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Social Pensions in Europe:
The Aim, The Impact and The Cost

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ABSTRACT

The aim of this paper is to evaluate the impact in terms of poverty and cost of the introduction of social (or non-contributory) pensions in Europe. We use data from the household survey EU-SILC and focus on 17 countries. After reviewing the existence of social pensions in Europe and evidence of old-age poverty, we simulate – in a static framework – the introduction of two social pension schemes: universal and means tested social pensions. We see that the old-age poverty would substantially decrease (average poverty rate goes from 19.7 to 2.5 percent with the universal scheme) but not totally, even though the level of the universal pension is set up to the poverty line. The impact on poverty with the means tested social pension is quite similar (though always smaller) than the one with the universal pension, since most elderly have few other income sources than pensions. On the opposite, it costs less. In fact, the means test reduces substantially the number of entitled elderly while the universal pension leads to a 'leakage' to non-poor elderly.

Key words: Old age poverty, pension systems, social pensions.
JEL Codes: D310, D190, H55, I380

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1. Introduction

Pension systems have two major objectives. The first is an insurance objective that aims at smoothing consumption of individuals between working and retirement years. The second concerns poverty alleviation, which usually occurs by redistribution within the elderly population cohort. Our paper focuses on the latter objective and more specifically on how pension systems do and could prevent poverty in old age. It is an important concern of social security systems since elderly constitute a vulnerable group of population: the ability to work decreases when aging and income sources are consequently fewer than for younger age cohorts. In addition, direct cash transfers – such as pensions – appear to be the only available tool to alleviate old-age poverty since other public policies, which go through the labour market for instance, simply cannot reach them. However, even in high-income countries where pensions systems are relatively well developed in terms of coverage and generosity (OECD 2007), elderly usually face a higher risk of deprivation than the rest of the population. To face this reality, the reinforcement of poverty alleviation instruments within pension systems has been recommended by international organizations (e.g. ILO (2003), World Bank (2005)). Social pensions, universal pensions or also minimum pensions are the main examples. These forms of retirement schemes guarantee a transfer to retirees *independently* of their past contributions and earnings. In low and middle-income countries, these non-contributory pensions appear to be a relevant tool to alleviate poverty, especially in the presence of an important informal sector, implying that few old people are entitled to receive a pension income (see e.g. Willmore (2007) and Palacios and Sluchynsky (2006) for a discussion of the role of social pensions in low-income countries, as well as a review of the existing social pension schemes). In high-income countries, the coverage of the mandatory pension systems is usually higher (ranging from 60 to 95 % of the population aged 15-64).[2] However, this picture does not reflect that an important share of the covered population may not have accrued full pension rights or contributed enough, even where coverage is very high. Levels of old-age benefits can thus be insufficient to meet basic needs. The reinforcement or the implantation (if any exists) of social pension schemes may consequently be relevant in high-income countries as well.

The major contribution of this paper is to simulate the introduction of social pensions in European countries (different forms are considered, as explained subsequently) and look at

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[2] OECD data: World Bank pensions database in M. Pearson and E. Whitehouse (2009).

their impact in terms of poverty reduction and costs (sections 4-6). Similar exercises have been carried out for African countries and Latin American countries. [3] We also provide a typology of social pensions, which explain their role in pension systems. As shown, the design of pension systems varies widely across European countries and it is important to distinguish social pensions from other poverty alleviating instruments within contributory schemes. We also review briefly the types of social pension schemes existing in each country.

Before presenting the results of the simulation, we discuss old-age poverty in Europe using data from the household survey EU-SILC 2006, European Union – Survey on Income and Living Conditions (the remaining of the paper focus on 17 countries due to data constraints). In order to understand the social pensions' impact, it is necessary to examine the determinants of old-age poverty in each country, namely pensions currently received; elderly labour income and living arrangements (section 3).

In the simulation, two scenarios are considered: universal pensions and means tested social pensions. In the first scenario, every elderly receives a retirement benefit at least equal to the poverty line. We see that poverty decreases sharply, without however being totally eradicated. The remaining poverty is due to living arrangements: if elderly were living alone (or with other elderly), there would be no more poor elderly. In the second scenario, we consider two types of means tests: on individual and on couple's income. The level of the social pension is reduced with respect to the personal (or couple's) income resources of the poor elderly. Poverty reduction is less important with the test on couple's income, again due to living arrangement and intra-household redistribution. But in both cases, the impact on poverty is smaller than with a universal pension. Nevertheless, the difference between both schemes is not significant since in most countries, poor elderly have few other income resources than pensions. In contrast, the impact on the prospective costs of both scenarios varies largely: the additional costs of the means tested social pensions are, on average, half cheaper than the ones of the universal pension.

However, the simulation we undertake is static. It therefore does not take into account on how individuals will respond to the introduction of different social pensions schemes. If one would conduct a behavioural simulation (which is out of the scope of our paper), the costs would certainly be higher. It is particularly true for the means tested social pensions, which

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[3] Kakwani and Subbarao (2005) have conducted a similar simulation in 15 African countries. They found that the cost of universal pension is unaffordable (on average almost 3 percent of GDP). Dethier, Pestieau and Ali (2010) have simulated the introduction of universal and means tested social pension in 18 Latin American countries. They found that universal pensions would substantially reduce poverty at an affordable cost.

induces stronger disincentive effects; such has 'hiding income', reducing labour supply and saving and changing living arrangements. As a matter of fact, workers, particularly those close to the eligibility line, have less incentive to work, as extra-earnings will lead to the same level of social pension benefit. It then also penalises those who save for their retirement period.[4] Moreover, as only poor elderly receive a means tested benefit, elderly who are not poor because they benefit of other household incomes, but have low pension and/or personal income, will have the incentive to live alone in order to benefit from the means tested social pension and increase its level. Consequently to these disincentive effects, one can expect that in the long run, the cost of the means tested pension will be much higher than the one predicted since the number of elderly who are entitled for a means tested social pension will increase. Next to the disincentive issues, our simulation 'forces' individual to benefit from the means tested pensions. However, the means testing leads to the so-called 'take up' issue: some elderly may be reluctant to claim a social transfer that is means tested (stigmatization, complexity of the procedure, etc.). This problem will reduce the impact of means test in term of poverty reduction. Finally, a universal scheme is easier to implement than a means test pension as means testing requires information on incomes and is therefore administratively more expensive. These issues are discussed in section 6.

It is worth noting that the social pension schemes could be designed differently. We had chosen to set up the age condition at 65 as it is the most common legal age of retirement in Europe, but it could also depend on life expectancy (especially if we do the same exercise in developing countries where life expectancy varies greatly). The maximum level of the social pension is fixed at the poverty line of each country (that is 60% of the equivalent disposable income). We could consider a smaller level also, which will reduce the costs, and possibly the distortion on labour supply. Finally, the form of the means test can also be discussed. In the simulations, we have considered two different possible cases: every elderly receives a top-up transfer so that his personal income (current pensions received plus other incomes) reaches the poverty line or so that the incomes of elderly couples are at least equal to the poverty line. The test could also take into account incomes of other cohabitants, but the disincentives in term of living arrangements would be even stronger.

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[4] See Piggott, J., D. Robalino and S. Jimenez-Martin (2009) for an analysis of these effects. They simulate the introduction of a social pension within a life- cycle behavioural model. Disney and Emmerson (2005) have also shown the importance saving disincentive due to the introduction of minimum pension in United Kingdom.

The remaining of the paper is structured as follows. In the second section, the difference between the several forms of social pensions will be clarified. The current situation in European countries will also be reviewed. The third part aims at analyzing poverty in the countries under study. It focuses on several elements, such as the impact of current pension systems, the labour income and assets of the elderly and the household composition. The simulations results of two schemes of social pensions are presented in section four. We discuss the coverage of the schemes in section five while the costs of these programs are analysed in the sixth section. Before concluding, the last section raises the question of adverse incentive issues and questions which social pension scheme would be preferable.

2. Social pensions within pension systems

2.1. A taxonomy

The design of pension systems varies greatly among European countries. In the same time, there are numerous typologies that categorise their differences. The aim of this section is to propose a clear typology of the different types of retirement incomes and particularly to understand their role within retirement schemes.

One of the common typology of pension systems classifies pension income provisions into three tiers (OECD 2004, 2005, 2006, Pearson and Whitehouse 2009).[5] The first tier concerns the non-contributory cash transfers that guarantee a minimum level of income during old age. The level of benefit and the entitlement are independent of work history. Their financing is consequently independent of employees' contributions but rather depends on general taxation. The role of these pensions is to prevent poverty in old age. Two forms of non-contributory pensions can be distinguished: Universal pension (also called basic pension) and means tested social pension. *Universal pensions* are **flat rate** transfers given to all individuals above a certain age. Benefits are the same regardless of income, asset or work history. Their disbursement may be conditional on years of residency (or citizenship). *Means tested social pensions* are similar to universal pensions, but the **entitlement and the level of**

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[5] There is also the 'pillar's approach', see e.g. World Bank 2004, 2005 and M. Jakubowicz 2006. And the Typology of Whitehouse (2007).

the transfer depend on an income test.[6] The test can take different forms across countries (e.g. on household income, personal income, financial assets).

The second tier, the predominant one in European countries, includes the mandatory schemes that link future pension's income to individual's resources (to different extend across countries). The eligibility is always related to work history. They can be managed either by the public or private sector and are typically financed by workers and employers' contributions. The objective of this tier is mainly to smooth consumption between working and retirements years.

The third tier comprises voluntary schemes and intends to incite individuals to save more, on a voluntary basis, and increase their income during old age. Two types of private pensions are usually distinguished according to their link to an employment relationship (individual and occupational private pension).[7]

The limitation of such typology however, is that the frontiers between each tiers may be blurry in many cases. For instance, one could question whether minimum pension guaranteed within a contributory pension plan stands in the first tier or in the second. It is also worth for pension benefits that are weakly related to previous contributions (flat rate pensions), but whose eligibility depends on work history. The fact that contributory schemes may also include some poverty alleviating instruments and that the benefit formula varies widely across countries may lead to a lot of confusion. To better clarify the typology, one should also consider the common distinction between 'Bismarckian' and 'Beveridgean' pension schemes.

Within contributory schemes, two types of systems are usually distinguished according to their pension benefits formula and in particular to their link between past earnings and retirement income. In 'Bismarckian' oriented countries, this link is strong, leading to a relatively high and uniform pension's replacement rate (that is the individual (net or gross) pension entitlements as a proportion of (net or gross) individual lifetime-earnings when working) among individuals of all income levels. On the opposite, in 'Beveridgean' oriented countries, the benefits are poorly linked to past contribution, implying higher replacement rates for low earners than for high earners and therefore involving intragenerational redistribution. Typical Bismarckian countries are France, Italy and Germany while United Kingdom, Ireland and The Netherlands are labelled as Beveridgean.[8] Figures 1 and 2

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[6] Let us note that these programs may be part of a general social assistance scheme and then concern younger cohorts as well.

[7] This distinction is also worth for the private pensions within the second tiers.

[8] For a classification see e.g. I. Conde-Ruiz and P. Profeta (2007) and OECD (2005)

illustrate the implications of these two different benefit rules: in UK, benefits are flat among all earners' types and the replacement rates are therefore decreasing with earnings. While in Italy, the benefits are increasing with earnings implying a flat replacement rate for different earning types. These graphs account for the mandatory schemes. One should nevertheless be aware that in Beveridgean countries, private (voluntary) pensions are much more developed than in Bismarckian countries. As mentioned by Conde-Ruiz and Profeta (2003), 'Bismarckian systems have typically a larger size of the public pension system, a smaller fraction of private pensions and lower returns from private pensions'. The best example is the Netherlands where 91% of employees are covered by a private voluntary scheme (OECD 2009) and were there are no mandatory earnings-related schemes. Furthermore, it is worth noting that some Bismarckian oriented countries may have a flat component (such as Luxembourg), but that the latter has a weak impact on redistribution because it is compensated by the tight link between contributions and benefits and the relative size of the earnings-related pensions. Also, some countries that initially had a Beveridgean approach have topped up their flat pensions by an earnings-related pension (e.g. the Scandinavian countries). They have consequently become closer from the Bismarckian approach even though their contributory scheme encompasses a Beveridgean flat pension (OECD 2009, Hinrichs 2006).
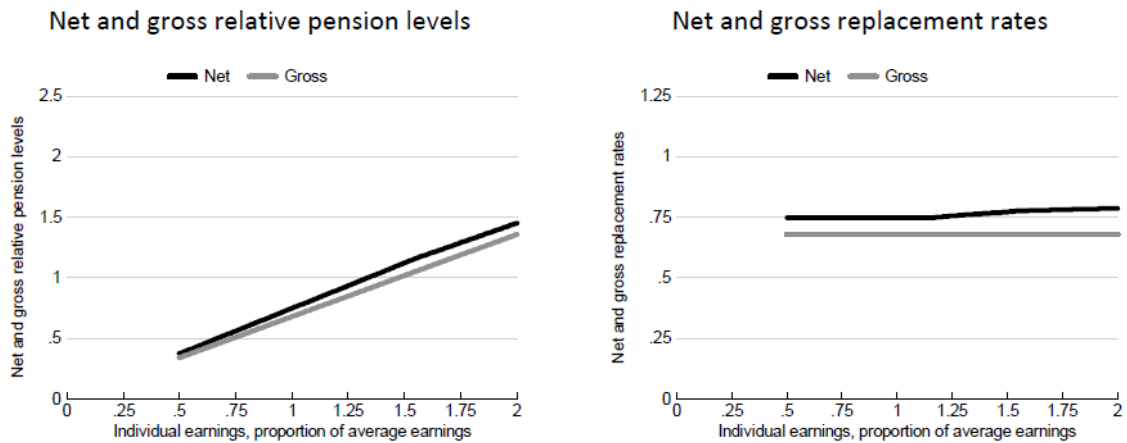
FIGURE 1: Pension level and replacement rate in United Kingdom
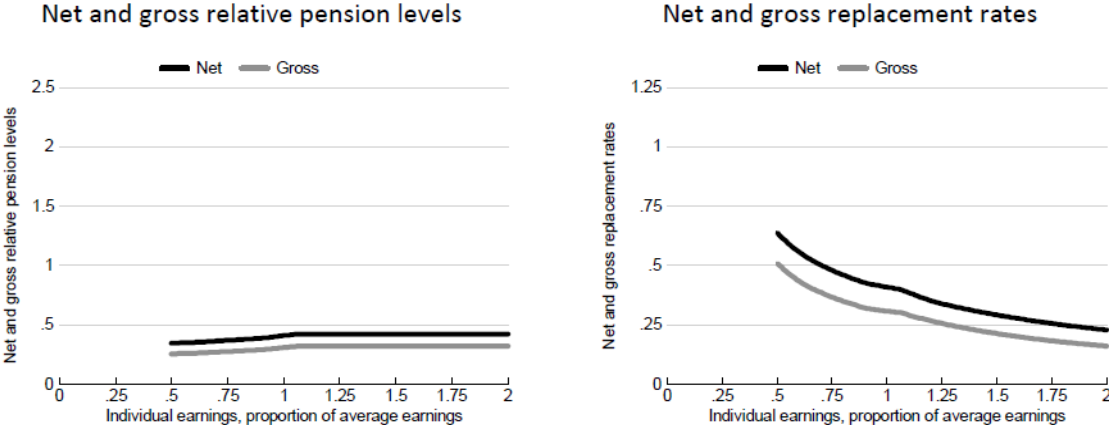
Source: OECD (2009)

FIGURE 2: Pension level and replacement rate in Italy

Source: OECD (2009)

The distinction between Beveridgean and Bismarckian types of pension is particularly relevant in the context of our analysis because it shows to which extent the contributory pensions have an insurance role (Bismarckian) or rather a redistributive – poverty alleviating role (Beveridgean). It therefore raises the following question: are pure Beveridgean pensions universal pensions? In the literature (e.g., Pearson and Whitehouse 2009), they are usually not differentiated. However, as one of the reasons for being of universal pension is to enlarge pension's coverage, the distinction between them is essential. As a matter of fact, Beveridgean pensions are contributory pensions as their entitlement depends on work and/or contributions history. Individuals must accrue enough pensions' rights in order to be entitled. It does also explain that in countries such as UK, with flat rate Beveridgean pension, individuals (e.g. with interrupted carrier, housewives) may not benefit from it. However, this is evidently not the logic behind universal pension, which is not related to any work history and aims at covering the whole elderly population.

Another ambiguity with usual typologies of pension systems is that contributory schemes also include minimum pensions guaranteed or pension credits (the benefits for low earners are calculated as if they had a higher income). These have a similar objective than social pensions, namely preventing poverty, but concern only individuals covered by the contributory scheme. Next to this difference in coverage, they are comparable to means tested social pensions, but here, the test concerns exclusively the level of the entitled contributory pension and no other income sources. Some authors (e.g. Pearson and Whitehouse 2009) consider them as social pension, as they claim that in high-income countries a high proportion

of elderly is covered by contributory schemes. One should however be aware that they are exceptions (e.g. Ireland has no contributory scheme) and that such high coverage rates can be lower in middle and low income countries.

As it may appear from above, pensions systems are complex and institutional settings vary widely across countries. Our aim is not to review all European systems (for such international comparison see e.g. European Commission 2006, Whitehouse 2007, OECD 2007, 2009), nor to classify them into different clusters, but rather to clarify the terminology of the different pension plans and avoid confusion. In view of the two typologies mentioned above, one may see that it may be difficult to differentiate clearly social pensions from some benefits within the contributory schemes. The reason of this ambiguity is that contributory schemes are designed in many different ways: some privilege the link between contributions and benefits and some focus more on poverty alleviation through flat rate pensions. On top of that, earnings-related pensions may also be complemented by minimum pensions guaranteed and flat rate pensions may be topped up by some earnings-related scheme. Many combinations are possible. Table 1 reviews the different pension types. Three categories are distinguished according to their eligibility rules.

In the social pensions' category, the eligibility is independent of work and contributions history. Universal pensions cover all individuals above a certain age and usually depend on residency conditions. Means tested pensions are safety nets targeted to the elderly poor. The level of the benefits and entitlement depend on current income (may also depends on partner's or cohabitant's income (as in Belgium) and on other financial assets).

The contributory pensions include three sub-categories: the first two encompass all *mandatory* pensions whose eligibility depends on work and/or contribution history. This category is organised very differently across Europe. Some countries may only have a Beveridgean pension (e.g. Ireland and The Netherlands), or only an earnings-related pensions (Bismarckian) (e.g. Italy), which may in addition include a minimum pension, guaranteed (e.g. Belgium). And Beveridgean pensions may also be complemented by an earnings-related one (e.g. Czech Republic, Luxembourg). In addition, some mandatory contributory schemes may be public or private (e.g. In Denmark).[9] The third sub-category concerns pensions that are made on a *voluntary* basis (occupational or individual schemes).

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[9] Mandatory pensions can be managed by the public or private sector and the benefit rule may be defined contributions, defined benefits and the financing mechanism PAYG or fully funded. This discussion is however out of the scope of our analysis (see e.g. OECD 2009).

TABLE 1: Typology of pension systems

Non-contributory pensions (or social pensions)	Universal pensions		
	Means tested social pensions		
Contributory pensions	Mandatory pensions	"Beveridgean" pensions type (flat benefit)	
		"Bismarckian" pensions type (earnings' related benefit)	Minimum pensions guaranteed
			No minimum pensions guaranteed
	Voluntary private pensions		

Source: author's elaboration

2.2. Social pension in Europe

As already mentioned, the typical method to provide old-age support in Europe is through the contributory, and predominantly, the earnings' related schemes. However, most European countries have also adopted several means of keeping retirees' incomes above a minimal level. They all have one form of social pension scheme, or even several coexisting. We also consider poverty alleviation instruments within contributory schemes: the minimum pensions guaranteed. In addition, to prevent confusion between universal pension and the flat (Beveridgean) pensions within contributory schemes, we consider an additional category for Beveridgean pension.[10] This sub-section gives a brief overview of the poverty alleviating instruments implemented in European countries (which is summarised in Appendix 0).

Universal pensions are only present in two countries: Denmark and The Netherlands. In both countries, the condition to be eligible for the full benefit depends on the number of years of residency (40 years in Denmark and 50 years in the Netherlands). The Netherlands

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[10] Note again that the existence of a Beveridgean type of benefit does not mean that the overall pension system is Beveridgean. It can be topped-up by earnings-related pensions and eventually becomes more Bismarckian (e.g. Luxembourg).

universal pension is completed by voluntary private pensions (which is known as quasi-mandatory since the coverage of employees is more than 90%). The situation is equivalent in Denmark. But in addition, there is a means tested social pension that targets poor elderly (taking account of all income sources).

In Czech Republic, Estonia, Ireland, Luxembourg Lithuania and United Kingdom, the contributory scheme comprises a flat rate pension whose eligibility depends on the years of contributions (see OECD 2009 for the details conditions per countries). However, the importance of the Beveridgean pension compared to other types of pensions varies significantly across those countries. The extreme case is Ireland were there are no mandatory earnings-related (Bismarckian) pensions. Voluntary occupational pension complements the flat rate pension and a means tested social pension is available for the poor elderly (taking into account income and assets). The system in United Kingdom complements the flat contributory pension by a public earnings-related one which includes a minimum pension in the form of a pension credit (this scheme is relatively small compared to the flat pension). There is also a large voluntary private pensions sector. In addition, a means tested social pension has been introduced to target the poorest elderly. In Czech Republic, Estonia and Luxembourg, the flat contributory pension is complemented by a relatively large earnings-related pension. In the three cases, a means tested social pension guarantees safety nets to the poorest (it is part of the general social assistance in Czech Republic and Luxembourg) and a minimum pension is also included within the earnings-related pension in Czech Republic and Luxembourg. The flat pension in Lithuania is also complemented by an earnings-related pension.

In all other countries, a minimum level of pension is guaranteed within the earning related scheme, except in Austria, Germany and Italy. In those three countries, the unique type of pensions is a public earnings-related one, which is complemented by means tested social pensions targeted to poor elderly (part of general social assistance for Germany). Next to those three exceptions, countries with the minimum pensions share the common characteristic of a large earning-related pension scheme. Note again that, the design of the earning-related pension varies a lot across countries.[11] There are four countries with only a minimum pension guaranteed: Sweden, Poland, Slovenia and Slovak Republic. And the last eight countries (Belgium, Cyprus, France, Greece, Spain, Latvia, Malta and Portugal) encompass both a minimum pension within the earnings-related pensions and a means tested social pension.

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[11] See footnote 9.

From what precedes, we can only conclude that European countries have made some efforts in guaranteeing elderly with minimum income. Nevertheless, it does not mean that these social pension schemes have been effective in preventing old-age poverty. Such an exercise would require much more additional information on the different schemes, notably on the level of social pensions with respect to the standards of living in each countries, and it is far beyond the scope of our research.

One should however be aware that the existence of one or several poverty alleviating pension types does not necessarily imply low poverty rates in old age. Several reasons can explain that. First, where only minimum pensions are implemented, it is clear that individuals out of the contributory scheme (e.g. housewives, agricultural workers, informal workers, etc.) face a high risk of poverty. Second, when a means tested pension is guaranteed, some eligible individuals may not claim it (e.g. feel stigmatised, administratively too complicated, etc.). This is referred to as the 'take-up issue'. Moreover, the eligibility conditions may be too narrow (benefit level too high compared to minimum living standards, the eligibility may also depends on other household members' incomes, etc.). Finally, even with a universal pension, poverty prevention is not guaranteed, as the level of the benefit can also be not high enough to meet basic needs. In Denmark, the annual full universal pension in 2006 was 7.790 Euro (representing 17.5% of average earnings) while in the Netherlands, the universal pension was 12.017 euro (30% of average earnings) (OECD 2007).

Some additional information on each social pension schemes (such as pension levels, eligibility conditions, coverage, etc.) would be needed to evaluate their effectiveness in alleviating poverty, but it is out of the scope of this paper. We limit ourselves at pointing out the fact that there exist different forms of social pensions in each European country, but that some improvements could be made. It will be particularly evident when looking at relatively high old-age poverty in the following section.

3. Poverty in Europe

Before simulating any policy changes and evaluating their impact on poverty, it is important to understand what poverty is and what its determinants are.

3.1. Data and methodology

Our paper aims at examining old-age poverty (current and after introduction of social pension schemes) in Europe using the European survey on Income and Living Condition (EU-SILC) from 2006. It is a household survey that covers the 24 EU members (plus Norway and

Iceland) with an original sample size of 536.993 individuals.[12] However, due to missing values in some incomes variables, we had to exclude some countries. The remaining of the paper focuses on 17 countries: Austria (AT), Belgium (BE), Czech Republic (CZ), Estonia (EE), Spain (ES), France (FR), Greece (GR), Ireland (IE), Italy (IT), Lithuania (LT), Luxembourg (LU), Latvia (LV), Poland (PL), Portugal (PT), Sweden (SE), Slovenia (SI), and United Kingdom (UK). Finally we excluded all records with negative disposable income. The final sample size amounts for 368.978 individuals and 138.441 households.

We focus on one type of poverty measure: "at-risk-of-poverty rate" (or poverty rates), that is the share of individuals with an equivalent disposable income below a relative poverty line.[13] Here, the disposable income is a core concept: it represents the sum of incomes and social transfers of all household members (see Appendix 1 for a detailed composition). In order to account for differences in household size and economies of scale within household, equivalence scales are used to yield the equivalent disposable income. In other words, they allow us to go from household resources to personal well being. We apply the OECD scale, which implies that the consumptions needs of children are smaller than for adults. The equivalent household size is computed using the following formula: $1 + 0.5 * (adult - 1) + 0.3 * kid$, with adult being individuals over 14 years old. If no scale were used, elderly poverty would be relatively much more lower than for other age groups, as few elderly live with children (see e.g. Lanjouw and al. (1998) for the incidence of equivalence scale on old-age poverty in transition economies). Like most cross-national studies on poverty within relatively wealthy countries, we compare equivalent disposable income with a relative poverty line, set at 60% of the median national equivalent income (which is also the official method adopted by Eurostat (2000)). It is important to realise that relative poverty measures are therefore influenced by the income distribution in each country. The at-risk-poverty rate indentifies individuals with low income in comparison to other residents in that country.

Old-age benefits are an aggregate income component defined under the European system of integrated social protection statistics (see Eurostat 1996, ESSPROS manual). They include all mandatory pensions, be it public or private. It also includes disability benefit, survivors' pension, partial pension, early retirement benefits and safety nets paid after the legal age of retirement. It excludes private pensions made on a voluntary basis. Unfortunately, it is not possible to distinguish social pensions from contributory pensions.

[12] Bulgaria and Romania are not yet covered by EU-SILC (EU members since 2007).
[13] See Jäntti and Danziger (2000) for an overview of alternative poverty measures

Finally, the elderly population is defined as individuals aged 65 years old and more as it is the most widespread legal age of retirement in Europe.

3.2. Evidence of old age poverty

Elderly are a vulnerable group of the population. When getting older, the likelihood of sickness and disability increases and consequently reduces the earning capacity. In the same time, usual redistributive policies that go through labour, educational and output market for instance, cannot reach them. Direct cash support, such as public pensions appears to be the only relevant poverty-alleviating instrument. As mentioned by Kidd and Whitehouse (2009), income security in old age has been considered as a fundamental human right since 1948 in the Universal Declaration of Human Right. And as a matter of fact, the effort of European countries to provide elderly with an income support has been continuous. On average, they spend 7 percent on gross domestic product (GDP) on public pensions (EU-SILC 2006, see appendix 2).[14] However, it is still legitimate to question the ability of the current pension schemes in alleviating poverty. From figure 1, we see that elderly poverty rates vary largely across countries: the average poverty rate in the 17 countries is 19.7%, while the minimum rate is in CZ (6.32%) and the maximum in ES (29.96%). The issue we raise in this section is whether old people are poorer than the overall population. From Figure 2, it appears that in most countries elderly poverty rates are significantly higher than for the whole population. [15]

FIGURE 3: Elderly at-risk poverty rates

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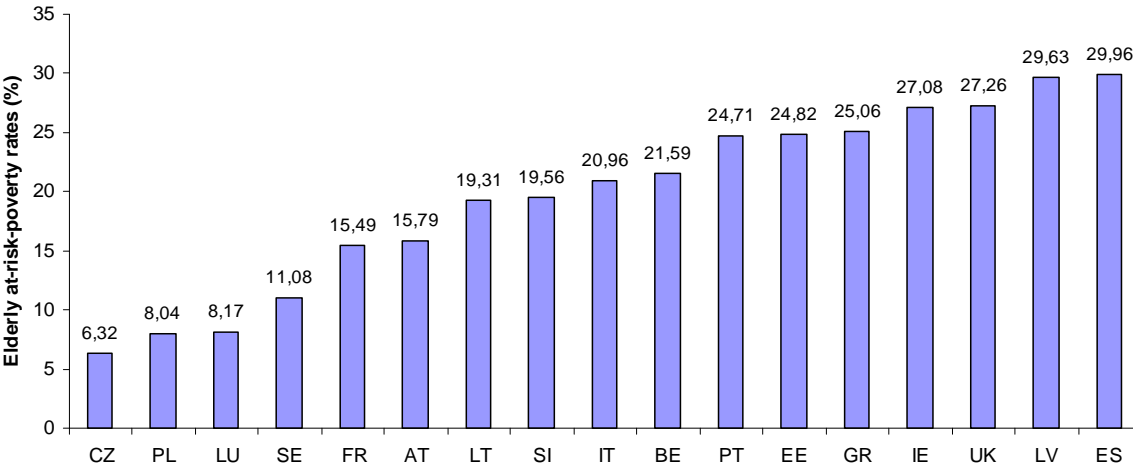
[14] Note that the share of pensions in GDP depends also on the life expectancy of elderly. The latter is smaller in new members' sates (Eurostat).

[15] See appendix 5 and 6 for the at-risk-poverty rates (for total population and elderly) in each countries.

FIGURE 4: comparison between poverty rates for elderly and for the whole population
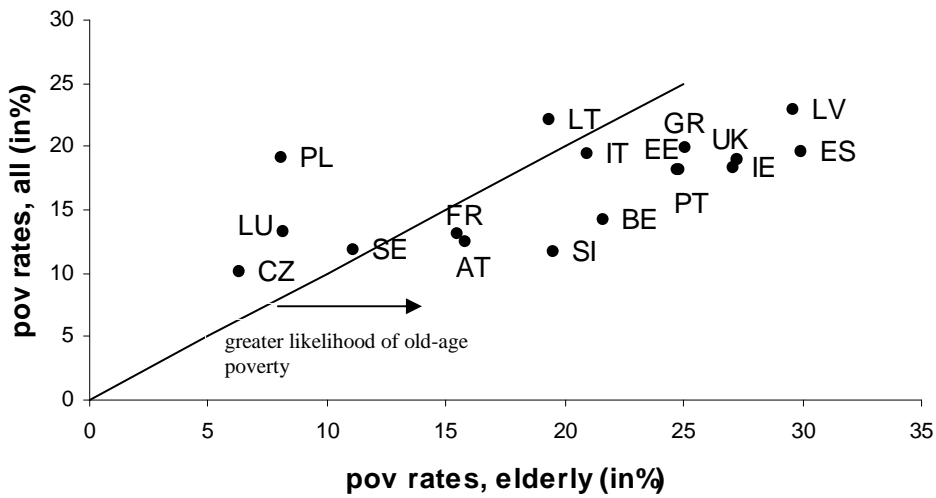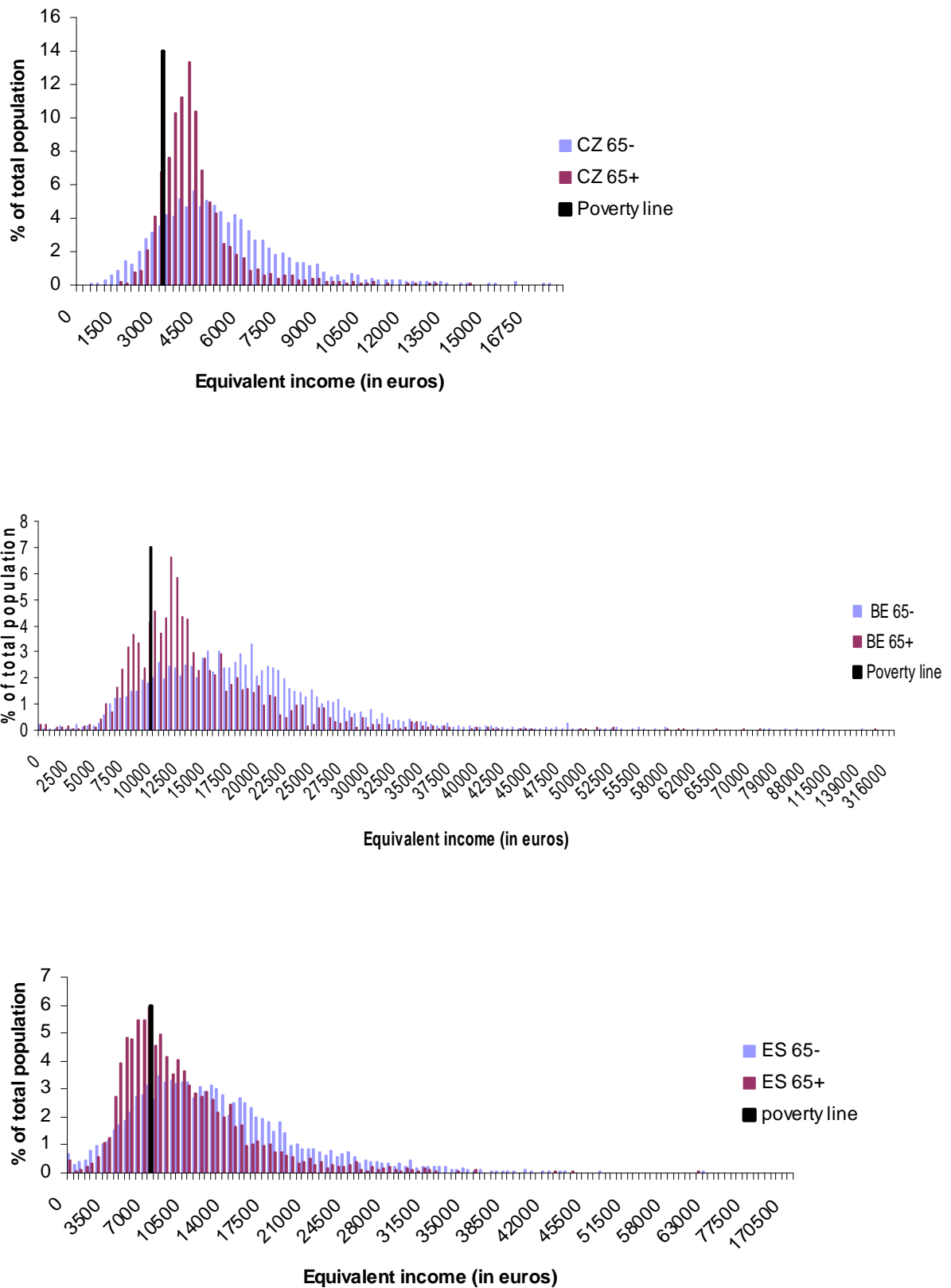

Source: EU-SILC database (2006)

Only in Czech Republic, Poland, Luxembourg and Lithuania, elderly face a smaller poverty risk than the total population. It evidently does not mean that pension systems perform better in these countries. Many other factors can influence elderly poverty (e.g. elderly labour supply, family solidarity, etc.). But before looking at the determinants of poverty, one has to be aware that the above findings, and especially the fact that the elderly at-risk-poverty rates are relatively weak in most of new European Member Sates (CZ, PL, LT and also SI), is directly influenced by the poverty measure we utilise. As the equivalent income is compared to the national median income (60% of the equivalent median income more precisely, see appendix 3), poverty rates also reflect that the overall income level in those countries is low. It would be evidently mistaken to conclude that elderly are better off in Czech Republic than in Belgium for instance. We can compare the income distribution in three countries (CZ where the rates is the smallest, BE where the rate is close to the average and ES, with the highest rate) to understand why there are such differences in poverty rates. Figure 3 shows that the income distribution in CZ is just more 'concentrate' around the poverty line for both age cohort (less than 65 years old and 65 years old and more). In Belgium, the income distribution of the two cohorts is different, leading to a more important difference between old-age poverty rates and the one of the non-elderly. The old-age poverty in Spain is more important as the elderly income distribution is even more skewed to the left than in Belgium.

**FIGURE 5**: Income distribution in CZ, BE and ES

Source: Author's own calculations based on EU-SILC database (2006)

The at-risk-poverty rates consequently also reflect the income distribution in each country, as our poverty measure is relative. An absolute one (with a same poverty line for each country) would evidently lead to different results (see e.g. Jäntti and Danziger 2000). We, however, do not enter into this discussion, as the aim of this section is to understand why some elderly are poor. In the next three sections, we investigate the causes, or the determinant, of old-age poverty.

3.3. Poverty and current pensions

We first consider the impact of pension benefits. Doubtlessly, retirement transfers have a great impact on old-age poverty. If one considers the artificial situation where no public pension systems exists, the average poverty rates in Europe would reach 78 percent of the elderly population, as shown on figure 6. Of course, these results are artificial because they do not take into account changes in living arrangements and elderly labour supply. For instance, family ties would become stronger and other solidarity mechanisms would emerge. The elderly labour supply would also probably increase. In addition, savings and private pensions would also increase. Still, it is a good indication of the importance of public support to elderly covered by the pension schemes.

FIGURE 6: Poverty rates for the old-age population, with and without pensions
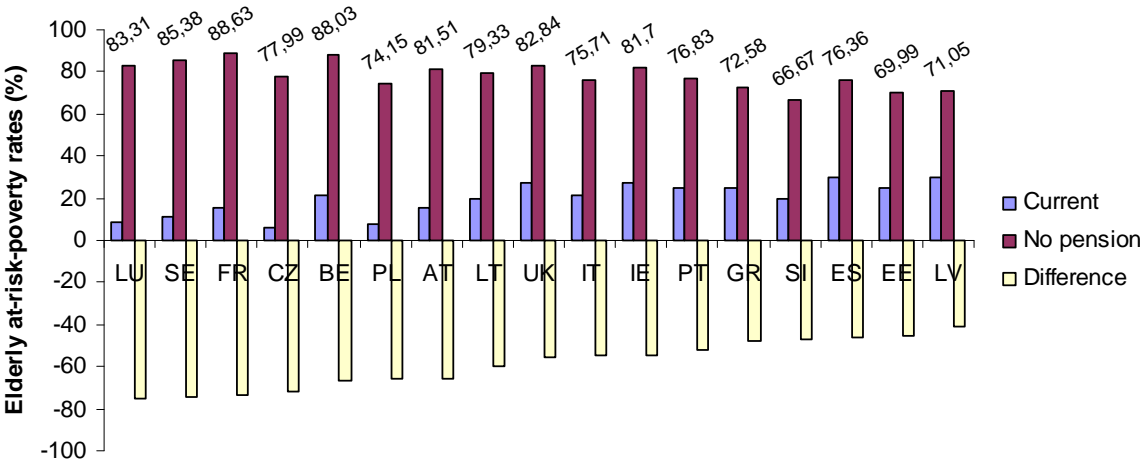
Source: Author's own calculations based on EU-SILC database (2006)

It is also important to note that even if the impact of pensions currently received is important; a part of the elderly population is not affected by such an artificial policy since they simply do not receive any pension. The pension coverage (considered here as the

proportion of elderly who receive an old-age benefit) evidently affects the current poverty rates. There can be several reasons of low coverage: individuals did not participate in labour market covered by the public scheme (self-employed, the agricultural workers, the informal workers), individuals did not contribute enough to qualify for benefits (interrupted career, housewife, etc.) or lifetime earnings have been too low (long term poor). Moreover, an old-age person can also make the choice to continue working. Table 2 shows the proportion of elderly population receiving a positive pension (the latter could still be very low). On average, coverage is very high in the European countries considered (almost 90% of all elderly). But still, in countries such as Spain and Greece, the relatively low coverage can also explain the high poverty rates and the relatively low impact of pension. However, one has to be aware that the following coverage rate may be artificially low in countries were the pension of an elderly is adapted if he lives with a dependent partner. As example, the pension benefit of a Belgian retiree is increased by 25 percent if he/she lives with a spouse that does not receive any replacement income.

TABLE 3: Percentage of elderly population that received a pension

Countries	Share of elderly with positive current pension
AT	92,60
BE	85,59
CZ	99,28
EE	98,93
ES	78,80
FR	93,00
GR	84,88
IE	86,37
IT	91,80
LT	99,83
LU	96,90
LV	99,14
PL	98,02
PT	91,85
SE	97,05
SI	97,85
UK	98,86

Source: EU-SILC database (2006)

The no-pensions poverty rates also show the dependence of the elderly to pensions' income: the lower the difference between poverty rates before and after pensions, the higher the proportion of elderly having other incomes' sources to subsist. There are four potential income sources: financial assets, voluntary private pensions, elderly labour income and family solidarity.

3.4. Old-age poverty and other income

Though few individuals still work after 65 years old (on average 6.6% in the countries considered), it partially explains the weaker poverty increase after no pensions in some countries (e.g. in EE, LT, LV were the percentage of elderly that have positive labour income is among the highest, see appendix 4). Participation to private voluntary pension plans can play the same role. However, this participation is insignificant, except in three countries (SE, UK and IE, see appendix 5). Concerning the assets, it is difficult to assess their impact on elderly poverty, as they are an income component at household level. We however looked at two income variables (income from rental of a property or land and interests, dividends, profit from capital investments in unincorporated business) in households composed by elderly only. It appears that the share of households with elderly that have such assets is relatively large in BE, FR, LU, AT, UK and SE, but weak in Eastern and Southern European countries (see appendix 6). For these latter, the relatively weak poverty rates without pensions could also be explained by family solidarity. But as we will see in the following section, the household dimension of poverty may lead to diverse effects on old-age poverty.

3.5. Poverty rates and household composition

Before simulating the introduction of social pensions, it is worth highlighting the influence of household composition on poverty. In fact, poverty is determined using equivalent household income, which also implies equal sharing of resources among household's members. When looking at old-age poverty, one has to be aware that the household dimension creates two potential distortions:

- It leads to overestimate poverty when old individuals have sufficient incomes resources but live with poor household members. For instance, a pensioner can have a pension higher than the poverty line, but has to 'share' it with other poor household members so that all household members are finally poor;

-   It leads to underestimate poverty when elderly have few income resources but are not considered poor because they live, and depend, on other household's members' income.

In this section, we therefore look at how old-age poverty would be affected if elderly were living among themselves or with their younger spouse only. In what follows, we refer to extended family as household where at least one elderly is living with at least one non-elderly, without being partner, and as elderly couple living with at least one non-elderly. We artificially split extended household but do not separate couples of one elderly and one non-elderly. This last type of household is called 'intergenerational couple'.[16]

3.5.1. Current households composition

The percentages of elderly living within an extended household are represented in figure 7. In all countries, the majority of elderly lives alone or with other elderly. Nevertheless, the share of elderly living in extended household varies significantly among countries. As one may expect, it is particularly high in Southern and Eastern European countries (Spain, Latvia, Poland, Slovenia and Greece) and low in Sweden, France, United Kingdom, Belgium and Luxembourg.

FIGURE 7: Percentages of elderly living within an extended household
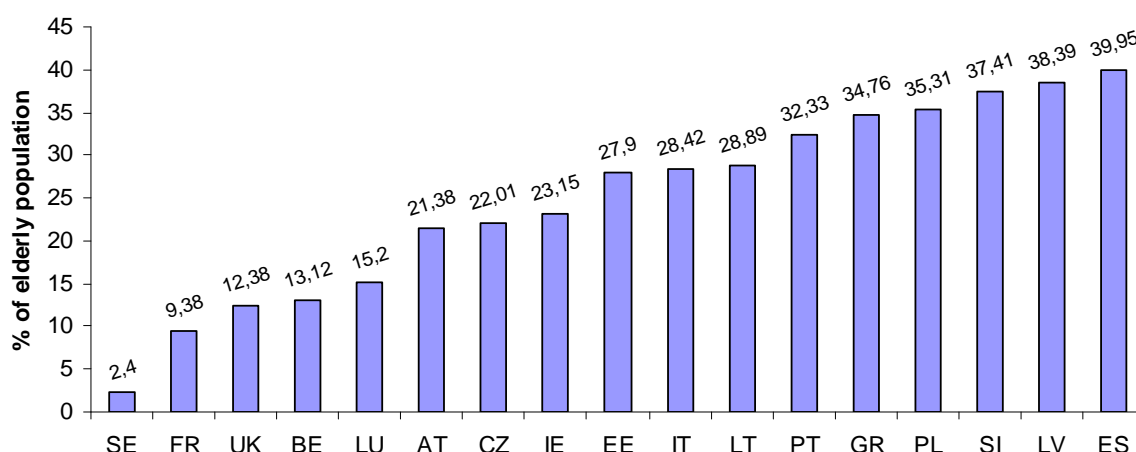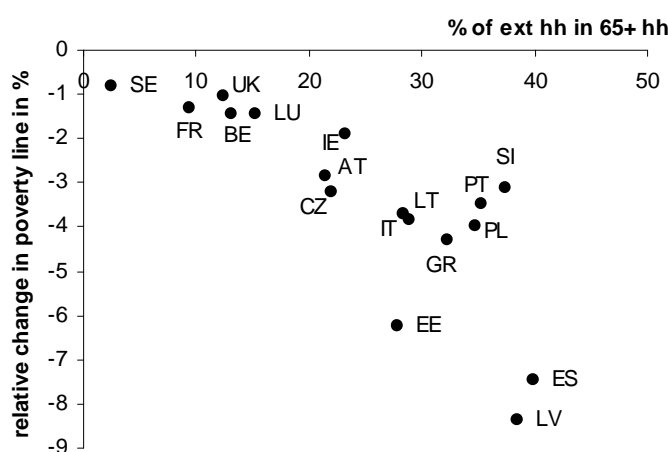

Source: Author's own calculations based on EU-SILC database (2006)

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[16] The reason of not splitting intergenerational couple is that it is less probable that any change in pensions' provision rules will lead to strategic divorce. However, it is much more likely to influence the decision of living in an extended family or not.

3.5.2. Poverty and modified household composition

In this section, we compute the poverty rates assuming that elderly do not live in households with non-elderly (except if they are in couple). One of the first implications of this scenario is that the median equivalent income decreases. And, as a direct consequence of the application of equivalent scale, the decrease is relatively more important when the proportion of extended household is higher. It consequently implies that the poverty line is inferior to the current one (see appendix 3) and again, the decrease is related to the proportion of extended household, as depicted in figure 8.

FIGURE 8: Impact of the change in household composition on median equivalent income

Source: Author's own calculations based on EU-SILC database (2006)

The impact on poverty rates is not directly linked to the proportion of extended household as it depends mainly on the income distribution within extended households. From figure 9, it appears that in most countries, elderly would be poorer if they were separated from other household' members. It is particularly significant for Slovenia, Latvia and Greece. On the other hand, in Poland, Lithuania and Estonia (less significantly in Czech Republic and Sweden), poverty rates would decrease.

Two opposite effects have to be distinguished: some elderly depends financially on other household members and if there are separated from them they become poor (poverty increases) and some elderly support financially other non-elderly household members and thus become non-poor if there are no extended-households. Depending on the household

composition in each country and especially on the intra-household intergenerational distribution, one of these effects will dominate the other.

FIGURE 9: Elderly poverty rates, with and without extended households.
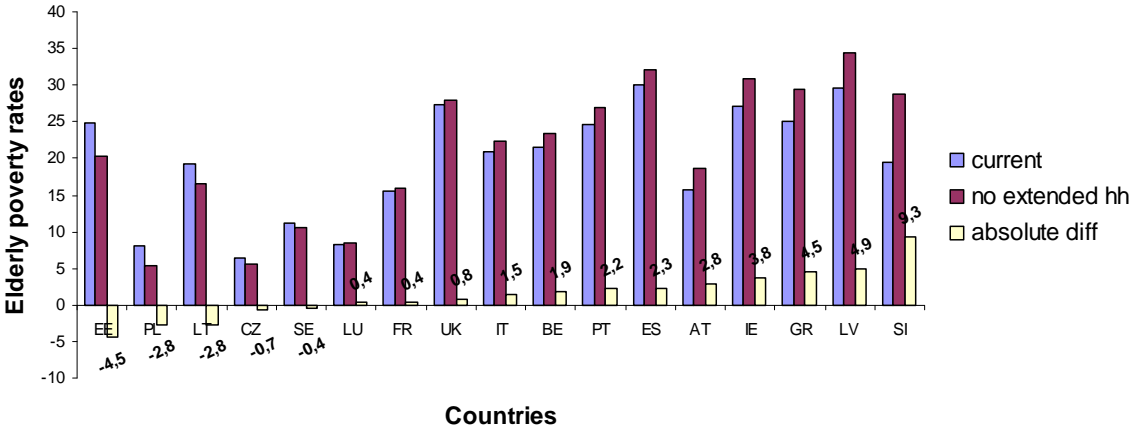
Source: Author's own calculations based on EU-SILC database (2006)

It is important to understand the ambiguity between poverty and household composition, especially in the case of social transfers targeted to a specific age group, as social pensions. Since poverty is computed using equivalent household income, it implies that the additional transfer will be shared among household members.[17]

4. Simulating the impact of social pension

In this section, we simulate the introduction of social pension schemes and look at their impact on old-age poverty. We use a similar methodology than Dethier, Pestieau and Ali (2009). The schemes we look at focus on persons aged 65 years old and more and are characterised by a level of social transfer benefit equals the poverty line in each country. Three scenarios are considered:

1. Flat benefit equal to the poverty line is given to all elderly (universal pension),
2. A 'individual' means test benefit (taking into account elderly personal incomes and assets) is given to all elderly who live in poor household,

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[17] Using OECD equivalent scale leads to the assumption of equal resource sharing among household members, with downward adjustment for children. However, an opposite situation where non-elderly members do not share their income with the elderly in the household is also possible (see e.g. in India, Dreze and Scrinavasan 1997).

3. A means test benefit based on couple's income (taking into account the personal incomes and assets of isolated elderly or elderly couple) is given to all elderly who live in poor household.

4.1. Universal pension

The poverty line income is guaranteed to all individuals aged 65 and more. We use the following formula to introduce the universal pension:

T=Max $(0,\ s\text{-}p)$ if age>=65, where T is the transfer needed to adjust the pensions currently received (p) to the poverty line (s).

The personal income after the introduction of the universal pension is thus: $y_i{}^*=y_i+p+T$, where y_i is the personal income of individual i with no pension. The new poverty rate is then computed: we sum the new personal income $y_i{}^*$ for all household's members and then apply the equivalent scale. From figure 10, we see that poverty rates decrease sharply: the average poverty rate for the 17 countries goes from 19.7 percent to 2.5 percent.

FIGURE 10: Poverty rates for the elderly population, before and after the universal pensions
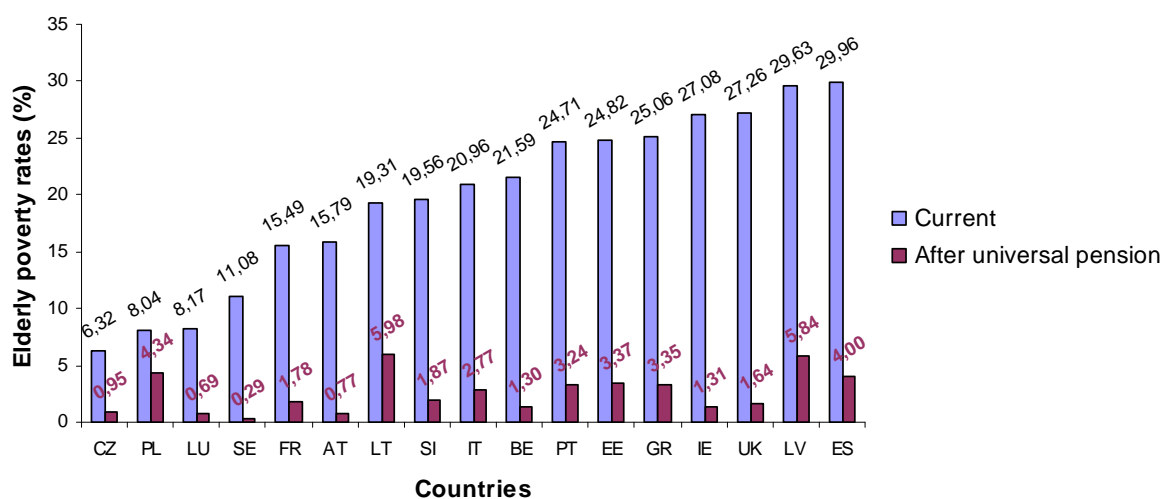
Source: Author's own calculations based on EU-SILC database (2006)

However, it could seem surprising that old-age poverty does not entirely disappear as all elderly now have a pension income at least equal to the poverty line. As already mentioned,

household composition is at the origin of this residual poverty. It is particularly not surprising that the poverty rates after the universal pensions are relatively high in countries were the proportion of elderly living in extended household is high (such as Estonia, Latvia, Lithuania and Poland).

To illustrate the impact of household composition and its implication on poverty rates after universal pension, we simulate the impact on poverty assuming that there are no more extended household (like in 3.3.2.). We see that the impact of the universal pension is higher: the average poverty rate in the 17 countries being 0.88 percent.

FIGURE 11: Poverty rate after universal transfer with current household composition and modified household composition (no extended households)
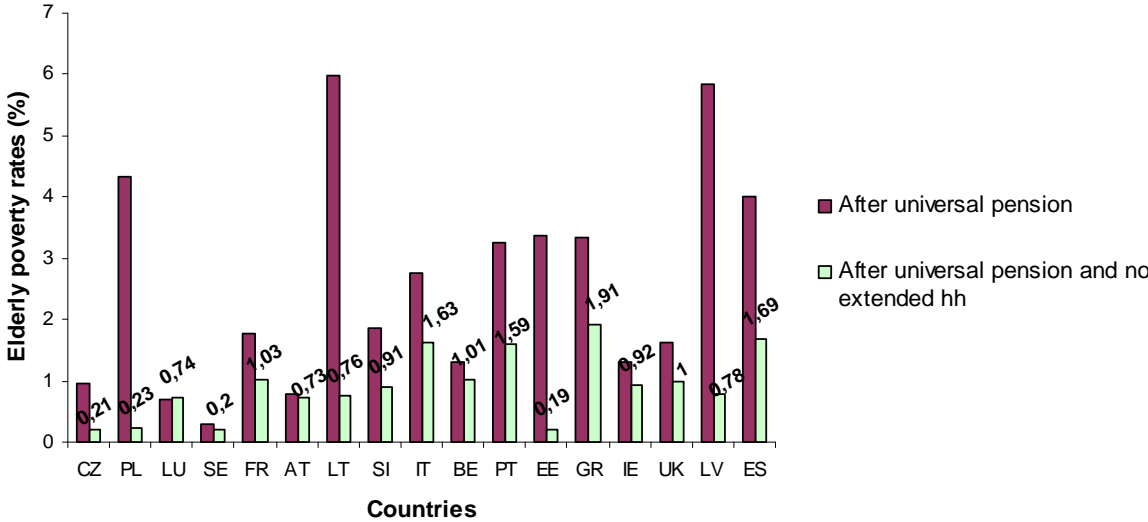
Source: Author's own calculations based on EU-SILC database (2006)

Finally, the residual poverty after the universal pension and the change in household composition is explained by the fact that elderly still share their pension with their non-elderly partner. Therefore, the residual poverty is linked to the proportion of intergenerational couple in each country, and more particularly, to the income distribution within the intergenerational couples (see appendix 9). For a same proportion of intergenerational couples (as in Belgium and Greece), the poverty is higher when, on average, the non-elderly partners financially depend on the elderly. Consequently, old persons that are still poor after introduction of the universal pension are so only because of their choice in living arrangements. If all elderly

would be living alone, or only with other elderly, old-age poverty would completely disappear.

4.2. A means tested universal pension

With a universal pension, every elderly receives a pension benefit at least equal to the poverty line. Even those who initially had other income resources to be out of poverty (e.g. housewife who receives no pension but whose husband's one is raised due to their living arrangement, see 'taux des ménages' in Belgium). In order to reduce the cost of such a program, a social planner could introduce a means test to restrict the eligibility to those in need. For instance, one could consider that the poverty line income is guaranteed to individuals aged 65 and more *but only* if they live in poor household, using following formula: T=Max $(0, s\text{-}p)$ if age>=65 and if $y_{eq}<s$, where T is the transfer needed to adjust the pensions currently received (p) with the poverty line (s) and y_{eq} the equivalent disposable income. In this case, referred to as 'modified universal pension' in the following, the impact on poverty is exactly the same as in the case of the universal pension. Poor elderly receive exactly the same additional transfer as in the universal pension case. The only difference is that this transfer is not awarded to elderly who currently received a low pension level but are not poor (thanks to other income sources or to support from household's members). The fact that the latter do not receive an additional transfer does not affect poverty rates as they were already out of poverty.

Nevertheless, once one starts means testing to decide whom to pay an extra-pension, the social security administration could also use information on income to limit the costs. In fact, the cost of the modified universal pension could be lowered if the level of benefits the elderly receives would be adapted in function of some other income. The crucial question is which income? In what follows, we consider two alternatives: the personal income of the elderly or the couple's income (the sum of both personal incomes) of elderly (see appendix 2 for definition of personal income).

We could alternatively means test using the equivalent household disposable income. But it would strongly penalise poor elderly who live in extended household because they cannot subsist on their own. The incentive of living separately will be extremely high. Strategic changes in household composition would finally lead to a similar situation than the means test using personal income, as the income after strategic change in living arrangement would basically be the personal income of elderly. We however consider the means test on the income of the couples as it is less likely that this mean-test will lead to strategic divorces.

As already mentioned, using income information to means test pension benefit reduces the costs. As we will see in section 6, we expect that the simulated cost of the universal (c_u) will be higher than the cost with the 'individual' means test (c_i), while the cost of the means test on elderly couple's income will be the lowest (c_c): $\mathbf{c_c<c_i<c_u}$. On the other side, the effect on poverty rates will be the reverse, $\mathbf{r_u<r_i<r_u}$, as means testing on income couple reduces the level of the social pension benefit.

4.2.1. Means tested social pension: Individual income

The benefit formula used to introduce the 'individual' means tested social pension is the following:

T=Max (0, s-p_i-y_i) if age>=65 and if y_{eq} <s, where T is the transfer needed to adjust the pensions currently received (p_i) and the personal income with no pension of individual i (y_i) to the poverty line (s), and y_{eq} the equivalent disposable income.

From figure 12, we see that the impact on poverty of this means tested social pension is similar than the one of universal pension. Even if the poverty is always higher with this scheme, the differences between poverty rates after the universal and the means tested scheme are small in most countries (the maximum difference is 0.72% in UK). This means that few elderly *having pension below the poverty line*, have other income resources. In addition, one has to be aware that the composition of personal income (income component that are at household level have been divided by the household size, see appendix 1) may have an impact on the difference in poverty rates between the universal and individual means test. In particular, the personal income may be artificially high, because of the equal sharing assumption, if the elderly live in extended household where income components at household level are substantial.

FIGURE 12: Difference between poverty rates for the elderly population, after universal pension and after means tested social pension
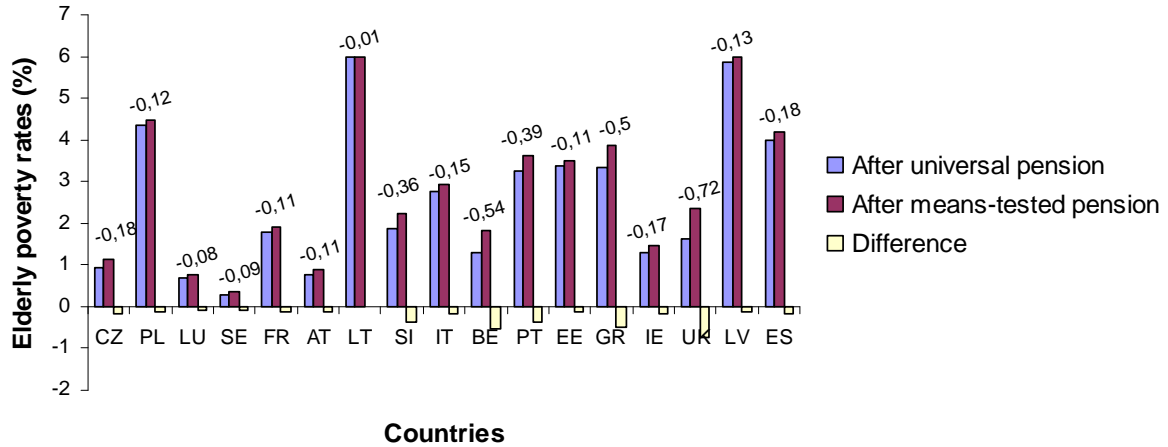
Source: Author's own calculations based on EU-SILC database (2006)

4.2.2. Means tested universal pension: Couple's income

Another way of designing a means tested social pension is to adapt the level of benefit in function of the incomes of both partners. To illustrate the difference with the previous means tested social pension, we can consider a simple situation of a poor household composed by a couple of elderly (with equivalent income smaller than the poverty line s) where the wife has zero pension and the husband a pension $p_H=s$ and they have no other income. Under, the first means test, the wife receives s as a social pension while the husband receives nothing. They equivalent income after the social pension is thus $2*s/1.5$, with 1.5 being the equivalent household size. The equivalent income is thus higher than the poverty line s because the 'individual' means test does not take into account that the husband has other income and it is therefore 'too generous' with the spouse. A means test that takes into account the income of both partners adapts the benefit level of the wife with respect to the income of her partner in a way that they both end up with an equivalent income equal to the poverty line s, and not superior. In order to bring the couple out of poverty, the sum of income of both partners (p_H+0 in this case) has to be equal to the poverty line, multiplied by the equivalent scale. In our example, as the only income source is the pension of the husband, we want that $p_H =s*1.5$. The additional transfer has to be equal to $T=s*1.5- p_H =0.5\ p_H$ (as $p_H =s$) to bring the couple out of poverty. We suppose that both partner receive half of the transfer T such the

final equivalent income y_{eq} is thus $((p_H - 2*(p_H/4)/1.5$, and as we have assumed in the example that the level of pension received by the husband equals the poverty line ($p_H = s$), $y_{eq} = s$.

The formula we use to introduce the 'couple' means tested social pension is therefore:

T=Max $(0, s*1.5-p_c-y_c)$ if age>=65 and if $y_{eq} < s$, where T is the transfer needed to adjust the sum of the pensions currently received by the couple (p_c) and the sum of the personal income with no pension of the couple (y_c) to the poverty line (s), and y_{eq} the equivalent disposable income. Each partner receives $T/2$. Evidently, if the elderly has no partner, the top-up transfer T is equal to the one in the 'individual' means test as $p_c = p_i$ and $y_c = y_i$.

As predicted, the poverty rates in this case are higher than with the individual means test (figure 13). Since the additional transfer T is now reduced to barely allow elderly couples to be out of poverty, it has a consequence on the poverty risk of households composed by both elderly couple and non elderly. In the individual means test, the 'surplus' that was granted to elderly couple allowed some extended household to end up with a sufficient equivalent income. It is therefore not surprising that in countries where the percentage of elderly couples living with non-elderly, such as Spain, Greece and Italy (see appendix 11), the increase in poverty compared to the individual means test is important. But again, the increase in poverty also depends on the income distribution within these households.

FIGURE 13: Poverty rates for the elderly population, after the three different social pensions
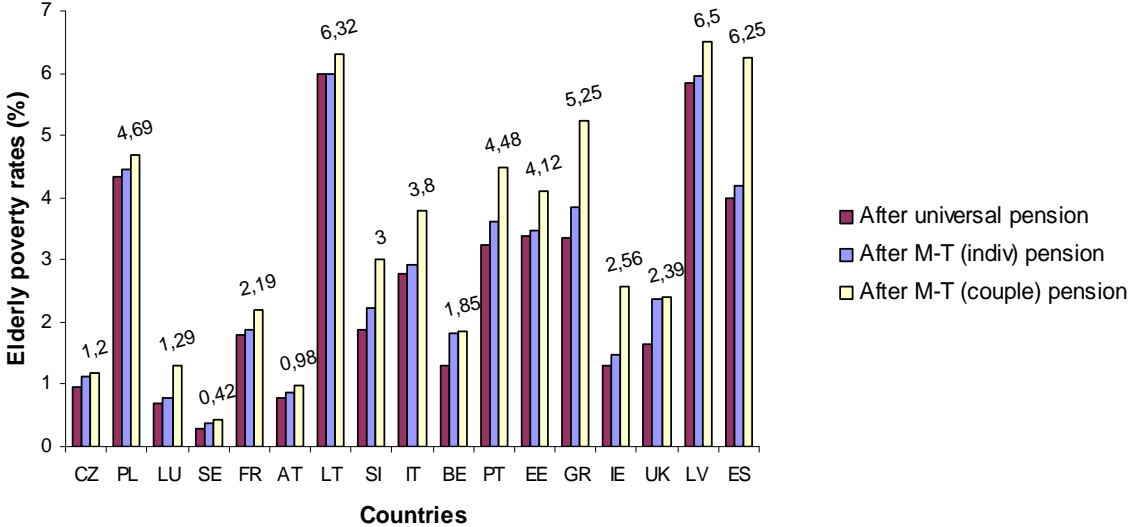
Source: Author's own calculations based on EU-SILC database (2006)

5.   Who are the beneficiaries of Social pensions?

Before presenting the simulated costs of the different social pension schemes, let us have a look at the proportion of the elderly population who are entitled to receive an additional transfer T under the different schemes.

From table 3, we see that, in every country, the share of the old-age population that receives an additional transfer with the universal pension is at least twice as high as the current poverty rates. This reflects the fact that an important share of elderly benefits from the universal pension whereas they are non-poor. If we decompose the share of beneficiaries, two issues arise. First, a part of the poor elderly does not get any additional transfer and second, some non-poor elderly do get it. In Belgium for instance, out of the 41.41 percent of beneficiaries, only 16.55 percent are poor (see column four) while 24.86 are non-poor. Consequently, a share of the population does not benefit from the additional transfer because they already receive a pension (above the poverty line) but stay poor because they 'share' it with other household's members. And on the other side, a share of the elderly receive the additional transfer because their current pension is low or inexistent, while other income sources (personal or from other household members) bring them out of poverty. In Belgium, from the 24.86 percent of the elderly who are in this situation, around 30 percent of them have never worked (almost only women), 25 percent were independent workers and 45 percent were employees (note that these are the last status in employment and do not take into account the length of the working period and the fact that some old persons may continue to work). The third column of table 3 thus also reports the proportion of the elderly who have a current pension below the poverty line.

Columns four and five show the proportion of poor elderly receiving a modified universal pension (that is a universal pension with an eligibility condition on being poor) and the 'individual' means tested pension. The difference between them is quite weak as the poor elderly depend mostly on pensions and have few other incomes. And in both cases, the percentages are much lower than with the universal pension, since the issue of granting universal pension to non-poor elderly does not arise. Finally, the last column reports the number of beneficiaries of the means tested pension on couple's income. In general, the number of beneficiaries increases, but in some countries it decreases. In fact, two effects arise: some elderly that had a relatively high pension but live with a partner who had a weak pension and/or personal income may become eligible (the percentage is higher than in column fifth). On the opposite, some elderly were entitled with the individual means tested pension but taking their partner income into account makes them non-eligible. However, as we will

see in the next section, even if more elderly receive an additional transfer with the means test on couple's income, what matters – in terms of costs – is the amount of the additional transfer.

Table 3: Percentage of old-age population receiving the additional transfer *T* under the different schemes

Countries	Current poverty rates	% under universal pension	% under modified universal pension	% under individual M-T	% under couple M-T
CZ	6,32	23,76	5,34	5	5,16
PL	8,04	16,13	4,52	4,24	3,96
LU	8,17	33,63	6,44	6,33	6,75
SE	11,08	40,48	10,74	10,61	10,7
FR	15,49	37,66	13,08	12,78	13,9
AT	15,79	35,57	13,54	13,48	15,36
LT	19,31	43,07	16,53	15,93	15,61
SI	19,56	47,47	18,17	17,8	18,07
IT	20,96	46	18,56	18,34	19,02
BE	21,59	41,41	16,55	16,18	20,39
PT	24,71	58,2	23,31	22,97	23,35
EE	24,82	63,97	23,74	23,45	22,72
GR	25,06	56,17	21,98	21,13	22,62
IE	27,08	73,18	25,59	25,43	25,54
UK	27,26	55,99	24,47	23,96	25,15
LV	29,63	81,22	29,06	28,86	28,01
ES	29,96	57,93	24,27	23,78	26,95

Source: Author's own calculations based on EU-SILC database (2006)

6. Costs of universal pensions schemes

As seen in section 4, the introduction of social pensions allows for important poverty reductions: the average poverty rate in the 17 countries goes from 19.7 to 2.5 percent with the universal scheme, 2.8 with the means tested social pension and to 3.4 with the means test on couple's income. While the difference of the impact in term of poverty is no more than 1 percent on average, their respective cost varies greatly.

In order to understand the difference between the costs of the social pensions, one has to be aware that several elements influence them such as the initial coverage and the

proportion of elderly who receive the social pension. But more importantly, it depends directly on the gap between current pension (and other personal income in the case of the means tests) and the poverty line. The proportion of elderly in the total population also plays a role (see appendix 15).

In what follows, we express the costs in percentage of Gross Domestic Product (GDP data from Eurostat 2006, see appendix 12). The simulated cost of the universal (c_u) is higher than the cost with the 'individual' means test (c_i), while the cost of the means test on elderly couple's income is the lowest (c_c): $\mathbf{c_c < c_i < c_u}$. As a matter of fact, the more information on income is used to means test, the less expensive the scheme is. The cost of the pension systems is on average 6.94 percent of GDP in the 17 countries. After the introduction of the universal pension, it increases by 0.88 percent of GDP, 0.27 with means tested pension on individual income and 0.22 with the one on couple's income (see appendix 13 and 14 for the cost per countries). In figure 14, we compare the additional costs of the three schemes. They are thus the sums of the additional transfers T divided by the GDP (with $T = s\text{-}p$ for social pension and $T = s\text{-}p_i\text{-}y_i$ or $T = (s*1.5\text{-}p_c\text{-}y_c)/2$ for the means test pensions).

FIGURE 14: Comparison between the additional costs of the universal and the means tested schemes
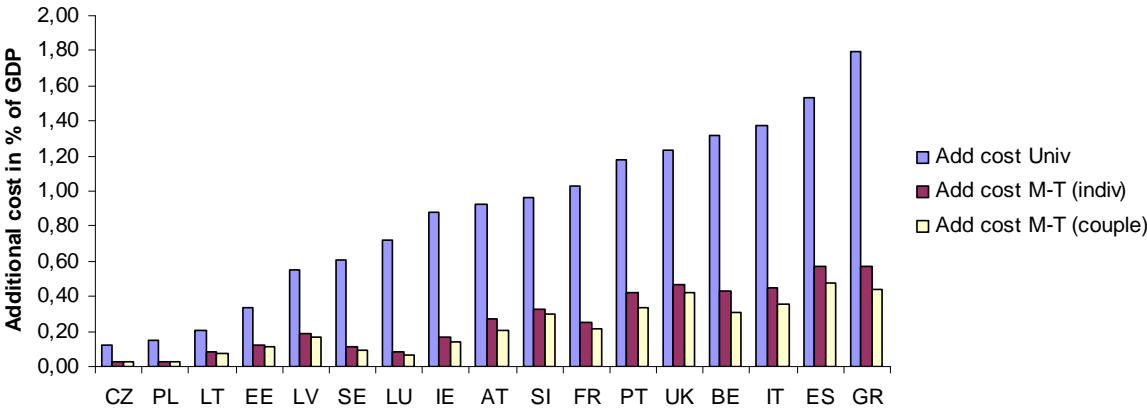
Source: Author's own calculations based on EU-SILC database (2006)
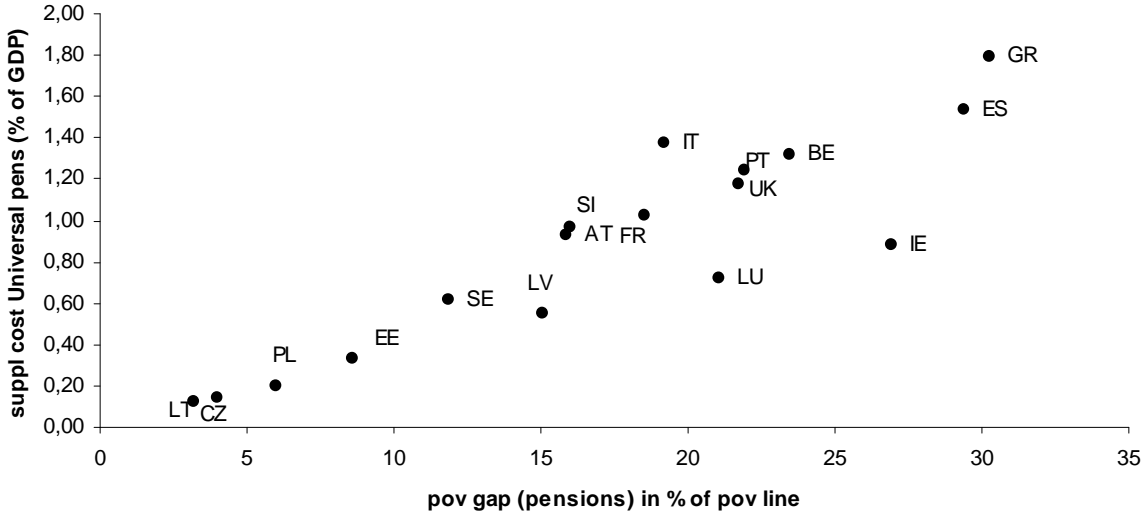
The cost of the universal pension scheme depends on the gap between the current pensions received and the poverty line. In other words, it is linked to what we here call the 'pension poverty gap' for the elderly. This is the mean difference between the pension income

currently received by elderly and the poverty line, expressed as a percentage of the poverty line. The figure 15 shows the relationship between the 'pension poverty gap' and the supplementary cost of the universal scheme. When current pensions are far from the poverty line, the additional cost will evidently be higher. The proportion of elderly who receive a pension also influences the pension poverty gap. The larger the share of the elderly population that do not receive any pension, the higher the poverty gaps.[18] Let us note that the cost is slightly smaller when the proportion of elderly in the total population is small (e.g. Luxembourg and Ireland) and inversely (e.g. Italy).

FIGURE 15: Relation between the additional cost of the universal pension and the pension poverty gap

Source: Author's own calculations based on EU-SILC database (2006)

The important difference between the cost of the universal scheme and the two means tested pensions is mainly explained by fact that no more additional benefit *T* are granted to elderly living in non-poor household.

In addition, the difference between the costs of the universal and the individual means test pensions is also related to the share of pension into personal income of poor elderly. If the main source of income during old age is the pension income, the difference between the means tested and the universal scheme will be smaller. This reflects that the poor elderly have

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[18] The same relationship is observed between the cost of the means tested scheme and the 'personal income poverty gap' of the elderly (computed as the difference between the mean personal income elderly and the poverty line, expressed as a percentage of the poverty line). See appendix 16

few other resources than pension. In other words, they depend strongly on their pension income. To understand this effect on the cost of the means test, we can compare the cost of the individual means test with the one of the 'modified universal pension' (where the eligibility is conditional of being poor) (see appendix 17). In countries where the *poor* elderly have no other income than pension, the cost difference is small (e.g. in Lithuania, Czech Republic, and Estonia). The reduction in cost with respect to the universal scheme is thus mainly due to the eligibility restriction and not to the change in the level of benefit. However, in countries where the share of current pension into personal income of poor elderly is weaker, the drop in cost will be more important. In fact, as the means test thus reduces the level of benefit, the costs decrease more (see e.g. Greece, Spain, and Belgium).

The cost difference between the two (individual and coupe) means tested pensions is due to the fact that the level of benefits of the additional transfer is reduced so as to bring elderly couples out of poverty. As the level of the additional transfer also takes into account the income and pension of the partner, the transfer is always smaller than with the individual means test. The difference is particularly high in countries where the proportion of elderly that receive no (or very weak) pension but rather depends on the income of their partner is high.

7. Universal or means tested social pensions? Incentives, administrative cost and take-up issue

From what precedes, one could question the utility of universal pension, compared to the means tested ones. It costs much more that the means tested schemes while the difference in terms of poverty reduction is not so impressive. The cost difference is mainly explained by the fact that non-poor elderly benefit from the additional transfer. This problem has been central in the debates on universal versus means test transfers for many years already.[19] To quote Besley (1990, p. 119), "Universal provision entails a cost in the form of a leakage of some of the benefit to the non-poor". Nevertheless, as Sen (1995) mentioned, the problem with means tested benefits is that the "so-called targets" are not easily indentified (see administrative costs hereafter) and that they are not "unreacting".

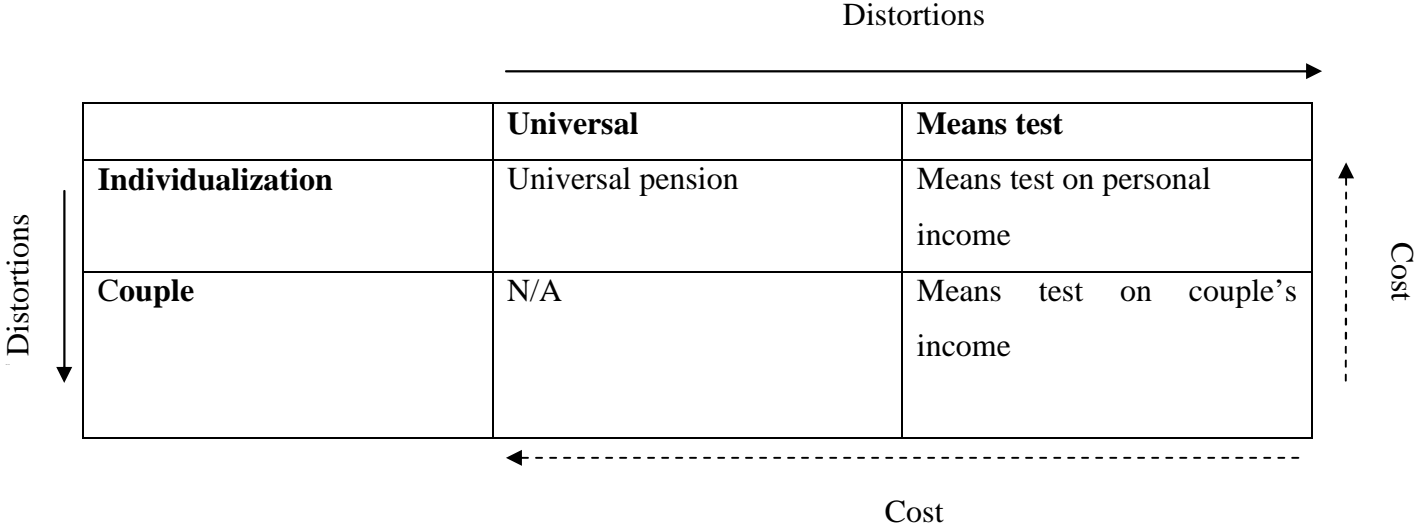And as a matter of fact, our results do not take into account the behavioural responses of individuals to the social pensions. Our simulation is static and shows only the mechanical effects of the introduction of such pensions. However, the different schemes induce different incentives effects that may lead individuals to modify their choices, in particular in term of

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[19] See e.g. Garfinkel (1982).

their labour supply, saving and living arrangement. In figure 16, the three social pensions we have considered are represented and the arrows' direction represent the increases in costs and distortions in behaviour.[20]

FIGURE 16: Cost and incentive effect of the social pension schemes

Distortions

	Universal	**Means test**
Individualization	Universal pension	Means test on personal income
Couple	N/A	Means test on couple's income

Cost

Concerning the costs, it has been stated clearly in section 6 that universal pensions are more costly and in particular that means testing reduces the cost, and even more when the test is based on a couple's income. Still, as it is represented in figure 16, the distortions in incentives are expected to increase.

First, the existence of minimum income guaranteed during old age is known to lead individuals to reduce their labour supply and savings (see e.g. Gruber and Wise (1999), Kanbur, Keen and Tuomala (1994)). These disincentives effects are even stronger with a means test as any extra-wage received will be compensated anyway by the means test transfer. The poor elderly will then become poorer; the elderly who were at the margin of poverty will become poor in order to become eligible. It similarly reduces the incentive to save for old age.[21]

Second, living arrangements are most likely to change under a means tested scheme. The means test would lead to strategic changes in family composition as one may expect that

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[20] We do not consider universal pension that would be attributed in function of living arrangements. That would be again the principle of universal transfers, which are per se individual.

[21] See e.g. Besley and Kanbur (1993) for a discussion on the marginal tax rates of universal and means test schemes and Piggott, J., D. Robalino and S. Jimenez-Martin (2009) for an analysis of these effects. They simulate the introduction of a social pension within a life- cycle behavioural model. Disney and Emmerson (2005) have also shown the importance saving disincentive due to the introduction of minimum pension in United Kingdom.

elderly who financially depend on other family members will live on their own so as to become entitled to the means tested transfer. It has often been argued that social security, and especially pension system, induces a decrease in family size as pensions enable elderly to live separately from their children (see e.g. Bourguignon (2005)). However, even if in most European countries the majority of elderly live alone or in couple, the proportion of extended households may still be significant in some countries (particularly in Eastern and Southern countries). When the reason of living with their children is income support, the number of eligible elderly will increase, and so will the costs of the means tested schemes. This effect on living arrangements will be even stronger when the test takes account of other household's member incomes. In the case of the means test on couple's income, strategic 'divorce' of two elderly may also occur so that the level of benefit they both receive is higher.

Another caveat of means testing is that elderly have incentives to hide some income and/or asset (or work in the informal sector), to become artificially poor, and therefore, eligible.

All these incentives effects are clearly expected to raise the number of eligible elderly, and therefore, to increase the cost of means tested pension. Consequently its relative attractiveness compared to the universal pension should be cautiously reconsidered in views of the latter possible distortions. The only way to evaluate accurately the respective costs and benefits of the different schemes would be through a behavioural micro-simulation, which is out of the scope of this paper. We limit ourselves to highlight that our results certainly under-estimate the cost of the means tested pensions because of the above mentioned disincentive effects.

Furthermore, identifying who is eligible or not requires information on income and/or asset. Means testing induces therefore more administrative cost than a universal pension. This should also been taken into account when comparing their respective pros and cons.

Finally, it is worth noting that in our simulation, we 'force' elderly to receive the social pensions. However, the so-called 'take-up issue' are often associated with means testing (see e.g. Besley (1990)). Individuals may not claim the benefit while they were entitled to it. Several factors can explain the non-take-up: the administrative cost (time in filling out forms, etc.), the stigma (shame of being poor; see e.g. Moffitt 1983) or simply the lack of information (individuals may be ignorant of the existence of the benefit). The take-up issue weakens the impact of means tested social pensions in terms of poverty reduction.

8. Conclusions

The design of European pension systems varies greatly among countries. We have seen that in most countries, contributory schemes include poverty-alleviating instruments (such as a minimum pension guaranteed and a flat pension, called Beveridgean component). Next to that, social pensions are also widely present, especially under the form of means tested social pensions. In fact, universal pensions are only implemented in The Netherlands and Denmark. However, we would need more accurate data and information on social pensions to evaluate their effectiveness in reducing poverty. This was out of the scope of our research.

Before simulating the introduction of different types of social pensions, we examine old-age poverty in 17 European countries (due to data constraints). It is important to analyse the determinant of poverty (current pensions and coverage, other income and living arrangements) because they influence the impact of social pensions in terms of poverty alleviation and costs. For instance, the impact of universal pension will be lower in countries where the proportion of elderly living in extended household is higher (as in Spain, Latvia, and Lithuania) the means tested pensions' poverty impact depends on the importance of other incomes than pensions. These elements evidently affect the costs as well: the more poor elderly, the more costly social pensions are. More precisely, the cost is directly influenced by the gap between pensions under current policies and the poverty line. It is therefore not surprising that in countries where few elderly are receiving pensions (e.g. Greece and Spain) the cost is among the highest. The additional incomes (next to pension benefit) of the poor elderly also influence the costs: in countries where poor elderly depend less of their current pensions (e.g. Belgium and Luxembourg), the means test leads to a higher cost reduction than in others. Let us remind that the impressive decrease in old age poverty after the introduction of the different scheme is mainly due to the fact that existing social pensions schemes do not covered enough elderly and that their current level may be too low compared to the poverty line.

As expected, the more information we use on incomes, the less important the impact on poverty is and the less costly the schemes are. The average poverty with the universal scheme drops to 2.5 percent, to 2.8 with the individual means test and to 3.4 on the one on couple's income. As opposite, the additional cost of the universal pension is on average 0.88 with the universal scheme, 0.27 and 0.22 for the individual and couple's means tests. Next to the determinants of poverty, the high difference in cost between the universal and means tested schemes is mainly explained by the 'leakage' of universal pension to non-poor elderly.

It is however important to take account of adverse incentive effects induced by the means test when comparing both social pension schemes. As a matter of fact, living arrangement, savings and labour supply are expected to change. The long run cost of the means tested pension will probably be much higher than the one predicted by the simulation. Moreover, the means test leads to supplementary administrative costs. In that respect, universal pensions are easier to administer. On the opposite, the cost will be lowered if the take-up issue is important (here we have forced elderly to take the additional benefit).

One way of reducing the costs of the universal scheme would be to increase the eligibility age. Ideally, it should depend on life expectancy and reflect the age at which pensioners do not have the capacity to work any longer. Another way would be to reduce the benefit level. Also, one could possibly tax those who do need the universal transfer. However, taxing leads to some administrative costs, as means testing.

Further research should examine more deeply the financial feasibility of universal pensions and simulate the behavioural changes induced by the means test.

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Appendix

Appendix 0: Social pensions and other poverty alleviating instruments within contributory scheme, in Europe

Countries	Universal pension	Means tested social pension	"Beveridgean" pension	Minimum pension
AT		x		
BE		x		x
CY		x		x
CZ		**x**	**x**	**x**
DK	**x**	**x**		
DE		x		
EE			x	x
ES		x		x
FR		x		x
GR		x		x
HU				x
IE		**x**	**x**	
IT		x		
LT			x	
LU		**x**	**x**	**x**
LV		x		x
MT		x		x
NL	**x**			
PL				x
PT		x		x
SE				x
SI				x
SK				x
UK		x	x	x

Source: OECD (2009), and for non-OECD member countries, Whitehouse (2007).[22]

Appendix 1: disposable income

The disposable income is computed as the sum of the net components of all household members: employee cash or near cash income; cash benefits or losses from self-employment; unemployment benefits; old-age benefits; survivor' benefits; sickness benefits; disability benefits; **plus** net components of income components at household level (income from rental of a property or land; family/children related allowances; social exclusion not elsewhere classified; housing allowances; regular inter-household cash transfers received; interests, dividends, profit from capital investments in unincorporated business;**) minus (**regular taxes on wealth; regular inter-household cash transfer paid; repayment/receipt for tax adjustments on income**)**.

The household components are divided by the household size when the individual income is calculated.

Appendix 2: Cost of public pensions in percent of Gross Domestic Product

Countries	Current cost (in % of GDP)
AT	10,02
BE	6,87
CZ	5,93
EE	4,48
ES	6,31
FR	10,64
GR	8,57
IE	3,78
IT	11,27
LT	4,53
LU	5,47
LV	4,25
PL	8,32
PT	9,15
SE	6,33
SI	8,93
UK	8,12

Source: EU-SILC database (2006) and appendix 12

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[22] Table 1 may thus not represent accurately the current situation in non-OECD member since reforms in pension systems may have occurred since 2007.

Appendix 3: Poverty lines (current and if not extended households)

Countries	Pov line	Pov line no extended hh
AT	10671,59	10366,18
BE	10226,13	10080
CZ	2888,324	2795,976
EE	2182,631	2045,917
ES	6856,8	6345,6
FR	9726,9	9599,2
GR	6000	5760
IE	11787,5	11561,38
IT	8815,429	8488,2
LT	1449,147	1393,752
LU	17729,6	17470,2
LV	1542,414	1413,384
PL	1865,772	1800,449
PT	4400,583	4212
SE	10659,82	10570,88
SI	5589,986	5416,19
UK	11574,15	11451,31

Source: Author's own calculations based on EU-SILC database (2006)

Appendix 4: Percentage of elderly population that have positive cash or near cash income and/or positive cash benefits from self-employment, or above the poverty line (second column)

Countries	Elderly still working (% of elderly population)	Elderly still working (% of elderly population) (income>poverty line)
AT	2,94	1,58
BE	1,9	1,11
CZ	4,91	1,59
EE	13,66	7,13
ES	3,36	2,18
FR	2,11	1,03
GR	6,27	2,53
IE	10,43	5,26

IT	7,96	4,18
LT	10,66	4,69
LU	2,36	1,06
LV	9,99	5,78
PL	3	1,44
PT	7,34	4,19
SE	13,03	4,96
SI	6,68	1,17
UK	6,22	2,38

Source: Author's own calculations based on EU-SILC database (2006)

Appendix 5: Percentage of elderly population that have positive private voluntary pension

Countries	Proportion of elderly that receive a private voluntary pension
AT	0,7
BE	0,7
CZ	1
EE	0,1
ES	1,7
FR	0,1
GR	0,1
IE	3,3
IT	0,6
LT	0
LU	0,4
LV	0
PL	0,1
PT	0,5
SE	24,9
SI	2
UK	10,2

Appendix 6: Percentage of elderly households that have positive assets (income from rental a property or land and/or interests, dividends, profit from capital investments in unincorporated business) and mean assets expressed as a percentage of the poverty line

Countries	% of elderly households	Mean assets as a share of poverty line
AT	64,57	2,11
BE	76,02	7,35
CZ	3,77	0,42
EE	6,56	0,32
ES	23,63	3,22

FR	85,82	7,79
GR	19,27	7,54
IE	17,17	2,68
IT	50,75	4,75
LT	9,18	0,98
LU	74,35	11,25
LV	2,13	0,52
PL	2,20	0,79
PT	24,11	4,50
SE	73,99	5,10
SI	37,30	1,30
UK	62,26	6,51

Appendix 7: Poverty rates for whole population

Countries	Pov rates	Pov rates Universal	Pov rates no extended hh	Pov rates Universal And no extended hh
AT	12,55	10,48	13,14	11,09
BE	14,15	9,1	14,55	11,11
CZ	10,15	14,69	10,18	10,14
EE	18,16	16,11	17,77	15,76
ES	19,62	10,44	21,26	18,17
FR	13,06	15,08	13,02	10,88
GR	19,96	15,12	21,19	16,77
IE	18,37	15,29	18,76	16,16
IT	19,37	19,86	19,53	16,56
LT	22,11	11,96	21,99	20,34
LU	13,28	19,14	13,49	13,07
LV	22,84	18,33	23,83	20,45
PL	19,03	13,69	19,89	20,56
PT	18,14	9,97	18,7	15,29
SE	11,83	7,83	12,04	10,5
SI	11,68	14,66	13,99	9,93
UK	19,02	10,48	19,09	15,09

Source: Author's own calculations based on EU-SILC database (2006)
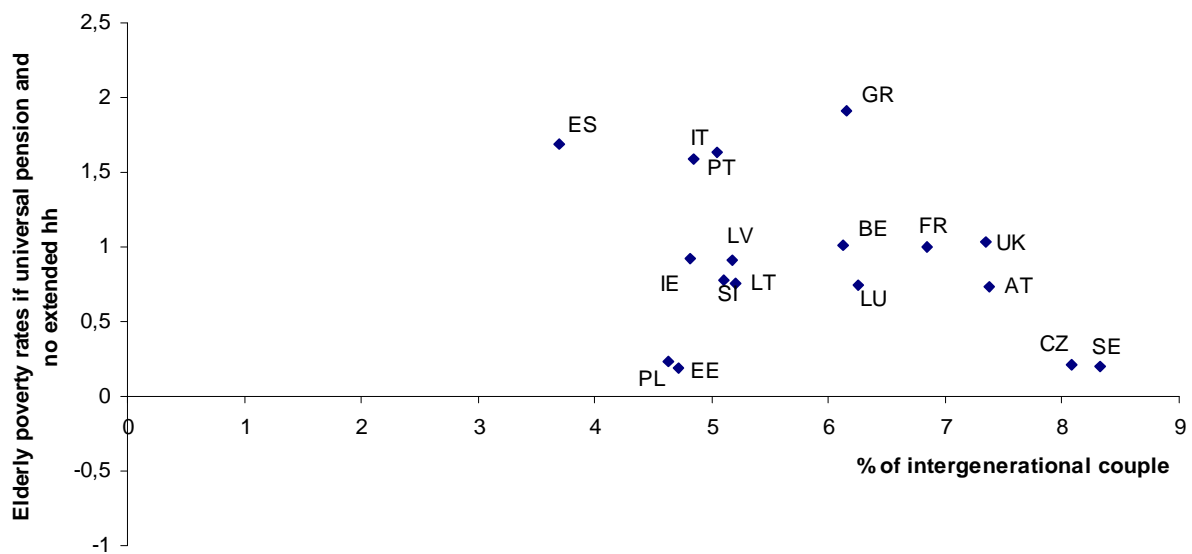
Appendix 8: Old-age poverty rates

Countries	Pov rates	Pov rates Universal	Pov rates no extended hh	Pov rates Universal And no extended hh
AT	15,79	0,77	18,56	0,73

BE	21,59	1,3	23,47	1,01
CZ	6,32	0,95	5,59	0,21
EE	24,82	3,37	20,37	0,21
ES	29,96	4	32,21	1,86
FR	15,49	1,78	15,9	1,03
GR	25,06	3,35	29,52	1,96
IE	27,08	1,31	30,84	0,92
IT	20,96	2,77	22,44	1,63
LT	19,31	5,98	16,53	0,76
LU	8,17	0,69	8,52	0,74
LV	29,63	5,84	34,5	0,78
PL	8,04	4,34	5,25	0,23
PT	24,71	3,24	26,87	1,59
SE	11,08	0,29	10,64	0,2
SI	19,56	1,87	28,82	0,91
UK	27,26	1,64	28,01	1

Source: Author's own calculations based on EU-SILC database (2006)

Appendix 9: relation between poverty rates after the universal pension and the change in household composition (no more extended families) and the proportion of intergenerational couple.

Source: Author's own calculations based on EU-SILC database (2006)

Appendix 10: Old-age poverty rates under means tested pensions

	Pov rates	Pov rates individual M-T	Pov rates couple M-T
AT	15,79	0,88	0,98
BE	21,59	1,84	1,84
CZ	6,32	1,13	1,2
EE	24,82	4,09	4,12
ES	29,96	5,62	6,25
FR	15,49	1,89	2,19
GR	25,06	4,21	5,25
IE	27,08	1,48	2,56
IT	20,96	2,92	3,8
LT	19,31	5,98	6,32
LU	8,17	0,77	1,29
LV	29,63	6,36	6,5
PL	8,04	4,46	4,69
PT	24,71	3,87	4,48
SE	11,08	0,38	0,42
SI	19,56	2,23	3
UK	27,26	2,36	2,39

Source: Author's own calculations based on EU-SILC database (2006)

Appendix 11: Percentage of elderly couple living with non-elderly

Countries	% of old couples with non-elderly
AT	0,45
BE	0,44
CZ	0,34
EE	0,47
ES	1,34
FR	0,24
GR	1,37

IE	0,30
IT	1,12
LT	0,44
LU	0,48
LV	0,67
PL	0,56
PT	1,03
SE	0,05
SI	0,86
UK	**0,37**

Source: Author's own calculations based on EU-SILC database (2006)

Appendix 12: Gross Domestic Product at current price (2006)

	GDP (millions of Euros)
AT	256162
BE	318193
CZ	113696
EE	13229
ES	984284
FR	1806429
GR	210458
IE	176758
IT	1485378
LT	23978
LU	34150
LV	16047
PL	272089
PT	155446
SE	313450
SI	31056

UK	1944751	

Source: Eurostat database http://appsso.eurostat.ec.europa.eu/nui/show.do

Appendix 13: Cost of universal scheme with respect to GDP:

	Current cost	Cost of universal pension	Additional cost of the universal pension
AT	10,02	10,95	0,93
BE	6,87	8,19	1,32
CZ	5,93	6,05	0,12
EE	4,48	4,81	0,33
ES	6,31	7,84	1,53
FR	10,64	11,66	1,03
GR	8,57	10,36	1,79
IE	3,78	4,67	0,88
IT	11,27	12,64	1,37
LT	4,53	4,73	0,20
LU	5,47	6,19	0,72
LV	4,25	4,80	0,55
PL	8,32	8,47	0,15
PT	9,15	10,32	1,18
SE	6,33	6,94	0,61
SI	8,93	9,89	0,96
UK	8,12	9,36	1,24

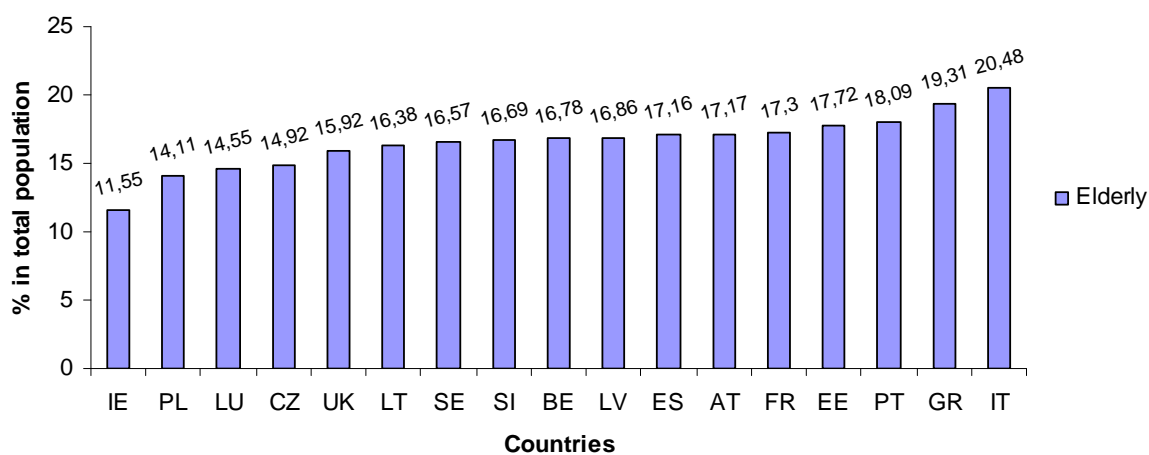Source: Author's own calculations based on EU-SILC database (2006)

Appendix 14: Cost of Means tested scheme with respect to GDP:

	Current cost	Cost of the individual M-T	Additional cost of the individual M-T	Additional cost of the modified universal pension	Additional cost of the couple M-T
AT	9,95	10,23	0,27	0,81	0,20
BE	6,83	7,26	0,43	1,09	0,31

|					
CZ	5,52	5,55	0,03	0,10	0,03
EE	4,48	4,60	0,12	0,26	0,11
ES	6,30	6,86	0,57	1,30	0,47
FR	10,34	10,59	0,25	0,82	0,21
GR	7,71	8,28	0,57	1,33	0,44
IE	3,75	3,92	0,17	0,56	0,14
IT	11,19	11,63	0,45	1,11	0,35
LT	4,53	4,61	0,08	0,16	0,08
LU	5,38	5,46	0,08	0,62	0,06
LV	4,21	4,40	0,18	0,45	0,17
PL	8,22	8,24	0,03	0,11	0,02
PT	8,23	8,65	0,42	0,90	0,33
SE	6,18	6,29	0,11	0,28	0,09
SI	7,06	7,40	0,34	0,81	0,30
UK	8,12	8,59	0,47	0,92	0,42

Source: Author's own calculations based on EU-SILC database (2006)

Appendix 15: Proportion of elderly in total population

Source: Author's own calculations based on EU-SILC database (2006)

Appendix 16: Relation between the additional cost of the means tested pension and the personal income poverty gap
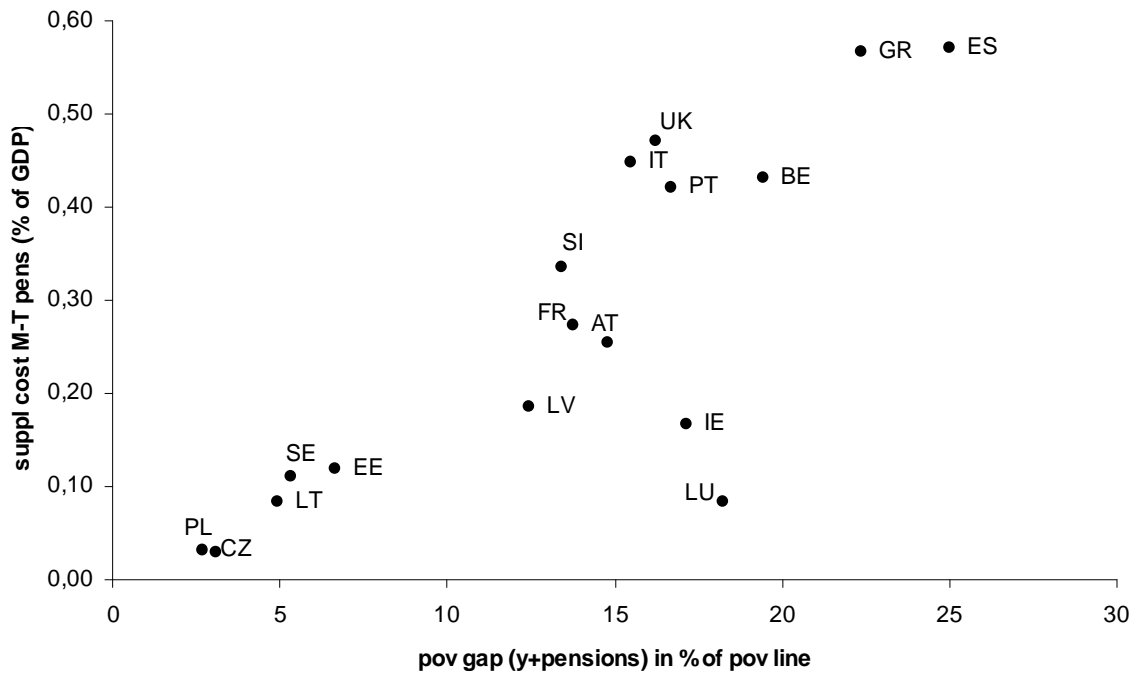
Source: Author's own calculations based on EU-SILC database (2006)

Appendix 17: Relation between the difference of the additional cost of the modified universal pension (conditional on being poor) and the individual means tested pension, and pensions share in poor elderly personal income