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TOWARDS SUSTAINABLE BUT STILL ADEQUATE PENSIONS IN THE EU

THEORY, TRENDS AND SIMULATIONS

JURAJ DRAXLER AND JORGEN MORTENSEN

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Juraj Draxler and Jorgen Mortensen*

This report is a summary of the research project on the “Adequacy and Sustainability of Old-Age Income Maintenance” (AIM). Thirteen institutes from across the EU have collaborated on the task of assessing the situation of today’s pensioners and providing insights into future trends and policy options for securing adequate income for EU pensioners.

The AIM project produced several state-of-the-art additions to the debate on EU pension reforms. Among others, the National Institute of Economic and Social Research in the UK calculated cohort spending for a sample of European countries to show how much countries need to save to take care of future pensioners. The team led by the Belgian Federal Planning Bureau developed the first EU, multi-country, dynamic simulation model for pension expenditure called MIDAS. A group of research institutes led by the Netherlands Institute for Social Research provided a current map of the social exclusion of the elderly in the EU.

The report starts with a discussion on what pensions we can consider adequate. Indicators of adequacy are proposed. Then, to determine the different pension mechanisms in existence in the EU and the prevalence of various kinds of schemes, the report provides an up-to-date classification of pension systems. This classification section is followed by an analysis of public opinion on pension reforms. While the public is generally in favour of the status quo, certain segments of the population fear and resist changes for diverse reasons.

The bulk of the study entails a statistical description of the material situation of the elderly in the EU-15 and the new member states, simulations of assorted policy scenarios and discussions on incentives to retire or stay in the labour force.

The broad conclusion of the report is that the pension incomes of future generations are under threat everywhere, mostly owing to demographic developments. Yet policy-makers have a range of reform options at their disposal that, when implemented with careful regard for the political and social context, can ensure adequate incomes of the elderly in the future.

Participating institutes

This report is a summary of the research reports produced within the AIM project, as interpreted by the authors of this document and with additional observations. Researchers from the following institutes took part in the project:

- Centre for European Policy Studies (CEPS), Belgium, Project Coordinator
- Federal Planning Bureau (FPB), Belgium
- Deutsches Institut für Wirtschaftsforschung (DIW, German Institute for Economic Research), Germany

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- Fundación de Estudios de Economía Aplicada (FEDEA), Spain
- The Netherlands Institute for Social Research (SCP), the Netherlands
- Istituto di Studi e Analisi Economica (ISAE, Institute for Studies and Economic Analysis), Italy
- National Institute for Economic and Social Research (NIESR), UK
- Centrum Analiz Społeczno-Ekonomicznych (CASE, Center for Social and Economic Research), Poland
- Tarsadalomkutatasi Informatikai Egyesüles (TARKI Joint Research Centre), Hungary
- Centre for Research on Pensions and Welfare Policies (CeRP), Italy
- Bratislava Institute for Economic Research (BIER), Slovak Republic
- Inštitut za ekonomska raziskovanja (IER, Institute for Economic Research), Slovenia

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Towards Sustainable but still Adequate Pensions in the EU:

Theory, Trends and Simulations

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1. Introduction

This report is the outcome of the project on the “Adequacy and Sustainability of Old-Age Income Maintenance” (AIM). This collaborative effort of 13 research institutes from across the European Union, led by the Brussels-based Centre for European Policy Studies (CEPS), was financed out of the EU’s Sixth Research Framework Programme and lasted three and a half years.

The programme broadly encompassed three components: a) analysis of the concept of adequacy, c) a statistical description of current pension provision and the social situation of the elderly and c) various simulations of policy options.

The project produced several empirically and methodologically unique additions to the debate on how to reform pension systems in the EU. The National Institute of Economic and Social Research (NIESR) in the UK calculated cohort spending for a sample of European countries to show how much countries need to save to take care of future pensioners. The team led by the Belgian Federal Planning Bureau (FPB) developed the first EU, multi-country, dynamic simulation model for pension expenditure called MIDAS. A group of research institutes led by the Netherlands Institute for Social Research (SCP) provided an up-to-date map of the social exclusion of the elderly in the EU.

Other studies dealt with particular theoretical aspects of pension system design and pension modelling, or provided additional empirical information on public attitudes, intergenerational features of pension reforms and various aspects of the interplay of labour markets and pension systems.

The objective of AIM has been to assess policy options in view of the need to reform pension systems to be better suited to the demands of the 21st century, as required by the Laeken summit of the European Council in 2001.

Why talk about adequacy? In the 1990s, the policy arena fully awoke to the problem of the sustainability of existing pension schemes. The World Bank published its report, entitled *Averting the Old-Age Crisis* (1994), which proposed to introduce significant funded components to existing public pension schemes. The report proved to be a successful blueprint for large-scale pension reforms in Central and Eastern Europe. Nevertheless, while crucial in bringing the demographic ageing problem to the attention of the public and the policy-makers, the document has been criticised as unreasonably extolling the virtues of funded schemes, and as paying critical attention solely to public pay-as-you-go (PAYG) schemes (Orszag and Stiglitz, 1999; Barr, 2001).

Indeed, in the meantime, it has become painfully clear that countries with significant funded, occupational schemes are also facing problems stemming from economic and demographic uncertainties. In the EU, the plans’ sponsors started to phase out defined-benefit (DB) schemes

in favour of defined-contribution (DC) ones (the UK), or base the payout on average income over the individual's working life instead of the final years (the Netherlands).

Reform efforts to improve the sustainability of pension schemes continue. Still, in the face of these efforts, the public demands that pension coverage remains adequate. Adequacy is a controversial term because it is difficult to base it on one universally accepted measurement. Moreover, public pension schemes, as components of larger welfare regimes, sometimes have roots in different objectives. In some cases, the original aim was simply to prevent people from falling into poverty. In others, pension schemes were intended to help individuals maintain their lifestyle and social position.

This project began with the effort to bring some clarity to these discussions. Adequacy is discussed at length and possibilities for measuring it are outlined. This foundation stone then forms the basis for the statistical and econometric exercises guided by adequacy and its twin concept, sustainability. Our report is divided into distinct sections, each of which is a summary of the papers written by individual researchers involved in the project:

- adequacy – the concept and its operationalisation,
- classification of pension systems in the EU,
- pension reforms and public opinion,
- approaches to modelling aspects of pension reforms,
- pension reforms and the labour market,
- ensuring sustainability and actuarial fairness,
- poverty and social inclusion of the elderly,
- maintaining living standards, and
- solidarity between and within generations.

It should be noted that this summary is indeed only a very brief introduction to the project's extensive individual reports.

The project has covered many aspects of retirement policies, from the political economy to simulations of particular reform options. The good news is that people seem to respond to economic incentives. Certain adjustments to pension rules can not only bring static savings but also change the behaviour of workers so that they create more funds for their adequate, and socially sustainable, pensions.

People seem to respond to economic incentives. Adjustments to pension rules can not only bring static savings but also change the behaviour of workers.

2. Adequacy – The concept and its operationalisation

In the discussions on sustainability, one can always have recourse to the notion of actuarial fairness. Indeed, this is why we discuss sustainability only in passing throughout the text. There is no similarly straightforward anchor for the concept of adequacy. Yet a discussion of adequacy *is* unavoidable in any analysis of pension systems leading to comprehensive policy recommendations. Pension saving is mostly mandated and enforced by state power, even if not necessarily state-administered. The highly politicised nature of the mechanism requires some

heuristics to indicate how much redistribution – over the life cycle of an individual, between individuals or between generations – is to be mandated. A series of policy documents at the EU level sets adequacy as one of the objectives of pension schemes (Box 1).

Box 1. Adequacy in EU policy documents[†]

The adequacy concept:

“securely financed, adequate income that does not destabilise public finances or impose an excessive burden on future generations, while maintaining fairness and solidarity, and responding to the changing needs of individuals and society” (Social Protection Committee, 2000).

The objectives of pension adequacy:

1) “[e]nsure that all older people enjoy a decent living standard, share in the economic well-being of their country and are able to participate actively in public, social and cultural life” (European Commission, 2001b).

2) “[p]rovide access for all individuals to appropriate pension arrangements necessary to maintain the living standard of their choice after retirement due to old age or invalidity and that of their dependants in the event of death” (European Commission, 2001b).

These objectives were further specified as i) preventing social exclusion; ii) enabling people to maintain living standards; and iii) promoting solidarity within and between generations (European Commission, 2003).

The sustainability constraint:

“adequacy, financial sustainability, and adaptability to change” as “the three broad principles for securing the long-term sustainability of pension systems” (European Commission, 2001a).

A general tool for implementation:

“a set of objectives and working methods with a view to creating an integrated framework for policy co-operation in this field. The aim is to help member states to develop their own national strategies for securing adequate and sustainable pension provision in the long run” (European Commission, 2001a).

Detailed tools to reach adequacy:

“public earnings-related schemes (first pillar), private occupational schemes (second pillar) and individual retirement provision (third pillar), provide good opportunities for most Europeans to maintain their living standards after retirement” (European Commission, 2002).

[†] This summary is based on Fornero and Vanriet (2005).

Despite the difficulties in defining adequacy, **Fornero and Vanriet (2005)**¹ argue that it is possible to construct a set of rules on adequacy that, while not prescribing adequacy as a one-dimensional concept, can allow us to choose from several criteria and then proceed to operationalise the concept and measure adequacy quantitatively.

2.1 The three dimensions of adequacy

The central problem to which a pension system is to provide a solution is the falling earning power of the ageing individual. A consensus seems to be emerging that a pension system needs to reflect both the need to keep individuals out of poverty as well as to allow them to maintain previous living standards. A recent World Bank report on pension reforms defines as *adequate* a pension system “that provides benefits to the full breadth of the population that are sufficient to prevent old-age poverty on a country-specific absolute level, in addition to providing a reliable means to smooth lifetime consumption for the vast majority of the population” (Holzmann and Hinz, 2005, emphasis added).

In a similar vein, the Laeken summit (2001), which fixed eleven objectives for pension systems ranging from financial sustainability to modernisation, mentioned two that specifically referred to adequacy. Pension systems should “ensure that older people are not placed at risk of poverty and can enjoy a decent standard of living” and “enable people to maintain, to a reasonable degree, their living standards after retirement”. A further requirement called for pension systems to “promote solidarity within and between generations” (European Commission, 2003). This third objective thus links the issue of adequacy to sustainability.

Pension systems should “ensure that older people are not placed at risk of poverty and can enjoy a decent standard of living” and “enable people to maintain, to a reasonable degree, their living standards after retirement”.

These three dimensions of adequacy can serve to create a map of objectives, covered risks, indicators, analytical tools and policy steps (Table 1).

Objectives

Consumption smoothing is the first, and given the falling poverty rates in industrialised countries in the last decades, increasingly the main objective of pension systems. The problem can be viewed as one of inadequate preparation for the post-productive life largely stemming from the inability of individuals to predict their changing needs (Bernheim and Garrett, 2003).

The *antipoverty* or *social protection function* of pension systems can be delivered essentially through two mechanisms. One is a universal basic benefit, granted on a citizenship basis, and the other is the system aiming more towards actuarial fairness, where the citizen is credited with notional contributions for the periods when he or she is not engaged in paid activity (periods of childbearing, caring, etc.).

The *generational compact* calls for the comparison of the living standards of the generations and may well call for a redistribution of income between them. If preparation for old age is inadequate in terms of consumption smoothing and prevention of poverty, the comparison of living standards might create a political push for redistribution from younger generations. As we see, the three basic adequacy objectives are intrinsically linked.

¹ AIM research, workpackage 1.

Table 1. A framework for the analysis of adequacy

Objectives	Covered risks	Measures/ indicators	Models/ analytical tools	Policy - preparation - diversification - assistance
Consumption smoothing	Individual/household risks - longevity - myopia - time inconsistency	(Individual) replacement ratio - extended - comprehensive	Microsimulation	<ul style="list-style-type: none"> • Compulsory participation (at less than full coverage) • Education • Incentives for savings
Prevention of poverty in old age	Individual and aggregate risks - earning risk - contribution risk	<ul style="list-style-type: none"> • Individual/occupational group/gender • Poverty and inequality indexes 	Microsimulation and semi-aggregate models	<ul style="list-style-type: none"> • Discourage early retirement (reduce the implicit tax rate) • Incentives for women's participation in the labour market • Redistributive measures
Maintaining a compact between generations	Aggregate demographic and economic risks	<ul style="list-style-type: none"> • Net present value • Internal rate of return • Focus on indexation 	General equilibrium models	<ul style="list-style-type: none"> • A PAYG component (in a mixed system) • Requisites on benefit indexation

Source: Fornero and Vanriet (2005).

Allocation of risks

Some risks are *individual*. There are essentially two:

- **Earnings risk.** This refers to the *inability* to earn enough for the predetermined level of contributions to add up to a sufficient old-age income.
- **Contribution risk.** This refers to individual myopia, an unwillingness to save for old age.

Other risks are *social* or *aggregate*:

- **Political risks.** These relate to legislative changes or bad regulation.
- **Demographic risks.** Notable here is the risk that population ageing will disrupt those pension schemes that are not flexible enough to accommodate demographic shifts.
- **Annuity risks.** Many systems have indexation rules that do not adjust automatically. In such cases, there can be a mismatch between consumption needs and rising prices or rising consumption levels of the younger generations versus the older cohorts. In addition, changes in consumption needs per se at (and during) retirement can lead to disparities between planned (simulated) and actually observed behaviours.

Instruments

Relative welfare ratios or replacement rates can be used in both longitudinal and cross-section comparisons to see income gaps for the same population under different rules. Poverty indexes (e.g. the poverty rate among the retired and the number of poor retired households among poor households) may be used to refer more specifically to poverty. Measures such as the Gini coefficient can be applied to study how unequal the income is within the same group or cohort.

Critical assessment of future needs

Longitudinal comparisons involving needs and income are inherently problematic. The needs of the retired may change compared with the needs of the active. Also, components of income may change for the ageing. These restrictions to comparisons constitute challenges for future research.

The authors recommend developing and using a semi-aggregate simulation tool for EU member states to build comprehensive replacement ratios. This tool would take into account both the immediate needs and the changing structure of income during retirement.

2.2 Measuring adequacy through a multidimensional approach

It is, of course, not necessary to rely on indexes to measure adequacy in such a multi-objective framework. One approach is to use dominance conditions ordering techniques.² Such techniques might be preferred for the sake of robustness. Yet, indexes allow for complete orderings and the loss of robustness is an automatic condition, since they need to satisfy the requirement of consistency at the expense of unanimity.

Abatemarco (2009)³ constructs an index that allows us to look at the impact of pension systems on any given population. He accounts for the heterogeneity of income units by using disposable equivalence incomes as obtained through standard *multiplicative* equivalising transformations (Ebert and Moyes, 2003). This approach captures redistribution effects by referring to both actual and virtual incomes. The latter is computed under the actuarial equivalence (null solidarity) condition, which takes into account a) the market return on savings accumulated in funded pension schemes, and b) the sum of labour force and productivity growth for savings accumulated in PAYG systems (Samuelson, 1958; Aaron, 1966).⁴ To capture the poverty dimension, a variation of Reynolds and Smolensky's (1977) index is used, which is defined as the difference between virtual and actual poverty, i.e. how much poverty would have occurred under the hypothesis of an *actuarially equivalent* pension scheme and how much poverty there really is. The study thus neglects debates on the poverty line by assuming that for each period there is a generally agreed, absolute poverty line, which is invariant with respect to income distribution.

² One example here is stochastic dominance conditions, where among other things we may claim that society A is poorer than society B, if and only if any poverty-averse individual were to label A as poorer than B (Foster and Shorrocks, 1988).

³ AIM research, workpackage 1.

⁴ This approach is taken as opposed to using actuarial solidarity, which assumes that individuals accumulate their savings in a risk-free asset at the market return (Creedy et al., 1993; Disney, 2004).

3. Classification of pension systems in the EU

Soede and Vrooman (2008)⁵ provide an analysis of 19 member states of the EU and four other countries – the US, Australia, Canada and Norway – to identify pension system clusters. They establish a list of 34 traits of the various first- and second-tier pension schemes.⁶ They use data from the OECD and the International Social Security Association as well as from the two EU social security databases (MISSOC and MISSEEC). Six countries (Estonia, Latvia, Lithuania, Slovenia, Malta and Cyprus) of the EU had to be left out of the analysis because of limited data availability, as these states are not members of the OECD.

The analysis is based on the situation in 2004–05, although some quantitative data (e.g. expenditures relative to GDP) refer to 2001. The analysis takes into account the system as it is for current entrants, i.e. where radical reforms have taken place in recent years (Sweden and Italy in the EU-15, and in several new member states)⁷ it is the new system that features here, even though the majority of contributors could still be contributing according to older rules.

The statistical technique used is categorical principal component analysis (CatPCA). As in a classic PCA, variables are reduced to a limited number of uncorrelated dimensions. CatPCA does not assume that variables are continuous, however, so it can handle indicators of rank or class (ordinal and nominal variables).

The CatPCA exercise results place systems within two main dimensions. The first dimension relates to the ‘generosity’ of the pension systems in terms of total pension wealth, average replacement rate and the target of the pensions system. The second dimension relates to the existence of a private scheme in the mandatory system. Pension systems that score highly in this dimension generally have one or more mandatory schemes in the second tier, which are funded and managed privately. These schemes are almost without fail DC ones.

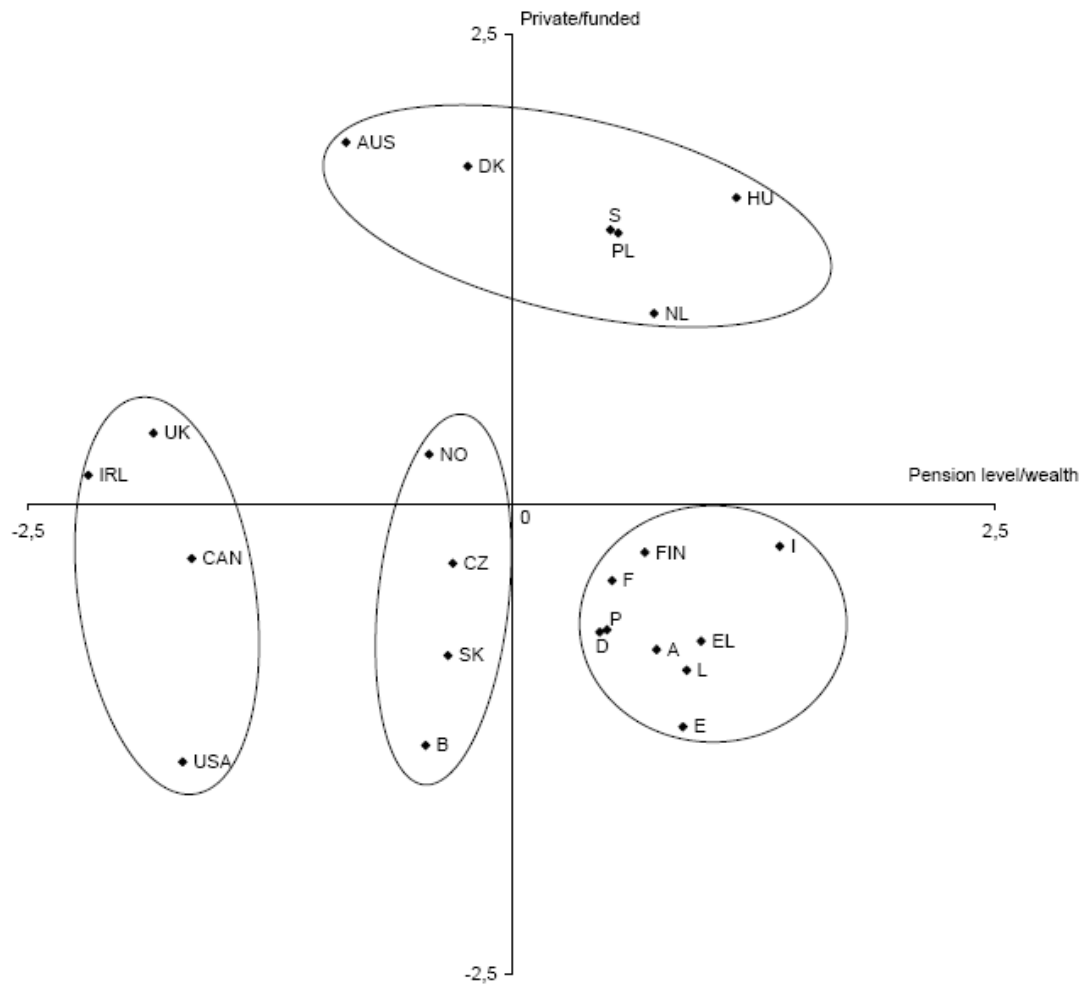
As we can see in Figure 1, the analysis yields four clusters. The lower right corner of the picture shows a group of nine countries: Finland, Italy, France, Portugal, Greece, Germany, Austria, Luxembourg and Spain. These countries are characterised by a relatively high degree of protection for pensioners. The mandatory schemes are fully public. This can be regarded as a ‘corporatist’ pension cluster.

⁵ AIM research, workpackage 2.

⁶ This document uses the designation of pillars relatively loosely, with ‘first’ meaning a mandatory public pillar and ‘second’ referring to a mandatory or quasi-mandatory, privately-managed pillar. A more precise classification used by the OECD, which now clashes with the ever more widespread taxonomy coined by the World Bank, is discussed in Yermo (2002, pp. 16-17).

⁷ A World Bank-sponsored reform to split the public system into two pillars, a public and a privately managed one, was adopted by Hungary, Poland, Latvia, Estonia and the Slovak Republic in the period 1998–2004, in approximately this order. Lithuania has a similar system, but the option to split contributions between the public and the privately-managed funded component is fully optional (Draxler, 2007). Bulgaria and Romania, which acceded in 2007, have this system too. As noted above, though, Estonia, Latvia and Lithuania do not feature in this analysis due to lack of data, nor do Bulgaria and Romania, which acceded after this analysis was undertaken.

Figure 1. Scaling of 23 countries based on 34 pension system characteristics



Four countries can be observed on the left side: the UK, Ireland, Canada and the US. These countries provide relatively meagre public pensions focusing on the poor and thus may be considered a ‘liberal’ pension cluster. In these countries, the pension provision for employees is primarily left to the market. This does not mean that the average total pension benefit (public and market) is necessarily low – only that the collectively guaranteed part is small.

In between these two clusters, a ‘moderate pensions’ group may be identified: Slovakia,⁸ the Czech Republic, Belgium and Norway. The average pension benefit with respect to average earnings is slightly below the EU average and the pension provision is fully public.

The final group consists of countries having a mandatory second-tier pension scheme that is funded and private; this cluster has therefore been designated as ‘mandatory private’.

⁸ In 2004, Slovakia adopted a new pension system with a sizeable funded component. Its position would likely move in this graph, although given political uncertainty following the change of government in 2005 (with the new government being publicly hostile to the reform) not much can be said about the future of the system.

4. Pension reforms and public opinion

A publicly mandated pension system is a compact between citizens and the government. When facing reform options, much depends on how reforms are framed. For example, in some cases ‘reform bundling’ seems a more viable strategy than an incremental approach. In other words, parametric changes, which may be viewed as zero-sum games, may encounter tougher resistance than a more comprehensive approach, which is sold as a winning situation for all. This seems to have been the case in post-communist Europe (Müller, 2003), where radical reforms have recently taken place (Draxler, 2007) amid general support from the population. Even the most radical pension system overhaul in the EU-15 – the Swedish switch to a notional defined-contribution system (NDC), which was preceded by careful negotiations – was in the end approved by all stakeholder groups (Könberg, Palmer and Sundén, 2006).

Europeans are aware of a potential pension crisis. They also resist reforms.

So on the one hand, opinion polls show that Europeans are aware of a potential pension crisis. On the other hand, they also generally resist pension reforms (e.g. Boeri, 2004; Boeri et al., 2002; Kohl, 2003). Thus, it seems important to know the exact nature of this resistance. Can we identify

relationships between variables that would allow us to address particular worries of precisely defined groups?

It turns out that the answer is yes. **Janky and Gál (2007)**⁹ have been able to analyse the attitudes of over 15,000 respondents from the EU-15 towards intra- and intergenerational redistribution. They conclude that rejection of specific components of reform proposals is strongly correlated with individuals’ position in the labour market, income, age and other variables.

The authors use the data of the Special Eurobarometer Survey on “Pension Policy and Pension Reform” (No. 161/Wave 56.1 – see European Opinion Research Group, 2004). The fieldwork of the survey was carried out in September and October 2001 in what was then the EU’s 15 member countries. The authors also analysed another Special Eurobarometer Survey, that on “Social Precarity and Social Integration”. In this respect, the authors have an extended information base compared with previous analysis of the survey (Kohl, 2003).

The authors derive their conclusions by comparing the effects of the same explanatory variables on the two different dependent variables: the intragenerational and the intergenerational model.

Gender does not influence preferences. The expected remaining active lifetime does not affect attitudes towards intragenerational redistribution but strongly shapes preferences on intergenerational transfers. Younger voters are less likely to support increases of contributions and benefits.

Income is an important factor shaping opinions. High earners, active as well as retired, resist a larger redistribution among pensioners. Not surprisingly, those with financial problems are more likely to support stronger intragenerational redistribution. At the same time, the analysis also shows that individuals of active age facing financial problems support intragenerational redistribution, but oppose higher pensions and higher contributions. Janky and Gál note that at least a segment of the low-income population therefore seems to realise that a higher level of *average* pensions does not necessarily help them.

Low education has its own separate effect on preferences. Those with only primary education also oppose higher intergenerational transfers.

⁹ AIM research, workpackage 3.

The model includes variables for ideological stance. Left-wing respondents predictably support intragenerational redistribution as well as a possible increase in intergenerational transfers.

A special feature of this analysis is an incorporation of indicators of social interaction into the models. The presence of poverty in the neighbourhood seems to increase the strength of social solidarity. Respondents surrounded by the poor are more likely to support intragenerational redistribution. If those respondents are active, they are more supportive of a large social security system as well.

5. Approaches to modelling aspects of pension reforms

5.1 Use of simulation models

As policy-makers have gradually become aware of the problems associated with changing population structures, notably demographic ageing, the demand has grown for simulation tools that could help evaluate changes of policy, particularly in the sphere of pensions. Overlapping generation models, option value models and others have gradually been added to earlier ‘standard’ simulation models, specifically to help evaluate the problems associated with demographic ageing.

Building models for national or larger scales typically entails a substantial investment of time and resources. It is therefore in the interest of both researchers and policy-makers to establish a map of models used in Europe, with the view to having a common toolbox from which researchers could choose already-tested methods to avoid duplicating work done elsewhere. This is a particularly pressing problem in the field of the fast-developing microsimulation methods. The issue is, however, currently being addressed by the EU-funded project PENMICRO. The project, led by the Hungarian institute TARKI (a partner in the AIM project described here) seeks to establish a taxonomy of models that comprise micro instruments and chart the existence of micro datasets.¹⁰

Building models entails a substantial investment of time and resources. It is in the interest of both researchers and policy-makers to establish a map of models used in Europe.

Typically, models attempt to provide answers to questions falling into one of the following classes (Zaidi, 2008):

- 1) fiscal questions (projections of pension expenditures);
- 2) institutional questions (descriptions of pension system parameters);
- 3) income-distribution questions (e.g. comparing the income of older persons with other cohorts, identifying distributional trends and highlighting vulnerable groups); and
- 4) microsimulation questions (effects of systemic changes on the individual or groups within a larger population).

As the use of simulation methods proliferates, it also becomes necessary to be clear about the properties of the individual simulation models. These complex models are black boxes to laymen but often likewise to professionals. One must be clear about the assumptions of the individual methods. And ultimately, some models may be better suited to providing answers to certain questions than others.

¹⁰ The project description is available on the TÁRKI website (<http://www.tarki.hu/en/projects/intergen/index.html#penmicro>).

5.2 *Simulating Belgium, Germany and Italy through a two-module, micro- and semi-aggregate simulation model*

MIDAS¹¹ is a dynamic microsimulation model developed for Belgium, Germany and Italy for simulating future developments in the adequacy of pensions (Dekkers et al., 2009).¹² The model uses the programming language LIAM, specially developed for this purpose. The model follows, wherever possible, the projections and assumptions of the Ageing Working Group (European Commission, 2005). The model was developed under the coordination of the Belgian FPB as a cooperative effort of three institutes: the German DIW, the Italian ISAE and the FPB. It is unique in being the first dynamic model including several EU countries.

SAM¹³ provides the macroeconomic background to these simulations, not only with respect to social protection expenditures but also in terms of labour market evolution and economic growth. The model was developed by the Italian institute CeRP.

MIDAS itself consists of three modules: the demographic module, the labour market module and the pension module. The behavioural equations of MIDAS make it possible to capture the individual's reaction to the constraints coming from the economic environment and to policy inputs. SAM allows the disaggregation of variables along different lines, such as gender and age, proving an automatic 'translation' of demographic trends.

The main purpose of SAM has been to assist in the calculation of comprehensive replacement rates (COREs) to assess consumption smoothing and antipoverty aspects of pension reforms (see also section 8 on maintaining living standards). It includes Denmark, France, Germany, Italy, Latvia, Luxembourg, the Netherlands, Poland, Spain and the UK. In this exercise, it has been used for macroeconomic aggregate projections. The baseline scenario highlights the rising trend of old-age dependency rates in all the countries analysed. An increase in the rates of labour force participation and a decrease in unemployment bring about a substantial improvement of employment rates until the 2020s. In the following decades, employment growth slows down. Simulations run to the year 2050 show, in the absence of policy changes, a substantial increase in public expenditure on social policy, including pensions (Table 2).

Simulations run to the year 2050 show, in the absence of policy changes, a substantial increase in public expenditure on social policy, including pensions.

The simulation results show that the Belgian replacement rate will gradually decrease until the beginning of the 2030s, after which it will stabilise. The replacement rate is lower in Germany, but the development over time is comparable to Belgium. The Italian situation, on the other hand, is different: here, the replacement rate starts off higher than in Belgium, but shows a continuous decline as benefits from the earlier DB system are gradually replaced by benefits from the NDC pension system.

¹¹ MIDAS stands for Microsimulation for the Development of Adequacy and Sustainability.

¹² AIM research, workpackage 4.

¹³ SAM stands for semi-aggregate model.

Table 2. Social protection expenditure in cash (ESSPROS[†] definition), as a % of GDP

		Old age	Unempl.	Fam/ child	Sick/ health	Disability	Survivor	Social excl.	Total
Low demographic scenario									
Denmark	2005	9.2	2.6	1.6	1.0	2.8	0.0	0.8	18.0
	2050	18.7	2.3	1.3	1.0	2.8	0.0	0.7	26.8
France	2005	10.4	2.2	2.0	0.7	1.2	1.9	0.4	18.8
	2050	11.6	1.9	1.8	0.7	1.2	1.6	0.3	19.2
Germany	2005	11.5	2.1	2.2	1.4	1.5	0.4	0.4	19.5
	2050	18.8	1.7	2.2	1.3	1.5	0.8	0.4	26.7
Italy	2005	13.0	0.5	0.7	0.5	1.4	2.5	0.0	18.6
	2050	26.6	0.5	0.7	0.5	1.4	2.5	0.0	32.3
Latvia	2005	5.7	0.4	1.1	0.6	1.0	0.3	0.1	9.2
	2050	18.2	0.3	1.1	0.6	1.0	0.3	0.1	21.6
Luxembourg	2005	5.8	1.1	3.4	0.8	2.1	2.3	0.4	15.8
	2050	15.3	1.3	3.2	0.8	2.1	1.8	0.4	24.9
Netherlands	2005	8.7	1.7	0.7	2.1	2.6	1.4	0.5	17.8
	2050	14.7	1.8	0.7	2.1	2.6	1.6	0.4	24.0
Poland	2005	10.8	0.7	0.9	0.7	2.3	1.0	0.1	16.5
	2050	9.6	0.3	0.9	0.7	2.3	1.0	0.1	15.0
Spain	2005	8.1	2.4	0.4	1.2	1.4	0.6	0.0	14.1
	2050	30.2	2.0	0.3	1.2	1.4	0.6	0.0	35.8
UK	2005	10.0	0.5	1.3	0.6	2.0	0.8	0.1	15.4
	2050	17.5	0.4	1.1	0.6	2.0	0.6	0.1	22.4
High demographic scenario									
Denmark	2005	9.2	2.6	1.6	1.0	2.8	0.0	0.8	18.0
	2050	15.5	2.3	1.4	1.0	2.8	0.0	0.7	23.7
France	2005	10.4	2.2	2.0	0.7	1.2	1.9	0.4	18.8
	2050	10.0	1.9	1.8	0.7	1.2	1.5	0.3	17.5
Germany	2005	11.5	2.1	2.2	1.4	1.5	0.4	0.4	19.4
	2050	14.2	1.6	2.1	1.4	1.5	0.6	0.4	21.8
Italy	2005	13.0	0.5	0.7	0.5	1.4	2.5	0.0	18.6
	2050	22.0	0.4	0.7	0.5	1.4	2.3	0.0	27.3
Latvia	2005	5.7	0.4	1.1	0.6	1.0	0.3	0.1	9.2
	2050	13.3	0.3	1.1	0.6	1.0	0.3	0.1	16.7
Luxembourg	2005	5.8	1.1	3.3	0.8	2.1	2.3	0.4	15.8
	2050	12.3	1.3	3.1	0.9	2.1	1.5	0.4	21.5
Netherlands	2005	8.7	1.7	0.7	2.1	2.6	1.4	0.5	17.8
	2050	11.5	1.6	0.7	2.1	2.7	1.3	0.4	20.3
Poland	2005	10.8	0.7	0.9	0.7	2.3	1.0	0.1	16.5
	2050	7.0	0.3	0.9	0.7	2.3	1.0	0.1	12.4
Spain	2005	8.1	2.4	0.4	1.2	1.4	0.6	0.0	14.0
	2050	24.4	1.9	0.4	1.2	1.4	0.6	0.0	29.9
UK	2005	10.0	0.5	1.3	0.6	2.0	0.8	0.1	15.4
	2050	14.0	0.5	1.2	0.6	2.0	0.5	0.1	18.9

[†] ESSPROS refers to the European System of Integrated Social Protection Services

Note: ESSPROS refers to the European System of Integrated Social Protection Services; old age includes public and private pensions; 'evolving' life tables.

Source: Dekkers et al. (2009).

Also, the difference between men and women in terms of their replacement rates is smaller in Belgium and Germany than in Italy. The difference between men and women appears only after 2015 – in this regard, the introduction of the NDC rule seems to be a strong contributory factor.

In all three countries, and for Italy only in the first years of the simulation, the levels of income inequality decline as cohorts move from working to retirement ages.

The differences between workers and retirees in terms of their relative risk of poverty are notable. 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 increases very considerably until about 2030. This suggests that the systemic reform in Italy has a more profound impact on poverty than the parametric reforms in Belgium and Germany.

In the three countries, the risk of poverty of pension benefit recipients increases at first and then decreases. In Belgium and Germany, this turning point is early in the 2020s, whereas it is in the late 2020s in Italy. About a decade after the first turning point (i.e. the early 2030s for Belgium and the early 2040s for Italy), poverty risks stabilise and then start to rise modestly again. This last change is stronger in Belgium than in Italy or Germany. In terms of the whole period under analysis, poverty among the recipients of social security pension benefits increases more in Italy than in Belgium and Germany.

In sum, this international comparison of the simulation results suggests that the impact of the parametric reforms in Belgium and Germany and the systemic reform in Italy on (re)distribution and poverty should go in the same direction, but the magnitudes will differ, with the Italian reform creating a stronger impact in terms of the level of pension benefits.

6. Pension reforms and the labour market

The 2002 Joint Report¹⁴ by the European Commission and Council stated that “the negative impact of demographic developments on employment and economic growth potentials can be alleviated by lower levels of unemployment and more persons of working age participating in the labour market”. At stake, however, is the potential effect of higher employment levels of ‘marginal’ groups on the level of potential GDP. In the short and medium run, bringing these groups into the labour market is likely to reduce the *average* level of productivity, as the productivity of the previously long-term unemployed and some groups of the elderly is likely to be lower than the average of those already working.

There is obviously a significant, two-way interplay between conditions in the labour market and the pension system. Changes in pension rules may affect the behaviour of workers still in the labour market. These changes can refer to

- the benefit calculation formula;
- statutory limitations on the age of retirement and minimum benefit entitlement periods;
- the portability of pension rights; and even, maybe,
- changes in benefit indexation.

¹⁴ See *Adequate and sustainable pensions – Joint report by the Commission and the Council* (European Commission, 2002).

On the other hand, labour market conditions have a bearing on the amount of pension benefits as well as the ability of older workers to participate in the labour market. These conditions can refer broadly to

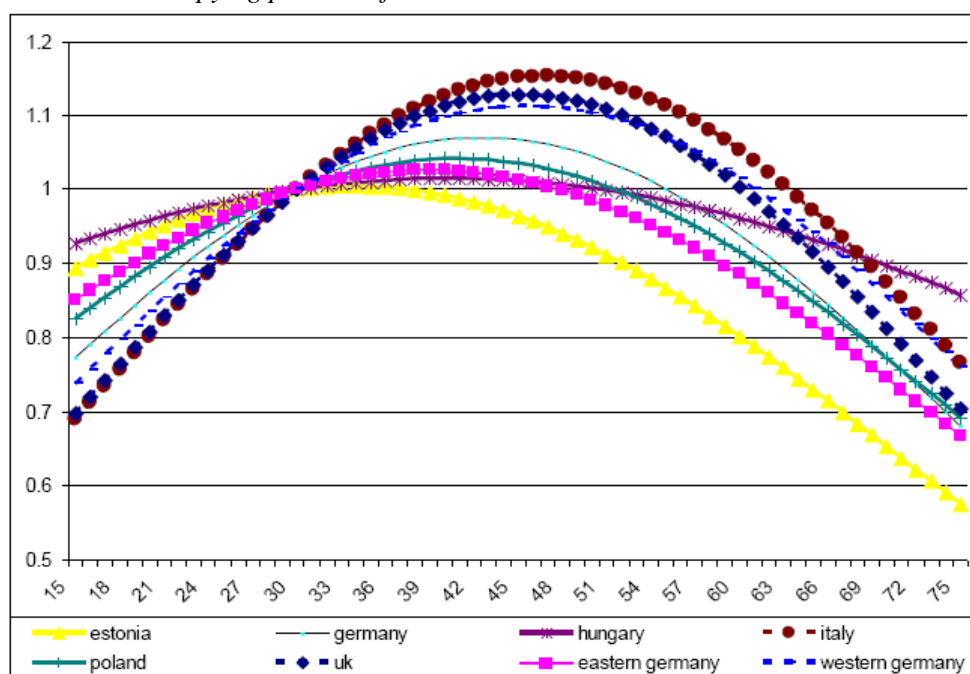
- the overall labour market income of a person over a lifetime;
- the income profile of an individual over a life cycle in the labour market;
- continuity and discontinuity in labour market participation (i.e. gaps in spells of work);
- narrow employment conditions, such as the employability of older workers;
- regulation of the right to be employed; and
- active policies to employ older workers.

This section looks at the various aspects of this interplay of the labour market and pension systems by summarising the existing situation and simulating changed conditions in either the labour market or the pension system.

6.1 The effect of pension reforms on productivity and employment

Walewski (2008)¹⁵ shows that the shape of the age–productivity relationship in the new member states (NMS) differs from that observed in EU-15 countries. He reaches his conclusion by taking wages as a proxy for productivity, but only those of less skilled workers in competitive economic sectors, to diminish seniority premia and other distorting effects (Figure 2).

Figure 2. The estimated age–wage profiles for workers with maximum, general secondary education, working in manufacturing, construction and market services and occupying positions from ISCO9 to ISCO5



Source: Walewski (2008).

¹⁵ AIM research, workpackage 6.

On average, an unskilled worker in a NMS reaches maximum productivity earlier than in the EU-15, and his/her productivity also tends to return earlier to its level at the beginning of the career. The average relative productivity level of older unskilled workers (aged 50-64) is also lower when compared with the productivity of prime-aged (25-49) workers in the NMS than it is in the EU-15.

An unskilled worker in a NMS reaches maximum productivity earlier than in the EU-15, and his/her productivity tends also to return earlier to its level at the beginning of the career.

Furthermore, there are indications that the low relative productivity of unskilled older workers in the NMS exerts a negative influence on their relative employment rates.

Consequently, in new member states with a large number of unskilled (or mis-skilled) workers among the older or middle-aged labour force, employment rates for these groups should not be expected to increase substantially in the nearest future. Besides its direct negative influence on total employment rates, this factor has important negative fiscal consequences, namely growing spending needs through unemployment, social benefits or pensions, as the latter are financed mainly from labour taxes.

This negative characteristic of the labour supply structure in the NMS might gradually wear down owing to socio-demographic processes (a cohort effect), as new cohorts become endowed with human capital more suited to the new economic conditions as compared with the cohorts who were trained and educated under the previous (Soviet bloc) regime. Nevertheless, in this respect it is necessary to observe whether the education system is performing adequately and Walewski sounds a cautionary note citing the 2005 PISA study, which indicates that the young in some countries of the post-communist bloc trail their OECD counterparts in basic academic skills.

It is additionally advisable to influence the labour market prospects of these countries over the medium-term by having an effective system of lifelong learning and vocational training for those currently in their 30s and 40s.

6.2 Extending working lives

Working longer is essential for increasing employment rates in general and making a significant contribution towards the improved adequacy and financial sustainability of social security systems. This can be realised by both increasing activity levels in the pre-retirement age group as well as promoting working beyond statutory retirement ages. There are some policy objectives in all member states to achieve employment goals. For many countries, the main focus will be on the age group 55-59, whose employment rates are already on the rise. This should be seen as the first step, however. Improving employment rates for those aged 60-64 will also be necessary in order to contribute to future sustainability. Moreover, early retirement should no longer be seen as a way to make room for young workers or to reduce unemployment. A cultural shift is required, placing a greater emphasis on enhancing the working capacity and employability of older workers.

For many countries, their focus will be on the age group 55-59, whose employment rates are already on the rise. But improving employment rates for those aged 60-64 will also be necessary.

A key question for the future is whether the reforms carried out since the last exercise undertaken through the open method of coordination are sufficiently thorough to ensure efficient incentives to work longer, such that the Lisbon targets for employment rates and the increase in the effective retirement age can be achieved. Important differences can be observed among member states regarding the strength of incentives to work longer, depending on the

design of the pension system and the policies to help people back into the labour market. This suggests that the structure of incentives could be further revised in a number of member states. In particular, attention needs to be paid in some member states to paths of early exit (before the standard retirement age) from the labour market. Pension reforms should give strong incentives to work longer and when well designed they will reward doing so with adequate pensions. At the same time, there is a need to ensure that not only can individuals work longer but they can also do so effectively.

The policy reaction to the challenge of raising the participation of older workers can thus be summarised in a few points:

- raising the statutory retirement age (and/or tightening requirements, especially the minimum contribution period), and
- discouraging early retirement, by
 - applying actuarial reductions for early and premia for later exits,
 - restricting access to or abolishing altogether early retirement schemes, and
 - restricting access to incapacity schemes.

A study by **Labeaga (2006)**¹⁶ analyses retirement behaviour as a result of the operation of a number of determinants: family structure, personal history of labour force participation, health and income.

The study finds a positive effect of age among couples when one spouse is already retired. Own education has a negative effect, while the cross-couple effect is asymmetric (positive for women, negative for men). It is relevant who the head of the household is, in the sense that the more the household depends on one member of the couple, the smaller is the probability of that individual retiring. The propensity to retire is greater and the propensity to go back to work after inactivity is smaller for individuals who are married. In addition, women are more likely to retire earlier than men are. The larger the size of the family the lower is the probability of making transitions to retirement for both men and women.

There is also significant evidence that the personal history of employment plays a major role in retirement decisions. Having occupied part-time jobs or being unemployed during a preceding period is positively correlated with the probability of retiring. Indeed, individuals frequently use unemployment as a step from the labour market into retirement. Self-employment, on the other hand, appears to have a negative effect on the probability of retirement. This is related both to income and to the special system of retirement and the acquisition of pension benefits for the self-employed in most of the countries. Furthermore, low-skilled workers are more likely than high-skilled ones to retire earlier. This confirms findings in other studies, such as those by Gruber and Wise (1999) or Conde-Ruiz and Galasso (2003). In addition, the probability of exiting from the labour market onto disability benefits prior to retirement benefits is greater for low-skilled workers than for the rest of workers. Finally, older workers with incomplete working histories also retire earlier while white-collar workers retire later in all countries.

Low-skilled workers are more likely than high-skilled ones to retire earlier.

Poor health has a strong positive effect on own transitions, especially for men and a man's health status is also particularly relevant in joint retirement. Thus, the effects of health appear to be asymmetric, with the health status of the husband more important for the retirement of the wife than the health status of the wife for the retirement of the husband. In this context,

¹⁶ AIM research, workpackage 6.

receiving disability benefits is an important factor increasing the probability of retirement, and as indicated earlier, disability is confirmed again as a path to early or normal retirement.

As far as income is concerned, the study finds a negative effect on the likelihood of retirement in the presence of income from both work and other income categories. Also in this domain, the study finds that cross-spousal effects are asymmetric: a husband's income has a positive impact on the probability of the wife's retirement, while a wife's income has a negative effect on the probability of the husband's retirement.

The generosity of old-age pensions increases the chances of retiring in all countries. Again, this is a confirmation of findings in Gruber and Wise (1999) for several countries. It suggests that the structure of incentives could be further revised. In particular, attention needs to be paid in some member states to paths of early exit (before the standard retirement age) from the labour market such as unemployment and disability. On the other hand, in order to design features of social security systems that facilitate later retirement and longer working lives, it is essential to provide suitable access for older workers to appropriate employment; otherwise, the incentives provided by social security systems are unlikely to be effective. Opening up employment opportunities for older workers also needs labour market reforms in some EU countries in addition to pension reforms. Continued vocational training should offer opportunities for older workers to acquire new skills and to actualise qualifications throughout their professional lives.

In a study on retirement decisions in eight NMS, **Ruzik (2008)**¹⁷ shows that older workers in Central and Eastern European (CEE) countries react to economic incentives for early retirement created by their social security systems and to changes in requirements more or less like older workers in the old member states. They stop work when acquiring the right to a social security benefit, which does not solely have to be an old-age pension but also other transfers treated as a substitute for early retirement (like disability pensions in some cases).

<p>Older workers in CEE countries react to economic incentives for early retirement more or less like older workers in the old member states. They stop work when acquiring the right to a social security benefit.</p>

Econometric analysis shows that *education level* is not an important predictor of transition to retirement. Such a result can be explained by much lower returns to education and obsolete human capital accumulated before the transition to a market economy started. As persons in the sample were born in the 1940s or 1950s, their human capital was formed mainly in the previous system.

Marital status does not appear to have a significant influence on individual retirement behaviour. Generally, married and non-married persons in the sample behaved in a similar way.

Unemployment is one of the most important predictors, significantly raising the likelihood of retirement for both men and women. Becoming unemployed at an older age is a strong factor increasing the probability of retirement, regardless of the overall situation in the country's labour market. This outcome suggests that labour demand influences the economic activity of older persons substantially and that a distinction between being unemployed and retired at older ages is not very meaningful. It also means that in times of high unemployment (as in Poland or Slovakia in early 2000s) it is more difficult to implement a successful policy of extending working lives.

Sector of employment has a significant impact on chances of retiring. Work in agriculture makes both men and women work longer. But different studies suggest that activity in this branch of the economy is often only part-time work of a very low productivity, which may disappear with the future development of CEE economies.

¹⁷ AIM research, workpackage 6.

As the CEE countries share the problem of ageing populations and need to raise employment rates at older ages with the old member states, some reforms are being implemented. The major ones aim at establishing a closer link between the contributions paid and benefits received. Active labour market policies aimed at older workers might increase their economic activity.

The scope for extending working life is dealt with conceptually in a paper by **Belloni (2008)**.¹⁸ The economic literature on retirement behaviour has constantly progressed since its birth. The first one-period leisure/consumption model, in which retirement was treated as a standard labour supply choice, made clear its peculiarities and called for an ad hoc framework of analysis. Gradually, models incorporated forward-looking behaviour and the life-cycle approach replaced the shortsighted one. Reduced form models were initially the only available analytical framework; OLS regressions, hazard models and other simplified techniques were the econometric tools. When the dynamic programming rule came onto the scene, the development of structural models was slowed down by its computational complexity. Strong simplifying assumptions on the error terms had to be imposed in order to make them tractable.

The option value model was considered a less complex rule than dynamic programming, and no worse in approximating actual behaviour. Afterwards, economic, econometrics and technological advances, together with the availability of longitudinal datasets, allowed for increasingly complex models. Modern specifications relax many simplifying assumptions and include the modelling of multiple simultaneous decisions and alternative exit routes. They explain much more than the first dynamic programming applications to which the option value was compared. The most known example is given by the spikes of exit at the ages of 62 and 65 in the US, which had puzzled researchers for a long time. Recently, several explanations of this puzzle have been tested and confirmed in structural models, ranging from heterogeneous, subjective discount factors to limited borrowing and to interactions between the US Social Security and Medicare institutions.

A comparison between option value and more recent models, however, depends on the specific context of analysis. Even if in many cases, as occurred for the US puzzle, it is likely that more complex models better approximate reality, there can be situations in which rules governing actual behaviour are simpler and suitable to be modelled within the option value framework. At the same time, the option value itself can be modified to some extent and adapted to given circumstances.

Among the possible directions taken by the literature on retirement in the coming years, two seem particularly promising. The first is the development of analytical frameworks where supply and demand side aspects of retirement are jointly modelled. While the study of demand has been limited so far by scarce information on labour inputs and outputs, the new availability of matched employer–employees datasets can favour the development of unified approaches. This can be potentially helpful in understanding much of the unexplained retirement behaviour. The second consists of modelling continuous transitions to retirement. Recent evidence highlights various patterns of exit from the labour force and frequent irregular transitions from full-time contracts to old-age pensions. Assuming retirement as a zero-one choice – or as an absorbing state – should therefore be reconsidered in many cases.

A paper by **Piekkola and Deschryvere (2005)**¹⁹ studies retirement transitions of Europeans and focuses on the impact of social security systems and well-being at work on retirement behaviour. The analysis uses the first eight waves (1994–2001) of the European Community Household Panel (ECHP). Option values are constructed accounting for household behaviour in

¹⁸ AIM research, workpackage 6.

¹⁹ AIM research, workpackage 6.

pooled data from four countries: Finland, Belgium, Germany and Spain. They show that the incentive-compatible pension system postpones retirement on average by one year and is socially more just than the current system of encouraging (low-income) earners to retire too early. The incentive effects are roughly similar for men and women, but women and low-income earners would benefit more from the new system. The new rules have the strongest effects in Finland, where pension wealth and option values are most clearly decreasing with age.

6.3 Flexibility of employment and career patterns

The Joint Report (European Commission, 2002) sets out the objectives of ensuring i) that pension systems are compatible with the requirements of flexibility and security in the labour market; ii) that, without prejudice to the coherence of member states' tax systems, labour mobility within member states and across borders and non-standard employment forms do not penalise pension entitlements; and iii) that self-employment is not discouraged by pension systems.

These objectives concern both access to pension rights and the portability of (vested) pension rights. As indicated in the Joint Report, second-pillar schemes “still pose problems on both fronts” but those member states promoting such schemes are working to address these difficulties and action to facilitate cross-border portability of occupational pension schemes at the EU level is continuing.

As stressed in other contributions and in general in the literature on retirement behaviour, the resulting interaction with labour force participation and employment patterns are likely to be influenced by the level of pensions and the associated option values of work and leisure. But again, the value of pensions and the scope for drawing pension benefits are determined by several important, interconnected aspects of the pension schemes:

- rules for the accrual of pension rights,
- the portability of pension rights, and
- the vesting of pension rights, which refers to
 - the length of the minimum benefit entitlement period, and
 - the type of vesting (i.e. whether one acquires the right to a pension after simply reaching a given minimum entitlement period, and of course the retirement age, or whether it is done so gradually, as a percentage of total entitlement).

The level of pension benefits is also directly affected by risks arising out of the pension sponsor's performance (the employing company) or by the performance of the whole economy. These factors affect the labour market by influencing individuals' choice of pension plans through choice of jobs.

An examination of the pension reforms undertaken in a number of developed countries in recent years, done within the framework of this research project and presented in a paper by **Draxler and Mortensen (2007)**,²⁰ identified three basic features:

- a shift from defined-benefit to defined-contribution schemes,
- various measures aimed at extending working lives in PAYG schemes, and
- certain adjustments of the rules for accrual of pension rights, such as accrual of pension rights during maternity (or paternity!) leave, notably in the context of the reform of PAYG schemes.

²⁰ AIM research, workpackage 6.

In those countries relying on occupation pensions, a typical characteristic of DB schemes as they originated was that they were sponsored by a single employer with the goal of not only providing a scheme of old-age income maintenance but also of establishing a broader and enduring link between the employer and employee. One important drawback of DB schemes has therefore been, and to some extent still is, a low degree of portability of pension rights. By contrast, DC schemes normally offer a high degree of portability and options for transfer of the capital from one scheme to another. One important consequence of the shift from DB to DC schemes is consequently a likely considerable enhancement of the flexibility of labour markets.

PAYG schemes have traditionally been less linked to a specific job and therefore they have offered larger scope for portability in case of job changes. Consequently, the reforms of the existing PAYG schemes have aimed at extending working lives but have not specifically resulted in an increase in labour market flexibility. Nonetheless, as mentioned above, certain reforms have involved improvements or the introduction of rules for accrual of pension rights in case of a temporary leave of absence for maternity or childcare. This aspect of pension reforms is therefore likely to have substantially enhanced the scope for women to decide to bear children, to obtain leave of absence and to return to employment without a loss of pension rights.

6.4 Equality of women and men

Women enter retirement having spent fewer years in market work, earned less over their lifetimes and worked in different jobs than men of the same age. There are important differences in anticipated retirement income by gender that exist largely between non-married men and women. Indeed, 85% of this retirement income gap can be attributed to differences in lifetime labour market earnings, years worked and occupational segregation by gender. As women's work-life experiences become more congruent with men's over time, the gap in retirement income between men and women may shrink.

As underlined in the Joint Report (European Commission, 2002), women represent the majority of older persons: close to two-thirds of those over 75 are women. Ensuring 'adequate' old age 'pensions' for women is therefore an important social policy issue. Where the standard pension systems do not ensure an appropriate standard of living for older women they can hardly claim to have satisfied the criteria of 'adequacy'. Still, there is likely to be a conflict between a narrowly-defined principle of actuarial fairness and the specific problems of ensuring the standard of living of old women (even if the specific problems of old women may be less serious in the future as more women will have worked at least during some of their lives).

Women represent the majority of older persons: close to two-thirds of those over 75 are women.

The simulation of retirement benefits for persons with different characteristics with respect to the level of education and the number of children for selected old and new member states (Poland, Germany, Italy, Latvia and Lithuania), presented in a paper by **Kotowska, Stachura and Strzelecki (2008)**,²¹ offers the insights below.

Men work more (higher employment rates) and earn more (higher wages) if they are in a household with one or more children. This outcome could result from two different effects: the selection effect – only those who have a job and earn enough money decide to have a child – or the motivation effect – a man with children is forced to search for the funds to provide for a family. The results show that in Poland, Germany and Lithuania the biggest gains in relative

²¹ AIM research, workpackage 6.

income are made by men with children and lower education in comparison with men without children and the same education level.

The relationship between the number of children and women's benefits is straightforward for women without tertiary education. Having one or more children decreases expected pension benefits in the future. This decrease is sharper if a woman has two or more children, lower education or lives in Italy or Germany. Timing also plays a role. If a woman does not have a child before age 35, the loss in expected pension benefits tends to be lower when she finally has one in comparison with a woman who has a child at age 25. For women with tertiary education, the benefit loss caused by having a child is small. In the cases of Italy and Latvia, women with tertiary education and one child after age 35 can expect even higher pensions than those without children.

An additional simulation of future benefits applies the new Polish DC system rules to populations of other countries used in the analysis. The results for Poland in 2001 and 2005 show that period-specific differences were quite small despite the fact that these observations were made at different times in the business cycle (the 2001 downturn and 2005 recovery). Country-specific differences are far more important, especially for women with different levels of education. These could be the result of economic factors (dissimilarities in employment and unemployment rates caused by the demand side or differences in wages), socio-demographic factors (variations in the labour supply of women and men) and different social policy systems, which may be responsible for the incentives and behaviour of those in the labour market.

The most important cross-country differences concern the pension gap among women with secondary or lower education who may or may not have children. Results suggest that in Latvia and Lithuania the gap does not exist. In Poland, it was hardly observed in the case of women caring for one child after age 34. In Germany and Italy, the situation was completely different. If the pensions in those countries were calculated based on the new Polish DC system, a woman with non-tertiary education would usually end up with a pension reduction of 20% or more if she had one child and a reduction of 20-40% if she had two and more children.

In general, the simulation shows that the divergences among the countries analysed here result more from differences in their labour markets than their pension systems.

A further analysis of the relative pension position of men and women, under alternative characterisations of their respective working lives and various pension designs was undertaken by **Belloni and Fornero (2007)**.²² They consider both a DB and a DC scheme, and a few variants of their basic pension formula, each exemplifying a stylised normative framework. They first compare DB with DC schemes, in order to assess their respective roles in determining the relative pension position of men and women. Within each of the two schemes, they then quantify the effectiveness of different provisions (such as pension credits for childbearing and childrearing, and diverse annuitisation rules for the DC scheme) in obtaining a more equal distribution of retirement resources between genders.

They look at two eurozones (the EU-15 and EU-25), even though their characterisation only differs with respect to very few aspects (i.e. productivity, occupation and mortality). To capture the different position of men and women in the labour market, they compare four stylised career patterns for women against the benchmark of a unique pattern for men, with a further distinction within each pattern as to the growth rate of earnings (according to the level of education). Each combination of these dimensions defines a 'simulation scenario'. They then examine the two stylised systems (a DB and a DC scheme) and different variants of their basic formula, with each of these variants defining a 'normative framework'. In the 'base case', a pension system

²² AIM research, workpackage 6.

with no specific provision directed at compensating the disadvantaged position of women in the labour market is assessed.

The simulations show that, not surprisingly, the working career is the most relevant factor in determining the relative retirement income of women with respect to men; pension systems can compensate but only to a point. As for a comparison between DB and DC systems, taken without explicit redistributive measures (such as a minimum pension provision in the former and pension credits in the latter) the latter can fare better than the former in providing a more equal distribution of retirement income between men and women. The reason is that DC systems remove the greater return to steeper earnings profiles that is more characteristic of men. The introduction of a minimum pension provision in the DB system improves the relative position of women with discontinuous or poor careers, while in DC systems a formal recognition of women's care activities through pension credits seems less effective than neutralising their longer life expectancy in the determination of the pension benefits using unisex longevity tables.

<p>A formal recognition of women's care activities through pension credits seems less effective than using unisex longevity tables.</p>

A comparative descriptive analysis of the present rules for the calculation of survivor's benefits and women's pension rights in the various pension schemes in EU member states and selected acceding and candidate countries was undertaken collectively by **Monticone, Ruzik and Skiba (2008)**.²³ The report focuses on 25 member states, and to the extent possible, on acceding and candidate countries (Romania, Bulgaria, Turkey and Croatia). Because of the common features of some groups of pension systems, sometimes the member states are divided into two groups: the 15 old member states and the 10 NMS that joined the EU on 1 May 2004.

The analysis of rules for the calculation of pension rights for men and women and survivor's benefits shows that countries adopt rather similar measures for ensuring adequate old-age income for women. Among the measures that should significantly reduce the differences between men and women for old-age income is the gradual elimination of differentiated entitlement rules for standard and early retirement, as far as age and contribution requirements are concerned. In particular, the elimination of differences in the retirement age for old-age pension eligibility means a more rapid rise in the minimum retirement age for women. In the long run, higher employment rates of women and reduced wage differentials between men and women should lead to better individual pension rights for women, especially in DC schemes, which have recently been introduced in some of the countries.

The extent to which higher employment rates will reduce the need for measures such as survivor's benefits, the crediting of contribution periods for childcare and others is not sure. There is universal recognition of the need to develop childcare and educational provisions that facilitate the employment participation of mothers. Furthermore, there is now a growing consensus about the importance of encouraging men to accept a greater share of parental responsibilities (for example by making it easier for fathers to take parental leave) to enable women to take shorter breaks in their working lives.

²³ AIM research, workpackage 6.

7. Ensuring sustainability and actuarial fairness

7.1 Population saving

Generally, the problem of demographic developments has translated into the recognition that population ageing on the one hand reduces the tax base and on the other hand leads to an increase in age-related expenditures. Generational accounts have been developed and widely applied to explore these issues.

Such an analysis of the public sector impact addresses many important issues. But it *does not* tell us whether a particular country as a whole is making adequate provision for old age. First, public pensions are not the only source of old-age income – people may also rely on savings or private pension schemes. Second, future tax payments are not the only way of financing the possible future shortfalls. Public schemes can run short-term surpluses and these can be used to pre-fund the future strain of negative demographics. Third, although not very probably, the private sector may be saving up to meet the future tax burden associated with population ageing.

An analysis of the public sector impact of demographic ageing addresses many important issues. But it *does not* tell us whether a particular country as a whole is making adequate provision for old age.

Weale and Khoman (2008)²⁴ set out a framework for assessing the adequacy of overall saving in the economy. Their approach is robust to differences in the mix of public and private provision of resources for old age in different countries and therefore allows meaningful cross-country comparisons to be made.

This work is different from an earlier approach (Pomerantz and Weale, 2005), which looked at savings from a macroeconomic perspective. Looking at how much saving is needed for the stock of wealth to grow in line with income – thus sustaining the economy – is a straightforward approach, which nevertheless raises some objections. These are mostly related to the fact that the approach does not identify what motivates saving. On the other hand, Scholz et al. (2004) have developed an optimal life-cycle consumption savings model, looking at individuals in a large random sample of US households. Yet, data similar to those used in the US study do not exist in the EU for the number of countries that would allow for a meaningful comparison. Weale and Khoman thus adopt a simpler approach based on a study of consumption and income as functions of age. They explore the savings needs of France, Italy, Spain and the UK on the assumption that each cohort is self-sufficient. For the income and consumption profiles, two data sources are used: the updated profiles used in the construction of generational accounts (Cardarelli, Sefton and Kotlikoff, 2000) for the UK and OECD information on public spending per person classified by age for the other countries. Mortality rates by age for each year since 1970 are taken from the Human Mortality Database.²⁵

In the study, all produced capital is fully annuitised, with the implication that the assets of those who die are shared among the survivors of the same cohort. Land is bequeathed rather than sold from one generation to the next and the rent on land accrues to adults on a per capita basis.

The study concludes that in none of the four countries studied is the current pattern of consumption by the elderly affordable for the young. Italy's consumption is well in excess of its resources. The UK shows a relatively modest shortfall. The UK has some advantage in paying for retirement owing to its higher rate of return. At the same time, it is vulnerable to a decline in its rate of return. For France and Spain, savings rates are found to be lower than those required

²⁴ AIM research, workpackage 7.

²⁵ See the Human Mortality Database website (<http://www.mortality.org/>).

but holdings of produced wealth are higher than those needed so both countries have adequate resources for the consumption patterns of the current adult population (aged 20 and older). Spain's situation is also attenuated by having a younger population than the other countries in the sample. This offsets Spain's disadvantage of having the lowest rate of return of the four countries. Only in Italy is the past accumulation of wealth insufficient to make up for the shortfall – this is the one country whose consumption patterns are creating substantial difficulties for the future.

A more favourable scenario would assume no changes in mortality rates. Here, the young would still not be saving enough to sustain current consumption patterns. Wealth holdings would make up for the shortfall, however. Italy would have enough resources to pay for the current consumption patterns of the population aged 20 and older, and France, Spain and the UK would have a surplus. But this scenario is fairly unlikely.

Another scenario extends working life by five years. This comes close to making the consumption profile affordable for younger generations although the results are obviously sensitive to the assumptions made about the wage rates people command in their extended working lives as well as the growth rates and rates of return. It is also questionable whether an extension of working life is practical given that healthy life expectancy seems to be rising less rapidly than overall life expectancy.

In all four countries – the UK, France, Spain and Italy – the young need to save more to sustain the consumption patterns enjoyed by today's elderly populations.

The analysis thus highlights the quantitative choice between saving more and working longer. A clear policy message is that in all four countries – the UK, France, Spain and Italy – young individuals need to save more to sustain the consumption patterns enjoyed by today's old-age populations.

7.2 *Microsimulating actuarial fairness: Italy as a case study*

The macroeconomic perspective is particularly useful in answering the question of sustainability at the national level, abstracting from details such as the particular pension system and pillar mix.

For monitoring the effects of reforms, on the other hand a micro approach in many cases might be more appropriate, especially when simulating complex situations where different cohorts fall under diverse pension rules. With recourse to the notion of actuarial fairness, microsimulation can allow us to monitor sustainability at an individual level.

A micro approach might be appropriate when simulating complex situations where different cohorts fall under diverse pension rules.

Italy offers a good case study. Since 1992, three major reforms and several small adjustments have taken place there. The public DB system has thus been gradually turned into a form of NDC system and additional forms of pension saving have been encouraged.

Coda Moscarola (2008)²⁶ uses the microsimulation model CeRPSIM developed by CeRP between the years 2004 and 2006 (Borella and Coda Moscarola, 2006), later modified to reflect subsequent legislative changes, to simulate the money's worth of participation in the system for six cohorts of workers (born from 1945 to 1995) under the pre-reform and under the post-reform rules. The model has been designed to accommodate a fair amount of individual heterogeneity and the complex structure of time-varying pension rules.

²⁶ AIM research, workpackage 7.

CeRPSIM can be defined as a stochastic dynamic microsimulation model by cohorts, using the taxonomy proposed by O'Donoghue (2001). The model is not behavioural in that, in particular, workers are supposed to retire as soon as they reach the minimum requirements. The simulation sketches out a certain worst-case scenario concerning sustainability (especially of DB systems) and adequacy (especially of DC systems).

The main instrument used in the analysis is the present value ratio. This is a benefit-to-tax ratio, in other words, the ratio between the present value of the pension benefits to be received and the present value of payroll taxes paid, both valued at retirement. Computed at the equilibrium rate of interest of the PAYG system, the measure allows immediate evaluations of the actuarial fairness and then of the long-term sustainability of the system.

In the resulting analysis, the new NDC system seems to be effective in stopping the process of debt accumulation. Results of simulations show that cohorts completely under the new NDC rules are granted an internal rate of return almost equal to the estimated long-term growth rate of the contributions.

Still, there are some obstacles on the road to the recovery of the sustainability of the Italian system. The new system will take a long time to be fully phased in. This, together with the fact that annuity rates are to be updated only every 10 years, with the updating process being the object of bargaining, exposes the system to long-term political threats.

8. Poverty and social exclusion of the elderly

8.1 Social exclusion of the elderly – A comparative EU study

Adequate pensions can help avoid social exclusion of the elderly. EU member states, using the EU's streamlined open method of coordination, have made an explicit connection between social protection and social inclusion. Social inclusion policy and monitoring processes should be integrated with the parallel developments in pensions, health and long-term care (European Commission, 2006, p. 11).

The elderly are considered a vulnerable social group, mainly because they risk a reduction in participation in various domains of life through the loss of paid work along with the decrease in income and an increase in health problems. Yet not so many empirical studies have been conducted on the actual extent of exclusion of the elderly in various EU member states.

The elderly are considered a vulnerable social group...Yet not so many studies have been conducted on the actual extent of exclusion of the elderly in various EU member states.

Jehoel-Gijsbers and Vrooman (2008)²⁷ present a comparative study on this topic. They ask four main research questions:

- 1) To what degree do the elderly (aged 55 and older) differ in social exclusion *among* countries?
- 2) To what degree do the elderly cohorts (aged 55-64, 65-74 and 75 and older) differ in social exclusion from younger cohorts (<55 years) *within* countries?
- 3) Which risk factors determine whether the elderly (aged 55 and older) are socially excluded?
- 4) Which country characteristics determine social exclusion of the elderly?

²⁷ AIM research, workpackage 8.

To measure social exclusion, they break the concept down into four theoretical factors: material deprivation, social rights, social settings and cultural factors (Box 2).

Box 2. Characteristics of social exclusion

A. Economic–structural exclusion (distributional dimension)

1) *Material deprivation*

Deficiencies in relation to basic needs and material goods; ‘lifestyle deprivation’; problematic debts and payment arrears (e.g. housing costs)

2) *Inadequate access to government and semi-government provisions (‘social rights’)*

Waiting lists; financial impediments and other obstacles to health care, education (especially of children), housing, legal aid, social services, debt assistance, employment agencies, social security and certain commercial services (such as banking and insurance); unsafe public areas

B. Socio-cultural exclusion (relational dimension)

3) *Insufficient social integration*

A lack of participation in formal and informal social networks, including leisure activities; inadequate social support; social isolation

4) *Insufficient cultural/normative integration*

A lack of compliance with core norms and values associated with active social citizenship, indicated by a weak work ethic; abuse of the social security system; delinquent behaviour; deviating views on the rights and duties of men and women; no involvement in the local neighbourhood or society at large

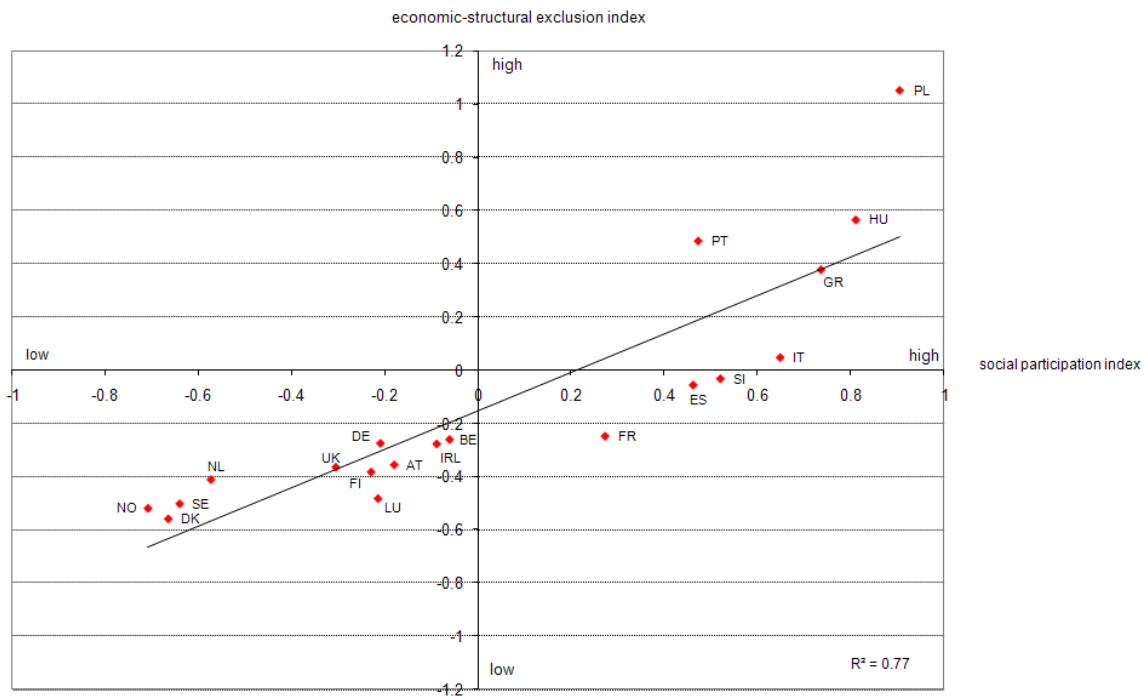
Source: Jehoel-Gijsbers and Vrooman (2008).

The original method was devised and tested for the Netherlands, making use of a dedicated dataset. The present study covers other EU member states. For data reasons, normative integration has been omitted. For the first three dimensions, indexes have been constructed by performing secondary analyses of two international surveys: the European Social Survey of 2002 and the EU Statistics on Income and Living Conditions (EU-SILC) of 2005.

The authors conclude that the elderly in the Nordic countries and the Netherlands are the least excluded, in terms of both the three separate dimensions of social exclusion and a more general index. The Continental and Anglo-Saxon countries, however, follow closely behind. In the Mediterranean countries, social exclusion among the elderly is greater, but it is highest in the EU’s new member states in Eastern Europe, especially in the Baltic States and Poland (Figures 3 and 4).

The elderly in the Nordic countries and the Netherlands are the least excluded. Social exclusion of the elderly is highest among the EU’s NMS.

Figure 3. Scaling of 22 countries on dimensions of social exclusion,^{a)} 55+ population in EU member states^{b)} (2002–05)

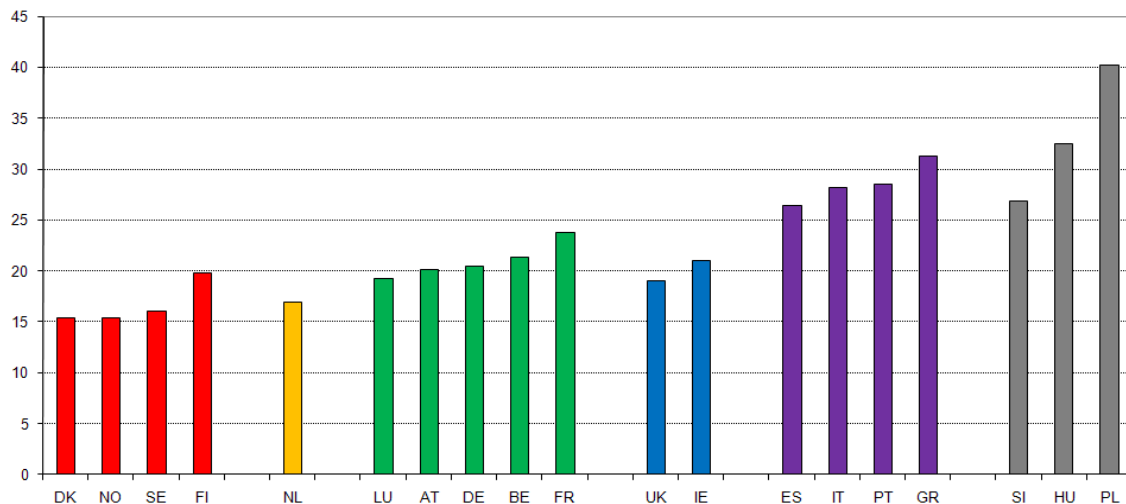


a) A high score equals a high degree of exclusion

b) EU member states in 2002 plus Norway, Slovenia, Hungary and Poland

Source: EU-SILC, 2005; European Social Survey, 2002 (SCP treatment).

Figure 4. Social exclusion in EU member states^{a)} – Overall index among the 55+ age group (2002–05)



a) EU member states in 2005 plus Norway but excluding Malta, Estonia, Latvia, Lithuania, the Czech Republic, Slovakia and Cyprus

Notes: Average of mean scores on the dimensions of material deprivation, access to social rights and social participation; a high score = a high degree of social exclusion

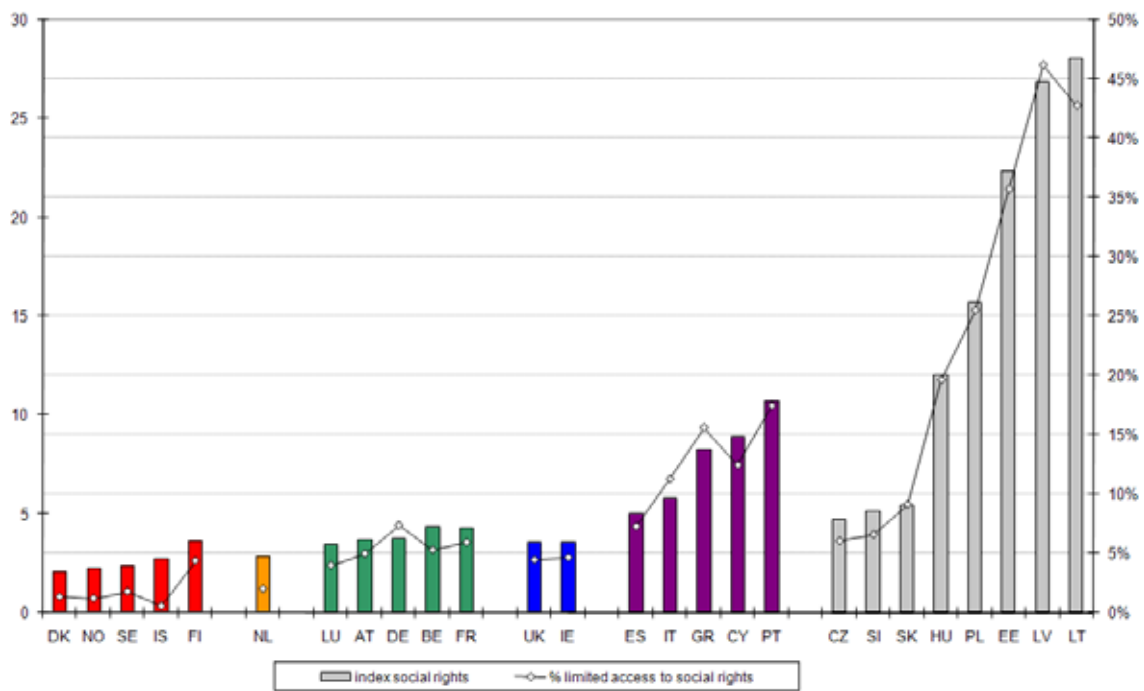
Source: European Social Survey, 2002 and the EU-SILC, 2005 (SCP treatment).

The research of the team led by Jehoels-Gijbergs and Vrooman goes well beyond this generalised picture, as presented in the above graphs. Their study further offers a detailed look at the patterns of elderly exclusion/inclusion across Europe. They find that in all EU member states, exclusion in terms of social participation increases as individuals grow older – i.e. people experience less social participation as they age. Social exclusion in terms of material deprivation shows the reverse pattern: in almost all countries, this form of social exclusion decreases with age.

With respect to access to social rights – operationalised in terms of adequate housing and access to medical/dental care here – the picture is less straightforward. In nearly all Mediterranean and Eastern European countries, the elderly are more excluded than are younger generations. In the Nordic countries, Germany and the UK, the opposite occurs: access to social rights improves with rising age.

In general, in this dimension of social exclusion, the NMS exhibit high levels of exclusion, i.e. except for the Czech Republic, Slovenia and Slovakia, they show the most limited access to social rights among the elderly (Figure 5).

Figure 5. Social exclusion in EU member states^{a)} – Limited access to social rights among the 55+ age group (2005)



^{a)} EU member states in 2005 plus Norway and Iceland but excluding Malta

Notes: Left vertical axis/bars = the average country score (1-100); right vertical axis/lines = the percentage with limited access to social rights. Limited access to social rights = respondents’ index score > average score across countries + one standard deviation; a high score = a high degree of social exclusion.

Source: EU-SILC, 2005 (SCP treatment).

In all countries covered by the analysis, bad health is an important factor increasing the risk of social exclusion. Age and gender cannot be considered serious risk factors for any of the dimensions of social exclusion once the impact of other variables has been controlled for.

Most of the differences among countries can be attributed to differences in household income. Differences in the composition of the population with respect to health, education level, age, and gender play a smaller role. Diverging institutional arrangements – as defined by a classification of countries in terms of their social security and pension regimes – also explain some of the variation in social exclusion. Yet, after controlling for the impact of income inequality this effect largely disappears. This suggests that such regime types mainly influence social exclusion indirectly, through their effects on income inequality.

8.2 *The elderly poor in the NMS*

There is one subgroup within the EU member states for which the research on the income position of the elderly is particularly interesting: the NMS. First, not much research has been done to compare the position of the elderly in these countries, partly owing to the difficulty of obtaining the data that would allow cross-country comparisons. Second, these are post-transition economies, and it would be interesting to see how the socio-economic transformations have affected the position of the elderly. Third, many of these countries have recently undergone dramatic pension reforms. These reforms have clearly been driven by the sustainability criterion. But is the position of the elderly in terms of income going to change in the future?

Vrooman et al. (2008)²⁸ have looked at the vulnerability of the income position of the elderly aged 55 or older in the post-communist member states that have joined the EU since 2004, with a careful description of the demographic, socio-economic and institutional contexts of these countries. The focus is on the degree of poverty. They have conducted a cross-comparative analysis for all countries in 2005 (the post-communist NMS of that time,²⁹ plus Cyprus). This first step was followed by in-depth studies showing historical trends for Estonia, Hungary, Poland, Romania, Slovakia and Slovenia. While the report does not simulate the future income of the elderly, it provides hints at trends and concludes with policy recommendations.

The authors conclude that the elderly in these six NMS *currently* do not experience more relative or absolute poverty than their younger compatriots do, Slovenia being an exception. On the other hand, in terms of material deprivation the elderly in all the NMS lag behind the EU-15 – the least in Slovenia and the most in Poland.

The elderly in these NMS *currently* do not experience more relative or absolute poverty than their younger compatriots do.

In the *future*, however, the relative income position of the elderly can generally be expected to be on the decline in most of the NMS. A host of reasons lead to this tentative, cautionary conclusion: the implementation of new DC pension schemes; the impact of ageing and external migration on pension financing; the after-effects of the transition period (low accrual of pension rights due to spells of unemployment); and the decreasing importance of extended families, which until now have served as a safety net.

The report suggests changing the way in which the future income position of the elderly is monitored. Instead of the standard relative poverty line, a combination of poverty measured in a more ‘absolute’ sense (through a generalised budget approach) and a direct measurement of the main dimensions of social exclusion could be more suitable (cf. section 7.1, Box 2). In addition, specific attention should be paid to measuring the income risks of marginal elderly groups in the EU’s NMS, especially the Roma minorities.

²⁸ AIM research, workpackage 8.

²⁹ Bulgaria and Romania, which acceded in 2007, are therefore not included, although Romania is included in the second phase on the in-depth analysis.

Conclusions that are more detailed can be found in the comparative analysis and in the separate summaries for each country study below.

8.2.1 *Income and poverty among the elderly in the NMS: A cross-country comparative analysis*

The analysis presented here is cross-sectional and based on the EU-SILC 2005 database. It presents the absolute and relative income position of the elderly (persons aged 55 and older) in the NMS (all of them excluding Malta): their (possible) material deprivation and their subjective evaluation of their own situation.

In the NMS, the elderly represent up to 34% of the total population, less than the share of the elderly in the total population of the EU-15.

In the NMS, the elderly represent up to 34% of the total population, less than the share of the elderly in the total population of the EU-15. The elderly in the EU-15 are over-represented in the bottom income deciles. But as shown in Table 3, this is not the case in Hungary, Lithuania, Poland and the Slovak Republic. Looking at the separate age groups of the elderly, we see that in the NMS (except the Baltic States), those aged 55-59 are under-represented in the bottom income deciles. For persons aged 65 and older this is true for all countries except Cyprus and Slovenia. In these two countries, the over-representation in the bottom income decile is considerable.

Table 3. The elderly (men and women aged 55 and over) in the bottom and top deciles as a percentage of all persons, NMS and EU-15 (2005)

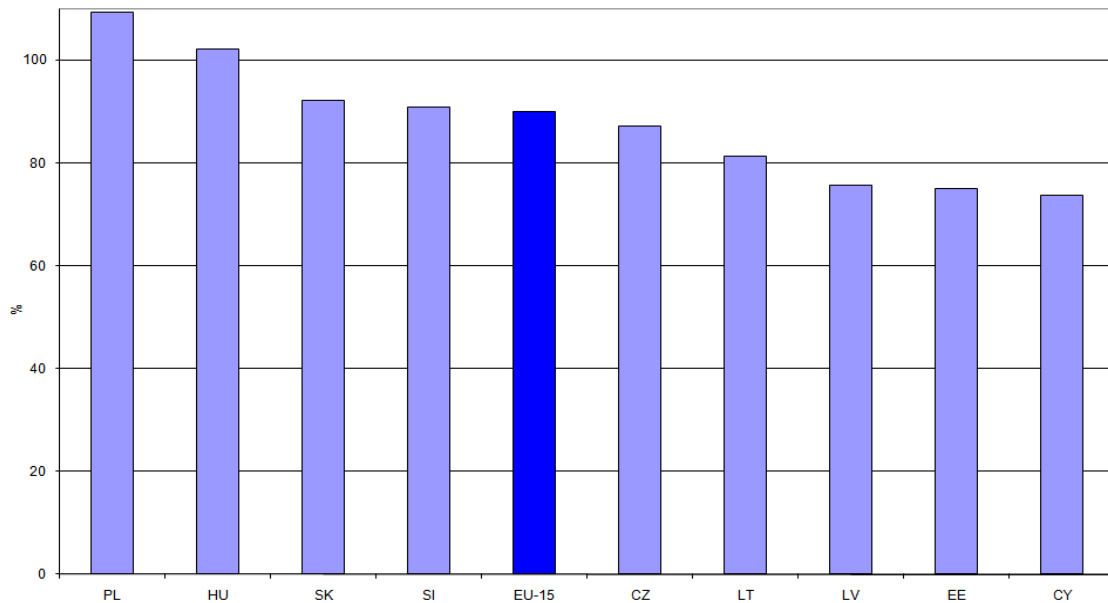
Country	Age 55 and older			Total
	1	2	10	
CY	59.9	49.1	26.7	28.3
CZ	21.0	45.0	21.6	33.4
EE	27.3	55.3	18.0	34.2
HU	19.2	29.1	28.9	33.8
LV	26.8	49.0	22.0	34.5
LT	19.6	40.0	22.0	32.1
PL	12.1	20.6	23.9	29.5
SK	15.0	32.4	22.6	28.7
SI	44.6	36.5	27.1	30.9
EU-15	38.4	45.0	33.2	35.8

Source: Calculations by Vrooman et al. (2008) based on the EU-SILC 2005 database.

Income inequality is higher among the younger cohorts than among the elderly in all the NMS except Cyprus and Slovenia. Cyprus is the country with the highest income inequality among the elderly. It is, with Latvia, the only NMS where elderly inequality exceeds the average for the population of the EU-15.

The countries differ substantially regarding the ratio between the median income of the elderly and the younger population (Figure 6). The average ratio in the EU-15 is 0.90 – ranging from 0.73 in Ireland to 1.01 in Luxembourg. Among the NMS, Cyprus is close to the lowest ratio in the EU-15. In the Baltic States, the relative situation of the elderly is only slightly better. In two NMS, the ratio is over 1: 1.09 in Poland and 1.02 in Hungary. These results stem from a low median income of the younger population rather than from a high median income of the elderly. High ratios also reflect the fact that the pension systems in these two countries were successful in safeguarding the standard of living of the elderly.

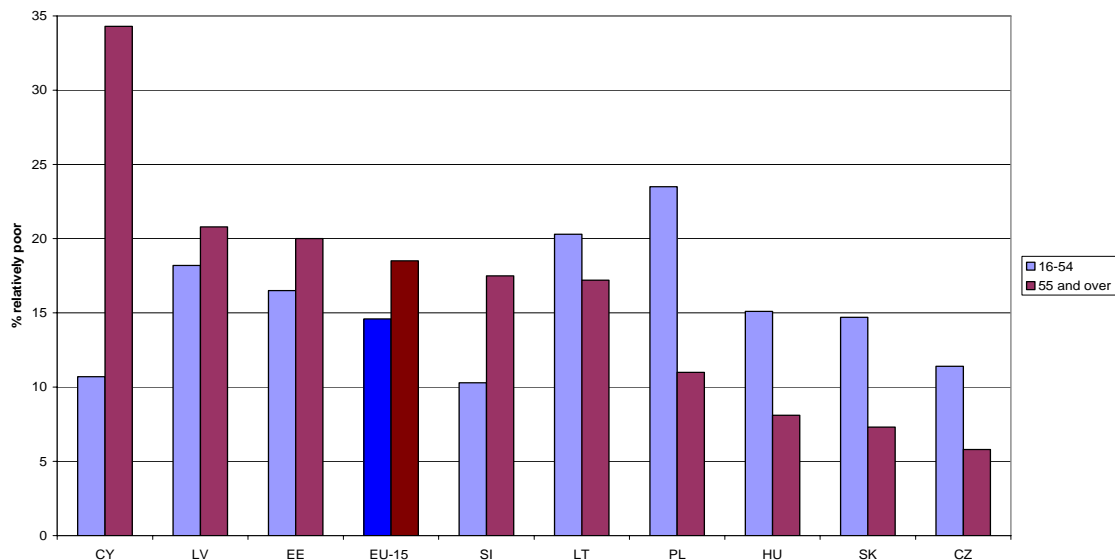
Figure 6. Median income of the elderly as a percentage of the median income of the younger population, NMS and EU-15 (2005)



Source: Calculations by Vrooman et al. (2008) based on the EU-SILC 2005 database.

Cyprus has by far the highest relative poverty among the elderly, 34.3% (Figure 7). Only in Cyprus, Latvia and Estonia are elderly persons more exposed to relative poverty than the population of the EU-15 on average. In all the NMS except Poland, the poverty incidence is higher among elderly women than among elderly men.

Figure 7. Poverty incidence (at 60% median income) among the elderly and younger population, NMS and EU-15 (2005)



Source: Calculations by Vrooman et al. (2008) based on the EU-SILC 2005 database.

In the EU-15, almost 70% of the poor elderly in the EU-15 own their housing. The proportions are even higher in six NMS, with Lithuania (94%) at the top. Generally, the quality of housing is the worst in the Baltic States.

Not being relatively poor does not necessarily mean having enough income to make ends meet! It is evident that the average lowest monthly income to make ends meet exceeds the relative poverty threshold (60% of equivalised disposable median income) in all NMS and for both the elderly and their younger counterparts. This is particularly true for the poor elderly in the Slovak Republic.

8.2.2 Highlights from the individual country studies

Apart from a comprehensive cross-country comparison of living conditions of the elderly in the NMS, the project also encompassed detailed studies of the individual countries.

Estonia has seen a fast opening-up of the economy and high growth rates. In the early stages of the transition, the elderly were considered better off (because of their access to stable incomes and indexation of pensions), but since 1996 the income position of the elderly has been growing less favourable than is the case of the younger generations. Nevertheless, the overall situation of the elderly is fairly stable, partly owing to increases in the employment rate.

The impact of the minimum pension and the redistributive character of the pension formula used for today's pensioners have translated into lower income inequality among the elderly than among persons under age 55.

It seems that the phenomenon of extended families, where pensioners share their income with less wealthy, younger family members (which causes them to fall into lower income levels), is gradually being replaced by the opposite trend: increasingly wealthy children support their parents. Estonia has also overhauled its pension system, whereby future generations will draw on a DC pension.

The poverty gap is quite substantial in Estonia, but it reduces with age, starting from the 60-64 group. According to two absolute poverty measures (the subsistence minimum and the absolute poverty line), the income situation of the elderly looks relatively favourable, especially in recent years.

The prospects for the income situation of the elderly are not particularly optimistic, although less gloomy than in some other transition economies. Pension reform will diminish the replacement rate in the public system, but the funded pillar is expected to compensate for this and the overall net replacement rate, which is currently low already, is expected to remain stable until 2050 (at around 43%).

In **Hungary**, the labour market lost more than one-quarter net of jobs in 1990–97, while the number of beneficiaries of the pension system grew by more than 20%.

Throughout the transition period, the income position of the elderly compared favourably with that of the younger population in both absolute and relative terms. The relative income position of the elderly improved between 1991 and 2005,³⁰ while within-group income inequalities among the old were lower than among the non-elderly. Even though their disposable income was below the disposable income of the active, the difference was significant only in the beginning of the 1990s. Also, the elderly did not experience the massive loss in real incomes that the younger population did in the mid-1990s, at the peak of the employment crisis. Measured by the poverty line of 60% of equivalent median income, almost one-fifth of the

³⁰ Owing to the time-period limit of the study, developments after 2005 are not discussed here.

elderly were poor in 1991 compared with 9% in 2005, while the overall poverty rate was at the same level at the beginning of the period as at the end (12%).

The relatively good income position of the elderly was due to old-age pensions, which proved to be more reliable than labour income. Old-age pensions represented about half the total income of households with an elderly household member, while the share of labour market income (wages and income from self-employment) was about 20% of total income. Other sources of income, mostly social transfers, also played an important role.

During the transition in Hungary, old-age pensions represented about half the total income of households with an elderly household member.

A comprehensive pension reform took place in 1998. The reform introduced a small new, funded, privately managed pillar within the mandatory scheme. The reform reduced the generational imbalance (the implicit pension debt) significantly. This step, however, came at the expense of burdening currently active cohorts.

The reform effort was partly defeated by subsequent political developments, with pension expenditures being sensitive to the electoral cycle. Various adjustments resulted in a rapid increase in the generational imbalance (implicit pension debt) in the 10 years after the reform. Planned austerity measures will lead to a renewed intergenerational redistribution.

The future situation of the elderly looks much less rosy. Widespread tax avoidance redistributes the contribution burden among the currently active. The cohorts that were hit by the labour market shock most severely show flatter age-earning profiles, and they have shorter average service periods than preceding and subsequent cohorts. So those born roughly between 1945 and 1959 are likely to face particular financial difficulties in retirement.

In **Poland**, the income position of the elderly tended to be more favourable than that of younger groups in 1994–2004. The median income of the elderly was higher and it grew faster than that of their younger compatriots, thanks to a generous social security system. The system, inherited from the centrally planned economy, was used as a politically expedient way of placating workers laid off in the early stages of transition. Meanwhile, the population of working age was affected by one of the lowest employment rates in what is currently the EU-27.

Throughout the analysed period, the elderly were substantially less poor than younger generations, according to both relative and absolute thresholds. Income inequalities among the elderly were smaller than among their younger counterparts. The poverty gap for the younger population exceeded the gap among the elderly by several percentage points.

The relative poverty levels of the elderly remained fairly stable. Absolute poverty decreased among the elderly while growing among younger groups.

Although the elderly usually live in larger accommodation, the conditions of their homes tend to be worse than those of the younger population.

Poland carried out an extensive reform of the pension system. In the new system, effective since 1999, pensions will depend on paid contributions throughout the entire working career, the age of retirement and the returns on capital accumulated in second-pillar pension funds. So current replacement rates, among the highest in the NMS, will be considerably lower under the new system.

Owing to the nature of the new DC system, future pensioners run a much higher risk of being threatened by poverty in cases of relatively shorter careers or lower earnings resulting from unemployment, care responsibilities, low qualifications or unofficial income. Poland could thus

make a transition from having a system with a high degree of pension adequacy combined with low financial sustainability, to one of high sustainability but low adequacy.

Absolute poverty in **Romania** fell from 36% to 15% in the period of economic growth between 2000 and 2005. The rate of absolute poverty peaked in 2000, following the years of economic recession in 1997–99. In spite of the sharp decline, the poverty rate is still among the highest in Europe. The poverty range is narrow: the population is densely concentrated around the poverty threshold.

The income position of the elderly improved relative to the younger population in 1995–2005. The most affected group is elderly single women. The rural elderly in general have a high poverty incidence.

The land reform of 1991 granted two-thirds of agricultural land to pensioner-led households. The combination of a large-scale land reform and industrial restructuring induced a massive outflow of less-qualified workers, in particular older workers, from cities to villages and from industry to agriculture. In the absence of an adequate safety net, the move to subsistence agriculture represented an important survival strategy at the end of the 1990s. In 2005, 15% of household revenues stemmed from self-consumption, down from 23% in 2000.

Subsistence agriculture protected pensioners the most. The relative share of self-consumption in total income, which was 23% for society as a whole, was 29% for the elderly (55 and older) and 32% for the oldest elderly (75 and older) in 2000.

The PAYG pension system inherited from the state's socialist era granted pensions of over 50% of the average net wages. In the turbulent 1990s, the replacement rate declined rapidly, falling to 33% by 2006, although it has recently started increasing.

In the current pension system, the number of beneficiaries actually exceeds the number of contributors. A multi-pillar pension system started to operate in 2007–08.

The economic transformation that began in the early 1990s plunged **Slovakia** into a relatively short but sharp recession and a protracted period of massive unemployment. While the country has seen high and healthy growth in recent years, long-term unemployment remains a serious concern for policy-makers. As a result of difficult employment conditions at home, there has been a continuous migration of the labour force to EU-15 countries. This outflow now accounts for around 7% of the Slovak labour force.

To mitigate the potential negative effects arising from demographic problems, the previous Slovak government undertook a pension reform in 2004. The reform introduced a sizeable funded, privately managed pillar. Individuals could opt into the pillar during a two-year transition period, after which enrolment in the funded pillar became mandatory for new labour market entrants. At the beginning of 2008, however, the new government established a period of six months in which those already in the system could opt out. Officially, this was intended to allow those who would have been worse off in the two-pillar system to switch back to a fully public pension system. Yet, the difficulty of financing the public system at a time when a large share of contributions was being diverted to the second funded pillar also played a major if not the main role.

For most of the current pensioners, the risk of poverty and material deprivation is limited, thanks to social assistance and particularly to the widespread ownership of fairly good quality housing. Even so, as with any DC pension system, the pension reform has ushered in risks for those with intermittent working careers or protracted periods of labour market inactivity stemming from caring and other out-of-market responsibilities.

In **Slovenia**, the employment rate of the population aged 55-64 is one of the lowest in the EU – just over 30% in 2005 and 2006 (although now increasing). Slovenia also has the lowest effective retirement age in the EU – 59.6 for old-age retirement in 2005. It is among the worst affected in the EU as regards future demographic developments.

In the beginning of the 1990s, early retirement started to be encouraged and subsidised by the government. The number of old-age pensioners rose by 22% in the period 1990–2005. Following the 1999 pension reform, the effective age at retirement was increased by 2 years and 3 months for both men and women in 2000–05. The employment rate of the population aged 55-64 grew notably.

Income inequality is not high, and indeed a decreasing trend was registered between 1997 and 2005. Inequality among the population aged 55 and older exceeds that among the younger population and the total population, but is falling at a quicker pace.

Compared with other European countries, relative poverty in Slovenia is not high and it declined in the period 1997–2005. It was higher for the population aged 55 and older (17.8% in 2003–05) than for the younger population (9.5%). Earlier, in 1997–99, the poverty rate for pensioners had been below the average for the total population.

The pension reform of 2000 tightened eligibility criteria and reduced benefits. Early retirees now face disincentives. Slovenia also has a small pillar of fully voluntary pension saving in non-public pension funds.

In the long run, pension reform will probably lead to a decline in the relative income position of pensioners. Lower accrual rates as well as broken, fragmented or short labour market careers owing to unemployment will have a negative impact on future pensions. On the other hand, bonuses for having worked longer will lead to higher pensions. If increases in the retirement age do not lead to higher labour force participation rates, there will be a threat of increased poverty among pensioners.

9. Maintaining living standards – Using comprehensive replacement rates as a method of comparison

Borella and Fornero (2009)³¹ propose the use of a comprehensive replacement rate (CORE) for comparing the ability of different pension systems to enable individuals to maintain their living standards when retired. They perform the analysis on eight countries: Italy, Spain, France, Germany, the UK, Denmark, the Netherlands and Luxembourg. Their data source is the European Community Household Panel (ECHP).

The authors focus on disposable income. Consumption would be a better measure to appraise individuals' standard of living, but it is not available in the ECHP. Also, while 'permanent income' should be preferred to assess the capability of individuals to smooth their consumption, since the main source of income uncertainty – i.e. the uncertainty of labour income – is no longer relevant for retirees, it is to be expected that disposable income is not a bad proxy for permanent income.

By using the ECHP data, the authors are able to define disposable income in a broad way, including pension income from public and private schemes, income from work, unemployment, disability, survivor's, housing and other social benefits. Clearly, the weight of each component will vary according to the active/retired status of the individuals. All the income measures are defined in net (after tax) terms, which make comparisons across countries possible.

³¹ AIM research, workpackage 9.

The index is longitudinal, i.e. it compares incomes of the same groups of individuals at different points in time, specifically when they are active and when they are retired.

The study computes both an actual (data-based) version of the index and a projected one, showing its evolution into the future. For this purpose, the authors use the (CeRP) SAM simulation model (Ferraresi and Monticone, 2009). The model is briefly described in section 4 of this report on approaches to modelling aspects of pension reforms. They compute the index for a family as well as individuals. Of course, the projected replacement rate is necessarily individual-based, as the family structure is not projected by the simulation model.

The authors first look at the theoretical replacement rates calculated by the Indicators Sub-Group of the Social Protection Committee (2006). These country-specific calculations are based on a uniform methodology. Yet, the representativeness of the typical worker considered may vary across countries. Base-case replacement rates are computed for a single (male, if relevant) worker covered by the most general scheme, in full-time work, earning average earnings for his 40-year long career and retiring at age 65 (Box 3).

Box 3. Theoretical replacement rates at retirement

The two main official studies dealing with the calculation of replacement rates at retirement are those by the ISG (2006) and OECD (2007).

In the report *Current and Prospective Theoretical Pension Replacement Rates* by the ISG (2004 and 2006), replacement rates are calculated for sample individuals to allow a comparison of similar work histories among different European countries. The sample individuals have a career pattern lasting 40 years, from the age of 25 to 65, a full-time job and a salary steadily equal to 100% of the national average wage. Other common assumptions include the inflation rate and the formula to calculate pension and survivor's benefits.

Replacement rates can be made comparable not only by setting common assumptions, but also by choosing the individuals who best represent the population of their country. To enable higher comparability, some variations of replacement rates are calculated, considering lower earning profiles (two-thirds of the national average wage), more dynamic careers (from 100 to 200% or from 80 to 120% of the average wage), or interrupted careers (lasting 30 years instead of 40, with a 10-year out-of-work period after the first 15 years).

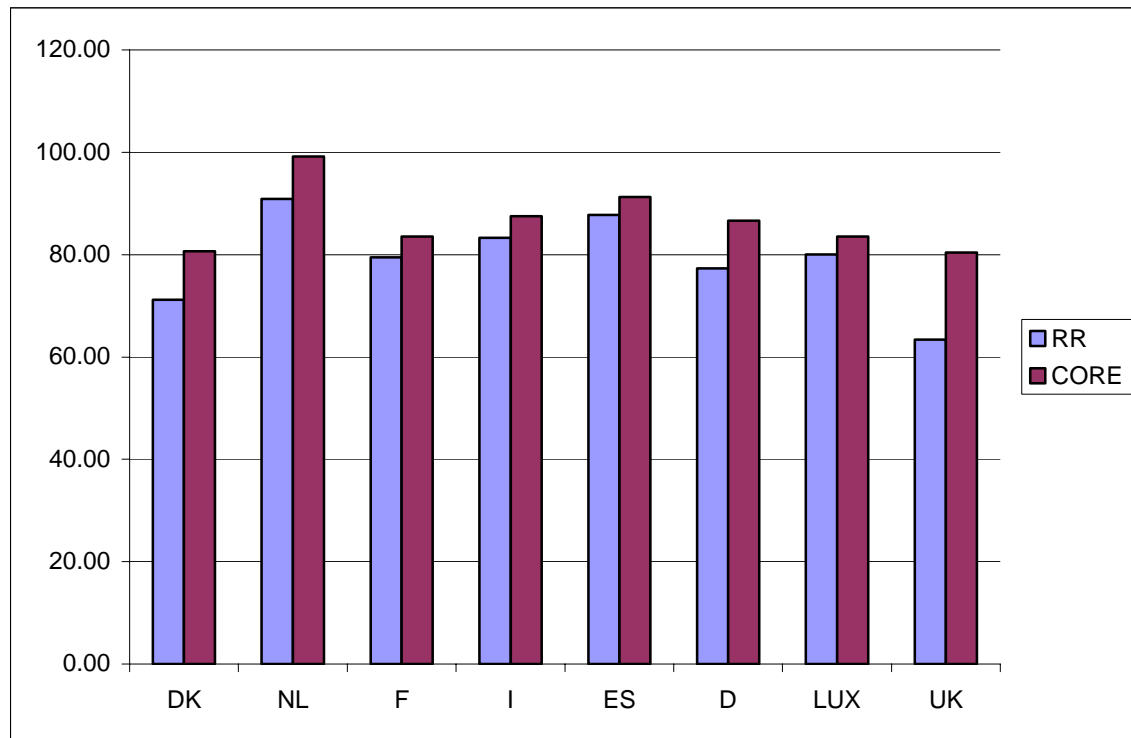
In *Pensions at a Glance 2007* (OECD, 2007), gross and net replacement rates are calculated for sample individuals entering the labour market at the age of 20 and working until retirement. The gross replacement rate is calculated for workers with incomes equal to the median and to 0.5, 0.75, 1, 1.5 and 2 times the national wage. Net replacement rates take into account the individual's taxation and paid contributions. The calculation of supplementary pension benefits assumes a yearly actual return rate of 3.5%, net of administrative costs. Two sensitivity analyses are performed, looking at individuals entering the labour market at the age of 25 and other return rates for supplementary pensions (1 and 6%).

A comparison between the ISG (2006) and the OECD (2007) theoretical replacement rates is made difficult by the different hypotheses supporting the calculations. For a comparison with our sample replacement rates, we use the ISG (2006) theoretical replacement rates.

Source: Quoted from Borella and Fornero (2009).

To compare replacement rates calculated by the ISG using a representative individual with sample-based replacement rates, the authors calculate replacement rates based on the first and the second pillars, net of taxes, and for men only. With the exception of Germany and France, all the sample replacement rates are lower than the theoretical ones, reflecting lower average retirement ages, and very likely the shorter working careers than the one examined in the theoretical computations, which consists of 40 years. Already when calculating comprehensive rather than traditional replacement rates for individuals, i.e. when comparing disposable income before and after retirement, the results indicate higher replacement rates for all countries, as well as less cross-country dispersion (Figure 8).

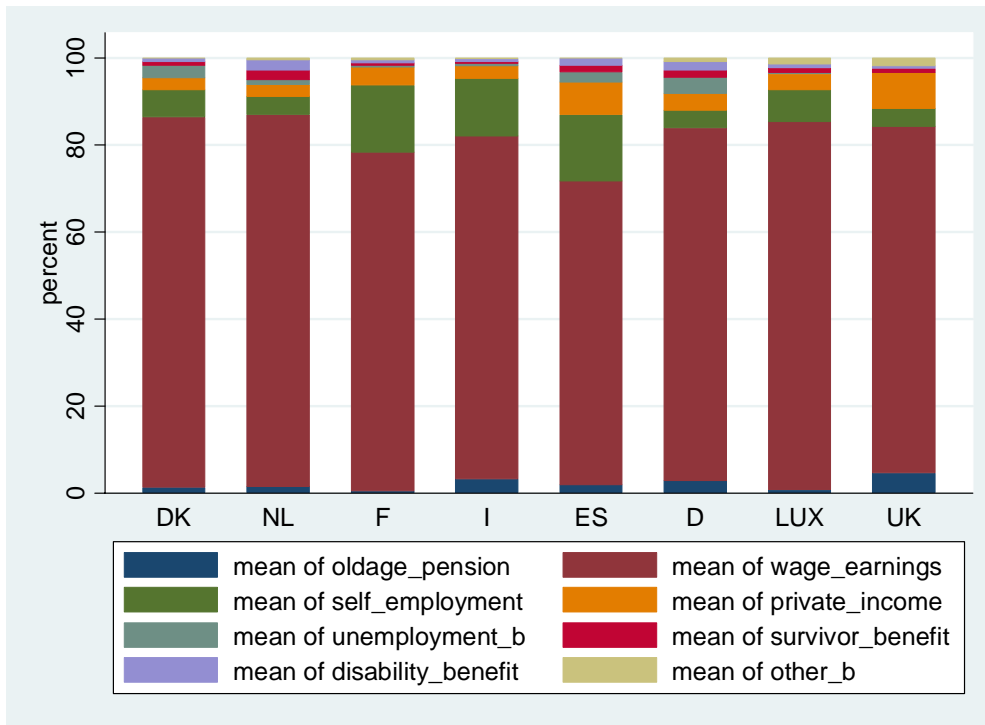
Figure 8. Median RR and CORE by country, total sample



Source: Borella and Fornero (2009) based on ECHP data.

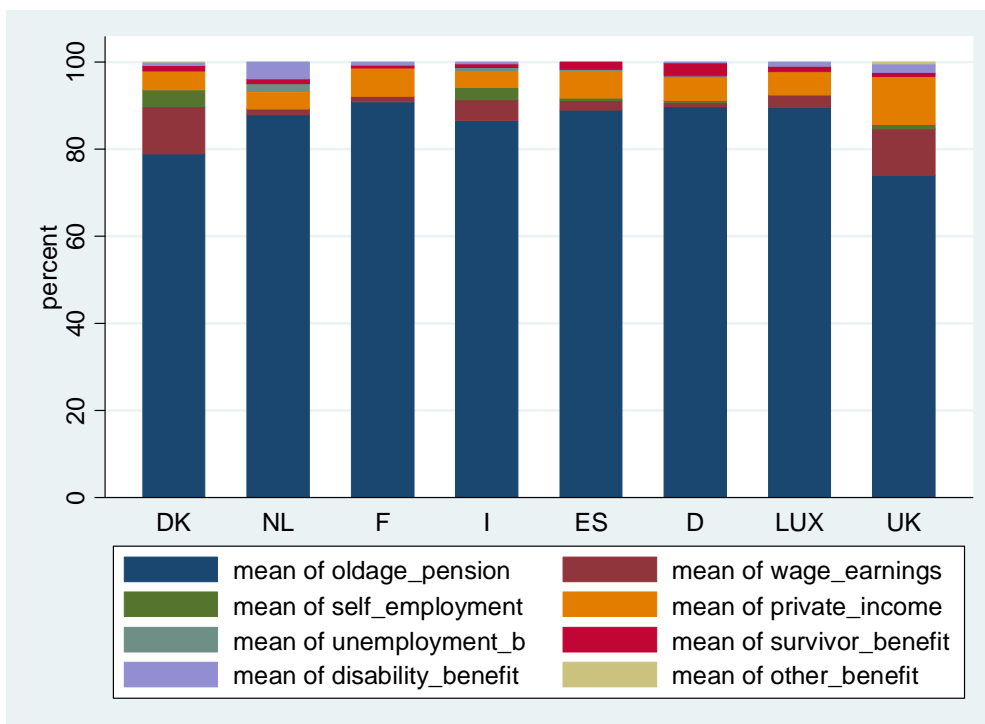
The authors also analyse the composition of income before and after retirement. Country differences in income composition before retirement are noticeable. After retirement, pension benefits – from both the first and second pillars – are the most important source of income in all countries. In the UK – and to a lesser extent in Denmark – the average pension benefit makes up a small part of the average disposable income, and in these two countries wages are, even after retirement, an important component of income. In the Netherlands, and to a lesser extent in the UK, disability benefits are also important after retirement (Figures 9 and 10).

Figure 9. Composition of income, the year before retirement



Source: Calculations by Vrooman et al. (2008) based on the EU-SILC 2005 database.

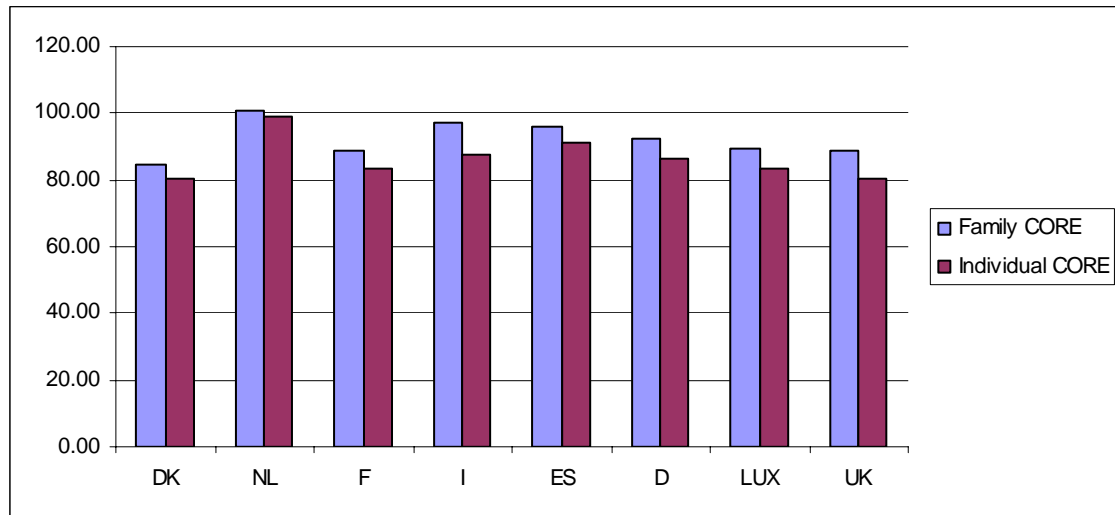
Figure 10. Composition of income, the year after retirement



Source: Calculations by Vrooman et al. (2008) based on the EU-SILC 2005 database.

After individual-based replacement rates, the authors turn to a family-based analysis. This is more suitable in assessing the resources available to each individual, since presumably an individual shares his/her resources within a close family. Indeed, family-based COREs are higher than individual-based ones (Figure 11).

Figure 11. Comparison between family and individual median COREs



Source: Calculations by Vrooman et al. (2008) based on the EU-SILC 2005 database.

This descriptive analysis confirms that, when moving from a narrower to a broader measure of the replacement rate, European cross-country differences in the resources allocated for retirement needs tend to decrease. Measured on a comprehensive basis, different countries provide in their own way for almost the same retirement income in relation to pre-retirement income, as it is the composition, much more than the level, that varies across countries.

When moving from a narrower to a broader measure of the replacement rate, European cross-country differences in the resources allocated for retirement needs tend to decrease.

Building on and cooperating with Borella and Fornero (2009), researchers in Poland, Hungary and Slovakia looked at comprehensive income replacements in their respective countries.

In Poland (Pietka, 2008), the post-productive generation tends to have a higher income than the pre-retirement groups. The median-based CORE for cohorts aged 65-69 and 55-59 was above 100% for almost the entire period surveyed and the CORE for the groups aged 65-69 and 50-54 was even higher. Nevertheless, the educational attainment of younger generations is much higher than that of the post-productive generation. It may gradually start dragging down the CORE through higher wages of younger generations as compared with the past wages shaping current pensions of those aged 65-69. Still, the role of the pension formula, which is flattening the wage structure, may be of importance.

In Hungary, Gál and Keller (2008) have been able to construct micro-level replacement rates, based on three sets of survey data. The first is the Hungarian Household Panel and the second is a targeted pension block of the regular TARKI Omnibus survey, including retrospective questions on retirement. The third is a sample of the register of the Central Administration of the National Pension Insurance. The first two datasets are old but they allow the calculation of both the standard replacement rates and COREs, whereas the third set is much larger and newer

but it only allows replacement rates. Their results generally show that in Hungary, those with a regular retirement history have higher replacement rates. Disability pensions also offer a replacement rate close to the average; on the other hand, individuals drawing on early retirement have clearly lower benefits.

For Slovakia, **Kosta and Workie Tiruneh (2008)** compute replacement rates based on EU-SILC 2005 and 2006 microdata. They generally find that those with lower skills have lower replacement rates. Replacement rates for households are higher than for individuals.

Although total replacement rates are predicted to fall slightly between 2005 and 2015, the results are not equal for both genders. While men's replacement rates are expected to deteriorate between 2005 and 2015, women, by contrast, are predicted to experience less of a slide. The authors warn that any projections are highly unstable because of the deeply politicised process of phasing in the new pension system.

10. Solidarity between and within generations

10.1 *Measuring incentives to postpone retirement through an option value approach*

Piekkola (2008)³² studies how it would be possible to postpone retirement in European households. The analysis uses the first eight waves (1994–2001) of the ECHP. In this approach, option values for retirement are constructed from a pool of four countries: Finland, Belgium, Germany and Spain. The values are calculated for public sector-mandated pensions.

The study uses the existing institutional setting to examine the incentives introduced in a new pension system. As a result of pension reforms during the 2000s, actuarial accrual deductions at early retirement and increments thereafter are used in Spain and Germany, and to a more moderate degree in Finland. The new pension system in Finland (effective as of 2005) with an actuarial adjustment of 4.5% leaves pension expenditures at roughly the same level (for given retirement patterns). In Germany, the most important change in the 2000s was the abolition of early retirement.

Are these incentives sufficient to postpone retirement? Gustman and Steinmeier (2002), using US survey data from the *Health and Retirement Study*, find that the 3% annual pension accrual is not enough for a large percentage of workers. An actuarially neutral pension system at age 60 would have an accrual rate of around 4%. Thus, the pension increase of 4% for one year's postponement of retirement matches the loss from the shorter period left as a result of retiring at age 60.

Piekkola therefore simulates an actuarial adjustment for a reduction of pensions by 5 percentage points for each year of early retirement pension before age 63 and an annual increase in pension rights of up to 7 percentage points for retirement postponed beyond age 63. This follows the suggested reform for Germany by Berkel and Börsch-Supan (2004) and is comparable to the Spanish early retirement schemes with a deduction of pension rights by 8 percentage points per year for retirement prior to age 65 (but with a minimum pension provision).

The method chosen is the option value model. In Europe, the option value model was first applied in Gruber and Wise's 1999 project ("Social security and retirement around the world"),

³² AIM research, workpackage 10.

but individually for each country.³³ The first, descriptive, phase of the project found a striking correlation between labour force participation and social security incentives. The second phase of the project carried out micro-estimations of the impact of social security on retirement. The authors found a causal relationship between social security incentives like the option value and labour force participation (Gruber and Wise, 2002). The study did not look specifically at the case of pension reforms, however.

It is indeed difficult to model the pension system for a group of countries, as rules vary significantly and there are many exceptions to the rules. Consequently, Piekkola uses a pooled estimation strategy.

He evaluates retirement patterns for a simulation whereby a flexible pension system is launched with higher actuarial increments and flexible retirement between ages 63 and 67. This system mimics the new pension system in Finland, which has been phased in since 2005. The simulated reform has the characteristics below.

- There is a unified pension system in all countries with the following actuarial adjustment: the annual accrual rate to replacement rate is 1.5 percentage points for the 18-53 age bracket, 1.9 percentage points for the 53-60 age bracket and 7 percentage points for the 61-68 age bracket.³⁴
- The pension is based on the entire working career, with 80% wage and 20% inflation indexation on past earnings. (In reality, Finland had a 50% wage and 50% inflation indexation for the last 10 years of earning, Belgium a 100% inflation indexation, Germany a 100% wage indexation and Spain a complex combination of both.)
- Pensions are indexed entirely to inflation. (In reality, the new Finnish system gives 20% weight to the wage index.)
- There is no cap on the replacement rate and no minimum or maximum pension.

The simulation shows a significant rise in the replacement rate for all countries except Belgium when the system described above is applied (Figure 12).

Owing to postponed retirement, the net present value of pension wealth rises for both the poor and the rich in Belgium and Germany, since the average retirement age increases by over 6.5 years with higher pensions (Figure 13). In Spain, the ‘abolition’ of the minimum pension by the simulated reform leads to the opposite effect. In Finland, the net present value of household pension wealth decreases, since the unemployment pension system is relatively generous and the postponement of retirement is only by one year. Yet, a country-specific estimation strategy performed by the author for Finland yields postponement by three years and the net present value of pension wealth would remain the same as before the reform (the results are not shown here). Overall, the distributional consequences of the pension reform are not adverse for poor families. Individuals at the bottom quarter of household pension wealth gain from the reform, too.

³³ The 12 participating countries in the “Social security and retirement around the world” project are Belgium, Canada, Denmark, France, Germany, Italy, Japan, the Netherlands, Spain, Sweden, the UK and the US (Gruber and Wise, 1999 and 2002).

³⁴ In all of the calculations for Finland, we account for the fact that accruals are halved for income earned prior to 1963.

Figure 12. Replacement rates at age 60 before and after pension reform

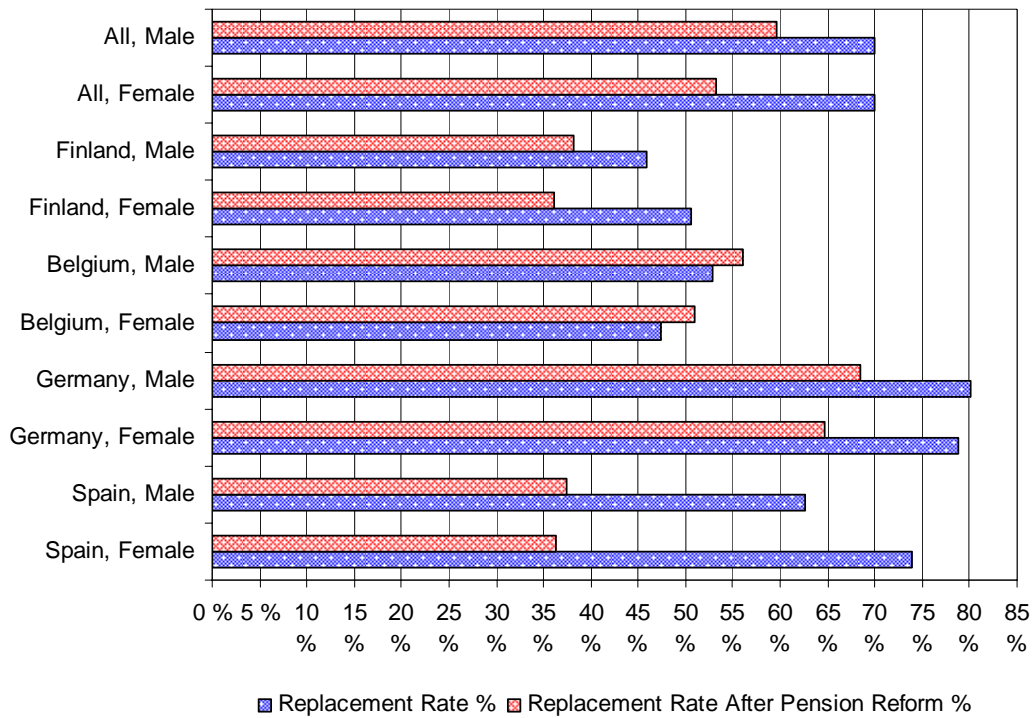
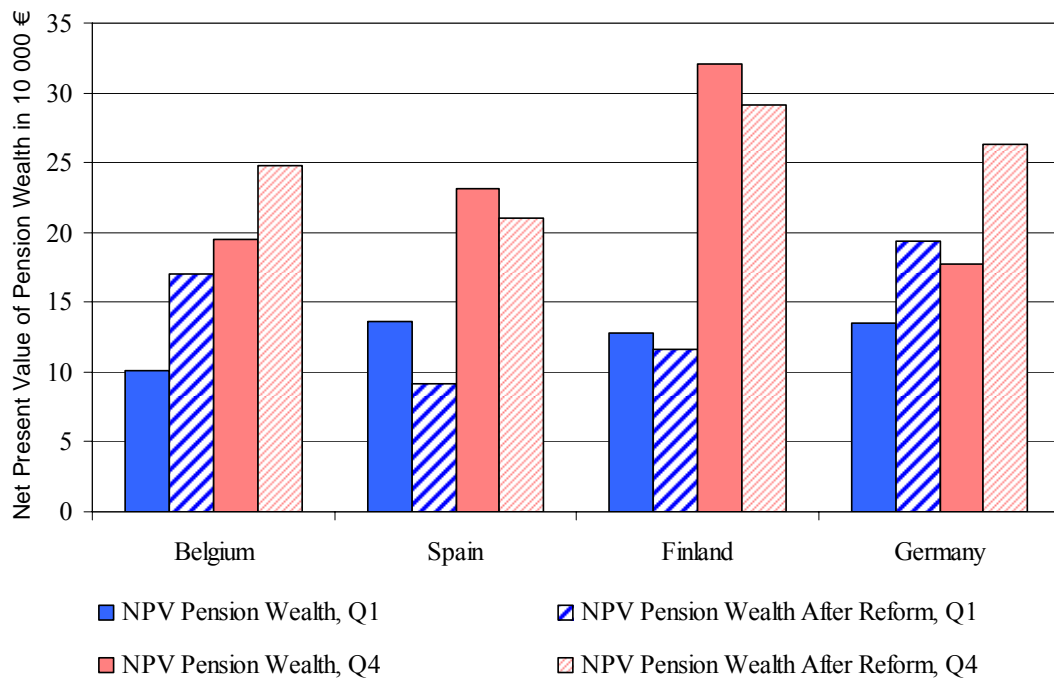


Figure 13. Net present value (NPV) of pension wealth before and after pension reform in the lowest (Q1) and highest quartiles (Q4) in the countries



Piekkola further shows that health and work satisfaction have relatively little influence on retirement. Likewise, the decision to retire by a person in a couple has little effect on the retirement decision of his or her spouse.

The main finding of the study is clear: pension reforms have to implement higher pension right accruals than those introduced by the reforms of the 2000s to date. Actuarial adjustment for a reduction of pensions by 5 percentage points for each year of early retirement and even higher accruals for postponed retirement would increase the retirement age by around 4.4 years on average and even up to 6 years in Belgium and Germany. The alternatives of improving well-being at work or improving health have minor effects.

Reforms have to implement higher pension right accruals than those introduced by the reforms of the 2000s to date.
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10.2 Case study: Retirement incentives in Hungary after the transition

Cseres-Gergely (2008)³⁵ argues that an option value model of retirement can be applied to a post-transition economy such as Hungary. He uses a stylised life-cycle model of participation and estimates a simplified option value model using Hungarian data.

His results show that economic incentives do have an effect on early retirement. He points out that the Hungarian pension system is selective in the sense that the relative benefit, or expected replacement rate, is higher for those with poor labour market prospects.

Although there is, by now, growing evidence on pension systems contributing to inactivity, this study describes the actual mechanisms, which have until now not been well documented in the transition and post-transition economies. With a model documenting the operation of the joint incentives of the labour market and the pension system for early retirement, it should not be difficult to make adjustments.

The study concludes that while the present system was perhaps necessary to ‘mop up’ excess labour supply in certain segments of the labour market (such as that of extremely low-skilled individuals), on efficiency criteria there is very little sense for the incentives to retire to be left in place today.

10.3 Case study: Retirement behaviour of Polish workers

Poland ranks among those countries that have the lowest labour market participation of older workers and the lowest effective retirement age in the EU. Early retirement privileges were granted in the course of the 1970s and 1980s in response to worker’s protests. Later, during the economic transition period, early retirement and relatively easy access to disability benefits were used to absorb the labour force that was becoming redundant in the business restructuring process. The pressure to keep these privileges continued during the period of high unemployment in the late 1990s.

Chlon-Dominczak (2009)³⁶ analyses the impact of individual characteristics, such as age, gender, education and industry in which a person worked at retirement age. She also presents an analysis of retirement age in relation to the previous wage level and assesses the potential impact of changes in the pension system on future retirement behaviour.

As a result of the incentives to retire early, the number of pensioners in Poland increased drastically and so did, naturally, the total pension expenditure, which is now among the highest in the EU. This led to the increase in social security contribution rates and a high tax wedge. In

³⁵ AIM research, workpackage 10.

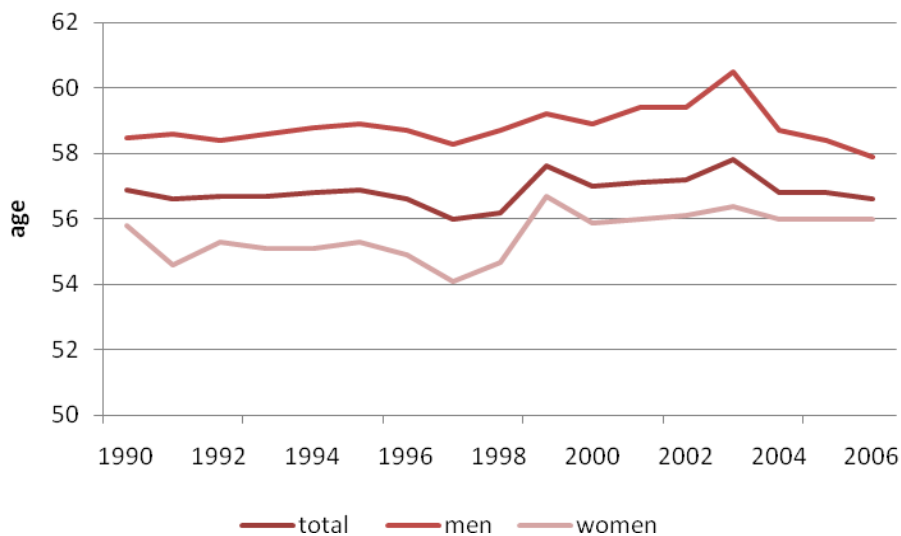
³⁶ AIM research, workpackage 10.

2006, with the tax wedge of 43.7%, Poland ranked above the OECD average. The weight of social security contributions in the tax wedge is also high. Out of the total 43.7%, 21.4% is allocated to employee social security contributions and 17.0% to employer social security contributions, with the remaining 5.3% to personal income tax. The high tax wedge, in turn, has an impact on the labour market, especially in the case of workers with lower qualifications.

The low employment rates and low retirement ages of Polish workers are perhaps the most important challenges to labour market policy in Poland. The old DB pension system encouraged early retirement and contained strong disincentives to postpone retirement.

In 2006, the average retirement age of persons who were granted old-age pensions was 56.6 (57.9 for men and 56.0 for women). Only 26.6% of men and 15.1% of women retire at or above the legal retirement age (Figure 14).

Figure 14. Average effective retirement age, men and women, Poland (1990–2006)



Source: Chlon-Dominczak (2009), drawing from ZUS (2007) and earlier.

In order to study the present retirement incentives in more detail, the study contains logit models based on pseudo-panels constructed from Labour Force Survey data. The results for transitions from employment to retirement in 2005–06 can be summarised in the following way:

- being a woman doubles retirement probability;
- compared with employment in manufacturing, employees in agriculture and fishery have a significantly reduced likelihood of retirement, as do employees in market services (though to a lesser extent);
- those aged 60-64 have a higher chances of retirement (five times) compared with those aged 50-54; and
- the lower the education level, the higher is the propensity to claim a pension (77% higher in the case of persons with at most primary education compared with those with higher education).

Analysis of the data on newly granted pensions in relation to the assessment base³⁷ allows testing of whether education level is linked to wage level and whether the wage level has an impact on retiring later. The results of the analysis show that neither of these is true for men. The situation of women is only slightly different in that the cohort of women retiring at age 65 and older has the largest proportion of women with the highest assessment base. So, women with higher wages tend to retire later – but only in this simple picture; if retirement age is broken down for women aged 65 and younger, this correlation no longer holds.

The author concludes that the new pension system, which came into effect in 1999 and is of a DC nature, will introduce incentives to prolong working lives, although of course we will only know for sure when the first pensions under this system are paid out.

The pension system alone is not sufficient, however. Continuous efforts are needed to encourage workers in Poland to stay in the labour market longer than they do currently. This requires a set of well-designed labour market policies and a changing legal framework to support the increase in the labour market participation of older workers.

10.4 Case study: Slovenia

Retirement decisions of workers in Slovenia are investigated by **Ahčan and Polanec (2008)**. Slovenia has been one of the worst affected post-communist countries when it comes to the decrease in the labour participation rates among the elderly. The authors estimate the probabilities of retirement of Slovenian men and women using the standard probit model. They use forward-looking variables such as option value, social security wealth and net wage, and include additional variables such as educational attainment and various proxies of real and financial wealth.

Their study shows that in Slovenia, incentives inherent in the social security system have little effect on retirement decisions. Changes in the net wage, on the other hand, have a dramatic impact on the decision to postpone retirement. Higher education also has the effect of delaying retirement. The authors conclude that raising the statutory retirement age is the only way of effectively delaying retirement.

Conclusions

The EU is on the way to sustainable pensions but is not quite there yet. This study illustrates in a striking and novel way that the spending patterns of today's retired cohorts are not possible for the current youngest working-age cohorts. It also shows that some of the latest adjustments to pension systems are not enough. For example, if people are to be convinced to defer retirement, they need to be offered a steeper premium for retiring after the statutory retirement age.

The manipulation of the retirement formula is one (and potentially a very effective) method of raising the retirement age and making pension schemes more sustainable. Several studies conducted within the AIM project illustrate that people respond well to financial incentives. Still, intervention in the labour market (for example, tax incentives for employers) should also be considered to facilitate the employment of older workers.

Whereas sustainability is one side of the coin, adequacy is the other. While making adjustments to improve the overall performance of pension schemes, policy-makers should continue to monitor the effect of reforms on the adequacy of coverage of particular population groups. For example, the widespread adoption of defined-contribution pension formulas heightens risks for

³⁷ The assessment base is the average, individual wage level compared with the nationwide average taken for 10 consecutive years chosen from the past 20 years of earnings.

those with scattered careers. One such group are women who have children and caring responsibilities. Here, an AIM study recommends the adoption of unisex mortality tables as the best way of compensating women for some disadvantages in the labour market.

AIM has produced several studies documenting in detail the existing material and social position of the old-age population in the EU. These are supplemented by studies of existing retirement calculation rules, the performance of labour markets and of productivity patterns of age cohorts.

As datasets available to policy-makers improve, it is becoming easier to monitor old-age income. The AIM project has shown how to construct comprehensive replacement ratios that take into account broader sources of income – not just wages and pensions. The results allow for a more precise picture of income adequacy.

Such comprehensive measures can be used in complex modelling in the future, which takes into account demographics, labour market and socio-economic developments like cohabitation patterns. The MIDAS model developed under the AIM project has provided such detailed projections for Belgium, Italy and Germany.

AIM has also provided a summary of existing pension regimes in the EU and of popular attitudes towards pension reform options. Finally yet importantly, the project has summarised theoretical arguments on what is an adequate income, and what should and should not be the role of pension policy.

The project has therefore provided a rich overview of existing conceptual and technical tools available to policy-makers as they seek to improve the sustainability of pension schemes, without unduly compromising adequacy.

Bibliography

- Aaron, H. (1966), "The social insurance paradox", *Canadian Journal of Economics*, Vol. 32, August, pp. 371-374.
- Abatemarco, A. (2009), *Measurement Issues for Adequacy Comparisons among Pension Systems*, ENEPRI Research Report No. 64, Centre for European Policy Studies, Brussels (retrieved from http://shop.ceps.eu/BookDetail.php?item_id=1779).
- Ahčan, A. and S. Polanec (2008), *Social Security and Retirement during Transition – Micro-econometric Evidence from Slovenia*, ENEPRI Research Report No. 58, Centre for European Policy Studies, Brussels (retrieved from http://shop.ceps.eu/BookDetail.php?item_id=1732).
- Barr, N. (2001), *Reforming Pensions: Myths, Truths and Policy Choices*, IMF Working Paper 139, International Monetary Fund, Washington D.C.
- Belloni, M. (2008), *The Option Value Model in the Retirement Literature: The Trade-Off between Computational Complexity and Predictive Validity*, ENEPRI Research Report No. 50, Centre for European Policy Studies, Brussels (retrieved from http://shop.ceps.eu/BookDetail.php?item_id=1639).
- Belloni, M. and E. Fornero (2008), *Gender Difference in Retirement Income and Pension Policy – Simulating the Effects of Various DB and DC Schemes*, ENEPRI Research Report No. 59, Centre for European Policy Studies, Brussels (retrieved from http://shop.ceps.eu/BookDetail.php?item_id=1695).
- Berkel, B. and A. Börsch-Supan (2004), "Pension reform in Germany: The impact of retirement decisions", *FinanzArchiv*, Vol. 60, No. 3, pp. 393-421.
- Bernheim, B.D. and D.M. Garrett (2003), "The effects of financial education in the workplace: evidence from a survey of households", *Journal of Public Economics*, Vol. 87, Nos. 7-8, pp. 1487-1519.
- Boeri, T. (2004), "Silence is Golden? Assessing the Public Debate on Pension Reforms in Europe", Presentation at the Centre for European Policy Studies in Brussels, 14 September.
- Boeri, T., A. Börsch-Supan and G. Tabellini (2002), "Pension reforms and the opinions of European citizens", *American Economic Review*, Vol. 92, No. 2, pp. 396-401.
- Borella, M. and F. Coda Moscarola (2006), "Distributive properties of pension systems: A simulation of the Italian transition from defined benefit to notional defined contribution", *Giornale degli Economisti e Annali di Economia*, Vol. 65, No. 1, pp. 95-125.
- Borella, M. and E. Fornero (2009), *Comprehensive Replacement Rates over Time: Projections*, ENEPRI Research Report, Centre for European Policy Studies, Brussels, forthcoming.
- Cardarelli, R., J. Sefton and L.J. Kotlikoff (2000), "Generational accounting in the UK", *Economic Journal*, Vol. 110, No. 467, pp. 547-574.
- Chlon-Dominczak, A. (2009), *Retirement Behaviour in Poland and the Potential Impact of Pension System Changes*, ENEPRI Research Report No. 63, Centre for European Policy Studies, Brussels (retrieved from http://shop.ceps.eu/BookDetail.php?item_id=1778).

- Coda Moscarola, F. (2009), *Measuring Sustainability of Pension Systems through a Microsimulation Model: The Case of Italy*, ENEPRI Research Report No. 66, Centre for European Policy Studies, Brussels (retrieved from http://shop.ceps.eu/BookDetail.php?item_id=1781).
- Conde-Ruiz, J.I. and V. Galasso (2003), *The Macroeconomics of Early Retirement*, CEPR Discussion Paper No. 3896, Centre for Economic Policy Research, London.
- Creedy, J., R. Disney and E. Whitehouse (1993), “The earnings-related state pension, indexation and lifetime redistribution in the UK”, *Review of Income and Wealth*, Vol. 39, No. 3.
- Cseres-Gergely, Z. (2008), “Retirement incentives in Hungary after the transition”, unpublished paper.
- Dekkers, G., H. Buslei, M. Cozzolino, R. Desmet, J. Geyer, D. Hofmann, M. Raitano, V. Steiner, P. Tanda, S. Tedeschi and F. Verschueren (2009), *What are the Consequences of the AWG Projections for the Adequacy of Social Security Pensions?*, ENEPRI Research Report No. 65, Centre for European Policy Studies, Brussels (retrieved from http://shop.ceps.eu/BookDetail.php?item_id=1780).
- Disney, R. (2004), “Are contributions to public pension programmes a tax on employment?”, *Economic Policy*, Vol. 39, pp. 267-311.
- Draxler, J. (2007), “Towards a post-communist welfare state?”, in Y. Stivachtis (ed.), *The State of European Integration*, Aldershot: Ashgate.
- Draxler, J. and J. Mortensen (2007), “Labour Market Aspects of Pension Reforms”, unpublished working paper.
- Ebert, U. and P. Moyes (2003), “Equivalence scales reconsidered”, *Econometrica*, Vol. 71, No. 1, pp. 319-343.
- European Commission (2001a), *Objectives and working methods in the area of pensions: Applying the open method of coordination*, Joint Report of the Social Protection Committee and the Economic Policy Committee (adopted in Laeken), Luxembourg: Official Publications of the European Communities.
- (2001b), Communication on supporting national strategies for safe and sustainable pensions through an integrated approach, COM(2001) 362 final, Brussels, July.
- (2002), *Adequate and sustainable pensions – Joint report by the Commission and the Council*, Luxembourg: Official Publications of the European Communities.
- (2003), *Adequate and sustainable pensions: Technical report*, Luxembourg: Official Publications of the European Communities.
- (2005), “The Budgetary Projection Exercise of DG ECFIN and the Ageing Working Group: Detailed description of agreed underlying assumptions and of projection methodologies”, Note for the attention of the Ageing Working Group, REP/E3/NDG/53678, DG ECFIN, Brussels, 10 August.
- (2006), *Social Inclusion in Europe 2006*, Luxembourg: Official Publications of the European Communities.
- European Opinion Research Group (2004), *Pension Policy and Pension Reform*, Report on the Special Eurobarometer 161/Wave 56.1, European Opinion Research Group, Brussels.

- Ferraresi, P.M. and C. Monticone (2009), *A Semi-Aggregate Model for Social Expenditure Projections*, ENEPRI Research Report No. 62, Centre for European Policy Studies, Brussels (retrieved from http://shop.ceps.eu/BookDetail.php?item_id=1777).
- Fornero, E. and J. Vanriet (2005), “Adequacy of Pension Systems: A Concept Paper (and a Comparison between France and Italy)”, unpublished working paper.
- Foster, J. and A. Shorrocks (1988), “Poverty orderings”, *Econometrica*, Vol. 56, No. 1, pp. 173-177.
- Gál, R.I. and T. Keller (2008), “Maintaining Living Standards after Retirement, Country Study: Hungary”, unpublished paper.
- Góra, M. (2008), *Retirement Decisions, Benefits and the Neutrality of Pension Systems*, ENEPRI Research Report No. 51, Centre for European Policy Studies, Brussels (retrieved from http://shop.ceps.eu/BookDetail.php?item_id=1640).
- Gruber, J. and D.A. Wise (eds) (1999), *Social Security and Retirement around the World*, Chicago: University of Chicago Press.
- Gruber, J. and D.A. Wise (2002), *Social Security and Retirement around the World: Micro-estimation*, Working Paper No. 9407, National Bureau of Economic Research, London.
- Gustman, A. and T. Steinmeier (2002), *The Social Security Early Entitlement Age in a Structural Model of Retirement and Wealth*, Working Paper No. 9183, National Bureau of Economic Research, Cambridge, MA.
- Holzmann, R. and R. Hinz (2005), *Old-Age Income Support in the Twenty-first Century: An International Perspective on Pension Systems and Reform*, World Bank, Washington, D.C. (website version of 18 February).
- Indicators Sub-Group of the Social Protection Committee (ISG) (2004), *Current and Prospective Theoretical Pension Replacement Rates*, Report by the Indicators Sub-Group of the Social Protection Committee, DG Employment and Social Affairs, European Commission, Brussels.
- (2006), *Current and Prospective Theoretical Pension Replacement Rates*, Report by the Indicators Sub-Group of the Social Protection Committee, DG Employment and Social Affairs, European Commission, Brussels.
- Janky, B. and R. Gál (2007), *Public Opinion on Pension Systems in Europe*, ENEPRI Research Report No. 36, Centre for European Policy Studies, Brussels (retrieved from http://shop.ceps.eu/BookDetail.php?item_id=1519).
- Jehoel-Gijsbers, G. and C. Vrooman (2008), *Social Exclusion of the Elderly: A Comparative Study of EU Member States*, ENEPRI Research Report No. 57, Centre for European Policy Studies, Brussels (retrieved from http://shop.ceps.eu/BookDetail.php?item_id=1700).
- Kohl, J. (2003), *Principles of Distributive Justice in Pension Policies: Cross-National Variations in Public Opinion*, Paper prepared for the Conference “New Challenges for Welfare State Research” in Toronto, 21-24 August.
- Könberg, B., E. Palmer and A. Sundén (2006), “The NDC reform in Sweden: The 1994 legislation to the present”, in R. Holzmann and E. Palmer, *Pension Reform: Issues and Prospects for Non-Financial Defined Contribution (NDC) Schemes*, World Bank, Washington, D.C.

- Košta, J. and M. Workie Tiruneh (2008), “Country Study: Replacement Rates in Slovakia”, unpublished paper.
- Kotowska, I.E., J. Stachura and P. Strzelecki (2008), *Equality of Retirement Benefits Received by Men and Women in Selected European Countries: Childbearing and Benefits*, ENEPRI Research Report No. 56, Centre for European Policy Studies, Brussels (retrieved from http://shop.ceps.eu/BookDetail.php?item_id=1664).
- Labeaga, J.-M. (2006), “Employment trends of older workers, effective average age of exit from the labour market and the relationship age-productivity”, unpublished AIM working paper.
- Monticone, C., A. Ruzik and J. Skiba (2008), *Women’s Pension Rights and Survivors’ Benefits: A Comparative Analysis of EU Member States and Candidate Countries*, ENEPRI Research Report No. 53, Centre for European Policy Studies, Brussels (retrieved from http://shop.ceps.eu/BookDetail.php?item_id=1644).
- Müller, K. (2003), *Privatizing Old-Age Security*, Cheltenham: Edward Elgar.
- O’Donoghue, C. (2001), “Dynamic Microsimulation: A Methodological Survey”, *BEJE* (Brazilian Electronic Journal of Economics), Vol. 4, No. 2 (retrieved from <http://www.beje.decon.ufpe.br>).
- OECD (2007), *Pensions at a Glance: Public Policies across OECD Countries*, OECD, Paris.
- Orszag, P.R. and J.E. Stiglitz (1999), *Rethinking Pension Reform: Ten Myths about Social Security Systems*, Paper presented at the Conference “New Ideas about Old Age Security”, World Bank, Washington, D.C.
- Pensions Commission (2006), *Implementing an Integrated Package of Pension Reforms: The Final Report of the Pensions Commission*, Pensions Commission, London.
- Piekkola, H. (2008), *Flexible Pension Systems – Postponed Retirement and Distributional Fairness*, ENEPRI Research Report No. 61, Centre for European Policy Studies, Brussels (retrieved from http://shop.ceps.eu/BookDetail.php?item_id=1742).
- Piekkola, H. and M. Deschryvere (2005), *Option Values for Retirement: Effects of Public Incentives to Postpone Retirement in Finland, Belgium and Germany*, ENEPRI Research Report No. 14, Centre for European Policy Studies, Brussels (retrieved from http://shop.ceps.eu/BookDetail.php?item_id=1255).
- Pietka, K. (2008), “WP9 – Country-Specific Analysis: Poland”, unpublished paper.
- Pomerantz, O. and M. Weale (2005), “Are we saving enough? The macroeconomics of the savings gap”, *National Institute Economic Review*, Vol. 191, No. 1.
- Reynolds, M. and E. Smolensky (1977), “Post-fiscal distributions of income in 1950, 1961 and 1970”, *Public Finance Quarterly*, No. 11, pp. 109-120.
- Ruzik, A. (2008), *Retirement Decisions as a Function of Socio-Economic Factors in Central and Eastern European Countries*, ENEPRI Research Report No. 52, Centre for European Policy Studies, Brussels (retrieved from http://shop.ceps.eu/BookDetail.php?item_id=1625).
- Samuelson, P. (1958), “An exact consumption loan model of interest with or without the social contrivance of money”, *Journal of Political Economy*, Vol. 66, No. 6, pp. 467-482.
- Scholz, J.K., A. Seshadri and S. Khitatrakun (2006), “Are Americans Saving Optimally for Retirement?”, *Journal of Political Economy*, Vol. 114, No. 4, pp. 607-643.

- Social Protection Committee (2000), *Adequate and Sustainable Pensions*, Report by the Social Protection Committee on the future evolution of social protection (for the Göteborg European Council), June.
- Soede, A. and C. Vrooman (2008), *A Comparative Typology of Pension Regimes*, ENEPRI Research Report No. 54, Centre for European Policy Studies, Brussels (retrieved from http://shop.ceps.eu/BookDetail.php?item_id=1647).
- Spataro, L. (2005), "Social security and retirement decisions in Italy: An empirical insight", *Research in Economics*, Vol. 59, No. 3, pp. 223-256.
- Vrooman, J.C. (ed.), A Gábos, R. Gál, J. Kosta, N. Kump, A. Lénárt, K. Pietka, N. Stropnik, J. Vokoun and M. Workie Tiruneh (2008), *The Elderly Poor in the EU's New Member States*, ENEPRI Research Report No. 60, Centre for European Policy Studies, Brussels (retrieved from http://shop.ceps.eu/BookDetail.php?item_id=1753).
- Walewski, M. (2008), *Differences in the Productivity Levels of Older Workers in the EU – A Cross-Country Analysis of the Age-Wage Relationship*, ENEPRI Research Report No. 49, Centre for European Policy Studies, Brussels (retrieved from http://shop.ceps.eu/BookDetail.php?item_id=1638).
- Weale, M. and E. Khoman (2008), *Are we living beyond our means? A comparison of France, Italy, Spain and the United Kingdom*, NIESR Discussion Paper No. 311, National Institute for Economic and Social Research, London (retrieved from http://www.niesr.ac.uk/pdf/100408_94720.pdf).
- World Bank (1994), *Averting the Old-Age Crisis: Policies to Protect the Old and Promote Growth*, World Bank, Washington D.C.
- Yermo, J. (2002), *Revised Taxonomy for Pension Plans, Pension Funds and Pension Entities*, OECD, Paris.
- Zaidi, A. (2008), "The OECD approach in modelling pension policy", Presentation at the workshop "Models for policy support on the impact of pensions: Bringing 'consumers' and 'producers' together" at the Centre for European Policy Studies in Brussels, 25 September.

About AIM (Adequacy & Sustainability of Old-Age Income Maintenance)

The AIM project aims at providing a strengthened conceptual and scientific basis for assessing the capacity of European pension systems to deliver adequate old age income maintenance in a context of low fertility and steadily increasing life expectancy. The main focus is on the capacity of social security systems to contribute to preventing poverty among the old and elderly and more generally to enable persons to take all appropriate measures to ensure stable or “desired” distribution of income over the full life cycle. In addition it will explore and examine the capacity of pension systems to attain broad social objectives with respect to inter- and intra generational solidarity.

Furthermore it will examine the capacity of pension systems to allow workers to change job or to move temporarily out of the labour market and to adapt career patterns without losing vesting of pensions rights. The project will also address the specific challenges with respect to providing appropriate old age income for women.

A general objective of the research project is to clearly identify and analyse the potential trade-offs between certain social policy objectives and overall stability of public debt.

AIM is financed under the 6th EU Research Framework Programme. It started in May 2005 and includes partners from both the old and new EU member states.

Participating institutes

- Centre for European Policy Studies, CEPS, Belgium, coordinator
- Federal Planning Bureau, FPB, Belgium
- Deutsches Institut für Wirtschaftsforschung (German Institute for Economic Research), DIW, Germany
- Elinkeinoelämän tutkimuslaitos, (Research Institute of the Finnish Economy), ETLA, Finland
- Fundación de Estudios de Economía Aplicada, FEDEA, Spain
- Social and Cultural Planning Office, SCP, Netherlands
- Istituto di Studi e Analisi Economica (Institute for Studies and Economic Analysis), ISAE, Italy
- National Institute for Economic and Social Research, NIESR, United Kingdom
- Centrum Analiz Społeczno-Ekonomicznych (Center for Social and Economic Research), CASE, Poland
- Tarsadalomkutatasi Informatikai Egyesüles (TARKI Social Research Informatics Centre), TARKI, Hungary
- Centre for Research on Pensions and Welfare Policies, CeRP, Italy
- Institute for Economic Research, IER, Slovak Republic
- Inštitut za ekonomska raziskovanja (Institute for economic research), IER, Slovenia