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Assessing the sustainability of pension reforms in Europe

Aaron George Grech

Abstract

Europe's pensions landscape has changed dramatically since the 1990s. This paper tries to assess better the impact of these changes using a broad social sustainability framework. Pension wealth estimates for a variety of hypothetical cases are used to assess the ability of systems to alleviate poverty and maintain living standards, while setting out how reforms could change future costs and relative entitlements for different generations.

By focusing on all prospective transfers rather than those at retirement and by looking into the interaction between entitlements and labour participation, this approach provides additional insights on the impact of reforms. Our estimates suggest that generosity has fallen significantly, but remains strong in many countries. However, moves to link benefits to contributions have raised adequacy concerns for certain groups and strengthened the need for longer careers. Though reforms have helped address fiscal challenges, in many countries pressures remain strong and further reforms are likely.

Keywords: Social Security; Public Pensions; Retirement; Poverty; Retirement Policies.

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The views expressed in this paper are those of the author, and organisations with which he is affiliated do not carry any responsibility towards data used and interpretations made in the paper. The author also takes full responsibility for all errors and omissions.

Introduction

Spurred by the ageing transition, many governments have carried out wide-ranging reforms, changing the public pensions landscape in Europe dramatically since the early 1990s. Nevertheless concerns about future costs remain at the top of the agenda of most EU finance ministers despite that public resistance to reforms remains strong.

Most reforms appear to have been driven by a limited concept of sustainability, conceived as reducing projected levels of future spending on state pensions, through cuts in generosity.¹ However, given the growing size of the pensioner population, there is an increasing risk that if the pension system does not fulfil public expectations, and/or older people find that they did not make appropriate saving and working decisions, the state could be forced by voters to reverse reforms and spend more on social transfers.² Rather than focusing only on the effect of reforms on projected spending on pensions, assessments of the sustainability of reforms should also attempt to understand the implications on pension adequacy, particularly on the entitlements of those groups that are less able to accommodate the effects of benefit cuts through behavioural changes.³ The social sustainability of reforms depends crucially on their impact on the pension system's ability to reduce poverty and replace pre-retirement income and also on the ability of individuals to change their work and saving behaviour to accommodate the reforms. This broader analysis is increasingly featuring in assessments of pension reforms.⁴

This paper will try to build on this literature by presenting evidence on reforms carried out since the 1990s in ten European countries, representative of the different pension system designs across the continent. In doing so, it will also focus attention on two issues. Many assessments of pension generosity focus on the level of pension entitlements at the point of retirement for men with a full career on average earnings. For example, the EU's main pensions adequacy indicator (see EU Commission (2012)) is "the level of pension income the first year after retirement as a percentage of individual earnings at the moment of take-up of pensions...for an assumed hypothetical worker, who in the so-called 'base case' has a given earnings and career profile (male, earnings of average wage constant over his fulltime 40 years career, retiring at 65, etc)". This approach is also typically used in World Bank and OECD studies (see Holzmann & Guven (2009) and OECD (2009)). However, this approach is increasingly misleading, as the effect of reforms on full career entitlements tends to be weaker than that on those with incomplete careers. Moreover while reforms have cut annual pension benefits at retirement, they have also tended to change by a larger margin

later pension benefits. This is particularly important when looking at systemic pension reforms, such as those in Sweden and Poland – which result in annual pension benefits changing automatically with demographic developments. To address these issues, this paper uses measures of pension wealth – the value of all prospective pension transfers received during retirement – computed for individuals of both genders across the income distribution and with more representative careers.

The paper has five sections. The first outlines the current role of state pensions in Europe. It then develops the concept of social sustainability and describes how this can be assessed using four indicators, all based on pension wealth. The third section applies this framework to reforms legislated in ten European countries between the early 1990s and 2008, with an overall synthesis presented in section 4. Policy considerations are made in the final section.

1. State pensions in Europe and their changing role

There are significant differences in the design of state pension systems across Europe.⁵ At present, the dominant model remains defined benefit – where pensions are defined as some fraction of previous income. However, throughout the 1990s several countries shifted to defined contribution – where benefits are linked to contributions made and projected longevity. In particular, in most of Eastern Europe labour market entrants now depend mostly on personal accounts for their main retirement provision.

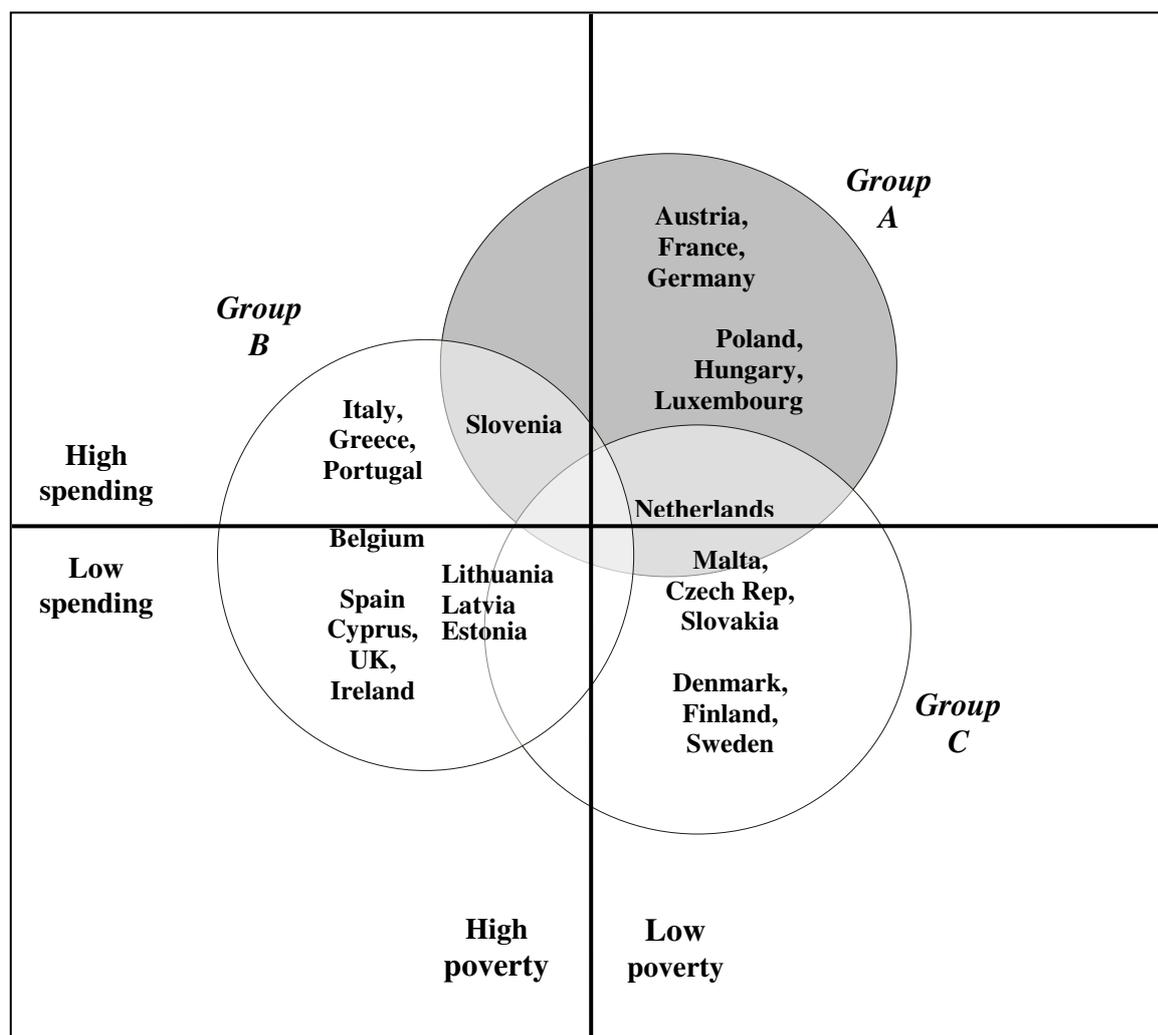
Rather than focusing on institutional features, to understand better how reforms might change performance, it might be better to investigate some of the current outcomes of pension systems. Most systems have been reformed extensively making it hard to classify them using institutional features. For instance, both Sweden and Italy have reformed their systems for new workers from defined benefit to defined contribution, but existing pensions are still determined by the previous rules. Moreover while design elements can be changed frequently, it is much less likely for the outcomes of a pension system to vary considerably in the short term. In this light in Figure 1 we categorise European pensions systems focusing on three dimensions – state spending, pensioner poverty and the level of income replacement. These dimensions encapsulate the two main aims of pension policy: alleviating poverty and smoothening income over the lifecycle (see Barr and Diamond (2006)), and the main concern of most international institutions: the budgetary impact of pensions. Countries where pension spending as a percentage of the national output is higher than the EU average are deemed to

be high spenders , and are placed above the horizontal line in the Figure (e.g. Italy), and vice versa (e.g. Ireland). Similarly countries where the proportion of elderly with an income below the relative poverty threshold is higher than the EU average are placed to the left of the vertical line (e.g. Italy), and vice versa (e.g. Sweden). So, for instance, since Poland spends more than the EU average on state pensions and the poverty risk among its elderly is below the EU average, it is categorised in the upper right quadrant of the Figure. By contrast, Ireland, a country with lower-than-average pension spending and higher-than-average risk of pensioner poverty, is placed within the lower left quadrant.

The other dimension of this pension system categorisation is illustrated by means of a darker shading of countries where the relative income ratio of elderly persons is above the EU25 average, typically because of a high replacement ratio of pensions. Thus Poland is in the darker shaded area, while Ireland is in the lighter shaded one. Given that countries with high relative income ratios tend to have lower-than-average risk-of-poverty and higher-than-average spending, the darker shading occurs mostly in the upper right quadrant. Some countries, which seem to be moving away from their current position in relation to the EU average, are placed closer to the intersections of the sets in Figure 1.

This process results in the identification of three relatively distinct groups of countries.⁶ Group A (e.g. Germany, France, Austria, Poland, Hungary) are characterised by high levels of income replacement and low pensioner poverty, but high spending. At the other extreme, Group B countries have both low levels of income replacement and high rates of pensioner poverty. Countries in this group can be further divided into those with high (e.g. Italy) and low levels (e.g. UK) of state pension spending. Group C (e.g. Sweden, Finland, Slovakia) is at an intermediate position, with relatively low levels of spending and low rates of relative poverty among pensioners, but also low levels of income replacement in retirement. The importance of this taxonomy is that it helps understand the possible sources of system stress – namely high spending in Group A, high poverty in Group B, and low replacement in Group C. Thus, a priori, one might expect that reforms in countries of Group A would have focused on curbing expenditure; reforms in countries of Group C to have concentrated on improving income replacement; and reforms in countries of Group B to have been focused on two aspects: in countries with high spending – the curbing of spending followed by measures to tackle poverty and income replacement, and in countries with low spending – the expansion of the pension system.

Figure 1: Pension system categorisation



Note: Groups B and C are both shaded lightly, as countries classified in these groups have low replacement rates; while those in Group A have high replacement rates. Countries placed above the horizontal line are high spenders on state pensions. Countries placed to the left of the vertical line have higher-than-average elderly poverty. The position of the countries in these groups reflects the extent to which their level of pension spending, relative income of the elderly and percentage of elderly population at risk-of-poverty differs from the EU average.

However, many studies of pension reforms in Europe enacted since the 1990s (for instance, Whitehouse & Martin (2008), Zaidi & Grech (2007), Hering (2006) and Schneider (2009)) argue that the main consideration of reformers was to reduce long-term financial cost (and in some cases, especially in Eastern Europe, short-term financial problems and a desire to reduce the state's role). The impact of reforms on the capability of pension systems to achieve their aims has not tended to be given primary importance.

2. Defining and measuring pension system sustainability

While there is consensus that ageing populations are a challenge for pension systems, the achievement of reduced growth in spending cannot be seen as the definitive solution to ageing. As Zaidi (2006) points out “policy-makers need to remember that pensions were not introduced by chance”.⁷ Spending on pensions is but a means to an end – the alleviation of poverty and the provision of income replacement during retirement. Howse (2004) argues that even if one agrees to the notion that spending on pensions is “already approaching the limits of political acceptability and economic efficiency”, this does not mean that the policy task is “simply that of ensuring that these limits are not transgressed”. While spending is an important constraint, a pension system is not successful just because it involves little spending. Rather, a successful system is that which achieves its goals with the least pressure on constraints. By adopting a narrow vision of sustainability focused on minimising growth in state spending on pensions, policymakers risk failing to take into account potential feedback effects on fiscal spending from the impact of reforms on adequacy. Fiscal sustainability and pension adequacy are not conflicting aims, but rather two sides of the same coin. If pension systems fall short, there could be strong political pressure for higher government spending on other support.

European Commission (2006) notes that while declining pension generosity can contribute positively to fiscal sustainability, “such a decrease may raise concerns about the adequacy of public pensions that could translate into pressure for higher public spending”. The report also acknowledges that there is no great escape by simply reducing public responsibility and recognises that “the risks to public finances will crucially depend on the reaction of individuals regarding their future retirement arrangements”. Much in the same vein, Holzmann & Hinz (2005) present the revised World Bank position on pension reform arguing that pension systems should provide “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.”

There appear to be four concerns in terms of ensuring pension system sustainability. From a political economy perspective, the adequacy of the system for the average voter needs to be ensured. If a system is not seen as beneficial by the electoral majority, namely by not helping them maintain their pre-retirement living standards, it could be voted out. Similarly if a system is not seen as able to alleviate poverty, the political pressures that led to the setting up of social assistance to elderly people during the early part of the twentieth century

might re-emerge. In the process of achieving these two goals, policymakers need, however, to take into consideration the balance of transfers between different generations. Political pressures for reform can arise either because systems are not achieving the goals that individuals expect of them or because individuals are unhappy about the deal they are getting compared to previous generations. Individuals can be concerned about the level of taxes they pay to finance the system but also by that of their pension transfers compared to previous generations. Social sustainability can only be achieved if policymakers understand these tradeoffs and optimise pension systems in this light, in the presence on considerable uncertainty, particularly as regards economic growth and longevity.

By contrast, most evaluations of pension reform tend to focus only on a single aspect. Most commonly, the focus is concentrated on pension spending projections. For instance Schneider (2009) argues that “the larger the decrease in expected spending on public pensions in 2050 between two base years, the more successful a pension reform the country achieved”. Eckardt (2005) argues that this, in part, reflects the lack of consensus on what constitutes the most appropriate pension adequacy indicator. However recently international institutions, such as the EU, OECD and World Bank, (see respectively, European Commission (2012), Martin & Whitehouse (2008) and Holzmann & Guven (2009)) have focused on the effect of reforms on theoretical replacement rates for full-career individuals on average earnings. The latter have been widely used as measures of adequacy. However, they suffer from a number of important deficiencies, such as being single point-in-time comparisons and failing to capture the impact of changes in longevity. OECD (2005), for example, notes that a country with low life expectancy could ‘afford’ to pay higher replacement rates to its citizens while imposing the same contribution on workers as a country with higher life expectancy but with lower replacement rates, and that a country where pensions lose their relative value over time, could ‘afford’ to pay a higher replacement rate at retirement than one where the relative value remains constant throughout retirement. Similarly the full impact of longevity cannot be discerned by looking at single year projections of pension spending. Moreover spending projections and theoretical replacement rates have tended to be computed separately and in many cases, trends cannot be reconciled. For instance the average pension benefit underpinning the EU’s pension spending projections amounts to 40% of gross wages, as against the average 62% gross replacement rate used in the EU’s pension adequacy reports.

An alternative approach is to evaluate the impact of reforms on pension wealth. The latter is the discounted stream of future pension payments during retirement, weighted by the probability that the individual will still be alive at that particular age (see Feldstein (1974) and Brugiavini et al (2005)). This measure captures the total pension transfer to an individual and contrary to replacement rates (which only measure generosity at a particular point in time), it captures the effects of benefit indexation post-retirement and of longevity. Sutherland et al (2009) documents how changes in benefit indexation have reduced the generosity of the UK welfare system. Estimates of replacement rates made in European Commission (2012) suggest that over the first ten years of retirement the value of pension benefits (for someone with a full career on the average wage) declines by about a tenth of its original value. Pension wealth can therefore be used to assess whether pension systems provide transfers that would result in individuals, on average, having an annual income that keeps them out of relative poverty during retirement, and also to calculate more accurately the degree of consumption smoothing that pension systems allow. By comparing the pension wealth of two successive generations one can also arrive at an intuitive measure of intergenerational balance. Moreover, in conjunction with demographic and labour market data, pension wealth can be used to assess the long-term contribution rate needed to keep the pension system in financial balance across generations. This is a better measure of financial sustainability than focusing on projected spending on pensions in one particular year as it takes into account the fact that longer-lived generations will require this spending for more years.

As an empirical application of this framework, we estimate measures of pension wealth in 2005 and 2050 for hypothetical individuals under pre- and post-reform systems using the OECD's APEX cross-country pension entitlement model.⁸ In contrast with studies which just look at average male earners (such as European Commission (2012) and OECD (2009)), we look at nine hypothetical individuals for each gender working full-time but at the different deciles of the wage distribution in each country,⁹ together with a hypothetical part-time worker (earning the median part-time wage) and an individual on minimum pension provision for each gender. Looking at different individuals is important as many pension systems are non-linear, and one cannot discern the poverty alleviation function of pensions by looking at average male earners. The presence of substantial gender and income pension inequality is well-covered in the literature (see for instance, Bardasi & Jenkins (2002), Evans et al (2000), Ginn & Arber (2001), and Meyer & Pfau-Effinger (2006)). Note that our cases differ just by gender and their position in the wage distribution. Some studies (such as

Bridgen & Meyer (2008)) have also incorporated other differences, such as child care responsibilities.

Pension wealth estimates were estimated for ten countries. The latter, namely Austria, Finland, France, Germany, Hungary, Italy, Poland, Slovakia, Sweden and the UK, not only cover 70% of the EU's population, but also span the four different pension typologies developed in Section 1 of this paper and include examples of various types of reforms. The reforms modelled were introduced between the early 1990s and 2008. These do not consider later legislated or proposed pension reforms, such as the more recent changes to pension ages in the UK and France and the reforms carried out in Hungary in the wake of the financial crisis, which could result in much lower generosity than envisaged in this paper. The benchmark for comparison was taken to be the situation in 2005 – when the pensioner generation was retiring under the pre-reform systems. By 2050, individuals are assumed to retire under the post-reform systems, while living longer lives. Having such a long horizon may seem somewhat naive as pension systems are unlikely to remain unchanged till then. However this is the horizon used in EU pension policy discussions, with which the results of this paper are intended to compare.

Pension wealth estimates were used to calculate four social sustainability indicators, on a pre- and post-reform basis, as follows:

a) *Achievement of System Goals*

- *Strength of Poverty alleviation function* = Pension wealth is averaged over the retirement period and expressed as a percentage of national disposable income in each year (approximating the relative poverty threshold achievable by these transfers). In this case we looked only at hypothetical individuals of each gender with below-median wages (as these are most likely to be at-risk-of-poverty), and computed the weighted average of poverty thresholds achieved (with the weights dependent on the relative size of that group out of the total working age population).
- *Strength of Consumption Smoothing function* = The annual average pension transfer implied by pension wealth is compared to pre-retirement wages, and averaged over retirement. The ratio is calculated for all employed hypothetical individuals and then a weighted average (dependent on the relative size of that group out of the total employed) is taken as the aggregate indicator for that country.

b) Pressure on System Constraints

- *Intergenerational Balance* = The (weighted average for all hypothetical individuals) pension wealth, defined in terms of the contemporary average wage, of the 2050 pensioner generation is compared with that of the 2005 generation.
- *Financial Sustainability* = The contribution rate out of lifetime median wages required to pay the aggregate pension transfers of the 2005 and 2050 pensioner generations is computed by multiplying the weighted average gross pension wealth for all hypothetical individuals in a generation by the ratio of beneficiaries to contributors, and dividing this by average career length at the time.

In our modelling we assumed that there is full take-up of minimum pensions and that no private retirement saving is taking place – strong assumptions for countries with means-testing and significant private pension saving as take-up of benefits and the level of savings clearly affect state entitlements. Moreover our modelling skirted the issue of household formation and calculated entitlements to single individuals, ignoring entitlements arising from partners. The estimates also ignore the effects on entitlements of credits provided for non-contributory periods – such as unemployment and childcare. These two simplifications can affect significantly results – especially for women. Finally, the indicators presented here assume pension wealth is transferred equally throughout retirement. In practice, transfers tend to be higher during the earlier part of retirement.

The main contribution of this analysis lies in four methodological innovations. Firstly, by using pension wealth, it captures the impact of two elements, namely longevity and indexation rules. The second innovation is the explicit use of benchmarks against which to assess pension entitlements. Most frequently policy makers have not sought to look at benchmarks in this area, preferring to retain a good level of discretion on what constitute ‘adequate’ outcomes. While the benchmarks used here can be seen as arbitrary, the framework is flexible enough to allow the testing of various outcomes. The third innovation is to attempt to measure all elements using the same indicators instead of using different models. This increases transparency and also clearly illustrates the trade-offs between system goals and constraints. Finally this framework is able to incorporate distributional and gender analysis – an element of pension reform assessment that has frequently not been given enough importance by international institutions.

3. Applying empirically the pension system sustainability framework

The assumption of complete careers till pension age over-represents the real efficacy of existing pension systems, by over-estimating the achievement of goals, since it implies that individuals benefit from the maximum generosity of the system, while diminishing the constraints faced, as it boosts the support ratio (as everyone is assumed to be in work). Moreover, reformers may have based their policy choices on the understanding that there would be developments in the labour market which would offset part of the effects of their reforms. To understand whether pension reforms are socially sustainable, one needs to adopt more representative labour market assumptions.

This paper presents two sets of sustainability indicators. In the first set – the “full-careers” assumption – we focus on just the nine hypothetical full-time individuals of each gender and assume that they work from age 20 to the state pension age in their country. We also assume that everyone of working age is in employment. In the second set – the “actual careers” assumption – we look at all eleven cases (thus including the representative part-time worker and the person on minimum provision in addition to the nine full-timers). Moreover instead of assuming full-careers for those in employment, estimates of the number of years spent in the labour market were constructed using EU LFS current and projected participation rates by age (taken from European Commission (2012)). For instance, if the participation rate of those aged 20 is 80%, we add 0.8 career years, and continue to cumulate this career length till pension age with age-specific participation rates in that country. Note that in this approach we are imposing the average labour market participation of a cross-section of generations on a single generation, and we are assuming that all our individuals display average labour market participation trends over their career. Despite these significant caveats, these estimates should present a more realistic view of the present and future efficacy of pension systems being studied, as current and projected labour participation rates, particularly among women, differ greatly among the ten countries.¹⁰ The aggregate results for the four sustainability indicators are presented for both the “full-careers” and “actual-careers” assumption in Tables 1 to 4, below.

Our estimates suggest that while reforms have reduced the poverty alleviation and consumption smoothing functions in nearly all countries, generosity remains high in many countries, with pension transfers keeping most of those below median earnings above the 60% relative poverty threshold, on average, throughout retirement. Reforms have mostly followed existing system goals, but with an eye to reduce future cost. However there have

been some reforms, mostly in Eastern Europe, which raise issues about the future adequacy of pensions for women and those on lower incomes as the degree of progressiveness has been reduced considerably. The “actual careers” estimates confirm the importance of understanding the interaction between the labour market and the social protection system. A system may look very generous on paper, but not be so in reality as only few individuals qualify for full benefits.

Table 1: The poverty thresholds (% of median disposable income) achievable in 2005 and 2050 under different labour market assumptions

a) Men

	Full-careers assumption [^]			Actual-careers assumption*		
	2005	2050	Change in p.p.	2005	2050	Change in p.p.
Austria	96	85	-11	95	74	-21
Finland	79	72	-7	64	66	+2
France	73	62	-11	63	59	-4
Germany	69	58	-11	61	59	-2
Hungary	79	82	+3	70	65	-5
Italy	99	78	-21	95	68	-27
Poland	77	54	-23	66	50	-16
Slovakia	102	77	-25	93	51	-42
Sweden	72	64	-8	70	65	-5
UK	48	61	+13	46	59	+13

b) Women

	Full-careers assumption [^]			Actual-careers assumption*		
	2005	2050	Change in p.p.	2005	2050	Change in p.p.
Austria	69	70	+1	68	61	-7
Finland	70	64	-6	57	58	+1
France	67	59	-8	44	59	+15
Germany	55	52	-3	48	56	+8
Hungary	73	79	+6	68	59	-9
Italy	79	71	-8	68	50	-18
Poland	68	39	-29	55	35	-20
Slovakia	82	62	-20	74	41	-33
Sweden	60	54	-6	59	56	-3
UK	41	60	+19	39	56	+17

[^] These indicators are the average for the 4 hypothetical full-timer full-career workers with below-median wages.

* These indicators are the weighted averages for 4 hypothetical actual-careers full-timers with below-median wages and the hypothetical part-timer. The weights reflect the respective share of full-time and part-time workforce in each country.

Source: Own analysis using APEX.

This tends to be particularly pertinent for women. The “full-career estimates” of the strength of the poverty alleviation function are far higher than those resulting when adopting more realistic labour market assumptions (see Table 1). For instance, the relative poverty threshold achievable by pension transfers in France drops to 63% from 73% among men and from 67% to 44% among women. Overall, the “actual-careers” results are more in line with current data on the actual risk-of-poverty and gender gaps in poverty risks. For example, under the “full-careers” assumption, Italian women are among the best provided for across Europe, failing to explain their high relative poverty rate. The “actual-careers” estimates appear to be much more representative of effective pension generosity.

While these are important contributions, potentially the most interesting finding is that labour market trends can act as a countervailing force that offsets in part pension reforms. This is particularly true in those countries where the reforms created closer links between contributions and benefits. Reforms, generally speaking, reduce the strength of the poverty alleviation function and result in a greater degree of convergence across countries. If one were to look at “full-careers”, reforms make systems more generous only in the UK and in Hungary. However taking into account actual and projected labour participation shows us a different picture. Effective generosity is set to improve in some countries, like France and Germany – on account of higher labour market participation. Thus the “full-careers” estimates show women as being the main losers of the reforms, with very substantial losses anticipated, for instance, among women in Poland and Slovakia. The “actual-careers” assumption reverses this finding for some countries, though it should be noted not for those countries with the strongest losses. Higher labour participation might actually result in improvements over time in pension entitlements for women despite the reforms, cases in point being France and Germany. Moreover in many countries, cuts in the general pension system’s generosity have been complemented by a strengthening of minimum pensions. This has the potential to reduce the impact of the reforms on pensioner poverty.

There are similar trends when one looks at average replacement ratios – i.e. the strength of the consumption smoothing function. For instance, Table 2 shows that in Germany the average replacement ratio for men with a full career will be more than a sixth lower by 2050; and a fifth lower in Italy. The loss here is however relatively stronger and in countries like Poland, Austria and Italy the state pension on its own will not be enough to sustain pre-retirement levels of consumption. Again the decline here is much pronounced for men. Gender gaps in replacement rates should decline, as men (with their fuller contributory

records) will lose more in actual entitlements than women. This can be discerned by comparing the “full-careers” with the “actual-careers” cases – in some cases, e.g. Italy and Slovakia, the reforms favour those with full careers. However in many cases, the impact of the reforms on replacement rates differs by income; for those on high incomes generosity has been cut, while for those on low incomes it was maintained stable. In many countries, the consumption smoothing function of the state pension system for middle-to-high earners may need to be supplemented by other means. But there are exceptions – in Poland and Slovakia those on low incomes face the toughest challenge as systems are much less progressive.

Table 2: The average replacement ratios through retirement (% of pre-retirement wages) achievable in 2005 and 2050 under different labour market assumptions

a) Men

	Full-careers assumption [^]			Actual-careers assumption [*]		
	2005	2050	Change in p.p.	2005	2050	Change in p.p.
Austria	91	78	-13	89	66	-23
Finland	75	69	-6	59	59	0
France	68	57	-11	56	58	+2
Germany	85	68	-17	71	69	-2
Hungary	85	90	+5	74	62	-12
Italy	92	72	-20	92	67	-25
Poland	87	63	-24	67	56	-11
Slovakia	72	67	-5	62	56	-6
Sweden	66	62	-4	66	59	-7
UK	40	48	+8	37	53	+16

b) Women

	Full-careers assumption [^]			Actual-careers assumption [*]		
	2005	2050	Change in p.p.	2005	2050	Change in p.p.
Austria	83	82	-1	75	66	-9
Finland	75	70	-5	58	60	+2
France	71	61	-10	41	51	+10
Germany	82	71	-11	59	67	+8
Hungary	83	90	+7	74	64	-10
Italy	82	73	-9	65	50	-15
Poland	86	50	-36	65	43	-22
Slovakia	83	67	-16	75	56	-19
Sweden	71	64	-7	66	57	-9
UK	44	60	+16	40	57	+17

[^] These indicators are the averages for the 9 hypothetical full-timer full-career workers.

^{*} These indicators are the weighted averages for the 9 hypothetical actual-careers full-timers and the hypothetical part-timer. The weights reflect the respective share of full-time and part-time workforce.

Source: Own analysis using APEX.

Turning to pressures on constraints, our estimates suggest that had replacement ratios remained untouched by reforms, future generations of pensioners would have got much larger net pension transfers as a result of increasing longevity. The reforms appear to have addressed this. So while year-on-year replacement rates may have fallen, generally, future pensioners still get more transfers than current ones, with the exception of Italy, Poland and Slovakia. In these countries the drop is quite significant and reflects the large financial problems which these countries would have faced had they retained their previous system rules. Table 3 indicates that the consideration of labour market participation does not result in any significant reinterpretation of the development of the relative size of intergenerational pension transfers. Rising labour participation and increasing longevity should result in net pension wealth expanding slightly in many countries. Interestingly while under “full-careers”, women generally lose out compared to men, on account of the equalisation of pension ages, the “actual-careers” assumption shows them in some countries, such as France and Germany, as being better off as their entitlements are buoyed by their rising labour participation.

Table 3: The net pension wealth of the 2050 generation compared to that of the 2005 generation under different labour market assumptions (%)

	Male		Female	
	Full-careers assumption [^]	Actual-careers assumption [*]	Full-careers assumption [^]	Actual-careers assumption [*]
Austria	109	94	98	87
Finland	114	125	106	119
France	98	101	96	141
Germany	92	104	95	124
Hungary	131	116	112	82
Italy	95	77	87	76
Poland	106	83	69	73
Slovakia	109	80	79	58
Sweden	107	112	100	96
UK	127	127	112	117

[^] These indicators are the averages for the 9 hypothetical full-timer full-career workers.

^{*} These indicators are the weighted averages for the 9 hypothetical actual-careers full-timers and the hypothetical part-timer. The weights reflect the share of full- and part-time workforce in each country.

Source: Own analysis using APEX.

In Table 4 we present estimates of the contribution rates workers in 2005 and 2050 would need to pay to finance the pension transfers to the pensioner cohorts retiring in those years. For 2050, the financing cost is presented both for the reformed pension systems and also assuming no reforms had taken place (so that system rules remained as at 2005). While generosity is lower under the “actual careers” assumption, the financing requirements of

pension systems are significantly higher. On average, across Europe a contribution rate of 17% is required to finance the pension wealth of the currently retired as against the 11% implied when modelling full-careers. In the absence of reforms, fiscal pressures would have increased substantially more. The impact of the ageing transition, in fact, would be compounded by the impact of increasing women’s entitlement to pensions. The reforms, however, partially address this factor so that the increase in fiscal pressures by 2050 is of around 10 percentage points, on average. There are some notable outliers, however, such as France, Poland and Slovakia, where the required increase is around double this increase. In these countries, weak labour market participation combines with rapid ageing to make up a very dangerous cocktail. The trends implied by the estimates in Table 4 differ from standard assessments of pension spending projections, as they suggest that despite reforms the financing burden of pension systems will still increase very significantly (by contrast, Economic Policy Committee (2009) suggests pension spending across the EU will rise by just 2.4% of GDP by 2060). This is because our measure captures better the full implications of longevity increases, by looking at pension spending for the whole retirement period of a cohort, rather than focusing on one year of future spending.

*Table 4: Comparing financial sustainability under the different careers assumptions**

	Full-careers assumption			Actual-careers assumption		
	2005	Pre-reform 2050	Post-reform 2050	2005	Pre-reform 2050	Post-reform 2050
Austria	13.8	27.3	22.7	19.3	47.7	26.8
Finland	8.5	20.4	18.3	8.7	23.7	20.9
France	14.6	29.6	24.3	21.0	50.3	41.4
Germany	8.0	17.9	14.4	11.8	39.6	20.9
Hungary	22.0	43.0	30.8	37.7	80.9	44.5
Italy	17.3	34.1	24.7	29.7	67.1	31.6
Poland	8.4	30.4	20.7	14.4	67.7	34.7
Slovakia	11.1	35.9	24.6	20.6	85.4	38.7
Sweden	10.1	18.3	16.7	11.5	30.4	21.5
UK	5.8	7.1	6.7	9.1	17.6	10.3
Average [^]	11.1	23.6	18.3	17.5	47.2	27.2

* The proportion of total lifetime wages needed to finance the pension wealth of different generations.

[^] The contribution rate of a country is weighted in line with relative population size.

Source: Own estimates using APEX, EU labour market and population projections.

4. Overall assessment of social sustainability of pension reforms

The achievement of “sustainability” has been the main objective that policymakers have set themselves when reforming pension systems. However when looking into the future,

policymakers need to reassure themselves not only that pressure on constraints is being managed properly, but also that pension systems remain effective and still achieve expected goals. To do this, policymakers need to be able to map out the impact of reforms on the strength of the poverty alleviation and consumption smoothing functions, particularly for groups with low incomes and/or partial careers, together with the influence reforms have on relative size of transfers between generations, both in terms of the pension wealth accruing to future generations and the contribution rates required to finance these transfers.

By looking holistically at the developments in the four social sustainability indicators described in the previous section, policymakers could compare how the achievement of the twin goals of pension systems and the pressure on system constraints should change by 2050 when looking across the aggregate pensioner population. This approach allows one to understand whether one aim is being sacrificed for better results on the other, and provides an indication of how the role and scope of state pension systems could evolve. The fact that this comparison is done on a cross-country basis also allows one to understand how different policymakers reacted to similar challenges. There are some quite striking similarities. For instance, only countries which faced a very substantial fiscal challenge due to ageing put in place reforms that cut the relative size of total pension transfers to future generations. In most countries, the reforms offset only part of the effect on pension wealth of the projected rise in longevity, and accommodate the projected change in the relative size in the pensioner population by a rising (implied) contribution rate.

The estimates in Table 1 suggest that most countries will converge towards providing pension wealth which keeps individuals above the 60% poverty threshold throughout retirement. The only exceptions appear to be Poland and Slovakia. Despite these radical cuts, these countries will still experience large increases in their financing costs (see Table 4), on account of steeply declining support ratios. Improving employment rates could help stem these developments. In a similar vein, in France and Hungary the pension system seems to face significant fiscal challenges, which could be partially addressed by increasing employment at older ages and raising the pension age – options which these two countries have started to address though recent reforms not modelled here.

The above analysis can be deepened by looking more closely at the social sustainability indicators, and zooming to particular sections of the population. For instance, the estimates presented in the previous section suggest very different gender and income distribution effects of pension reforms in Poland compared to the UK. The impact of the

pension reforms in Poland will be more strongly felt by those on low incomes, and particularly women. By contrast in the UK, the reforms are very progressive. Our social sustainability indicators help set out the major risks faced by pension systems. They show that in some countries, like Poland and Slovakia, pensioner poverty could become an issue, while in others future pensioner generations may be seen to be favoured at the expense of current pensioner generations (e.g. Finland, UK) and/or future generations of workers (e.g. France).

The estimates can help us try to assess how the taxonomy depicted in Figure 1 might change by 2050 as a result of reforms. The overall situation in 2050 will be very different than in 2005, as can be inferred from the averages for the four indicators shown in Tables 1 to 4. In particular, the level of pension spending, on average, will be significantly higher, there will be more convergence across countries in terms of replacement rates and the risk-of-poverty among pensioners could be higher than in Figure 1.

The projected changes in the social sustainability indicators suggest that while there will still be three general groups of countries (Group A – systems with high levels of income replacement and low pensioner poverty, but high spending, Group B – systems with high or low spending, but low replacement rates and high pensioner poverty, and Group C – systems with low spending, low replacement rates and low pensioner poverty); the composition of the groups could change significantly. For instance, Poland and Slovakia could join Italy in Group B, as their level of pensioner poverty could be negatively affected by the reforms they have put in place, while at the same time their lower labour participation combined with ageing will result in a substantial increase in financing costs. Group B will, however, probably lose one member, the UK. By focusing resources even more on those on low incomes and women, the UK pension system should make inroads on pensioner poverty while maintaining spending low on account of the planned increase in pension age. The UK could join the Scandinavian duo, Finland and Sweden, but their level of pension spending will increase, rising to levels which in 2005 characterised high-spending countries. In Group A, besides the movement of Poland, Hungary could be moving towards Group B, as the reforms leave some groups at-risk-of-poverty.

The position of Austria, Germany and France may also change, as they move closer to Group C in terms of the replacement rates they provide. One could argue that France will separate from the other two, as it faces much higher projected increases in spending, and join Hungary, but at the same time the French system appears to have a much more effective

poverty alleviation function than the Hungarian one. The only country that might still be in the same place it occupies today is Italy. While the reforms mean that it will be less of an outlier in spending terms, low labour participation among older workers and women, together with lack of pension protection for the unemployed could keep pensioner poverty levels high while the reforms have cut the replacement rates individuals can look forward to in 2050.

5. Policy considerations

After having applied our social sustainability assessment framework empirically, we can now proceed to make some policy considerations. Two questions appear to be particularly relevant – namely the possibility that changes in economic behaviour could accommodate changes in pension generosity; and the resilience of pension systems to shocks.

One of the main hopes of policymakers is that any negative impacts of pension reforms on retirement income can be undone by means of additional private saving. In fact, the standard solution offered by the World Bank to reforming countries was to introduce mandatory private pensions. While this may be feasible for those on medium- to high-incomes, it is less likely for those with low-incomes. In Table 5 we show that in many countries these individuals would need to save relatively high amounts in order to generate the same average replacement rates throughout retirement as in 2005, even if they accept the reduction in pension wealth due to higher pension ages. Moreover, notably in Poland and Slovakia, this task is made more difficult by the fact that individuals will also be called upon to pay higher contribution rates to pay for contemporary pension transfers. Longer working lives present a more likely way of maintaining consumption smoothing. Table 2 showed how different the change in replacement rates, on average, would be under different career lengths. This confirms that reforms place a significant disincentive for individuals to maintain the same career length as in 2005. By contrast, longer careers undo a significant part of the reduction in generosity, except in countries which currently have above-average replacement rates. In the latter cases, policymakers appear to have concentrated on reducing costs.

Labour market participation also plays a large part in ensuring the resilience of pension systems to shocks. Different longevity assumptions have significant impacts on the sustainability indicators, particularly for those countries which have not adopted features in their pension systems which automatically take into account improvements in life expectancy. Longevity increases the length of retirement, and tends to reduce overall generosity as pensions in payment tend to lose value relative to average earnings over time.

The resilience of the poverty alleviation function to higher longevity is very dependent on the generosity of minimum pensions (e.g. pensioners in Sweden and Italy are better protected than those in Poland), while that of consumption smoothing is linked to the length of working lives, particularly in systems which have linked closer contributions and benefits. As for the pressure on constraints, longevity shocks inevitably result in stronger impacts, though the UK with its relatively modest and increasingly flat pension system is also not that much affected by higher longevity. By contrast the estimates shown in Table 4 suggest that the French system appears to be one of the systems which would gain the most if working lives were to rise closer to the full-careers assumption

Table 5: Additional saving (% of wages) to maintain consumption smoothing (actual-careers case) unchanged between 2005 and 2050 (assumed net nominal rate of return: 5.5%)

a) Men

	10th Decile	20 th Decile	30th Decile	40 th Decile	50th Decile	60 th Decile	70th Decile	80th Decile	90th Decile	Part-time
Austria	7.6	7.6	7.6	7.5	7.7	8.0	8.5	9.2	8.0	8.7
Finland										
France			2.6	4.8	4.8	4.6	5.1	4.7	4.0	5.1
Germany		0.6	0.8	1.1	1.4	1.8	2.3	3.0	4.0	1.4
Hungary	0.4	0.4	0.4	0.4	0.4	0.3				
Italy	13.3	13.4	13.5	13.5	13.7	13.9	13.9	13.6	13.2	13.6
Poland	8.9	7.2	6.3	4.7	4.3	3.7	2.8	1.8	0.6	6.4
Slovakia	12.6	12.9	13.1	13	11.5	7.5	3.6			12.9
Sweden	3.4	2.1	2.2	2.4	2.5	2.6	2.7			
UK										

b) Women

	10th Decile	20 th Decile	30th Decile	40 th Decile	50th Decile	60th Decile	70th Decile	80th Decile	90th Decile	Part-time
Austria	2.2	3.8	4.0	3.2	3.0	3.0	3.0	3.1	3.8	3.3
Finland										
France										
Germany								0.2	1.0	
Hungary	7.8	5.3	6.8	5.6	5.8	6.0	6.3	5.9	5.6	6.0
Italy	6.3	5.2	6.2	5.8	5.8	5.8	5.8	6.3	6.4	5.8
Poland	15.4	14.6	13	12.5	11.9	11	9.7	8.3	6.7	12.6
Slovakia	17.7	18.2	18.5	18.7	18.9	18.9	19.0	16.3	6.6	18.7
Sweden	5.0	5.1	4.4	3.1	3.3	3.5	3.7	4.0	0.7	3.9
UK										

Note: In cases where consumption smoothing will be higher in 2050, no estimates are made.

Source: Own workings using APEX.

Conclusion

The social sustainability framework developed in this paper tries to assess in an internally consistent and holistic way what pensions systems achieve and at what cost. The approach of many assessments of pension reforms of just looking at one part of the phrase – ‘at what cost’ – is counterintuitive. Rather policymakers need to focus on what realistically systems can achieve, and act in a way as to change individual behaviour to accommodate changes in public provision.

Many assessments of reforms, especially those of international institutions, such as the EU and the World Bank, have adopted point-of-retirement indicators and concluded that reforms have reduced greatly pension transfers to future generations and addressed large part of the fiscal impact of ageing. The analysis presented in this paper changes somewhat these conclusions, showing that while most governments have sought to reduce the future burden on taxpayers, increasing longevity means that the relative size of pension transfers will remain broadly similar – except in countries with very large projected spending (where policymakers have made more aggressive cuts). Looking at projected levels of pension wealth also indicates that some systems remain very vulnerable to longevity shocks.

Similarly our estimates show that the focus on modelling “full-careers” can be deceptive, particularly when looking at reforms which have tightened links between benefits and contributions. For instance, in Slovakia the poverty threshold achievable by pension transfers to low-income individuals could nearly halve when considering projected labour participation. The “full-careers” assumption, by contrast, implies a drop of just a fifth. Rising labour participation in many cases can help undo a lot of the cuts in system generosity. The analysis in this paper, however, suggests that pensioner poverty may once again re-emerge as an important issue in some countries where at present its low level does not attract much political attention. Moreover in some cases, such in Eastern European countries, moves to link benefits with contributions may have serious gender equality implications.

The social sustainability framework developed in this paper confirms that in many cases, there remains more to be done to address the financial requirements brought by the rapid ageing of Europe’s population. It shows that when pressed, policymakers, particularly in Western Europe, were more willing to sacrifice the income smoothing function of pensions rather than poverty alleviation. This is a decision that makes considerable sense as middle- to high-income individuals are possibly in a better position to accommodate the effect of state pension reforms by increasing their private saving. However in some cases, notably in

Eastern Europe, results suggest that policymakers may not have fully considered the full impact of their policies on those on low incomes, on those with incomplete careers and on women. The required increase in private saving combined with the additional contributions required to finance public pensions appears to be too hefty for those on low incomes.

By contrast, policymakers who have focused on extending working lives (partly by increasing pension ages) appear to be in a better position to maintain the effectiveness of their pension system. Decreasing pension wealth through reductions in generosity appears to create more risks to sustainability than decreasing pension wealth by raising entitlement ages. By maintaining the proportion of life spent in retirement unchanged across generations, policymakers would be better able to achieve similar system aims as under current systems, while minimising the required increase in future financing requirements.

If tackled in a socially sustainable way, pension reform need not be as tortuous a process as it has been over the last decades. If policymakers agree on the aims they want their pension systems to achieve, and have the good sense to get political acceptance or at least make sure citizens are well informed of these aims, they will be able to set in place reforms that stand the test of time. The framework developed here presents one way in which policymakers can determine how best to structure their reforms. It shows the interaction between the achievement of system goals and pressure on system constraints, and is able to shed light on the effects of reforms on all groups of society. Pension systems have proven to be one of the most treasured social constructs of the twentieth century. There is little reason why they should not remain so also during the twenty-first century, if policymakers make the necessary modifications to assure their social sustainability.

References

- Bardasi, E. and Jenkins, J. (2002) *Income in later life: work history matters*, York: Joseph Rowntree Foundation.
- Barr, Nicholas and Peter Diamond (2006) "The economics of pensions", *Oxford Review of Economic Policy*, 22(1):15-39.
- Barr, N. and P. Diamond (2008) *Reforming pensions: Principles and policy choices*. Oxford: Oxford University Press.
- Barrientos, Armando (2006) "Poverty reduction: The missing piece of pension reform in Latin America", *Social Policy and Administration*, 40 (4): 369-384.
- Bonoli, Giuliano (1997) "Classifying welfare states: A two-dimension approach", *Journal of Social Policy*, 26(3): 351-372.
- Bottazzi, R., Jappelli, T. and Padula, M. (2006) "Retirement expectations, pension reforms, and their impact on private wealth accumulation", *Journal of Public Economics*, 90(12): 2187-2212.
- Bridgen, P. and Meyer, T. (2008) "Politically dominant but socially flawed: Projected pension levels for citizens at risk in six European Multi-pillar pension systems" in M. Seeleib-Kaiser (ed.), *Welfare State Transformations: Comparative Perspectives*. Hampshire: Palgrave Macmillan.
- Brugiavini, Agar, Karen Maser and Annika Sunden (2005) *Measuring pension wealth*, Paper prepared for a meeting of the Luxembourg Wealth Study held in January 2005: http://www.lisproject.org/lws/introduction/files/brugiavini_rev.pdf
- Castles, Francis and Deborah Mitchell (1993) "Three worlds of welfare capitalism or four?" in F. Castles (ed.), *Families of Nations*, Brookfield: Dartmouth.
- de Deken, J.J. (2002) "Pensions and the reduction of non-wage labour costs: Modelling a decade of reforms in Germany", *Journal of European Social Policy*, 12(4): 277-291.
- Disney, R. (2000) "Crises in public pension programmes in OECD: What are the reform options?", *The Economic Journal*, 110(461): F1-F23.
- Dusek, L. and Kopecsni, J. (2008) "Policy risk in action: Pension reforms and social security wealth in Hungary, Czech Republic and Slovakia", *Czech Journal of Economics and Finance*, 58 (7): 329-358.

Eckardt, M. (2005) “The open method of coordination on pensions: an economic analysis of its effects on pension reforms”, *Journal of European Social Policy*, 15(3): 247-267.

Economic Policy Committee (2007) *Pensions schemes and projection models in EU-25 Member States*, European Economy Occasional Papers No. 35. Brussels: DG Economic and Financial Affairs.

Economic Policy Committee (2009) *The 2009 Ageing Report: economic and budgetary projections for the EU-27 Member States (2008-2060)*. Brussels: DG Economic and Financial Affairs.

European Commission (2006), *The long-term sustainability of public finances in the European Union*, European Economy no 4/2006, Brussels: DG Economic and Financial Affairs.

European Commission (2012) *Pension adequacy in the European Union 2010-2050*, Report prepared jointly by the Directorate-General for Employment, Social Affairs and Inclusion of the European Commission and the Social Protection Committee. Brussels: European Commission.

Evans, M., Rake, K., and Falkingham, J. (2000) “British Pension Policy in the Twenty-first Century: A Partnership in Pensions or a Marriage to the Means Test?”, *Social Policy and Administration* 34(3): 296-317.

Feldstein, Martin (1974) “Social security, induced retirement and aggregate capital accumulation”, *The Journal of Political Economy*, 82(5): 905-926.

Ferrera, Maurizio (1996) “The ‘southern model’ of welfare in social Europe”, *Journal of European Social Policy*, 6(1):17–37.

Forster, M. and D’Ercole, M.M. (2005) *Income distribution and poverty in OECD countries in the second half of the 1990s*, Social, Employment and Migration Working Papers No.22, DELSA/ELSA/WD/SEM(2005)1. Paris: OECD.

Frericks, Patricia, Robert Maier and Willibrord de Graaf (2006) “Shifting the pension mix: Consequences for Dutch and Danish women”, *Social Policy and Administration*, 40(5): 475-492.

Fultz, E. and Steinhilber, S. (2003) “The gender dimensions of social security reform in the Czech Republic, Hungary and Poland”, in *The Gender Dimensions of Social Security Reforms in Central and Eastern Europe: Case Studies of the Czech Republic, Hungary and*

Poland, E. Fultz, M. Ruck and S. Steinhilber (eds). Budapest: ILO Sub-regional Office for Central and Eastern Europe.

Ginn, J., Street, D. and Arber, S. (2001) "Women's pension outlook: variations among liberal welfare states", in Ginn, Street and Arber (eds), *Women, Work and Pensions*, Buckingham: Open University Press.

Grech, A.G. (2012) *Evaluating the possible impact of pension reforms on future living standards in Europe*, CASE Paper 167. London: Centre for the Analysis of Social Exclusion (London School of Economics and Political Science).

Hering, M. (2006) *The politics of structural pension reform in Western Europe: Does the EU matter?*, Paper presented at the *Fifteenth International Conference of the Council for European Studies*, March 29–April 2, 2006, Chicago:

www.ces.columbia.edu/pub/papers/Hering.pdf

Holzmann, R. and Guven, U. (2009) *Adequacy of retirement income after pension reforms in Central, Eastern and Southern Europe – Eight country studies*. Washington: World Bank.

Holzmann, R. and Hinz, R. (2005) *Old-age income support in the 21st century: An international perspective on pension systems and reform*. Washington D.C.: World Bank.

Howse, K. (2004) "What has fairness got to do with it? Social justice and pension reform", *Ageing Horizons*, 1: 3-16.

Martin, J. P. and Whitehouse, E. (2008) *Reforming retirement-income systems: Lessons from the recent experiences of OECD countries*, Social, Employment and Migration Working Papers, DELSA/ELSA/WD/SEM (2008)3. Paris: OECD.

Menahem, Georges (2007) "The decommodified security ratio: A tool for assessing European social protection systems", *International Social Security Review*, 60(4): 69-103.

Meyer, T. and Pfau-Effinger, B. (2006) "Gender Arrangements and Pension Systems in Britain and Germany: Tracing change over five decades", *International Journal of Ageing and Later Life*, 1(2): 67-100.

Modigliani, Franco and Arun Muralidhar (2005) *Rethinking pension reform*. Cambridge: Cambridge University Press.

Muller, K. (2002) "Beyond privatisation: Pension reform in the Czech Republic and Slovenia", *Journal of European Social Policy*, 12(4): 293-306.

Natali, David (2004) *Basic glossary for the analysis of pension systems*. Bruxelles: Observatoire Social Europeen.

Ove Moene, Karl and Michael Wallerstein (2003) "Earnings inequality and welfare spending: A disaggregated analysis", *World Politics*, 55: 485-516.

Orszag, Peter R. and Joseph Stiglitz (1999) *Rethinking pension reform: Ten myths about Social Security systems*. Washington D.C.: World Bank.

OECD (2005) *Pensions at a glance 2005: Public policies across the OECD*. Paris: OECD.

OECD (2009) *Pensions at a glance 2009: Retirement-income systems in OECD countries*. Paris: OECD.

Sefton, T., Evandrou, M., Falkingham, J., and Vlachantoni, A. (2011) "The relationship between women's work histories and incomes in later life in the UK, US and West Germany", *Journal of European Social Policy*, 21(1): 20-36.

Schneider, O. (2009) "Reforming pensions in Europe: Economic fundamentals and political factors", *Czech Journal of Economics and Finance*, 59 (4): 292-308.

Soede, Arjan J., Cok Vrooman, Pier Marco Ferraresi and Giovanna Segre (2004) *Unequal welfare states: Distributive consequences of population ageing in six European countries*. The Hague: Social and Cultural Planning Office.

Sutherland, Holly, Ruth Hancock, John Hills and Francesca Zantomio (2009) "Failing to keep up? The long-term effects of current benefit and tax uprating policies", *Benefits*, 17(1): 47-56.

Taylor-Gooby Peter (1999) "Policy change at a time of retrenchment: recent pension reform in France, Germany, Italy and the UK", *Social Policy and Administration* 33(1): 1-19.

World Bank (1994) *Averting the Old-Age crisis: Policies to protect the old and promote growth*. Oxford: Oxford University Press.

World Bank (2007) *Pensions panorama: Retirement-income systems in 53 countries*. Washington D.C.: World Bank.

Zaidi, A. (2006) *Pension policy in EU25 and its possible impact on elderly poverty*, Policy Brief. Vienna: European Centre for Social Welfare Policy and Research.

Zaidi, A. and Grech, A.G. (2007) "Pension policy in EU25 and its impact on pension benefits", *Benefits: The journal of poverty and social justice*, 15(3): 229-311.

Endnotes

¹ The World Bank was an early advocate of this limited concept of sustainability, described in World Bank (1994). It was espoused in many studies; see for instance Disney (2000) and Schneider (2009), and features prominently in policy discussions.

² There already have been some policy reversals. For instance, in the UK, recent administrations have reversed prime elements of 1980s pension policy such as price uprating of the Basis State pension and contracting-out of the State Second pension. Taylor-Gooby (1999) singled out the 1980s reforms as “puzzling” as they “damage the interests of substantial numbers of the more vulnerable pensioners who are least attractive to commercial providers”, concluding they were prone to be reversed. Similarly Barrientos (2006) notes that reforms removed the poverty reduction element of many Latin American systems, despite widespread elderly poverty. Recently some countries, like Chile, are re-introducing these elements.

³ The focus on projected spending has been criticised by many (see Barr & Diamond (2008), de Deken (2002), Modigliani & Muralidhar (2005), Muller (2002), and Orzsag & Stiglitz (1999)). Empirical evidence is also showing that this focus might have led to new policy issues. For instance, Forster & Mira D’Ercole (2005) conclude that “changes in the generosity of public transfers and taxes have played the largest role in shaping changes in poverty risks among the elderly within individual countries” of the OECD during the second half of the 1990s.

⁴ For instance Fultz & Steinhilber (2003), Frericks et al (2006) and Sefton et al (2011) note that reforms tend to disadvantage women, as they penalise having partial careers. Bottazzi et al (2006), looking at Italy, show how younger cohorts are affected disproportionately by pension changes, while Dusek & Kopecsni (2008), focusing on Hungary and Slovakia, indicate reforms will hit those with low education, while increasing generosity for those with higher education.

⁵ The approach of using institutional features to classify different pension systems is common in the literature (see for instance Bonoli (1997), Ferrera (1996) and Natali (2004)).

⁶ The practise of clustering welfare systems using quantitative indicators is found in the literature, though not that much in respect of pensions (see Castles & Mitchell (1993), Menahem (2007), and Soede et al (2004)).

⁷ See Ove Moene & Wallerstein (2003) for a discussion of why public pensions were set up – namely whether they represent a struggle for redistribution or a desire to have protection against particular risks.

⁸ The APEX (Analysis of Pension Entitlements across countries) model was originally developed by Axia Economics, with the help of funding from the OECD and the World Bank. The model codes detailed eligibility and benefit rules for mandatory pension schemes based on available public information that has been verified by country contacts. It provides

most of the results reviewed in the OECD's 'Pensions at a Glance' publication, the World Bank's 'Pensions Panorama' and the EU's Pension Adequacy reports.

⁹ This wage distribution (for workers in the private sector excluding farming and fishing) was derived from Eurostat's Structure of Earnings Survey.

¹⁰ For details on the assumed contribution years used in the "actual-careers" scenario, see Grech (2012).