.4	0.3
35-39	3.2	12.2	0.9
40-44	3.2	14.3	1.4
45-49	2.2	16.3	2.6
50-54	2.1	16.4	4.1
55-59	2.1	15.9	6.6
60-64	1.7	15.5	11.7
65-69	1.1	12.1	23.9
70-74	2.7	8.2	34.6
75+	3.2	3.8	39.6
Total	2.7	12.4	3.0

* The term "single mothers" refers here to women that had children during the course of their lives and were not married in 2005.
Source: calculations based on the 2005 tax records dataset.

Table 4

Work Status Given the Spouse's Income

(percent of spouses in the quintile)

Spouse's Income Quintile	Wife		Husband	
	Works*	Doesn't Work	Works*	Doesn't Work
1	68.2	31.8	86.2	13.8
2	67.9	32.1	89.2	10.8
3	73.6	26.4	89.6	10.4
4	80.0	20.0	88.2	11.8
5	84.3	15.7	91.5	8.6
Total	76.9	23.1	88.8	11.2

* Either the observed individual reported that the spouse works or the spouse appears in the dataset with positive labor income.
Source: calculations based on the 2005 tax records dataset.

20 years older age group in 2007) as well as by looking at a cross-section of individuals in 2007. We find clear and consistent patterns for men, which differ between education levels. Those with high education move up the wage ladder early in their careers and enjoy large wage increases for about 30 years before their wages stabilize. The pattern is similar, although more moderate, for those with post-secondary education up to – and including – a bachelor's degree. In contrast, those with lower education have an initial low wage which is rising by less than the national average wage over the course of their employment (that is, they have no premium for tenure);

8) women's wages rise more moderately than men's, especially at the ages 30-45. This reflects the interruptions in their career and shorter working hours, especially in the periods of raising children (Brender and Gallo, 2008). Even at the high education level a significant share of women work part-time (Table 7). The wages of women with low education tend to increase at a similar, or even higher, rate than men in these ages – but this may be due to a statistical artifact, since a large share of the women in this group does not work;

9) consistent with the wage profiles identified above, in the tax dataset we find significant persistence of individuals' rank in the income distribution in the main working age (30-55). While these data only cover a 5 years period they have the advantage of being based on a panel (Table 8A). We also find that the dropout rate among those at the bottom deciles is double that of those at the top. The same type of persistence is observed between 2005 and 2007 (Table 8B);

10) there is a strong correlation between workers' incomes and those of their spouses. It is also much more common to find non-working wives of men with low incomes (Table 9).

Based on these observations we set up several prototypes of individuals which share the most common characteristics of the Israeli population in order to analyze the pension system. These are described in Table 10 and their detailed characteristics appear in Appendix A.

4 Loss/Benefit from Social Security and Pension Savings

The analysis of the net gains or losses from participating in the social security OAA program and from contributing to a pension plan was based on the simulated wage profiles of the various types described in Table 10. At the first stage we calculated the contributions and potential benefits in the – compulsory – OAA program; then the marginal benefit from choosing to save in a pension fund, accounting

Table 5

Age Differences between Spouses*
(years)

Age	Age difference	
	Men	Women
25-29	0.4	–3.3
30-34	1.6	–2.9
35-44	2.5	–3.2
45-54	3.0	–2.7
55-64	3.5	–2.9
65-74	4.9	–3.6

* Calculated as the individual's age minus the spouse's age.
Source: calculations based on the 2005 tax records dataset.

Table 6

Accumulated Years of Experience* Compared to Potential**
(percent of potential working years)

a) by Income and Gender

Income	Male		Female	
	Experience/ Potential	Percent of the Group	Experience/ Potential	Percent of the Group
up to 1500	83.8	2.3	63.6	6.1
1501-3000	87.7	6.0	67.6	17.7
3001-5000	88.9	22.4	81.5	32.7
5001-7000	94.0	19.2	89.2	20.3
7001-9000	95.9	12.3	85.0	8.9
9001-12000	94.7	14.0	89.7	7.6
12000+	92.1	23.9	87.4	6.6

b) by Gender, Religion and Age

Age	Male, Jewish	Male, Arab	Female
30-34	88.8	79.3	70.0
35-39	89.5	84.8	70.8
40-44	91.0	75.9	73.7
45-49	93.7	79.9	72.8
50-54	90.0	75.6	68.4
55-59	93.4	79.1	65.4

c) Females by Age and Number of Children

Age	No Children	1 Child	2 Children	3+ Children
35-39	75.1	82.2	81.4	66.1
40-44	73.2	88.6	81.1	71.8
45-49	71.8	80.5	84.4	69.4

d) Monthly Income by Percent of Potential Years Actually Worked and Age

Age	The Ratio of Actual Years of Experience Accumulated to Potential				
	up to 30%	30%-50%	50%-70%	70%-85%	86%+
35-49	2,245	3,381	4,816	5,208	6,179
50-59	2,427	3,382	4,565	4,931	6,383

* Defined as the self-reported number of years worked by the individual. The figures used here are based on averages of the reported categories.
** Potential years are age less 21 for Jewish Men, age minus 18 for Arabs and age minus 20 for Jewish women. The tables include individuals over the age of 25.
Source: Calculations based on the 2002 *Social Survey*.

Table 7

Employment of Women, by Education

Years of Schooling	Age			
	25-29	30-39	40-49	50-59
	(percent working from all the women in the group)			
0-10	21.7	20.6	28.9	27.9
11-12	49.1	58.0	67.3	58.9
13-15	76.3	74.6	80.8	74.2
16+	78.8	86.3	88.6	82.4
	(percent working less than 30 hours per week)[*]			
0-10	35.2	35.2	32.9	32.4
11-12	37.7	36.4	35.9	34.8
13-15	36.3	37.3	37.8	35.9
16+	35.4	37.7	36.8	36.2

[*] Among those working at least 5 hours.
Source: Calculations based on the 2007 *Incomes Survey*.

Table 8

Persistence of Income Distribution

a) between 2000 and 2005[*]

Income Quintile in 2000[***]	Quintile in 2005[***]					Not Working in 2005[**]
	1	2	3	4	5	
	(percent of all the workers in the quintile)					
1	**32.2**	21.4	8.4	3.1	0.8	34.1
2	16.0	**36.6**	22.3	5.0	1.1	19.1
3	7.7	12.1	**41.2**	22.5	2.1	14.3
4	4.1	4.6	9.3	**48.5**	17.1	16.4
5	2.9	2.1	2.7	8.0	**66.6**	17.8
Total	**12.4**	**15.3**	**16.8**	**17.5**	**17.7**	**20.3**

b) between 2005 and 2007[****]

Income Quintile in 2005[***]	Quintile in 2007[***]					Not Working in 2007[**]
	1	2	3	4	5	
	(percent of all the workers in the quintile)					
1	**37.2**	18.7	7.0	2.2	1.0	34.0
2	15.0	**48.1**	14.9	3.9	1.1	17.1
3	5.1	14.0	**55.2**	12.7	1.4	11.7
4	2.3	3.1	12.6	**62.4**	8.6	11.0
5	0.8	0.8	1.2	9.0	**72.4**	15.7
Total	**12.0**	**16.8**	**18.2**	**18.1**	**17.0**	**17.8**

[*] For the age group 35-50 in 2000 and 40-55 in 2005.
[**] "Not working" is defined as not being reported in the dataset for that year.
[***] Quintiles are defined across the relevant group (e.g., individuals aged 35-50 who worked in 2000).
[****] For the age group 35-55 in 2005 and 37-57 in 2007.
Source: calculations based on the tax records panel dataset for 2000, 2005 and 2007.

Table 9

Correlation Between Spouses' Income Quintiles in 2007

Husband's Income Quintile*	Doesn't Work**	Wife's Income Quintile				
		1	2	3	4	5
1	45.8	17.6	12.9	10.1	7.9	5.7
2	34.0	16.3	16.7	15.4	10.7	6.9
3	25.9	14.7	16.6	17.6	14.8	10.4
4	20.6	11.5	14.0	15.8	18.9	19.3
5	22.1	9.2	10.0	11.9	18.4	28.5
Total	**29.6**	**13.9**	**14.0**	**14.2**	**14.2**	**14.2**

Source: calculations based on the 2007 tax records dataset.
* based on data for married men aged 30-55 with minimum annual income of 12,000 NIS and women with a minimum income of 6,000 NIS.
** The share of those who do not work includes women whose husband's state that they work but they do not show-up in the tax authorities' records.

Table 10

Description of the Household Types Used in the Pension Analysis

	Type	Net Lifetime Income*
1	Manual worker, married to a non-working wife, 4 kids, retires at age 60	5.9
2	Secondary education, married to a non-working wife, 3 kids	7.2
3	Secondary education, wife working part-time when the children are in pre-school age: 0.7 of full-time when the first child is born and 0.5 when the second is born. Three kids	10.3
4	Bachelor, post-secondary education	9.3
5	Post-secondary education for both husband and wife, 2 kids	16.0
6	Single (divorced mother) with post-secondary education, two kids. Working part-time until the kids reach age 18. Housing costs are covered by alimony until the children reach age 18	5.3
7	Academic degree for both husband and wife, 3 kids. Wife works 50 per cent of a full-time job all her adult life	17.1
8	Post secondary education, wife has secondary education and works 20 years. Three kids	11.8
9	Academic degree for both husband and wife, 3 kids	21.0
10	"Fast-track" successful couple, both with tertiary education and working full-time. Two kids	30.4

* In millions of NIS capitalized to the retirement date.

for potential offsets with the OAA. We focus on three parameters: 1) net lifetime financial gain or loss from participating in a program, 2) the net replacement rate offered by the program relative to the last income earned by the employee, 3) the path of the ratio of disposable income to the "poverty line" over the course of the individual's life.

4.1 Old-age allowances

The OAA program's three main components are the universal basic amount, the tenure-based supplement and the means-tested income supplement. For two-worker couples with tenure of at least 35 years for each spouse (regardless of the hours worked or income during these years) the means-tested program is irrelevant because the sum of their regular benefits slightly exceeds those of the means-tested income supplement. This latter program has disregard boundaries for labor income and pensions that differ between individuals and couples. Once the disregard level is exceeded the phase-out rate of the allowance is 60 per cent, until it reaches the basic – universal – amount (which includes the tenure supplement). Contributions to the OAA are based on a two-level schedule with a cap at 5 times the average wage. Direct contributions are not expected to cover the full cost of the program and the balance is covered by pre-specified government contributions.

To calculate the net benefits from the program each "type's" OAA annual contributions were simulated and accumulated using a real interest rate of 3.5 per cent.[13] Then the accumulated contributions were compared to the value of the benefits the individual (or couple) are eligible for if they do not have a pension. For two-worker couples this typically means that they would receive the sum of their individual benefits (except if one of them did not work for at least 35 years). For other couples and for singles the potential benefits include the means-tested supplement. The calculated potential benefit is then capitalized by using pension fund conversion coefficients for the equivalent amount and conditions.[14]

Columns 1 and 2 of Table 11 report the lifetime contributions and potential benefits of the OAA. It is evident that the program is very progressive and provides a large subsidy for low-income households. For higher-income households it offers a much smaller subsidy, but they still enjoy a net benefit from participating. Only at the very top of the income distribution – about 15 per cent of all households which are represented by "type 10" (and those on the range between types 9 and 10) – do the program contributions exceed the benefits.[15]

Table 12 shows that the OAA provides quite an adequate replacement rate for low-income households: the replacement rate is close to 100 per cent for "type 1" which represents about one fifth of the working population. "Type 2" also enjoys quite adequate replacement when accounting for job-related costs during their employment years. In contrast, the replacement rates appear to be insufficient for higher-income households. This is hardly surprising as the program's purpose is to protect the elderly from poverty, rather than provide a standard of living consistent with their employment income – especially when compared to the top of their earnings which is typically reached prior to retirement.

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[13] This is an assumed long-term net return accounting for management fees of pension funds. As discussed in Whitehouse (2000 and 2001) differences in administrative fees may have significant impact on the real return. Such differences seem to have emerged between funds in Israel but we abstract from this issue here.

[14] Specifically, we use the coefficients applied to individuals who are currently 25 years old. Notwithstanding the uncertainty of these numbers, as discussed by Whitehouse (2007), the current coefficients do not vary significantly between cohorts and the results are not qualitatively sensitive to changes in the magnitudes of those prevailing between cohorts.

[15] The comparison between income groups abstracts from the possibility, discussed in Cutler *et al.* (2006) and Breyer and Hupfeld (2007) that life-expectancy is positively correlated with income.

Table 11

Life-time Benefits from Social Security's Old-age Allowance Program and from Pension Savings
(thousands of NIS at 2009 prices)

Type	Social-security OAA Program		Life-time Tax Benefits for Pension Savings	Net Gains from Pension Savings**		
	Life-time Contribution	Value of Potential Benefits*		Only Husband	Household	Total Net Benefit from OAA + Pension***
	(1)	(2)	(3)	(4)	(5)	(6)
1	94	1,148	29	–143	…	1,054
2	138	1,148	190	–82	…	1,010
3	187	1,161	198	190	198	1,172
4	336	643	463	308	…	615
5	447	1,161	500	463	500	1,214
6	95	685	32	…	–165	591
7	703	1,161	729	719	729	1,187
8	371	1,161	468	463	468	1,258
9	845	1,161	850	719	850	1,166
10	1,711	1,161	1,443	1,196	1,443	893

* The capitalized benefit if the post-retirement income of the individual/household is below the means-tested program's threshold, where relevant.
** Accounting for offsets of old-age allowances.
*** Assuming that households losing from pension savings do not contribute to a pension fund.

4.2 Pensions

The placement of all new pension savers in Israel in pure defined contribution programs implies that the only net financial benefits from such savings are due to tax incentives. These benefits are granted in Israel mostly at the contribution stage but also at the time the annuities are disbursed. However, to enjoy these tax benefits one has to reach the income tax threshold – an income level which 45 per cent of all employees (30 per cent of working men) fall below.[16] Upon retirement, the annuity payments are taxed at the regular brackets with an additional discount on pensions up to about a third of the average wage. An additional tax benefit is granted to pensioners whose spouses have no pension and Social security's OAA are tax-exempt. This implies that many of those who enjoyed tax advantages at the contribution stage enjoy a substantial – or full – exemption at the withdrawal stage as well.

[16] The cap on tax-exemptions for employer contributions is at 4 times the average wage – an income level reached by only 3 per cent of all employees.

To calculate the net benefits from pension savings we simulated the contributions of the employees (or households) through their (assumed) entire working life.[17] The hypothesized contribution rate for those who contribute was the maximum allowed by the tax authorities, regardless of whether the individual's income is above the threshold for affecting tax benefits. This assumption is in the spirit of the "mandatory pension" decree and consistent with the current practice; it will be revisited below.

Table 12

Net Replacement Rate at Retirement*
(percent of pre-retirement income)

Type	No Pension	With Pension
	(1)	(2)
1	94.2	171.1
2	74.8	141.4
3	54.4	145.1
4	33.8	116.5
5	31.1	113.2
6	49.8	112.9
7	29.4	112.1
8	35.7	100.6
9	24.4	108.7
10	15.5	87.9

* The ratio of post-retirement income to the last net income before retirement. Pre-retirement income is calculated net of pension contributions.

Column 3 of Table 11 shows the capitalized value of the lifetime pension tax benefits granted to the household. These amounts include the capitalized sum of the tax benefits during the contribution period reduced by the taxes paid on the annuity – net of the tax benefits at that stage. The benefits are quite small for the low-income types, reflecting their low income-tax rates – if they pay at all – throughout their working lives.[18] This is particularly true with respect to women who enjoy extra tax credits for their children.[19] In contrast, the tax benefits for high-income households are large and may even exceed the value of the OAA.

While all households may gain from the pension tax benefits, these gains can be offset, or even reversed, by a phase-out of the means-tested component of the OAA. As discussed above this offset is relevant only for couples in which at least one spouse did not work 35 years and for singles. In such cases the magnitude of the offset depends on the joint annuities amount. Columns 4 and 5 show that this offset can be quite substantial. Household types 1, 2 and 6 – in which there is only a single worker with low income – actually lose from saving for a pension. These types represent a substantial share of households in Israel, especially in the populations targeted by the "mandatory pension" decree.[20] The mid-high income bachelor (type 4) loses about a third of the pension tax benefits but retains a positive incentive for savings. All the household types that represent two fully working spouses are not affected by the offset and retain their tax benefits (although in the case of the relatively low-income type 3 these are quite small).

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[17] The hypothesized alternative to pension savings is not saving at all. In this way we abstract from the tax exemption on the pension accumulation return.

[18] The benefit is always positive due to the exemption of employer contributions from social-security.

[19] The Israeli tax unit is the individual. Women receive an additional 0.5 tax credit (2.75 compared to 2.25 for men) and one more for each child. As a result only a relatively small fraction of working women – especially of working mothers – actually reaches the tax threshold (Brender, 2005 and 2009).

[20] Individuals with higher income at relatively old ages who lack the 35 years tenure and did not save for a pension may also lose from the legislation, but such individuals are quite rare.

Column 6 presents the net combined benefits from the OAA program and joining a pension fund (if yielding a net gain). We find that there are only small differences between the various household types: low income ones enjoy a large net surplus in the OAA while the others replace these benefits with tax incentives.[21] The only, somewhat different household type is 10, which enjoys a smaller benefit due to high taxes on the annuities. Household types 4 and 6, which include singles, have similar benefits to the others, proportionally reduced to their size. Therefore it appears that, in their pre-mandatory pension design, Israel's joint OAA and pension systems are neutral in terms of lifetime income distribution.[22]

Column 2 of Table 12 shows the net replacement rates for the various types of households if they contribute to a pension fund through their entire working life. These rates are calculated relative to the pre-retirement income, net of taxes, social-security charges and pension contributions. It is evident that for low-income households full pension savings create replacement rates that are too high, especially given that they also lose out on a net basis from pension savings. For higher-income households the lifetime savings produce a more moderate replacement rate, although still substantially higher than 100 per cent. This may suggest that lifetime savings at the maximum permitted rates are too high, at least at the assumed real net return of 3.5 per cent. It should be noted that the mandatory contribution rate from 2013 will be slightly higher than those assumed here. Furthermore, the tax-records data indicate that in practice the pensions of the current retirees that do collect a pension typically provide a replacement rate of about 40 per cent (for the top 4 quintiles, excluding OAA). These rates are much lower than those mandated by the current law and similar to the prevailing rates in most OECD countries.

4.3 Pension contributions and income allocation through life

While the discussion of pensions is often focused on the need to secure an adequate standard of living for the elderly there is also the opposite concern: does the pension system produce "too much" savings? When decisions take place freely between market-priced pension alternatives such a result is unlikely. However, the presence of tax-subsidy incentives and mandatory savings may lead to different outcomes.

The main reason why pensions can actually "unsmooth" consumption is that tax benefits are typically granted with an annual cap based on gross income, attempting to smooth contributions. This approach ignores the distribution of other expenses during a families' life – most notably on raising children and mortgages. Although a family could ideally spread mortgage payments over its entire life, typically it is paid during a limited period – while the "residence" consumption continues deep into retirement. This problem is intensified in Israel (as in several other countries) because there is no tax relief for mortgage payers. The costs of child raising are particularly relevant in Israel where families typically have 2 or 3 – and in many cases more – kids, child allowances are significantly lower than in most developed countries, and tax benefits for parents are small and limited to women.

To estimate the household's "appropriate" consumption level its simulated income (including child allowances) was divided by the number of "standard" persons, using the scale employed in the calculation of the "poverty line". We also deducted the simulated mortgage payments for those household types that are expected to have one – based on the national Expenditures Survey conducted by the Bureau of Statistics (Table 13).

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[21] The benefits for non-working individuals and households are of the same magnitude as those for working ones.

[22] Although the taxes used to cover the residual cost of the OAA program are paid disproportionately by those at the top life-time income levels. Also, high-income households have to actually save for pension in order to enjoy the same benefits provided to low-income ones by the OAA.

Table 14 provides some evidence on the level of net income per "standard person" relative to the poverty line (27 per cent of the average wage per "standard person"). For each household type this ratio is calculated under the alternative assumptions of saving for pension and not saving. The results show that for all family types full pension savings tend to exacerbate the phenomenon of relatively low disposable income at the early stages of a family's life. This phenomenon is most notable in the low-income types where the already low disposable income in younger ages is further reduced in order to generate high post-retirement income. It therefore seems quite rational for low and median-income families to postpone pension savings, especially if their salaries trend towards higher tax brackets.[23]

Table 13

Mortgage Payments by Age Group

Age of Head of Household	Has Mortgage*	Monthly Mortgage Payments**
25-29	24.8	30.7
30-34	34.0	23.4
35-44	48.5	18.7
45-54	43.4	20.1
55-64	28.5	36.7

* Percent of all households in the age-group.
** Among those paying a mortgage, in percent of gross labor income.
Source: Calculations based on the 2007 *Household Expenditure Survey*.

5 Myopia, passivity and irrationality of savers

Some of the arguments for government intervention in the pension market relate to households' myopia with respect to post-retirement savings. It is argued that young persons underestimate their pension needs and are consequently "stuck" with too little resources when they retire. An observationally similar argument is that even if individuals are aware of these needs they tend to postpone action with respect to their pensions, so by the time they start saving it may be too late to accumulate sufficient funds to pay for a decent annuity.

While distinguishing between optimization based on individual discount rates and myopia is not a trivial analytical issue, this section tries to examine the saving behavior of Israeli workers in this light. The analysis above suggests that saving for pension is a poor financial move for low-income individuals and for families with one earner – both in the present and during the course of adulthood. We also find that consumption smoothing would suggest that younger families that pay mortgages and those with children are likely to be less inclined to save at that stage of their life.

Figure 1 shows that pension contributions are indeed positively correlated with income.[24] In the bottom deciles of the employment-income distribution less than one fifth of men and less than a third of working women save for pension while at the top deciles pension contributions are almost universal. In the lower deciles the larger share of women saving for pension compared to men is consistent with the fact that nearly 90 per cent of working women have a working spouse (Table 4),

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[23] The tax incentives in Israel are granted in the form of non-refundable tax credits; many employees spend a significant share of their working lives under the tax threshold and cannot use these credits. Moreover, the value of the exemption for the employer contributions directly depends on the tax bracket.

[24] The figure is based on the 2007 tax-records dataset. The figures for earlier years are similar.

Table 14

Disposable Income Per "Standard Person" Relative to the Poverty Line
(percent of the "poverty line" in that year)

Type		Age				
		30	**40**	**50**	**60**	**Retirement**
1	With pension	71	65	84	101	152
	No pension	81	74	97	118	98
2	With pension	82	71	92	115	160
	No pension	92	80	105	133	98
3	With pension	103	79	126	161	207
	No pension	121	92	145	185	99
4	With pension	241	261	280	288	295
	No pension	271	294	315	325	104
5	With pension	171	147	292	294	294
	No pension	199	172	333	335	99
6	With pension	126	71	84	186	203
	No pension	145	82	97	216	104
7	With pension	169	135	208	317	316
	No pension	196	157	235	359	99
8	With pension	142	72	162	258	235
	No pension	167	83	184	293	88
9	With pension	196	154	254	384	373
	No pension	231	182	288	433	99
10	With pension	268	290	400	616	490
	No pension	310	336	447	683	99

so they are less likely to fall into the position of net losers from savings due to an offset of the means-tested component of the OAA. Women are also more commonly employed in the public sector, banks and large corporations where pensions are almost universal.

Figure 1

Pension Contribution by Income Deciles, 2007

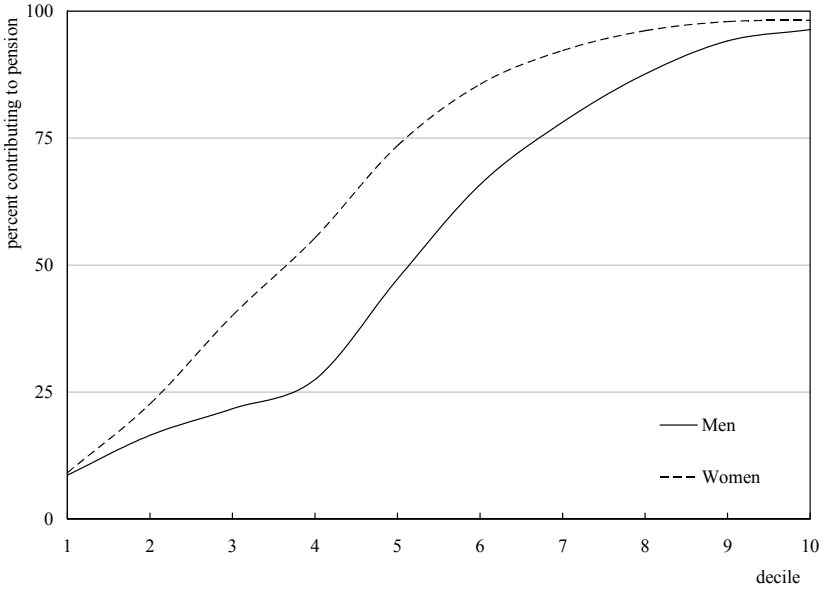

Table 15 examines the savings decisions of households in a more detailed and formal way. The table reports the results of a Probit equation where the dependent variable was whether the individual contributed to a pension fund or not. This analysis is based on more the 100,000 tax files of males in 2007 (the coefficients are similar for the 2005 data) and the results are quite consistent with the expectations discussed above.[25]

- Income has a strong and positive effect that rises throughout the relevant incomes range.[26] Consistent with expectations there is a strong a distinct negative effect for individuals with salaries below the income-tax threshold. Having a working wife also has a strong positive effect – as it reduces the potential loss from the phase-out of the income supplement.
- Having a wife that contributes to a pension fund has an additional strong effect on the choice to save. Given the other variables in the equation this quantitatively important variable (0.36) is likely to reflect two factors: 1) the lower probability to be at the phase-out level of the OAA income supplement which is based on the joint pension income, 2) the wife's work experience: it is required to reach 35 working years to receive the full tenure supplement in the OAA, and women who contribute to pension have, on average, longer working spells than those who do not.
- The equation also points to the liquidity effect: the presence of children, especially young ones, in the household reduces the tendency to save for retirement.
- Age has a positive effect until retirement. This effect may be due to the phase-out of mortgage payments (Table 13). It may also be associated with the reduction of pension benefits for those who started to work after 1995, but the continuing increase of the probability to save at the pre-retirement cohorts is more consistent with the former explanation.

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[25] Equations estimated for women showed similar results. The noticeable difference was that the coefficient for young children was positive. This non-intuitive result is likely to reflect a selection bias: mothers for young children are more likely to quit work if their employers do not accommodate their special needs. The employers that would typically do that are large and established organizations (e.g., the public sector and the banks) where pensions are universal.

[26] The joint *effect* of the coefficients of income and squared income begins to decrease at incomes more than 65 times the average wage.

Table 15

Probit Equation for the Probability of a Working Men to Contribute to a Pension-Plan

	Coefficient	*Z*	
Age	0.01786	4.4	*
Age squared	–0.00009	–1.9	***
Single *(binary variable)*	–0.03465	–2.2	**
Divorced/Widowed *(binary variable)*	–0.03808	–1.8	***
Annual income *(thousands)*	0.00736	94.7	*
Squared annual income *(thousands)*	0.00000	–66.9	*
Annual income <45,000 *(binary variable)*	–0.85144	–61.1	*
Number of jobs during the year	–0.06455	–12.0	*
Months worked *(up to 12)*	0.01968	9.7	*
Does the spouse work *(binary variable)*	0.50414	28.8	*
Spouse contributing to pension *(binary variable)*	0.35625	24.7	*
Annual income of Spouse *(thousands)*	–0.00093	–8.4	*
Number of children	–0.03552	–6.7	*
Number of Children aged 0-3	–0.02785	–2.9	*
Number of Children aged 4-8	–0.02909	–3.5	*
Number of Children aged 9-18	–0.01566	–2.2	**
Age of spouse	–0.00854	–17.5	*
Constant	–0.89339	–10.16	*
Number of observations	117,107		
Pseudo *R* squared	0.34520		

[*] Significant at the 1 per cent level, [**] significant at the 5 per cent level, [***] significant at the 10 per cent level.
Source: calculations based on the 2007 tax records dataset.

- Single individuals (including divorced) tend to contribute less. This may reflect their larger probability to be eligible to the means-tested part of the OAA compared to married working couples.

The analysis so far has focused on the snapshot of individuals' behavior in 2005. We do find however that this behavior is quite reflective of their longer term choices as reflected in the correlation between the decision to contribute in 2000 and 2005 (Table 16). It turns out that those who already contributed in 2000 continued to do so in 2005, while those who did not, have not started. Nevertheless, about half of the males and a third of females in the lowest income quintile stopped contributing (the comparison relates only to individuals who continued working).

Table 16

Percent of Workers Contributing to Pension Savings in 2005, by Gender, Age, Income and Whether they Contributed in 2000

Age	Men	Women	Men	Women
	Contributed in 2000		Did Not Contribute in 2000	
25-29	76.5	80.3	42.0	47.0
30-44	82.3	85.7	31.2	37.8
45-54	84.1	84.1	26.9	27.4
55-64	75.2	66.1	17.8	10.8
Total	**80.7**	**81.7**	**29.3**	**29.5**
Income Quintile*				
1	51.5	64.5	30.8	34.9
2	60.9	79.0	31.0	41.9
3	76.1	87.9	39.7	48.5
4	86.2	91.7	40.6	51.2
5	91.7	92.7	38.9	48.8
Total	**81.7**	**84.1**	**33.6**	**38.7**

* For men aged 25-60 and women aged 25-55 in 2000.
Source: calculations based on the tax records panel dataset for 2000 and 2005.

One of the proposed justifications for government intervention in the pension market is that individuals may be passive with respect to their retirement. As discussed above, the pension reforms between 2000 and 2005 eliminated the financial benefits from pension savings for workers at the bottom 5 deciles of the income distribution (since they do not reach the tax threshold and because the funds were converted to pure DC schemes – with no subsidy). Table 17 examines the response of workers to the changes that took place in the tax system between 2000 and 2005. It shows a marked decrease in the share of contributing individuals at the bottom 5 deciles and a much milder decrease at the higher ones.[27] There was also quite a noticeable decrease in employer contributions, suggesting that this component of savings also responded rapidly to the changes. Finally, the drop in contributions was much larger among the young cohorts, while among the older ones – in which many still belong to the pre-1995 schemes or to employer-funded programs – the decrease was milder.[28]

Table 18 shows that too little pension savings is not necessarily the dominant problem. It reports the share of individuals in post-retirement ages that collect a pension, have no other income and continue to contribute to pension-related schemes. We find that about a third of the men and

[27] Overall, the per cent of contributing employees in Israel – 62 per cent – is quite similar to those in Germany, Canada, Ireland the UK and the US (Antolin and Whitehouse, 2008).

[28] While the members of the old funds also suffered a substantial downgrading of their benefits, these funds still offer much better terms than any available alternative.

Table 17

The Change in Contribution Between 2000 and 2005*

Income Quintile in 2005**	Percent Contributing in 2005	Change from 2000	Only Employer Contributes in 2005	Change from 2000	Employee Contributes with the Employer in 2005	Change from 2000
1	21.0	–14.9	12.5	–5.1	7.2	–8.9
2	40.1	–18.6	15.8	–4.1	23.4	–14.1
3	67.6	–13.5	19.7	–2.1	47.6	–11.1
4	88.1	–4.5	19.5	0.9	68.4	–5.1
5	96.1	–1.1	11.8	–1.6	84.1	0.5
Total	**62.6**	**–10.5**	**15.9**	**–2.4**	**46.2**	**–7.7**
Age						
21-24	16.0	–22.2				
25-29	46.8	–18.0				
30-44	64.5	–9.2				
45-64	68.7	–8.5				
65+	45.5	–15.5				
Total	**51.9**	**–12.5**				

* The change is expressed in percentage points from the 2000 level.
** Ages 25+.
Source: calculations based on the tax records panel dataset for 2000 and 2005.

Table 18

Post-Retirement* Pension Contributions by Type of Income and Income Level

	Men		Women	
	Percent Contributing	Percent of the Group	Percent Contributing	Percent of the Group
Source of income				
Receives a pension on account of a late spouse	21.1	1.7	44.2	21.1
Has labor income and no pension	30.6	22.4	47.5	24.2
Has pension and no labor income	56.6	64.7	36.4	47.7
Has both labor income and pension	74.3	11.2	63.5	7.0
Total	**52.2**	**100.0**	**42.6**	**100.0**
Income quintile in 2005**				
1	63.3	…	44.4	…
2	65.1	…	30.8	…
3	59.4	…	29.1	…
4	53.0	…	35.6	…
5	49.0	…	42.9	…
Total	**56.6**	**…**	**36.4**	**…**

* Men over the age of 65 and women over 60.
** Among those that have only income from pension.
Source: calculations based on the 2005 tax records dataset.

half of the women continue to save after retirement[29] and that this phenomenon covers individuals at all (post-retirement) income levels. These findings suggest that many individuals reach their pension age with an income level beyond their immediate consumption needs. It should be noted that these retirees saved in a period where pension savings were optional. Therefore, it seems that these – perhaps – excessive savings reflect a response to the high and unsustainable returns offered in the old system. Nevertheless it is indicative that individuals do respond to financial incentives for post-retirement savings, an indication that received further support by the sharp decline in the share of post-retirement savers between 2000 and 2005 (Table 17), as the incentives for such contributions were eroded.

Overall the behavior of workers with respect to their pension contributions seems to be rational and active: employees seem to adjust their saving choices in a way that is consistent with the financial incentives. It appears that the low contribution rates of low-income employees reflect the meager financial incentives for pension savings, and the undesired consumption path in which such savings result.

6 Conclusion

Government intervention in the pension market is often justified by a need to protect the public from miscalculating and underestimating the advantages of saving for retirement. A similar argument is that young cohorts are too passive with respect to their post-retirement needs and may therefore act too late to ensure sufficient resources for that age. Another argument – to some extent an analytical opposite of the previous ones – is that individuals optimize their lifetime income profiles by taking (unfair) advantage of old-age income-support programs. All these arguments were used in the debate preceding the recent adoption of "mandatory pensions" in Israel.

The current paper studied the reality of the Israeli pension system in its post-reform pre-mandatory pension structure. Using stylized representative prototypes of the most common Israeli household compositions and employment profiles it examined the potential benefits of pension savings for each "type". The findings suggest that mandating pension savings imposes a net loss on low-income households. Moreover, this loss breaks the egalitarian feature of the current system: while at present all family types (except those at the top lifetime income decile) roughly enjoy the same subsidy/tax incentive, compulsory contributions will make the benefits for low-income households smaller than those of the others. This loss results from eroding their entitlement for the means-tested income supplement without offering offsetting effective tax incentives.[30] These calculations make the argument that low-income households take an excessive advantage of the means-tested income support program less convincing.

The disadvantage of mandatory savings for low-income households is also evident in its impact on their lifetime income distribution. The post-retirement replacement rates offered by the new system are over 140 per cent, and for quite a significant group they exceed 150 per cent. These high incomes come at the expense of low disposable income at younger ages, when households have to care for children and pay mortgages.

The analysis therefore shows that, given the existing level and structure of OAA, saving for retirement is not beneficial for low-income households while it is for higher-income ones. An examination of the households' behavior suggests that they indeed act in line with these

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[29] The figures relate only to pension-related savings that require reporting to the tax authorities. Other savings, such as bank deposits, bonds and stocks, are not recorded in this dataset.

[30] The recently adopted plan to raise the means-tested benefits for retirees at the oldest cohorts increases the loss inflicted on low-income families by mandatory pensions, but its magnitude does not qualitatively change the analysis.

calculations. Moreover, households' response to the restructuring of pension incentives between 2000 and 2005 suggests that they are not indifferent to developments in this area – notwithstanding that the magnitude of change in this period was quite extreme.

The disadvantages of "mandatory pensions" are not limited to lifetime low-income households. Many middle-income households begin their careers at income levels below the tax threshold. For these families it may be preferable to postpone savings until their income grows due to consumption smoothing and to yield considerations (losing the tax credit of 35 per cent is equivalent to 9 years of – assumed – net returns in the pension fund). The current decree forces them to contribute in each month regardless of their income. Moreover, there is no provision for partial contributions which would allow couples to optimize their contributions with respect to their eligibility for tax credits – e.g., when women work part-time post-partum. This is a substantial restriction in the decree because half of those who did not contribute to pension before it was affected had a spouse that did. These individuals are also highly unlikely to need assistance from the OAA income supplement.

The initial concerns that led policy makers to adopt the "mandatory pension" had to do with the income distribution and the low-standard of living of the elderly. It seems, however, that the policy action they adopted only harms further the weakest segments among the working population. The high income inequality appears to be a reflection of labor market outcomes and not a result of the restructured pre-compulsory pension system. While the pension decree may reduce future fiscal expenses of the OAA's income supplement, it will do so at the cost of increasing lifetime inequality and the effective tax rate on the lifetime poor. A potential positive outcome of that may be raising labor market participation of non-working spouses from low-income households' to avoid the reduction in their allowance. However, this participation can be minimal as there is no floor for the necessary monthly working hours to meet the tenure requirement.[31] Working couples may actually reduce their labor supply, due to the substitution effect; although Brender and Strawczynski (2006) and Brender and Gallo (2009) show that the elasticity of labor supply to wages is quite small in Israel.

Finally, if policy makers are concerned with reducing the number of income supplement recipients, this target may be achieved in a way that is more consistent with retaining the lifetime neutrality of the pension system. One way of achieving that is by making the tax credits refundable while financing the additional cost by reducing the size of the credit to about 30 per cent. Such a scheme will split the cost of reducing the income supplement more evenly.

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[31] While one could suggest that families will raise their participation in order to offset the loss in their permanent income, the smaller increase is sufficient to prevent the reduction in the OAA and avoid the loss.

APPENDIX

Characteristics of the Various Household Types

Male			Female		Children	Mortgage
Type	**Initial Monthly Salary**	**Wage Profile***	**Employment**	**Monthly Salary**		
1	4,400	1% annual rise, quits work at age 60.	No	…	4, Born at ages 25, 28, 31, 34	No
2	5,200	0.9% annual rise	No	…	3, Born at ages 28, 30, 33	No
3	5,200	0.9% annual rise	Full up to age 30, 70% up to age 33, 50% thereafter	3,850, rising by 2% annually when working FT. rising with the average wage thereafter	3, Born at ages 30, 33, 35	15% in ages 28 to 47
4	6,300	2.1% up to age 46, 1.8% up to age 60, no increase thereafter	…	…	…	…
5	6,300	2.1% up to age 46, 1.8% up to age 60, no increase thereafter	Full time until retirement	5,250, rising by 0.6% annually up to age 46 and by 1% thereafter	2, Born at ages 28, 32	15% in ages 27 to 46
6	…	…	Full time until the first child is born and after the youngest reaches 18. 75% of FT in between	5,250, rising by 0.6% annually up to age 46, by 1% up to age 52 and like the average wage thereafter	2, Born at ages 30, 33	…
7	8,700	2.6% up to age 46, 2.1% up to age 56, no increase thereafter	50% of a FT job throughout her career	3,000, rising by 1.6% annually up to age 46 and does not change thereafter	3, Born at ages 30, 33, 36	15% in ages 27 to 46
8	6,300	2.1% up to age 46, 1.8% up to age 60, no increase thereafter	Works FT at ages 25-30 and 50-64	3,850, rising by 1.9% annually up to age 30. At 50 starts with the same wage she had at 30, rising like the average wage thereafter	3, Born at ages 30, 33, 36	20% in ages 27 to 46
9	8,700	2.6% up to age 46, 2.1% up to age 56, no increase thereafter	Full time until retirement	6,000, rising by 1.6% annually up to age 46 and does not change thereafter	3, Born at ages 30, 33, 36	20% in ages 27 to 46
10	10,000	2.5% up to age 45, a 35% raise at 30 and another 50% at 35. From 44 to 60 annual wage increase of 2.3% and no increase thereafter	Full time until retirement	7,050, rising by 1.6% annually up to age 46 and does not change thereafter	2, Born at ages 30, 33	15% in ages 27 to 46

* The average wage in the economy is assumed to rise by 1.1 per cent annually.

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"SO PENSIONS IN EUROPE WILL REMAIN SUSTAINABLE. BUT WILL THEY REMAIN ADEQUATE?" AN ASSESSMENT OF THE CONSEQUENCES OF THE AWG PROJECTIONS ON THE ADEQUACY OF SOCIAL SECURITY PENSIONS IN BELGIUM, ITALY AND GERMANY

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Introduction

Europe faces important demographic changes in the coming decades. These will have profound consequences on both the sustainability and adequacy of social security, including pensions. In Europe, the focus was primarily on securing the financial sustainability. Indeed, the long-term sustainability of public finances was considered an important part of the Stability and Growth pact. Already in 1974, the European Council decided to set up the Economic Policy Committee (henceforth EPC) to contribute to the work of the Ecofin Council, by focussing on structural policies for improving growth potential and employment. The EPC established the Ageing Working Group (henceforth AWG), which was assigned among other things to assess the long-term sustainability of public finances. It does so by presenting a set of public expenditure projections for all Member States, including the spending on pensions. These projections are based on demographic forecasts provided by Eurostat and agreed assumptions on key economic variables. Table 1 presents public pension expenditures as a percentage of GDP in Belgium, Germany and Italy, as well as for the EU15 and EU25 as a whole.

In 2004, public pension expenditures amount to 10.6 per cent of GDP in the EU15 Member States. The share is lowest in Ireland (4.7 per cent) and highest in Italy (14.2). Public pension spending in Belgium is roughly on the EU15 average, whereas spending in Germany is somewhat higher. In the EU15 Member States, the share of public pension expenditures of GDP is projected to increase by 2.3 percentage points. The strongest decrease is projected for Poland with 5.9 percentage points the strongest increase will be observed for Cyprus with 12.9 percentage points (EC, 2006, p. 71). In Italy, the increases are very small because of the introduction of an NDC scheme. Like many EU15 Member States, public pension spending in Germany show a relatively moderate increase. Projected increases are larger in Belgium (5.1 percentage points), but this is still far from the rates reported for the countries that face the largest challenges. This includes Portugal (9.7 percentage points of GDP), Luxembourg (7.4 percentage points of GDP) and Spain (7.1 percentage points of GDP).

To date, the projections that Member States produce for the AWG include only a limited notion of adequacy, being the benefit ratio. However, the sustainability and adequacy of pensions

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Table 1

Gross Public Pension Expenditures between 2004 and 2050
(percent of GDP)

	2004	2010	2015	2020	2025	2030	2040	2050	Change 2004-2050[(2)]
Belgium	10.4	10.4	11.0	12.1	13.4	14.7	15.7	15.5	5.1
Germany	11.4	10.5	10.5	11.0	11.6	12.3	12.8	13.1	1.7
Italy	14.2	14.0	13.8	14.0	14.4	15.0	15.9	14.7	0.4
EU15[(1)]	10.6	10.4	10.5	10.8	11.4	12.1	12.9	12.9	2.3
EU25[(1)]	10.6	10.3	10.4	10.7	11.3	11.9	12.8	12.8	2.2

(1) Excluding Greece.
(2) Percentage points of GDP.
Source: EC (2006) Table 3.3, page 71.

are two sides of the same coin. The assessment of sustainability may not be very meaningful without considering current or prospective developments in adequacy, and vice versa. This paper aims to set a first step into integration by assessing the consequences of the AWG projections and assumptions on the adequacy of social security pensions in Belgium, Germany and Italy.

The setup of this paper is as follows. The second paragraph of this paper will give a flavour of the MIDAS model, without however going too much into its nuts and bolts. The third paragraph will present and discuss some simulation results, insofar as they pertain to the adequacy of pensions. The fourth and final paragraph will conclude. For a more detailed discussion of this project, the model and a broad range of simulation results, the reader is invited to read the report of the project (Dekkers *et al.*, 2009). We will refer to this report as the *MIDAS Report* in the remainder of the text.

1 The MIDAS model for Belgium, Germany and Italy

Lusardi *et al.* (2008, p. 8) define a pension system to be adequate when it provides means for individual consumption smoothing, and reduces inequality and poverty. To assess the adequacy of pensions, a model is needed that allows for the simulation of inequality, poverty and (re)distribution. A micro simulation model is the most obvious candidate for this, since it starts modelling at the level of the individual. As the conclusions of the AWG pertaining to sustainability are prospective, so should the model be dynamic. Finally, since the simulation of pension benefits and eligibility conditions, as well as the simulation of poverty and inequality require the modelling of households, the model needs to be a dynamic, closed, cross-sectional micro simulation model. These are the broad characteristics of the model MIDAS, (an acronym for "Microsimulation for the Development of Adequacy and Sustainability"). This model is designed to simulate future developments of the adequacy of pensions in Italy, Germany and Belgium,[1] following wherever possible the projections and assumptions of the AWG.

MIDAS starts from a cross-sectional dataset representing a population of all ages at a certain point in time, in this case the PSBH dataset for Belgium in 2002, the SOEP for Germany in 2002

[1] In the remainder of this paper, the specific Belgian, German and Italian versions of the model will be denoted MIDAS_BE, MIDAS_GE and MIDAS_IT. The name MIDAS without the country-specific suffix is used for general descriptions of the model.

and a compound dataset based on the ECHP, for Italy in 2001.[2] From that starting year up to 2050, the life spans of individuals in the dataset are simulated, together with their interactions. Events simulated include birth, receiving schooling, marriage or cohabitation, divorce or separation, entering the labour market, work, unemployment, disability, retirement and death. During their active years, individuals build up pension rights, which result in a pension benefit when they retire.

MIDAS is developed in the programming language LIAM (the Life-cycle Income Analysis Model). One of the strong points of LIAM is that it allows for extensive alignment, which ensures that aggregates from the micro model match AWG projections. Mortality and fertility as well as the labour market participation decision are aligned to AWG projections in each country model. Thus, for example, the activity rates that result from a behavioural equation are aligned with the AWG activity rate projections differentiated by age and gender. In MIDAS_IT, also the unemployment rates are aligned to AWG projections, while disability rates are aligned to national data. In MIDAS_BE, alignment is used for unemployment, disability, retirement, and conventional early leavers' scheme ("prépension conventionnelle", henceforth CELS). Besides via alignment, AWG assumptions and projections are also included through the development of aggregate earnings (assumed to follow the growth rate of productivity) and the social policy hypothesis pertaining to the relation between the growth rate of wages and of social security benefits.

MIDAS consists of different modules, the demographic module, the labour market module and the pension module. The structure of the demographic module is identical in the three country-specific versions of the model; the labour market modules are based on a common general setup, but take some country-specific characteristics into account, mostly depending on the information necessary to run the pension module. Finally, the three development teams had complete freedom in the development of the pension module.

2 The demographic module

The demographic module consists of four different parts: The birth process, the survival process, the education process and the marriage market. The first two processes are essentially alignment-driven random selection processes, and are based on the 2004 demographic projections created by Eurostat and used by the AWG.

The education submodule consists of two serial steps. First, using observed education levels on data from the Labour Force Survey, OECD, every ten-year old individual is by chance "assigned" a level of education. Given the assigned or observed level of education, the second step of the education submodule determines if an individual is still in education or not. This status will depend on the level of education. An age of education ending will be associated with each education level. The average age of education ending is computed on AWG participation rates for each level of education.

The third demographic sub module is the partnership formation process or "marriage market". Figure 1 overleaf describes this module.

This process links candidates eligible to marriage as well as cohabitation. It is therefore better to speak of it as the "partnership formation process". It is a three stage process, which starts with a simple random selection procedure selecting males and females in the population who are eligible for marriage or cohabitation. In the second step and for each of the selected females, a vector is constructed that contains the probability that she will become partner with any of the

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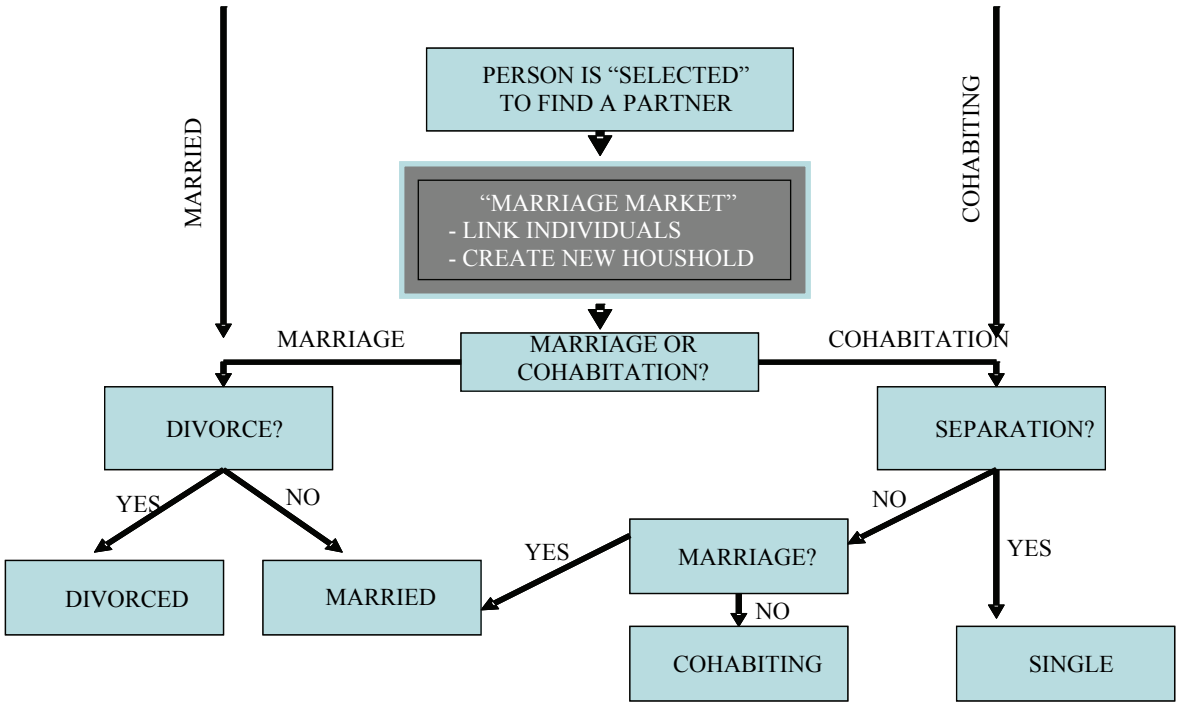
[2] See Doutrelepont *et al.* (2004), Wagner *et al.* (2007), and Nicoletti (2005), for a discussion of the PSBH, the SOEP, and the ECHP, respectively. Istat (2002) describes specifically the Italian ECHP.

Figure 1

The Marriage Market Module



males eligible. These estimated probabilities are a function of the difference between the two potential partners with respect to several variables, such as age, education level, having a job, and so forth. The third step in this process is the selection procedure itself. This selects each female in turn, and matches her with a male. When a female is to be matched, the male with the highest probability calculated from the regression and still available, is selected to form a partnership. Links are then created between the new partners, and they receive the same household number.

Once two individuals are linked into a couple, a simple logit regression determines whether these individuals are married or cohabiting. Another logit regression is used to model the probability that cohabiting couples later decide to enter into marriage.

Note that marriage or cohabitation is just one way in which a new household can be formed. By default, individuals that reach the age of 24 without being married "leave the nest" and start a new household of their own.

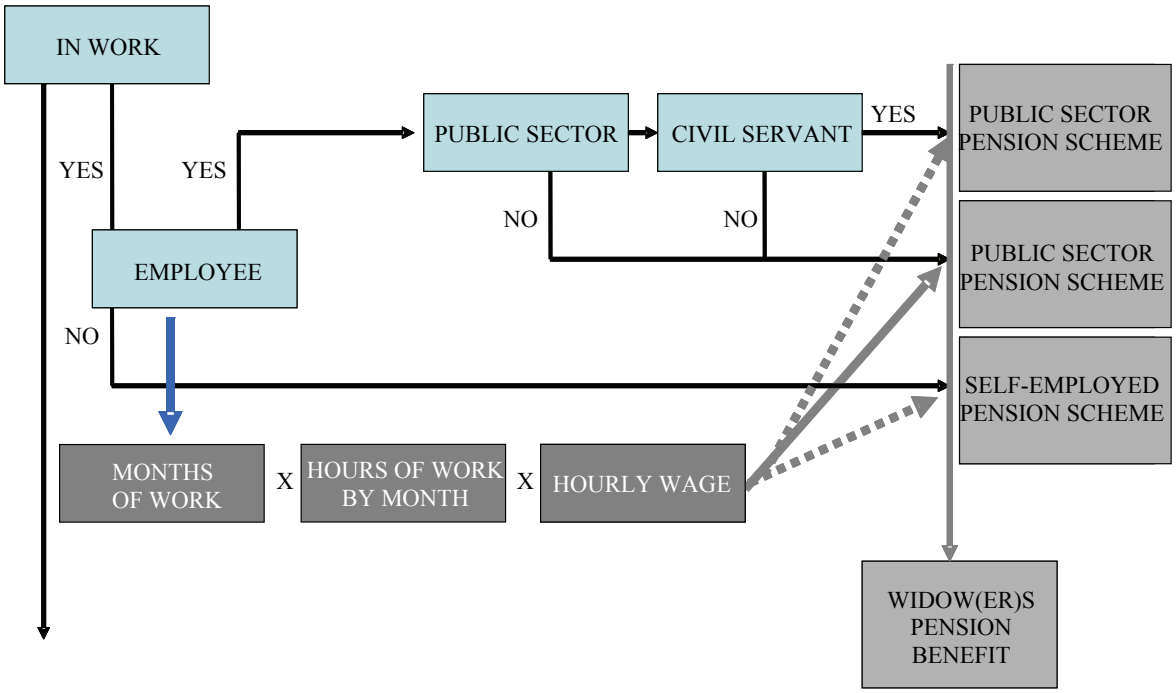
Any routines describing household formation obviously come with routines describing household dissolution. Indeed, all couples are subject to a certain risk of divorce (in case of marriage) or separation (in case of cohabitation). The probabilities of this happening are again the result of logits, with among other things the duration of the marriage or cohabitation as explanatory variable.

3 The labour market module

The general setup of the labour market module, and the relation with the pension module, is described by two figures. Figure 2 describes the labour market states of individuals that are

Figure 2

Labour Market Module – Working Individuals



"selected" to be in work.

The process of being in work is modelled by a logit regression whose results are aligned to AWG prospective data. If an individual enters the active state, then the next decision is whether or not he or she is an employee or a self-employed. In the first case, the next decision is whether or not he or she works in the public sector, and – if so – whether he or she does so as a civil servant.[3] Given the labour market state one occupies in a certain period, logit regressions describe the probability that one moves to another labour market state, or leaves the labour market for one of the inactive states (see Figure 3). Figure 2 also shows that for wage-earners and civil servants, separate regressions are used to simulate months of work, hours of work per month (conditional on working full time) and the hourly wage. This results in the annual wage, which, together with annual increases of the length of career, is the information on which the future pension benefit is based. When working, individuals build up a virtual pension claim in the pension module, and they therefore become eligible to a pension benefit once they enter retirement. In MIDAS_BE and _IT, the pensions module includes wage-earners' pensions, self-employed pensions and civil servants' pensions, early retirement pensions, disability pensions and widow(er)s pensions. In MIDAS_GE, employees' pensions, including civil servants and widow(er)s pensions are simulated. Figure 3 overleaf presents the decisions for those that are not active in the labour market.

Given that a person does not work in a given year, it is simulated sequentially whether the person is unemployed, retired or in a residual inactivity category which comprises all remaining inactive states. Else and specific to the Belgian case, one may be eligible for Conventional Early Retirement' Benefit (CELS). In MIDAS_BE, all of these states, use age and gender to align to AWG labour market projections. In MIDAS_IT, unemployment and disability are aligned.

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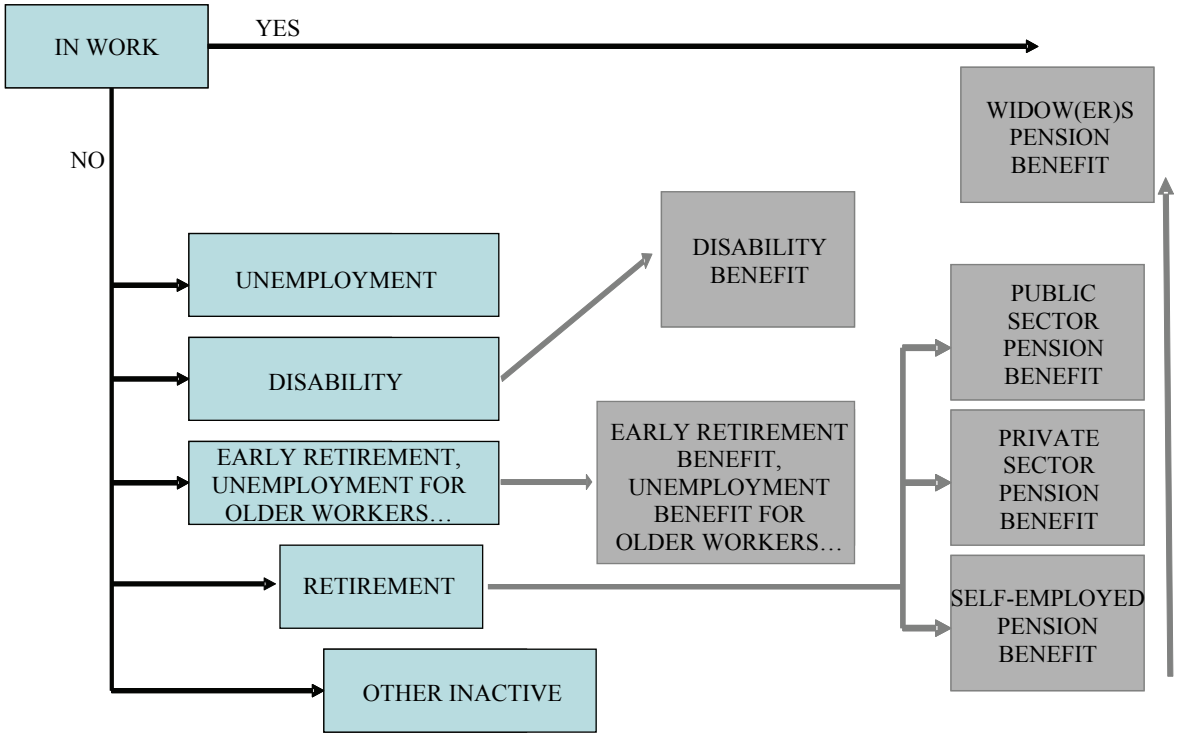
[3] In MIDAS_IT, this last decision does not occur, because there is a full overlap between civil servants and workers in the public sector.

Figure 3

Labour Market Module – Inactive Individuals



In the inactive states, one can still build up a (virtual) pension claim, for example via a prolongation of the career. For example, in Belgium, unemployed build up an "equivalent period" in the sense that the length of the career increases, and that the pertaining income is based on the income of the last year employed. For disabled persons and retirees (also CELS), MIDAS simulates the amount of social security pension benefits.

4 The pension module

Of the three modules of the model, the pension module is the most country-specific. It will therefore be described for each country separately. Given the scope of this paper, the description will be limited to social security pensions.

4.1 The Belgian pension module

As in most countries with a Bismarckian pension system, social security pension benefits in Belgium have an occupationally tied character that is toned down by diverse minimum provisions and ceilings. The first-pillar retirement system for wage-earners provides former private sector employees and public-sector employees that were no civil servants a pension benefit that essentially is a function of the past career. The mandatory age of retirement is 65 for males. For females it is gradually increasing from 61 years of age (1997) up to 65 (from 2009 on). However, one can become eligible for early retirement from the age of 60 on, if one has a career of minimum 35 years.

The pension benefit is calculated as:

Benefit = (.60 or .75)*(length of career / length of career for full pension)*wage-base

The wage-base essentially is the average of past salaries, indexed on the development of prices and with additional discretionary adjustments for the development of wages between the years of receiving the salary and the year of retirement. This modified average of corrected salaries is then multiplied by the length of the career and divided by the length of the career needed for a full pension. The latter equals the age at which one becomes eligible to a full pension benefit minus 20. So, for males, it is 65–20=45 years. For females, it is gradually increasing to 45 years. This wage-base is then multiplied by either 60 or 75 per cent. If the individual is single, the 60 per cent is used. If (s)he is married to someone with a very low pension entitlement, the couple can opt for a "family pension benefit", based on of 75 per cent of the wage-base of the high-earning partner. In this case, the low-earning partner loses his or her own pension entitlement.[4]

Redistributive solidarity elements are embedded in the pension system in several ways. First of all, pensions are a function of lifetime earnings up to a ceiling. Inversely stated, the wage one earns in a certain year during ones career is taken into account only up to a certain limit or ceiling. Those earning a higher income therefore face a lower replacement rate. Moreover, there are two ways in which a minimum benefit is implemented in the pension benefit: the minimum right by career year and the minimum pension.

The conventional early leavers' scheme (CELS) for employees is essentially an unemployment scheme for private-sector workers of 58 and older. Unlike the retirement benefit, the CELS benefit does not depend on the number of working years. Furthermore, when one enters the CELS, the career length, on which the future old-age pension will be based, continues to increase.

The disability scheme for wage earners is also considered as a pathway of withdrawal out of the labour market. Indeed, disability is in practice an absorbing state for workers aged 50 and older. The disability benefit is equal to 40 per cent of the last wage when the individual is cohabiting and 50 per cent of the last wage when he or she is not. This amount also is subjected to a minimum and maximum.

Civil servants are subject to a first-pillar pension system that is separate to that of the private sector. Retirement is compulsory as of age of 65 for both men and women. Early retirement is possible from the age of 60 if at least 5 years of work as civil servant is proved. Public sector pensions are based on the income earned by an individual during the last five years before retirement. Benefits are computed according to the following formula:

$$\text{Benefit} = n/N * \text{reference earning}$$

where n is the number of eligible years spent in the public service, N is a benefit accrual factor and the reference earning is the average wage over the last five years. The benefit accrual factor N is in general equal to 60, but there are many exceptions.

Self-employed retirement benefits are not modelled using exact regulation as it is done for civil servants and wage-earners. Data describing earnings of the self-employed are often missing or unreliable, so we assume that self-employed retirees receive the minimum pension for self-employed. This minimum is adjusted for those that do not have a full career. As 78 per cent of "pure" self-employed benefit from the minimum pension (Scholtus 2008), the error introduced by this simplification might be limited.

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[4] Actually, the "family pension benefit" is divided over the two partners. The high-earning partner receives 60 per cent of the wage-base, so an amount equal to the individual pension, and the low-earning partner receives 15 per cent of the wage-base of the high-earning partner. Together, they get 75 per cent of the wage-base.

Summarizing, the Belgian pension module of MIDAS simulates first-pillar old-age pension benefits for private sector employees, civil servants and self-employed. Furthermore, it simulates the Conventional Early Retirements (CELS) benefit, the disability pension benefit for private sector employees, and – finally – the widow(er)s' pension benefit, again for private sector employees, civil servants as well as self-employed.

As said in the previous section, hourly wages increase with productivity over time, and the speed of this increase is the hourly productivity growth rate assumed by the AWG. Social policy hypotheses used in MIDAS for other pension systems are those used to produce the 2005 AWG projections for Belgium. These growth rates are defined as a difference relative to the productivity growth rate.

- Wage ceiling: difference of 0.5 per cent with productivity growth
- Welfare adjustment: difference of 1.25 per cent with productivity growth
- Welfare adjustment for civil servants: difference of 0.5 per cent with productivity growth
- Lump-sum benefits: difference of 0.75 per cent with productivity growth
- Minimum right by career year: difference of 0.5 per cent with productivity growth

4.2 The German pension module

The vast majority of gainfully employed persons in Germany is compulsorily insured in the public pension scheme (PPS). The most important exceptions are civil servants and the majority of self-employed persons. These are not simulated by MIDAS_GE, so we will not discuss their pension systems in more detail. Furthermore, disability pensions exist and derived pensions such as surviving spouse pensions.

The PPS is a pay-as-you-go system of the Bismarck-type. Most of accumulated pension rights result from so called "earning points" which represent the relation of individual earnings to average earnings in a given year. Earnings points can also be derived from other sources, e.g. from childbearing, education, unemployment. A person becomes eligible to a pension if she has a minimum insurance record and if she reaches a threshold age (this depends on the birth cohort). At present, the regular retirement age (65) is equal for all individuals with the exception of handicapped persons.[5] Several groups are allowed to retire before the regular retirement age (up to 5 years). However, each month (year) of early retirement leads to a deduction of pensions of 0.3 per cent (3.6 per cent). Retirement before the age of 60 is only possible for disabled persons.

The old-age pension amount without deductions is given by the product of the sum of earnings points and the current pension value. The current pension value is identical for all persons and is adjusted, depending on the growth rate of the average gross wage, changes in the ratio of pensioners to employees, changes in the income share of subsidized private pension provisions, and changes in the PPS contribution rate.

The social security pension scheme also provides surviving spouse benefits. The amount of a surviving spouse benefit is a fraction of the pension of the deceased spouse. The pension is withdrawn to some extent if own income of the surviving spouse exceeds a threshold.

For the growth of gross wages, we use the assumptions of the AWG (1.6 per cent on average per year). We use a simulation of the current pension value of Buslei and Steiner (2006) to capture assumptions on the changes of all factors that enter the adjustment rule. The development of wages and current pension value are shown in the following Table 2.

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[5] The regular retirement age will gradually increase to 67 between 2012 and 2030. This reform is not modelled in MIDAS_GE.

Table 2

Assumptions on the Development of Wages and Current Pension Value

	2010	2020	2030	2040	2050
Percent increase of wage compared to 2002	4.6	21.4	43.7	70.0	101.3
Percent increase of pension compared to 2002	2.9	15.7	27.9	48.0	73.4

While wages double up to the year 2050, the current pension value increases by about 73 per cent. This lower growth rate of pensions is essentially driven by demographic ageing. Pension growth is linked to gross wages but the new adjustment formula for the current pension value takes into account changes in the ratio of pension benefit recipients and contributors. This ratio is likely to grow strongly up until 2030 which works like a discount factor and lowers the growth rate of pensions. Thus the difference between the increase of gross wages and pensions is maximized around 2030 when demographic ageing is expected to reach its peak. This adjustment mechanism is one of the core elements that are assumed to guarantee financial sustainability of the pension insurance in Germany.

4.3 The Italian pension module

The Italian public pension system has been subject to many reforms during the last 15 years, changing both the age at which one becomes eligible to seniority and old age pensions and the formula for computing benefits.

In Italy two different kinds of options for retirement are allowed. The first option is the old age pension. Workers can receive an old age pension benefit when they are aged 65 (males) or 60 (females) and their contribution years exceed a specific threshold. The mandatory retirement age is 65 so women can choose to take up an old age pension benefit between 60 and 65.

The second option for retirement is called the seniority pension. One becomes eligible to this when, before being aged 65 or 60, specific requirements concerning both age and seniority are satisfied (e.g. 40 years of seniority or, since 2008, at least 58 years old with at least 35 seniority years).

The 1995 reform introduces a NDC regime for those entering the labour market after that moment. For older workers with vested rights, the old scheme rests in place, and a transitory system applies to others. Three different public pension schemes therefore currently apply in Italy. Workers' enrolment to such schemes depends on their seniority in 1995 according to the following rules:

1) individuals with a seniority of at least 18 years in 1995 receive a benefit that is fully earnings related (so called retributivo). This retributivo is compound of the "A quota" and "B quota". For private sector employees, the "A quota" is based on the average of wages earned during last five working years. For public sector employees, the "A quota" is based on the final wage. In the "A quota" wages are indexed only to inflation rate. The "B quota" is linked to the average wage over the last 10 working years for both civil servants and private sector employees. In the "B quota", pensions are indexed to inflation rate plus 1 per cent;
2) individuals entering the labour market on or after 1995 receive a benefit wholly based on the NDC scheme (so called contributivo). In the NDC regime the pension is based on contributions paid which are accumulated – receiving nominal GDP growth rate as rate of return – and are

transformed in an annuity stream through transformation coefficients depending in an actuarially fair way on retirement age. Coefficients do not differ between males and females;

3) individuals working in 1995 with less than 18 years of seniority receive a mixed benefit computed pro quota by a weighted average of pension benefits resulting in earnings related and NDC schemes, where weights are, respectively, years worked until and after 1995. The "B quota" of the earnings related part is now based on wages earned during the whole working life rather than only on last 10 working years.

In addition, for workers fulfilling the requirement concerning years of contributions for receiving an old age pension, in the earnings related (1) and mixed scheme (2), a means tested integration to a fixed minimum pension is guaranteed, taking into account income only. Individuals enrolled in the NDC scheme are eligible at 65 to a means tested social assistance benefit, amounting to less than the minimum pension. This however is not included in MIDAS_IT.

Until the 1992 reform, pension benefits were indexed to gross nominal wages. Since then, pension benefits are indexed only to prices.

The pension module simulates first pillar old age and early retirement pensions for private and public sector employees, as well as the minimum pension. In addition to "pure" pensions MIDAS_IT includes survivor pensions and disability pensions for wage earners and civil servants. Finally, like the Belgian version of the model, MIDAS_IT simulates pension benefits for the self-employed. Most self-employed in Italy pay the minimum contribution fixed by the law. As a consequence merely the minimum pension is imputed as pension benefit to self-employed enrolled (wholly or pro quota) to the earnings related scheme (and fulfilling requirements for receiving such pension). For self-employed enrolled to the NDC, the payment of the minimum contribution is instead accumulated into the model and the benefit is computed according to the usual rules of the NDC scheme.

5 Simulation results describing the prospective adequacy of pensions

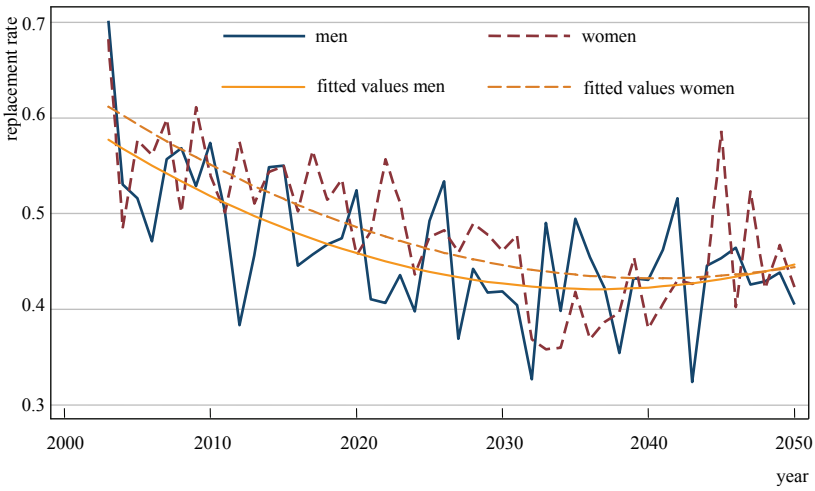
This section presents and discusses the main simulation results pertaining to retirement and the adequacy of pension benefits, as projected by MIDAS. This presentation will be limited to the bare necessities for reaching the conclusions on adequacy. These are the replacement rate, the redistributive impact of pensions and the different risks of poverty pertaining to pension beneficiaries relative to wage-earners.

When analysing retirement income in MIDAS, two problems have to be dealt with. First of all, questions on pension income in the PSBH and ECHP starting dataset do not make a difference between benefits from the first, second or third pillar of the pension system. Neither does it make a difference between pension benefits coming from the pension systems for former employees, civil servants or self-employed. So, the pension income in the starting dataset (*i.e.*, of those retired in the starting year 2002) is likely to be too high on average, and to much skewed to the right. Furthermore, it does not allow making a separate analysis of the systems for civil servants or employees.

A second problem which is common to all three versions of MIDAS is that transitions within labour market states result in many low pension benefits. This does not necessarily mean that the individuals actually have a low retirement income, because a considerable share of individuals in MIDAS receives benefits from multiple systems. Consequently, studying the benefits from the pension systems of employees and civil servants separately might result in an overestimating of the inequality of pension income, while underestimating the average retirement level.

Figure 4

Replacement Rates – Belgium



Source: MIDAS Belgium and own calculations.

Both problems cannot be solved, but we can try to surface them as much as possible so that they become explicit in the analysis.

5.1 Adequacy of pensions in Belgium

Figure 4 shows the replacement rate for Belgium. Note that the development of the replacement rate is somewhat erratic, due to the sometimes low numbers of people actually making the transition into retirement. To clarify their development, quadratic trends have been estimated and the fitted values are added to the figure. In the largest part of the simulation period, the trend is decreasing. One important reason for this is that less and less pensions are allocated at the higher household rate. As it is most of the time the man who receive this family pension, it is not surprising to see the replacement rate of men decreasing. Furthermore, women that forego their own individual pension benefit in order to benefit from the household rate pension of their partner, are obviously not included in Figure 4. As more and more women apply for the individual pension benefit, the replacement rate of women decreases as well.

The growth rates of productivity that the AWG assumes for Belgium provide a second explanation of the trends in the replacement rate. However, as pensions of new retirees are based on past growth rates, the replacement rate will show an opposite development. The AWG assumes that the growth rate of productivity will increase from 1.5 (the years up to 2010) to 1.8 (from 2010 to 2030) and this implies a lowering of the replacement rate from 2010 on. From 2030 on, the assumed growth rate decreases somewhat, namely from 1.8 to 1.7, and the replacement rate hence starts to catch up from the mid-2030s on.

A third explanation pertains to the effect of the wage ceiling in the calculation of the pension benefit. This ceiling lags to the development of wages, and therefore depresses the growth of the pension benefit relative to wages. As a result, the replacement ratio decreases over time. However, following the social policy assumptions of the AWG, this lag of the development of the pension ceiling becomes smaller. As a result, the speed of decrease of the replacement rate will decline over time.

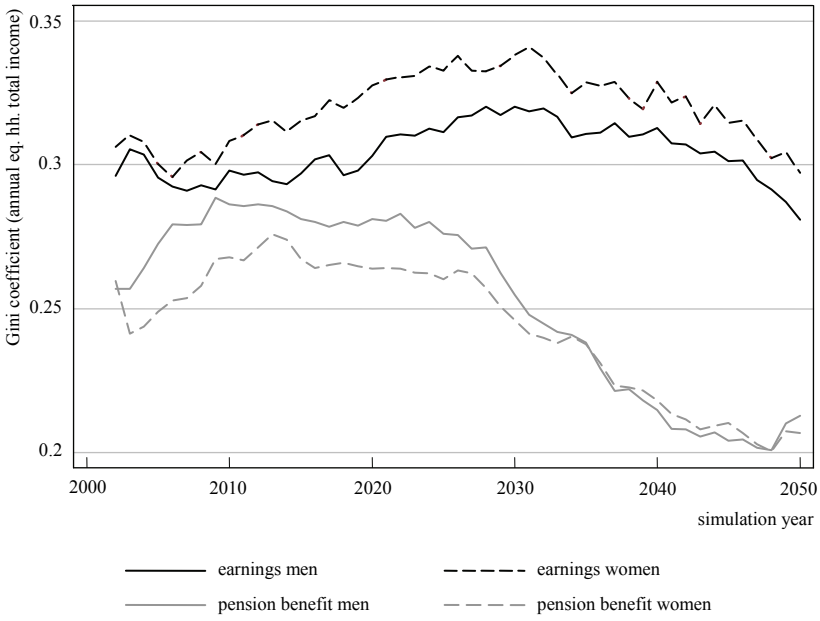
Figure 4 also shows that the replacement rate is generally higher for women than for men. This is because men have a higher wage than women. This implies that the annual wage of men more often than women exceeds the ceiling, thus resulting in a proportionally lower pension benefit. Furthermore, women more often than men see their pension being adjusted upwards to the minimum, which means that their pension increases proportionally to their wage. The replacement rates of men and women however converge, and this is mainly due to the increasing labour market participation of women, which results in an increasing length of their career.

Figure 5 specifies the redistributive impact of pensions to gender.

In general, the inequality of retirement benefits is considerably lower than that of earnings. This redistributive effect confirms the findings of Brown and Prus (2006). The figure suggests that this redistribution increases after 2020.

Figure 5

Inequality of Gross Earnings and Retirement Benefits – Belgium



Source: MIDAS Belgium and own calculations.

A first reason pertains to the comparison of the linkage between wages and benefits before and after the start of the simulation. Following the assumptions of the AWG, we assume that benefits lag behind the development of wages. The difference between the growth rate of pension benefits, for example, and that of wages is assumed 1.25 percent. Fasquelle *et al.* (2008) show that this lag was on average 1.8 percent between 1956 and 2002. Thus, the assumptions used by the AWG – and hence by MIDAS_BE – imply a reinforcement of the link between wages and pension benefits. Hence, the relative decrease of the benefit of older retirees is slowed down, not only relative to workers but also relative to younger retirees (who retired later). As a result, the inequality of pension benefits will ceteris paribus decrease over time.

A second reason that explains this decreasing inequality starts by emphasizing that the model takes only earnings and pension benefits into account. Welfare benefits, unemployment benefits and all other kinds of replacement incomes are ignored. This not only means that the levels of inequality are most likely too high, but this omission may make the simulation results dependent on the structure of households. Indeed, the larger the household, the higher the probability of observing other types of income. Or, the more individuals in the household, the more the simulation results of MIDAS will overestimate actual inequality. Consequently, when the average number of individuals in the household decreases, then the overestimation would become smaller in size, and we therefore can expect inequality to decrease as well. Figure 11 in the *MIDAS Report* indeed shows that the average number of individuals in households – restricted to households whose at least one individual is retired – is first slightly increasing until 2020 and therefore decreases a lot until the end of the period. This development coincides with the Gini index of pension benefits. Indeed, we see this inequality index increase until 2020 and decrease thereafter.

The inequality of earnings is higher for females than for males because the proportion of part time workers and workers that work only a limited number of months is higher for the former than for the latter. However, the inequality of pension benefits is lower for females than for males, and

Figure 6

Incidence of Poverty Pertaining to Individuals from Working and Retired Households – Belgium

Source: MIDAS Belgium and own calculations.

the redistributive effect of pensions is therefore stronger for the former than for the latter. As the average pension benefit is lower for women as well, these pensions more often are confronted with the various minimum benefits. As a result, the inequality is lower. Furthermore, retired men more often than women receive a pension benefit from the second or third pension pillar. Even though the effect of this is diminished by the fact that we use equivalent household income, we can expect this to increase the inequality of the pension benefit of men at least up to 2020.

Figure 6 shows the incidence of poverty among individuals with households that have only earnings, only retirement benefits, or both. The first conclusion from Figure 6 is that those who live in households that have both earnings and pension benefits, have a lower risk of poverty as compared to the other categories. These individuals have best of both worlds: they benefit from the high but unequal earnings, as well as the lower but highly redistributive pension benefits.

The advantageous position of those having both earnings and pensions relative to others who live in households with only earnings can furthermore be explained by noticing that those that live in "mixed households" often are older than those that live in households that have only earnings as income. This means that their income from work is usually higher, and their households are usually smaller in size to that welfare is ceteris paribus higher.

The lower risk of poverty of those that have household earnings relative to those that receive just pensions can be explained by the fact that one common poverty line has been used in all previous figures. The lower mean pension benefit compared to earnings (see the replacement rate in Figure 4) thus results in a higher poverty risk for those having only a pension benefit.

Next we consider the development of poverty risks and intensities over time in Figure 6. This shows a rather grim picture where both the risk and intensity of poverty of those having earnings remain more or less the same, while both the risk and intensity of poverty of those receiving only a pension benefit shows a development that can roughly be decomposed in five phases corresponding to the five decades. Poverty among pension recipients increases during the first decade. Next, it roughly stays constant between 2010 and 2020, decreases during the third decade, on average stays more or less constant between 2030 and 2040 and finally increases again during the 2040s. This evolution is mainly explained by the evolution of the household structure combined with the evolution of earnings composition into households. These are presented in Table 79 of the *MIDAS Report*.

During the 2010s, the number of two-person households with two incomes goes down at the benefit of the three other categories. The two above-mentioned effects go in the same direction and combine each other to cause poverty to increase. A second effect, works though the 4 percentage points increase of two-person households with only one income, and reinforces poverty growth: Figure 29 in the *MIDAS Report* shows that the proportion of "household rate" pensions raises until about 2010. Couples benefiting from "household rate" pensions being worse off than couples benefiting from two pensions or even than single households with a single pension,[6] this proportion increasing makes poverty rise.

The analysis of Table 79 in the *MIDAS Report* reveals only minor changes into the composition of households between 2010 and 2020. Furthermore these changes have opposite impacts on poverty and cancel each other out.

The 2020s are characterized by an important decrease in poverty among pension recipients. The number of one-individual households stays constant during that period while the number of two-person households with two incomes increases considerably at the expense of households with 2 or more individuals and two-person households with one income. As explained above, a reduction in the average number of dependent individuals in households leads to a reduction of poverty. Moreover, because they receive more often two incomes, households consisting of two individuals become wealthier. The two effects joining together result in a considerable reduction of poverty.

The 2030s do not present a significant trend in poverty. The two opposite effects explained above cancel each other out.

Finally, the 2040s show an increase of the poverty level by 10 percentage points. The effect at work here is the first one explained above. The number of single-person households increases considerably, from 57 to 68 per cent, and this at the expense of households consisting of two individuals with two incomes.

So, far, the development of poverty among pension-receiving households has been explained using developments in the structure and income composition of these households. These however are not the only factors influencing poverty. Several other important explanations will be discussed in what follows.

First of all, the poverty increase from 2002 to 2010 is also the result of a technical characteristic of the model that was discussed at length before. The observed pension benefits in the starting year 2002 indeed consist of benefits from not only the first, but also the second and third pillar of the pension system. As new generations of individuals enter retirement, the observed retirement benefits become merged with fully simulated retirement benefits. The latter do not include benefits from the second and third pension pillar, and poverty therefore increases. This, obviously, is not necessarily a realistic development, but a technical characteristic.

Figure 38 of the *MIDAS Report* shows that the average age of the recipients of pension benefits start to increase considerably from the early 2030s. Ongoing pension benefits are only partially linked to the development of wages – even though this linkage is stronger in projection than it was in the past – so a strong increase of the average age of recipients explains the increase of poverty among the recipients of pensions.

Ignoring the increase of poverty among the pensioners in the first decade of the simulation period, a contradiction between the poverty among pensioners and the replacement rate becomes visible. Between about 2020 and the first half of the 2030s, the position of retirees will meliorate

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[6] The proportional difference between the "household rate" and the "single rate" (being 25 per cent) is lower than the increase of the equivalence scale (50 per cent).

relative to that of the other categories. This development seems in contradiction with the ongoing decrease of the replacement rate in Figure 4. Furthermore, poverty among pensioners in Figure 6 increases again from the 2030s on, which is just when the replacement rate has reached its minimum and is again increasing! So the development of the poverty position of the elderly seems somewhat in contradiction to the development of the replacement rate. An answer lies in realizing that the replacement rate represents "only" the income fall at retirement. It hence represents only the youngest cohort of retirees and not all those that retired earlier. Indeed, the higher the average age of the pensioners, the lower the value of the replacement rate in explaining poverty among pension beneficiaries. This suggests that the age development of pensioners could explain the development of poverty.

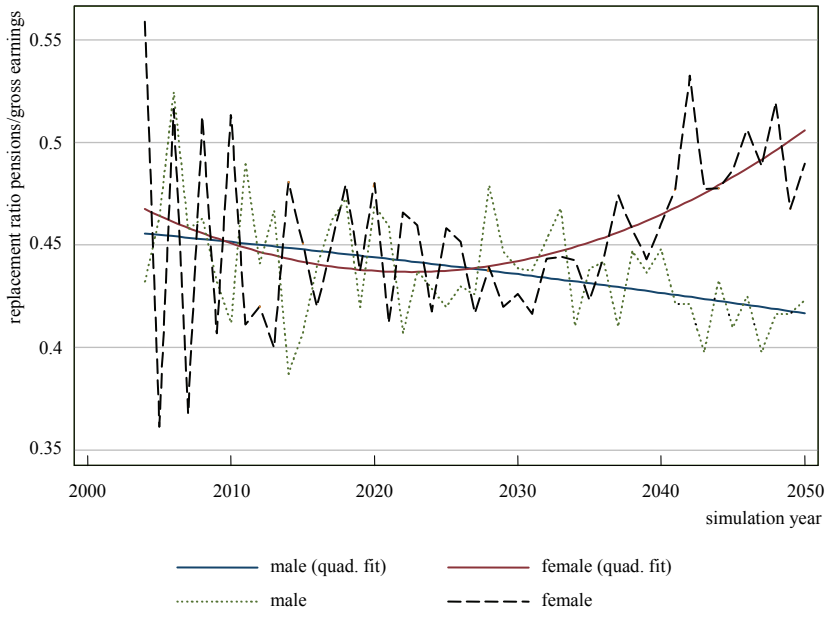
5.2 Adequacy of pensions in Germany

The replacement rate takes into account our growth scenarios in which pensions are assumed to grow slower than earnings (see prior section). Pensions will grow at a slower rate than gross wages which in turn implies that the replacement rate can increase only if supplied labour increases over the cohorts which are affected. For men, it turns out to result in a slightly decreasing average replacement rate. For women, on the other hand, the increase in labour supply over the lifetime of future cohorts of female retirees more than compensates the reduction in the current pension value.

The erratic movement is caused by low sample size since we only look at new transitions to retirement in each year. A quadratic trend was added to make it easier to identify the overall development of the replacement ratios of men and women. Replacement ratios decrease significantly for men from about 45 per cent in 2003 to roughly 42 per cent in 2050. The slight negative trend can be attributed to the lower growth rate of pensions compared to wages and increasing male labour force participation. The increase in the employment rates leads c.p. to higher pensions and compensates partly the slow growth of pensions. For women, the mechanisms apply but the employment effects – *i.e.*, higher labour market attachment of women – even dominates the effect of the lower growth rate of pensions, at least after 2025. It is also important to keep in mind that replacement ratios of men and women are different in terms of levels: a higher replacement ratio of women does not mean a higher pension, after all male pensions remain

Figure 7

Replacement Rates – Germany



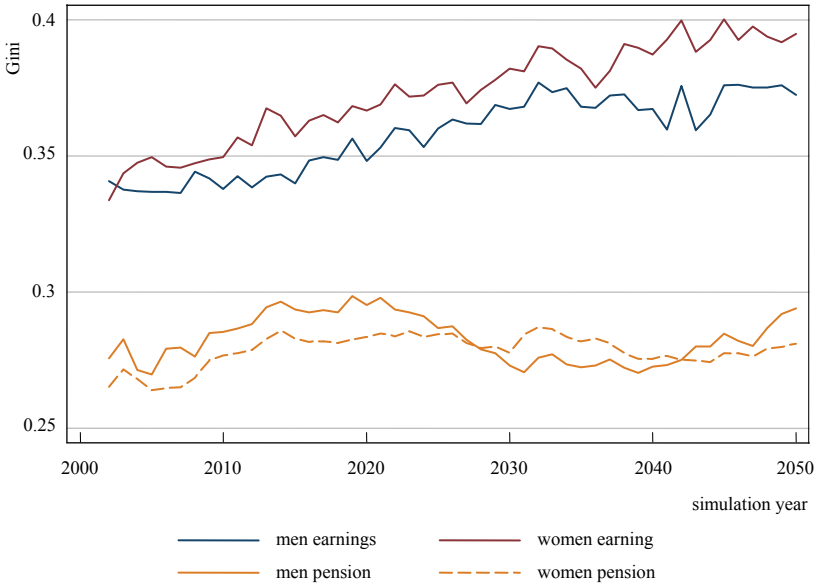
Source: MIDAS Germany and own calculations.

higher than those of females and the same holds true for wage income.

This result resembles well the ageing process of the population because – somewhat simplified – pension growth is slower the higher the old age dependency ratio is. Around 2030 demographic ageing reaches its peak and the difference in growth rates of pension and earnings shrinks. For women we also find that a higher employment rate leads to higher pensions in the future. This mitigates the downturn in the replacement rate for women.

Figure 8

Gini of Individual Monthly Earnings and Pensions by Gender (age 16-64, Employees and Retirees) – Germany



Source: MIDAS Germany and own calculations.

Figure 8 shows the development of the Gini of equivalized household earnings and pensions. Interestingly, the Gini of equivalized earnings develops like that of unweighted individual earnings.[7] This means that the household structure does not change its trend. The inequality increases up until the end of the simulation period for both men and women. For both, the Gini starts off from about 34 points and increases for men to a value of about 37 and for women to about 39. The household dimension leads to a lower difference between the Gini of men and women compared to the comparison based on individual earnings. This difference is obviously driven by single households since household income is equivalized.

A different development can be observed for households with pension benefit recipients. The Gini for male pensioners starts off with about 0.27 and increases until 2020 to about 0.3. After that it starts to decrease relatively fast until 2030 when it again starts to rise until 2050. But comparing 2002 and 2050 no large difference can be observed. The development for women is less volatile. Their Gini remains relatively stable with slight positive trend over the simulated period. That both measures do not develop as parallel as those for equivalized earnings can be attributed to a higher share of single households within the group of pension recipients. Here they even dominate the development of the Gini. And since the Gini of unweighted individual pensions develops differently for men and women, a similar development can be observed for equivalized pensions.

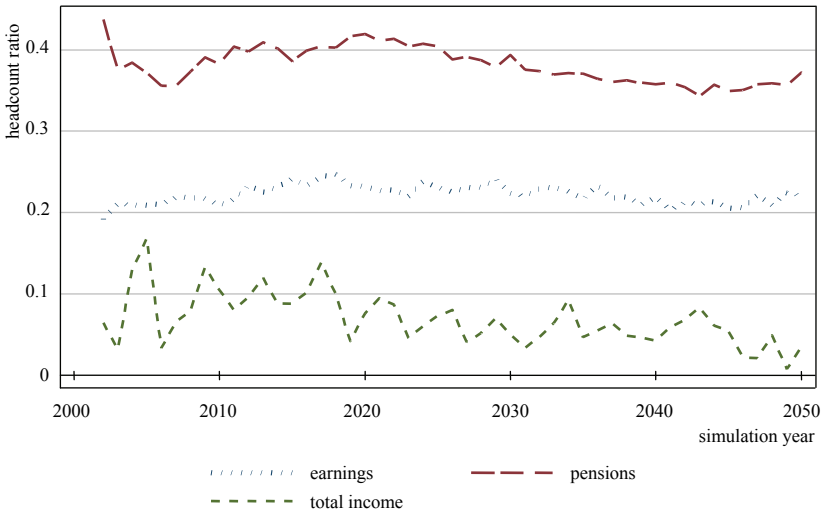
Figure 9 shows the incidence of poverty among individuals with households that have only earnings, only retirement benefits, or both.

Note that we analysis gross income components and do not take into account welfare, self-employed income, private pensions or income from other sources than dependent employment

[7] Figure 92 in the MIDAS Report (p. 222).

Figure 9

Incidence of Poverty Pertaining to Individuals from Working and Retired Households – Germany



Source: MIDAS Germany and own calculations.

and public pensions. Typically retirees pay no or only low taxes, thus looking at gross income means that the income difference between workers and pensioner is higher than for net income components. A higher income difference implies in turn a higher poverty risk for retirees in this perspective. Concerning the missing household income components, it has to be kept in mind that we restrict this poverty analysis to simulated income components. This leads to a relatively high poverty rate for pensioners for three reasons. The first is mentioned above: the difference between pensions and gross earnings is higher than that between pensions and net earnings. The second reason is that households without earnings and pensions are not part of the analysis. However, we observe virtually no household without pension rights in the simulation but we do observe that households have no market income from time to time. These pension rights might be very small. This leads to the third reason for high poverty rates of pensioners: very low pensions are often associated with welfare recipience which we do not simulate. Taken all together, the following figures are not comparable to official poverty statistics. However, they show in a very pure way the relation of gross earnings and pensions before taxes and redistribution.

Receiving income from both sources, earnings and pensions, leads to a lower risk of poverty as compared to having only one source of income. Adding to the difference in levels, pensions show a negative trend in poverty risks over time. This trend is dominated by higher pension benefits for women and a stable or slightly negative growth for men. All households experience the aforementioned trends regardless of their sources of income. That explains the decrease in poverty risks over time for pensions and total income.

5.3 Adequacy of pensions in Italy

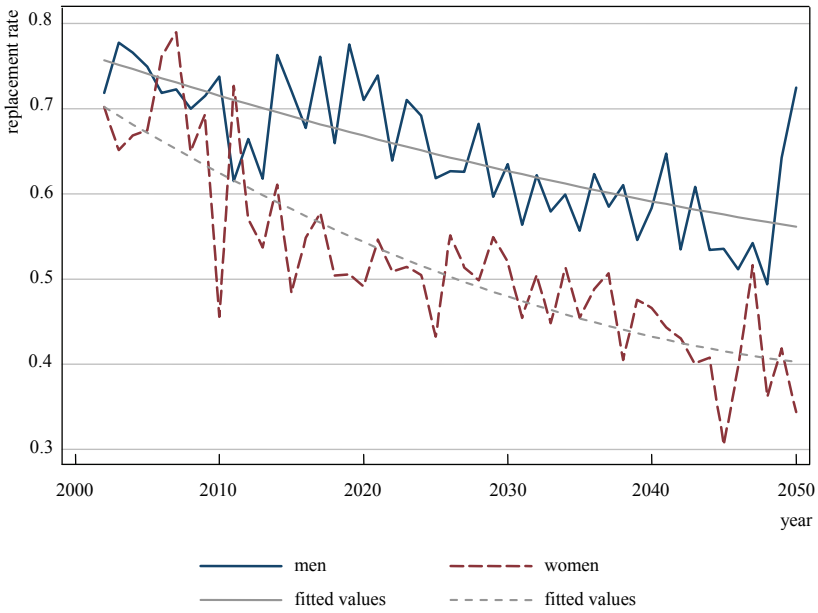
The development of the replacement rate in Figure 10 again is somewhat erratic, due to the sometimes low numbers of people making the actual transition into retirement. Hence, global trends emerging from these figures, rather than their punctual values, should be observed and assessed.

The increase of career length, assessed through seniority years, is lower than that of the average age of retirement (see Figure 117 in the *MIDAS Report*). This is because of two factors that counteract an increase in the age of withdrawal from work: an increase in the average age of labour

market entry (due to higher educational attainments) and the decrease of the seniority requirements for receiving an old age pension in the NDC system (amounting to 5 years, while it amounts to 15/20 years in earnings related and mixed schemes). Finally, over the whole simulation period, male average career length increases, while female one is quite constant, maybe due to the higher share of women getting an old age benefit after having worked for few years.

Figure 10

Average Replacement Rate of Individuals Entering into Retirement – Italy



Source: MIDAS Italy and own calculations.

The counteracting effect played by 1) benefits remaining rather constant over time (see the discussion of the replacement rate in the *MIDAS Report*) and 2) real wages that increase steadily with the productivity growth level, emerges in the development of the replacement rates (*i.e.*, the ratio between the first pension received and the last wage earned) in Figure 10. The more benefits are based on the NDC formula, the more replacement rates decrease both for males and females. The increases in career length and in age of retirement shown before are not enough for compensating this decrease in replacement rate brought about by the change from the earnings related to the NDC formula.

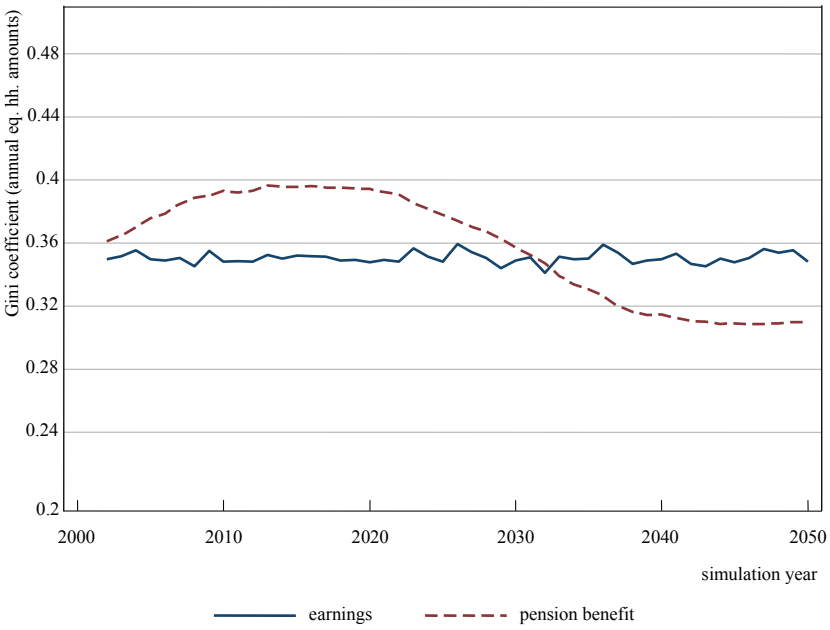
Figure 11 shows the development of the inequality of (equivalent) earnings and pension benefits in Italy.

In MIDAS-IT like in the other countries, earnings inequality remains fairly constant in the whole period. On the contrary, the trend of the Gini coefficient of pension benefits is much more diversified. It starts from a value slightly higher than the one pertaining to wages (about 0.36 vs. 0.35), but it steadily increases towards 0.40 in the mid-2010s. From 2020 onward, the Gini of pension benefits decreases, crosses the Gini of wages around 2035 and finally reaches a value around 0.31 in 2050. This trend of the Gini seems consistent with the evolution of the Italian pension system; at the beginning of the simulation the inequality of pension benefits increase because individuals with high pensions retire, then such increase is exacerbated by the coexistence of cohorts of retired belonging to different (and differently generous) schemes. After 2025, the death of the most of individuals fully belonging to the more generous earnings related scheme contributes to reduce the inequality of pension benefits.

Figure 12 shows the spread of poverty risks among the different groups of the population. During the whole simulation period, the incidence of poverty among households receiving only pension benefits increases importantly, while it steadily reduces among households receiving

Figure 11

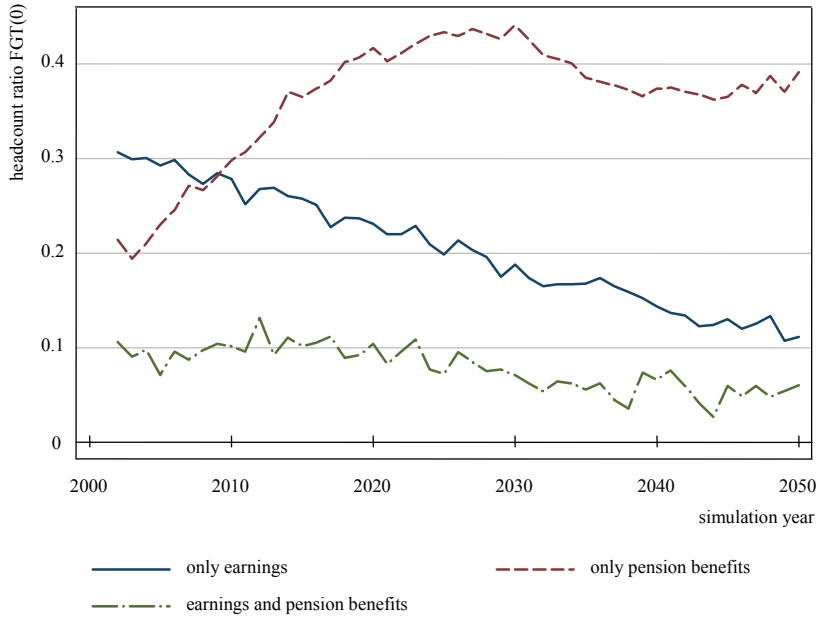
Gini Coefficients of Gross Earnings and Retirement Benefits – Italy



Source: MIDAS Italy and own calculations.

Figure 12

Incidence of Poverty by Household's Sources of Income – Italy



Source: MIDAS Italy and own calculations.

earnings. After 2010, poverty risks are much higher for pensioners than for workers. This trend can be explained by the different evolution of wages, which steadily increases in line with productivity, raising then also the poverty threshold (the 60 per cent of median income), while benefits, being not indexed according to the real wage growth, reduce their relative value compared to wages in all years of simulation.

6 Conclusions

The AWG projections of social security pensions in the European Member States are an important tool in the assessment of their sustainability. To date, the projections that Member States produce for the AWG include only a limited notion of adequacy, being the replacement rate. Other relevant aspects of pensions, specifically pertaining to the adequacy of pensions, are not considered. This paper aims to set a first step into integration by assessing the consequences of the AWG projections and assumptions on the adequacy of pensions in Belgium, Germany and Italy.

The simulation results pertaining to the

adequacy of pensions show that the Belgian replacement rate will gradually decrease until the beginning of the 2030s, after which it will recover. The level of the replacement rate is lower in Germany, but the development over time is comparable to Belgium. This is not so for Italy: here, the replacement rate starts off higher than in Belgium, but shows a continuous decrease as benefits from the earnings related system are gradually replaced by benefits from the NDC pension system. This larger impact in Italy than in Belgium and Germany seems to be consistent with the findings of Zaidi and Grech (2007, Table 1, page 305)

Also, the difference between men and women in terms of their replacement rates is smaller in Belgium and Germany than in Italy. Seeing that the difference between men and women seems to appear only in the second half of the 2010s, it seems to be caused by the NDC pension system as well.

In all three countries, and for Italy only in the first years of simulation, levels of income inequality decline from working to retirement ages, confirming the findings of Brown and Prus (2006).

Inequality of equivalent pension benefits in all three countries are roughly alike in their development, but not in their level. The inequality of pension benefits increases at first, reaches a maximum in the early 2010s (late 2020s for men in Germany) and then decreases again. The redistributive effect of pensions (measured by comparing the inequality of earnings with that of pension benefits) will increase from the late 2020s on in Italy and Belgium, and from the early 2020s on in Germany.

The forces causing this development in equality of pension benefits are quite different, at least between Belgium and Italy. Using the terminology of Zaidi and Grech (2007), the increasing redistributive impact of pensions in Belgium is caused by the parametric reform of reinforcing the link between pensions and earnings. In Italy, the effect is caused by the systemic changes of pension system. This also explains why the effect is stronger in Italy than in Belgium. Furthermore, inequality of pension benefits in Belgium is in all years well below that of earnings. In Italy, it is the opposite in the period up to the first half of the 2030s.

The paper also discusses the difference between workers and retirees in terms of their relative risk of poverty. Here the differences are more outspoken. In Belgium and Germany, the risk of poverty of those receiving only pension benefits is in all years higher than for those living in households receiving earnings (as well). In Italy, the poverty risk of those receiving a pension benefit starts of lower than those receiving earnings (as well), but increases very considerably until about 2030. This suggests that the systemic reform in Italy has a more profound impact on poverty than the parametric reform in Belgium and Germany.

Next, we consider the development of the incidence of poverty of those living in households that receive only pension benefits. The developments are roughly comparable between the three counties, as was the case with inequality, but the levels are not. Furthermore, the risk of poverty shows a rising trend in Italy, and the "common pattern" therefore surfaces in the speed of this increase, rather than in the change itself.

In the three countries, the risk of poverty pertaining to pension benefit recipients increases at first, and then decreases. In Belgium and Germany, this turning point is early in the 2020s, whereas it is late in the 2020s in Italy. Furthermore, relative to the preceding increase, the decrease of both risk of poverty is considerably stronger in Belgium and Germany than in Italy. As a result, the poverty rate of Italian pension benefit recipients show a positive trend, which is absent in Belgium and Germany. About a decade later after the first turning point (*i.e.*, early 2030s for Belgium, and early 2040s for Italy), poverty risks stabilize and then starts a modest increase again. This last change is again stronger in Belgium than in Italy and Germany. The explanations for these

developments in both countries are comparable as well, namely the link between the development of wages and pension benefits. In Belgium, however, the impact of the average age of the elderly seems to play an important role in conjunction with this linkage. This is not reported in the Italian case. On the whole, poverty among the recipients of social security pension benefits increases more in Italy than in Belgium and Germany, which for the first two countries confirms the tentative results of Zaidi *et al.*, 2006, Table 16, page 51.

An international comparison of the simulation results suggests that the impact of the parametric reform in Belgium and Germany and the systemic reform in Italy on (re)distribution and poverty should go into the same direction, but that the magnitudes would differ. Indeed, this impact is expected to be stronger in Italy than in Belgium and Germany.

Demographic ageing, in combination with projected growth rates of productivity and the assumed linkage between the development of earnings and pensions, has a profound impact on the future adequacy of pensions. Policies aiming to restore or improve sustainability therefore are bound to affect adequacy, and this makes it all the more important that both aspects of pension systems be assessed in unison.

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PUBLIC TRANSFERS AND THE AGE-PROFILE OF POVERTY IN EUROPE

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Ensuring adequate living standards to a growing number of elderly while restraining the growth of pension spending represents the main challenge for pension policy in most countries. There is a need for an in-depth analysis of the economic conditions of the elderly which can help targeting resources in the coming years to the more needy groups. Children are another potentially vulnerable group of the population: their poverty can affect human capital accumulation and have long lasting effects on life-time well-being. Using data from the latest wave of the EU Survey on Income and Living Conditions (SILC), we document that the poverty rates of these two age groups with respect to the other components of the population differ considerably across European countries. These differences are largely due to the different anti-poverty effectiveness of national social policies. In particular, in "Social-democratic" and "Corporatist" welfare states the age-profile of poverty is flat; on the contrary, in Anglo-saxon and especially in Southern European countries young and elderly groups show remarkably higher poverty rates.

1 Introduction

The main aim of this paper is to assess the extent of income deprivation among children and elderly in EU countries, as well as the role of social spending policies in shaping cross-country differences in the age-profile of poverty.

Focusing on poverty is especially relevant from a normative point of view. Indeed, while there is a lot of disagreement about the "just" or "fair" amount of inequality within a society, there is wide agreement that poverty and social exclusion are the source of huge individual and collective costs (see, e.g., Feldstein, 2005). Widespread poverty can put into question the European endeavour itself, which might be seen as unable to promote social cohesion and to protect the living conditions of a significant fraction of the European population. These concerns are confirmed by the inclusion of "eradication of poverty and social exclusion" as one of the main objectives of the Open method of co-ordination (OMC) on Social inclusion and social protection launched in 2006.[1] Focusing on the young and the old is also justified by the fact that these two subgroups are particularly vulnerable: indeed, we show below that both the elderly and the young face a higher-than-average risk of poverty, and that for both groups public transfers represent a large fraction of their resources. Children deserve particular attention for two further reasons: they do not bear responsibilities for their conditions, and deprivation in the first part of life can have long lasting effects on their lifetime well-being (OECD, 2009).

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The opinions expressed herein do not necessarily reflect those of Banca d'Italia.

[1] In the EU jargon, the OMC is an approach to the coordination of member states' policies which is intermediate between EU common policies and the policies left to the single countries. Under the OMC, the member states agree on common objectives and on a set of common indicators. They prepare national reports on a regular basis, in which plans are outlined in order to meet the common objectives, and plans are then evaluated in joint reports by the EU Commission and the Council. The OMC on Social inclusion and social protection brings together two previously separated sets of policies in the field of social inclusion and pensions, and encompasses for the first time the field of health and long-term care. This process has three "overarching objectives": promote social cohesion and equal opportunity for all; interact closely with the Lisbon objectives; strengthen governance, transparency and the involvement of the stakeholders in the design, implementation and monitoring of policy. It also has three more specific aims (one for each of the three policy areas): eradication of poverty and social exclusion, adequate and sustainable pensions, accessible, high-quality and sustainable health care and long-term care. Based on the work of its Indicators Subgroup, the Social Protection Committee of the European Union adopted a set of common indicators for the social protection and social inclusion process. It consists of a set of fourteen indicators meant to reflect the overarching objectives and of three sets of further indicators specific to the policy areas of social inclusion, pensions, and health and long-term care. See European Commission (2009a).

An in-depth examination of the conditions of these vulnerable age-groups is also particularly relevant from a public finance point of view. At the moment, most European countries are striving with difficult budgetary choices. On one side, it is urgent to gain fiscal room to finance expansionary stimulus packages. On the other side, long-term challenges, especially those due to the aging process and to the related spending pressures, are looming large. So it seems important that increasingly scarce fiscal resources are targeted toward the most needy groups of the population.

While it is well known that European countries differ markedly in the incidence of poverty among the population (Marlier *et al.*, 2007; European Commission, 2009a; OECD, 2008), in this paper we show that European countries differ with respect to another less-discussed dimension, namely the relative condition of children and elderly citizens with respect to the rest of the population.[2] Moreover, we show that in some – but not all – European countries the tax-benefit system is particularly effective in smoothing-out the age-profile of poverty, thereby reducing the differences in deprivation between young and elderly citizens and the other groups of the population.

An assessment of welfare policies is complicated by the fact that they differ along many dimensions across European countries. Following Esping-Andersen (1990), we group European welfare states into a small number of clusters: "Liberal" (the United Kingdom and Ireland), "Corporatist" (Austria, Belgium, France, Germany and Luxembourg), "Social-democratic" (which comprises the Scandinavian countries – Denmark, Finland, Iceland, Norway and Sweden – and the Netherlands), and "Southern European" (Cyprus, Greece, Italy, Spain and Portugal).

As the labels suggest, the typology is built to reflect hypotheses concerning (1) the common historical and political origins of each different welfare regime and (2) the common consequences in terms of inequality and class differences. It is argued that in Liberal regimes the state has a residual welfare role with respect to the market; it provides means-tested social benefits targeted to the very poor. Corporatist countries allegedly give less emphasis to redistribution and use welfare primarily for reasons of mutual aid and risk pooling, with rights to benefits depending on the individual being inserted in the labour market. In Social-democratic countries the state has instead a substantial redistributive role, through generous social welfare and unemployment benefits. Finally, the Southern European group is singled out for the strong role of family support, while labour market policies are relatively less developed and selective.

In what follows, we do not take a stance in this debate. However, although researchers disagree about the causes and consequences of different welfare regimes, they broadly agree on the grouping of countries (Arts and Gelissen, 2002). So we use the four-group distinction (to which we add the Post-communist country group) as a handy way to present and summarize our findings.[3]

The four groups also dovetail nicely in the two-dimensional classification proposed by Bonoli (1997), based on (1) the amount of spending, distinguishing small welfare states (Liberal and Southern) from large welfare states (Corporatist and Social-democratic) and (2) the redistributive impact of policies, separating Beveridgean welfare states (Liberal and Social-democratic) from Bismarkian welfare states (Southern and Corporatist). The significance of

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[2] Two exceptions are Smeeding and Sullivan (1998) and Dang *et al.* (2006). The former paper considers four countries (Canada, Sweden, UK and USA) over the 1974-1994 period. The latter uses data for the late nineties about 9 OECD countries. Both papers differ from ours because they rely on national surveys, each with a different questionnaire design and definition of variables.

[3] There is some disagreement about the usefulness of separating southern and corporatist countries (in favour of the separation are, for example, Bonoli (1997) and Ferrera (1996). There is also some debate about the right place for the Netherlands. We put it in the Social-democratic cluster following, among others, Nolan and Whelan (2007). Lynch (2006) provides an in-depth analysis of the post-war II evolution of the Netherlands welfare state towards Scandinavian standards.

these two dimensions has also been emphasized in the economics literature (e.g., Conde-Ruiz and Profeta, 2007; Koethenbuerger *et al.*, 2008).

The importance of the age-orientation of public spending has been stressed by several studies. The literature on generational accounting (Raffelhuschen, 1999; European Commission, 1999) takes an inter-temporal approach. Combining cross-sectional micro-data with macroeconomic and demographic projections, and imposing an economically meaningful inter-temporal government budget constraint, this stream of literature aims at assessing whether public policies treat different cohorts differently. Instead, we limit ourselves to the first step, taking a snapshot of differences in policies as of today. This might be a limit if one considers that in many European countries current fiscal policies might not be sustainable (they do not comply with the inter-temporal government budget constraint), so that they will have to be changed in some point in the future (see European Commission, 2009b; Balassone *et al.*, 2009).[4]

There are two more fundamental differences between the generational accounting approach and ours. First, we consider the distribution of resources across and within age groups, whereas the latter dimension is ignored in generational accounting studies. Second, while in generational accounting studies the approach is completely individualistic (it assumes the absence of resource-sharing within families), we assume that resources are shared equally among the members of the same household. Of course in the two frameworks the impact of public transfers on the well-being of different cohorts/age groups can be quite different. For example in our framework old-age pensions benefit not only the recipient, but also the people who live with her or him, some of which may be young.

Our paper is particularly related to Lynch (2001 and 2006), who has made the first attempt at measuring and explaining the age-orientation of developed countries' welfare states. We improve on her contribution in two respects: first, we provide more accurate and comprehensive measures of the age-bias of European social policies; second, we explore the impact of such age-bias on poverty.

The rest of the paper is organized as follows: in Chapter 2 we briefly describe our micro-data (drawn from the EU-SILC survey), review the main concepts usually employed in the study of poverty, and highlight their main limitations. In Chapter 3 we provide a short overview of poverty and deprivation across Europe, considering in particular the role played by living arrangements and working conditions. In Chapter 4 we focus on our main issue of interest: the age-profile of poverty and its cross-country variations. In Chapter 5 we provide measures of effectiveness, efficiency and age-orientation of public policies and evaluate their impact on the age-profile of poverty. Chapter 6 offers some tentative conclusion.

2 Data, definitions and measurement issues

Our analysis is based on data from the latest available wave of the European Union Survey on Income and Living Conditions (EU-SILC). It has been conducted in 2006 with reference to 2005 and contains data for twenty-six countries, namely all EU member states in that year except Malta plus Iceland and Norway.[5]

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[4] Moreover, government policies are already changing. In recent years, many countries have introduced pension reforms which are characterized by less generous benefits and tighter eligibility conditions (Feldstein and Siebert, 2002). As a result, the economic conditions of elderly people are likely to deteriorate with respect to those of workers, unless longer working lives and a quick development of private pensions can offset the less generous social security rules.

[5] The survey has been launched for the first time in 2004, with reference to 2003. EU-SILC is organised under a common framework and is compulsory for all EU member states. A Regulation defines the minimum effective sample size to be achieved. For the cross-sectional component, it is planned to achieve a minimum effective sample size of around 121,000 households or 250,000

(continues)

The EU-SILC sample covers about 203,000 households and 537,000 individuals. One sixth of these individuals are younger than 16, two thirds are in the 16 to 64 bracket, and one sixth are older than 64 (Table 1).

Among households, 30.3 per cent are composed by only one person, 36.5 per cent is made up of two or more adults without children. Among the households with children (32.5 per cent), those with a single parent are slightly more than 4 per cent (Table 2).[6]

EU-SILC, which adopts a questionnaire common to all countries, provides information on individuals living in private households.[7] It includes variables measured both at the household and individual level. These variables include: income, education, information on current and past working status, health, access to health care, detailed labour and career information.

An important goal of the survey is to provide both gross and net income data. In particular, three main aggregates are made available by EU-SILC: total disposable household income, total disposable household income less transfers, and total gross income (disposable income plus taxes and social contributions). However, the latter will only be fully available with the data concerning 2007. The years 2004-06 can be seen as transitional period as five countries, namely France, Greece, Italy, Latvia and Portugal, are allowed to deliver only net income components and for all countries a limited number of components is not compulsory.

Gross income components covered by EU-SILC are: employee income, self-employment income, imputed rents, property income, interests paid on mortgage, current transfers paid (this item is in turn made up of: tax on income and regular taxes on wealth, social security contributions and regular inter-household transfers), and current transfers received.

For our aims, transfers received from the government are particularly important. Social benefits are decomposed in: unemployment benefits, old-age benefits, survivor' benefits, sickness benefits, disability benefits and education related allowances. At the household level, we also have family/children related allowances, housing allowances, and a third item concerning other transfers generically directed to the problem of social exclusion.[8]

individuals older than sixteen years in the EU (respectively 127,000 and 260,000 including Iceland and Norway). Useful information about the EU-SILC survey can be found in Eurostat (2007b).

[6] Here and in what follows, we will focus on the population counterparts of the sample variables. The latter are derived from the former applying a specific set of weights. Indeed, if the sampling design is such that individuals in the population have different probabilities of sample participation, due to sampling design or to systematically different non-response behaviour, this may bias inference from the sample to the population, unless selection probabilities are properly taken into account through weights (see, e.g., the discussion in Deaton, 1997). In accordance with the Commission Regulation on sampling and tracing rules (Regulation No. 982/2003 of 21 October 2003, par. 7.4), EU-SILC provides weights "calculated as required to take into account the units' probability of selection, non-response and, as appropriate, to adjust the sample to external data relating to the distribution of households and persons in the target population, such as by sex, age (five-year age groups), household size and composition and region (NUTS II level), or relating to income data from other national sources where the Member States concerned consider such external data to be sufficiently reliable".

[7] All individuals living in collective households and in institutions are therefore excluded. In some countries this implies an under-representation of elderly people, which often live in specialised institutions. Furthermore, the exclusion of collective households, hospitals and prisons may conduct to an under-estimation of the incidence and intensity of poverty.

[8] In order to be considered as social transfers, the monetary benefit has to come from collectively organised schemes or by government units and non profit institutions serving households and should meet one of two criteria: coverage in the scheme is compulsory or it is based on the principle of social solidarity. In the EU-SILC, social benefits are consistent with the European System of integrated Social Protection Statistics (ESSPROS) classification, even if not all elements of ESSPROS itself are included (in particular, EU-SILC definition covers only cash benefits with the exceptions of housing and only current transfers; it includes the function education while ESSPROS does not; the ESSPROS definition, differently from EU-SILC, covers certain reductions on taxes different from family allowances if they meet the general criteria for social protection schemes and other specific criteria). The ESSPROS classification is in turn consistent with the COFOG classification of government expenditures by function. In some countries social transfers include the value of social contributions and income taxes payable on the benefits by the beneficiary.

Table 1

Individuals and Households in EU-SILC

Countries	Individuals				Households				
	Total	0-15	16-64	65+	Total	One-person Households	Households with Two or More Adults without Children	One-adult Households with Children	Two-adult Households with Children
Austria	14,883	2,778	9,680	2,425	6,028	1,754	2,192	273	1,809
Belgium	14,329	2,840	9,378	2,111	5,860	1,642	2,134	366	1,708
Cyprus	11,069	2,251	7,280	1,538	3,621	533	1,412	98	1,578
Czech Republic	17,830	2,907	11,807	3,116	7,483	2,923	2,916	361	2,083
Germany	31,777	5,515	20,400	5,862	13,799	3,832	5,415	1,016	3,521
Denmark	14,676	3,222	9,763	1,691	5,711	1,108	2,294	254	2,022
Estonia	15,840	2,503	10,830	2,507	5,631	1,139	1,960	326	2,180
Spain	34,694	5,667	22,896	6,131	12,205	1,981	5,246	314	4,521
Finland	28,039	5,768	19,125	3,146	10,868	2,377	4,408	392	3,691
France	24,940	5,279	15,966	3,695	10,036	2,752	3,452	536	3,242
Greece	15,190	2,415	9,475	3,300	5,700	1,228	2,558	102	1,793
Hungary	19,902	3,290	13,009	3,603	7,722	1,939	3,057	366	2,360
Ireland	14,634	3,139	8,600	2,895	5,836	1,816	2,065	312	1,643
Iceland	8,598	2,061	5,734	803	2,845	383	938	152	1,359
Italy	54,512	8,035	35,215	11,262	21,499	5,491	8,805	599	6,604
Lithuania	12,134	1,811	7,928	2,395	4,660	1,016	1,838	219	1,587
Luxembourg	10,242	2,391	6,857	994	3,836	866	1,306	199	1,465
Latvia	10,985	1,678	7,005	2,302	4,315	1,120	1,591	261	1,318
Netherlands	23,096	5,489	15,128	2,479	8,986	2,091	3,358	327	3,209
Norway	15,454	3,434	10,541	1,479	5,768	1,232	2,071	274	2,109
Poland	45,122	8,201	30,613	6,308	14,914	2,726	5,165	528	6,256
Portugal	12,071	1,788	7,820	2,463	4,367	770	1,933	112	1,545
Sweden	17,149	3,577	11,419	2,153	6,803	1,664	2,441	344	2,330
Slovenia	31,276	4,136	23,044	4,096	9,478	872	3,936	258	4,412
Slovakia	15,147	2,258	10,917	1,972	5,105	1,122	1,801	151	2,028
UK	23,365	4,789	14,592	3,984	9,902	2,768	3,983	634	2,309
Total	536,954	97,222	355,022	84,710	202,978	47,145	78,275	8,774	68,682

Table 2

Individuals and Households in EU-SILC (Weighted)

Countries	Individuals				Households				
	Total	0-15	16-64	65+	Total	One-person Households	Households with Two or More Adults without Children	One-adult Households with Children	Two-adult Households with Children
Austria	8,182,229	1,355,651	5,465,163	1,361,415	3,508,442	1,218,616	1,224,163	137,467	928,196
Belgium	10,432,483	1,848,167	6,840,279	1,744,037	4,521,958	1,510,535	1,593,291	236,457	1,175,082
Cyprus	762,164	148,087	522,308	91,770	256,600	41,096	94,566	6,594	114,344
Czech Republic	10,160,544	1,588,904	7,135,368	1,436,272	4,027,670	953,570	1,644,553	165,076	1,264,470
Germany	81,954,033	12,363,215	54,046,986	15,543,832	38,895,762	14,810,117	13,587,872	2,016,935	8,432,803
Denmark	5,365,079	1,054,800	3,474,598	835,681	2,661,145	1,165,972	782,542	142,808	563,791
Estonia	1,348,337	211,901	908,533	227,903	565,138	186,847	174,066	35,603	166,752
Spain	44,539,936	6,602,000	30,560,782	7,377,154	15,604,257	2,569,350	6,969,705	285,726	5,575,340
Finland	5,179,228	949,916	3,393,406	835,906	2,434,999	938,394	843,927	99,011	553,667
France	59,513,895	11,194,694	38,327,629	9,991,572	25,988,931	8,073,528	9,043,656	1,268,085	7,490,537
Greece	10,828,138	1,643,477	7,136,878	2,047,782	4,009,513	792,216	1,808,290	73,025	1,321,767
Hungary	9,927,583	1,765,058	6,636,188	1,526,337	3,810,173	942,461	1,419,344	197,435	1,250,933
Ireland	4,253,340	941,700	2,835,179	476,461	1,494,000	326,500	501,965	119,025	546,510
Iceland	281,817	78,893	176,506	26,418	104,685	25,262	27,502	9,035	42,280
Italy	58,839,605	8,799,229	38,026,793	12,013,583	23,907,410	6,851,696	9,157,601	636,373	7,261,741
Lithuania	3,389,407	595,433	2,255,037	538,937	1,326,551	373,219	397,332	72,507	483,492
Luxembourg	451,387	88,010	301,151	62,226	182,860	52,846	62,042	6,000	61,971
Latvia	2,249,039	364,142	1,516,631	368,266	856,874	208,973	302,153	46,577	293,521
Netherlands	16,237,968	3,166,257	10,771,522	2,300,189	7,146,088	2,498,086	2,493,229	234,477	1,919,879
Norway	4,602,262	953,564	2,952,756	695,942	2,101,694	871,295	599,855	113,522	496,055
Poland	37,925,985	6,492,843	26,250,536	5,182,606	13,318,760	3,290,217	4,273,567	395,116	5,150,441
Portugal	10,607,674	1,694,283	7,046,651	1,866,740	3,829,465	640,547	1,595,464	109,058	1,480,475
Sweden	9,153,151	1,870,151	5,781,016	1,501,984	4,344,671	1,792,642	1,259,193	259,256	1,025,979
Slovenia	2,005,885	303,331	1,383,967	318,586	710,818	145,078	272,712	24,830	268,197
Slovakia	5,388,751	853,000	3,820,762	714,990	1,872,687	453,877	638,538	54,574	724,700
United Kingdom	59,772,192	11,503,490	39,021,474	9,247,229	25,528,775	7,752,949	9,675,802	1,609,747	5,779,741
Total	463,352,111	78,430,196	306,588,097	78,333,818	193,009,927	58,485,889	70,442,930	8,354,319	54,372,664

We estimate household poverty considering the equivalised total disposable income obtained using the modified OECD equivalence scale.[9] This allows to take into account that larger households can exploit economies of scale in housing and in the consumption of goods and services.

As it is typical in poverty studies for rich countries, we endorse a relative concept of poverty.[10] This is not incompatible with an "absolute" view of deprivation, as long as the minimum amount of resources which are necessary to avoid social exclusion rises with general prosperity (Sen, 1983 and 1987). In particular, for each country we calculate the poverty line as the 60 per cent of the country median equivalised income and define as poor persons those living in households with a total equivalised disposable income lower than this threshold.[11] Robustness of the poverty rates is tested considering two alternative poverty lines (respectively equal to 50 and 70 per cent of the national median income).

Even controlling for family composition, other comparability problems remain. First of all, for a given level of income and for a given household composition, well-being also depends on personal characteristics, such as health, education and the amount of available leisure time. Secondly, we ignore in-kind transfers, which in many countries are quite sizable (Commission of the European Communities, 2002; Garfinkel *et al.*, 2006). Thirdly, we do not take into account the flow of benefits stemming from the ownership of durable consumption goods and real assets (however, we do try to capture some of the effects of real-asset ownership by taking into account imputed rents).

Finally, while in most of the paper we consider a nation-specific poverty line (as it is customary in cross-country studies), we also provide some poverty statistics using both a single EU-wide poverty line and a mixed poverty line (built as a geometric mean of the national and the EU-wide thresholds). These estimates are to be considered with extreme caution, given the many conceptual and empirical difficulties implied by this kind of exercises (see, e.g., Atkinson, 1998; Brandolini, 2007; Mogstad *et al.*, 2007).

3 A bird's eye on poverty in Europe

3.1 The incidence of poverty

Poverty rates among households differ widely across EU countries. They range from 8.6 per cent in the Czech Republic to 22.8 per cent in Latvia (Table 3). Four countries have poverty rates near or below 10 per cent (Czech Republic, the Netherlands, Slovakia and Iceland); eleven countries have rates between 11 and 15 per cent (Denmark, France, Sweden, Norway, Luxembourg, Belgium, Hungary, Slovenia, Finland, Austria and Germany); the remaining ones have poverty rates above 15 per cent. Eleven countries have poverty rates above the EU average (16.2 per cent).

The relative position of countries in terms of poverty rates does not change significantly if we use poverty lines equal to 50 and 70 per cent of the median equivalised disposable income (Table 4). The only exceptions are represented by Finland, Latvia, Austria and, to a lesser extent, Ireland and France, suggesting that in those countries there is a high number of people concentrated around the poverty line.

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[9] This scale assigns a unitary weight to the head of the household, a weight of 0.5 to each household component aged 14 and over at the end of the income reference period and a weight of 0.3 to members aged 13 or less. It is the scale endorsed by the EU in the construction of the indicators used in the OMC on Social inclusion and social protection.

[10] Relative poverty is also one of the indicators agreed upon by EU member states in the context of the OMC on Social protection and inclusion.

[11] This is consistent with the indicators used in the OMC on Social inclusion and social protection.

Table 3

Poverty Rates

Countries	Poverty Line: 60% of Median Income	Robustness Exercises		Unique Poverty Line(1)	Hybrid Poverty Line(2)
		50% of Median Income	70% of Median Income		
Austria	14.7	7.0	22.1	5.0	8.0
Belgium	14.2	7.3	22.7	7.7	9.9
Cyprus	19.6	11.9	27.1	14.0	14.0
Czech Republic	8.6	4.2	16.3	90.8	50.3
Germany	14.9	8.7	22.5	9.3	10.9
Denmark	12.1	6.5	20.5	3.0	4.4
Estonia	16.5	9.9	27.8	92.1	57.6
Spain	20.4	13.2	28.0	30.1	24.4
Finland	14.6	6.7	24.4	3.7	6.2
France	13.1	7.3	21.0	8.4	10.0
Greece	19.8	13.1	27.5	40.2	28.4
Hungary	14.5	9.0	22.3	93.3	61.1
Ireland	18.7	8.7	28.4	4.6	8.9
Iceland	10.3	5.4	18.7	1.3	3.2
Italy	19.6	12.5	27.0	17.9	18.4
Lithuania	18.2	11.5	27.4	96.8	69.9
Luxembourg	13.9	8.0	21.7	1.0	3.7
Latvia	22.8	12.7	30.5	95.7	67.0
Netherlands	10.0	5.3	19.0	4.8	6.4
Norway	13.4	6.9	21.4	2.2	3.7
Poland	17.7	11.2	25.8	95.3	67.5
Portugal	19.0	12.0	27.5	60.2	35.5
Sweden	13.2	8.1	20.7	6.4	8.3
Slovenia	14.5	8.0	21.8	39.6	20.8
Slovakia	10.1	5.6	17.5	97.5	69.4
United Kingdom	18.8	11.8	27.2	8.1	12.2
Min	8.6	4.2	16.3	1.0	3.2
Max	22.8	13.2	30.5	97.5	69.9
EU average	16.2	9.8	24.1	24.5	20.6
All countries average	16.2	9.7	24.1	24.3	20.4

(1) It is a poverty line calculated as 60 per cent of the European equivalised median income. It is equal for all counties.

(2) Calculated as $pl_i^{\alpha} \cdot \overline{p}^{1-\alpha}$, where the first term is the poverty line of each country (equal to 60 per cent of the median equivalised income) and the second term the unique poverty line described in footnote (1). We used $\alpha = ½$.

Table 4

Correlation between Poverty Rates Computed with Different Poverty Lines

Median Income	60%	50%	70%	EU-wide	Hybrid
60%	1.000	0,948	0.970	0.156	0.214
50%		1.000	0.898	0.240	0.294
70%			1.000	0.170	0.224
EU-wide				1.000	0.989
Hybrid					1.000

Table 5

Main Indicators by Welfare Regimes

	Social-democratic	Corporatist	Liberal	Southern	Post-communist
Poverty rates					
Overall	9.8	12.7	16.7	17.6	14.3
0-15	9.9	14.3	20.5	18.8	18.7
16-64	9.4	11.7	14.4	15.0	13.6
65+	11.1	14.5	22.2	29.1	12.1
Poverty rates pre-transfers					
0-15	27.7	22.5	28.4	23.6	30.1
16-64	27.7	28.0	24.5	27.3	30.1
65+	91.6	91.3	87.4	82.3	83.6
Overall	37.1	37.7	33.8	36.0	38.3
Age-bias index					
Old/Working age	4.19	4.07	4.17	3.53	3.78
Child/Working age	0.79	0.35	0.53	0.22	0.52
VEE					
Families with children	52.4	57.8	74.0	46.6	46.4
Families with working-age adults	67.3	71.9	54.1	52.7	58.7
Families with elderly	93.9	91.8	87.6	81.8	85.7

Overall, low levels of poverty rates characterise Social-democratic countries (12.3 per cent on average) and Corporatist countries (14.2 per cent), whereas above EU-average levels of poverty characterize Liberal (18.8 per cent), Southern (19.7 per cent) and Post-communist (15.4 per cent) countries (Table 5).

3.2 The intensity and inequality of poverty

Together with the incidence of poverty (how many are the poor) summarized by the poverty rate, a further dimension of poverty is its "intensity" (how poor are the poor). To capture intensity we computed the widely-used poverty gap, defined as the difference between the average income among poor families and the poverty line, expressed as a percentage of the latter.[12]

Neither the poverty ratios nor the poverty gaps are sensitive to changes in the income distribution among the poor (to the so called "inequality" of poverty). To keep this element into account we also consider a version of the so-called Forster-Greer-Thorbecke index (FGT2).[13] As with the poverty gap, this index can be seen as a weighted sum of the households' poverty gaps. The difference is that the weights are not equal for all: instead, in the summation the gaps of very poor households have bigger weights.

According to our data, poverty gaps in Europe range from around 20 per cent in Finland and Ireland to a maximum of 44 per cent in Norway (Table 6). However, the majority of countries has poverty gaps between 25 and 35 per cent, and the average poverty gap is slightly above 30 per cent. No clear-cut distinction emerges across different groups of countries. The poverty rates and the poverty gaps are weakly correlated: there are some countries with relatively high headcount ratios but relatively low poverty gaps (i.e., Cyprus, Finland and Ireland) and vice versa (*i.e.*, Denmark, Germany, Hungary, the Netherlands, Norway and Sweden) (Table 7). If one disregards outliers (Norway, Belgium and Germany), these considerations are confirmed if one looks at the FGT2 index.

3.3 Poverty and family composition

Behind national differences in poverty rates there can be differences in factors such as family structure and labour market characteristics.

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[12] Sometimes the poverty gap is averaged over the entire population (non-poor have obviously a gap of 0). Indeed the measure we show in the main text does not satisfy some desiderable monotonicity properties (for example, if one of the richest among the poor gets out of poverty, the index may well increase); besides it is not decomposable among subgroups (see the next footnote). However, the latter measure can be obtained as the product of the former times the headcount ratio:

$$\frac{\sum_i gap(i)}{Population} = \frac{\sum_i gap(i)}{\#\,Poor} \times \frac{\#\,Poor}{Population}$$

[13] Foster-Greer-Thoerbeke indices are calculated as:

$$\frac{\sum_i gap(i)^a}{Population}$$

where a is greater than or equal to 0 (if $a = 0$ one has the headcount ratio, with $a = 1$ one has the poverty gap). The poverty indices which are used more frequently in applied work belong to two main families: the family of Sen indices, which have the nice property to be sensitive to inequality among the poor, and the Foster-Shorrocks indices, which have the property of being decomposable among population subgroups. The poverty ratio and the poverty gap (averaged over the whole population) belong to the second family but not to the first. Foster-Greer-Thoerbeke indices with $a > 1$ share both set of properties. In our calculation we set $a = 2$ (for poverty indices a classic reference is Sen, 1997).

Table 6

Poverty Gaps

Countries	**Poverty Gap**	**Forster-Greer-Thorbecke Index** (FGT2)
Austria	24.8	1.7
Belgium	28.9	11.8
Cyprus	24.2	1.7
Czech Republic	21.2	0.7
Germany	35.6	13.3
Denmark	35.4	5.9
Estonia	29.6	2.8
Spain	30.7	3.3
Finland	20.5	1.2
France	24.6	1.5
Greece	32.2	5.5
Hungary	32.6	4.5
Ireland	19.0	1.2
Iceland	26.7	2.6
Italy	32.7	4.0
Lithuania	32.5	3.3
Luxembourg	26.7	2.8
Latvia	31.7	5.2
Netherlands	33.4	4.4
Norway	44.0	80.5
Poland	29.8	2.6
Portugal	28.8	2.6
Sweden	35.2	3.1
Slovenia	25.3	1.6
Slovakia	25.4	1.1
United Kingdom	30.5	3.2
Min	19.0	0.7
Max	44.0	80.5
EU average	30.7	5.3
All countries average	30.8	6.1

Table 7

Correlation among Poverty Indicators

	Poverty Rate	**Poverty Gap**	**FGT2**	**Poverty Rate × Poverty Gap**
Poverty rate	1.000	0.070	-0.100	0.810
Poverty gap		1.000	0.630	0.620
FGT2			1.000	0.260
Poverty rate × Poverty gap				1.000

Table 8

Poverty Rates by Household Types

Countries	One-person Households	Households with Two or More Adults Without Children	One-adult Households with Children	Two or More Adults with Children	Total
Austria	21.8	9.7	26.8	10.2	14.7
Belgium	19.9	11.3	25.2	8.6	14.2
Cyprus	40.9	25.0	26.6	7.0	19.6
Czech Republic	13.4	3.3	33.7	8.7	8.6
Germany	21.5	10.4	23.3	8.6	14.9
Denmark	20.5	5.2	9.9	5.0	12.1
Estonia	26.7	8.3	33.9	10.1	16.5
Spain	34.1	16.0	35.3	19.4	20.4
Finland	28.3	5.6	13.2	5.3	14.6
France	17.7	9.7	23.2	10.2	13.1
Greece	23.9	17.3	26.3	20.6	19.8
Hungary	12.2	18.3	35.1	16.8	14.5
Ireland	15.2	22.6	38.9	11.1	18.7
Iceland	5.9	11.5	25.7	7.9	10.3
Italy	16.8	29.0	27.5	20.9	19.6
Lithuania	9.8	20.9	33.3	15.1	18.2
Luxembourg	9.1	17.7	44.5	14.9	13.9
Latvia	19.3	30.3	31.3	15.9	22.8
Netherlands	5.3	11.4	27.3	8.3	10.0
Norway	4.3	13.6	14.1	5.3	13.4
Poland	14.7	28.7	29.6	22.5	17.7
Portugal	40.6	36.1	32.7	14.6	19.0
Sweden	3.9	11.3	25.5	8.5	13.2
Slovenia	16.1	20.1	17.7	7.1	14.5
Slovakia	7.0	12.6	23.8	11.1	10.1
United Kingdom	16.2	29.2	36.2	14.4	18.8
Min	13.4	3.3	9.9	5.0	8.6
Max	44.6	25.0	44.5	22.5	22.8
EU average	22.5	11.2	27.8	14.3	16.2
All countries average	22.5	11.2	27.6	14.2	16.2

Figure 1

Poverty Rates by Family Type

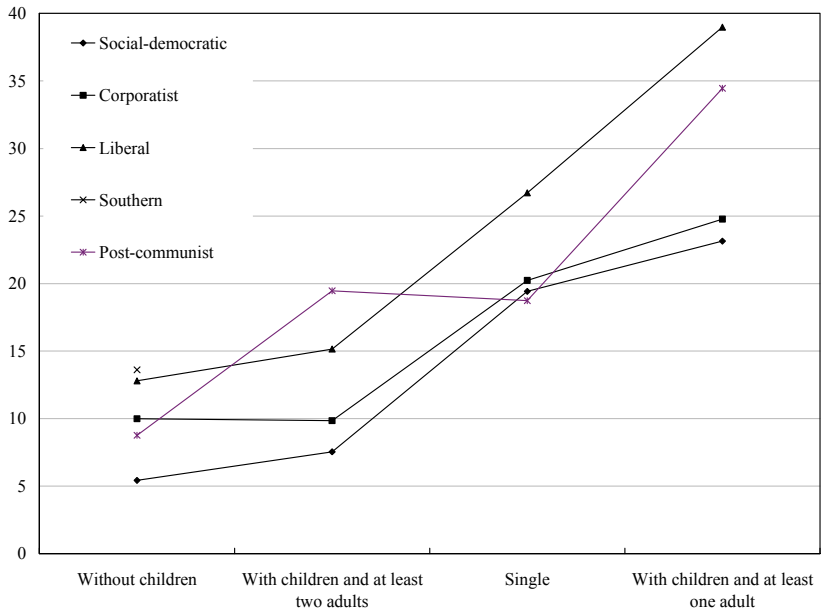
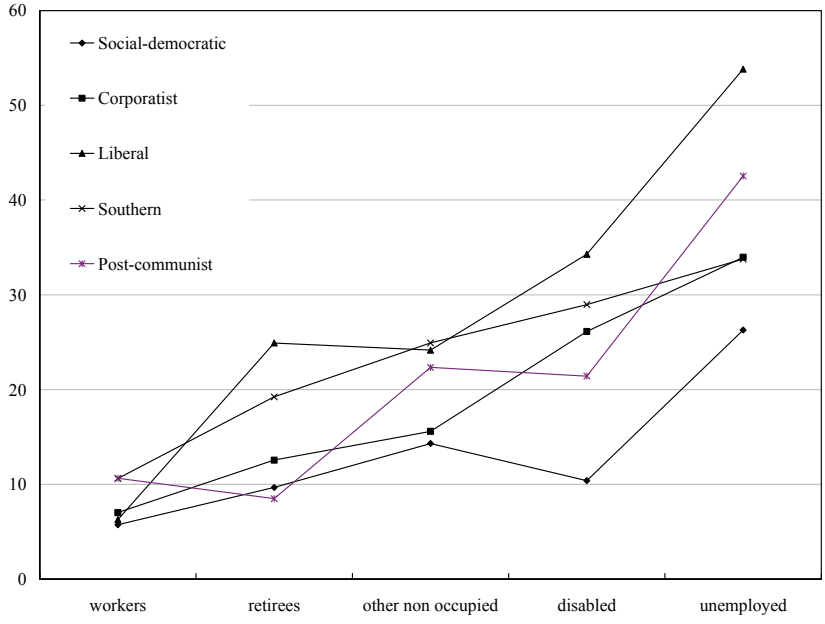


Figure 2

Poverty Rates by Economic Status



Indeed, poverty risks differ among household types (Table 8 and Figure 1). As one could expect, they are significantly higher than the average for one-person households (22.5 per cent) and especially for single-parent families (27.6 per cent).[14] Households with one adult are often those made up of younger or older people which are more likely to be in poverty conditions; in households with two adults there is generally income pooling which represent a cushion against temporary income shocks.

There are however huge differences across Europe. There are countries in which the poverty rate among one-adult households with dependent children is lower, or only slightly higher than the overall poverty rate (Denmark, Finland and Norway). At the other extreme, there are countries in which the poverty rate for single parent households is almost four times (Czech Republic) or three times (Luxemburg) higher than the overall average.

3.4 Poverty and occupation status

Poverty risks depend also on the

[14] We defined as dependent children household members aged 17 or less and economically inactive members aged between 18 and 24.

occupational status. We grouped individuals in five categories: workers, retirees, disabled, unemployed and other non-occupied individuals. As expected, workers have the lowest poverty rate (8.3 per cent on average for the European countries), followed, in order, by retirees (14.8 per cent), other non-occupied individuals (20.6 per cent), disabled (24.6 per cent) and unemployed (36.7 per cent) (Table 9 and Figure 2).

Poverty rates vary substantially between and within countries. For example, the poverty risks for workers range from 0.1 per cent in Lithuania to 15 per cent in Poland; those for retirees range from 3.9 per cent in the Czech Republic to 46.3 per cent in Cyprus. In some countries retirees have a poverty rate which is close to the rate of workers (Czech Republic, Sweden and Slovakia); in some other countries they are actually better-off (Hungary, Luxembourg, Netherlands and Poland) (Table 9).

Similar differences arise for the unemployed. Unsurprisingly, they always display higher poverty rates. In the Czech Republic their poverty rate is more than ten times the poverty rate of workers. In the United Kingdom, Finland, and Ireland it is more than seven times. In Cyprus, Spain, Greece, Iceland, Italy, Poland, Portugal and Sweden it is between two and four times higher.

4 The age profile of poverty

Children and elderly people tend to be poorer than individuals in working age. In Europe the poverty rate is 17.9 per cent for the young (less than 16-years-old) and 17.4 per cent for the old (more than 64-years-old). It is 14.1 per cent for the population in working age (between 16 and 64 years old). Therefore, on average, poverty among the young and among the old is about one quarter higher than among the working age people.

Table 10 shows that European countries differ not only with respect to the incidence of poverty, but also with respect to its age-profile. In four countries the risk of poverty among young people is even lower than that for the working age population (Cyprus, Denmark, Finland and Norway). In other countries the ratio between the two is quite high.

Looking at different groups of countries, poverty among the young is higher than among the working age people by 42 per cent in Liberal countries, 25 per cent in Southern countries, 22 per cent in Corporatist welfare states, 5 per cent in Social-democratic countries. It is 37 per cent higher in Post-communist states (Figure 3).

As for elderly people, in nine countries, most of which Post-communist (the Czech Republic, Estonia, Hungary, Lithuania, Luxembourg, the Netherlands, Poland, Sweden and Slovakia) their poverty rates are below national average.

Poverty among the elderly is higher than among the working age people by 66 per cent in Liberal countries, 45 per cent in Southern countries, 19 per cent in Corporatist countries, and 2 per cent in Social-democratic countries. It is 5 per cent lower than that among working age people in Post-communist states.

To sum up, Liberal and Southern welfare states display both a higher overall poverty rate, and a more pronounced V-shaped age profile of poverty, with respect to Corporatist and Social-democratic welfare states. In Post-communist countries the age profile of poverty is monotonically decreasing.

Table 9

Poverty Rates by Occupation Status

Countries	Workers	Unemployed	Retirees	Disabled	Other Unemployed
Austria	7.0	32.1	12.8	15.2	17.2
Belgium	4.3	31.5	15.6	24.7	16.3
Cyprus	6.7	20.3	46.3	28.0	10.9
Czech Republic	3.3	35.9	3.9	10.7	13.5
Germany	7.6	38.4	12.7	29.7	14.3
Denmark	4.4	20.2	8.6	6.4	15.1
Estonia	6.5	43.9	15.8	43.2	17.0
Spain	10.2	30.3	23.4	28.3	24.8
Finland	4.3	31.1	15.2	14.8	11.2
France	6.5	28.3	11.9	23.7	16.8
Greece	14.1	29.3	22.8	39.3	22.7
Hungary	8.3	43.9	7.8	21.5	23.7
Ireland	5.2	37.5	20.1	37.2	21.5
Iceland	6.3	21.4	10.5	5.4	12.7
Italy	10.4	39.8	16.0	28.2	26.0
Lithuania	0.1	45.1	15.7	23.8	21.3
Luxembourg	10.9	45.2	7.5	26.4	18.0
Latvia	9.8	49.8	25.9	30.4	23.1
Netherlands	5.8	28.0	5.6	10.0	14.0
Norway	5.4	24.4	14.6	9.7	12.8
Poland	15.0	44.7	7.9	22.6	25.8
Portugal	10.6	25.1	21.0	26.9	22.0
Sweden	7.3	23.5	9.6	10.9	17.1
Slovenia	4.4	27.1	14.4	38.6	10.2
Slovakia	6.1	34.9	6.7	8.6	14.1
United Kingdom	6.4	55.9	25.1	34.1	24.4
Min	0.1	20.2	3.9	5.4	10.2
Max	15.0	55.9	46.3	43.2	26.0
EU average	8.3	36.8	14.8	24.9	20.7
All countries average	8.3	36.7	14.8	24.6	20.6

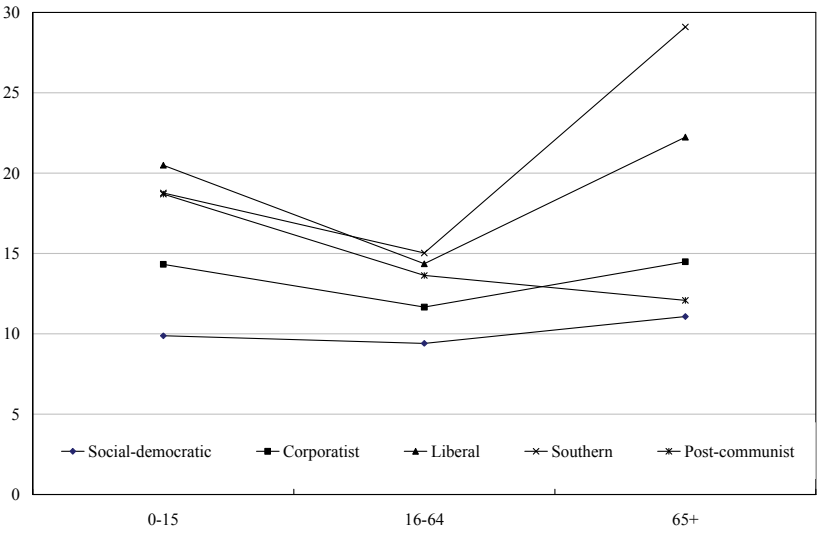
Table 10

Poverty Rates by Age

Countries	0-15	16-64	65+	Total
Austria	14.6	11.1	15.7	12.4
Belgium	12.6	10.6	19.6	12.4
Cyprus	8.8	9.5	48.1	14.0
Czech Republic	14.5	8.0	3.7	8.4
Germany	11.9	11.8	13.3	12.1
Denmark	7.2	9.2	9.9	8.9
Estonia	16.0	13.2	13.6	13.7
Spain	22.9	15.5	28.7	18.8
Finland	6.6	9.5	16.6	10.1
France	12.5	11.0	15.1	12.0
Greece	21.3	18.1	24.3	19.8
Hungary	24.1	14.5	8.8	15.3
Ireland	18.4	14.0	19.8	15.6
Iceland	11.7	8.3	9.6	9.4
Italy	23.1	17.3	20.6	18.9
Lithuania	21.0	16.6	14.9	17.1
Luxembourg	20.0	13.9	8.7	14.4
Latvia	21.8	17.4	22.6	19.0
Netherlands	13.4	9.1	5.8	9.5
Norway	7.5	9.4	14.6	9.8
Poland	27.7	21.1	8.7	20.5
Portugal	17.7	14.7	23.7	16.8
Sweden	12.9	11.0	9.8	11.2
Slovenia	10.1	8.4	17.3	10.1
Slovakia	14.4	9.8	6.9	10.1
United Kingdom	22.5	14.7	24.6	17.7
Min	6.6	8.0	3.7	8.4
Max	27.7	21.1	48.1	20.5
EU average	18.0	14.1	17.4	16.4
All countries average	17.9	14.1	17.4	16.4

Figure 3

Poverty Rates by Age Class



These results are substantially confirmed by a multivariate analysis (Table 11).[15] Estimating logistic regressions in which the probability of being poor is related to the age-group of the individual and its regime, allowing for interaction terms between the two, it appears that: (1) elderly people are poorer that working age people in Southern and especially Liberal countries, while their position is not much worse than those of the middle-aged in Corporatist countries. It is virtually identical in Social-democratic countries, while it is actually better in post-communist countries; (2) the relative conditions of children appear to be worse than those of working age people in all regimes. Their relative position is however somewhat better in Social-democratic and Corporatist countries, while it is especially critical in liberal countries.

Therefore, it remains true that the age profile of poverty is flatter in Social-democratic and Corporatist countries, whereas its V shaped profile is particularly pronounced in Liberal and Southern countries. Post-communist countries are somewhat a class of their own, due to the particularly good relative position of the elderly.

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[15] The underlying assumptions are: (i) the difference between the national poverty threshold and the equivalized household income is measured with some noise, so that it is equal to the "real" difference plus an i.i.d. error term distributed according to a logistic distribution function; (ii) the "real" difference depends linearly on the regime type, and on the age group at which the individual belongs (in some specification the age group is decomposed into a finer partition, and the specification allows for interaction terms):

$$P_i \equiv \text{Prob}(\text{poverty threshold} - \text{equivalized household income of person i} > 0) = \frac{e^{c+\sum_r \alpha_r regime_{ir} + \sum_a \beta_a age_{ia} + \sum_a \sum_r \gamma_{ra} regime_{ir} age_{ia}}}{1+e^{c+\sum_r \alpha_r regime_{ir} + \sum_a \beta_a age_{ia} + \sum_a \sum_r \gamma_{ra} regime_{ir} age_{ia}}}$$

where $regime_{i,r}$ (viz. $age_{i,a}$) is equal to 1 if i belongs to regime r (viz.: i belongs to the age group a), and 0 otherwise. So the odd-ratio of being in poverty for a person in regime r and age group a is: $O(r,a) \equiv \frac{P_i}{1-P_i} = e^{c+\alpha_r+\beta_a+\gamma_{ra}}$. An index of the relative disadvantage of group a' with respect to group a in regime r is given by: $\frac{O(r,a')}{O(r,a)} = e^{\beta_{a'}+\gamma_{ra'}-\beta_a-\gamma_{ra}}$, and to compare the relative disadvantage of group a' one can look at:

$$\frac{\frac{O(r,a')}{O(r,a)}}{\frac{O(r',a')}{O(r',a)}} = \frac{e^{\beta_{a'}+\gamma_{ra'}-\beta_a-\gamma_{ra}}}{e^{\beta_{a'}+\gamma_{r'a'}-\beta_a-\gamma_{r'a}}} = e^{\gamma_{ra'}-\gamma_{ra}-\gamma_{r'a'}+\gamma_{r'a}}$$

Notice that only the interaction terms matter.

Table 11

Risk To Be Poor with Respect to Age and Welfare Regime

Poors	Coefficient	Standard Error	*t*	*P* > | *t* |	95% Confidence Interval	
Age1	0.37548	0.02775	13.53	0.000	0.32109	0.42987
Age3	0.46378	0.02312	20.06	0.000	0.41847	0.50910
Corporatist	–0.42636	0.02322	–18.36	0.000	–0.47188	–0.38085
Liberal	–0.13760	0.02723	–5.05	0.000	–0.19097	–0.08422
Social-democratic	–0.61737	0.02786	–22.16	0.000	–0.67198	–0.56277
Post-communist	0.0154	0.01728	0.89	0.372	–0.01844	0.04930
Age1 × Social-democratic	–0.22845	0.05369	–4.25	0.000	–0.33369	–0.12321
Age3 × Social-democratic	–0.44004	0.05643	–7.80	0.000	–0.55065	–0.32943
Age1 × Corporatist	–0.28172	0.04622	–6.09	0.000	–0.37232	–0.19113
Age3 × Corporatist	–0.19432	0.04438	–4.38	0.000	–0.28130	–0.10733
Age1 × Liberal	0.134318	0.05029	2.67	0.008	0.03576	0.23288
Age3 × Liberal	0.166917	0.04980	3.35	0.001	0.06931	0.26452
Age1 × Post-communist	0.04586	0.03553	1.29	0.197	–0.02377	0.11550
Age3 × Post-communist	–1.15478	0.03865	–29.88	0.000	–1.23053	–1.07903
Constant	–1.62457	0.01304	–124.57	0.000	–1.65013	–1.59901

Logistic regression. Number of observations = 534,997. Wald χ^2 (14) = 3,797.31. Prob.> χ^2 = 0.0000.

Log pseudo-likelihood =-224,126.6. Pseudo R^2 = 0.0162.

If one takes a further step and distinguishes, inside the working age population, different working conditions, other interesting results emerge. It turns out that younger pensioners (*i.e.*, less than 65-years-old) are better off than the elderly in the south, they are equally well off in the social-democratic regime, and they are worse off in the remaining regimes (Table 12). This might be due to the generous early retirement schemes which characterize several of those countries (e.g., France, Germany and Italy).

Age seems to matter for poverty gaps as well, but the direction is opposite. For all groups of countries analysed in the paper poverty gaps have an hump-shaped curve if plotted against age classes. Middle-age individuals, if poor, are poorer than the other individuals.

Table 12

Risk To Be Poor with Respect to Age, Occupational Status and Welfare Regime

Poors	Coefficient	Standard Error	*t*	*P* > | *t* |	95% Confidence Interval	
Age1	0.8881	0.0319	27.85	0.000	0.8256	0.9506
Age2 × unemployed	1.4662	1.4662	34.04	0.000	1.3817	1.5506
Age2 × retiree	0.0649	0.0649	1.06	0.288	–0.0549	0.1846
Age2 × disabled	1.2333	1.2333	13.52	0.000	1.0544	1.4121
Age2 × non-occupied	1.0698	1.0698	35.85	0.000	1.0113	1.1283
Age3	0.9764	0.9764	34.94	0.000	0.9216	1.0311
Corporatist (C)	–0.5031	–0.5031	–13.67	0.000	–0.5752	–0.4310
Liberal (L)	–0.5749	–0.5749	–12.08	0.000	–0.6683	–0.4816
Social-democratic (SD)	–0.6619	–0.6619	–15.75	0.000	–0.7443	–0.5795
Post-communist (PC)	0.0176	0.0176	0.65	0.519	–0.0359	0.0712
Age1 × SD	–0.1839	–0.1839	–2.95	0.003	–0.3059	–0.0619
Age2 × unemployed × SD	0.3020	0.3020	2.96	0.003	0.10197	0.5021
Age2 × retiree × SD	–0.3915	–0.3915	–2.24	0.025	–0.7335	–0.0494
Age2 × disabled × SD	–0.5620	–0.5620	–3.97	0.000	–0.8392	–0.2849
Age2 × non-occupied ×	0.3954	0.3954	6.33	0.000	0.2730	0.5178
Age3 × SD	0.3955	–0.3955	–6.12	0.000	–0.5221	–0.2688
Age1 × C	–0.2050	–0.2050	–3.77	0.000	–0.3114	–0.0985
Age2 × unemployed × C	0.5430	0.5430	7.56	0.000	0.4022	0.6838
Age2 × retiree × C	0.3231	0.3231	3.22	0.001	0.1262	0.5199
Age2 × disabled × C	0.4227	0.4227	3.36	0.001	0.1764	0.6691
Age2 × non-occupied × C	0.0443	.04427	0.78	0.433	–0.0664	0.1550
Age3 × C	–0.1176	–0.1176	–2.23	0.026	–0.2210	–0.0141
Age1 × L	0.5717	0.5717	8.98	0.000	0.4469	0.6964
Age2 × unemployed × L	1.4155	1.4155	11.74	0.000	1.1792	1.6518
Age2 × retiree × L	1.4336	1.4336	12.64	0.000	1.2112	1.6560
Age2 × disabled × L	0.8814	0.8814	6.81	0.000	0.6279	1.1350
Age2 × non-occupied × L	0.6043	0.6043	9.21	0.000	0.4756	0.7329
Age3 × L	0.6043	0.6043	9.55	0.000	0.4802	0.7283
Age1 × PC	0.0437	0.0437	1.06	0.291	–0.0374	0.1247
Age2 × unemployed × PC	0.3535	0.3535	6.49	0.000	0.24668	0.4606
Age2 × retiree × PC	–0.3926	–0.3926	–4.95	0.000	–0.5482	–0.2370
Age2 × disabled × PC	–0.3130	–0.3130	–3.08	0.002	–0.5123	–0.1136
Age2 × non-occupied ×	–0.1540	–0.1540	–3.69	0.000	–0.2358	–0.0722
Age3 × PC	–1.1570	–1.1570	–26.26	0.000	–1.2433	–1.0701
Constant	–2.1371	–2.1372	–104.71	0.000	–2.1772	–2.0972

Logistic regression. Number of observations = 534,997. Wald χ^2 (34) =12,501.54. Prob.> χ^2 = 0.0000.

Log pseudo-likelihood = –213,392.62. Pseudo R^2 = 0.0633.

5 Public policies and the age-profile of poverty

In the previous chapter, we documented that poverty and its age-profile differ markedly across welfare regimes. Our next step is to show that social policies have a major role in shaping these differences.

5.1 Measuring the anti-poverty effectiveness of expenditures

The amount of transfers received by each family can be computed using EU-SILC data (Table 13). Reassuringly, there is a very high correlation (above 80 per cent) between social expenditure as taken from our micro-data, and the amount of social expenditures recorded in the national accounts by Eurostat (Table 14).

The amount of transfers can be used to compute some straightforward measure of the anti-poverty effectiveness of public policies. In particular, one can compare actual poverty with poverty computed in absence of government transfers (Tables 15 and Figure 4). It appears that anti-poverty effectiveness, defined as the ratio between the two (so that a higher value of the index means lower effectiveness), varies significantly across countries (Table 16).[16] The index is 58 per cent in Cyprus, while it is below 25 per cent in Netherlands, Norway, Finland and Denmark.

Anti-poverty effectiveness of public spending is highest in Social-democratic and Corporatist countries: the above mentioned index takes values, respectively, equal to 27 and 34 per cent, while effectiveness is much lower in Liberal and Southern welfare states (in both cases, the index is around 50 per cent).

Anti-poverty effectiveness can be also calculated for population subgroups. As with overall effectiveness, we find big differences. For example, in the case of children, poverty after transfers is just 22 per cent of poverty pre-transfer in the case of Finland, while it is still 87 per cent in the case of Greece. Concerning the elderly, the maximum reduction in poverty is achieved in the Czech Republic: post-transfers poverty is just 4.2 per cent of pre-transfer poverty; the minimum reduction is in Cyprus, where the index is equal to 57 per cent.

Across regimes, differences in the age-profile of poverty before social transfers are quite small (Figure 4). For example, while the post-transfer poverty rate of children in the liberal regime is on average twice that in the Social-democratic regime, the pre-transfer poverty rates are respectively equal to 28.4 and 27.7 per cent (Table 5). For the elderly, pre-transfers poverty rate are very high (above 80 per cent) in all regimes.

Therefore, most of the cross-regimes differences in the actual age-profile of poverty are attributable to differences in effectiveness. Social-democratic states are the most effective in reducing both child and old age poverty (with an index of 37 and 12 per cent respectively), while the Southern countries are the less effective (the index is equal to 79 and 35 per cent respectively).

As a more formal way to capture the link between public transfers and (the age-profile of) poverty, we run a logistic regression in which the individual probability to exit the poverty status thanks to government transfers is related to the age class and the welfare regime of the individual's country, also allowing for regime-age interaction terms. There are two main results (Tables 18 and 19):

- with respect to the other groups of the population, children have the highest probability to exit poverty in Social-democratic countries and the lowest in the Southern ones, while their probability to be in poverty before transfers is the same of that of the working age population in both groups of countries;

[16] The percentage reduction in the poverty rate has been used, among others, by Moller *et al.* (2003).

Table 13

Social Transfers in EU-SILC

Countries	**Social Transfers** *(percentage of national disposable income)*	**Average Social Transfers by Family Type** *(euros per equivalent household members)*				
		Families with Children	**Families with Working-age Adults**	**Families with Elderly**	**Young/ Working Age**	**Old/ Working Age**
Austria	10.33	835	3,662	14,755	0.23	4.03
Belgium	10.68	2,867	4,092	12,027	0.70	2.94
Cyprus	4.72	377	2,185	8,011	0.17	3.67
Czech Republic	8.45	375	922	3,435	0.41	3.73
Germany	13.12	1,099	3,292	14,541	0.33	4.42
Denmark	15.64	4,670	6,271	22,833	0.74	3.64
Estonia	6.32	137	387	2,080	0.35	5.37
Spain	7.14	532	1,657	6,815	0.32	4.11
Finland	13.34	3,802	4,710	16,259	0.81	3.45
France	12.12	1,281	4,175	15,550	0.31	3.72
Greece	8.05	284	1,870	6,278	0.15	3.36
Hungary	11.05	850	1,013	3,182	0.84	3.14
Ireland	5.24	1,591	3,335	11,538	0.48	3.46
Iceland	5.71	3,765	2,918	19,362	1.29	6.64
Italy	10.28	638	3,176	10,842	0.20	3.41
Lithuania	7.47	320	386	1,618	0.83	4.19
Luxembourg	7.94	962	4,758	25,019	0.20	5.26
Latvia	5.65	155	302	1,332	0.51	4.41
Netherlands	13.70	2,174	5,179	19,685	0.42	3.80
Norway	12.40	6,142	6,744	24,355	0.91	3.61
Poland	9.61	289	926	2,890	0.31	3.12
Portugal	8.45	504	1,829	5,691	0.28	3.11
Sweden	10.88	1,954	3,412	13,696	0.57	4.01
Slovenia	8.12	571	2,047	5,986	0.28	2.92
Slovakia	8.80	537	811	2,687	0.66	3.31
United Kingdom	7.93	1,660	2,857	13,959	0.58	4.89
Min		137	302	1,332	0.2	2.9
Max		6,142	6,744	25,019	1.3	6.6
All country average		1,476	2,804	10,939	0.5	3.9

Table 14

Public Expenditure from National Accounts

Countries	Total Government Expenditure *(percent of GDP)*	Health	Education	Social Protection						Other Non-age-specific Expenditure
				Sickness and Disability Benefits	Old-age Benefits	Survivors Benefits	Family Allowances	Unemployment Benefits	Housing Allowances	
AT	49.4	7.5	5.2	1.9	12.0	1.6	2.4	1.3	0.0	17.4
BE										
CY	43.4	3.1	7.2	0.2	4.4	0.1	1.9	0.8	0.1	25.6
CZ	43.8	7.2	4.9	2.8	6.6	0.7	1.5	0.3	0.1	19.7
DE	45.3	6.3	4.0	2.6	9.7	2.1	2.2	2.7	0.1	15.8
DK	51.6	7.1	7.7	4.8	7.6	0.0	5.0	2.6	0.7	16.1
EE	34.2	4.3	6.2	1.8	5.5	0.1	1.6	0.3	0.0	14.4
ES	38.5	5.7	4.3	2.1	6.2	1.9	0.5	1.6	0.1	16.2
FI	48.7	6.8	6.0	4.3	8.9	0.7	2.6	2.3	0.3	16.8
FR										
GR	42.2	5.0	2.9	1.8	12.2	1.3	0.6	0.4	0.1	17.9
HU	51.9	5.6	5.8	3.8	6.5	1.2	2.4	0.5	1.1	25.1
IE	34.1	7.8	4.3	1.8	2.7	0.9	2.1	0.9	0.6	12.9
IS										
IT	49.9	7.0	4.5	1.7	12.2	2.6	1.0	0.5	0.0	20.3
LT	33.6	4.6	5.4	2.4	4.7	0.4	1.0	0.4	0.1	14.7
LU										
LV										
MT	43.6	6.4	5.6	1.9	7.4	1.9	1.1	0.6	0.2	18.5
NL										
NO	40.5	6.9	5.4	5.8	4.9	0.3	3.1	0.4	0.1	13.6
PL	43.8	4.6	6.0	2.5	9.9	1.8	1.2	1.0	0.1	16.7
PT	46.3	7.1	7.1	1.6	9.5	1.6	1.1	1.2	0.0	17.0
SE	54.1	6.8	7.0	5.7	10.6	0.5	2.6	2.0	0.4	18.5
SI	44.5	6.0	6.3	2.7	10.2	0.3	1.9	0.7	0.0	16.4
SK										
UK	44.2	7.2	6.1	2.7	7.3	0.1	2.7	0.3	1.1	16.7
Simple average	43.4	6.1	5.3	2.7	7.4	1.0	1.9	1.0	0.2	17.7

Source: Calculations based on Eurostat data. Data refer to 2006 except for Ireland (2005). The item "Other Non-age-specific Expenditure" includes general public services, defense, public order, economic affairs, environment protection, housing and community amenities, recreation culture and religion, other non attributable social protection.

Table 15

Poverty Rates by Age in Absence of Social Transfers

Countries	0-15	16-64	65+	Total
Austria	21.3	26.1	87.2	35.5
Belgium	26.6	29.3	90.3	40.0
Cyprus	11.9	17.0	84.0	24.1
Czech Republic	21.9	24.7	88.2	33.2
Germany	21.2	29.8	94.7	40.8
Denmark	27.8	31.2	95.4	40.5
Estonia	21.1	21.8	79.8	31.5
Spain	29.0	29.7	83.0	38.5
Finland	30.2	31.9	93.8	41.6
France	19.8	28.8	95.6	38.3
Greece	24.5	30.8	80.8	39.3
Hungary	47.4	39.3	86.8	48.0
Ireland	25.8	24.1	83.7	31.2
Iceland	25.0	18.0	79.7	25.7
Italy	27.5	30.5	82.2	40.6
Lithuania	32.0	29.1	83.2	38.2
Luxembourg	23.6	25.9	88.6	34.1
Latvia	29.1	28.1	74.4	35.8
Netherlands	27.9	29.4	96.2	38.6
Norway	30.7	30.1	93.8	39.9
Poland	38.8	42.0	87.1	47.6
Portugal	24.9	28.6	81.5	37.3
Sweden	24.6	25.7	90.6	36.1
Slovenia	18.5	26.7	80.7	34.0
Slovakia	32.3	29.4	88.4	37.7
United Kingdom	30.9	24.9	91.1	36.3
Min	11.9	17.0	74.4	24.1
Max	47.4	42.0	96.2	48.0
EU average				
All countries average	26.7	28.2	87.0	37.1

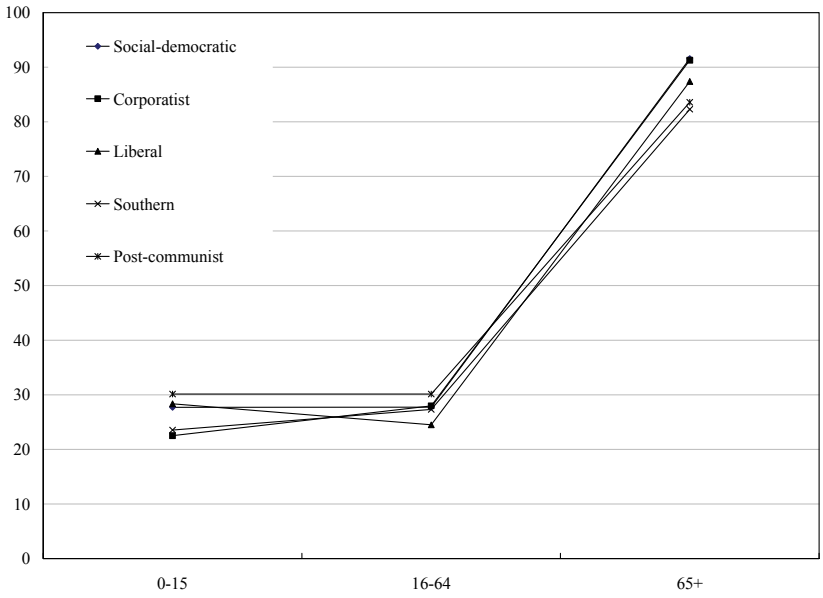
Table 16

Anti-poverty Effects of Transfers
(post-transfer poverty as a fraction of pre-transfer poverty)

Countries	Total	0-15	16-64	65+
Austria	0.35	0.69	0.42	0.18
Belgium	0.31	0.47	0.36	0.22
Cyprus	0.58	0.74	0.56	0.57
Czech Republic	0.25	0.66	0.32	0.04
Germany	0.30	0.56	0.40	0.14
Denmark	0.22	0.26	0.30	0.10
Estonia	0.43	0.76	0.60	0.17
Spain	0.49	0.79	0.52	0.35
Finland	0.24	0.22	0.30	0.18
France	0.31	0.63	0.38	0.16
Greece	0.50	0.87	0.59	0.30
Hungary	0.32	0.51	0.37	0.10
Ireland	0.50	0.71	0.58	0.24
Iceland	0.36	0.47	0.46	0.12
Italy	0.46	0.84	0.57	0.25
Lithuania	0.45	0.66	0.57	0.18
Luxembourg	0.42	0.85	0.54	0.10
Latvia	0.53	0.75	0.62	0.30
Netherlands	0.25	0.48	0.31	0.06
Norway	0.24	0.24	0.31	0.16
Poland	0.43	0.71	0.50	0.10
Portugal	0.45	0.71	0.51	0.29
Sweden	0.31	0.53	0.43	0.11
Slovenia	0.30	0.55	0.32	0.21
Slovakia	0.27	0.44	0.33	0.08
United Kingdom	0.49	0.73	0.59	0.27
Min	0.22	0.22	0.30	0.04
Max	0.58	0.87	0.62	0.57
All countries average	0.38	0.61	0.45	0.19

Figure 4

Poverty Rates by Age-class Pre-transfers



- the elderly have the highest probability to exit poverty thanks to transfers (relative to that of the working age population) in Southern countries and the lowest in the Social-democratic ones, notwithstanding a higher pre-transfer poverty rate with respect to working age people in the first group of countries with respect to the second group.

The next natural step is to understand better why the age-profile of effectiveness differs so much across countries and regimes.To this aim, we investigate its two fundamental determinants: the age distribution and the degree of targeting of social transfers.

5.2 The age-bias of European welfare states: a new measure

As already mentioned, our measure of poverty, as it is common to all the literature on this subject, assumes that all the resources of the individuals are shared with the other members of the household, so that all the members of the household have the same poverty status, determined by the level of the disposable (equivalized) household income. Therefore, old-age pensions might in principle benefit a child, if he lives with the pension recipient. So our first step to compare the age orientation of national social policies is to compute the average amount of transfers which in each country accrues, respectively, to families with children, to families with just working age components (*i.e.*, without children nor elderly) and to families with elderly components, in equivalized terms (in turns out that the number of families in which children and old people live together is negligible).[17] The distribution of transfers across family types is displayed in Table 13.

We propose a new index of pro-old bias of policies, defined as the ratio between the transfers accruing to families with elderly components and those accruing to families with working age people (both divided by the number of equivalent persons in the household). According to such measure, Social-democratic countries, Corporatist and Liberal countries are the more pro-elderly (with an index of about 4.0/4.2) and the Southern ones are the less pro-elderly (with an average index equal to 3.5).

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[17] We considered transfers gross of taxes. Only for the few countries for which this information was not available we used net amounts. This does not affect much our results, because generally transfers are not subject to taxes (as we could ascertain looking to those countries which report both figures).

Table 17

Vertical Expenditure Efficiency

Countries	Families with Children	Families with Working-age Components	Families with Elderly	Total
Austria	55.4	69.9	90.1	81.8
Belgium	46.9	69.6	90.8	76.7
Cyprus	40.1	41.2	79.3	64.1
Czech Republic	55.4	63.4	89.4	77.3
Germany	60.9	73.1	93.5	86.2
Denmark	57.1	76.4	96.9	83.7
Estonia	28.3	46.6	81.9	69.7
Spain	49.8	58.7	83.4	75.1
Finland	49.7	71.3	93.9	79.2
France	57.3	75.7	95.9	86.8
Greece	51.8	57.9	80.8	74.0
Hungary	59.3	65.3	87.1	75.4
Ireland	64.5	50.6	85.3	70.7
Iceland	43.1	45.4	90.0	65.9
Italy	37.6	52.4	81.5	72.1
Lithuania	44.9	54.1	85.5	70.2
Luxembourg	68.4	71.0	88.5	82.3
Latria	40.5	51.3	76.9	64.8
Netherlands	60.1	82.7	95.6	87.3
Norway	53.3	68.6	95.6	78.4
Poland	58.8	70.9	89.4	79.5
Portugal	53.9	53.4	84.1	72.4
Sweden	51.3	59.3	91.6	76.9
Slovenia	41.4	61.3	84.9	72.6
Slovakia	42.2	56.3	90.2	69.9
United Kingdom	83.4	57.6	89.8	80.8
Min	28.3	41.2	76.9	64.1
Max	83.4	82.7	96.9	87.3
All countries average	52.1	61.7	88.2	75.9

Table 18

Probability To Get Out of Poverty with Respect to Age and Welfare Regime

Poor	Coefficient	Standard Errors	*T*	*P* > | *t* |	95% Confidence Interval	
Age1	–3.2624	0.0466	–70.04	0.000	–3.3537	–3.1711
Age2	–2.2007	0.0215	–102.29	0.000	–2.2429	–2.1586
Corporatist	0.9773	0.0318	30.77	0.000	0.9150	1.0395
Liberal	0.3389	0.0374	9.07	0.000	0.2656	0.4121
Social-democratic	1.3377	0.0378	35.37	0.000	1.2636	1.4118
Post-communist	0.8992	0.0261	34.42	0.000	0.8480	0.9504
Age1 × Social-democratic	–0.0200	0.0626	–0.32	0.749	–0.1427	0.1026
Age2 × Social-democratic	–0.8909	0.0427	–20.88	0.000	–0.9745	–0.8073
Age1 × Corporatist	–0.4140	0.0666	–6.22	0.000	–0.5446	–0.2835
Age2× Corporatist	–0.7505	0.0378	–19.88	0.000	–0.8245	–0.6765
Age1 × Liberal	0.1849	0.0777	2.38	0.017	0.0324	0.3373
Age2 × Liberal	–0.6545	0.0479	–13.67	0.000	–0.7484	–0.5607
Age1 × Post-communist	0.0859	0.0557	1.54	0.123	–0.0233	0.1951
Age2 × Post-communist	–0.4333	0.0311	–13.92	0.000	–0.4943	–0.3723
Constant	0.3397	0.0167	20.31	0.000	0.3070	0.3725

Logistic regression. Number of observations = 534,997. Wald χ^2 (14) = 50,987.54. Prob.> χ^2 = 0.0000.

Log pseudo-likelihood = –230,934.65. Pseudo R^2 = 0.2156.

Table 19

Probability of Being Poor before Transfers with Respect to Age and Welfare Regime

Poors	Coefficient	Standard Errors	*t*	*P* > | *t* |	95% Confidence Interval	
Age1	–2.5093	0.0315	–79.570	0.000	–2.5711	–2.4475
Age2	–2.3857	0.0244	–97.790	0.000	–2.4335	–2.3379
Corporatist	1.0962	0.0459	23.890	0.000	1.0062	1.1861
Liberal	0.7469	0.0586	12.750	0.000	0.6321	0.8618
Social-democratic	1.2294	0.0488	25.200	0.000	1.1338	1.3251
Post-communist	0.3358	0.0331	10.150	0.000	0.2710	0.4007
Age1 × Social-democratic	–1.2145	0.0582	–20.880	0.000	–1.3285	–1.1006
Age2 × Social-democratic	–1.2657	0.0516	–24.530	0.000	–1.3668	–1.1646
Age1 × Corporatist	–1.4456	0.0574	–25.200	0.000	–1.5581	–1.3332
Age2× Corporatist	–1.2032	0.0488	–24.660	0.000	–1.2988	–1.1076
Age1 × Liberal	–0.5930	0.0700	–8.470	0.000	–0.7303	–0.4558
Age2 × Liberal	–1.0029	0.0625	–16.040	0.000	–1.1255	–0.8803
Age1 × Post-communist	0.0618	0.0433	1.430	0.154	–0.0231	0.1468
Age2 × Post-communist	–0.0370	0.0357	–1.030	0.301	–0.1070	0.0331
Constant	1.5344	0.0221	69.520	0.000	1.4912	1.5777

Logistic regression. Number of observations = 534,997. Wald χ^2 (14) = 38,301.22. Prob.> χ^2 = 0.0000.

Log pseudo-likelihood = –296,462.89. Pseudo R^2 = 0.1720.

Our index can be seen as a refined version of the one proposed by Lynch (2001 and 2006) based on national accounts data. First, as mentioned above, it takes the household as the unit of analysis, consistent with the literature on poverty and inequality. Second, it is more precise in estimating who gets what in the first place. For example Lynch assumes that all pension and survivors benefits are paid to elderly people, while a part of the benefits are actually paid to younger individuals. Symmetrically, unemployment benefits, which Lynch completely attributes to the working age group, can also be paid to elderly unemployed. Of course, even our refined index must be taken with caution. First, some important items which potentially show an age-related profile are not included in the index (this is the case of expenditure for health and education). Second, the revenue side of the budget is not taken into consideration.[18] One of the main reasons for the difference between the two indicators is the fact that a sizable share of pension benefits goes to people less than 65 years old.[19]

Shifting the focus from the elderly to the young, we compute an index of the pro-children bias of policies. It is defined as the ratio between the transfers accruing to families with children and those accruing to families with working age people (Table 13). Differences across countries are larger than those concerning the orientation towards the elderly. While in some countries the expenditure for families with children is less than 20 per cent of what is given to families with working age individuals, this ratio is above one in Iceland, close to one in Norway, and above 80 per cent in Finland, Hungary, and Lithuania. Concerning the different regimes, the ratio is highest in Social-democratic countries (0.8). and lowest in the Southern countries (0.2).

To sum up, Social-democratic and Southern countries appear to be polar cases: public spending in the former is the most pro-children and the most pro-elderly, while the opposite is true for Southern countries. The other regimes lie somewhere in between these two extremes.

5.3 The degree of targeting

Differences in effectiveness might be due not only to the distribution of transfers but also to the design of the transfer system itself. For example, even in a country in which most of the transfers go to families with elderly people, there is the possibility that these resources are enjoyed mainly by families which are not poor to start with.

A widely used indicator of the anti-poverty *efficiency* of public expenditure (first introduced by Beckerman, 1979) is the so-called Vertical Expenditure Efficiency index (VEE).[20] It is defined as the percentage of transfers going to households which would have been poor without the transfers. This component of spending has a clear impact in the direction of reducing poverty, whereas money going to those who are not poor to start with does not change overall poverty indices.

In Table 17, we display the Vertical Expenditure Efficiency (VEE) for each country. Data show that in several countries VEEs are lower than 70 per cent (Cyprus, Latvia, Iceland, Lithuania, Estonia and Slovakia), whereas in others it exceeds 80 per cent (the United Kingdom, Austria, Luxembourg, Denmark, France, Netherlands and Germany). However, there is not much difference in expenditure efficiency across country groups, as in all of them there are very efficient and very inefficient countries. For example, while on average Social-democratic countries have the highest

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[18] The correlation between the elderly-to-non-elderly spending ratio computed by Lynch and the ratio between transfers going to families with elderly and transfers going to the rest of the families computed by us from EU-SILC data is positive (56 per cent). Lynch has data for only 15 EU countries. She considers average spending between 1985 and 2000.

[19] An analysis of the economic conditions of older retirees relative to younger retirees for the case of a Southern country (Italy) can be found in Franco *et al.* (2008).

[20] See also Mitchell (1991).

Table 20

Determinants of the Age-poverty Profile

	Anti-poverty Effectiveness Index for the Middle-aged – Anti-poverty Effectiveness Index for the Young		**Anti-poverty Effectiveness Index for the Middle-aged – Anti-poverty Effectiveness Index for the Old**	
Constant	–0.285	***	0.204	
	(–4.03)		(0.63)	
Difference in VEE	–0.001		–0.002	
	(–0.45)		(–0.57)	
Pro-old Bias			0.060	**
			(2.66)	
Pro-young bias	0.317	***		
	(6.47)			
R^2	0.65		0.25	
Observations	26		26	

average VEE, Iceland has the lowest score of all countries (64 per cent). While the Southern group has the lowest VEE, Portugal displays a very high score (82 per cent). Moreover, VEE is positively, not negatively related to the overall amount of transfers: it seems that smaller welfare states are not more, but less efficient than the bigger ones.

We also compute VEE indicators for the different kinds of families. There are no big differences across regimes in the targeting of the transfers going to families with old age components (in all cases efficiency is above 80 per cent). The same is true for transfers accruing to families with children, with the exception of Liberal countries in which efficiency is relatively higher (74 per cent).

Before concluding this section, in order to get a feeling of how far our measures of age-orientation go in explaining anti-poverty effectiveness, we run two simple cross-country OLS regressions (Table 20). In the first, we relate the difference in the effectiveness indices of the middle-aged and of the young to our pro-young bias index, controlling for differences in the degree of vertical efficiency. As expected, the coefficient of the pro-young bias index is positive and significant. In the second regression, the difference in the effectiveness indices of the middle-aged and of the old is regressed on our pro-old bias index, again controlling for differences in the degree of vertical efficiency between the two age groups. Again, the coefficient of the pro-old bias index is positive and significant.

6 Conclusions and policy implications

We have documented that sizeable differences exist across Europe with respect to the relative conditions of young and elderly citizens: in some countries (mainly belonging to the Southern European and Anglo-Saxon groups) their poverty rate is indeed much higher than that of the remaining part of the population.

We showed that these cross-country differences are largely due to differences in the effectiveness of national social policies in lifting children and elderly people out of poverty, whereas pre-transfer age-poverty profiles are rather similar across countries.

Finally, we have proposed new country-level measures of the age-orientation of social spending, and argued that they can be useful to explain why in some countries (mainly belonging to the Social-democratic and Corporatist groups) the transfer system is relatively more effective in lifting children and elderly people out of poverty.

Understanding the determinants of the age-orientation of welfare states is an obvious area for further research. Concerning this issue, economists emphasize the role of the lobbying power of the elderly, given their-single-mindedness (they do not care about the adverse labour market implications of large spending programs) and their reduced opportunity cost of lobbying (Mulligan and Sala-i-Martín, 1999).[21] Political scientists add that the elderly and the retirees are over-represented and over-influential inside powerful collective actors (e.g. trade unions), and that certain characteristics of the political system may further enhance their influence (for example, the "familist" ideology of some Christian democratic parties).

Of course, our results do not mechanically translate into a value judgement, or a ranking of European welfare states. As a matter of fact, we just investigate one particular dimension of social spending effectiveness – namely, the degree of protection against the risk of poverty – which is not the only, and not even the main goal of welfare systems. Moreover, as Esping-Andersen emphasizes, national systems differ in their ultimate targets, shaped as they are by country-specific historical forces and political struggles. So it would be wrong to look for a one-size-fits-all template, and for a common reform path.

On the other hand, our findings are potentially relevant from a policy point of view, in particular for Southern countries, where the age-poverty profile is pronouncedly V shaped. The evidence provided in our paper suggests that they have ample room for a reorientation of expenditures towards the more vulnerable age groups. Another implication of our results is that generous and expensive pension systems, such as those which are in place in some Southern countries, do not automatically translate into low poverty levels for the elderly. Indeed, due to the rules of the system, a sizable fraction of pension expenditures might goto the richest part of the elderly population, and/or to working-age individuals.

As we remarked at the beginning, EU welfare states do face common challenges, due to common socio-economic changes (Esping-Andersen, 1999) and to adverse budgetary developments, mainly due to the looming population ageing. We believe that there is much to be learnt from one's neighbors. This also represents a test for European institutions and in particular for the OMC as a platform for mutual learning. If it succeeds, it might be also fruitfully applied to other policy areas, taking into account both EU-wide challenges and national peculiarities.

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[21] See also the survey papers by Mulligan and and Sala-i-Martín (2004a and 2004b) and Galasso and Profeta (2002). While most of the papers consider the political sustainability of pensions and, more generally, transfers from the workers to the retirees, there is a more recent literature which brings transfers to the youngest part of the population into the picture (e.g., Boldrin and Montes, 2005; Slavov, 2006).

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SOME REFLECTIONS ON PENSION REFORMS IN INDIA

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Pension policy in India has been characterized by the dominance of the orgainsed sector based on financing through employer and employee participation. As a result the coverage has been limited to the organised sector and the employees in the unorganized sector needs to be brought into purview of the formal channels of old age financial support. Further, the existing mandatory and voluntary private pension system needs uniform regulatory framework for transparency and improved service. There is an imperative need to manage the pension funds through fund managers as is the practice in some of the developed countries to derive the positive spin-offs in terms of investment options and making available the resources for improving growth. In view of the experience with the current pension system in India, efforts have been made by the Government in the recent years towards the direction of reforms in pension policy with the introduction of a new pension system in 2004. The present paper focuses on the recent initiatives and reforms in the pension system in India in the light of international experience as also the compulsions due to demographic factors and attendant implications for finances of the Government both Central and State Governments. The policy initiatives include setting up of the Interim Pension Fund Regulatory and Development Authority (October 2003), introduction of a New Pension System and introduction of the Pension Fund Regulatory and Development Authority (PFRDA) Bill in Parliament in March 2005. Against this backdrop the paper also highlights some of the policy challenges and imperatives to be addressed in the medium term.

The pension reforms initiatives have emerged as one of the important tenets of public policy in the recent past, although these are yet to take off on account of the pending of the passage of the PFRDA Bill. The introduction of pension is an integral component of the refining the social security system in India. The paper is organised as follows. Section 1 briefly deals with the international experience with regard to pension reforms. Section 2 presents necessity of pension reforms in Indian context and also focuses on the demographic factors having bearing on pension reforms. It also presents the salient features of the New Pension System and its architecture. A brief description of the role of private sector in pension also discussed in this section. Section 3 deals with the recent policy initiatives including some of the issues flagged by the PFRDA based on the recommendations of the Expert Group on investment guidelines for pension in the informal sector released recently. Section 4 concludes with emerging challenges and policy issues.

1 Brief review of international experience on pension reform

Many countries are grappling with the problem of how to reshape their onerous, tax-financed pension schemes. Latin America, however, has been a laboratory for pension reform. Starting with Chile in 1981, several countries such as Peru, Argentina and Mexico embarked on pension reforms. The details have varied across the region but, overall, pension provision has shifted decisively to a privatised model. What can the rest of the world learn from Latin America? A study by Gill *et al.*, *Keeping the Promise of Social Security in Latin America*, from the World Bank, presented a

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comprehensive analysis of the Latin American experiment. The World Bank set out a model of pension reform based on three "pillars": first, a tax-financed public safety-net; second, compulsory saving by workers, generally into individual pension accounts; and third, voluntary saving for retirement. The study found that main success of Latin American pension reform aimed at improving the governments' finances. The reform also galvanised the development of capital markets and helped to modernise the financial system, both by improving the quality of regulation and by generating services such as risk-rating.

According to the World Bank report, *Old-Age Income Support in the 21st Century*, most pension systems in the world "do not deliver on their social objectives, they contribute to significant distortions in the operation of market economies, and they are not financially sustainable when faced with an ageing population". Pension reform must take account of workers in the informal economy, who often make up more than half the labour force in developing countries. And it must also cater for people who will be poor throughout their lives.

Chile has been considered to be model country for implementation of pension reforms. Its pension system is based on obligatory individual accounts and private administration. In Chile, the debate has focused on the people who remain outside the system – a problem that the Chilean government says it would fix broadening Social Security coverage. Overall, the consensus is that the system of pension fund administrators has more strengths than weaknesses. That explains why, from Central and South America to Eastern Europe, the Chilean system has served as the inspiration for 17 countries that have decided to get rid of their underfinanced systems of distribution. The main attraction of the Chilean pension system was that it was created at the beginning of the 1980s as the successor to the old state-run system, which went bankrupt. A second factor was that the Chilean reform included the concept of individual capital accounts. "This feature appeals to many people who believe that governments are often unable to maintain sufficient assets to finance a retirement system." Individual accounts can be better protected against political risks. Its system incorporates a "security network" in the form of minimum pensions and old-age benefits guaranteed by the government (Olivia Mitchel).

According to a study by the AFP Association (which comprises Chile's seven private-sector pension administrators), the first foundation of the Chilean model is the country's government. In its subsidiary role, the government finances a portion of the minimum pensions and all of the public-assistance pensions provided for the aged poor. The second foundation consists of the private-sector pension administrators who administer the obligatory Social Security savings. They help to relieve the burden on the government. The third pillar is Chile's workforce, which voluntarily saves, either to increase its pensions or in order to take early retirement. The mechanism for doing this is called "voluntary provisional savings".

Individual accounts permit the establishment of a direct link between those contributions that people make to the system and the benefits they derive from it. This creates incentives for people to assume responsibility for their own pensions and can lead to a range of positive results for savings, the development of capital markets, and higher worker productivity. These factors, in turn, stimulate economic growth. Its impact on economic growth is a key "virtue" of the Chilean model.

According to the OECD report, *Pensions at a Glance: Asia/Pacific, a Joint OECD/World Bank Report*, many Asian countries would need to reform their pension systems in order to deliver sustainable and adequate retirement incomes for today's workers. In order to prepare for the rapid population ageing forecast over the next two decades, it is vital to act now to avoid future problems and repeating many of the mistakes made in Europe and North America. The report analyses the retirement income systems of 18 Asian countries, including Australia, China, India, Indonesia, Pakistan, the Philippines and Vietnam. It says that reform is needed because:

- coverage of formal pension systems is relatively low;

- withdrawal of savings before retirement is very common;
- pension savings are often taken as lump sums and often do not provide people with adequate income over their lifetime;
- pensions payments are not automatically adjusted to reflect changes in the cost of living.

In order to improve the pension systems in Asia Pacific region including India, the pension report by OECD relating to this region makes three key recommendations: Asian countries with defined-benefit schemes based on workers' final salaries should shift to calculating pension entitlements using lifetime average earnings, as most OECD countries do. This would make them more financially sustainable and fairer; final salary plans tend to favour the higher paid whose earnings tend to rise more rapidly with age compared to lower paid manual workers; and many countries allow people to withdraw their pension benefits before retirement or pay lump-sum benefits, rather than a regular retirement income. Allowing people to take out their savings only on retirement *via* regular payments, known as annuities, would reduce the risk of people's savings running out in retirement.

In OECD countries, an average of 70 per cent of the working-age population is eligible for a pension. However in South Asia, just 7.5 per cent of the working-age population are eligible and in East Asia 18 per cent. Furthermore, few countries in Asia/Pacific have social pensions to provide safety-net retirement incomes for people who are not members of formal schemes. Only in India are social pensions significant, with around 10 to 15 per cent of older people covered.

2 Demography and importance of pension reforms in India

Nearly one eighth of the world's elderly population lives in India. The vast majority of the population is not covered by any formal pension scheme. Instead they are dependent on their own earning and transfer from their children. Pension policy in India has traditionally been based on financing through employer and employee participation. As a result, the coverage has been restricted to organised sector and vast majority of the workforce in the unorganised sector has been denied access to formal channels of old age financial support. Only about 12 per cent of the working population in India is covered by some from of retirement benefit scheme. Besides the problem of limited coverage, the existing mandatory and voluntary private pension system is characterized by limitations like fragmented regulatory framework, lack of individual choice and portability and lack of uniform standards. High incidence of administrative cost and low real rate of returns characterize the existing system, which has become unsustainable. Non-sustainability of the existing pension system would be accentuated by the sharp increase in the financial burden on the Government and other employers on account of pension liabilities. The working age population is likely to increase in the next two decades at a brisk pace, thereby pension reform is vital to provide support at the old age without having any adverse effect on finances of the Government (Table 1).

The total pension liability on account of the Central Government employees has increased from 6 per cent of its revenue receipts in 1990-91 to 11 per cent in 2000-01, sharp rise possibly reflecting the impact of Fifth Pay Commission, before falling to 5.8 per cent in 2008-09 (budget estimates). In respect of State Governments, the same ratio has increased from 5.4 per cent in 1990-91 to 11.3 per cent in 2001-02 before sliding to 8.7 per cent in 2008-09 (budget estimates) (Table 2). There is an imperative to need reduce the burden on the Governments in view of the likely rise in these payments in future.

India is one of the youngest country in the World today with an average age being only 26 years. The dependency ratio in India is also one of the lowest in the World. However, old-dependency ratio during 2000-25 is estimated to increase almost 1.5 times (8.1 in 2000 to 12.2 in 2025); the next 25 years is likely to witness a sharper increase of around 2 times (from

Table 1

India's Labor Force and Demographic Indicators

	Indicator		Time Period
1	Life expectancy at birth *(years)*		2000-05
	Male	63.2	
	Female	64.6	
2	Life expectancy at age 60 *(years)*		2001
	Male	15.7	
	Female	17.1	
3	Total fertility rate (No. of children)	2.85	2001
4	Population *(millions)*	1028	2001
	Females *(millions)*	496	
	Males *(millions)*	532	
	Sex Ratio *(females per thousand males)*	933	
5	Population above age 65 *(millions)*	46.6	2000
		129.3	2030
	Old Age Dependency Ratio (percent)	11.9	2001
6	Total workforce *(millions)*	424.6	2001
	Urban workforce *(millions)*	97.7	
	Rural Workforce *(millions)*	326.9	
7	Working age population *(millions)*		
		619.7	2000
		921.5	2025
		1048.2	2050

Source: Asher and Vasudevan (2006).

12.2 in 2025 to 22.6 in 2050). The policy imperative under these circumstances is to a establish a strong and sustainable social security network in the country. At the same time India is growing old at a very fast rate and the population of people above 60 years of age, constitute 80 million in 2008 would double in the next 18 to 20 years. In order to reap the advantages implementation of pension reforms is vital. The coverage of old age constitute about 12 per cent of the total workforce in the formal social security system. The remaining 88 per cent do not have access to any formal scheme. New Pension Scheme is aimed at 88 per cent of the workforce.

The pension scheme in operation in India can be broadly divided into the Civil Services Pension schemes (12 million), Employees Provident Fund (40 million), Empoyees' Pension Scheme (28 million), Special Provident Funds (2.1 million) and New Pension Scheme (0.3 million). The Civil Servants' Pension (CSP) is a traditional defined benefit scheme which runs on the basis of pay-as-you-go system, for employees of Central Government who were

Table 2

Pension Payments
(billion rupees)

Year	States	*as percent of revenue receipts*	Centre	*as percent of revenue receipts*
1	**2**	**3**	**4**	**5**
1990-91	35.93	5.4	32.72	6.0
1991-92	37.16	4.6	37.48	5.7
1992-93	43.79	4.8	45.85	6.2
1993-94	51.07	4.9	52.06	6.9
1994-95	61.46	5.1	57.34	6.3
1995-96	78.13	5.8	69.28	6.3
1996-97	98.27	6.5	82.52	6.5
1997-98	115.99	7.0	113.76	8.5
1998-99	161.66	9.4	153.46	10.3
1999-00	226.79	11.2	194.46	10.7
2000-01	254.53	10.9	211.17	11.0
2001-02	282.19	11.3	218.26	10.8
2002-03	310.05	11.3	221.02	9.6
2003-04	330.24	10.7	236.29	9.0
2004-05	373.78	10.3	249.7	8.2
2005-06	406.48	9.4	271.96	7.8
2006-07	468.61	8.8	295.2	6.8
2007-08 RE	560.02	8.9	324.44	6.2
2008-09 BE	627.29	8.7	346.75	5.8

BE: Budget Estimates. RE: Revised Estimates.
Source: Union Budget documents, various issues, State Finances, *A Study of Budgets* and Swarup (2007).

recruited up to December 31, 2003 and employees of State Governments recruited up to the effective date mentioned in notifications issued by those Governments. CSP is an unfunded scheme and there has been no attempt at building up pension assets through contribution or any other provision.

2.1 New Pension System

There was a marked shift in pension policy during the period 2000 to 2007 in India which culminated in introduction of new pension system. A High level Expert Group and Old Age Social

and Income Security (OASIS) project commissioned by the Government were two milestones on the road to pension reforms for the Government employees and the unorganised sector respectively. These efforts culminated in setting up of the Pension Fund Regulatory and Development Authority (PFRDA) in October 2003, introduction of New Pension System in January 2004 and introduction of PFRDA Bill in March 2005. In order to reduce the liability, the Central Government has introduced the defined contributory system for the new employees. Similar schemes have been undertaken by nineteen State Governments. The remaining State Governments are expected to opt the Defined Contribution (DC) based New Pension System (NPS). The NPS contributions of the employees of the Central Government and 19 State Governments would be transferred to these fund managers by the respective Governments in the beginning of 2009-10. The NPS has been implemented for Central Government employees (excluding defence personnel) recruited on or after April 1, 2004. The NPS is designed for scalability, outreach, fair play and low cost, and provides choices to individual. For such a system sound regulatory framework is an imperative. The NPS envisages individual retirement based accounts, with the worker empowered to exercise investment choice.

The salient features of the NPS are that it provides seamless portability across jobs and across locations, unlike all current pension plans, including that of the EPFO. It would provide hassle-free arrangement for the individual participants and a pure DC product with no defined benefit element, returns being totally market-related. NPS also provides various investment options and choices to individuals to switch over from one investment option to another or from one fund manager to another subject to certain regulatory restrictions. At present there shall be only two investment choices – investment of entire contribution in Government securities alone or adopting the investment guidelines applicable to non-government provident funds. The current government guidelines provide that up to 15 per cent can be invested in equities and the balance 85 per cent in fixed income instruments. After the passage of the PFRDA Bill by Parliament, the Regulator would provide more investment choices. NPS will have comparatively lower costs. Low costs will enhance pension wealth and bring in more customers. The main challenges are: providing safety and high returns; extending coverage to as many people as possible and to improve financial literacy levels. There is an imperative to make efforts to educate potential participants about benefits and advantages of saving for retirement. According to an estimate made by a FICCI-KPMG study the assets under management will be US$ 95 billion in less than 20 years. One important element which would greatly incentivise pension savings is the tax treatment given to it. At present, NPS is subject to the EET tax regime. On the other hand, Employees Provident Fund (EPF), General Provident Fund (GPF) and Public Provident Fund (PPF) have more favourable tax treatment. EEE benefit is available to them. This goes against the basic philosophy of encouraging contractual savings, which provide long-term funds for investment.

One issue which needs attention for making the new pension scheme equitable is the tax treatment. Pension savings in general and the NPS in particular is a very long term saving instrument having a time horizon of 30-35 years. Therefore, the treatment of this instrument from a tax perspective, if not the most preferential, should at least be at par with other medium or short term financial instruments. This is especially important at the nascent stage of the new pension system development. In this context, example of Public Provident Fund (PPF) and other such instruments are worth mentioning. PPF having a life cycle of 15 years is under an EEE (exempt-exempt-exempt) tax regime and is not taxed at any point whereas NPS being a 30-35 years instrument is taxed at exit. Therefore, subscribers to NPS are at a disadvantage compared to the PPF especially when seen in the context that NPS is a mandatory scheme whereas PPF is a voluntary scheme. The Government employees appointed before January 1, 2004 participate in the GPF scheme which is again an EEE tax regime whereas NPS is subject to EET regime and the withdrawable tier-II account of NPS (a substitute to GPF) is envisaged to get no preferential tax treatment. Further, a common ceiling for contributions of both the employees and Government

under the Income Tax Act, 1961 may be a disadvantage for the subscribers of NPS. Accordingly, a need is felt to treat all long term savings instruments equitably and provide the same tax treatment to NPS as being given to PPF and other similar schemes. The tax treatment merits a review so as to take care of the distortions across financial instruments and giving right fiscal incentives for the development of the pension sector. The main challenges in the development of this sector include: covering the unorganized sector; empowering the subscribers to take appropriate investment decisions based on their risk and return profile, provide safety and optimum returns, and to improve financial literacy levels.

2.2 NPS architecture

The Pension Fund Regulatory and Development Authority (PFRDA) and National Securities Depository Limited (NSDL) entered into a formal agreement on November 26, 2007 relating to the setting up of a Central Recordkeeping Agency (CRA) for the New Pension System (NPS). The CRA is a first of its kind venture in India and is critical to the successful operationalisation of the NPS. The main functions and responsibilities of the CRA are: (i) Recordkeeping, Administration and customer service functions for all subscribers of the NPS; (ii) Issue of unique Permanent Retirement Account Number (PRAN) to each subscriber, maintaining a database of all PRANs issued and recording transactions relating to each subscriber's PRAN; (iii) Acting as an operational interface between PFRDA and other NPS intermediaries such as Pension Funds, Annuity Service Providers, Trustee Bank etc. An important feature of the PRAN to be issued by CRA is that it shall be portable across jobs and geographical locations.

The NPS architecture consisting of a Central Recordkeeping Agency (CRA) and competing pension fund managers along with the NPS trust, custodian, Trustee bank, Retirement Advisers and other players. Based on the systems prevalent in both developing and developed countries, PFRDA devised a system that meets Indian conditions and needs. PFRDA had attempted to design an architecture which is simple, cost effective and robust.

PFRDA has completed the process of putting in place the full NPS architecture. The selection of the Central Record Keeping Agency (CRA), Pension Fund Managers (PFMs) and Trustee Bank was made. State Bank of India (SBI), UTI Asset Management Company (UTI-AMC) and Life Insurance Corporation (LIC) have been appointed as Pension Fund sponsors under the NPS.

As these intermediaries were selected through a bidding process, the fees/charges are very competitive *vis-à-vis* the prevalent fee/charges in the mutual fund and insurance industry. A Custodian of NPS assets and an NPS Trust have also been appointed. Once the volumes increase, these costs can only move southwards. Low costs will enhance pension wealth and bring in more customers. Once the volumes increase, these costs can only move southwards. Low costs will enhance pension wealth and bring in more customers.

2.3 Private sector

Three private sector groups – Reliance (ADAG), ICICI and Kotak Mahindra – were among the six bidders shortlisted by the Pension Fund Regulatory & Development Authority (PFRDA) for managing pension funds for citizens other than government employees. The other three are UTI, SBI and IDFC. As per the Government plan, the New Pension System for all citizens will be rolled out from April 1 2009. The six parties were shortlisted by PFRDA from more than a dozen participants in the competitive bidding. Under the NPS, fund managers, besides incurring the operating expenses, will have to pay PFRDA Rs 10 lakh a year as marketing expenses. There was aggressive bidding from private parties who feel that the corpus would be large as the scheme is

Table 3

Investment Pattern of Pension Funds

Instrument	Revised Investment Pattern	Investment Pattern Dated January 2005
Government securities and mutual funds dedicated to government securities, regulated by the Securities Exchange Board of India (SEBI)	up to 55%	minimum 40%
Debit securities (issued by corporate bodies, including banks and public financial institutions); term deposit receipts (issued by scheduled commercial banks) and rupee bonds	up to 40%	minimum 25%
Money market instruments, including units of money market mutual funds	up to 5%	previously not allowed
Equities	up to 15%	up to 5%
Equity-linked schemes of mutual funds regulated by the SEBI	up to 15%	up to 10%

open to all. Analysts, however, think it may not be the case, going by the investor response to some of the existing pension schemes. Private sector entities were barred from bidding for the New Pension System for government employees launched last year. However, they were allowed to bid when it came to managing funds for citizens other than government employees. The NPS for the government employees is currently managed by three public sector institutions – LIC, SBI and UTI. Under the new NPS – which is a voluntary scheme – an individual can join any one of the funds and would have a permanent Retirement Account Number (PRAN). The records of subscribers are run by a central record keeping agency.

3 Recent policy initiatives

As a sign of increasing confidence in the expansion of private pension systems in India, the Ministry of Finance had increased the flexibility in the pattern of investment. This would be effective from 1 April 2009 for non-governmental provident funds, superannuation and gratuity funds. In line with the practice in many developing countries, there have always been significant restrictions on how these funds could be invested, with a considerable bias toward local investments and toward government securities. The latest revision to the investment pattern provides an avenue of investment options and will give more flexibility for investment management within the revised ceilings available for different categories of investment (Table 3).

Within the above instruments, it should be noted that investment in equities is limited to shares of companies for which derivatives are available on the Bombay Stock Exchange or the National Stock Exchange. However, this does cover more than 250 stocks, which would now be available. Concerning debt securities, these should have a duration of at least three years, and at least 75 per cent of investments need to be investment grade. Bonds denominated in Indian currency and issued by multilateral agencies such as the International Finance Corporation, a member of the World Bank Group or the Asian Development Bank must also have a maturity of at

least three years. The required duration for term deposit receipts has been changed from a maximum of three years to a minimum of one year. Overall, this is a significant extension of flexibility in creating a range of bond portfolios.

Apart from a specific limit on exposure to mutual funds, which is not to be more than 5 per cent of the portfolio at any time, there are some further significant relaxations around trading and the monitoring of the investment pattern. While the investment pattern must be in place at the end of each year, movement is allowed during the year provided that each category does not exceed the investment pattern limit by more than 10 per cent. Also, the entire portfolio can be treated as tradable and exposed to active management. Rather than the old limit of 10 per cent of the portfolio being tradable, the only limit now is that the overall turnover ratio (that is, the value of securities traded during the year divided by the average value of the portfolio during the year) should not be more than 2 per cent.

3.1 Investment guidelines for pension funds in informal sector

PFRDA had constituted an Expert Group (Chairman: Shri Deepak Parekh) to recommend investment norms for the New Pension System for all citizens other than Government employees covered by NPS. The Report submitted by the Group to PFRDA on February 17, 2009. The recommendations of the Group have been considered by PFRDA. Comments/views of the public on the recommendations of the Expert Group and modifications proposed to be made in the investment norms by PFRDA are invited. The major recommendations of the Group and the modifications proposed to be carried are shown in Table 4. A set of questions raised for evaluation relate to administrative choices were made at PFRDA as features of NPS. These are: how frequently ought a contributor be allowed to change his investment allocation? What are the valuation guidelines to be adopted to calculate the NAV of the funds under management? How are the PFMs to be evaluated on their fund management performance? What would be the frequency of NAV disclosure to PFRDA and to the contributors? What is the action to be taken on evaluating their performance? How are the "auto choice" funds to be allocated for fund management? Also see Annex 1 for investment guidelines for pension funds in the informal sector submitted by the Expert Group to the PFRDA.

3.2 Valuation guidelines to calculate the NPS funds NAV

Pension funds are invested for long-horizon, it is important that there is no ambiguity about the NAV or the assets that the funds are invested in. In addition, the NPS is a new pension system . In order to build the credibility of the system, it is even more important to have clarity on what the NAV is with as much accuracy as possible. Thus, it would be commendable to have the NAV at each PFM reported to the PFRDA on a daily basis. However, a problem with the NPS funds is that the three proposed asset classes "E" , "G" , "C" have very different characteristics in terms of their frequent valuation. "E", the index funds have an extremely high level of valuation accuracy – these are the most liquid stocks traded on electronic exchanges showing as accurate a price as possible from minute to the next. "G" contain some ambiguity in valuation (on the older Government of India bonds, which are hardly traded and thus , is very difficult to find a recent market price for). Both E and G are not problems when it comes to standardised valuation guidelines, as described above. The problem lies in valuing funds invested in "C": here, there is very little trading of these securities; most of them are bought in over the counter trades; and often are held to maturity.

Table 4

Suggestions on Investment Pattern for NPS for All Citizens

Schemes	Expert Group	PFRDA
"E"	100%	100%
"G"	100%	100%
"C"	100%	100%
Auto Choice (till 35 years of age)		
"E"	65%	60%
"G"	10%	10%
"C"	25%	30%
at age	**60 Years**	**55 Years**
"E"	10%	0%
"G"	80%	80%
"C"	10%	20%
Asset Class/Scheme	Expert Group	PFRDA
"E"	Nifty 50	Index Funds that replicate the portfolio of a particular index such as BSE Sensitive index, NSE 50 index, etc. These schemes invest in the securities in the same weightage comprising of an Index.
"G"	**Government of India bonds** Liquid Funds of Asset Management Companies with following filters: - AMCs are SEBI regulated, with Average total assets under management (AUM) for the most recent six-month period of, at least, Rs 5,000 crores. - All assets that are permitted for investment into liquid funds by SEBI. Fixed Deposits of banks with following filters: - Net worth of at least Rs 500 crores and a track record of profitability in the last three years, - Capital adequacy ratio which is not less than 9% in the last three years, - Net NPA of under 5% as a percentage of net advances in the last year, - Be a participant in the RTGS system, - The price-to-book ratio of the bank Must exceed 1.25	**Government of India bonds** **State Government Bonds**
"C"	**Govt. bonds/Credit rated State Govt. bonds** **Credit rated Public Financial Institutions/PSU bonds** **Credit rated Municipal bonds/infrastructure bonds** **Bonds of all firms (including PSU/PSE) that have shares listed on a stock exchange with nation-wide terminals,** and: 1 Have a market capitalisation of over Rs 5,000 crore (as on 31st March), 2 Which have been traded for at least three years, 3 Whose shares have an average trading frequency of at least 95% for a period of the last one year on the exchange, 4 Whose top management as well as the board of directors of the company have no legal/regulatory charges against them	**Liquid Funds of AMCs regulated by SEBI with filters suggested by the Expert Group**. **Fixed Deposits of scheduled commercial banks with following filters:** - Net worth of at least Rs 500 crores and a track record of profitability in the last three years, - Capital adequacy ratio of not less than 9% in the last three years, - Net NPA of under 5% as a percentage of net advances in the last year. **Debt securities with maturity of not less than three years tenure issued by Bodies Corporate, including scheduled commercial banks and public financial institutions [as defined in Section 4 (A) of the Companies Act]** Provided that at least 75% of the investment in this category is made in instruments having an investment grade rating from at least one credit rating agency. **Other categories/requirements as recommended by the Expert Group**

4 Emerging challenges and issues

There are certain policy issues which need to be addressed for the success of New Pension System. The voluntary nature of NPS along with poor financial literacy and attitude of households towards financial savings pose challenge to achieving optimum coverage of NPS. Designing an effective, efficient and accessible system, which caters to the heterogeneous workforce should be priority in the success of NPS in India (See Annex 2). According to ADB survey, there is transition from family support to self-support in retirement. Therefore corrective measures are essential at an appropriate time. A major challenge in the new pension system is to provide the individual subscriber with an adequate retirement income. Public sector pension schemes involve policy risk in as much as the Government of the day may not be able to accommodate required pension outlays leading to delays in pension payment. The DC system does involve capital-market risk during the accumulations phase when contributions and returns on investment build up in the fund.

NPS architecture for Government employees has already started functioning in terms of investment of NPS corpus and the CRA started functioning from June 1, 2008. The real challenge will be in seeing that the entire system functions smoothly. In this regard, issues relating to safety and high returns, extending coverage to as many people as possible would be important. It is only when the system is made available to all citizens that its full potential will be realized in terms of economies of scale and the subscribers will gain substantially in terms of even lower fees and charges and high returns. Pension savings would provide the much needed funds for infrastructure development. NPS would provide an opportunity to every citizen to save for retirement in a regulated environment and thus help in promoting inclusive growth. In order to address the issue of investment of pension contributions under NPS through a mechanism of consensus, a conference of Chief Ministers on pension reform was held in January 2007, which was chaired by the Prime Minister. Except three state governments, all were in favour of the guidelines applicable to non-government PF prescribed by the Ministry of Finance for investing accumulations under NPS.

India has the world's youngest and fastest growing working-age population. In contrast to the rise in the median age of population in the industrialised countries from early 30s to early 40s over the last two decades, the median age in India has increased from 20 in 1980 to 24 in 2005. According to the projections made by the United Nations, the median age in India would cross 30, only by 2025 and would remain around 35 till 2040. In 2020, the average Indian will be only 29 years old, compared with the average age of 37 years in China and the US, 45 in West Europe and 48 in Japan. The demographic process would create a large labour force. However, the window of opportunity provided by a relatively large and young workforce in India needs a conducive social policy environment for getting realised. Therefore, to reap the rewards of demographic dividend, public-policy has a critical role to play. The evolving demographic characteristics, in view of the coverage of pension to the mainly to organised sector efforts need to be made in bringing the unorganised sector into purview of pension system in the coming years.

ANNEX 1
INVESTMENT REGULATIONS FOR THE NEW PENSION SYSTEM FOR THE INFORMAL SECTOR

What assets classes should be offered in NPS investment choices?

Recommendation: The simpler structure of the "E", "G", "C" investment choices is easier to understand, provides clear choices to the contributors and lowers the cost to the contributor, the regulator as well as the CRA. Thus, the Group recommend that investment choices offered in NPS be the "E", "C" , "G" asset classes.

Asset Class "E"

Given the need for prudence and simplicity in the initial stages of NPS, the Group argue that equity participation be done through a standardised portfolio across all PFMs, implemented through an index fund only (Nifty index fund). This should be approach adopted in the first stage of the NPS implementation. This can be expanded to include a wider set of alternative index funds after the first five years of the NPS to allow more choices to the fund managers to deliver better returns. As regulatory experience with NPS increases and regulatory capacity expands, NPS equity funds may even include active management of equity portfolios. This should include more sophisticated products such as derivative portfolios, hedge funds, and international investments as the capacity of both the contributor and regulator expand to accommodate these.

Asset Class "G"

All investments into asset class G assets should be either in Central Government bonds or the securities/instruments listed as follows:

1) liquid funds of mutual fund companies funds, where the AMCs satisfy the criteria of: having AMCs that are regulated by SEBI, with, average total assets under management (AUM) for the recent six-month period of , at least, Rs 5,000 crore;
2) all assets that are permitted for investment into liquid assets by SEBI. If this channel is used, the fees and expenses of the liquid fund do not become an issue;
3) fixed deposits of certain specified banks, where the banks must satisfy the following criteria: net worth of at least Rs 500 crore and a track record of profitability in the last three years; CAR of not less than 9 per cent in the last three years; net NPA of under 5 per cent as percetange of advances in the last year; be a participant in the RTGS system; the price to book ratio of the Bank must exceed 1.25;
4) NPS funds invested by any PFM in a liquid fund or FD of a bank should be under 10 per cent of the total "G" funds held by the PFM.
5) the total NPS funds invested in any single asset management company ought to be under 5 per cent of the total AUM of the AMC;

Limits on funds invested in any single FD or liquid fund should not exceed 5 per cent of the total funds invested in asset class "G".

Asset class "C"

1) all State Government bonds that are explicitly guaranteed by the state government;

2) all State Government bonds that are rated by a rating agency. There is no restriction on an acceptable minimum credit quality – the choice of investment is left up to the PFM to decide;
3) all bonds/securities of: 1. public financial institutions as specified under Section 4 (A) of the Companies Act, and 2. public sector companies as defined in Section 2 (36-A) of the Income Tax Act, 1961; the principal whereof and whereon is fully and unconditionally guaranteed by the Central Government that have credit rating;
4) all municipal bodies/infrastructure funds bonds that are rated by a credit rating agency. There is no restriction on an acceptable minimum credit quality in the case of municipal bonds as well – investment choice is left up to the PFM to decide;
5) bonds be permitted for NPS investment of all firms (including PSU/PSE) that have shares listed on a stock exchange with nationwide terminals, and: 1) have market capitalization of over Rs 5,000 crore (as on 31st March); 2) which have been traded for at least three years; 3) whose shares have an average trading frequency of at least 95 per cent for a period of the last one year on the exchange; 4) whose top management as well as the board of directors of the company have no legal/regulatory charges against them.

The stock market-based filters for selection of corporate bonds for NPS "C" asset investment also implies that the stock market indicators can be used for valuation of the "C" assets. This will be an improvement in the current valuation framework that is based on credit rating downgrade since the stock market price can be a more real-time measure of credit quality compared to the credit rating.

- Besides, exposure to any single bond of an entity should not exceed more than 5 per cent of the total funds invested by the PFM in asset class "C".
- The total exposure to bonds by any single entity should not exceed more than 10 per cent of the total funds invested by the PFM in asset class "C".
- The total credit exposure of all the NPS funds invested in the debt of any permitted entity should be limited to a concentration of less than 5 per cent of the total debt of the company.

Limits on an individual contribution in a specific asset class

Recommendation: Contributors making an active choice of NPS investment 9Class A contributors) can choose how much they wish to invest in "E", "G" and "C" asset classes. The se contributors have no limits on what fraction of their investment can go into any of the asset choices. Class A contributors have to choose their PFM. As well. NPS contributors who do not actively choose their NPS investment (Class S contributors) are invested into the "auto choice" scheme. Class S contributors do not have to choose their PFM.

The auto choice investment scheme

Recommendation: The auto choice investment is made in the form of a life cycle fund. Here, the fraction of funds invested across "E", "G" "C" are determined by eth age of the contributor. In this scheme the maximum amount permitted for investment in the "E" asset class is proposed to be set at 65 per cent of the contributions. The maximum amount permitted for investment in the "C" asset class is proposed to be set at 25 per cent of the contributions. There will be the choice of "E" and "C" investment for any auto choice contributor whose age is under 35 years.

As the contributors grow older, the amount invested in "E" and "C" start being draw down automatically to reduce the amount of risk exposure in the contribution portfolio. This will also

automatically reduce the expected return to the contributors portfolio. The risk of the portfolio becomes the lowest when the person nears retirement at age 60. The lowest risk of the portfolio is proposed to be set for an 80 per cent investment in “G” , 10 per cent in “E” and 10 per cent in “C” assets.

What are the valuation guidelines to calculate the NPS funds NAV?

Recommendation: Since the “E” class has components that are actively traded on the exchange, valuing AUM invested in “E” is not a problem. However, PFMs must have a third party valuation of the AUM in “G” and “C” investments. Given the difficulty with valuation , the Group recommend that the “G” and “C” AUM should be valued and reported to the PFRDA quarterly.

How frequently should the contributor be allowed to change investment choice, or PFM choice?

Recommendation: Contributors have to hold their choice of investment and PFM constant for the period of a year during the initial stages of NPS.

What is the framework to use for evaluating the performance of NPS PFMs?

Recommendation: If more than 605 of the NPS AUM is in “E” assets, PFRDA might consider the tracking error of the AUM invested in index funds for the different PFMs as a relative measure of their performance. Since costs of fund management is strongly related to the AUM,, it is recommended that NPS starts with a small group of PFMs.

How should the selection of the “auto choice” funds in PFM be done?

Recommendation: The auto choice funds should be split equally among all PFMs who offer to manage these funds at the cost quoted by the lowest bid in the PFM auction.

ANNEX 2
APPOINTMENT OF POINTS OF PRESENCE AND SPONSORS OF PENSION FUNDS/PENSIONS FUNDS UNDER THE NEW PENSION SYSTEM FOR ALL CITIZENS OTHER THAN GOVERNMENT EMPLOYEES COVERED UNDER THE NPS

I. The following entities have been approved by PFRDA for appointment as Sponsor(s) of Pension Fund/Pension Fund under the New Pension System for all citizens other than Government employees covered under NPS:

1) ICICI Prudential Life Insurance Company Limited
2) IDFC Asset Management Asset Management Company Limited
3) Kotak Mahindra Asset Management Company Limited
4) Reliance Capital Asset Management Company Limited
5) SBI Pension Funds Limited
6) UTI Retirement Solutions Limited

II. The following entities have been approved by PFRDA for appointment as Points of Presence (POPs) under the New Pension System for all citizens other than Government employees covered under NPS:

1) Allahabad Bank
2) Axis Bank Limited
3) Bajaj Allianz General Insurance Co Limited
4) Central Bank of India
5) Citibank N.A.
6) Computer Age Management Services Private Limited
7) ICICI Bank Limited
8) IDBI Bank Limited
9) IL&FS Securities Services Limited
10) Kotak Mahindra Bank Limited
11) LIC of India
12) Oriental Bank of Commerce
13) Reliance Capital Limited
14) State Bank of Bikaner & Jaipur
15) State Bank of Hyderabad
16) State Bank of India
17) State Bank of Indore
18) State Bank of Mysore
19) State Bank of Patiala
20) State Bank of Travancore
21) The South Indian Bank Limited
22) Union Bank of India
23) UTI Asset Management Company Limited

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MACROECONOMIC IMPLICATIONS OF PENSION REFORM OR HOW TO PAY FOR THE CRISIS

Ray Barrell,[*] Ian Hurst[*] and Simon Kirby[*]

The national debt stocks of the Euro Area countries and the UK are rising sharply as a result of the economic crisis, and equilibrium output is falling, with the capital stock contracting. Both problems could be alleviated by the rapid introduction (but slow implementation) of a policy to extend working lives. The paper analyses a delayed extension of working lives in the Euro Area and the UK. A distinction is drawn between the impacts of these changes on output (GDP) and income (GNP) in open economies with capital mobility. Increasing working lives will in equilibrium raise consumption and tax revenues and reduce pension spending. These gains by the government can be used to improve services, cut taxes or pay off debts.

1 Introduction

This paper looks at the effects of changes in retirement ages on tax rates and the national debt stock which is rising sharply as a result of the economic crisis. At the same time equilibrium output is falling because risk premia are being permanently re-evaluated and as a result of an increase in these premia the equilibrium capital stock is contracting. Both problems could be alleviated by the rapid introduction of a policy to extend working lives. Increasing working lives will, in equilibrium, raise consumption and the equilibrium capital stock. If consumers and firms were aware that they would work longer and hence have higher incomes then consumption and investment would be increased now, helping to offset the impact of the current recession. In addition tax revenues would be higher and pension spending reduced. These gains by the government can be used to improve services, cut taxes or pay off debts. We advocate the policy of paying down government debt. It is of course difficult to implement this strategy. Society could choose to have everybody work longer and this would enable governments to cut taxes. However, as individuals we have less of an incentive to choose to extend our working lives, but this act would actually require us to pay more in tax in order to contribute to the pensions of others. Even if retirement decisions are personal the state can encourage later retirement by changing the state pension age, where there is significant bunching of retirements. A coordinated increase in working lives of one effective year (18 months on the age of retirement) could increase tax revenues and lower retirement spending by enough to reduce the government deficit by 1 per cent of GDP permanently.

Analysing individual optimising decisions in relation to working lives in a macro economic context is difficult, especially as the most commonly used overlapping generations models do not easily aggregate. We discuss the implications of a change in expected life in a growing economy where people save for retirement. The supply side of the model is the most important feature structuring the outcomes of the simulations, and the next section looks at the importance of the assumption that the economy is open with mobile capital. There is a discussion of the model of the public sector, where tax receipts and government spending are described. The major focus of the paper is on the impact of extending working lives on output, incomes and saving in the UK and the

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Euro Area using NiGEM with fully forward-looking consumers. Extending productive working lives means that a lower stock of saving is needed, and in a growing economy the saving rate will therefore be reduced marginally. The implications for incomes depend in part on the rate of return on assets, and especially on foreign assets. Increasing the work force will require that capital accumulates and domestic investment as a per cent of GDP will rise for a period. In a closed economy the increase in desired capital and the fall in saving would mean the rate of return on assets would rise, whilst in a small open economy it means that the stock of net foreign assets will decumulate.

2 The modelling framework

We utilise the NiGEM model in a version that has similar long run properties to the dynamic stochastic general equilibrium models in use by institutions such as the Bank of England.[1] In this paper we focus on results from the UK and from the Euro Area country models for Germany, France, Italy, Spain, Netherlands, Belgium, Austria, Portugal, Finland and Ireland, all of which have a similar structure.[2] Output (Y) is determined in the long run by supply factors, and the economy is open and has perfect capital mobility. The production function is CES, where output depends on capital (K) and on labour services (L) which is a combination of the number of person in work and the average hours of those persons. Technical progress (tech) is assumed to be labour augmenting and independent of the policy innovations considered here:

$$Q = \alpha(\delta(K)^{-\rho} + (1-\delta)(Le^{\lambda_L tech})^{-\rho})^{-1/\rho}$$

We assume forward-looking behaviour in production and because of "time to build" issues investment depends on expected trend output four years ahead and the forward-looking user cost of capital. However, the capital stock does not adjust instantly, as there are costs involved in doing so that are represented by estimated speeds of adjustment. The equilibrium level of unemployment is the outcome of the bargaining process in the labour market, as discussed in Barrell and Dury (2003), and the speed of adjustment depends on (rational) expectations of future inflation. Financial markets follow arbitrage conditions and they are forward-looking. The exchange rate, the long rate and the equity price will all "jump" in response to news about future events. Fiscal policy involves gradually adjusting direct taxes to maintain the deficit on target, but we assume that this has no direct effect on the labour supply decision. We investigate different fiscal responses to extending working lives and spell out the impact on the budget deficit. Monetary policy involves targeting inflation with an integral control from the price level, as discussed in Barrell, Hall and Hurst (2006) and inflation settles at its target in all our simulations.

Perhaps the most important feature of the model for our discussion is that consumers react to the present discounted value of their future income streams which we may call total wealth (*TW*), although borrowing constraints may limit their consumption to their personal disposable income in the short run. Total wealth is defined as:

$$TW_t = Y_t - T_t + TW_{t+1}/((1+rr_t)(1+my_t))$$

where *TW* is real total wealth, *Y* is real income, *T* are real taxes, and the suffix *t*+1 indicates an expected variable which is discounted by the real interest rate rr_t and by the myopia premium used

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1 The Bank of England Quarterly model is discussed in Bank of England (2005). NiGEM is discussed in Barrell (2007) and Barrell *et al.* (2007) and in other papers at www.niesr.ac.uk. NiGEM does not impose maximising equilibrium conditions in the same way as DSGE models, but has the same steady state equilibrium properties.

2 Greece has a similar model, but we do not find the assumption of forward-looking consumers useful in that country. The models of Slovakia and Slovenia are smaller, and the results less interesting.

by consumers, my_t. The equation represents an infinite forward-recursion, and permanent income is the sustainable flow from this stock. Total wealth and permanent (PI) income can be linked by the stock flow relationship where γ is the rate of return on *TW*:

$$PI_t = \gamma * TW_t$$

Although consumers know their total wealth and hence their permanent income, they may not consume it all as they are either risk averse or face a probability of death (ρ) in each time period and also a probability (τ) that they will not make the transition from working to not working. If life span is uncertain, then consumers will have precautionary saving as discussed in Blanchard and Fisher (1989). If the length of working life is also uncertain then they may pay a small premium to insure themselves against early retirement. This premium falls with an increase in working lives. During their working years consumers save and then use their interest income and run down assets in retirement. The saving rate will depend, amongst other things, on the proportion of life that they expect to work, the level of consumption they prefer in retirement and on their desire to leave bequests. In a stationary economy consumption will equal permanent income. The gross stock of financial wealth will depend on the saving rate and on the number of years they expect to be retired.[3] Given that there is an optimal wealth to income ratio, *WR*, in an economy growing at a rate *g* the saving rate will be *g*WR* higher to sustain the equilibrium ratio; consumption will be lower than permanent income.

Total wealth will also change when asset prices change or when accumulation changes. Non-human wealth may rise when, for instance house prices increase, and this may raise consumption in the short term, even though real output may not have risen. We assume that consumption is determined by forward-looking behaviour in the long term, but that short term adjustment depends upon a number of factors. As Barrell and Davis (2007) show, changes in financial (*dlnNW*) and especially housing wealth (*dlnHW*) will affect consumption. Their estimates suggest that short-run impact on consumption from changes in housing wealth is five times the impact from changes in financial wealth. They also show that the adjustment to the long run equilibrium shows some inertia as well. Al-Eyd and Barrell (2005) discuss borrowing constraints, and investigate the role of changes in the number of borrowing constrained households. It is common to associate the severity of borrowing constraints with the coefficient on changes in current income (*dlnRPDI*) in the equilibrium correction equation for consumption, where *d* is the change operator and *ln* is natural log. We may write our equation for *dlnC* as:

$$dlnC_t = \lambda(lnC_{t-1} - b_0 - lnPI_{t-1}) + b_1 dlnRPDI_t + b_2 dlnNW_t + b_3 dlnHW_t$$

where the long run relationship between *lnC* and *lnPI* depends upon the equilibrium saving rate, and this relationship forms the long run attractor in an equilibrium correction relationship. We should note that permanent income, *PI*, is a forward-looking variable based on the infinite forward recursion of total wealth. The log approximation is explained in Barrell and Davis (2007).

Policy reactions are important in the determination of speeds of adjustment. Nominal short term interest rates are set in relation to a standard forward-looking feedback rule as described in Barrell, Hall and Hurst (2006). These feedback rules are known to be in place in the future and hence we can describe the path of future interest rates. Forward-looking long rates should be related to expected future short term rates:

$$(1 + LR_t) = \Pi^{T}_{j=1} \qquad (1 + SR_{t+j})^{1/T}$$

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[3] In a stationary world with no risk, no interest rates, a constant level of consumption and no bequests, the saving rate will the proportion of life in retirement (τ) and the number of years in retirement. For instance if one third of adult life is in retirement and there are 60 years of adult life then the equilibrium wealth to income ratio will be 6.666. It will be lower if interest rates are positive or desired consumption in retirement is lower than in work.

The exchange rate and the equity market are also assumed to be forward-looking, with exchange rates following the open arbitrage path and equity prices moving in line with the discounted future value of expected net of tax profits.

In order to evaluate the effects of extending working lives on the public finances we need a reasonably disaggregated description of both spending and tax receipts. We model corporate (*CTAX*) and personal (*TAX*) direct taxes and indirect taxes (*MTAX*) on spending, along with government spending on investment and on current consumption, and separately identify transfers and government interest payments. Each source of taxes has an equation applying a tax rate (*TAXR*) to a tax base (profits, personal incomes or consumption). As a default we have government spending on investment (*GI*) and consumption (*GC*) rising in line with trend output in the long run, with delayed adjustment to changes in the trend. They are re-valued in line with the consumers' expenditure deflator (*CED*). Government interest payments (*GIP*) are driven by a perpetual inventory of accumulated debts. Transfers (*TRAN*) to individual are composed of three elements, with those for the inactive of working age and the retired depending upon observed replacement rates. Spending minus receipts give us the budget deficit (*BUD*), and this flows onto the debt stock.

$$BUD = CED*(GC+GI) + TRAN + GIP - TAX - CTAX - MTAX$$

We have to consider how the government deficit (*BUD*) is financed. We allow either money (*M*) or bond finance (*DEBT*):

$$BUD = \Delta M + \Delta DEBT$$

Rearranging, that gives:

$$DEBT = DEBT_{t-1} - BUD - \Delta M$$

In all policy analyses we use a tax rule to ensure that Governments remain solvent in the long run. This ensures that the deficit and debt stock return to sustainable levels after any shock, as is discussed in Blanchard and Fisher (1989). A debt stock target can also be implemented. The tax rate equation is of the form:

$$TAXR = f(\text{target deficit ratio} - \text{actual deficit ratio})$$

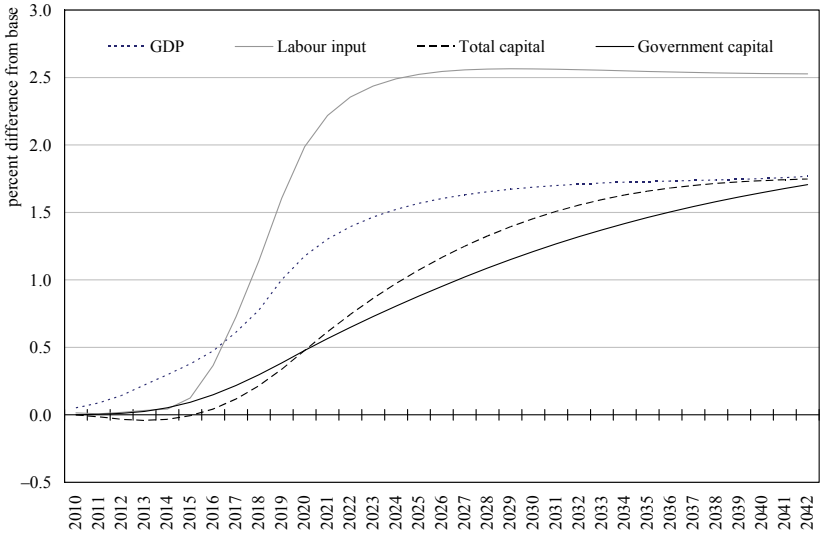
If the Government budget deficit is greater than the target, (e.g. –3 per cent of GDP and target is –1 per cent of GDP) then the income tax rate is increased. However, it is possible to turn off the tax rule and allow deficits to decline in response to increased tax revenues. However, debt stocks cannot expand or contract without bound, and hence in some analyses below we have to put a ceiling on the improvement in the deficit.

3 Extending working lives

We analyse the impact of a one year increase in effective working life in all the Euro Area countries together. Obviously, it might be wise to raise expected working lives by more, the effects of which can be extrapolated from our results. We assume that the working age population begins to increase five years after the start of the scenario and that it takes 5 years to increase the length of working lives by one year. Workers know that they will work longer and hence they need to save less now, and consumption will rise ahead of the increase in incomes. As the availability of increased labour is fully anticipated and comes through slowly in this simulation, the market adjusts and in our simulation there is little impact on the unemployment rate, which is determined by the wage bargain. Employers have enough time to raise investment in advance of the anticipated increase in labour supply so that the capital stock can grow approximately in line with employment. The business sector capital stock is assumed to be determined by the underlying production

Figure 1

Impacts of a One-year Increase in Working Lives in the Euro Area



function and hence rises in line with employment given any changes in real wages relative to the user cost of capital. If all capital did the same, then output should rise in exactly in line with labour input in the long run, as we would expect from the production function.

In Figure 1, GDP rises less than labour input in the long run, and continues adjusting. However, in the short run output rises ahead of labour input as demand increased. We also plot capital inputs, if these were to adjust more rapidly output would rise more quickly. These marginal changes could be smoothed if we assumed the government capital stock moved at the same pace as private sector capital, but we consider it useful to demonstrate the effects of budget rules. We assume that government investment rises with expected capacity output, and hence the government capital stock increases more slowly than business sector capital but eventually adjusts. All private sector investment plans are assumed to depend on capacity output anticipated for 4 years ahead as well as the forward-looking user cost of capital. As a result of these assumptions the capital stock rises less than the workforce, as we can see from Figure 1. Private sector capital rises less than employment as the increase in demand for capital, and hence the reduction in net saving, puts marginal upward pressure on long term real interest rates.

The need to finance capital inflows that go with an increased labour force require current account deficits and hence a build up of foreign liabilities. This will put a wedge between GNP and GDP and net property income from abroad will decline, as we can see from Figure 2. We could see a reduction of around 0.1 percentage points in the household saving rate of the Euro Area in the long run for every extra years working life we add. In the short term an expected (or anticipated) increase in working lives will immediately reduce the saving rate by around 0.3 percentage points. Total wealth rises as people anticipate higher future incomes and the effects are brought forward by rational optimising consumers. In the short run consumption rises ahead of incomes, as we can see in Figure 3.

4 Giving the Government options

The effects on the economy of extending working lives depend upon the assumptions made about government reaction. We consider three possible government reactions. Our main case leaves government investment and consumption rising in line with, but not ahead of trend output. Government transfers to the elderly (pensions and other social security payments) would be reduced because the number of retired people would fall relative to baseline. The scale of the

reduction would depend upon the numbers involved and the replacement ratio. Hence it is possible to cut taxes or reduce borrowing. In this scenario we allow taxes to fall in order to meet the government budget deficit target. The second case assumes taxes are kept fixed at base levels and government spending an investment rise with GDP. The failure to cut taxes allows the deficit to be reduced. Our third case keeps government investment and consumption at their baseline trajectory with tax rates fixed, at least initially, allowing more debt to be paid off with the increased revenue from higher incomes along with the reduction in spending. Once the improvement in the deficit reaches one per cent of GDP taxes are allowed to fall and the deficit improvement stays at that level. Figure 4 plots possible paths for direct taxes.

If tax rates are fixed but spending rises then the government deficit will be reduced by around 0.4 per cent of Euro Area GDP, as we can see from Figure 5. The government debt stock falls, and after 30 years the debt stock will have fallen by 6 per cent of (the value in 2043 of) GDP. With spending and

Figure 2

Current Account Effect of a One-year Increase in Working Lives in the Euro Area

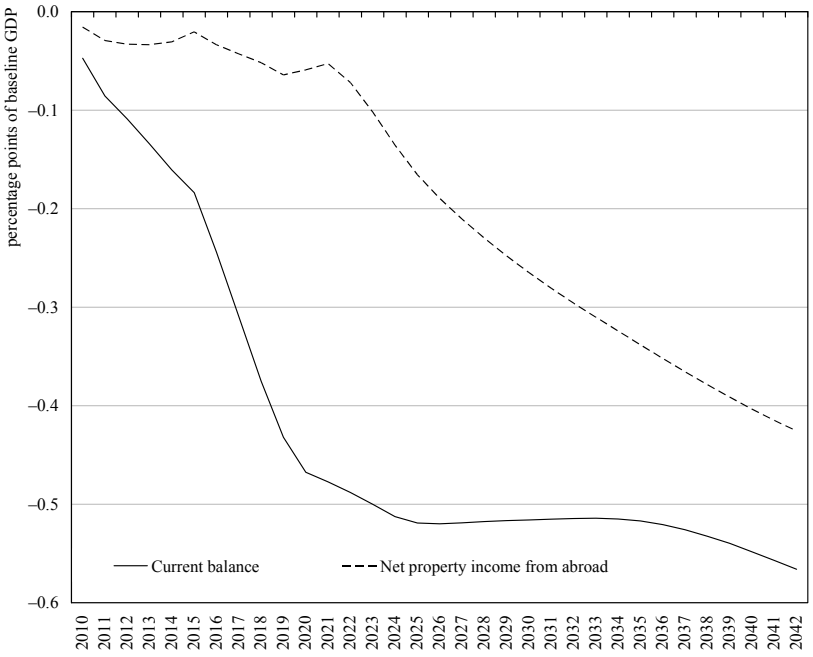


Figure 3

Impacts of a One-year Increase in Working Lives on Consumption

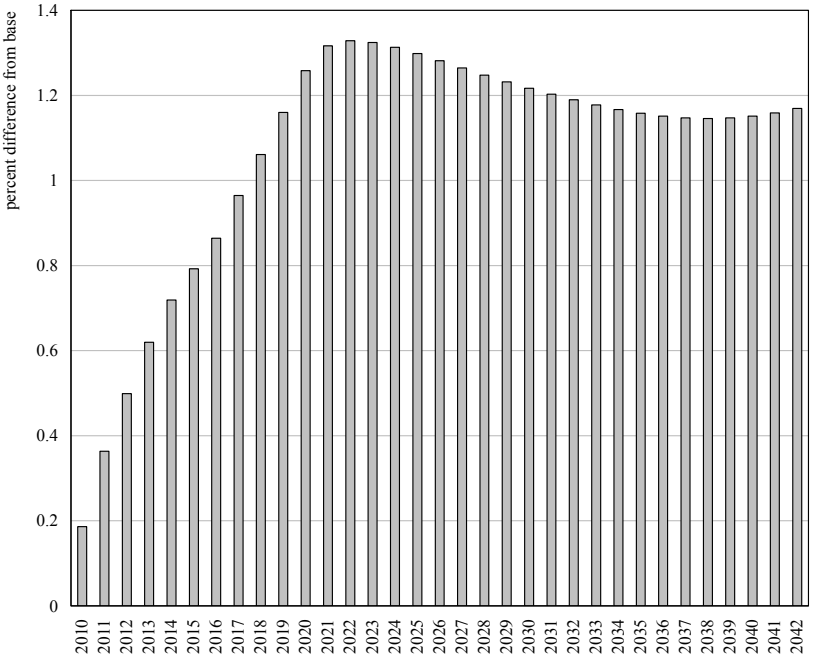


Figure 4

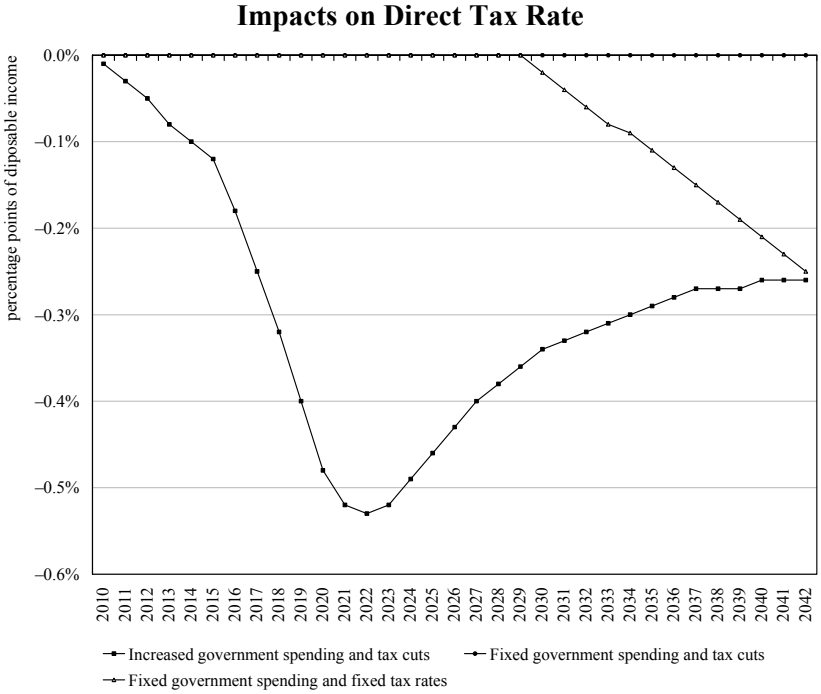
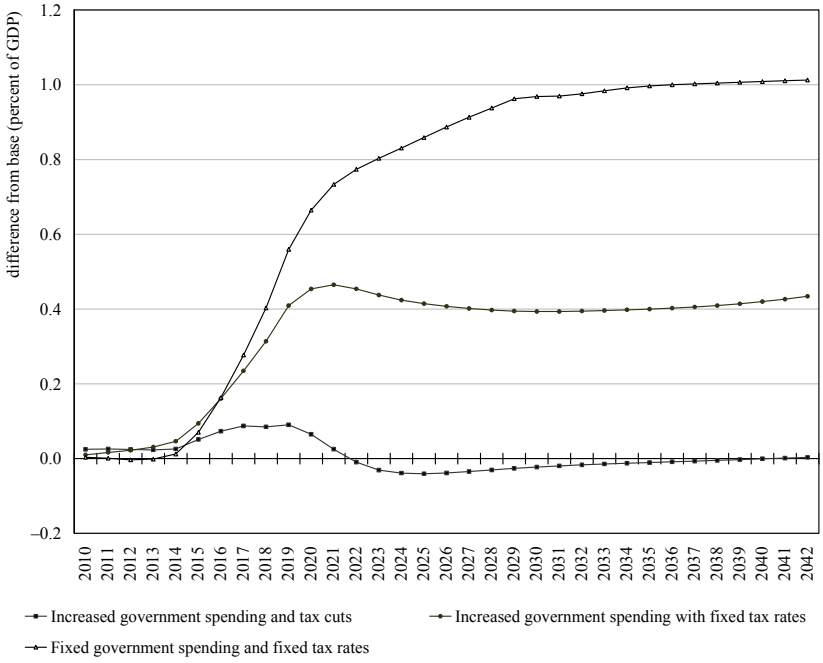


Figure 5



investment fixed, the budget deficit improves by 1 per cent of GDP after 20 years and stays higher in part because we impose the target at this level in all countries once the begin to reach it. Hence taxes are cut in order to ensure the budget deficit is kept different from base by a constant one per cent of GDP. As a result the government debt stock falls more rapidly and after 30 years it is 14 per cent of GDP lower. The choices available to the government are clear. Extending working lives can be absorbed into lower taxes, or it can finance higher spending, or it can be utilised to pay off the government debt accumulated in the recession.

5 Modelling Europe

NiGEM has a model of each of the 12 main European countries, and each has a complete supply side and rational expectations. The forward projection of population depends on Eurostat data both for the total population and the breakdown into the population of working age, the retired and those below working age. In each country government transfers to individuals depend on three factors:

*Transfers = a*ytrend + inactive*replacement rate + pensioners*pension replacement rate*

where *ytrend* is capacity output in nominal terms since transfers are also nominal.

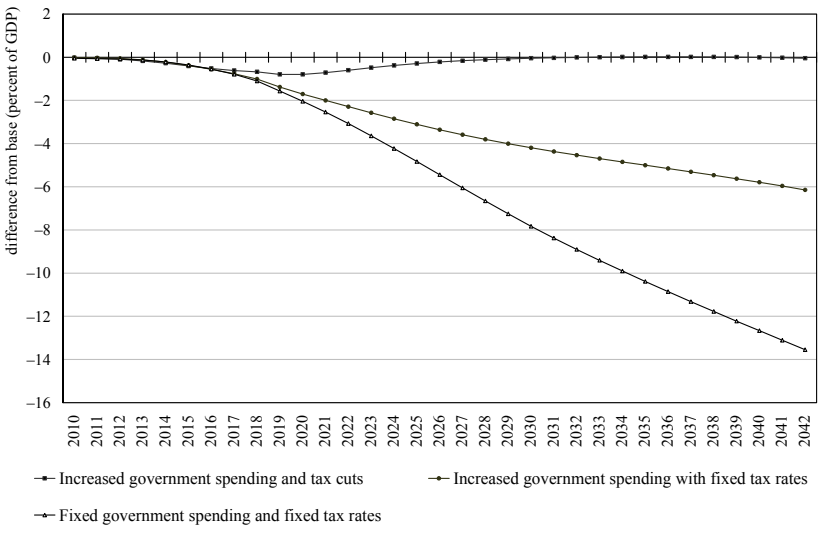
The replacement ratios are uprated with trend output in nominal terms. As a result of the uprating rule and the increase in the dependent population transfers rise as a share of GDP, and taxes rise to finance this in order that governments are solvent. If the retirement age is raised then transfers for pensions are reduced but initially unemployment rises, and the net effect on government spending depends on the two replacement ratios. We assume that over the first five years of the scenario working lives are raised progressively to be 2½ per cent longer than on the baseline. This is equivalent to an additional year of working life. The increase in the workforce is relatively quickly absorbed, and output rises in all cases.

The impact on interest rates in the rest of the world depends in large part on the projected change in the current account, and in the first case we can expect it to deteriorate. Figure 7 plots the output effects, whilst Figure 8 plots the impact on long term real interest rates in the steady state. We report numbers for the Euro Area, but similar changes take place in the US and the UK because the model allows for complete capital mobility and world real interest rates change approximately together. In Barrell, Hurst and Kirby (2009) we discuss similar policy initiatives in the UK, which is a small open economy, and hence global real interest rates are little affected. However, the Euro Area, like the US is not a small open economy, but a large one, and when it changes its saving and investment balance would real interest rates will change. If the increase in working lives were to be associated with higher government spending and lower taxes, and hence a similar government budget deficit, then world real interest rates would rise. Saving in the Euro Area would fall and the demand for capital would rise, and the market would have to find a new equilibrium. The larger the share of increased income that is used to pay down debt, the smaller is the increase (or larger the fall) in steady state real interest rates.

In each country we have details on the effects on output and direct tax rates, and these are plotted in Figures 9 and 10 for the base case where spending rises and the budget deficit is fixed, and hence taxes are cut. The increases in labour input are similar across countries in the long run but in the short run depend on how quickly labour markets adjust to increased labour input. The more forward-looking the wage bargain, the faster the increase in the supply of labour is absorbed. The effects on output vary more across countries, especially in the short run, where the dynamics of the trade equations will also have an impact. In the long run the effects depend mainly on the parameters of the production function (and the impact on the user cost which feeds into the production function).

Figure 6

Debts after Extending Working Lives



The effects on tax rates will depend in the

Figure 7

European GDP

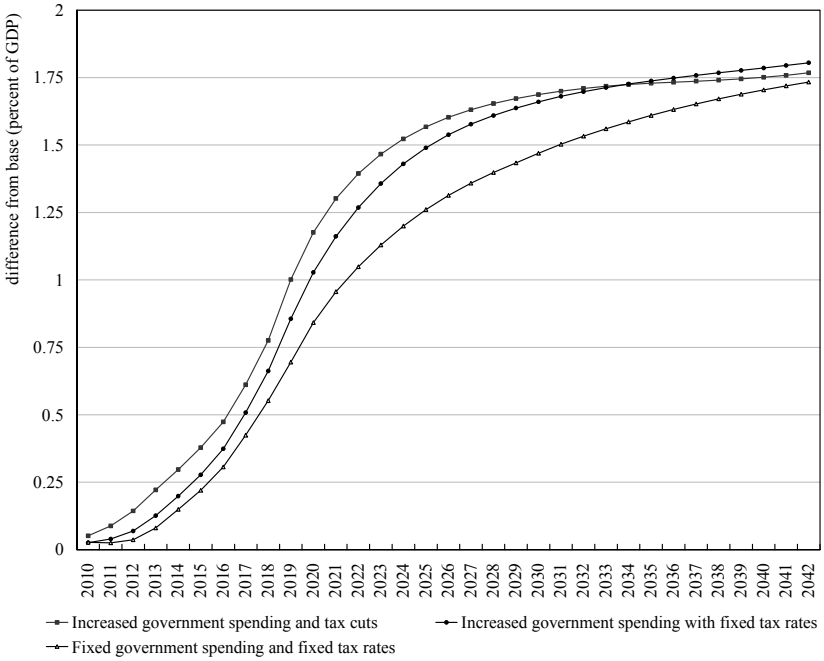
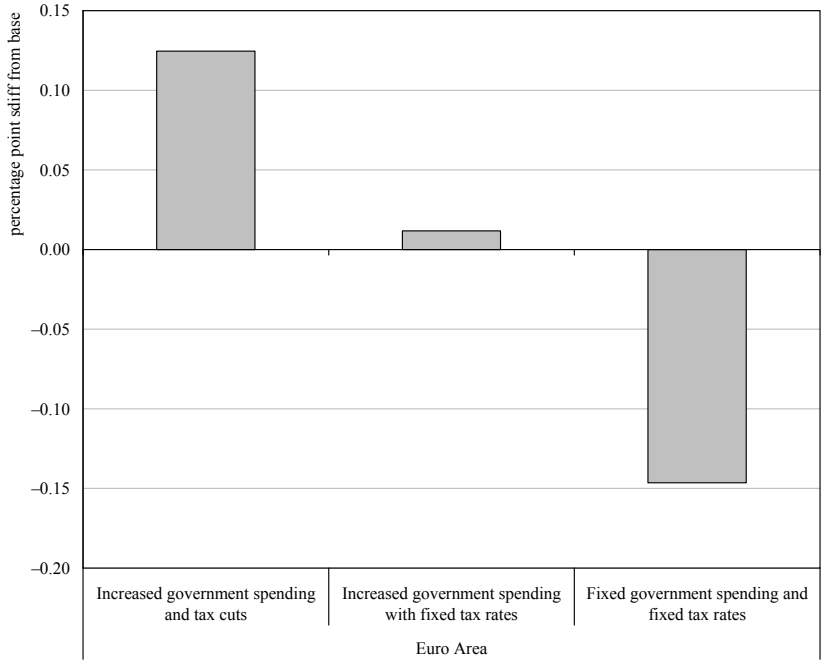


Figure 8

Changes in Real Interest Rates in the Euro Area



long run on the generosity of the state in the amount of transfers to households in relation to average incomes. The effects are least in the less generous countries such as Italy, but also in Germany. There is a correlation of –0.38 between our estimates of replacement ratios and the impact on tax rates, with higher ratios giving larger negative tax cuts. The short run effects depend on the relative generosity of state aid to the unemployed as an increase in the labour force might take a short while to absorb into increased employment. The speed of absorption of the retained workers depends on the degree of labour market flexibility. A shift to a more flexible labour market should increase the speed of adjustment.

6 Conclusion

It is widely acknowledged that the many countries have a shortfall of savings and an accumulation of government debt. The natural consequence is a shortfall in the resources available to cover retirement incomes. Extending working lives can be used to address this issue. Fewer assets are needed in order to provide an income stream over retirement

Table 1

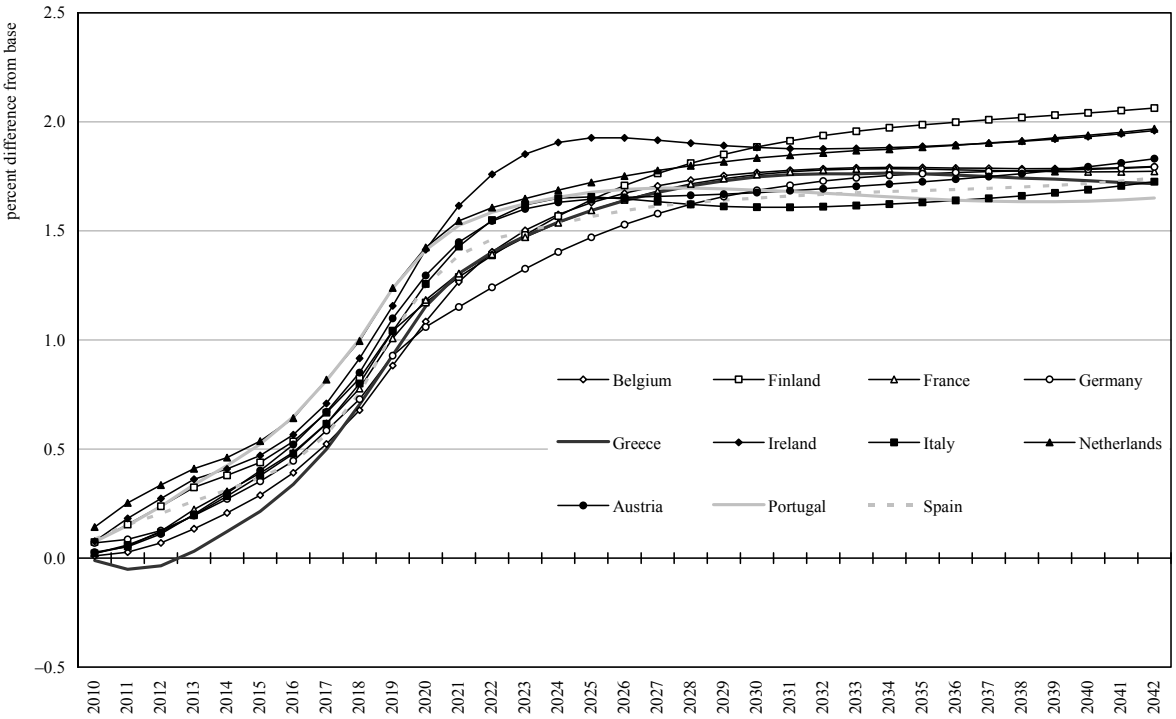
Replacement Rates and Tax Changes with Extended Working Lives

	Belgium	Finland	France	Germany	Greece	Ireland	Italy	Neths	Austria	Portugal	Spain
Replacement rate	0.119	0.138	0.167	0.152	0.1225	0.1032	0.1621	0.076	0.245	0.1861	0.1391
Change in direct tax rate											
Fixed spending	–0.0075	–0.016	–0.0127	–0.0084	–0.0092	–0.0104	–0.0118	–0.0087	–0.0105	–0.0175	–0.0115
Increased spending	–0.002	–0.0095	–0.0061	–0.003	–0.0038	–0.0063	–0.0066	–0.0019	–0.0063	–0.0098	–0.005

Source: Eurostat social spending data, NiGEM simulations.

Figure 9

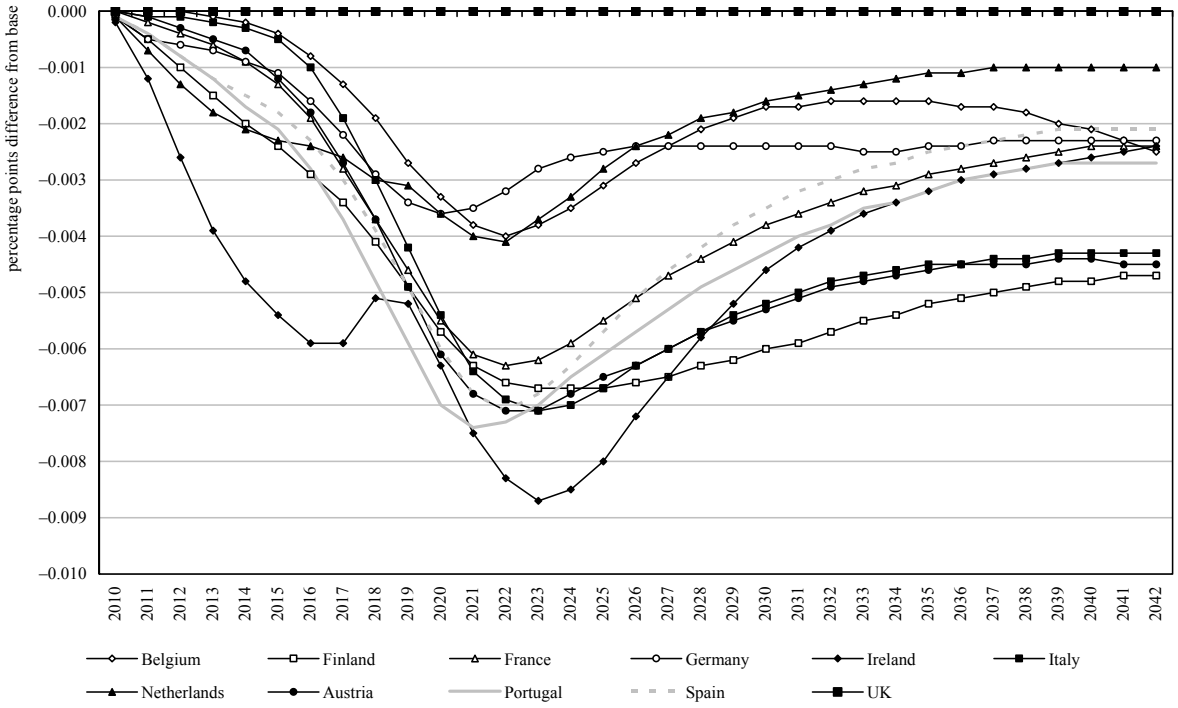
GDP across Countries with Extended Working Lives



reducing the necessary level of saving. Extending working lives gives governments a number of options for taxes and spending. It reduces transfer payments to pensioners without need to reduce their generosity, a policy option which may be politically easier than the alternatives of reducing the generosity of state contributions or raising taxes on the employed. It also increases tax revenues through increased incomes and consumption. These increased net revenues can be used to actually reduce the tax burden, increase spending or both together. It is also possible they could be used to pay down the national debt. Increased working lives raises output and hence the demand for capital to accompany more workers. Forward-looking consumers will adjust both their consumption patterns and their saving at the same time, with those who anticipate working longer increasing their consumption well before they approach retirement. The increase in consumption comes from

Figure 10

Tax Rates across Countries with Extended Working Lives



both increased output and a reduced the need to save for retirement. In a small open economy increasing working lives reduces net saving and hence reduces the current account surplus and foreign assets de-cumulate. In a large open economy such as Europe, an increase in the demand for capital and a reduction in saving will impact on the price of saving – the steady state real interest rate. Extending working lives in Europe by one year could raise the steady state real interest rate by 0.1 percentage points.

Increasing spending and cutting taxes are not the only options available to governments. If tax rates and spending plans were kept constant but working lives were to increase by one year then European general government budget deficits would, on average, improve by 1 per cent of GDP after 15 years. If this were maintained, in around 30 years national debt would be reduced by the equivalent of 16-20 per cent of GDP. Given the enormous increase in government debt induced by the banking crisis and the subsequent severe global recession policy options to reverse this accumulation of government debt need to be implemented. Extending working lives is a practical and feasible solution to this issue. We argue that the extension of working lives by 2 years in Europe would be enough to pay off government debt equivalent to around 40 per cent of GDP, which is what we expect the current crisis to have cost. If government debt were to be run down real interest rates would not rise by as much as we suggest. This is the case even if consumers are forward-looking, since they use a higher discount factor in their decision making than that observed in bond markets. This condition alone is enough to ensure "Ricardian equivalence" does not hold.

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POVERTY AND INCOME OF OLDER PEOPLE IN OECD COUNTRIES

Asghar Zaidi[*]

1 Introduction

Two considerations impinge on the issue of what constitutes adequacy of pension income. How does the income of the current generation of older people fare in comparison to that of the current generation of working age population? And, how do older people fare in retirement in comparison to their living standards during working lives? Regarding the former consideration, two indicators that can be reliably measured are used in this paper: *relative poverty* and *relative income* of older people. For the latter consideration, the indicators of prospective replacement rates of workers who enter into labour force during 2004 are derived using micro-simulation analysis, and they are presented and analysed in detail elsewhere (see, e.g., Martin and Whitehouse, 2008; Queisser and Whitehouse, 2007).

The other critical issue is what constitutes poverty? For the purpose of international comparisons across developed countries, poverty is almost always a relative concept. A widely accepted measurement approach is to use household income as the measure of well-being, to "equivalise" household income for differences in household size and define the poverty threshold as one-half of national median household income. This approach is adopted in OECD's recent report on poverty and inequality *Growing Unequal?* (OECD, 2008). Under this approach, people are considered poor if they live in households whose equivalised disposable income is less than 50 per cent of the national median disposable income.

For the purpose of a good interpretation of results presented in this paper, two important implications of the measurement approach need to be kept in mind:

- poverty thresholds in use are country-specific as they use the national median income as its basis. Thus, the purchasing power of these poverty lines differs across countries, with the implication that some poor persons will be better off in one country than some non-poor persons in another country;
- poverty rates among older people for some countries will be high because the income of their working age populations have observed an unprecedented growth in the recent past. This situation arises in particular for Ireland and Spain in the recent past.

The Annex provides further discussion on the measurement methods used, their strengths and limitations, and differences in the poverty thresholds across countries. These issues are discussed at a greater length in Zaidi (2008).

The paper makes use of data available in the OECD Income Distribution Database – itself the basis of OECD (2008). The discussion below is presented in five parts. *First*, results on patterns of poverty among older people are analysed. *Second*, income of older people, levels relative to the rest of the population and its composition, are analysed. *Third*, the distributional role of public pension benefits and taxes is investigated. *Fourth*, the analysis included explores the impact of

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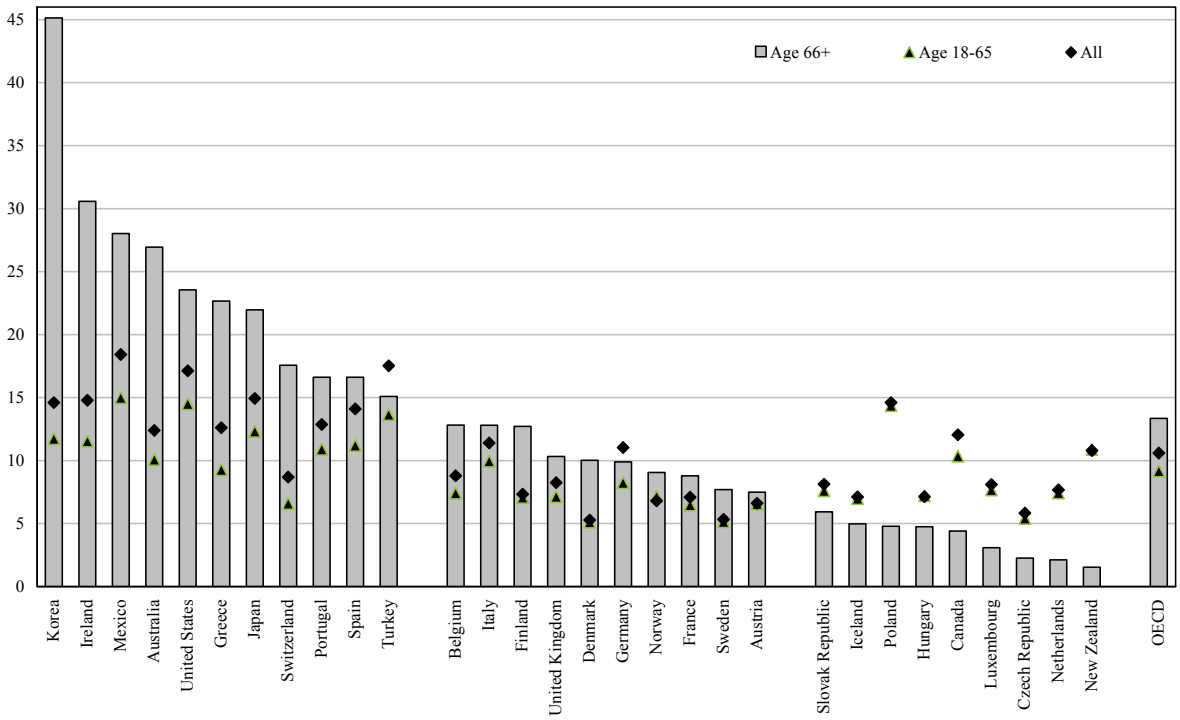
The views expressed in the paper are those of the author, and neither the OECD nor the other organisations with which the author is affiliated carry any responsibility with regard to data used and interpretations made. The author takes full responsibility for any remaining errors and omissions.

Figure 1

Poverty Rates among People of Retirement Age, Working Age and the Total Population, Mid-2000s



Note: Poverty rates are defined as the proportion of individuals with disposable income less than 50 per cent of the national median. Countries are ranked, from left to right, in increasing order of income poverty rates of people of retirement age. The income concept used is that of household disposable income adjusted for household size.
Source: Computations from OECD Income Distribution Questionnaire.

recent pension reforms on the future value of pension entitlements. *Finally*, some recommendations are made in view of conclusions drawn from this paper.

2 Patterns of poverty among older people in OECD countries

2.1 Key findings on older people poverty

Using the definitions mentioned above, results for the years around 2005 show that about 13 per cent of all older people in OECD countries are counted as "poor". In the context of this study, an older person is someone who is aged 66 or more, for the fact that these people have reached the most usual statutory retirement age of 65 as observed across many OECD countries.

Figure 1 highlights the variations observed across countries. Results are brought together so as to allow the poverty rates for three population groups – older people, working age people and the overall population – to be presented and contrasted. The country-by-country variations observed are broadly captured by the following three groupings of countries:

- *low poverty rates (<6 per cent):* Nine countries fall in this category: the Slovak Republic, Iceland, Poland, Hungary, Canada, Luxembourg, the Czech Republic, the Netherlands and New Zealand;

- *lower-than-average poverty rates (between 7-13 per cent):* Ten other countries show older person poverty rates lower than the OECD average of 13.3 per cent: Belgium, Italy, Finland, the United Kingdom, Denmark, Germany, Norway, France, Sweden and Austria;
- *higher-than-average poverty rates (>15 per cent):* This cluster of countries has 11 countries, with Korea standing out among the OECD countries with the highest poverty rate for older people (45 per cent). Other countries with a higher-than-average poverty rate for older people are Ireland (30.6 per cent), Mexico (28 per cent), Australia (26.9 per cent), the United States (23.6 per cent), Greece (22.7 per cent), Japan (22 per cent), Switzerland (17.6 per cent), Portugal (16.6 per cent), Spain (16.6 per cent) and Turkey (15.1 per cent).

In countries with higher-than-average poverty rates among older people, the corresponding rates for the working age population (age 18-65) are considerably lower. For example, working age poverty rates in Korea, Ireland, Australia, Greece and Switzerland are less than half of poverty rates observed for older people. In contrast, in countries where older people poverty rates are low, the poverty rates for working age people are generally higher. This result is observed in particular for Poland and New Zealand. Among many of the countries with high poverty rates for older persons, a gap of notable magnitude is observed in the poverty rates between these two age groups. The differential is highest in Korea, in excess of 30 percentage points, followed by five other countries (Ireland, Australia, Greece, Mexico and Switzerland) where it is in excess of 10 percentage points.

Other perspectives on the profile of older people poverty are dealt with by the data available in the OECD Income Distribution Survey, and the following analytical questions are relevant:

- how do poverty rates differ across older men and women?
- how do the younger cohorts of older persons (aged 66-74) fare in comparison to the oldest cohorts (75 or more)?
- what is the impact on the poverty rate for older households with someone in the household working?
- how do different living arrangements of older households, specifically living as a single person or a couple, affect poverty rates?
- what are the underlying trends in the poverty rate for older persons?

These issues are addressed in more detail in the rest of this section.

2.2 The gender dimension

The different experiences of poverty for older men and women are captured by Figures 2a and 2b. The following patterns emerge from these results:

- older women in general have a much higher poverty rate compared to older men. On average, older women have a poverty rate of about 15 per cent as compared to older men poverty rate of about 10 per cent (see Figure 2a). The exception to this result is observed only in four countries with low overall poverty rates for older persons (New Zealand, the Netherlands, Luxembourg, and Iceland);
- the above result is all the more striking when they are compared with the corresponding poverty rates for the equivalent working age cohorts. Female poverty rates are in most cases broadly equivalent with those of the males (see Figure 2b). Obviously, the two groups of men and women belong to different generations, but it also reflects the fact that the relative risk of poverty for older women increases in their old age.

Partly mirroring the above results is the fact that the oldest age cohorts, aged 75+, have a higher poverty rate than those aged 65-74. This is principally because women dominate the oldest

Figure 2a

Poverty Rates across Men and Women of Retirement Age, Mid-2000s

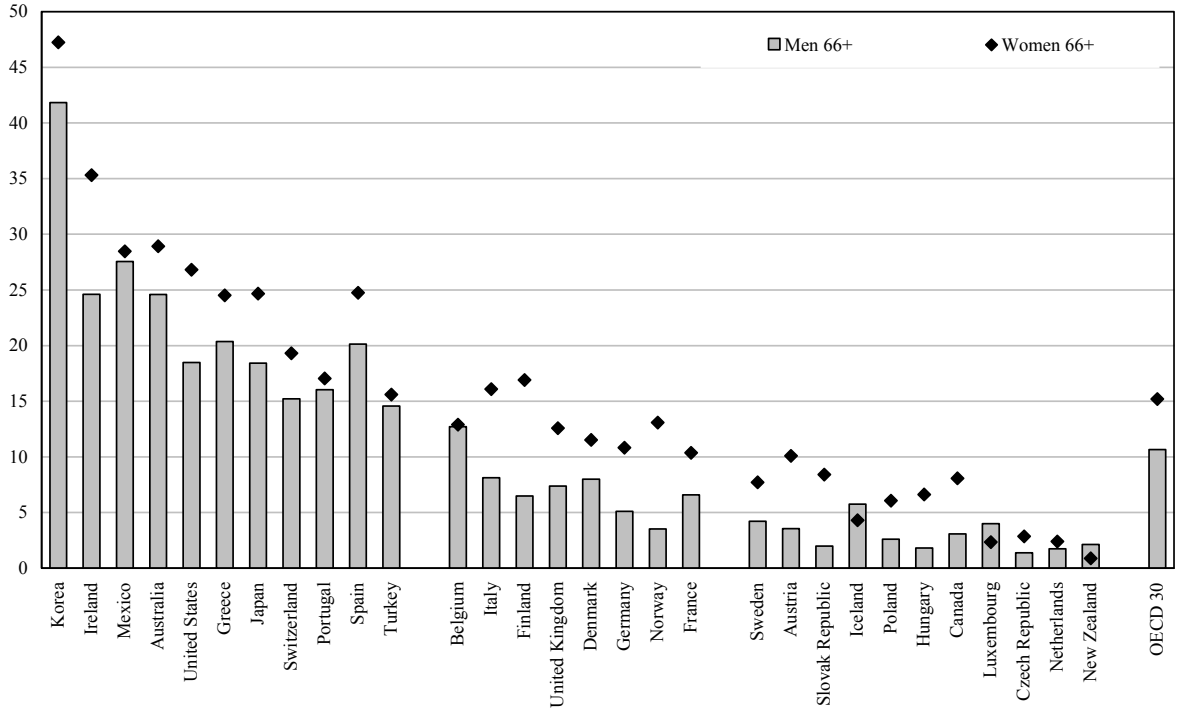
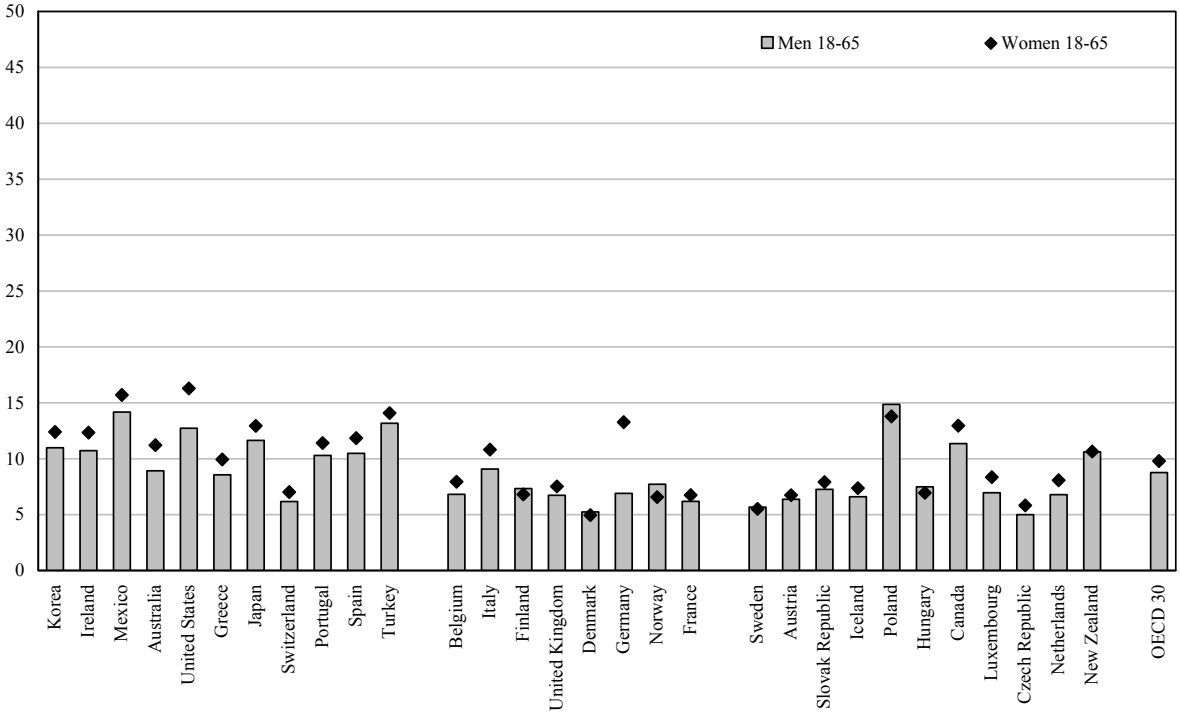


Figure 2b

Poverty Rates across Men and Women of Working Age, Mid-2000s



age cohort, as – on average – women live longer than men. Another compositional effect, contrasting in nature, arises because richer people tend to live longer than poorer people.[1]

Further analysis between older men and women within each of the two age cohorts draws attention to the result that older women in the age group of 75+ stand out as the poorest subgroup (see Figure 3a and 3b). On average, almost 18 per cent of all women aged 75+ have a risk of falling in poverty. In the majority of countries with higher-than-average poverty rates for older persons, the risk for poverty for the oldest women cohort is strikingly high (in excess of 25 per cent).

2.3 The impact of earnings and living arrangements on older people poverty

Many OECD countries now offer pension income bonuses to those who delay their retirement and continue to work beyond the statutory retirement age. Although the opportunities of older people to adjust their labour supply behaviour may be restricted for the reasons of seniority wages and employers' age discrimination (see OECD 2006), it is nonetheless useful to analyse how the poverty risk of older people is affected when they are able to work beyond the retirement age.

The living arrangements dimension of households is also an important dimension in determining income. Couple households benefit from pooling and sharing their pension income resources and also enjoy economies of scale. However, their lives are affected by events common to old age, such as widowhood, and this has a detrimental impact on income, which varies across countries depending upon the systems of social insurance and social assistance provision. Thus, it is of importance to analyse how households with different living arrangements fare in terms of risks of poverty in old age.

In many OECD countries, the effective retirement age has been rising (approximating one year for women and almost half year for men during the decade ending in 2007). Nevertheless, at 27 per cent, the share of elderly people who work (or live with persons who work) has remained remarkably stable over the past ten years. Where members of such older households continue to work, the poverty rates are much lower. On average, across the OECD, poverty rate is 7 per cent when someone in older households works as opposed to 17 per cent for others (see Table 1). The decrease in poverty due to the working status a household member is most noticeable in Australia, France, Germany, Greece, Ireland, Italy, Norway, Portugal and the United Kingdom. The effect on the poverty rate is lower in Austria, Finland, the Netherlands, New Zealand and Poland. Turkey offers the only exception where non-working older households have lower poverty rates than working ones.

Different living arrangements also affect the poverty rates of older people. Two broad categories are covered here: (a) older persons living alone as single persons, and (b) older persons living as a couple. Older persons living alone – very often widowed women – face a much higher risk of falling into poverty than older persons living as a couple (see Table 1). However, during the decade spanning the mid-1990s and mid-2000s, in many OECD countries the poverty rates for single elderly persons have declined more than the equivalent rates for older couples. This decline in the poverty rates for single elderly persons is most notable in the Czech Republic (–19.1 percentage points), followed by Norway (–13.8) and Austria (–11.6). A contrasting result is obtained for seven countries, in particular for Spain and Finland where poverty rates for the single elderly persons increased considerably during the same period, by 32.7 and 12.5 percentage points respectively.

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[1] See Whitehouse and Zaidi (2008) for a survey of the literature and new evidence on socio-economic differences in mortality of older people in Germany, the United Kingdom and the United States.

Figure 3a

Poverty Rates among Men and Women for the Age Group 66-74, Mid-2000s

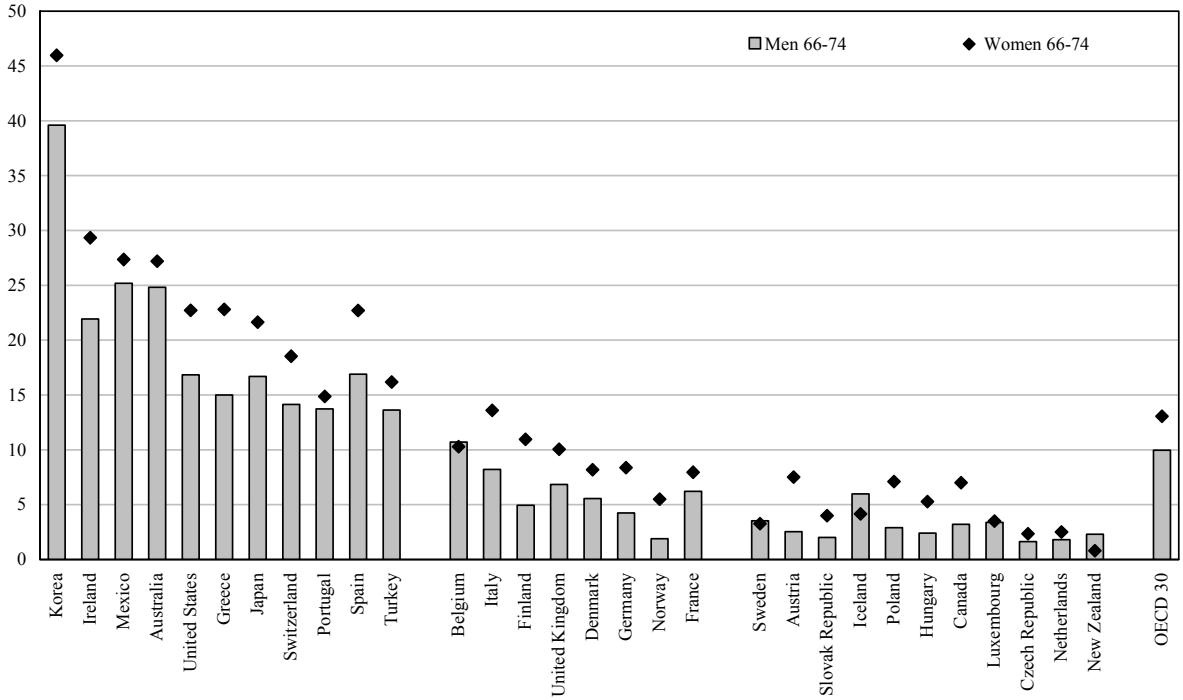


Figure 3b

Poverty Rates among Men and Women for the Age Group 75 and over, Mid-2000s

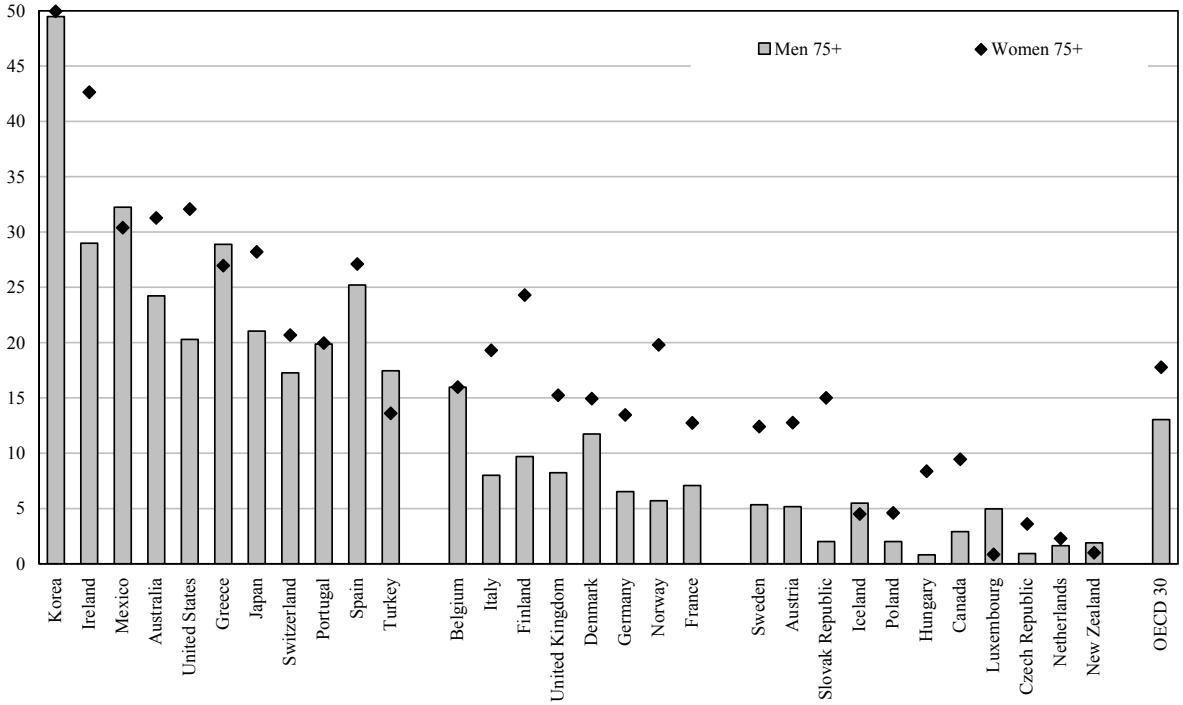


Table 1

Poverty among People of Retirement Age and in Households with a Head of Retirement Age, Subdivided by Working Status of Members and by Household Type, Mid-2000s and Point Change since Mid-1990s

Country	Poverty Among People of Retirement Age		Poverty in Households with a Head of Retirement Age									
			All		Working		Not Working		Singles		Couples	
	Mid-2000s	Point Changes since mid-1990s	Mid-2000s	Point Change since mid-1990s	Mid-2000s	Point Change since mid-1990s	Mid-2000s	Point Change since mid-1990s	Mid-2000s	Point Change since mid-1990s	Mid-2000s	Point Change since mid-1990s
Australia	27	4.6	27	5.6	4	3.2	32	5.4	50	–4.8	18	9.8
Austria	7	–5.7	8	–6.0	7	5.3	9	–7.6	16	–11.6	4	0.2
Belgium	13	–3.5	12	–2.3	4	–0.6	13	–3.7	17	–6.8	10	0.1
Canada	4	1.5	7	3.2	2	0.7	10	4.8	16	7.3	4	1.8
Czech Republic	2	–6.5	3	–5.8	[..]	[..]	3	–6.2	6	–19.1	2	0.5
Denmark	10	–2.1	10	–2.2	2	0.6	12	–2.3	17	–4.4	4	0.3
Finland	13	5.3	14	5.9	11	7.7	14	5.5	28	12.5	4	2.3
France	9	–3.0	9	–2.1	1	–5.9	9	–1.4	16	0.2	4	–2.4
Germany	10	–0.6	8	–1.6	2	–4.7	9	–1.2	15	0.2	5	–1.8
Greece	23	–6.6	21	–7.0	7	–10.5	31	–3.1	34	–4.5	18	–7.1
Hungary	5	–2.5	5	–2.9	[..]	[..]	5	–5.2	11	–6.9	1	–2.7
Iceland	5	..	5	..	3	..	7	..	10	..	2	..
Ireland	31	18.8	25	..	5	..	36	..	65	..	9	..
Italy	13	–2.3	13	–2.1	3	0.4	17	–4.5	25	–7.5	9	–1.2
Japan	22	–1.0	21	–1.1	13	–1.8	30	–7.6	48	–7.9	17	–1.5
Korea	45	..	49	..	35	..	69	..	77	..	41	..
Luxembourg	3	–1.8	3	–1.6	[..]	[..]	4	–5.4	4	–5.6	3	–6.4
Mexico	28	–4.6	23	–8.6	19	–9.1	39	–7.9	45	–5.9	21	–9.2
Netherlands	2	0.9	2	0.8	2	1.1	2	0.7	3	–0.1	2	1.3
New Zealand	2	0.2	4	2.5	1	–3.8	2	1.6	3	2.1	1	–0.1
Norway	9	–6.8	9	–7.1	1	–1.1	10	–7.9	20	–13.8	1	–2.1
Poland	5	..	6	..	6	..	6	..	6	..	6	..
Portugal	17	–1.1	20	–2.2	5	–4.6	25	–1.0	35	–4.8	16	–2.0
Slovak Republic	6	..	4	..	[..]	[..]	7	..	10	..	3	..
Spain	17	–1.1	27	16.8	12	–4.3	32	23.3	39	32.7	24	12.6
Sweden	8	4	6	2.7	3	1.1	7	3.2	13	5.8	1	0.5
Switzerland	18	4.3	18	–1.8	[..]	[..]	[..]	[..]	24	6.1	15	3.4
Turkey	15	–8.1	18	–4.1	20	0.6	16	–16.4	38	–6.2	17	–4.0
United Kingdom	10	–2.1	10	–0.8	1	0.1	12	–2.5	17	–0.9	7	–1.3
United States	24	2.9	24	3.2	9	1.4	34	5	41	3	17	3.2
OECD	13	–0.7	14	–0.7	7	–1.2	17	–1.4	25	–1.6	9	–0.4

Note: Poverty definition is the same as described for Figure 1. Data for mid-2000s refer to around 2000 for Japan and Switzerland. Data for changes refer to the period from the mid-1990s to around 2000 for Austria, Belgium, Czech Republic, Denmark, France, Ireland, Portugal and Spain (where 2005 data, based on EU-SILC, are not comparable with those for earlier years).
[..] indicates that the sample size is too small.
Source: OECD (2008).

Poverty differences between single elderly persons and elderly couples are most notable in Ireland: a full 56 percentage points separates the poverty experience of single elderly persons and elderly couples. Korea, Australia, and Japan show a poverty differential in excess of 30 points. Mexico, the United States, Finland, Turkey, Portugal and Norway had differences in the 19-24 point range. Note that the above countries are generally those with higher-than-average poverty rate for older people (see Section 2.1 above). In contrast, countries with relatively low levels of overall poverty rate for older people show smaller differences in the poverty rates for single elderly persons and elderly couples. This is observed particularly in Poland, the Netherlands and Luxembourg.

2.4 Trends in older people poverty

The rate of poverty increase or decrease for older persons over time clearly adds important detail to the body of knowledge on the poverty risk of older persons. The OECD Income Distribution Database provides information on longer term trends (since the mid-1970s) for seven countries: Canada, Finland, Greece, the Netherlands, Sweden, the United Kingdom and the United States. Results for other 23 OECD countries are available for a somewhat shorter period: since mid-1980s.

There is a growing body of evidence that suggests that older people poverty rates in OECD countries contrast favourably with those for younger age groups. This result is summarised in Figure 4, which provides poverty rates for seven age groups (from the age group "below 18" to the age group "above 75") as a proportion of the poverty rate for the entire population. These results provided for time periods for which data are available.

- On average – across the 23 OECD countries covered by the left-hand panel of Figure 4 – the poverty rates of people aged 75 and over has fallen from a level almost twice as high as that of the population average in the mid-1980s to 1.5 times by the mid-2000s. For people aged 66 to 74 this risk is now lower than for children and young adults.
- Results for a smaller number of OECD countries, as shown by the right-hand panel of Figure 4, indicate that the reduction of relative poverty rates for elderly people is even larger when looking at changes since the mid-1970s.
- In general, poverty rates for all age groups above 50 have declined, while those for people below that age have risen. By mid-2000s, children and young adults had poverty rates about 25 per cent above the population average, while they were close to and below that average, respectively, 20 years ago.[2]

Figure 5 highlights the differences across country experiences for trends in poverty rates for older persons during two periods: between mid-1980s and mid-1990s (the left panel) and between mid-1990s and mid-2000s (the centre panel). The findings can be summarised as:

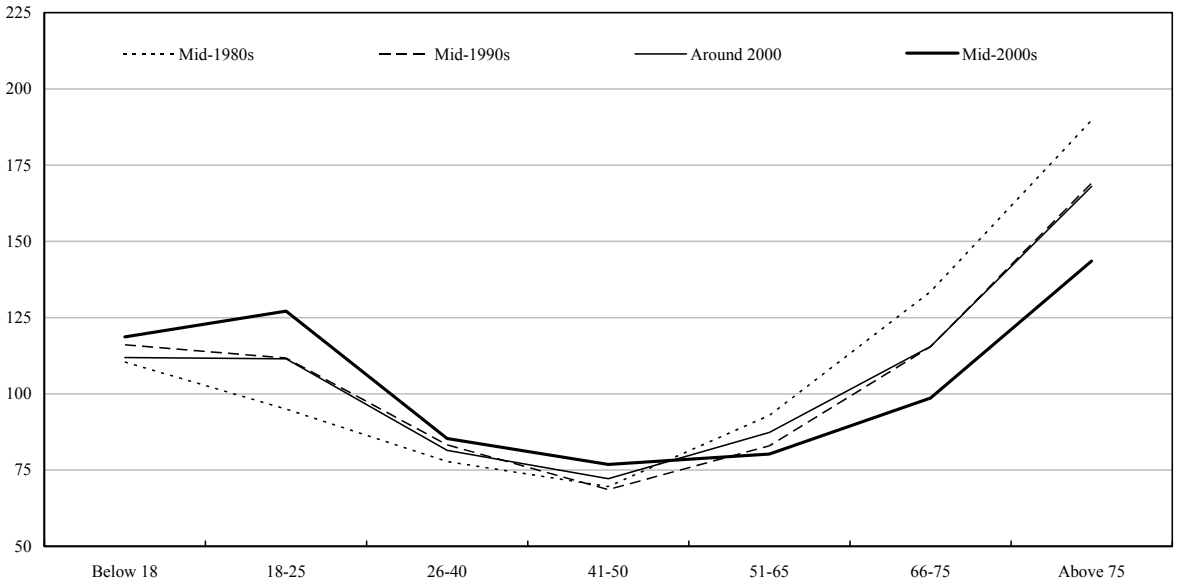
- from the mid-1980s to the mid-1990s, the un-weighted average of older people poverty rates across 24 OECD countries decreased by 0.2 percentage points. Canada, Denmark and Luxembourg observed larger decreases in poverty (5-8 points), while in Ireland and Mexico older people poverty rates increased by 10.9 and 4.6 points respectively;
- in the decade from the mid-1990s to the mid-2000s, poverty rates for older people decreased again in a majority of countries, with the average rate across 24 OECD countries declined again by 0.7 points. In six countries – Austria, the Czech Republic, Greece, Mexico, Norway and

[2] In some countries, however, the opposite pattern prevails. In particular, the poverty rate of children and/or young adults fell during the most recent decade in Australia, Spain and the United States while that of elderly people increased.

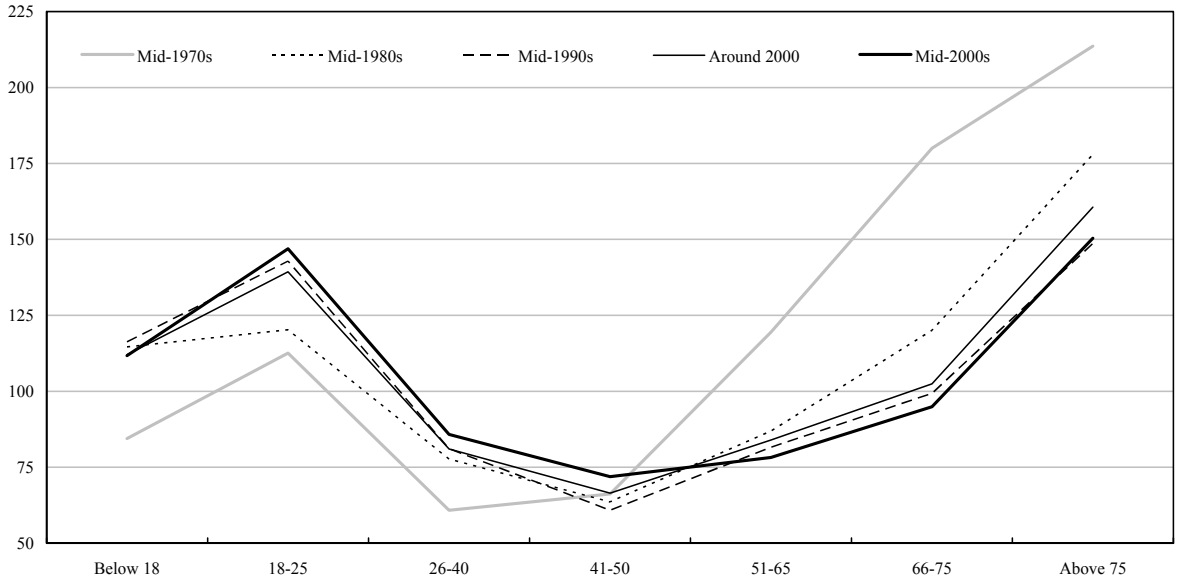
Figure 4

Risk of Relative Poverty by Age of Individuals, Mid-1970s to Mid-2000s, OECD Average
(poverty rate of the entire population in each year = 100)

23 OECD Countries



7 OECD Countries

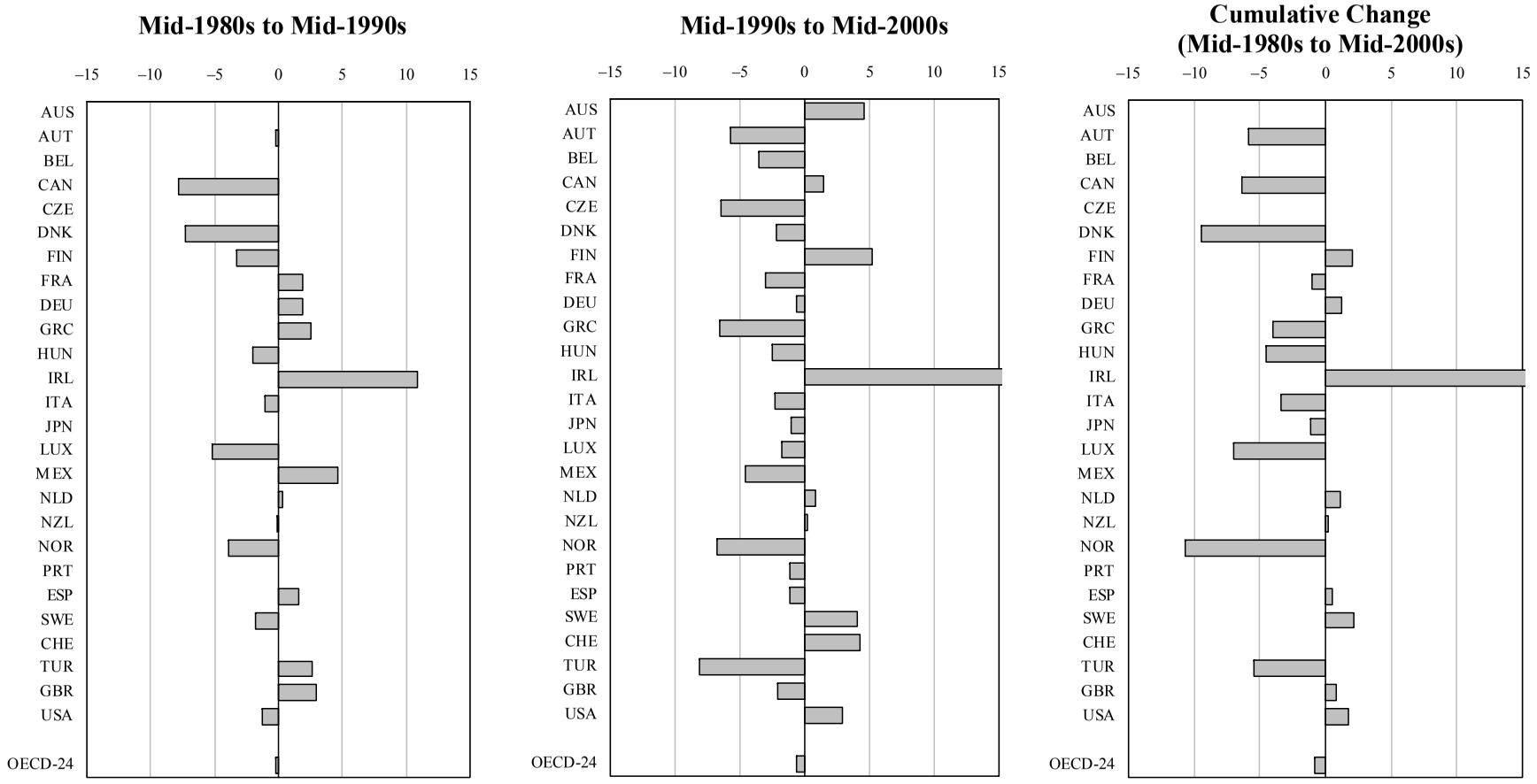


Note: Relative poverty risk is the age-specific poverty rate divided by the poverty rate for the entire population times 100. The poverty definition is the same as used for Figure 1. OECD-7 is the average for Canada, Finland, Greece, the Netherlands, Sweden, the United Kingdom and the United States, and OECD-23 is the average poverty rates across all the remaining OECD countries Data for mid-1980s refer to around 1990 for the Czech Republic, Hungary and Portugal; those for mid-2000s refer to 2000 for Austria, Belgium, the Czech Republic, Ireland, Portugal and Spain (where 2005 data, based on EU-SILC, are not comparable with those for earlier years).
Source: OECD (2008).

Figure 5

Trends in Poverty Rates among Older People (Age 66+)

(point changes in income poverty rate at 50 per cent median level over different time periods)



Note: Data in the first panel refer to changes in the poverty rate from around 1990 to mid-1990s for Czech Republic, Hungary and Portugal; no data are available for Australia and Switzerland. Data in the second panel refer to changes from the mid-1990s to around 2000 for Austria, Belgium, Czech Republic, Ireland, Portugal and Spain (where 2005 data, based on EU-SILC, are not comparable with those for earlier years); and to changes from 2000 to 2005 for Switzerland. OECD-24 refers to the simple average of OECD countries with data spanning the entire period (all countries shown above except Australia and Switzerland).
Source: OECD (2008).

Turkey – the decrease in poverty was particularly pronounced (at 5+ points), while sizeable poverty increases were recorded in Australia, Finland, Sweden, Switzerland and particularly in Ireland;

- for Norway, the decline in the poverty rate is a continuation of a trend from the previous period, whereas for Mexico the decline in this later period offsets the increase observed in the previous period;
- only seven countries observed a significant rise in older people poverty during this period. The most notable among them is Ireland: the poverty for older people rose by a large 18.8 points, making the cumulative change between mid-1980s and mid-2000s close to 30 percentage points.

3 Pension income patterns

3.1 Income patterns across age groups and household types

This section describes how average income varies across age groups and across different types of household. Average disposable income varies with the age of individuals in very similar ways across OECD countries (see Figure 6 for results in a selected group of countries). In all countries, average income rises with age until the end of working life and then declines, although there are differences across countries in the age at which the highest level is reached.

Similar results are observed when looking at people living in different household types that are a reflection of different life cycle stages (see Figure 7). Average income rises when comparing single-parent households to single working age persons without children, and is at its maximum for working age couples with no children. Average income are lower for two-adult households with children (with a head of working age), for couples with a head of retirement age and for older persons living alone. The income patterns by household type is generally more varied than that by age, and there is also greater variations across countries.

3.2 Income composition

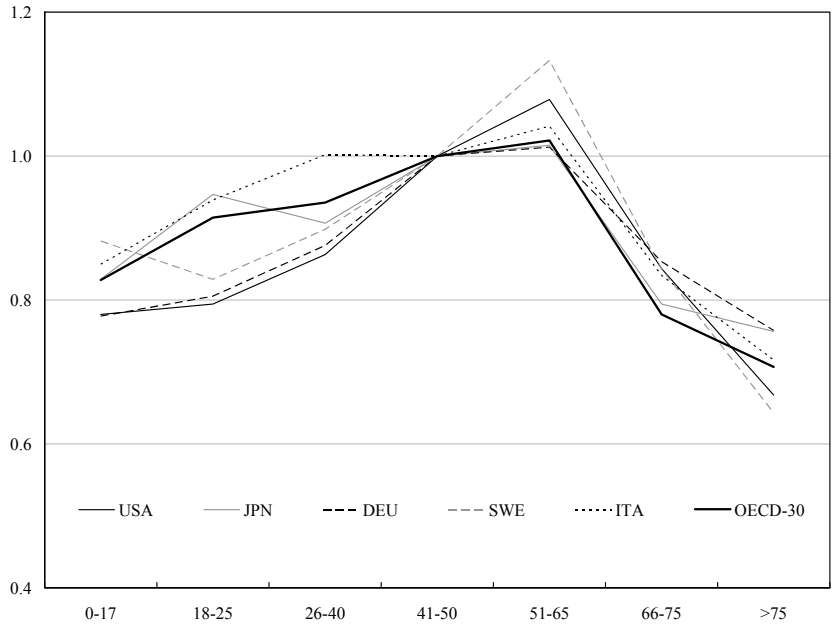
Pension systems in many OECD countries have been reformed in the last 10-15 years, and they underpin a trend towards a greater diversification of the pension income portfolio in the majority of countries. In general, there has been a move away from the public provision of pension income and towards greater reliance on capital income in the form of private personal and occupational pension income. Below, results from the OECD Income Distribution Database are presented so as to shed further light on these income developments for older persons.

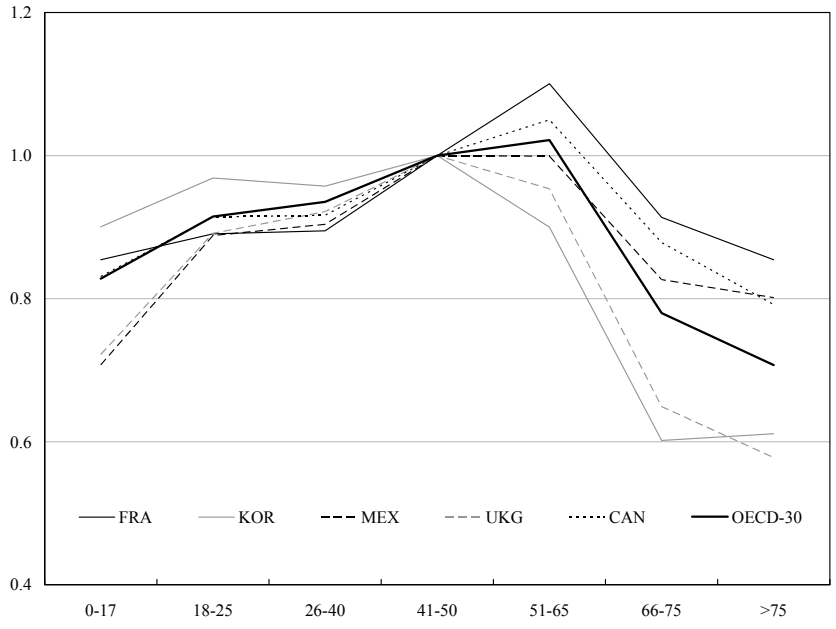
Table 2 illustrates the share of various components of income for households of retirement age. These components include capital income as well as social security cash benefits and household taxes. These results are provided for two time periods: for mid-1990s and mid-2000s. The following results stand out when looking at the share of the social security cash benefits, which contains universal, income-related as well as contributory components of public pensions.

- Not surprisingly, social security cash benefits are the most significant part of income for the population of retirement age. On average, this amounts to two thirds of their income, and to more than 90 per cent in Belgium, France, Italy, Luxembourg, Sweden and Austria.
- In contrast, social security cash benefits account for only around half of the household income of the elderly in Australia, Canada, Ireland, Japan, the Netherlands, Turkey, the United Kingdom and the United States, and they are least significant in Korea, and Mexico.

Figure 6

Relative Income by Age of Individual in Selected OECD Countries
Equivalised Household Disposable Income, Mid-2000s
(persons aged 41-50 = 1)





Source: OECD (2008).

- Out of 17 countries for which trend data is available, eight countries exhibit a decline in the share of social security cash transfers in retirement income. Two Nordic countries, Finland and Denmark, and Australia show a large decline (8+ share points) in the size of this component in retirement income.
- Retirement income saw a rise in the importance of the social security cash income in only three countries: Japan (18 share points), Portugal (13) and Italy (9).

Capital income, which contains private occupational and personal pensions and other private transfers, is the second most important component of income for older people in the majority of countries. Results show that:

- the share of capital income is particularly high in Australia, Denmark, Canada, the United Kingdom and the United States, as these countries have well developed private pension schemes;[3]

[3] The apparently high level of capital income for the retirement age population in Finland reflects the fact that, in the income questionnaire used by the OECD, mandatory occupational pensions are counted as a private transfer (hence included in capital income) rather than as government cash transfers.

Table 2

Income Composition of Older Households, Mid-1990s and Mid-2000s

Country	Mid-1990s					Mid-2000s				
	Earnings	Self-employment Income	Capital Income	Transfers	Taxes	Earnings	Self-employment Income	Capital Income	Transfers	Taxes
Australia	0.20	0.03	0.29	0.57	–0.09	0.18	0.04	0.39	0.49	–0.10
Austria	-	-	-	-	-	0.15	0.09	0.02	1.01	–0.27
Belgium	0.09	0.02	0.13	0.76	-	0.11	0.03	0.09	0.97	–0.20
Canada	0.18	0.03	0.45	0.52	–0.18	0.17	0.03	0.48	0.47	–0.15
Czech Republic	0.22	0.04	0.02	0.78	–0.06	0.20	0.06	0.01	0.79	–0.06
Denmark	0.13	0.04	0.41	0.90	–0.48	0.13	0.04	0.46	0.81	–0.44
Finland	0.08	0.06	0.79	0.34	–0.27	0.09	0.06	0.92	0.18	–0.25
France	0.08	0.02	0.08	0.89	–0.07	0.05	0.01	0.09	0.91	–0.06
Germany	0.12	0.02	0.14	0.86	–0.13	0.10	0.04	0.17	0.82	–0.13
Greece	0.12	0.16	0.12	0.60	-	0.14	0.11	0.08	0.66	-
Hungary	0.14	0.09	0.03	0.74	-	0.09	0.03	0.03	0.86	-
Iceland	-	-	-	-	-	0.36	0.05	0.13	0.80	–0.34
Ireland	0.20	0.13	0.14	0.59	–0.06	0.15	0.08	0.27	0.56	–0.05
Italy	0.19	0.11	0.11	0.79	–0.19	0.14	0.15	0.05	0.87	–0.21
Japan	0.56	0.14	0.08	0.38	–0.16	0.42	0.09	0.09	0.56	–0.15
Korea	-	-	-	-	-	0.31	0.31	0.28	0.16	–0.05
Luxembourg	0.13	0.02	0.09	0.76	-	0.10	0.04	0.10	0.91	–0.15
Netherlands	0.10	0.04	0.45	0.57	–0.14	0.09	0.02	0.46	0.53	–0.10
New Zealand	0.11	0.04	0.36	0.76	–0.27	0.14	0.04	0.25	0.77	–0.20
Norway	0.13	0.06	0.33	0.71	–0.23	0.12	0.02	0.35	0.73	–0.23
Poland	-	-	-	-	-	0.19	0.06	0.01	0.93	–0.18
Portugal	0.27	0.11	0.09	0.61	–0.07	0.26	0.07	0.05	0.74	–0.12
Spain	0.18	0.06	0.07	0.68	-	0.21	0.03	0.05	0.70	-
Slovak Republic	-	-	-	-	-	0.16	0.02	0.01	0.86	–0.05
Sweden	0.09	0.01	0.31	0.95	–0.35	0.12	0.02	0.30	0.96	–0.40
Switzerland	-	-	-	-	-	0.69	-	-	0.64	–0.33
United Kingdom	0.13	0.04	0.41	0.54	–0.11	0.11	0.03	0.42	0.54	–0.10
United States	0.27	0.04	0.39	0.44	–0.14	0.35	0.05	0.35	0.42	–0.16
OECD (17)	0.18	0.06	0.29	0.66	–0.18	0.17	0.05	0.30	0.66	–0.17

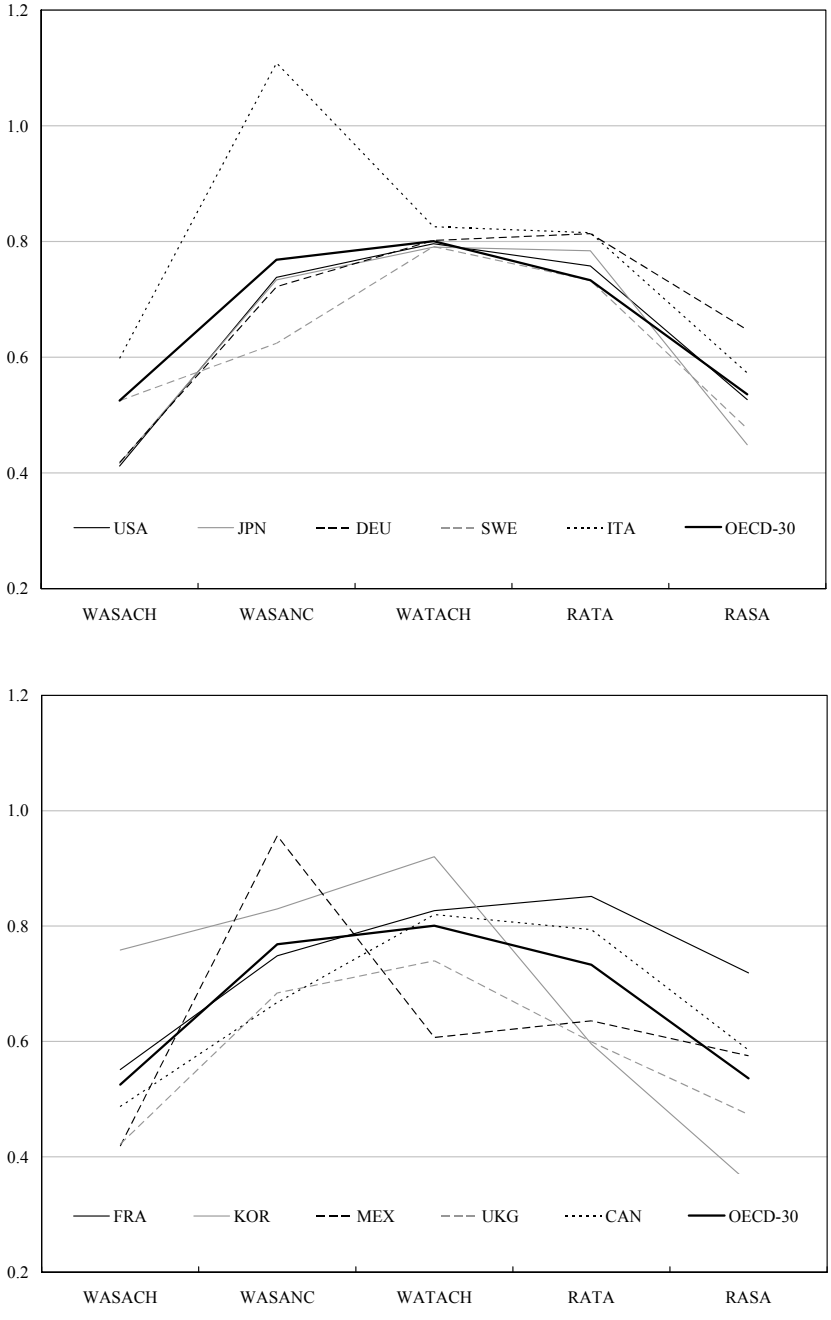
- in Finland, Denmark and Australia, the rise in the share of the capital income offsets almost exactly the fall observed in the share of the social security cash income. The rise in the capital income share in Ireland comes largely at the expense of a fall in the share of earnings and self-employment income.

The role of taxation for older households also varies widely across countries. Household taxes account for more than 40 per cent of household disposable income in Sweden and more than 50 per cent in Denmark and Iceland. The share of household taxes has decreased in Canada, Denmark, Finland, Germany, Japan, the Netherlands, and New Zealand over the period mid-1990s and mid-2000s.

It is also clear that the relationship between measured taxes and transfers differs across countries. For example, in the United States – based on the household survey data used – household taxes (at 26 per cent of household income) are nearly three times higher than public cash transfers. At the other extreme, in the Czech Republic, France, Luxembourg and the Slovak Republic,

Figure 7

Relative Income by Household Type in Selected OECD Countries
Equivalised Household Disposable Income, Mid-2000s
(two or more adults without children and working-age head = 1)



Note: WASACH = working-age head, single adult with children;
WASANC = working-age head, single adult without children;
WATACH = working-age head, two or more adults with children;
WATANC = working-age head, two or more adults without children;
RATA = retirement age head, two or more adults;
RASA = retirement age head, single adult.
Source: OECD (2008).

measured transfers account for a larger share of household disposable income than measured taxes. A major factor behind these variations is the fact that employer social security contributions – which finance a large part of the welfare state in these and some other countries – are paid by employers directly to the government, and since they do not pass through the household sector they are not recorded in household income surveys.

4 Redistributive role of public cash benefits and household taxes

4.1 Public cash benefits

Table 3 provides information for OECD countries on how public cash benefits are distributed across income groups. The measure used for summarising this information is the "Concentration coefficient" as defined at the foot of Table 3. The key message drawn from the measure of concentration coefficient is to see how poorer income groups benefit more from a higher share of public cash benefits than their share in the overall disposable income.[4] Results show that:

- cash benefits are more progressively distributed than market income in all countries, thus they contribute to reducing inequality;
- the distribution of cash benefits for retirement age households is most progressive in Finland, followed by Australia and Denmark, while it is least progressive in Mexico, Turkey, Korea, Portugal, Poland and France;
- with the exceptions of Portugal and Turkey, transfers to people of working age are more progressively distributed than those to people of retirement age, although the differences are small in Greece, Iceland, Poland and Portugal, as well as in Italy, Luxembourg and Spain;
- the ranking of countries is broadly similar for transfers to people of retirement age and of working age, although Finland (not Australia) has the most progressive distribution of transfers to people of retirement age.

4.2 Household taxes

The second panel of Table 3 shows the distribution of household taxes (income taxes and employee social security contributions). Because taxes are deducted from household income, higher values of the concentration coefficient imply a more progressive distribution of household taxes. Results show that:

- overall, there is less variation in the progressivity of taxes across countries than in the case of transfers. For the retirement age households, taxation is most progressively distributed in Australia, Ireland and the Czech Republic. This is followed by the Slovak Republic, the Netherlands and the United States;
- taxes tend to be least progressive in the retirement age households of the Nordic countries, Poland and Switzerland;
- in most but not all countries taxes are more progressive for the retirement-age population than for the working-age population, reflecting the existence of various tax concessions that exist for low-income retired people.

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[4] For greater details on the definition and suitability of the concentration coefficient, see discussion in OECD (2008), pp. 104-6. Note in particular that the concentration coefficient of transfers can be negative in the case where poorer income groups receive a higher share of transfers than their share of disposable income – with lower and more negative values implying greater progressivity.

Table 3

Progressivity of Cash Benefits and Household Taxes
(concentration coefficients for cash benefits and household taxes, mid-2000s)

Country	Public Cash Benefits			Household Taxes		
	Working Age	Retirement Age	Total	Working Age	Retirement Age	Total
Australia	–0.431	–0.080	–0.400	0.492	0.816	0.533
Austria	0.130	0.256	0.157	0.365	0.464	0.381
Belgium	–0.141	0.169	–0.120	0.363	0.420	0.398
Canada	–0.173	–0.006	–0.152	0.472	0.586	0.492
Czech Republic	–0.151	0.037	–0.154	0.424	0.789	0.471
Denmark	–0.303	–0.054	–0.316	0.332	0.336	0.349
Finland	–0.258	–0.138	–0.219	0.419	0.444	0.428
France	0.098	0.285	0.136	0.354	0.474	0.374
Germany	–0.066	0.175	0.013	0.439	0.485	0.468
Greece[1]	0.176	0.202	0.115	..	..	..
Hungary[1]	–0.025	0.119	–0.016	..	..	..
Iceland	0.018	0.037	–0.041	0.257	0.296	0.267
Ireland	–0.205	–0.001	–0.214	0.531	0.782	0.570
Italy	0.158	0.225	0.135	0.512	0.623	0.546
Japan	0.020	0.121	0.010	0.356	0.429	0.378
Korea	0.040	0.282	–0.012	0.363	0.462	0.380
Luxembourg	0.075	0.145	0.085	0.404	0.430	0.420
Mexico[1]	0.407	0.518	0.373	..	..	..
Netherlands	–0.223	–0.014	–0.198	0.436	0.705	0.471
New Zealand	–0.331	–0.011	–0.345	0.485	0.249	0.498
Norway	–0.177	0.074	–0.183	0.355	0.433	0.376
Poland[1]	0.173	0.198	0.185	0.382	0.325	0.379
Portugal[1]	0.315	0.295	0.247	..	..	..
Slovak Republic	–0.030	0.104	–0.056	0.388	0.726	0.422
Spain[1]	0.102	0.175	0.063	..	..	..
Sweden	–0.153	0.090	–0.145	0.330	0.312	0.337
Switzerland	–0.176	0.015	–0.170	0.211	0.202	0.223
Turkey[1]	0.320	0.288	0.347	..	..	..
United Kingdom	–0.347	0.035	–0.275	0.486	0.614	0.533
United States	–0.115	0.105	–0.089	0.549	0.658	0.586
OECD-24[2]	–0.107	0.085	–0.099	0.404	0.502	0.428

Note: The concentration coefficient is computed in the same way as the Gini coefficient of household income, so that a value of zero means that all income groups receive an equal share of household transfers or pay an equal share of taxes. However, individuals are ranked by their equivalised household disposable income.
[1] Data on public cash benefits are reported net of taxes (*i.e.*, household taxes are not separately identified).
[2] Average of the 24 OECD countries with data on both gross public cash transfers and household taxes (*i.e.* all countries shown in the table except Greece, Hungary, Mexico, Portugal, Spain and Turkey).
Source: OECD (2008).

5 Recent pension reforms and their impact

Figure 8 presents results for 13 OECD countries on the impact of recent pension reforms on the future value of pension entitlements.[5] It simulates the impact of reforms for those workers who entered the labour market in 2004.[6] It compares the situation for a person who spent a full career under the reformed pension system with the benefits that would have been received had the system not been changed.

The results shown are reported in terms of net replacement rates: that is, the value of the pension in retirement, after taxes, compared with the level of earnings when working, after taxes and contributions. In each case, the left-hand chart shows the position of low earners: people earning 50 per cent of the economy-wide average each year of their entire working life. At the right-hand side are the net replacement rates for average earners.

In view of the effect of pension reforms on retirement income of workers at different earnings levels, countries are divided into three groups depending on the effect of their reforms on the retirement income of workers at different earnings levels.

- In the top panel (Figure 8a) are countries that protected low earners from the impact of the reforms. In France and Sweden, for example, the benefits for average earners will be about 20 per cent lower as a result of the reforms while those of low earners are scarcely changed. In Mexico and Portugal, the reduction in benefits for average earners are around 50 and 40 per cent respectively. The reduction for low earners is only around half this level in both cases. In the United Kingdom, recent reforms left the pensions of average earners unchanged, but they increased the benefits for low earners by nearly 25 per cent. All of these reforms, therefore, increased the targeting of the pension system on people who had low income when working.
- The middle panel (Figure 8b) shows four countries in which reforms will result in a similar impact on benefits for both low earners and average earners. Germany and Austria observe the highest decline in net replacement rates, followed by Japan, and this is observed for both low wage and average wage earners. No changes in net replacement rates are observed for Korea and Finland, for both low and average earners.
- The bottom panel (Figure 8c) shows countries with reforms that worked in the opposite way to the first group of countries. In Poland, for example, benefits for average earners will change very little as a result of the reform while for low earners they will fall by over 20 per cent. Similarly, average earners are expected to lose around 5 per cent of benefits in the Slovak Republic, compared with 13 per cent for low earners. These countries explicitly wanted to strengthen the link between pensions in retirement and earnings when working in the belief that this was fairer than a redistributive system and that it would reduce work disincentive distortions in the labour market.

6 Conclusions

Results presented in this paper provide a robust evidence that OECD countries differ significantly in terms of older people poverty rates. Using a relative country-specific poverty line, almost 13 per cent of all older people (aged 66 or above) living in OECD member countries are identified as "poor". Three country groupings are distinguished on the basis of poverty rates for older people: nine countries with low poverty rates for older people (<6 per cent), ten countries

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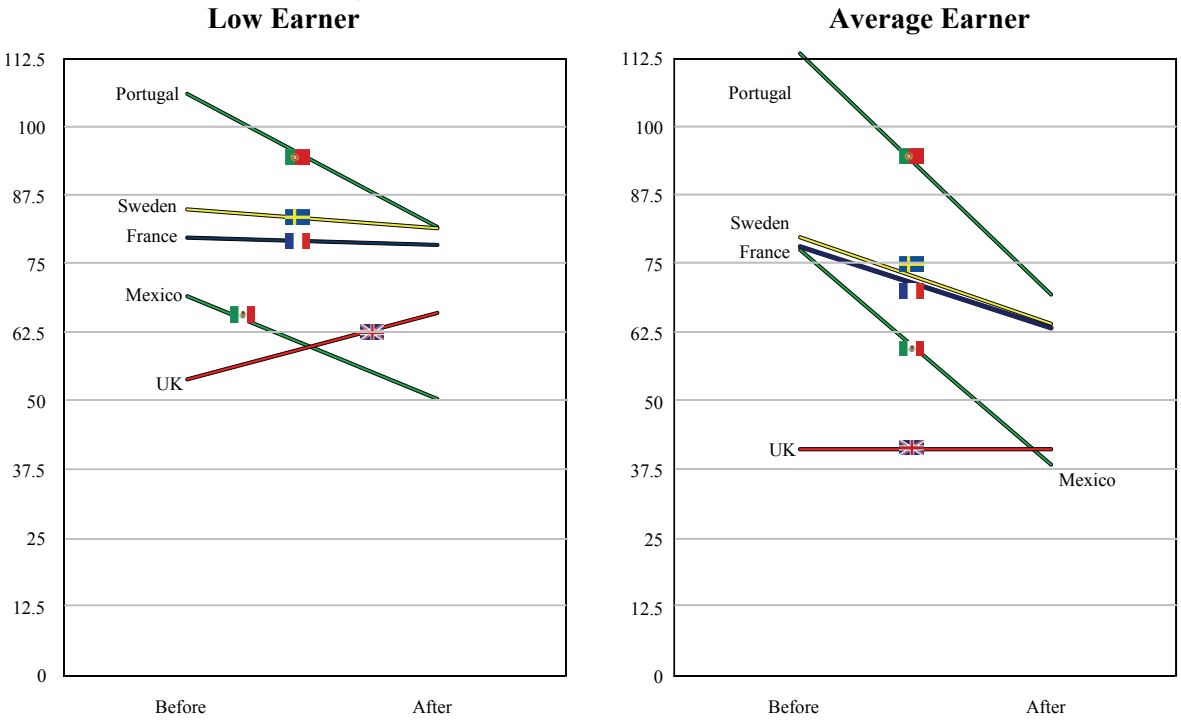
[5] These results are drawn from Martin and Whiteford (2008) and OECD (2007).

[6] For a summary of recent reforms, see OECD (2009), Zaidi and Grech (2007) and Whiteford and Whitehouse (2006).

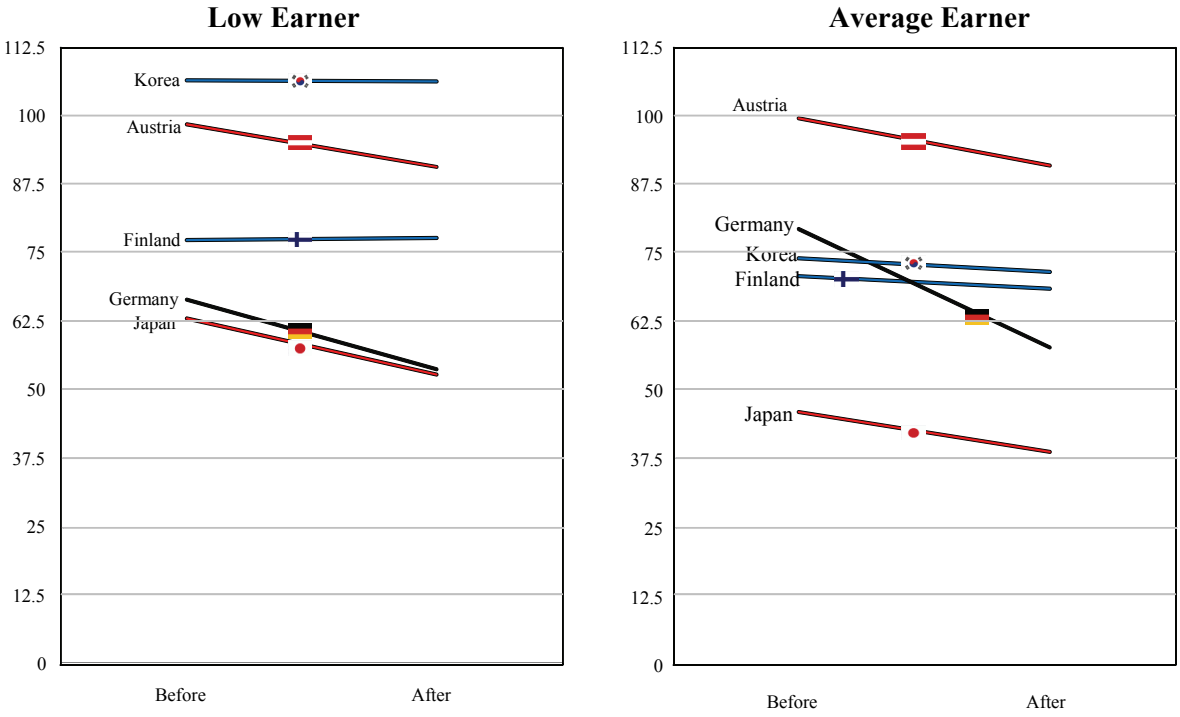
Figure 8

Impact of Pension Reforms on Net Replacement Rates by Earnings Level

a) Reforms that Protected Low Earners



b) Across-the-Board Cuts in Benefits

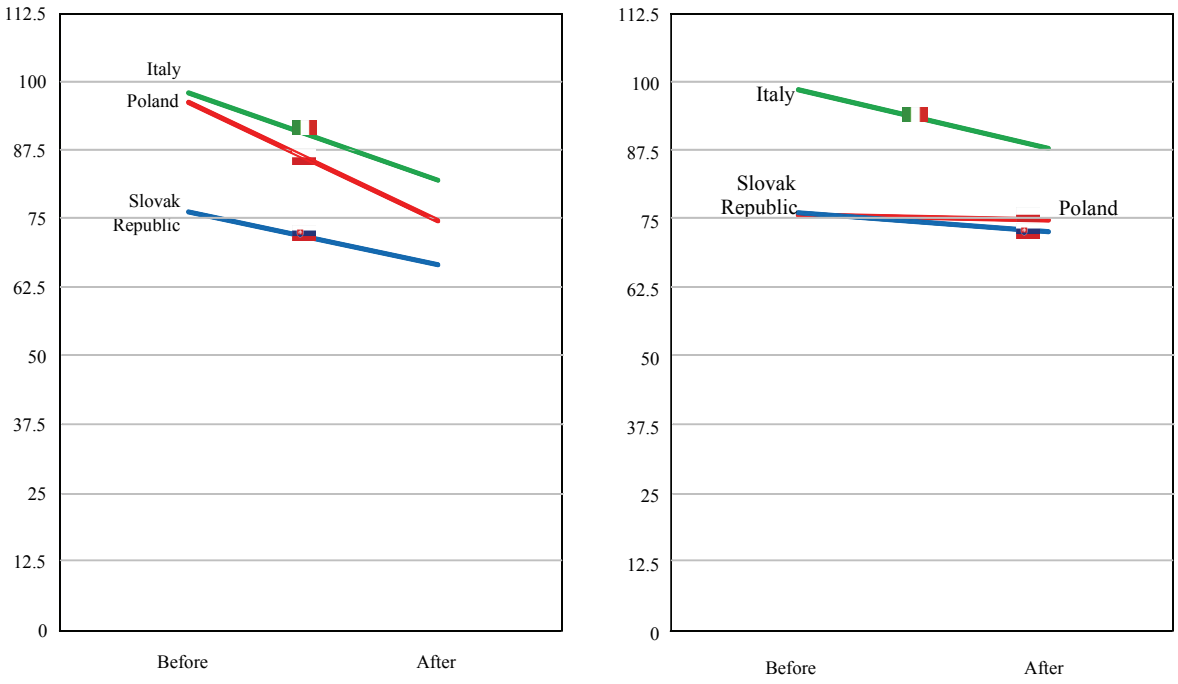


Source: Martin and Whitehouse (2008).

Figure 8 (continued)

Impact of Pension Reforms on Net Replacement Rates by Earnings Level

c) Reforms that Strengthened the Link Between Contributions and Earnings



Source: Martin and Whitehouse (2008).

with lower-than-average poverty rates (7-13 per cent) and eleven countries with higher-than-average poverty rates (>15 per cent). No single explanation can be meaningfully provided to explain this differentiation across the three groupings of countries. Countries with low poverty rates for older people generally have a good social safety net in the form of a basic pension (e.g. the Netherlands, New Zealand and Canada) and/or they offer strong redistribution in the earnings-related contributory pension schemes in the form of minimum guaranteed pensions.

The overlapping group of single elderly women and the oldest age cohort 75+ have, in general, a much higher poverty rate compared to other subgroups of older people. The low pension income for older women is mainly due to the fact that their working lives experienced patterns of employment which has generally low coverage of pension scheme affiliation, and also they had childcare related gaps in their employment record. One reason for the high risk of poverty for the oldest age cohort is that this group has not enjoyed a pension coverage in many countries during the earlier part of their working career. When pension systems matured, they gradually offered greater opportunities to a larger group of working age people to be affiliated with a formal mechanism to save for their pensions. Another explanation is that in many countries the indexation of pension benefits with prices only led to pension benefits lagging behind the general evolution of income.

There is a growing body of evidence that suggests that older people poverty rates in OECD countries contrast favourably with those for younger age groups. In general, poverty rates for all

age groups above 50 have declined, while those for people below that age have risen. The decline in the poverty of retirees is indeed a reflection of the success story of past pension policies in providing for adequate pension benefits. However, in view of financial sustainability concerns linked with such pension generosity in many countries, recent pension reforms have scaled down the level of pension benefits. Thus, in the absence of extending working careers, it is likely that future generations of older persons will be more often poor than the rest of the population. The evidence presented in this paper show that reforms in some countries will make their systems less redistributive whereas other countries (such as the United Kingdom and France) have strengthened the protection of low earners in their reformed system.

ANNEX
A SYNOPSIS OF POVERTY DEFINITION AND ITS MEASUREMENT

The poverty definition adopted in this study is the relative country-specific poverty measure: this views poverty in a nationally defined social and economic context. It is commonly measured as the percentage of population with cash income less than some fixed proportion (say, 50 per cent) of national median income. Such relative poverty measures are now commonly used as the official poverty rate in several OECD countries. The measurements are usually based on a household's yearly cash income and frequently take no account of household wealth, or inequality of resource distribution that may exist within a household.

The main poverty line used in the OECD's report *Growing Unequal?* (OECD, 2008) is based on a level of income that is set at 50 per cent of the median household income. Household income includes earnings, transfers and income from capital, and is measured here net of direct taxes and social security contributions paid by households.

The data reported here are collected through a network of OECD's national experts, who apply common conventions and definitions to the unit record data from different national data sources and supply detailed cross-tabulations to the OECD. Years of reference vary slightly across countries. For the mid-2000s, most data concern the year 2004, except for Canada, Denmark, Germany, Hungary, Ireland, Korea, the United Kingdom, and the United States for which data belong to 2005; and the Netherlands for which data belong to 2003. For the mid-1990s, most data concern the year 1995, except for Austria for which data belong to 1993; Ireland, Japan, Mexico and Turkey for which data belong to 1994; and the Czech Republic, France and Luxembourg for which data refer to 1996.

Some qualifications for results presented in this report are in order. The estimates of the elderly poverty rates are very sensitive to some of the measurement methods adopted.

- *First*, the cash income definition used here exaggerates the poverty rates of the elderly compared to other groups because no account is taken of the value of services drawn from owner-occupied accommodations. In Denmark, for example, the inclusion of imputed rents in the income definition lowers the poverty headcount of the elderly from around 10 per cent to around 4 per cent, as compared to a reduction from 5.3 to 4.7 per cent for the entire population.
- *Second*, as the old age pension is often the main (or only) income source for the elderly, their cash income is typically clustered around the prevailing pension rates. This leads to the high sensitivity of poverty estimates to small changes in the income threshold used: in Australia, for example, the income-poverty rate falls from 26 per cent for a threshold of 50 per cent of median income, to 18 per cent for a threshold of 47 per cent.
- *Third*, estimates are very sensitive to the equivalence scale used: in Australia, the elderly poverty rate at 50 per cent of median income falls from 26 per cent based on the 0.5 equivalence scale used in this report, to 17 per cent based on the "modified OECD equivalence scale" (where the first adult has a weight of 1.0, the second and subsequent adults a weight of 0.5, and dependent children a weight of 0.3, which is closely approximated by an equivalence scale of 0.6) conventionally used by the Australian Bureau of Statistics.

Household income data have other limitations as well. They do not include consumption value of durables or additional costs such as health insurance. Moreover, the income of current generation of older people reflects the pension rules of the past, and much has changed recently.

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THE OUTLOOK FOR PENSION SPENDING AND THE ROLE OF A RESERVE FUND

Falilou Fall[*] and Nicolas Ferrari[*]

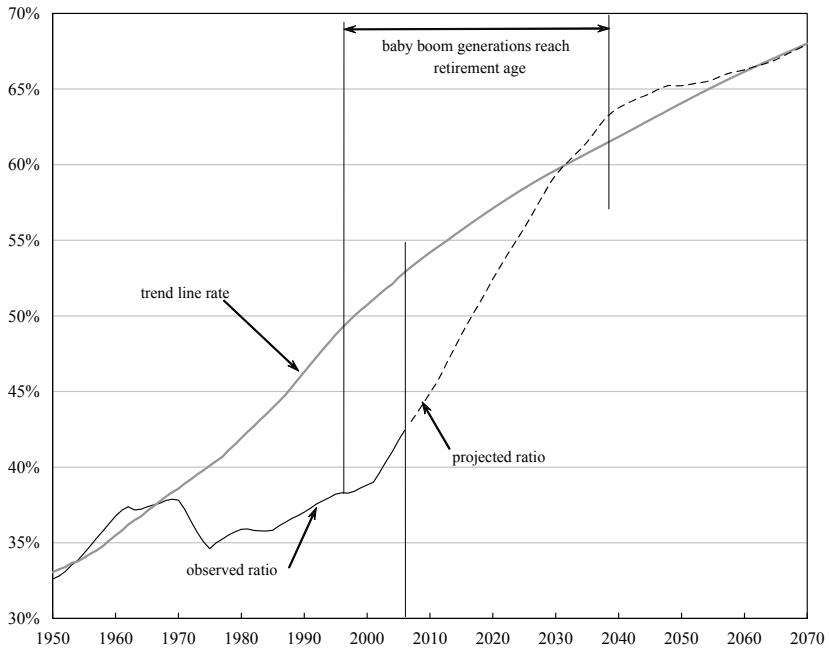
Thanks to the abundant baby boom generations, for the past several decades demographics have been highly favourable to pensions funding. This benign situation is coming to an end as these generations reach retirement. Much of the attendant increase in pension spending is set to last, thanks notably to the durable rise in life expectancy.

This is because the baby boom initially increased the proportion of children in the French population, and then, from the 1970s onwards, that of people of working age able to contribute. The increasing generosity of the French pension system was based on this highly propitious demographic situation. However, these favourable demographics partially hid the underlying ageing of the population and began to dwindle starting in 2006, as the first baby boomers took retirement. It will fade completely after 2030. After that date, the baby boom will no longer have any impact on the population's age structure, which will revert to its long-term trend.

Figure 1

Population Dependency Ratio

(ratio of population aged 55 and over to the population aged 15-64)



Sources: INSEE, INED, DGTPE calculations.

To smooth the temporary baby boom shock, a reserve fund ought to have been put in place starting in the 1970s, in order to build up surpluses during the entire period of favourable demographics. Instead, the system became increasingly generous, in proportions well above the leeway provided by the demographic situation, leading to the emergence of deficits. Consequently, even if it is unable to smooth the baby boom shock, the Fonds de Réserve pour les Retraites (FRR or Pension Reserve Fund) put in place in 2000 can help to smooth the rise in spending as these more abundant generations reach retirement (*i.e.,* smooth the necessary

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adjustments); alternatively, it could serve as a long-term fund to finance pensions, or it could cushion the shock brought about by the temporary drop in the birth rate at the end of the 20th century.

The Fonds de Réserve pour les Retraites (FRR or Pension Reserve Fund) was set up by the Social Security Finance Act in 1999. The intention was to build up a sizeable financial reserve from which it would be possible to draw down later in order to finance higher pension spending due to population ageing. At a time when public finances were briefly recovering, the aim was to spread the additional ageing-related charges over a longer period of time, notably drawing inspiration from other countries (Box 2). Under the 1999 Social Security Finance Act, amounts paid into the fund were placed in a reserve until 2020 for the benefit of the *Caisse Nationale d'Assurance Vieillesse* (CNAV or National Old Age Insurance Fund) and the pension schemes aligned with it.[1] The stated aim was to accumulate 1,000 billion francs (150 billion euros) by 2020 in order to cope with the imbalances over the period 2020-40 (see Box 3).

The FRR originated in the acknowledgment that old-age insurance spending was set to surge with the retirement of the baby boom generations. This has indeed has been happening since 2006, and the number of people subject to the CNAV scheme retiring has risen from a rate of 500,000 a year to 750,000.

1 After three especially favourable decades, the demographics underlying pension funding are reverting to long-term trend

1.1 Demographic shocks are modifying the conditions governing the funding of pensions systems

In a pay-as-you-go pension scheme, contributions paid out of the income of the working population serve immediately to pay retirees' pensions. A pay-as-you-go pension scheme is in balance each year if total contributions paid in equal total benefits paid out. This balance is achieved when the contribution rate is equal to the product of the average replacement rate (average pension relative to average wage) and of the economic dependency ratio (number of pensioners relative to the number of contributors).

All other things being equal, population trends affect the dependency ratio, thereby modifying the pension systems' financial situation. If the trends are structural, the parameters of the pension systems will need to be modified. Thus population ageing connected with the underlying rise in life expectancy is leading to an increase in economic dependency ratio. Accordingly, there are three "levers" that can help to keep the pensions systems solvent:

- raising contributions (or other receipts);
- reducing the replacement rate;
- lengthening the effective period of contribution, thereby reducing the economic dependency ratio by postponing the average age at which people retire and by increasing economic activity rates.

In the event of a transitory demographic shock (as for example with the surplus of births in the baby boom), it is possible to let the pay-as-you-go system move temporarily away from equilibrium, either by accumulating reserves (in the event of a positive shock), or by borrowing (in

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[1] The *CNAV* is the old-age pension sector of the "general (pension) scheme", the equivalent schemes being the *ORGANIC* (*Organisation Autonome Nationale de l'Industrie et du Commerce* – Autonomous National Organisation for Industry and Trade), the *CANCAVA* (*Caisse Autonome Nationale de Compensation d'Assurance Vieillesse des Artisans* – National Autonomous Old-age Insurance Compensation Fund for Crafts and Tradespeople) and the employees' scheme with the *Mutualité Sociale Agricole* (*MSA* – Farmers' Mutual Welfare Fund).

the case of a negative shock). In that sense, a reserve fund could be seen as a fourth additional lever for the funding of the pay-as-you-go retirement system.

1.2 The deteriorating demographic dependency ratio is a long-term trend

Future variations in the economic dependency ratio can be foreseen based on projections of the demographic dependency ratio, which is defined as the ratio of the population aged 55 and over (*i.e.*, the population liable to be retired) to the population aged 15-64 (the population liable to be economically active). This is expected to rise sharply in the coming decades. Between 1960 and 2005, the ratio rose by only 5 percentage points, from 37 to 42 per cent. According to the latest INSEE projections, this ratio is expected to increase by 23 percentage points between 2005 and 2050, rising to 65 per cent (see Figure 1).

Three factors allow us to break down trends in the population structure, namely: mortality rates, birth rates, and migration. These three factors have very different impacts on the demographic dependency ratio.

Over the very long period, the change in the dependency ratio is very powerfully affected by the sharp gains in life expectancy achieved in the 19th and 20th centuries: lower mortality rates are leading to a larger proportion of elderly people in the population. This long-term trend has nevertheless experienced a number of upsets due to war (the Napoleonic Wars, the Franco-Prussian War of 1870, and the First and Second World Wars, see Figure 5a and b), which sharply increased the mortality rate.

Box 1
Modelling the long-term trend

Central scenario

The demographic projections presented here are taken from the central scenario in the latest INSEE projections (July 2006). The scenario's main assumptions are:

- the mortality rate continues to fall at the pace observed over the past 15 years, bringing with it a life expectancy at birth of 89.0 years for women and 83.8 years for men in 2050;
- the cyclical index of fertility is 1.9 children per woman,
- the migratory balance is +100,000 people per year.

INSEE projections are available only until 2050. They have been extended beyond that date using these assumptions.[2]

The trend demographic dependency ratio (*i.e.*, the number of people aged 55 and over relative to those aged 15-64, excluding demographic shocks) was calculated projecting a fictitious population with the aid of long-term trends in mortality rates, birth rates and migration.

- Actual mortality quotients have been used for the past, except in the case of wars, when they have been smoothed. For projection purposes, the INSEE mortality rate scenario has been applied (Figure 5a and b);

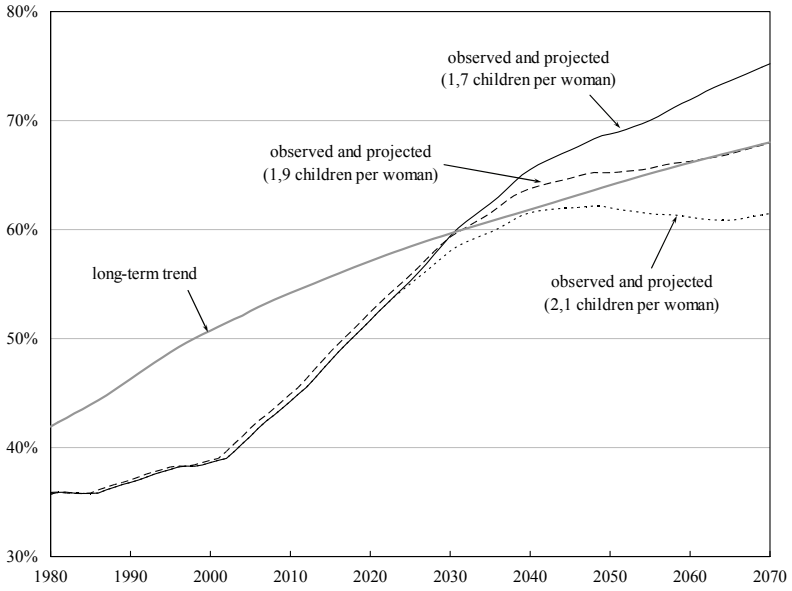
[2] More precisely, fertility by age remains at the level picked by INSEE from 2010 onwards. The profile of the migratory balance by age and sex remains at its level projected by INSEE. The rate of migratory increase remains at its 2050 level. Finally, the reduction in the mortality quotients predicted by INSEE is extended beyond 2050 (log-linear decline).

- Fertility has come down from 5.4 children per woman in 1740 to 1.9 from 1980 on (Figure 4);
- The migratory replacement rate is maintained constant at a level consistent with a net migratory inflow of 100,000 people per year.

It should be noted that the migratory assumption has little impact on the demographic dependency ratio: the gaps between the observed (and then projected) ratio and this trend ratio stems primarily from the birth-rate shocks.

Figure 2

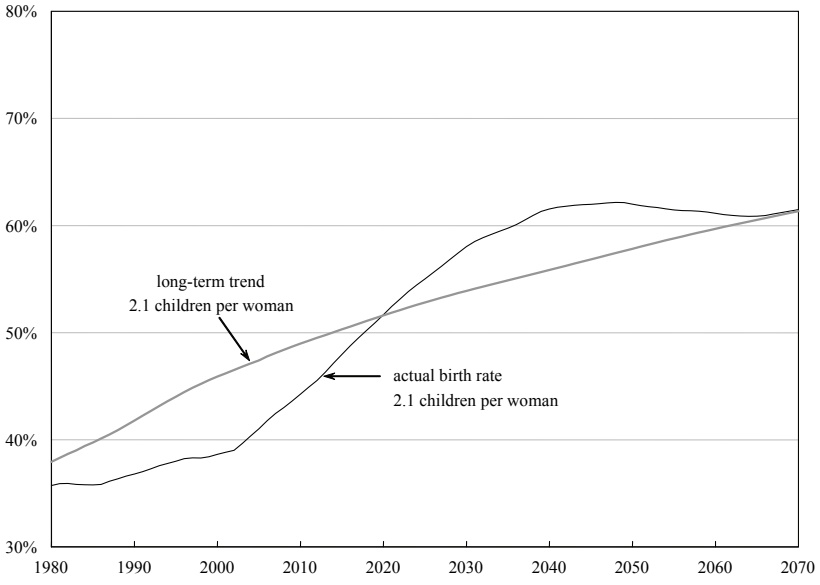
Dependency Ratio Depending on the Actual Birth Rate



Scope: Metropolitan France.
Source: INSEE, INED, DGTPE calculations.

Figure 3

Actual and Trend Ratio in the High-birth Rate Scenario



Scope: Metropolitan France.
Source: INSEE, INED, DGTPE calculations.

Birth rate variant scenarios

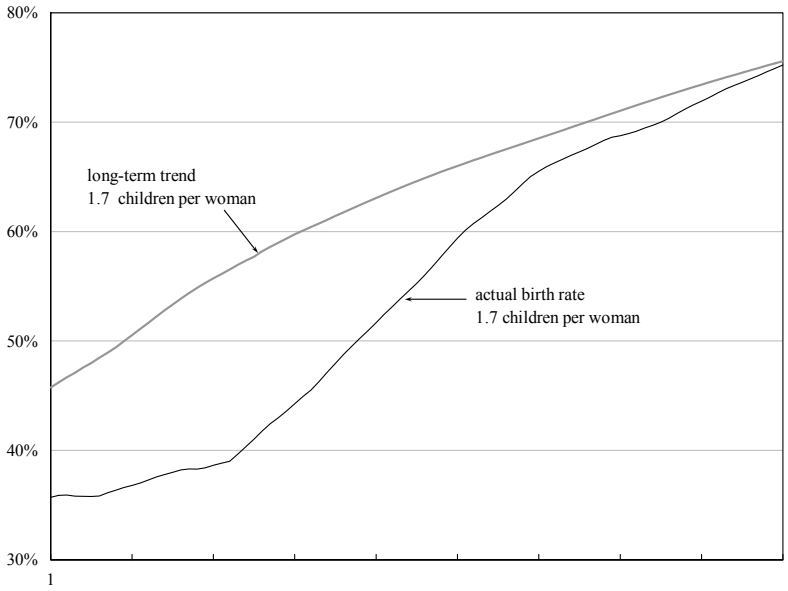
The birth-rate assumption plays a dual role here:

- it serves to project the age structure;
- it leads to the definition of the long-term birth rate equilibrium and hence to an assessment of past birth-rate deficits.

In the central scenario, we have assumed that the trend and project birth rates were equal to 1.9. But

Figure 4

Actual and Trend Ratio in the Low Birth-rate Scenario



Scope: Metropolitan France.
Source: INSEE, INED, DGTPE calculations.

in fact these rates can vary. Two types of birth-rate variants are therefore necessary, in answer to two distinct questions:

1) What would be the gap between the trend ratio under this central assumption (1.9 children per woman) and the actual ratio with a projected birth rate different from 1.9?
2) What are the birth rate shocks that need to be made good if the very long-term birth rate equilibrium is higher (2.1 children per woman) or lower (1.7 children per woman) than the assumption of 1.9 children per woman?

a) If the long-term trend is 1.9 children per woman, but the actual birth rate for the time frame considered is higher (2.1 children), the demographic ratio would never be lower than the currently envisaged trend ratio (Figure 2). Conversely, if the birth rate was lower (at 1.7 child), the ratio would be durably lower than the initially envisaged trend.

b) If one assumes that the very long-term birth rate is 2.1 children per woman, the past birth-rate deficits are very large, resulting in a significantly lower demographic dependency ratio in relation to its trend under the 1.9 children per woman assumption (see Figure 3). Conversely, if we adopt a very long-term birth-rate equilibrium assumption of 1.7 children per woman, there would be no past birth rate deficit to be made good (see Figure 4).

The specific baby boom shock comes on top of this long-term trend, consisting of a pronounced upturn in births from the end of the Second World War until the end of the 1960s (Figure 6). Far from being specific to France, the majority of industrialised countries experienced a similar shock. Whereas a continuation of the trend would have led rather to a cyclical fertility index of around 2 children per woman, the index approached 3 children per woman in the course of this period. The consequence of the demographic shock was to reduce the dependency ratio (Figure 1).

Conversely, during the 1980s and 1990s, the birth rate was slightly lower than its level observed since 2000 (the level retained in the projections). Assuming a long-term birth rate of

1.9 children per woman (the assumption adopted in the central scenario for the 2006 INSEE projections), this transitory birth deficit would lead to a worsening of the dependency ratio for the year 2006, sending it above its long-term trend between 2032 and 2062.

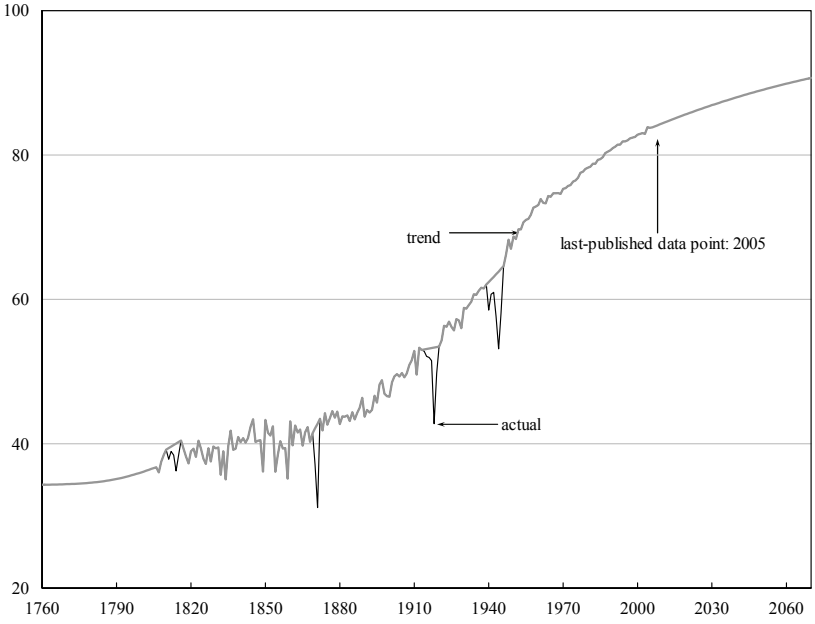
Migratory flows are the third factor in demographic trends. This factor has little long-term impact on the dependency ratio. This is because growth in the immigrant population increases both the working population and the retired population, in the long term. On the other hand, migratory flows can temporarily "rejuvenate" or "age" the resident population depending on the relative ages of the migrants and residents. Immigration primarily concerns people of working age, so that it tends to reduce the dependency ratio temporarily (Figure 7).

Overall, the demographic dependency ratio trend is essentially determined by long-term birth and mortality rate trends. The ratio itself may diverge from its trend primarily due to temporary birth-rate shocks and, secondarily, due to shocks resulting from migration and mortality (such as wars).

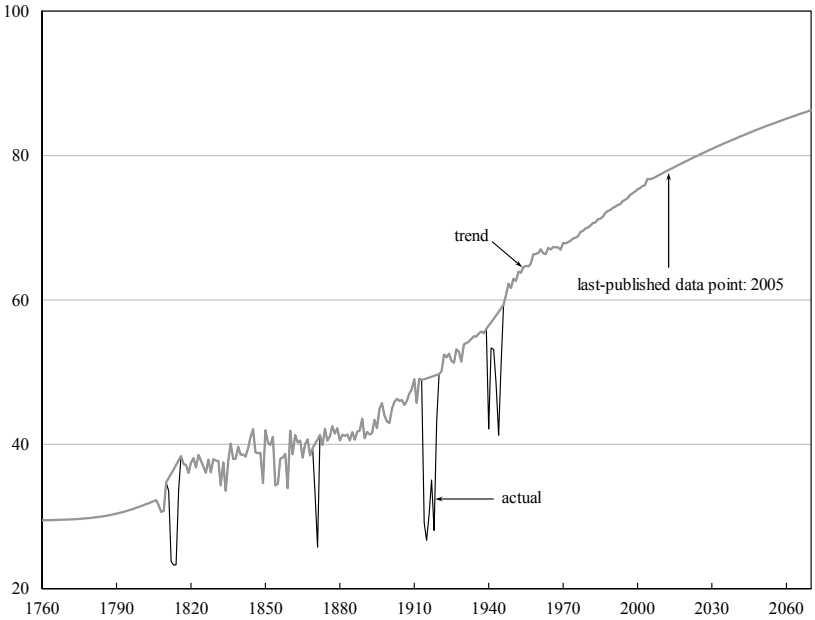
Figure 5

Life Expectancy at Birth

a) Women



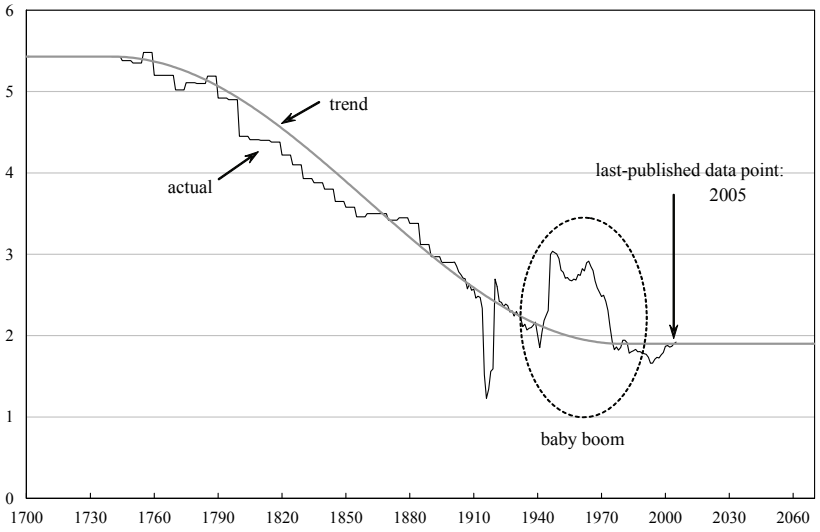
b) Men



Scope: Metropolitan France.
Note: Life expectancy at birth is calculated on the basis of mortality by age group recorded for the current year. The projected trend reflects mortality trends in the central scenario for INSEE projections in 2006. This scenario has been extended here from 2050 to 2070.
Source: INSEE and INED, DGTPE calculations for the trend.

Figure 6[3]

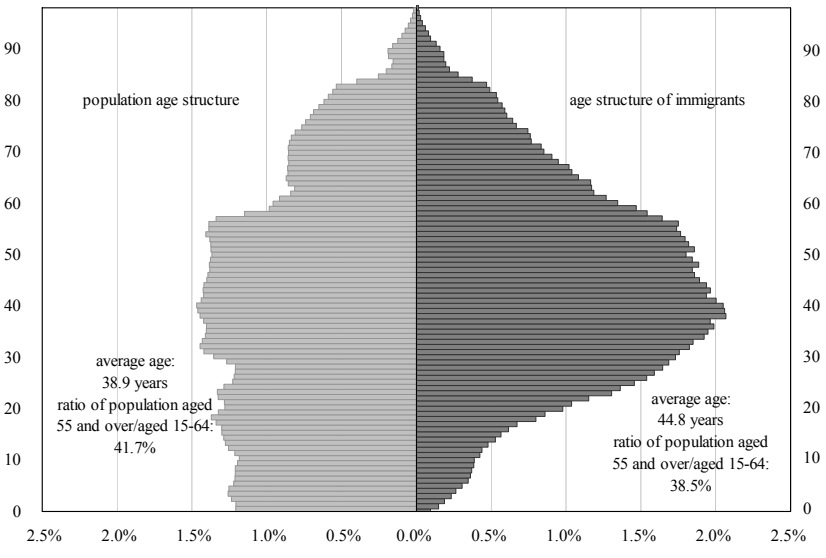
Cyclical Fertility Index



Scope: Metropolitan France.
Source: INSEE and INED, DGTPE calculations for the trend.

Figure 7

Age Structures, 2004-05



Scope: Metropolitan France.
Source: INSEE, INED, DGTPE calculations.

1.3 For more than 30 years, the baby boom contributed positively to the financial balance of the pension system

The baby boom was a massive shock in France, reducing the demographic dependency ratio for more than half a century (see Figure 1), which facilitated funding of the pension system. The expansion of the old-age insurance schemes between 1945 and 1983 consequently took place in exceptionally favourable demographic conditions in the years following 1970. Advantage was taken of these conditions not to build up reserves (see next section), but to increase the generosity of the pension system. Its parameters were altered as if this particularly benign transitory situation was in fact permanent.

The retirement of the first baby boom generations has prompted a sharp acceleration in pension spending. This phenomenon marks only the beginning of the dependency ratio's return to long-term trend, the return being completed in the 2030s.

[3] The cyclical fertility index measures the number of children a woman would have had throughout her life if the observed birth rate for the year considered at each age had remained unchanged. The fertility rate at a given age is the number of live births for women at that age in the course of the year relative to the average population of women of the same age in that.

Beyond 2030, the baby boom is roughly neutral in its effect on the demographic dependency ratio, the abundant retired baby boom generations being matched by equally abundant generations of working age. That is because the large cohorts of baby boomers proportionally increased the size of the following generations once their fertility rate reverted to a level close to the long term, permitting a renewal of generations. The trend will nevertheless be to a deterioration of the dependency ratio entailing a need to adapt the parameters of the pension system, notably by means of a lengthening of contribution periods.

1.4 Demographics are slightly less benign than the trend line around 2040

Beyond 2030, the dependency ratio is expected to worsen slightly relative to the long-term trend, for around 20 years. This is because the birth rate was lower in the last quarter of the 20th century, below the long-term target of 1.9 children per woman, thus reducing the size of the working age population at that time horizon.

However, the uncertainty at this time horizon is considerable. In particular, the long-term demographic trend is highly dependent on the target birth rate adopted (here as in the INSEE projections) of 1.9 children per woman (see Box 1 for the impact of a change of assumption on the fertility rate).

2 The possible aims of a reserve fund will determine its size and its horizon

In the light of the foregoing demographic developments, the "smoothing" objective assigned to the Pension Reserve Fund set up in 1999 is ambiguous, since the expected rise in pension spending over the coming decades is not transitory. Below we review the different functions that could be assigned to the FRR.

2.1 A fund to smooth demographic shocks

2.1.1 The principle of a demographic shock smoothing fund

In a pure pay-as-you-go system, pensions in a given year are funded exclusively by contributions for that year. In the case of temporary demographic shocks (such as a transitory drop in the birth rate, for example), it may be desirable to adapt the financial equilibrium constraint at each date by introducing reserves (or, conversely, by accepting a transitory debt). In that sense, a reserve fund is a means of smoothing the effects of temporary demographic shocks, fertility shocks in particular, *via* a form of collective capital funding. More precisely, it would serve to balance the system year by year, without permanently adjusting the three parameters, namely the contribution rate, the level of pensions, and the retirement age. *It is out of purpose here to try to compensate for a permanent shock such as deterioration in the demographic dependency ratio*. This will call for a gradual adjustment of the three aforementioned parameters, in particular lengthening the contribution period in order to avoid an undue deterioration in the economic dependency ratio.

2.1.2 Smoothing the baby boom demographic shock?

As explained in Section 1, a positive transitory birth-rate shock like the baby boom reduces the demographic dependency ratio for a few decades. As the smaller age groups preceding the baby boom die, the dependency ratio reverts to its long-term trend: the abundant retired baby boom generations are matched by equally abundant generations of working age (the large baby boom

population having proportionally increased the size of the following generations).

Consequently, to smooth the baby boom demographic shock (as defined in 2.1.1) it would have been necessary to build up reserves during the period in which this shock made the demographic dependency ratio more benign, *i.e.* over the entire period 1970-2030. This would have made it possible to cope with any eventual negative shock thereafter or to cushion the necessary tightening of the system as implied by the reversion to trend. Therefore, and given the high level of current and past pension system deficits, any smoothing of the baby boom shock that the FRR might provide is inherently very limited, even though the demographic context is still highly favourable.

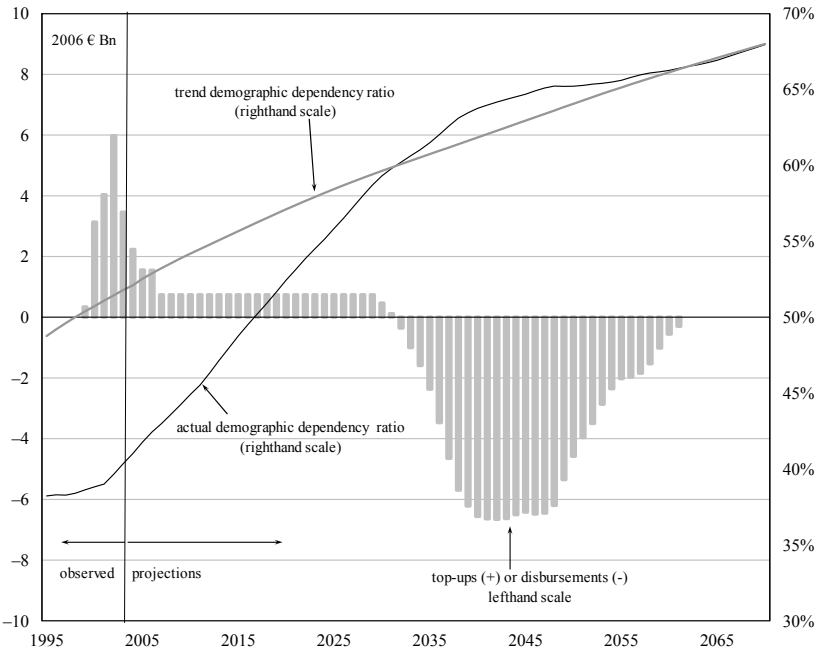
2.1.3 The FRR could smooth the temporary shock due to the drop in the fertility rate the end of the 20th century

In the present circumstances, the FRR could serve to compensate during the period 2030-60 for the rise in the dependency ratio above its long-term trend due to fewer births in 1980-90 compared with the rebound since 2000, now considered to be in line with the long term trend. Additional or top-up payments into the Fund should be relatively easy to make thanks to the baby boom, which will continue to improve the demographic situation until the end of the 2020s.

This approach will entail spreading the top-up payments until around 2030. Until that date the baby boom will still imply a more favourable demographic dependency ratio than the trend. Beyond that, the ratio is expected to deteriorate relative to trend owing to the shock needing to be smoothed (namely the smaller size of contributing generations). In that case the Fund could drawdown from its reserves until around 2060. This approach would entail envisaging the Fund's extinction beyond 2060, *a priori*. However, this deadline could be revised in the light of any new shocks emerging, or if the very long-term outlook were to change.

Figure 8

Using the FRR to Smooth Demographic Shocks



Scope: Metropolitan France.
Note: Assumption of a real return of 3 per cent, a potential growth scenario in projections, derived from *5th Report of the Commission d'orientation des retraites* (French Pensions Commission). In the trend population growth scenario, the share of GDP devoted to covered pension schemes is constant.
Source: INSEE, INED, DGTPE calculations.

By limiting qualifying pensions schemes to those provided for by law (*i.e.*, the "general scheme" and schemes aligned with it), and by assuming a long-term trend of 1.9 children per woman, the current top-ups would be sufficient to avoid an increase in contributions between 2030 and 2060 relative to the long-term trend.

2.2 *A fund to smooth the rise in baby boom-linked spending*

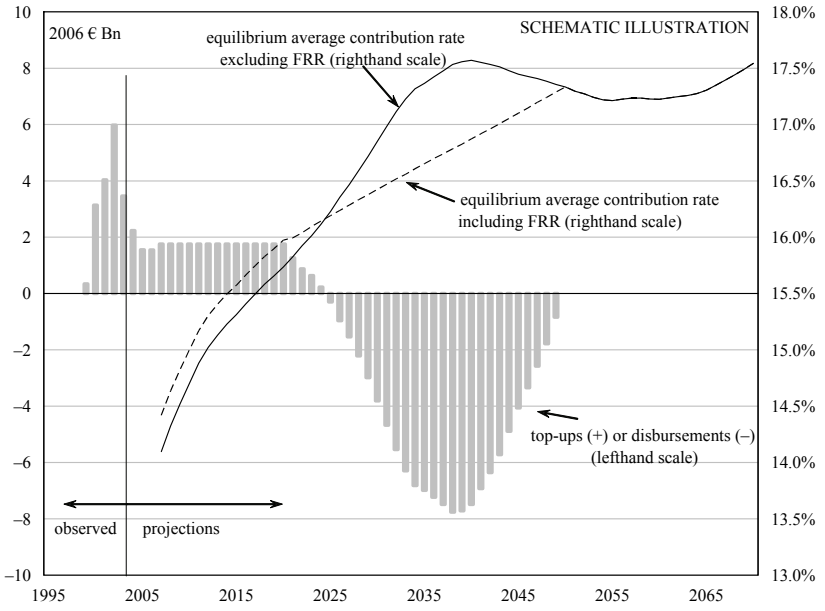
The FRR is often defined as a fund to smooth, not the baby boom shock, but simply the "hump" in spending resulting from this generation's arrival at retirement age. In its 3rd report, the Conseil d'Orientation des Retraites[4] proposed a smoothing function taking as its point of departure, not population trends, but future funding needs directly. The FRR was presented here as a means to accompany the pace of expected adjustments. In this case, the smoothing function was no longer linked to the gap relative to the long-term trend, but corresponds to a "linearization" of the necessary adjustments to balance the accounts of the pension schemes.[5] Thus conceived, the fund would naturally fall to zero once the shock had been smoothed.

In this approach, calibrating the FRR's smoothing function depends not only on the accelerating growth in spending resulting from the baby boom, but also from the changing parameters of the pension schemes. In addition, the date at which the Fund falls to zero is a matter of arbitrary choice, the size of the reserves required being heavily dependent on that choice.

By setting this date at 2050 (as an illustration), this approach would lead to a linearization of the necessary adjustments between 2020 and 2050: top-ups would continue at their current rate until 2020 (*i.e.*, 65 per cent of the 2 per cent "social levy" on investment income). The accumulated reserves would serve to smooth funding needs beyond that date: top-ups would progressively decline until 2025, after which disbursements from the fund would help to accompany the necessary adjustments to keep the Fund in balance. The current rate of top-ups would be sufficient for a scenario like this. It should be noted that this scenario is very fragile; it requires extending the COR's pension spending projections beyond 2050. This scenario is illustrated in Figure 9, which notably represents the changes in the average equilibrium contribution rate, defined as the relationship between benefits paid by the different pension

Figure 9

Using the FRR to Smooth Spending Growth



Scope: Metropolitan France.
Note: this figure schematically illustrates the use of the FRR in this approach. The equilibrium contribution rates cannot be seen as a result of projections.
Source: INSEE, INED, CCSS, DGTPE calculations.

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4 The *Conseil d'orientation des retraites* (Pensions Steering Commission), founded in 2000, comprises members of both chambers of parliament, representatives of the social partners, experts, and government representatives. Its purpose is to continuously monitor and perform concerted expert appraisals of the old-age insurance system and to make proposals.

5 By convention, these adjustments are generally expressed in terms of "additional contribution points" required to bring accounts into balance. But they can just as easily result from a reduction in spending or a broadening of the revenue base.

BOX 2
Reserve funds in other countries

The United States and Sweden pioneered the concept of pension reserve funds in 1944 and 1960 respectively. Subsequently, growing realisation of the effects of the demographic shock led to the creation of similar funds in most of the rich countries almost simultaneously in the 1990s. While most of these funds are smoothing funds, they differ in terms of their size, forms of governance, and sources of funding and methods of control.

Norway: The *Government Pension Fund – Global* was set up in 1990 and began to be built up from 1996. This fund is managed by the Central Bank of Norway and has no legal autonomy, being under the supervision of the Ministry of Financed and controlled by parliament. Its assets were equivalent to 83 per cent of GDP in 2006 (around 278 billion USD). It is funded mainly out of oil and gas revenues.

Its assets are invested in equities (40 per cent) and bonds (60 per cent) (in 2006), and entirely outside Norway. The aim of the fund is to ensure inter-generational equity in the sharing of the financial windfall generated by the country's oil and gas resources.

The United States: The *Social Security Trust Fund* was set up in 1940. It is an integral part of the pension system and the Board of Trustees consists of members of the Federal Government and Congress. It submits an annual report to Congress. Its funds stem mainly from pension system surpluses, employers' and employees' contributions, and additional payments by government. Its assets were equivalent to more than 15 per cent of GDP, or 2,048 billion USD in 2006, and must be invested in Treasury bonds (currently entirely in US Treasury bonds). This fund has a smoothing function but is not intended to fall to zero.

Sweden: The *AP-Fonden* were set up in 1960 and reorganised in 2001. These are five Independent bodies each with its own board of directors, some of whose members are appointed by the government. Their assets were equivalent to 31 per cent of GDP in 2006 or 117 billion USD, and are invested in equities (60 per cent) bonds (6 per cent) and other asset classes (4 per cent). Their aim is to smooth the pension system's expenditures and revenues.

Japan: The *National Reserve Fund* was set up in 1959 and was progressively transformed into an independent agency between 2001 and 2006, run by Ministry of Finance experts. Its assets were equivalent to 28 per cent of GDP in 2006, or 1,217 billion USD, invested in equities (22 per cent) and bonds (52 per cent). Although this fund has no explicit aim, it may be considered as a half-way house between a smoothing fund and a permanent fund.

schemes and the total wage bill of contributors to those schemes. It should be noted that this scenario is based on the assumption of a lengthening of the duration of contributions in order to qualify for a full pension to 164 quarters in 2012 and 166 in 2020, the assumption used in the COR's updated projections in November 2007.

2.3 A permanent additional pension fund

Finally, a pension reserve fund can be designed as a permanent means of additional funding for the old-age insurance system. After the fund's build-up phase, its capital is preserved and its investment income contributes to the financing of pension spending. The fund is then akin to a

"collective pension fund". In that case, the pension system stands in a middle position between a pure pay-as-you-go system and a funded system.

This kind of fund needs a substantial capital base in order to play a significant role in the system's financing. For example, the *Charpin Report* in April 1999 envisaged a reserve equivalent to a minimum of 10 per cent of GDP (at the end of 2007, the FRR was equivalent to around 1.5 per cent of GDP). This approach calls for a substantial and durable process of accumulation. Given today's very limited financial leeway, this would imply a major financial effort. It would have been possible and less costly to implement this, had the advantage of the benign baby boom demographic shock been taken several decades ago.

Few countries have followed this path. The only countries with reserves representing 10 per cent or more of GDP in 2006 were Norway (83 per cent of GDP), Jordan (46 per cent), Sweden (31 per cent), Japan (28 per cent), South Korea (21 per cent), the United States (16 per cent) and Ireland (11 per cent) (Box 2). Either these funds were set up a long time ago, as in the cases of Jordan, Japan, Sweden, South Korea and the United States, or they have benefited from an oil and gas "windfall" as in Norway's case, or again from particularly robust economic growth as in Ireland's case.

2.4 A fund for the short-term smoothing of economic shocks

A possible variant scenario might be a fund for the short-term smoothing of economic shocks. This would have a short horizon, corresponding to 5 to 10-year economic cycles, requiring smaller reserves. On this view, the fund would be intended to be permanent.

3 Conclusions

The main purpose of this study was to analyse the demographic factors and their impact on pension systems, and to consider the role a reserve fund can play in the context of the divergence from the long-term equilibrium. The study deliberately does not deal with the question of the financial management of the reserves. In particular, in the projections presented in Section 2, a purely normative assumption has been used for the return on reserves, corresponding to the average return on bonds over the long period (namely a 3 per cent real return).

Actually, a reserve fund's investments may be more profitable than repayment of Government debt, thereby generating leverage. This is because, despite a substantial short- and medium-term risk, asset prices exhibit a reversion to a trend over the long period. Consequently, a reserve fund can go overweight in risky (and hence high-yield) asset classes for as long as the disbursement horizon is distant, thus benefiting from attractive returns combined with limited long-term risk. By defining its schedule of income and disbursements, the FRR can optimise its returns for a given level of risk. However, even with a distant and well defined disbursement horizon, investment in the FRR would still be riskier than paying down the public debt.

Leverage is obviously not contradictory with the Fund's assigned objective (see above). But this leverage cannot be taken as the prime function of a reserve fund, and its size cannot be precisely calibrated on this basis.

BOX 3
The history of the FRR

Taking its cue from foreign examples and the report of the *Conseil d'Analyse Economique* (Council for Economic Analysis),[6] the French Government decided in September 1998 to set up a reserve fund for the pay-as-you-go pension system. This fund was meant to be constituted "without additional (employer and employee) contributions" out of exceptional resources and the surpluses of welfare schemes and those of the Caisses d'Épargne savings banks. It was thus expected to go "a long way towards" solving the pension system shortfall looking to 2005-2010. Consisting of "several tens of billions of francs", the fund was required to invest primarily in French government securities and bonds. It was to be established and administered in consultation with the social partners.

The FRR was set up by the 1999 Social Security Funding Act within the *Fonds de Solidarité Vieillesse* (FSV Old Age Solidarity Fund). The bill's preamble stated that this reserve fund was being set up in order to preserve the future of the pay-as-you-go pension system. Three categories of income could be allocated to it, namely available surpluses from the *Contribution Sociale de Solidarité des Sociétés* (social solidarity contributions paid by companies), the surplus on the "solidarity section" of the *Fonds de Solidarité Vieillesse*, and any other resources designated by law or regulations. The Government planned to allocate 2 billion francs in 1999 under the first of these categories, with the possibility of allocating additional resources in the course of the year.

In April 1999, the *Charpin Report* raised a number of questions regarding this newly-created fund, namely: what was its objective, between "smoothing the expected increase in contribution rates" and permanently supplementing the pension schemes' resources? How to replenish this fund on the basis of this objective? What type of investment should the fund favour? And what should be the fund's form of governance?

The Government announced its intention to strengthen the reserve fund in 2000. Based on the financial projections contained in the Charpin Report, the time horizon for the fund's utilisation was put back, with disbursements starting no longer in 2005 but in 2020. The plan was to finance the fund thanks to the maintenance of a benign demographic situation until 2006, and thanks to a return to growth and full employment. The intended resources were spelled out: 500 billion francs from CNAV, FSV and CSSS surpluses were to be added to the fund's 20 billion francs at the end of 2000; of the additional 500 billion, 150 billion would be drawn from the social levies on investment income, and 330 billion from these reserves' own interest and investment income. Overall, the Fund was expected to exceed 1,000 billion francs looking to 2020. It should be noted that the Fund was set up at a time when the public finances were recovering (even though the general government financial balance has been continuously negative), notably on the strength of the robust economic growth in the late-1990s. The FRR became autonomous on 1 January 2002, taking the form of a Government administrative public institution (*établissement public de l'État à caractère administratif*) under State supervision, with a Management Board and a Supervisory Board. The 20-member Supervisory Board is made up of 4 members of parliament, five representatives of social security "insureds" designated by the five trade union confederations, five

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[6] Davanne, O. (1998), "Eléments d'analyse sur le système de retraite français" (Elements for an Analysis of the French Pension System), *Retraites et épargne*, CAE, July.

representatives of employers and self-employed workers (two designated by the Medef-employers' federation, one by the CGPME-federation of SMEs, and one by the UPA-crafts and trades people's federation), four State representatives, and two qualified personalities.

- The Supervisory Board is responsible for setting broad guidelines for the Fund's investment policy, appointing the Statutory Auditors, controlling the Fund's performance, closing the financial statements, and drawing up a public annual report on its management.
- The Management Board of the Pensions Reserve Fund consists of three members and is chaired by the Chief Executive of the *Caisse des dépôts et consignations*. The Management Board manages the institution and is "accountable for its proper functioning". It is notably responsible for submitting broad guidelines for the Fund's investment policy to the Supervisory Board and for implementing the said guidelines, drafting specifications for invitations to tender to manage the assets of the FRR (via mandates entrusted to investment firms).

In 2003, the Supervisory Board of the Fund laid down the broad guidelines for the Fund's investment policy, appointed the asset managers' selection committee, and issued the first invitation to tender for asset management mandates. The strategic allocation is diversified, with both Eurozone and non-Eurozone equities and bonds. The predominance of equities serves to achieve high returns, the associated risk being smoothed by the distant horizon for disbursements. The process of investment gathered momentum in 2004.

The strategic allocation formulated in 2003 was refined in 2006, based on an assumption of constant disbursements over the period 2020-2040. This change of objective and the lengthening of the disbursement period has led to a shift in the strategic allocation in the direction of greater risk, an increase in the equity weighting (from 55 to 60 per cent), greater diversification, with an increase in the proportion of non-Eurozone investments and investments in property, infrastructures, raw materials and private equity.

COMMENTS ON SESSION 3
PENSION REFORM, REDISTRIBUTION, MACROECONOMIC IMPACT

Carlo Cottarelli[*]

The two papers on which I was asked to comment – "Macroeconomic Implications of Pension Reform" by Ray Barrell, Ian Hurst, and Simon Kirby; and "Poverty and Income of Older People in OECD Countries" by Asghar Zaidi – cover quite different topics and I will have to take them up in turn.

1 Comments on "Macroeconomic Implications of Pension Reform or How to Pay for the Crisis" by Ray Barrell, Ian Hurst and Simon Kirby

The paper by Ray Barrel and others uses the global macro model of the National Institute of Economic and Social Research to assess the macroeconomic effect of pension reform and, more specifically, of increases in the perception of expected life, and of increases in working life.

This is a very useful paper. The National Institute model, has many features that make it useful for the purpose of assessing the macroeconomic effects of the pension reforms, including being a general equilibrium model, its possible use for assessing the behavior of small but also large open economies, and, last but not least, the fact that its parameters have been estimated not imposed, unlike other general equilibrium dynamic models.

This said, I have some observations to offer, and some related questions.

First, as underscored by the website of the National Institute, the National Institute model (NiGEM) is "designed to be a flexible model, where assumptions on behavior and policy can be changed. Hence, there is no such thing as "the NiGEM simulation results suggest" but rather, "under these assumptions, the NiGEM simulation results suggest". In this respect, the paper does clarify what the assumptions are for the various scenarios, but the authors could have underscored better where some results depend on certain assumptions. More to the point, I would suggest undertaking more sensitivity analysis with respect to the various assumptions, including the speed through which agents respond to reforms. I will come back to this.

Second, the paper explores the macroeconomic effect of an increase in the perception of expected life. It argues that raising the retirement age will increase people's perception of their life expectancy. The question is whether there are any empirical studies to support this assumption.

Third, the paper looks first at the effect of an increase in expected life, for a given working life, then at an increase in working life, given expected life, but it does not look at a combination of the two, which would have been interesting.

Fourth, I am a bit skeptical about the quantitative results achieved for the euro area. For example, the equation describing the transfers to the population for pensions and unemployment benefits is the same across all countries and, therefore, does not take into account country-specific features of the pension system. So, I am not sure I can trust the key numerical result of the paper, namely that raising the retirement age by 2 years in the euro area would save 40 percentage points of GDP in the long run. More work is needed here.

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The opinions expressed herein are those of the author and do not necessarily reflect those of the European Central Bank or the Eurosystem.

Fifth, it would have been interesting to assess some of the results in light of the current crisis. For example, the paper assumes that the availability of increased labor following an increase in the retirement age is fully anticipated, which will provide the market enough time to adjust. In practice, however, how fast markets will adjust would depend on the state of the macro economy. For instance, it would be difficult to raise capital investment in the current global economic slowdown to accommodate the increased labor supply.

This raises my last and more general point, a point that is of key policy relevance. I am referring to the fiscal costs of the current crisis. I fully agree with the authors that pension reform, to be implemented gradually but legislated quickly, should be a key component of a strategy to finance the fiscal costs of the crisis, or, in other words, to allow governments to run in the short run expansionary policies while maintaining credibility in the long run solvency of public finances. However, from a purely accounting/budgetary perspective, saying that the cost of the crisis will be 40 per cent and that we can finance this by increasing the retirement age by 2 years is a bit misleading, because even before the crisis, increasing the retirement age by 2 years or more was necessary to ensure debt stability in the long run in European countries.

This said, I think the policy message remains appropriate. We should worry less about an increase in public debt, even as large as the one that we are experiencing now in all advanced countries, if, at the same time, these countries can show the ability to undertake reforms that will address the unresolved long-term pension problem. The paper recently prepared by the Fiscal Affairs Department of the IMF on "The State of Public Finances: Outlook and Medium-Term Policies After the 2008 Crisis" (http://www.imf.org/external/np/pp/eng/2009/030609.pdf – published on our website on March 6 and forthcoming as an IMF Occasional Paper) includes an interesting statistic. In NPV terms, the fiscal cost of the crisis is about 10 per cent of the future cost arising from aging for advanced G-20 countries. So you can go a long way in strengthening the perception of long-term solvency, in spite of the short-term costs of the crisis, by reforming the entitlement system.

2 Comments on "Poverty and Income of Older People in OECD Countries" by Asghar Zaidi

The paper is mostly descriptive. It does includes some interesting statistics on poverty across OECD countries. However, my general comment is that its findings could potentially be very sensitive to the measurement methods and the definition of poverty adopted. Therefore, some sensitivity analysis would be required to strengthen the robustness of the results.

The most relevant case in point is that the paper should acknowledge that the discussion of absolute versus relative poverty concepts is not settled, and take this into account by showing how sensitive the results are with respect to the use of alternative measures of absolute poverty. Important drawbacks of relative poverty measures, some of them particularly relevant in the case of pensioners, include:

- first, the fact that the purchasing power of the poor is obviously very different across countries. It would be, therefore, useful to define a consumption basket that could be considered as the minimum standard. The concept of a consumption basket is also more in line with the fact that individuals derive utility from consumption rather than from income;
- second, the focus on relative poverty can lead to misleading representations of poverty developments. Examples are mentioned in the text of the paper but mentioning them is not a solution. For example, in countries that experienced sharp growth spurts in recent years, where the income of the working population increases significantly while not affecting the

income of the old by the same extent, the use of the relative poverty indicators results in concluding that poverty in old age has increased;

- the focus on relative poverty could also lead to justify redistribution in favor of individuals who may hold sufficient assets or income to live comfortably;
- in this connection, the fact that measurements of poverty in this paper do not take into account household wealth should be highlighted. With growing household access to financial markets in many OECD countries in the sample, people in retirement could potentially receive significant interest or other non pension-related income arising from their wealth.

COMMENTS ON SESSION 3
PENSION REFORM, REDISTRIBUTION, MACROECONOMIC IMPACT

Glenn Follette[*]

1 Introduction

I, too, want to thank and congratulate Daniele Franco and his team for putting together this wonderful conference. I hope that my remarks will be as helpful as those of the earlier speakers. I was asked to comment in particular on Adi Brender's piece on the "Distributive Effects of Israel's Pension System" and Mallavarapu Ramaiah's "Some Reflections on Pension Reforms in India". These papers demonstrate the complexities of actual pension systems and the importance of the details in designing such programs. Because these design features depend on the goals of the pension system, it is critical to begin by outlining the principal goals of pensions and pension policies.

Let me posit the objectives for government pension policy. Of course, the overarching aim of pension programs is to provide financial well-being during retirement. Policymakers evaluate this goal by paying particular attention to several criteria: 1) the system's ability to alleviate poverty among the elderly, 2) the adequacy of retirement income relative to income during the working years, 3) the distribution of income within and across cohorts, and 4) the distribution of risk bearing and risk sharing within and across cohorts. Risk can come from various sources, including shocks to labor market and household composition, the variability of investment returns while working, and the risk from inflation and outliving ones assets when retired. As we have seen in the earlier sessions, the trick in designing a pension system is to meet these goals without distorting labor supply or savings decisions while maintaining solid public finances. This has proved difficult and has led to much reform of the pension sector. I think that most recent reforms have been driven by the desire to reduce government budget imbalances.

The design of each country's pension system and the reforms undertaken depend in large part on the relative importance of each of these goals. One canonical design is the three pillars. The three pillars are:

1) a universal poverty-level pension that is government-provided by nature.
2) a mandatory earnings-related pension, which could be either a defined benefit (DB) or defined contribution (DC) plan and which is funded by the individual, employer, or government.
3) voluntary retirement savings, where the government role may include fomenting reliable financial institutions with suitable investment products, introducing dedicated individual retirement accounts with restrictions on withdrawals and favorable tax treatment of contributions, investment returns, and/or disbursements.

With respect to the goals I outlined above, the first pillar protects the elderly from absolute poverty, but does not protect them from a large decline in their standard of living relative to their working years. It also provides some redistribution of income and risk sharing. The second pillar is in place to ensure adequate retirement income, the second goal. The design choices of how it is funded and whether it is a DB or DC plan has important implications for the distribution of income and risk sharing. Policymakers use the third pillar if the first two pillars do not generate enough retirement income or to offset distortions or incentives elsewhere. Israel has adopted a version of the three pillars. In contrast, India's structure appears to lack the first pillar, the second pillar is not

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completely formed as it has very low coverage across workers, and the third pillar is also under construction. Looking at the choices made by India and Israel, it appears that India puts relatively less weight on the goals of old-age poverty prevention and income redistribution than does Israel.

2 Comments on "Distributive Effects of Israel's Pension System" by Adi Brender

Let me turn to Adi Brender's paper on Israel. It clearly laid out the key parameters of the pension system and the simulations of the combined Old-age Allowances (OAA) and pension program were quite instructive. Israel has shifted from a DB plan to a somewhat smaller DB plan (the OAA) augmented by a DC plan with tax benefits. The DC plan is now mandatory. Thus, the plan resembles the three pillars. Brender uses 10 household types to examine the distribution of net benefits of the pension system and adequacy of retirement income. He simulates retirement income and taxes for households assuming that the DC plan is utilized up to the limit by all households and the real rate of return on the portfolio is 3.5 per cent. The simulations were quite helpful in understanding the working of the system. That said, the simulated households should be linked up with the quintile measures shown in many of the tables. For example, I think it might be helpful to reorganize the 10 types of households into 9 types with three levels of income and three types of family structures: first quintile, middle quintile and top quintile; single, married one-worker, married two-earner. This would allow the reader to link the simulations to the quintile-based analysis.

His first conclusion is that gross OAA benefits are distributed fairly evenly across households. As shown in Table 11, the complex formula for OAA benefits essentially boils down to $7 million NIS for single households and $1.1 million in benefits for couples. Given that $1.1 million NIS, when annuitized, is equivalent to 94 per cent of the wages of a continuously employed manual worker, it appears that the OAA is effective at providing poverty protection for low-income couples. Indeed, even for single households, where the benefit is only $0.7 million NIS, the replacement rate is 50 per cent of wages and the benefit is roughly equal to the poverty line. According to these calculations, the first pillar is well designed at preventing poverty among the elderly. That said, these stylized households may not capture all the variation in work and household formation experiences. For example, the paper on pension adequacy in Belgium, Italy and Germany (Dekkers *et al.*) suggests that the "messiness" of real life sometimes ends in poverty in old age – with systems that appear to be more generous than the Israeli system. Thus, I would like to know more about the adequacy of the OAA at poverty prevention for low- and moderate-income families for a wider range of work/marriage histories. I understand how challenging this would be and that it may be beyond the scope of this work; however, this is critical for judging whether the OAA is sufficient, a key determination of the paper.

The second major conclusion of the paper is that the mandatory DC program is too large for many households as it will deliver too much income in the retirement years and result in too little disposable income during working years. For example, because the OAA delivers benefits equal to 94 per cent of earnings (Table 12), low-income couples do not need additional pension income beyond the OAA to maintain their working years' standard of living (see type 1). By contrast, low-income singles (type 6), with only a 50 per cent replacement rate, will need additional income. In addition, OAA benefits for middle- and upper-income households are insufficient for adequate retirement income. For middle-income households, it appears that the OAA replacement rates are similar to those delivered by the U.S. social security system and that a second pillar is clearly needed for the middle-income group. However, the mandatory DC plan will generate too much

saving for most households as is shown by column 2 of Table 12, particularly for low-income households.[1]

As a result, Brender recommends that the DC plan not be made mandatory because doing so will cause lower income groups to save too much. This would not be a problem if households could offset the over-saving elsewhere. However, I suspect that over-saving in the retirement accounts will be difficult to offset by lower saving elsewhere – e.g., less precautionary saving or less housing wealth. Therefore, with saving too high during working years, households may adjust by reducing labor supply as workers near the retirement age, thus creating a material distortion in labor supply.

But is a voluntary DC plan the best solution? In the U.S., voluntary savings plans such as IRAs and 401(k)s have only 60 per cent take up rate and fairly low levels of asset accumulation. This suggests that if the pension plan were voluntary, then many households would enter retirement with too little saving because they would rely only on the OAA. Brender presents evidence that indicates that many Israeli households do save in voluntary accounts, but that contributions rates are low for low-income employees. My reading of his evidence is that it is consistent with the U.S. experience and thus that a voluntary plan would lead to too little retirement income for many households.

An alternative response to the over-saving problem would be to make several adjustments to the parameters of the OAA and DC programs. First, since overall replacement rates are too high, the mandatory pension program could be scaled back significantly, perhaps by a third. This would reduce the amount of over-saving at the low end but would not eliminate it. Second, the relative importance of the OAA and the pension plans could be shifted towards pensions – which are proportional to income – and away from the flat benefit. In itself, this would help flatten the net replacement rate and reduce the tendency for over-saving at the bottom end of the distribution. Third, because shifting from the OAA to pensions would shift the net tax burden towards lower income families, that aspect could be undone by subsidizing a portion of the pension savings. With these three changes, the two pillars could be adjusted to largely eliminate the over-saving problem without creating an under-saving problem.

The third major contribution by Brender is his examination of the distributional aspects of the combined OAA/pension programs. He concludes that net benefits (gross benefits plus tax benefits, net of contributions) are distributed fairly evenly across households in terms of shekels per adult. Brender makes an important point that one needs to look at the whole tax system to make a judgment on progressivity, especially since it is not self-financing.

One extension to Brender's paper would be to examine the adequacy of the new pension system under different assumptions about rates of return. The new system also shifts investment risk to workers, which will create more variation in replacement rates than shown here where the real return is assumed to be constant. This also may affect desired target replacement rates as actual replacement rates will vary.

3 Comments on "Some Reflections on Pension Reforms in India" by Mallavarapu Ramaiah

[1] The replacement rates reported by Brender exclude any income or assets outside the OAA and DC plans. Thus actual resources available at retirement would be even higher. However, Brender's calculations exclude simulated mortgage payments from income during working years. By comparing post-retirement income to pre-retirement income excluding mortgage payments, he implicitly assumes that housing wealth is de-cumulated during retirement.

Turning to Ramaiah's "Some Reflections on Pension Reforms in India," my first suggestion is that Ramaiah should include a short description of the goals of the pension reform and which features of the reforms addressed these goals. Before the recent reforms, India essentially had a defined benefit plan with low coverage – civil servants and a portion of those in the formal economy, only 12 per cent of the workforce – which was seen as unsustainable. The new system is a defined contribution plan that is mandatory for civil servants and those in the formal workforce. The only subsidy/transfer from the government is in the form of tax benefits for the DC program. According to the paper, the key benefits from recent reforms include: a more sustainable pension system, a unified regulatory framework, improved system parameters such as portability across employers, and the creation of pension institutions that can be expanded into other sectors. However, coverage has not been expanded, and risk, in many dimensions, has been shifted from the government/taxpayer to the household. The net benefits, as they come from tax preferences, are probably regressive, but one also has to account for the other taxes to finance the system to make a judgment on the overall progressivity of the pension reforms.

This description leads me to several questions. As noted in the paper, India's demographics are very favorable. Over what horizon was the former system putting pressure on government finances? How much improvement in public finances was accomplished as a result of the reforms? Shifting from pay-as-you-go to funded systems for new entrants leaves a financing hole for the pay-as-you-go system. How was that filled? According to U.S. experience, preferential tax treatment may not boost voluntary saving for retirement significantly. What options are being contemplated to expand coverage in the private sector?

Turning to the design of the DC plan, the paper lacks some of the key parameters of the DC plan, such as size of contributions, expected replacement rates, and the type of disbursement at retirement (nominal annuity, real annuity, lump sum). DC plans for low-income workers tend to have relatively high administrative costs. It is asserted that the Indian system has low costs compared to prevalent charges in the Indian mutual fund industry, but no data are provided. How do the administrative costs for the Indian plan compare to other countries' experiences? Are the centralized recordkeeping and administration costs subsidized by the government, and does centralization materially reduce costs? According to the paper, individuals choose fund managers, and these funds have limited amount of flexibility over portfolio choice.

Ramaiah provides a substantial discussion concerning the composition of portfolios (between equities and bonds) and the creation of an "auto choice" plan with an age-varying portfolio. Given the relatively low limits contemplated for equity investments, it appears to me that the riskiness of bond portfolios may be under-appreciated in this discussion. For example, Shiller (2005) shows the rates of return are much higher for equity portfolios than for bond portfolios and the riskiness between the two is little different when examined over long periods of time.[2] The recommendations are heavily weighted towards bonds, but bond portfolios may have significant inflation risk. Are inflation–protected securities available for the investment funds, or is the government contemplating issuing them? Moreover, there is no discussion about whether the pension benefits will be delivered as a real or nominal annuity. Inflation protection of the benefit during retirement may be as an important element of risk for the household as is the portfolio return during working years.

4 Conclusion

[2] Shiller, R. (2005), "The Life-cycle Personal Accounts Proposal for Social Security: An Evaluation", NBER, Working Paper, No. 11300, April. The equity portfolio exhibited a wider range of returns, but the lowest outcome was higher than the 25th percentile outcome of the bond portfolio. Thus, the extra variance was all at the high end of returns, not a greater chance for losses.

Israel has adopted a three pillar structure for its pension system. The new system should provide good protection against poverty, *more* than adequate income security, and an adequate amount of risk sharing via the minimum benefit. Brender shows that the combined program may be too large and that better integration of the two systems is needed. India has adopted the second pillar via a mandatory DC plan (for some sectors) and is trying to improve the third pillar by improving financial institutions and by giving retirement savings favorable tax treatment. Its challenges will be to complete the roll-out of the current program, to extend the quite limited coverage, and to create a first pillar. Both papers indicate that the changes improve public finances, but the magnitude of the adjustment should be indicated. Also, it is unclear whether imbalances still remain.

COMMENTS ON SESSION 3
PENSION REFORM, REDISTRIBUTION, MACROECONOMIC IMPACT

Laurent Paul[*]

First and foremost, let me express my gratitude to Daniele and his colleagues at the Banca d'Italia for their warm welcome and the wonderful organization of this Perugia symposium.

Economists, in my view, forget too easily that the ultimate objective of economic policy is not price stability or the soundness of public finances but poverty reduction. Therefore I am happy to be asked to comment two articles that deal with that issue.

The article by Franco *et al.* uses micro data to illustrate disparities existing across European countries in terms of level of poverty. Its main conclusions are: (1) poverty rates differ significantly among countries and across categories (children, adults and elderly); (2) the highest poverty rates for children and the elderly are found in the group of Anglo Saxon and Southern European countries; and (3) but, whatever the group of countries, it highlights a pro-old bias in the design of public policies which seems to give more assistance to the elderly compared to children.

The article by Dekker *et al.* aims at assessing, thanks to a micro simulation model and on the basis of the Ageing Working Group (AWG) projections, the foreseeable impact on pensioner's income of the recent reforms of PAYG schemes implemented in three countries: Belgium, Germany and Italy. Its main conclusions are not surprising for fiscal experts: (1) a large decline of pension levels and replacement rates must be expected; (2) demographic ageing has a significant impact on the future adequacy of pensions. Indeed, the risk of poverty pertaining to pension benefit recipients strongly increases by 2020 and then tends to decrease a bit; and (3) impact of parametric reforms (Belgium, Germany) and systemic reforms (Italy) on redistribution and poverty go into the same direction but the magnitude differs (it is higher in the case of Italy).

If we attempt to make a synthesis, we can say that both articles have a common feature. They deal with the impact of public policies on the poverty rate. It is true that poverty is also sensitive to factors like demography, economic, social or cultural conditions, and its level and distribution across the age categories are to a large extent dependent on the design of public policies. Thus, the two articles raise important converging questions:

- how can we account for the pro old bias and should it be corrected?
- do the reforms aimed at curbing the rise in pension expenditure endanger the necessary solidarity between generations?

The first issue raised by the two articles is the definition of poverty. The answer is not evident as poverty is a multi-dimensional concept which can be captured with different indicators:

- the easiest way to define poverty is to consider monetary indicators as Franco *et al.* do. In Europe, Eurostat computes for each country a poverty threshold equal to 60 per cent of the median income in the country under review. This indicator is easy to monitor and series are available on a long period. But the measure of poverty is relative as the indicator is based on the living standards of households in each country;
- there are also composite indicators on human development computed by the United Nations or the World Bank and which take into account different parameters like life expectancy, housing conditions, access to medical care, education, drinking water, etc…;

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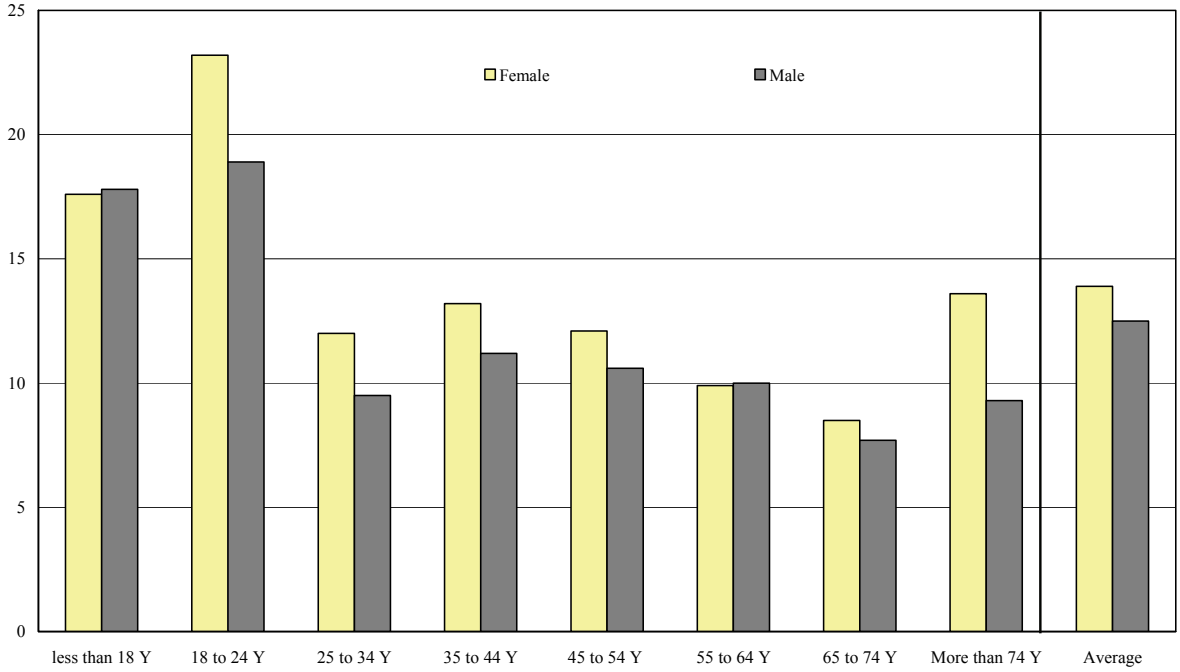
Figure 1

Proportion of Persons below the Poverty Rate (60 per cent of Median Revenue) in France
(percent)



Source: French National Statistical Office.

- then, there exists subjective poverty indicators aimed at capturing the way people assess their own living standards. Indeed, how living conditions are felt can be significantly different from the picture given by statistics taking into account your environment.

Obviously no indicator is able to describe the whole reality. In addition, you must keep in mind that poverty has always some national specificity. First, each society is more or less tolerant towards poverty, which will define the level of public redistribution; Furthermore, redistribution can go through other channels than public intervention. Last when you examine the poverty rate today, you always have to find its main origins in the past, as poverty remains to a large extent an inheritance of history.

To illustrate the impact of public policies, I inserted in my discussion the figure above about the distribution of poverty across the age for France in 2007.

The figure is consistent with the general conclusions of the Franco *et al.* article. Poverty rates are higher for the younger It is a little surprising in the case of France as the country developed a very generous family allowance scheme (which partly explains why France kept a relatively high fertility rate). But family allowances are not means-tested and are therefore insufficiently targeted on families with low revenue. An additional problem is the very high rate recorded for young adults between 18 and 24. In France young adults are especially hit by poverty because of high unemployment for those leaving the education system without any diploma and also because of the existence of a hole in the nest of public benefits. Indeed, young adults are no more eligible to family allowances which stop at the age of 20 and the minimum benefit for adults in state poverty

starts at the age of 25. This illustrates how the design of public policies can play a very important role to explain the distribution of poverty in the population.

The article by Franco *et al.* draws a very comprehensive picture of the state of poverty in the European Union 27 countries. Furthermore, it raises very relevant issues on the stance of public policies aimed at reducing poverty and their apparent pro old bias.

My first comment is about the limits inherent to monetary poverty indicators. First, they are relative indicators that give a picture of poverty rates for each country but say nothing about poverty levels. Thus comparisons between countries are made more difficult (better to be poor in Sweden than in Romania). Moreover these indicators are computed on a national basis which let room to huge disparities across regions within a single country (e.g., North and South of Italy). Lastly they are based on the official data and they do not take into account the informal economy, self consumption or the extent of family support, all phenomenon's that can greatly reduce poverty. Conversely, drop outs such as illegal migrant workers are beyond the scope of official indicators.

Moreover, although I do not question the existence of a pro old bias as reflected by the distribution of public expenditure across the age, I wonder whether this bias should be corrected by the fact that young people, even if they get less direct benefits from the public administrations compared with the elderly, do get indirect assistance through the allowances received by their parents. Thus, children poverty could be partly overestimated.

At the end, the article by Franco *et al.* raises a very important question for the European countries. Should social policies be reoriented in favour of the young people? At first thought, I would be tempted to say yes for the two following reasons. First, we need to increase potential growth in Europe. And to reach that objective one instrument is to help active or future active people in order they improve their contribution to the labour force. Then there is the argument of effectiveness: reducing children poverty should contribute to contain the elderly poverty in the future because poverty is frequently received in inheritance.

In addition, I think that understanding the roots of poverty cannot be based only on a picture of poverty rates at a given date. What is also very important is to assess why the persons have been trapped in this situation. It can be done through comparative studies over time and microeconomic analysis aimed at finding if poverty traps are existing or which trajectories fuel the population in poverty state in each country.

The article by Dekkers *et al.* takes a prospective view centred on the impact of recent reforms of pension regimes on the income level of retirees. Indeed this issue is crucial. Taking the example of France, although the same trend was observed in most of European countries, the elderly poverty continually receded as from 1945 thanks to several factors (extension of the coverage of pension systems, more generous pensions, and an increase in the women participation rate). Today, the poverty rate is lower than that of the working population but a reversal risks occurring under the impact of the rise of unemployment which makes it difficult to get full pension benefits and population ageing which threatens the financial balance of pay as you go pension systems.

As a preliminary remark, the AWG cannot be criticized for having disregarded the issue of poverty as its mandate is to assess the foreseeable development of the financial balance of pension regimes and not the adequacy of pension benefits;

I will not comment the results of the MIDAS model but I think we should be cautions with their interpretation.

First, one should keep in mind that the model does not thake into account income other that pensions in the framework of public systems. Capital income is not in the scope of this study nor

capitalization funded schemes developed as a replacement to the lesser generosity of PAYG systems.

Also the model is based on Gini coefficients which feature the development over time of pension distribution. This constitutes a relative value analysis which does not necessarily imply a rise in poverty but merely an increase in the risk of poverty. Indeed, you can record at the same time a reduction of poverty if a system of minimum pension is implemented by the government. At last, like any long term projection, adjustments even very small in the parameters related to demography and economic growth may substantially change the results.

A very important question is raised by the paper. Should the objectives of current pension regime reforms be twofold: sustainability and reduction of poverty?

The main problem in my view is the insurance logics inherent to a pension scheme and the need for solidarity is difficult to mix. PAYG schemes or funded schemes as well imply a close link between the financial effort of contributors and the benefits they will be entitled when they retire. Certain specifics risks (spouse survival, disability) may be covered within these schemes through risk pooling. However, for those who have not contributed at all or too little, a specific financing has to be found to guarantee a minimum pension which can be brought only through the State budget.

The article by Dekkers *et al.* gives relevant simulations on the foreseeable development in pension income compared to income received during working life. Within this framework, I would suggest the authors some ways to go further by testing additional variables which could produce a substantial impact on the central scenario:

- an increase in women participation rates;
- changes in migration flows;
- an extension of the number of retirees holding simultaneously an activity.

At last, I wonder whether it is possible to extend the model in order to take into account other factors that can interfere in the elderly poverty rate such as the household capital and the impact of public policies.