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# **Evaluating the possible impact of pension reforms on future living standards in Europe**

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## Contents

Introduction.....	1
1. A review of studies assessing the impact of pension reforms.....	2
2. Using pension wealth to measure impacts of pension reform.....	4
3. The possible impact of pension reforms on future living standards .....	10
Conclusion .....	15
References.....	17

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## **Editorial Notes and Acknowledgements**

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The views expressed in this paper are those of the author, and organisations with which he is affiliated with 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.

## **Abstract**

Successive reforms enacted since the 1990s have dramatically changed Europe's pensions landscape. This paper tries to assess the impact of recent reforms on the ability of systems to alleviate poverty and maintain living standards, using estimates of pension wealth for a number of hypothetical cases. By focusing on all prospective pension transfers rather than just those at the point of retirement, this approach can provide additional insights on the efficacy of pension systems in the light of increasing longevity.

Our estimates indicate that while reforms have decreased generosity significantly, in most countries poverty alleviation remains strong. However, moves to link benefits to contributions have made some systems less progressive, raising adequacy concerns for certain groups. In particular, unless the labour market outcomes of women and of lower-income individuals change substantially over the coming decades, state pension transfers will prove inadequate, particularly in Eastern European countries. Similarly while the generosity of minimum pensions appears to have either been safeguarded by pension reforms, or improved in some cases, these transfers generally remain inadequate to maintain individuals above the 60% relative poverty threshold throughout retirement. Our simulations suggest that the gradual negative impact of price indexation on the relative adequacy of state pensions is becoming even more

substantial in view of the lengthening of the time spent in receipt of retirement benefits.

The consumption smoothing function of state pensions has declined noticeably, strengthening the need for longer careers and additional private saving. When pressed, policymakers, particularly in Western Europe, seem to have been more willing to sacrifice the income smoothing function of pensions rather than its poverty alleviation function. Policymakers in some countries, notably Germany, France and the UK, have sought to refocus state pension systems towards generating better outcomes for people in the bottom half of the income distribution, probably with the insight that 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.

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## Introduction

Spurred by the ageing transition, many governments have carried out wide-ranging reforms, changing the state pensions landscape in Europe dramatically since the early 1990s. Most reforms appear to have been driven mainly by a desire to reduce projected levels of future spending on state pensions. There is a growing body of evidence which suggests that these reforms may have significant adverse implications on future state pension adequacy, particularly as they hit disproportionately entitlements of those population groups less able to accommodate the effects of benefit cuts. However, the indicators used to capture these impacts tend to focus specifically on the generosity of state pension benefits at the point of retirement rather than on the overall state pension transfers which future generations will benefit from. While in most cases reforms have cut annual pension benefits, increased longevity could mean unchanged total transfers over retirement.<sup>1</sup> On the other hand, increased longevity can impact on pension adequacy if state pension benefits lose some of their relative value over time, on account of not being increased in line with growth in average earnings.

This paper will try to address these issues, presenting evidence on the impact of pension reforms on overall state pension transfers in ten European countries.<sup>2</sup> In doing so, it will also point out the importance of not focusing solely on pension generosity for those with full careers and for those on average earnings, as the effect of reforms on full career entitlements tend to be weaker than the impact on those with incomplete careers. The approach taken in this paper follows an analytical framework set forth in an earlier paper, Grech (2010). However it adds much more detail, by focusing more thoroughly on the distributional impacts of pension reforms and presenting results for a number of hypothetical individuals, rather than focusing on aggregate impacts.

The paper has four sections. The first reviews a number of studies which have sought to evaluate the impact of reforms on pension adequacy. It then develops an alternative set of indicators, based on the concept of pension wealth – the value of all prospective pension transfers received during retirement – looking at a number of hypothetical individuals with incomplete careers and on different levels of income. The third section applies this framework to reforms legislated in ten European countries between the early 1990s and 2009, while section 4 concludes.

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<sup>1</sup> 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. Even standard defined benefit pay-as-you-go systems are increasingly incorporating automatic parametric changes linked to longevity (e.g. the sustainability factor introduced in the German system in 2004, the plans to link pension age to average life expectancy in the UK announced in 2012, etc.).

<sup>2</sup> These countries are examples of all pension system designs across Europe and experienced very different types of reforms since the start of the 1990s.

## 1 A review of studies assessing the impact of pension reforms

A substantial part of the literature assessing pension reforms focuses exclusively on its effects on Government finances, or rather on spending on pensions.<sup>3</sup> However, while there is broad agreement that the impact of ageing on future pension spending is an important constraint, there is increasing interest in assessing pension reforms more broadly, looking at their impact on pension system's abilities to achieve their goals.<sup>4</sup> This literature appears to be divided into 3 main strands. The first attempts to evaluate the impact of changes in the pension system on a population with set characteristics, while the second focuses on the impact of the same pension rules but on different population groups. The third approach tries to compare the impact of different pension rules on different population groups. Within these categories, researchers have adopted three different focuses, namely studying reforms in just one country, carrying out cross-country analysis and hypothetical reform simulations. Table 1 groups some of existing studies along these dimensions.

The most common studies are those which evaluate the impact of different pension rules on a population with the same characteristics. This is the approach, for instance, taken by Peuple (2004), Hering (2006), OECD (2007), Martin and Whitehouse (2008) and ISG (2009) on a cross-country basis and by Falkingham and Johnson (1995), Orban and Palotai (2005) and van de Coevering et al (2006) on a single-country basis. All of these studies develop estimates of the level of replacement rates – the value of pension benefits in the first year of retirement as a proportion of pre-retirement earnings – for hypothetical individuals pre- and post-reform. While these studies report significant declines in replacement rates across Europe as a result of reforms, they shy away from trying to assess the possible implications of this trend.<sup>5</sup> By contrast, Zaidi et al (2006) attempt to infer from the change in replacement rates the possible impact on at-risk-of-poverty rates in EU countries, arguing that “the anticipated decline in generosity is expected to result in an increase in at-risk-of-poverty rates among the 65+”.

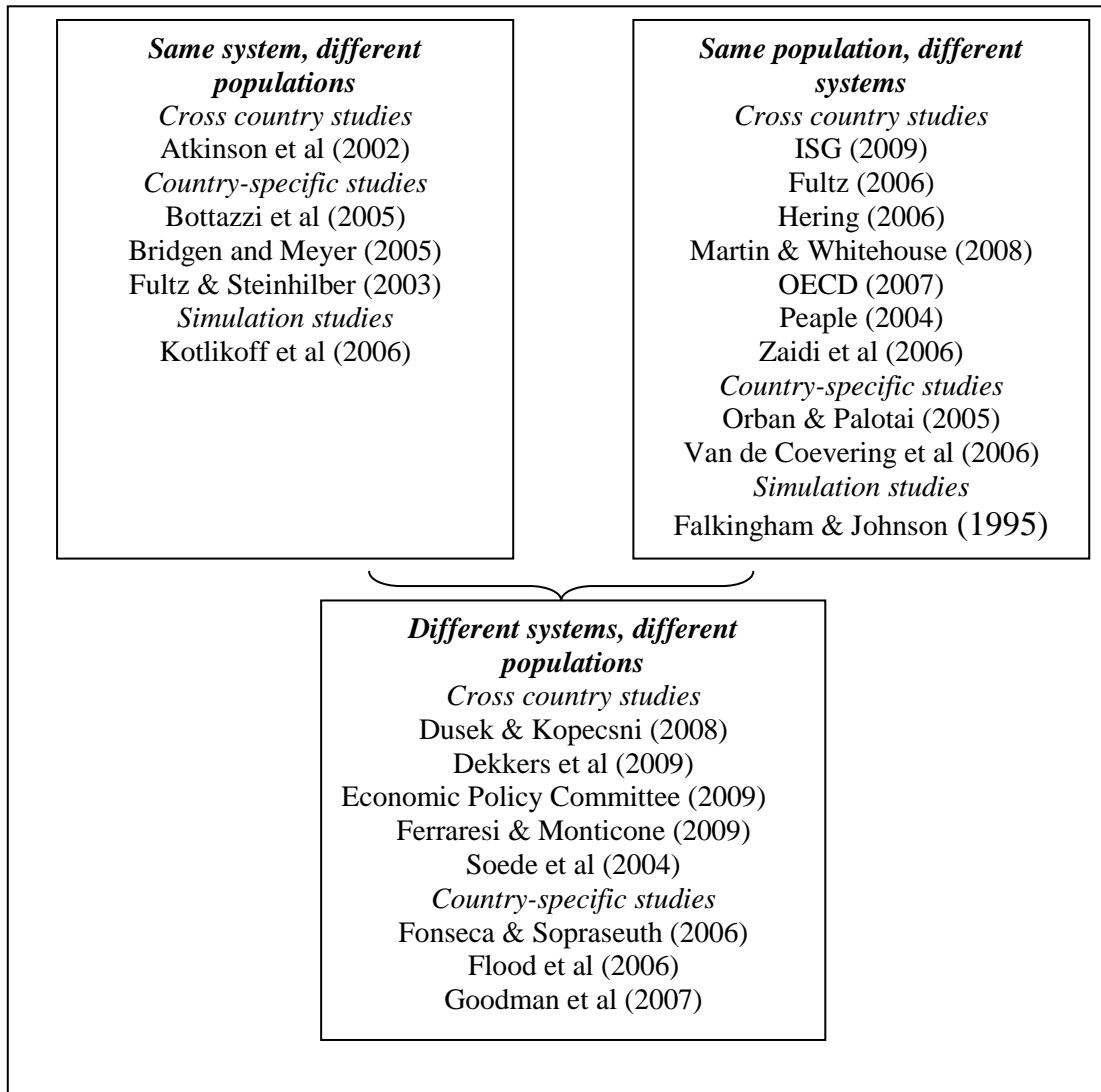
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<sup>3</sup> For instance, see World Bank (1994), Disney (2000), Hauner et al (2007), and Schneider (2009).

<sup>4</sup> 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 the policy task is simply that of ensuring that these limits are not transgressed”. In its 2006 report on long-term sustainability (European Commission (2006)), the European Commission 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.

<sup>5</sup> Fultz (2006) also assesses the impact of pension reforms by comparing pre- and post-reform replacement rates, but includes a fuller treatment of the possible effects of this decline in generosity on poverty rates.

**Table 1: A taxonomy of studies on reforms' effects on pension adequacy**



The second strand of pension reform analysis focuses on the impact of the same pension system on population groups with different characteristics. For example, Atkinson et al (2002) examine the implications of introducing a European Minimum Pension in the five biggest EU countries, finding that even if the pension set at the same level in each country in terms of purchasing power parity, the impact on poverty would differ greatly. Other studies in this strand have concentrated at looking at the impact of a pension system on different subsets of a national population. Fultz and Steinhilber (2003), for instance, finds that reforms have tended to bring “greater losses of pension protection for women compared to men”. Bottazzi et al (2005) find that pension reforms in Italy hit disproportionately younger cohorts of workers. Bridgen and Meyer (2005), looking at a group of seven ‘risk biographies’ in the UK – such as people with child care responsibilities, intermittent employment, self-employment and redundancy – find that despite facing the same pension system these individuals “face savings rates significantly above those currently paid by most employees” in order to guarantee an adequate income during retirement. Similarly, Kotlikoff et al (2006) find that the impact of the same pension policy – in this case a simulated cut of 30% in



Social Security benefits – differs greatly looking at 14 stylised households, with those on low incomes facing the biggest fall in living standards.

The final strand of pension reform evaluations attempts to evaluate how changes in both pension rules and the underlying population could affect poverty, income distribution and government spending. Fonseca and Sopraseuth (2006), Flood et al (2006), Goodman et al (2007) and Dekkers et al (2009) are all examples of this approach. These studies suggest that reforms have led to a significant reduction in the redistributive effects of state pension systems and increased risks for those with interrupted careers and unskilled workers. All of this is happening in a context of a significant reduction in future generosity of state pensions for the average person. In fact, Economic Policy Committee (2009), which documents official projections of state spending on pensions for EU Member States, suggests that the average benefit ratio – the average pension to output per worker - is set to decline by more than a quarter by 2060.

Soede et al (2004) – another seminal study in this field – using a static model<sup>6</sup> to study the distributive consequences of population ageing in six European countries up to 2025 finds that while increasing labour participation helps improve the situation, it does not result in financial sustainability. They conclude that “a policy focusing on financial sustainability is likely to lead to a substantial increase in poverty among the elderly in the future”. Ferraresi and Monticone (2009) adopting a similar approach but extending the analysis to another four countries and to cover the period up to 2050 also find similar reforms, noting that contribution rates faced by future working age generations will have to rise substantially. Dusek and Kopecsni (2008), looking at the pension reforms undertaken since the 1990s in Hungary, the Czech Republic and Slovakia find that reforms “affected different cohorts and education groups in quite peculiar ways”. For instance, reforms in Hungary favour future working age individuals, while those in Slovakia cut the entitlements of women, particularly those with low education, while raising the generosity of the system for young men with university education.

## **2. Using pension wealth to measure impacts of pension reform**

The studies summarised in section 1 appear to be in broad agreement that the pension reforms enacted since the 1990s in Europe have significantly reduced the generosity of state pensions at the point of retirement.<sup>7</sup> However most of them fail to address the

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<sup>6</sup> As Soede et al (2004) point out, “there are two possible approaches for exploring future poverty, income inequality and redistribution processes”. The first, dynamic microsimulation involves a year-to-year estimation of income for each person in a survey based on their projected personal characteristics and tax/benefit systems. The second, static microsimulation “implies the transformation of incomes according to projected average future income developments, diversified for each socio-economic group”, with the sizes of the groups adjusted by reweighting in line with demographic projections.

<sup>7</sup> To get a broad overview of cross-country differences in the role currently played by state

issue of whether increasing longevity could redress in part this decline, as future pensioners will receive their pension benefits for longer periods of time. Related to this, those studies which focus on the use of replacement rates at point of retirement fail to consider the fact that in many instances the relative value of state pensions declines considerably over retirement as most reforms have reduced the indexation of benefits post-retirement. Most studies also concentrate on the impact of reforms on pension entitlements of average earners, rather than on the impact on individuals across the earnings distribution.

In this light, in this paper we attempt to look at the overall pension promise underpinning pre- and post-reform pension systems, by focusing on the impact of reforms on pension wealth. The latter is a measure of the lifetime value of state pension benefits; computed as the discounted stream of future pension payments during retirement, weighted by the probability that the individual will still be alive at that particular age.<sup>8</sup> In simpler terms, this measure involves computing the annual pension benefits over the expected lifetime of the individual – taking into account the way legislation specifies the annual benefit will be increased over time.<sup>9</sup> This stream is then discounted so that these transfers can be expressed as a multiple of gross annual individual earnings at the time of retirement.<sup>10</sup> OECD (2009) suggests that pension wealth “can therefore be thought as the lump sum that is needed to buy an annuity giving the same flow of pension payments” over the expected retirement.

Since pension wealth captures the relative value of expected transfers throughout retirement, it is superior to measures of replacement rates. Consider for instance the case of a country where pension benefits start as very generous, but after retirement their value does not keep up with growth in national earnings. Looking at replacement rates, such a country would appear to have a generous pension system, but older pensioners who would have been drawing their pension for a long time would not be experiencing such a situation. Of course, the potential impact of this factor becomes

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pensions, refer to Section 1 of Grech (2010). For an overview of pension reforms enacted in Europe since the mid-1990s, see Zaidi, Grech and Fuchs (2006).

<sup>8</sup> For the purposes of this study we have adopted Eurostat’s mortality tables for the countries studied.

<sup>9</sup> Mathematically the estimation of pension wealth involves multiplying the initial pension benefit by an annuity factor. The latter is meant to capture the number of years the benefit will be received and also the relative reduction (if any) of the benefit in relation to average earnings. For example, if the initial benefit is worth 30% of average earnings, is uprated in line with average earnings and the benefit is received for 20 years, then pension wealth at retirement would be equivalent to 6 times average earnings. If however the benefit loses value over time, then the initial 30% is not multiplied by 20, but rather by a factor that captures this loss. Note that this study assumed real earnings growth of 2%. If earnings growth is slower, the negative impact of non-wage indexation would be smaller than shown in this paper.

<sup>10</sup> A discount rate of 2% (real) has been used in this paper. Using a higher discount rate would reduce the net present value of pension transfers paid towards the end of an individual’s life.

even more important as longevity increases.<sup>11</sup> Pension benefits which kept individuals above the poverty threshold close to retirement may stop to do so by the time the individual reaches age 80 and above. Pension wealth can, on the other hand, be used to assess whether annual pension transfers are enough so that individuals, on average, have an annual income that keeps them out of relative poverty throughout retirement.

We calculate our measures of pension wealth under pre- and post-reform systems using the OECD's APEX cross-country pension entitlement model.<sup>12</sup> APEX is a static simulation model which applies parameters of pre-reform and post-reform pension systems to hypothetical individuals whose characteristics are set by the researcher. The pension rules used for this paper date to 2009, while the pre-reform pension systems are those of the early 1990s.<sup>13</sup> We estimate pension wealth indicators for ten countries, namely Austria, Finland, France, Germany, Hungary, Italy, Poland, Slovakia, Sweden and the UK. These countries not only cover 70% of the EU's population, but also have very different pension systems and enacted very different reforms.<sup>14</sup> For example, Italy, Poland and Sweden moved from having a defined benefit system to having a national defined contribution system.<sup>15</sup> By contrast, France and Germany retained their defined benefit system but introduced sustainability factors to limit the impact of ageing.

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<sup>11</sup> Sutherland et al (2009) shows the potential impact of uprating on benefit generosity in the context of the UK benefit system.

<sup>12</sup> 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 biennial 'Pensions at a Glance' publication and in the World Bank's 'Pensions Panorama'. It was also used in ISG (2009).

<sup>13</sup> The reforms do not consider legislated or proposed pension reforms after 2009. These changes, such as those carried out in Hungary in the wake of the financial crisis, could result in much lower generosity than envisaged in this paper. In countries severely affected by the euro sovereign crisis, the generosity of state pensions and length of retirement have been targeted by policymakers. In others, such as France, attempts to raise pension ages have been the subject of considerable controversy. More broadly, the financial crisis has, like in many other areas, led to a significant shift in thinking (e.g. on the role of funded pensions). For a preliminary assessment of the effects of the financial crisis on pension systems in Europe, see European Commission (2010). For an outline of pension reforms enacted after 2010, see Annex 3 of European Commission (2012).

<sup>14</sup> For an overview of these reforms see OECD (2007) or Zaidi and Grech (2007).

<sup>15</sup> In a defined benefit system, pension benefits are determined as a ratio of a set salary – the final salary, the average lifetime salary or an intermediate figure - on which contributions were paid. Under a notional defined contribution system, pension entitlements depend on accumulated contributions (and credits) and on the notional interest accorded them. This accumulated sum is divided by the expected lifetime at retirement to calculate an annuity.

For the purposes of this paper we look at pension wealth arising just from state pensions (including minimum pensions)<sup>16</sup>. We assume that there is full take-up of minimum pensions and that no private retirement saving is taking place – which raises some issues for countries with means-testing and significant private pension saving (e.g. the UK) as take-up of benefits and the level of savings clearly affect state entitlements. However addressing the possible impact of private saving would make the paper lose focus from assessing the impact of the state pension reforms of the 1990s and 2000s.

Another limitation of our analysis is that it does not take into account the impact of household formation, as we model individuals. This raises a number of concerns in some countries (particularly those which rely more on means-tested benefits), as state pension entitlements may depend on the income of the individual's partner. However this issue is difficult to resolve unless one has access to a cross-country dynamic microsimulation model, and even then it would be very difficult to extricate the direct impact of reforms from all the underlying change.

On the other hand, this paper will not skirt away from trying to assess the impact of pension reforms using more realistic labour market assumptions. Many official assessments of pension reforms (e.g. World Bank (2007), ISG (2009), and OECD (2009)) look primarily at the pension entitlements of male average earners with a full labour market career. On the other hand, there is a growing body of evidence (see for instance Fultz and Steinhilber (2003), Bridgen and Meyer (2005) and Dusek and Kopeckni (2008)) which suggests that the impact of reforms may be stronger for those with incomplete careers, those on low incomes and women. In fact, most of the 1990s pension reforms sought to strengthen the link between contributory records and eventual pension entitlements, possibly reducing the extent of redistribution.

Data on the average number of contribution years achieved by workers are not readily available on a harmonised basis. ISG (2009) includes information on the contribution years (including credits in some cases) at retirement of new flows of retirees. These data, presented in Table 2, suggest that assuming the same labour market participation across all countries is unrealistic and creates significant problems on a gender level within the same country. While these data shed some light on the different labour market participation within countries, their reliability is dubious as they are based on a voluntary submission of data from Member States. In particular, the data for Eastern European countries appear to be suspiciously high, in light of other existing labour market data.

In this paper we adopt an alternative measure of career lengths based on Eurostat Labour Force Survey data on labour market participation data at different ages. Essentially we set the probability of the average person to be in employment at a particular age as equal to the activity rate at that age (e.g. if only 33% of women aged 57 are engaged in labour market activity, we deem the probability of the average

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<sup>16</sup> See ISG (2009) for details of the pension systems modelled in APEX.

woman to be in employment at that age as 33%). These probabilities are then summed up to arrive at the number of full years between age 20 and pension age in which the individual would be active in the labour market. The advantage of this approach is that the Labour Force Survey is a harmonised survey, and moreover the European Commission prepares updated projections of activity rates by age underpinning its biennial report on the impact of ageing populations. On the basis of these projections (see EPC (2009) <sup>17</sup>), one can create forecasts of how the length of contributory records are expected to change in future. The European Commission projections suggest that the average effective age of retirement for the overall population should rise significantly in most countries. The increase among women reflects both a cohort effect – reflecting the catch-up in gender employment rates – and a policy effect – gender pension age equalisation. The change among men mostly reflects tightening of early retirement and disability schemes.

**Table 2: Length of contributory records of new flows of retirees (years)**

	Male	Female	Both genders	Period for “full career”
Austria	NA	NA	NA	45
Finland	33.3	30.6	31.9	39
France	40.0	31.8	35.8	40
Germany	NA	NA	NA	No full career
Hungary	39.9	38.0	38.8	No full career
Italy	34.9	27.9	32.1	40
Poland	36.5	33.3	34.3	No full career
Slovakia	40.4	34.0	35.8	No full career
Sweden	40.0	34.0	37.0	40
UK	42.0	26.0	35.0	44 (M)/39 (F)

Source: ISG (2009).

In the next section we model pension entitlements on the basis of the career lengths set out in Table 3. While still subject to significant caveats,<sup>18</sup> 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. We compare these estimates with entitlements if one were to assume full careers since age 20 for individuals retiring in

<sup>17</sup> Projected participation rates were taken from Economic Policy Committee (2009). These were adjusted to reflect the legislated increase in pension age in Germany and the UK which were announced subsequently to this study.

<sup>18</sup> We are imposing the average labour market participation of a cross-section of generations on a single generation. Moreover we are assuming that all our individuals display average labour market participation trends over their career. These might instead differ across the wage distribution.

2005 under the pre-reform systems and in 2050 with the post-reform systems. One thing to note is that individuals retiring in 2050 are projected to have longer retirements on the basis of Eurostat's mortality rate projections. We look at hypothetical individuals for each gender working full-time but at the different deciles of the wage distribution in each country, together with an individual on minimum pension provision for each gender.<sup>19</sup> 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.

**Table 3: Assumed contribution years between 20 and pension age**

	2005		2050	
	Male	Female	Male	Female
Austria	35	29	36	35
Finland	36	34	39	38
France	35	30	35	33
Germany	37	31	41	41
Hungary	31	23	32	29
Italy	35	23	37	28
Poland	33	27	35	28
Slovakia	36	30	35	31
Sweden	38	36	42	39
UK	38	30	41	37

**Source:** Own workings using 2005 labour participation data from Eurostat's Labour Force Survey and EPC (2009) projections.

To assess the strength of the poverty alleviation function of current and future state pension systems, we compute the poverty threshold (average annual pension as a percentage of national disposable income per capita) pension wealth, defined net of income taxes and social security contributions, of the hypothetical individuals would sustain through retirement. Replacement rates at point of retirement, if defined as a percentage of national disposable income – rather than as a percentage of an individual's pre-retirement earnings - can give an indication of whether pension benefits are high enough to keep a newly retired person out of relative poverty. However they do not shed light as to whether this would continue to be the case through retirement. In an era where the length for which pensions are drawn is rising to well beyond 20 years, this question gains a lot of significance. Similarly while replacement rates are a good indicator of the degree of consumption smoothing which pensions allow at the point of retirement, pension wealth can provide a more accurate indicator of whether this degree of consumption smoothing can be maintained throughout retirement.

<sup>19</sup> These wage data are from Eurostat's Structure of Earnings Survey and represent the annual wages of workers in most of the private sector (excluding farming and fishing).

### **3. The possible impact of pension reforms on future living standards**

Assessments of pension reforms which assume full careers over-represent the real efficacy of existing pension systems, as they imply that individuals benefit from the maximum generosity of the system. 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, or may have wanted to induce these changes by providing financial incentives within the new pension systems.

In Tables 4 and 5 we present our estimates of the poverty thresholds which will be achievable for our modelled hypothetical individuals given their pension wealth at retirement. As explained in Section 2, the standard measure of pension defines the total pension transfers over a person's retirement as a multiple of average earnings. Instead, we converted this measure in terms of household disposable income in each country, as poverty thresholds are expressed in relation to this variable.<sup>20</sup> We then compared this multiple with projected life expectancy to come up with a measure of the poverty threshold which, on average, the individual could achieve on the basis of the expected state pension transfers in retirement. For example, if an individual at the point of retirement has a pension wealth equal to 10 times national disposable income, and life expectancy is 20 years, then pension wealth on average enables being above a 50% poverty threshold in retirement. It should be noted that this approach implicitly assumes that the individual would be able to transfer pension wealth equally throughout retirement.

Our estimates, like those in the studies reviewed in section 1, suggest that reforms have tended to reduce the strength of the poverty alleviation function of state pension systems. However, generosity remains adequate in many countries, with pension transfers keeping most men with pre-retirement earnings below median earnings above the 60% relative poverty threshold, on average, throughout retirement. On the other hand, it appears that state pension transfers not only remain inadequate for most low-income women, but that the situation has worsened in many countries. In particular, some reforms, mostly in Eastern Europe, raise issues about the future adequacy of pension systems for women and those on lower incomes as the degree of progressiveness has been reduced considerably. In these cases, unless women have access to other income sources, such as the pension entitlements of their partners, they appear to face a seriously increased risk-of-poverty. While the generosity of minimum pensions appears to have either been safeguarded by pension reforms, or improved in some cases such as the UK, Germany and France, these transfers generally remain inadequate to maintain individuals above a 60% relative poverty threshold throughout retirement. At the point of retirement, minimum pensions in some countries, like Poland and France, are currently higher than the poverty threshold, but due to price indexation their value falls rapidly during retirement, especially for women who can

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<sup>20</sup> See Grech (2010) for more details on the definition of this indicator and the broader framework underpinning this form of analysis of pension entitlements.

retire at age 60 in both countries. As Table 6 shows, only in Germany and the UK the value of minimum pensions does not decline relative to average wages.

**Table 4: The poverty thresholds (% of median disposable income) achievable in 2005 and 2050 under the assumed actual career lengths**

Men										
	10th decile		20th decile		30th decile		40th decile		Minimum	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Austria	82	63	92	70	99	75	105	80	42	41
Germany	47	57	55	57	63	58	69	63	43	49
Finland	58	59	62	62	66	66	69	70	37	36
France	51	61	58	60	64	59	70	57	43	45
Hungary	55	51	60	56	72	67	86	80	30	36
Italy	85	56	90	60	97	68	105	78	36	36
Poland	52	37	59	45	68	54	73	62	47	37
Sweden	63	56	66	61	70	64	74	67	37	35
Slovakia	74	46	89	47	100	53	110	59	49	46
UK	41	57	43	58	46	59	49	60	41	52
Women										
	10th decile		20th decile		30th decile		40th decile		Minimum	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Austria	48	48	53	50	67	56	72	62	30	37
Germany	47	58	47	58	47	55	47	58	36	42
Finland	53	55	55	57	56	57	57	60	30	32
France	39	60	40	60	40	57	41	60	37	40
Hungary	59	48	60	52	67	56	76	66	21	33
Italy	57	41	62	46	65	47	69	50	26	32
Poland	52	37	48	37	54	34	58	35	30	28
Sweden	46	44	51	50	55	54	61	56	32	31
Slovakia	59	41	70	41	78	41	85	41	37	41
UK	40	56	39	56	39	56	39	57	30	48

**Note:** These indicators calculate the percentage of national disposable income that pension wealth at point of retirement would be able to finance on average throughout retirement.

**Source:** Own analysis using APEX.



**Table 5: The poverty thresholds (% of median disposable income) achievable in 2005 and 2050 if individuals have full careers**

Men										
	10th decile		20th decile		30th decile		40th decile		Minimum	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Austria	83	74	93	83	101	89	108	94	42	41
Germany	52	46	66	57	75	63	83	68	43	49
Finland	71	65	76	70	82	74	87	80	37	36
France	63	57	69	57	76	63	83	69	43	45
Hungary	64	66	70	72	83	86	99	103	30	36
Italy	87	69	96	76	103	81	110	87	36	36
Poland	63	38	73	50	83	59	90	68	47	37
Sweden	62	57	70	63	75	66	80	69	37	35
Slovakia	81	61	97	73	109	82	120	91	49	46
UK	42	59	46	60	50	61	53	63	41	52
Women										
	10th decile		20th decile		30th decile		40th decile		Minimum	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Austria	60	61	67	68	72	72	78	79	30	37
Germany	43	50	51	50	60	52	67	58	36	42
Finland	64	61	68	63	72	65	75	69	30	32
France	59	59	64	59	70	57	74	62	37	40
Hungary	63	68	67	73	76	82	87	93	21	33
Italy	71	64	77	69	82	73	87	78	26	32
Poland	66	37	62	37	70	38	76	44	30	28
Sweden	49	44	58	54	65	58	69	62	32	31
Slovakia	66	50	79	60	87	66	96	72	37	41
UK	39	60	39	60	41	60	44	61	30	48

**Note:** These indicators calculate the percentage of national disposable income that pension wealth at point of retirement would be able to finance on average throughout retirement.

**Source:** Own analysis using APEX.

The “actual careers” estimates presented in Table 4 confirm that the interaction between the labour market and the social protection system needs to be considered by researchers and policymakers alike. A system may look very generous on paper, but not be so in reality if only few individuals qualify for full benefits. 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 5). For instance, the poverty threshold currently provided, on average, by the French pension system to those at the 10th decile of pre-retirement earnings drops to 51% from 63% among men and from 59%

to 39% 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 the high relative poverty rate reported in household income surveys. The “actual-careers” estimates appear to be much more representative of effective pension generosity.

**Table 6: Indexation of pension benefits in the different components of pension systems (2009)**

	<b>Minimum pension</b>	<b>Other state pension</b>
Austria	Prices	Prices
Finland	Prices	20% of pension is indexed to wages and the rest to prices
France	Prices	Prices
Germany	Wages	Wages
Hungary	Half the pension is indexed to wages and the other half to prices	Half the pension is indexed to wages and the other half to prices
Italy	Prices	Prices
Poland	Prices	Prices
Slovakia	Half the pension is indexed to wages and the other half to prices	Half the pension is indexed to wages and the other half to prices
Sweden	Prices	Wages - 1.6%
UK	Wages	Wages*

\* State Second Pension is uprated with prices

**Source:** Adapted from ISG (2009)

While these are important contributions, potentially the most interesting finding is that labour market trends can act as a countervailing force that offsets part of the effect of the 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, as can be seen from Table 4, though it should be noted not for those countries with the strongest losses. Growing labour participation might actually result in improvements over time in pension entitlements for women despite the reforms, cases in point being France and Germany.

**Table 7: The average replacement ratios through retirement (% of pre-retirement wages) achievable in 2005 and 2050 the assumed actual career lengths**

Men										
	30th decile		40th decile		50th decile		60th decile		70th decile	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Austria	91	69	90	68	90	67	90	68	91	66
Germany	67	62	68	63	70	64	72	64	75	64
Finland	60	60	59	59	59	58	58	57	57	58
France	58	49	59	45	57	45	57	44	56	41
Hungary	67	65	70	67	72	70	74	75	79	84
Italy	100	63	100	64	100	64	101	64	101	63
Poland	72	57	67	57	66	57	64	57	62	57
Sweden	66	58	65	57	64	56	63	55	62	58
Slovakia	81	43	82	44	80	46	72	47	63	48
UK	41	48	39	44	37	40	35	37	33	32
Women										
	30th decile		40th decile		50th decile		60th decile		70th decile	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Austria	77	65	77	67	77	67	76	67	75	66
Germany	60	71	55	68	55	62	57	63	59	64
Finland	60	61	58	61	57	59	56	59	56	58
France	42	60	40	58	39	53	39	48	40	43
Hungary	67	56	69	60	71	62	73	64	76	66
Italy	65	50	65	51	64	50	64	50	64	50
Poland	67	43	63	38	62	35	60	35	57	35
Sweden	70	59	65	57	64	56	63	55	62	53
Slovakia	77	54	78	55	79	55	80	56	81	58
UK	46	66	41	60	37	55	35	50	33	44

**Note:** These indicators calculate the percentage of pre-retirement income that pension wealth at point of retirement would be able to finance on average throughout retirement.

**Source:** Own analysis using APEX.

There are similar trends when one looks at average replacement ratios – our estimate of the strength of the consumption smoothing function of state pensions. Table 7 shows what replacement rates are achievable, on average, for individuals with pre-retirement earnings at the 30th to 70th wage deciles given their pension wealth. The latter is computed on the basis of the assumed career lengths shown in Table 3.

Results for full-careers are not presented for the sake of brevity, as the pattern is very similar to that found when comparing achievable poverty thresholds. The difference between these replacement rates and the standard replacement rates found in studies such as World Bank (2007), ISG (2009), and OECD (2009) is that while the latter

capture the extent of consumption smoothing just at the point of retirement, our measures capture the average across retirement. Table 7 shows for instance, that in Germany the average replacement ratio for men previously on the median wage will be nearly a tenth lower by 2050; and an eighth lower in Sweden.

The loss in the strength of the consumption function of state pensions seems to be relatively stronger than that in poverty alleviation, particularly in countries like Slovakia, Austria and Italy, where the role of the state pension appears to have been weakened considerably. Whilst pre-reform systems appeared to generally offer replacement rates higher than 60% throughout retirement, the bulk of retirees in 2050 will not be able to sustain this level of pre-retirement consumption just on the basis of their state pension entitlements. Again the decline here is much pronounced for men. Gender gaps in replacement rates should also decline, as women are expected to address part of the decline in system generosity through having fuller contributory records; an option which is less open to men – who already have long contributory records. Moreover in many cases, notably Germany and France, the impact of the reforms on replacement rates differs substantially by income; for those on high incomes generosity has been cut, while for those on low incomes it was maintained relatively stable. In many European countries, the consumption smoothing function of the state pension system for middle-to-high earners may need to be supplemented by other means; while the pressure on those on lower incomes is less stark. But there are notable exceptions – in Poland and Slovakia those at the bottom of the wage distribution face the toughest challenge as the system has become much less progressive.

## **Conclusion**

This paper has sought to complement the existing literature that tries to assess the impact of pension reforms beyond that on public finances, by using an indicator which as yet has not been put much to use – namely pension wealth. The benefit of this indicator is that it captures total pension transfers throughout retirement, rather than just those immediately received at the point of retirement. In this way it enables one to assess the efficacy of pension systems throughout retirement – a very important advantage given that most state pension benefits lose a significant part of their relative value over time. In order to verify that pension reforms may have hit harder those on lower incomes and with incomplete careers, our estimates of pension wealth were carried out for a range of hypothetical individuals with different income levels and with labour market behaviour more representative of actual contributory records. These results were compared to those arrived at when modelling “full-careers”.

Our results tend to confirm the finding that the pension reforms carried out in the 1990s and 2000s reduced state pension generosity substantially. They also confirm that focusing on pension entitlements for those with full careers can be very misleading, 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 market participation rates. The “full-careers” assumption, by contrast, implies a drop of just a fifth. In this respect, the impact of the financial crisis on employment prospects, particularly of younger people, raises the prospect of future low pension entitlements in many countries.

The analysis in this paper 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. That said, our estimates show that rising labour participation in many cases can help undo cuts in system generosity. Putting in place an economic growth agenda with an emphasis on job creation, alongside plans to control fiscal deficits, is crucial for the reformed pension systems to provide adequate and sustainable pensions.

On the other hand, our estimates suggest 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. Policymakers in some countries, notably Germany, France and the UK, have also sought to refocus state pension systems towards generating better outcomes for people in the bottom half of the income distribution. 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.

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