

AIM

Adequacy of Old-Age Income Maintenance in the EU



Scientific Support to Policies

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Executive summary

Project objectives:

The project aimed to develop new approaches and new methods for assessing the performance and adequacy of the pension systems with full respect of the sustainability constraint.

To this end, two main scientific objectives have been set for the project:

1. The work programme included an important research component addressing the *methodology* of analysis of the adequacy of pension schemes and pension reforms. This objective was pursued in two ways: (i) by undertaking *model simulations in common and in a coordinated framework* within a single work package and (ii) by undertaking a systematic examination of the *simulation properties of simulation models* including also models in application outside the consortium.
2. The project also applied the methodological tools in order to undertake research on the impact on the “adequacy” of pensions of parametric reforms proposed in particular in the work of the Working Group on Population Ageing of the Economic Policy Committee and similar general plans for policies to ensure sustainability of pension systems. It should be stressed that the research does only indirectly address the issue of sustainability: in general the simulations undertaken *assume* sustainability and *analyse the consequences for the adequacy objectives*. It is a main objective to undertake simulations on different classes of welfare systems (different social models) with the purpose of assessing the degree of convergence towards a European Social Model.

Adequacy was discussed, and possibilities of measuring it are outlined. This foundation stone then makes the base for the statistical and econometric exercises guided by adequacy and its twin concept, sustainability:

- Adequacy – the concept and its operationalisation (WP1).
- Classification of pension systems in the EU (WP2).
- Pension reforms and public opinion (WP3).
- Building and applying comprehensive replacement rates (WP4).
- Approaches to modelling aspects of pension reforms (WP5).
- Pension reforms and the labour market (WP6).

- Ensuring sustainability and actuarial fairness (WP7).
- Poverty and social inclusion of the elderly (WP8).
- Maintaining living standards (WP9).
- Solidarity between and within generations (WP10).

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Workpackage summary

WP No	WP title	Lead contractor	Deliverable No
<u>WPI</u>	Scientific Coordination	CEPS	D1.1 – D1.7
<u>WPII</u>	Classification of Welfare State arrangements	SCP	D2.1 – D2.5
<u>WPIII</u>	Public choice, public perceptions and voter preferences	TARKI	D3.1 – D3.5
<u>WPIV</u>	Modelling of pension systems, retirement decisions and adequacy	FPB, CeRP	D4.1 – D4.12
<u>WPV</u>	Simulation properties of models of pension systems	CEPS, FPB	D5.1 – D5.3
<u>WPVI</u>	Labour market aspects of pension reforms	CEPS	D6.1 – D6.5
<u>WPVII</u>	Ensuring sustainability and actuarial fairness through systemic reforms	NIESR	D7.1 – D7.5
<u>WPVIII</u>	Poverty and social inclusion of the elderly	SCP	D.8.1 – D8.7
<u>WPIX</u>	Maintaining living standards	CeRP	D9.1 – D9.6
<u>WPX</u>	Solidarity between and within generations	ETLA	D10.1 – D10.6
<u>WPXI</u>	Synthesis, policy issues and dissemination	CEPS	D11.1 – D11.4
WPXII	General administrative coordination and management of the project	CEPS	

SECTION 1: Major conclusions

The project has covered many aspects of retirement policies, from political economy to simulations of particular reform options.

The bulk of the study covers statistical description of the material situation of the elderly in EU-15 and the New Member States, simulations of various policy scenarios and discussions on incentives to retire or stay in the labour force.

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

Operationalising “adequacy”

Fornero and Vanriet (2005)¹ argue that it is possible to construct a set of rules on adequacy which, 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.

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).

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 techniques². This technique might be preferred for the sake of robustness. However, 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 (2008)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* equivalizing

¹ AIM research, workpackage 1.

² For example, 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 would label A as poorer than B (Foster and Shorrocks 1988).

³ AIM research, workpackage 1.

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, ie. how much poverty would have been under the hypothesis of an *actuarially equivalent* pension scheme and how much poverty really is. The study thus neglects poverty line debates by assuming that for each period there exists a generally agreed absolute poverty line, which is invariant with respect to income distributions.

Classification of pension systems in the EU

Soede and Cok (2008)⁵ provide an analysis of 19 member states of the European Union and four other countries - USA, Australia, Canada and Norway - to identify pension system clusters. They establish a list of 34 traits of the various first and second tier pension schemes⁶.

They identify 4 clusters of countries: a corporatist, a liberal, a moderate-pensions, and mandatory-private cluster.

Pension reforms and public opinion

Janky and Gál (2007)⁷ have been able to analyze attitudes of over 15,000 respondents from the EU15 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 (ref. 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 EU's 15 member countries. The authors also analyzed another Special Eurobarometer Survey, the survey on 'Social Precarity and Social Integration'. In this respect the authors have an extended information base compared to previous analysis of the survey (Kohl 2003).

⁴ 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).

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 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 AIM research, workpackage 3.

The authors derive their conclusions by comparing the effects of the same explanatory variables on the two different dependent variables: the intra-generational and the inter-generational model.

Gender does not influence preferences. Expected remaining active lifetime does not affect attitudes to intra-generational redistribution but strongly shapes preferences on inter-generational transfers. Younger voters are less likely to support increases of contributions and benefits.

Income is an important factor of shaping opinions. High earners, active as well as retired, resist larger redistribution among pensioners. Not surprisingly, those with financial problems are more likely to support stronger intra-generational redistribution.

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 poor people are more likely to support intra-generational redistribution. If those respondents are active they are more supportive of a large social security system as well.

One of the most intriguing results of the analysis is the unexpected effect of the role of funded elements on preferences to intergenerational transfers. In systems where private solutions and funded pillars are more important, citizens are more likely to support tax increases in order to maintain the existing level of benefits in the unfunded pillars.

The modelling aspects of pension reforms:

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

MIDAS⁸ is a dynamic microsimulation model developed for Belgium, Germany and Italy with the purpose of simulating future developments of the adequacy of pensions (**Dekkers et al., 2008**⁹). The model uses the programming language LIAM, specially developed for this purpose (O'Donoghue and Kelly, mimeo). The model follows, wherever possible, the projections and assumptions of the Ageing Working Group (AWG)(EC 2005).

SAM¹⁰ provides the macroeconomic background to these simulations, not only with respect to social protection expenditures but also in terms of labor 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. In addition, the Belgian version of the model also contains a module allowing for the simulation of the gross-net trajectory.

⁸ MIDAS stands for "Microsimulation for the Development of Adequacy and Sustainability".

⁹ AIM research, workpackage 4.

¹⁰ SAM stands for "Semi-Aggregate Model".

The main purpose of SAM has been to assist in the calculation of comprehensive replacement rates (COREs) to assess consumption smoothing and antipoverty dimensions of pension reforms (see Chapter 9 - **Error! Reference source not found.**). It includes Denmark, France, Germany, Italy, Latvia, Luxembourg, Netherlands, Poland, Spain and United Kingdom. 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 countries analyzed. An increase in the rates of labour force participation, as well as a decrease in unemployment, brings about a substantial improvement of employment rates until the 2020s. In the following decades, employment growth slows down. Simulations run to the year 2050, showing, in the absence of policy changes, substantial increase in public expenditure on social policy, including pensions.

Pension reforms and the labour market

There is obviously a considerable two-way interplay between the conditions in the labour market and the pension system. Changes in pension rules may affect the behaviour of the 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,
- portability of pension rights, even, maybe,
- changes in benefit indexation.

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

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

Walewski (2008)¹¹ shows that the shape of age-productivity relationship in the NMS countries differs from that observed in EU15 countries. He comes to the conclusion 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.

A study by **Labeaga (2006)**¹² analyzes retirement behaviour as the result of the operation of a number of determinants: family structure, personal history of labour force participation, health and income.

¹¹ AIM research, workpackage 6.

¹² AIM research, workpackage 6.

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

In a study on retirement decision in eight New Member States, **Ruzik (2008)**¹³ shows that older workers in CEE countries react to economic incentives for early retirement created by their social security systems and also 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 have to be only old-age pension but also other transfers treated as a substitute for early retirement (like disability pensions in some cases).

The scope for extending working life is dealt with conceptually in a paper by **Belloni (2008)**¹⁴. 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 short-sighted one. Reduced form models were initially the only available analytical framework; OLS regressions, hazard models and other simplified techniques the econometric tools. When the dynamic programming rule came into 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.

A paper by **Deschryvere and Piekkola (2005)**¹⁵ studies retirement transitions of Europeans and focuses on the impact of social security systems and well-being at work on retirement behavior. The analysis uses the first 8 waves (1994-2001) of the European Community Household Panel (ECHP). Option values are constructed accounting for household behaviour in pooled data from four countries: Finland, Belgium, Germany and Spain. They show that the incentive-compatible pension system postpone retirement on average by one year and is socially more just than the current system of encouraging (low-income) earners to retire too early.

¹³ AIM research, workpackage 6.

¹⁴ AIM research, workpackage 6.

¹⁵ AIM research, workpackage 6.

The 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)**¹⁶, 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, notably, accrual of pension rights during maternity (or paternity!) leave, notably in the context of reform of PAYG schemes.

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 aim not only of 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 still, to some degree is, a low degree of portability of pension rights. In contrast, DC schemes normally offer a high degree of portability and also 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.

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)**¹⁷, shows the following:

Men work more (higher employment rate) and earn more (higher wages), if they are in the household with one or more children. This could result from two different effects: the selection effect – only the persons that have a job and earn enough money decide to have a child - or the motivation effect – the male with children is forced to search for the funds to provide for the family. The results show that in Poland, Germany and Lithuania the biggest gain in relative income have the men with children and lower education in comparison to men without children and the same education level.

A further analysis of the relative pension position of men and women, under different characterizations of their respective working life and different pension designs was undertaken by **Belloni and Fornero (2007)**¹⁸. They consider both a DB and a DC scheme, and a few variants of their basic pension *formula*, each exemplifying a stylized normative framework. They first compare DB *versus* DC schemes, in order to assess their respective roles in determining the relative pension position of men and women. They then look within

¹⁶ AIM research, workpackage 6.

¹⁷ AIM research, workpackage 6.

¹⁸ AIM research, workpackage 6.

each of the two schemes, and quantify the effectiveness of different provisions (such as pension credits for childbearing and childrearing, and different annuitisation rules for the DC scheme) in obtaining a more equal distribution of retirement resources between genders.

They consider two euro-zones (EU 15 and EU 25), even though their characterization only differs with respect to very few aspects (i.e. productivity, occupation and mortality). In order to capture the different position of men and women in the labor market, they compare four stylized career patterns for women, against the benchmark of a unique pattern for men, with a further differentiation within each pattern as to the earning rate of growth (according to the level of education). Each combination of these dimensions defines a "simulation scenario" (represented by the ovals in the figure). They then consider two stylized pension schemes – a DB and a DC system – and different variants of their basic *formula*. Each of these variants defines a "*normative framework*". In the "base case", a pension system with no specific provision directed at compensating the disadvantaged position of women in the labour market is considered.

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 neutralizing their longer life expectancy in the determination of the pension benefits using unisex longevity tables.

A comparative descriptive analysis of the present rules for 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)**¹⁹. The report focuses on 25 member states and, to the possible extent, on acceding and candidate countries (Romania, Bulgaria, Turkey and Croatia). Due to common features of some groups of pension systems sometimes the member states are divided into two groups: 15 "old" Member States and 10 New Member States that joined the EU on May 1st 2004.

The analysis of rules for calculation of pension rights for men and women and survivor 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 in old-age income, is gradual elimination of differentiated entitlement rules to standard and early retirement, as far as age and contribution requirements are concerned. In particular the elimination of differences in the retirement age for the eligibility to the old-age pension means faster increase of a minimum retirement age for women. In the long run higher employment rates of women and reduced wage differentials between men and women would lead to better individual pension rights for women, especially in DC schemes, that were recently introduced in some of the countries.

Ensuring sustainability and actuarial fairness

¹⁹ AIM research, workpackage 6.

Weale and Khoman (2008)²⁰ 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.

The study concludes that in none of the four countries studied is the current pattern of consumption by old people affordable for young people. Italy's consumption is well in excess of its resources. The UK shows a relatively modest shortfall. This country has some advantage in paying for the retirement due to its higher rate of return. Conversely, 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 but holdings of produced wealth are higher than those needed so both countries have adequate resources for consumption patterns by the current adult population (twenty years and over). Spain's situation is also attenuated by the fact that it has a population younger than that in 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 not sufficient to make up for the shortfall, this is the one country whose consumption patterns are creating substantial difficulties for the future.

Coda Moscarola (2008)²¹ uses the microsimulation model CeRPSIM developed in CeRP between the years 2004 and 2006 (Borella and Coda Moscarola 2006), and later modified to reflect legislative changes, to simulate a money's worth of participation into the system for six cohorts of workers (born from 1945 to 1995) under the pre-reform under the post-reform rules.

The main instrument used in the analysis is the present value ratio (PVR). 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 pay-as-you-go 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 to cohorts completely under the new NDC rules the system grants an internal rate of return equal to the estimated long run rate of growth of the contributions.

Poverty and social inclusion of the elderly

Jehoel-Gijsbers and Vrooman (2008)²² present a comparative study on this topic. They ask four main research questions:

²⁰ AIM research, workpackage 7.

²¹ AIM research, workpackage 7.

²² AIM research, workpackage 8.

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

In order to measure social exclusion, they break concept down into four dimensions: material deprivation, social rights, social settings and subcultural factors (Box2).

Box 2 Characteristics of social exclusion (Jehoel-Gijsbers and Vrooman, 2008)

A. Economic-structural exclusion (distributional dimension):

1. *Material deprivation:*

Deficiencies in relation to basic needs and material goods; 'lifestyle deprivation'; problematic debts; payment arrears (a.o. 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.

A. 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 and society at large.

The original method has been 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, indices have been constructed by performing secondary analyses of three international surveys: European Social Survey (ESS) 2002, the Survey of Health, Ageing and Retirement in Europe (SHARE) 2004 and the European Union Statistics on Income and Living Conditions 2005 (EU-SILC) 2005. The authors come to the conclusion that that the elderly in the Nordic countries and the Netherlands are the least excluded, both in terms of the three separate dimensions of social exclusion and on the more general indices. The Continental and Anglo-Saxon countries,

however, follow closely behind. In the Mediterranean countries, the social exclusion among the elderly is higher and it is at the highest in the EU's new member states in Eastern Europe, especially in the Baltic States and Poland.

Cok et al. (2008)²³ have looked into the vulnerability of the income position of the elderly aged 55 years or more in the member states that accessed the European Union since 2004, with a careful description of the demographic, socio-economic and institutional context of these countries. The main focus is on the degree of poverty. They have conducted a cross-comparative analysis for all countries in 2005. 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 future income of the elderly, it provides hints at trends and concludes with policy recommendations.

The authors conclude that the elderly in these New Member States (NMS) *currently* do not experience more relative or absolute poverty than their younger compatriots, Slovenia being one exception. On the other hand, in terms of material deprivation the elderly in all NMS lag behind the EU-15 members; the least in Slovenia, the most in Poland.

The report suggests to change 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. In addition, specific attention should be paid to measuring the income risks of marginal elderly groups in the EU's new Member States, especially the Roma minorities.

Maintaining living standards

Borella and Fornero (2008)²⁴ propose the use of a comprehensive replacement rate (CORE) for comparing the ability of different pension systems to enable individuals maintain their living standards when retired. They perform the analysis on eight countries: Italy, Spain, France, Germany, United Kingdom, Denmark, Netherlands and Luxemburg. Their data source is the European Community Household Panel (ECHP).

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, housing and other social benefits.

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 pillar, net of taxes, and for males 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, shorter working careers than the one considered in

²³ AIM research, workpackage 8.

²⁴ AIM research, workpackage 9.

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 after and before retirement the results indicate higher replacement rates for all countries, as well as less across-country dispersion.

Solidarity between and within generations

Piekkola (2008)²⁵ studies how it would be possible to postpone retirement in European households. The analysis uses the first 8 waves (1994-2001) of the European Community Household Panel (ECHP). In this approach, option values for retirement are constructed from a pool of four countries Finland, Belgium, Germany and Spain.

Due to postponed retirement, the net present value of pension wealth is increased both for the poor and the rich in Belgium and Germany, since the average retirement age increases over 6.5 years with higher pensions. 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 unemployment pension system is relatively generous and the postponement of retirement is by one year only. However, 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 not shown here). The net present value of pension wealth remains the same as prior to the simulated reform. Overall, the distributional consequences of the pension reform are not adverse for the poor families. Individuals at the bottom quarter of household pension wealth gain from the reform, too.

²⁵ AIM research, workpackage 10.