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# The distribution of pension wealth in Europe

Javier **OLIVERA**[1,2]

[1] LISER, Luxembourg
[2] Pontificia Universidad Catolica del Peru (PUCP), Peru

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# The distribution of pension wealth in Europe

Javier Olivera*

Luxembourg Institute of Socio-Economic Research (LISER), and
Pontificia Universidad Catolica del Peru (PUCP)

Abstract

The present paper estimates pension wealth inequality among elderly households for 26 EU countries by exploiting cross-sections of the EU Statistics on Income and Living Conditions survey. To assess the role of life expectancy inequalities on pension wealth, this paper estimates life tables per educational level with auxiliary data in order to capture socio-economic status (SES). This procedure also distinguishes mortality estimates by sex, birth cohort, and year. The results indicate that differential mortality due to SES increases pension wealth inequality. In most of the countries, this effect has decreased between 2006 and 2014, which means that SES inequalities in mortality are less important in explaining today's pension wealth inequality. Gini re-centered influence function (RIF) regressions confirm the diminishing influence of tertiary education on pension wealth inequality.

Keywords: Pension wealth, Inequality, Europe, Mortality, Education, RIF regressions
JEL codes: D31, H55, J14

*Correspondence to: Luxembourg Institute of Socio-Economic Research (LISER). Maison des Sciences Humaines, 11, Porte des Sciences, L-4366, Belval, Luxembourg. e-mail: javier.olivera@liser.lu

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## 1. Introduction

This paper seeks to discuss the distribution of pension wealth in Europe considering inequalities in life expectancy, comparatively and over time. The goal is to describe how pension wealth has evolved over the last years in Europe and to what extent inequalities in mortality affect pension wealth inequality. In a context of rising economic inequality and pension schemes being challenged by rapid ageing, it is important to know which types of pension system are more or less important in determining the level of pension wealth inequality. The comparative analysis offers the possibility to include countries with a different mix of compulsory, voluntary, public and private pension plans, which may enrich the policy discussion.

Pension wealth is roughly defined as the present value of expected pensions and involves the use of discount rates and survival probabilities. Pension wealth is computed for elderly households, with at least one member receiving a pension, in the countries participating in the European Union Statistics on Income and Living Conditions survey (EU-SILC) of 2007 and 2015, which corresponds to the income reference years 2006 and 2014. The sample size for the analysis is composed of 124,486 households observed in 26 countries.

Once pension wealth is estimated for each household, inequality of pension wealth is computed for all the 52 country-year points. The computation of pension wealth and its distribution is performed, first, with mortality estimates but without distinguishing according to socio-economic status (SES), and then with mortality estimates differentiated according to SES, which is captured together with educational attainment. The difference between these results gives an idea about the size of the effect of differential mortality on the distribution of pension wealth. In this paper, SES life tables are estimated for each country, sex, educational group and birth cohort group by utilizing input data from the Wittgenstein Centre for Demography and Global Human Capital.

The results indicate the important role of life expectancy inequalities on the distribution of pension wealth in some countries (e.g. in Portugal, Cyprus, Greece and Spain), and an almost negligible role in most other countries. It is observed that between 2006 and 2014 the influence of differential mortality on inequality has decreased. Private pension plans tend to increase the inequality of pension wealth, although the effect is small. A further analysis seeks to uncover the effects of some predictors of pension wealth inequality by using 'Gini re-centered influence function' (Gini-RIF) regressions. This analysis confirms the diminishing influence of tertiary education on pension wealth inequality in the period of analysis.

The rest of the paper is organized as follows. Section 2 reviews the literature dealing with pension wealth estimation, section 3 presents the methodological approach to estimate pension wealth and inequality measures, and section 4 presents the results. Section 5 contains a further analysis to explore the determinants of pension wealth inequality by using RIF-Gini regressions, and finally section 6 presents some concluding remarks.

## 2. Studies on pension wealth

The study of pension wealth has been motivated by the so-called crowding-out effects of public transfers on private wealth (Feldstein 1974, 1976). i.e. by how much social security wealth would reduce personal savings. Evidence in Europe shows, for example, that pension wealth can reduce the savings of elderly households by 17%-31% (Alessie *et al*. 2013). Recent literature shows that pension wealth is more equitably distributed than private wealth and it therefore has an equalizing effect on a measure of 'augmented' wealth, which is the sum of pension and private wealth (Frick and Grabka 2013, Crawford and Hood 2016, Wolff 2015, Bönke *et al*. 2017).

The analysis of pension wealth must rely on household surveys when administrative datasets from social security are not available, which is always the case when one wants to perform cross-country analyses. For the retirees, the computation of pension wealth is much less complex because the individual already knows the amount of pension. In the case of workers, some studies have employed various forms of statistical matching between survey information and social security data (Frick and Grabka 2013; Engelhardt and Kumar 2011), self-reported social security information (Wolff 2007) and self-reported retrospective and subjective information (Alessie *et al.* 2013).

Studies such as the ones by Frick and Grabka (2013), Wolff (2007) and Banks *et al.* (2005) define pension wealth as the present value of expected pension streams, which involves the use of discount rates and survival probabilities. To compute individual survival probabilities, these studies generally employ official life tables. However, other alternatives include the estimation of individual subjective survival rates (Gan *et al.* 2015, Bissonnette *et al.* 2017, Peracchi and Perotti 2014) and the estimation of life tables by socio-economic status such as in Brown *et al*. (2002).

Many studies have shown a remarkably strong association between mortality and socio-economic status (captured by education). See for example Deaton and Paxson (2001), Currie and Moretti (2003), Lleras-Muney (2005), Cutler and Lleras-Muney (2010), Cutler *et al*. (2006) and Spittel *et al*. (2015). In the case of European countries, the study by Huisman *et al*. (2004) reports substantial differences in mortality by education among older individuals, while the study by Gathmann *et al*.

(2015) relies on changes in the length of compulsory schooling to identify a causal relationship from education to mortality (being statistically significant among men but not significant among women).

Building on the regularity of the education-mortality relationship, this paper focusses on the role of differential mortality arising from differences in SES (as captured by education) on the level of pension wealth inequality. This paper shares some similarities with studies carried on in Germany (Haan *et al*. 2017) and the U.S. (Waldron 2007) in the sense that it is concentrated on the analysis of distributional implications in the pension system due to mortality differentials. One of the main contributions of this paper is the introduction of heterogeneity in mortality in a large set of countries and in two periods in order to study the distribution of pension wealth. Because individuals with higher SES tend to live longer and enjoy more years of pension wealth than individuals with low SES, the introduction of SES-specific mortality can reveal a larger level of inequality in the distribution of pension wealth in a given pension system.

Further, it is also important to distinguish between compulsory pensions and private pension plans in the computation of pension wealth. Compulsory pensions in Europe tend to be organized as Defined Benefit (DB) and are public, while private pension plans are voluntary and are organized as Defined Contribution (DC) systems. Generally, private pension plans are less equally distributed than compulsory pension schemes. Therefore, it is expected that the addition of pension plans into a measure of total pensions will increase the inequality of pension wealth.

It is worth mentioning that the report 'Pension at a glance' (OECD 2013) shows Gini indices of pension entitlements using micro-simulation models (with country-specific rules and a number of assumptions such as length of career) applied to national income distributions. These indices are computed to obtain the so-called 'Progressivity index', which is designed to summarize the relationship between pension in retirement and earnings when working in a single number. Though those measures of pension inequality have their own merits, they are different from the ones estimated in this paper. The OECD pension Gini indices measure the inequality of simulated pension benefits while the Gini indices of this paper measure pension wealth (pension benefit multiplied by annuity price) based on pension data reported by the individuals.

## 3. Data and methods

The European Union Statistics on Income and Living Conditions survey (EU-SILC) is a high quality survey inquiring -in great detail- about income and key demographics of households and their

members. The survey is carried out yearly in all 28 countries belonging to the European Union plus Iceland, Norway and Switzerland[1]. For the purpose of this paper, the available cross-sectional data corresponds to the survey years 2007 and 2015, but the reference year in the survey is the immediate previous calendar year, and therefore the period of analysis consists of 2006 and 2014. Most of the countries have been surveyed since 2004, but in some countries the information related to gross pension values is only available from the survey year 2007 (i.e. reference year 2006). This is why the most distanced years with available information for studying the evolution of pension wealth distribution are 2006 and 2014. The selection of 26 countries is based on the availability of information for 2006 and 2014. The sample size for the analysis is composed of a total of 124,486 households, being 58,482 observed in 2006 and 66,004 in 2014 (see Table 1)[2].

In order to simplify the computation of pension wealth and reduce the abuse of *ad-hoc* assumptions for active worker's pension wealth, the analysis focusses on elderly households where at least one member is receiving a pension (as it is done in Cowell *et al*. 2017). In this way, all households are approximately in the same life-cycle section, so that life-cycle effects are less able to affect inequality measures. In particular, the sample is restricted to all households with at least one pensioner aged 60-79. Furthermore, a household is removed from the sample if the pensioner or his or her spouse is 80 or older. The reason is that age is top-coded at 80 in EU-SILC. Knowing the exact age is indispensable to assign a correct mortality estimate from the life table to the pensioner and pensioner's spouse.

It is assumed that future pensions keep their real value, i.e. future increases in pensions and inflation are balanced out. Similar to Frick and Grabka (2013), Crawford and Hood (2016) and the report Pension at a glance (OECD 2013) the discount rate is assumed to be 2%, but instead of simply employing the expected life expectancy as the horizon to receive pensions, 'annuity prices' are computed for each individual. If the pensioner is married or living in legal consensual union, the annuity price is the sum of her individual annuity price and that of the spouse weighted by the official default percentage for surviving spouses. More formally, the computation of pension wealth employs the following formula:

[1] Another potential data source could be the Survey of Health, Ageing and Retirement in Europe (SHARE), which includes information on pensions, and private wealth for the elderly, but EU-SILC allows having more countries analysed over time. In SHARE, there are only 13 countries that could be evaluated between wave 2 and 6 (about 2007 and 2015) while in EU-SILC the number of countries doubles.

[2] Two very large outliers for pension wealth are dropped from the UK (2006) and Romania (2014). For consistency, the single largest value of pension wealth is also removed from each country. Households with missing information on the variables of analysis are also removed from the sample.

$$A_z = \sum_{t=0}^{M-z} \frac{p_{z,z+t}}{(1+r)^t} \quad (1)$$

$$A_{z,y} = A_z + \theta \sum_{t=0}^{M-y} \frac{q_{y,y+t}(1-p_{z,z+t})}{(1+r)^t} \quad (2)$$

$$W_z = A_{z,y}P \quad (3)$$

The annuity price $A_z$ is the necessary amount of capital, in present value, to finance a monetary unit of life pension for a single person at age $z$. The probability of survival from age $z$ to $z+t$ according to life tables is represented by $p_{z,z+t}$. The maximum survival age is $M$ (assumed to be 110) and $r$ is the discount rate. The age of the pensioner's spouse is represented by $y$, while $q_{y,y+t}$ represents the probability of survival from age $y$ to $y+t$. The fraction $\theta$ indicates the percentage of pension that a spouse will receive upon the death of the pensioner. $A_{z,y}$ is the annuity price for the individual that will be used to compute pension wealth. In order to consider cases of single and married individuals, the parameter $\theta$ will be either 0% or the official default percentage, respectively[3]. The value of pension wealth is simply the product of the annuity price of the individual and the value of the yearly pension (equation 3). Pension wealth is computed for the pensioner and also for the spouse if she/he is a pensioner as well. Then, the pension wealth of the household is the sum of both pension wealth values. Given that the unit of analysis is the household, the pension wealth of other members of the household –if available- is also added into the pension wealth of the household.

Individual survival probabilities are specific by country, sex, age, year, educational level and birth cohort group and are estimated with information extracted from the database of human capital of the Wittgenstein Centre for Demography and Global Human Capital (see Lutz *et al.* 2014)[4]. This dataset contains the distribution of educational attainment (six levels: no education, primary, incomplete primary, lower secondary, upper secondary and tertiary) by 5-year age groups, 5-calendar years from 1970 to 2100, sex and country. The procedure consists in 'extracting' the total number of individuals of a specific cohort-sex-country-education across years and regress a Gompertz function on the number of survival individuals ($l_x$) where age ($x$) is the predictor[5]. In

[3] EU-SILC reports the total amount of old age pensions received from the obligatory pension system, but it does not identify the amount that can correspond to different pension benefits in the countries where the pensioner can accumulate more than one type of benefit. The parameter $\theta$ is a needed assumption in order to take into account the expected survivor pension wealth in the household.

[4] The data can be accessed in the following link: http://www.wittgensteincentre.org/en/index.htm

[5] For example, in 2015, men aged 60-64 with primary education are observed in 1980 when they were aged 25-29, in 1985 when aged 30-34, in 1990 when aged 35-39, and so on. They are also observed in 2020 when they will be 65-69, in 2025 when they will be 70-74, etc. All these points (represented in $l_x$) are regressed in

these functions mortality rates increase exponentially with age (Chetty *et al*. 2016). The following formula is used:

$$l_x = ke^{-e^{(s-cx)}} \qquad (4)$$

Then, a life table with a complete set of $l_x$ variables is computed for ages between 0 and 110 ($l_0$ is normalized to 100,000 and $l_{111}$ is assumed to be 0). This procedure is repeated for all the combinations of country, sex, education level, birth cohort group and year. The education level 'incomplete primary' is not used. The life table estimates correspond to the population in years 2005 and 2015, which roughly correspond to the years observed in the sample of analysis (2006 and 2014). The number of estimated life tables is 26x2x5x4x2 = 2,080 (countries, sex, education levels, birth cohort groups[6] and years). The adjust rate of the Gompertz functions is very high, in most of the cases the $R^2$ values are greater than 0.99. Only in 13 regressions out of 2080, the $R^2$ lies between 0.90 and 0.95. The set of coefficients of the Gompertz equations and values of adjustment are available upon request.

The role of life expectancy inequalities on the distribution of pension wealth is assessed by comparing the distribution of pension wealth computed with SES-mortality and a counterfactual distribution of pension wealth that does not utilize SES-mortality. This counterfactual distribution uses life tables estimated for the average individual without distinguishing by educational level. The degree of inequality of the distribution of pension wealth is measured with the Gini index. Although other inequality metrics exist, the Gini index is widely used and has some attractive properties. For example, this index is less affected by outliers and is bounded between 0 and 1. A score of zero implies complete equality, i.e. all individuals have the same level of pension wealth, and a score of 1 means complete inequality, i.e. only one individual owns the total of pension wealth.

This paper utilizes the pension classification embedded in EU-SILC, which diverges from the classification provided by the OECD. EU-SILC records i) obligatory pensions (old age, survivor and

a Gompertz function. Note that, in this way, the estimated life tables take into account birth cohort differences.

[6] For the year 2005, the birth cohort groups correspond to individuals aged 60, 65, 70 and 75 in year 2005, i.e. individuals born in 1945, 1940, 1935 and 1930. For year 2015, the birth cohort groups correspond to individuals aged 60, 65, 70 and 75 in year 2015, i.e. individuals born in 1955, 1950, 1945 and 1940.

disability) and ii) pensions from individual private pension plans[7]. The scheme of the mandatory pensions can vary from country to country. It can be, for example, based on PAYG or occupational plans. So, the goal of the EU-SILC classification is to show differences between mandatory and voluntary pensions (individual private pension plans). The main analysis of pension wealth is based on obligatory pensions, but voluntary pensions are also added for further analysis of total pension wealth (obligatory plus voluntary pensions). Private pension plans are more developed and more popular in some countries than in others and can show different effects on the level of pension wealth inequality in the country.

## 4. Results

Table 2 shows substantial heterogeneity in Gini indices across countries. For example, looking at the figures computed without SES mortality in 2014, the Gini is above 0.40 in Portugal, Cyprus and the UK, while in Norway, Slovakia, Czech Republic and Estonia the index ranges between 0.26 and 0.30. An increase in the Gini index is observed for every country after including SES mortality in the computation of pension wealth. This means that differences in mortality due to SES generate more inequality in pension wealth (see column 3 and 6 of Table 2). For example, in 2014 the Gini index increases in Greece from 0.357 to 0.370 (3.9%) due to SES-specific mortality, but this change is only 0.3% in Slovakia. Importantly, this effect has faded between 2006 and 2014 in most of the countries. The effect of SES on wealth inequality has increased between both years only in 7 countries (Austria, Denmark, Greece, Iceland, Norway, Portugal and the UK), although this increase has been very mild. The evolution of the effect of SES on pension wealth inequality for all countries can be easily observed in Figure 1. Luxembourg and Belgium are the countries that have experienced the largest reduction in the influence of SES on pension wealth inequality. SES mortality increased the Gini index of pension wealth of these countries by about 2.6% in 2006, but only 1.8% in 2014.

Paying attention to the Gini indices employing SES mortality (last column of Table 2) it is possible to observe that pension wealth inequality has fallen between 2006 and 2014 in 17 out of 26 countries. This reduction is considerable in Greece where the Gini index of pension wealth has decreased from 0.436 to 0.370, i.e. a reduction of 15.1%. This decrease is also important for France and Slovakia, down 10.4% and 8.5% respectively. Among the countries experiencing an increase in

[7] These pensions "refer to pensions and annuities received, during the income reference period, in the form of interest or dividend income from individual private insurance plans, i.e. fully organised schemes where contributions are at the discretion of the contributor independently of their employers or government." (Eurostat 2013: p321).

pension wealth inequality between both years, Latvia and Sweden are notable cases. In Latvia, the Gini has increased from 0.295 to 0.381 (up 29.1%), and in Sweden the increase has been from 0.335 to 0.369 (up 10.2%). In average, the drop in the Gini index between 2006 and 2014 is -5.0% (median is -4.5%) for the countries that experienced a decrease in inequality, while the average increase in the Gini index for the countries that experienced a rise in inequality is 7.6% (median is 4.7%).

The addition of voluntary pension plans to the measure of pension wealth leads to more inequality in almost all the countries in both years of analysis, although the effect tends to be rather small (see Table 3). In 2006, the largest effects of voluntary pension plans into inequality are observed in Sweden and Spain. In these countries, the Gini index increases by 5.2% and 2.2%, respectively, after adding voluntary pensions plans into household pension wealth. In 2014, Spain and Sweden are again the countries showing the largest effects of voluntary pension plans on inequality. The addition of voluntary pension plans increases the Gini index of Spain and Sweden by 5.8% and 2.9%, respectively. By comparing columns 3 and 6 of Table 3, it is possible to observe an increasing contribution of voluntary pension plans to the rise of pension wealth inequality. A possible explanation for the positive relationship between pension plans and inequality is that households with larger incomes (and associated with better survival rates) generally take up these plans, while poorer households are too liquidity-constrained to opt for these plans and rely mostly on public pensions. Although the size of pension plans in the sample of analysis is small (it represents, in average, 0.18% of GDP) it is interesting to note a strong positive relationship between the size of the national voluntary pension plans[8] and the contribution of these plans to the rise of pension wealth inequality in the country (the correlation is 0.58).

Although the preceding analysis has employed a discount rate equal to 2% -commonly used in other studies-, it is worth mentioning that other alternative rates do not qualitatively alter the results. Table A6 in the Appendix reports the results of a robust check employing discount rates of 1% and 3%. Interestingly, the estimated pension wealth inequality is lower when the discount rate is higher. The reason is that a higher interest rate reduces the annuity price (equation 2) and affects those individuals with higher annuity prices due to better survival probabilities more. Hence, a rise in the interest rate reduces large amounts of pension wealth more strongly, and in this way, it leads to greater equality of pension wealth distribution. Furthermore, the effect of differential mortality

[8] The relative size of private pension plans is computed as the product of the annuity price and the pension received from the pension plan in the year of reference for each household in the country. This is then summed across households in the country by using survey weights and divided by the GDP.

become smaller at higher interest rates, which may indicate that a low interest environment may create more inequality in pension wealth.

Regardless the use of SES life tables, there are noticeable differences in pension wealth inequality across countries, which can somehow be explained by looking at the distribution of pensions and annuity prices. As showed in equation 3, pension wealth is the product of two sources: pensions and annuity prices, and therefore the Gini decomposition by source (following Lerman and Yitzhaki 1985) is feasible[9]. By taking into account the relative share and Gini index of each source and the correlation among sources, the outcome of this method is the computation of the percentage change in the overall Gini index due to a marginal change in a particular source. In simple terms, this Gini elasticity measures the effect of an increase of 1% in pensions on the Gini index of pension wealth, i.e. whether pensions have an inequality decreasing or increasing effect on pension wealth inequality. Table 4 shows that in most of the countries (7 out of 26 in 2014) the elasticity is positive and hence pensions tend to make pension wealth inequality higher than it would be without this source, while annuity prices have the opposite effect. Interestingly, the size of this elasticity has increased between 2006 and 2014 for almost all countries, except Greece and Romania (see last column of Table 4). Indeed, the Gini of pensions has increased in the period analysed while the Gini of annuity prices (not reported) has decreased and attenuated the inequality increasing effect on pension wealth. So, the reduction of life expectancy inequalities (whose effects are captured by the annuity prices) has lessened the increase of pension wealth inequality.

## 5. Predictors of pension wealth inequality

The determinants of pension wealth inequality can be examined by using the 'Gini re-centered influence function' (Gini-RIF) regressions (see Firpo *et al*. 2009 and Choe and Van Kerm 2014). Gini-RIF regressions consist of two stages. In the first stage, one computes the influence of each individual (or household) on the Gini index of pension wealth as a function of their pension wealth and of the distribution of pension wealth; this is the influence function (IF) calculation (Hampel 1974). Intuitively, individuals in the tails of the distribution will tend to have positive influence on inequality, i.e. increasing the Gini index, whereas individuals in the middle of the distribution will have negative influence, i.e. more of them will tend to reduce the Gini index. In the second stage, this computed Gini influence is regressed (with OLS) against some covariates of interest such as age groups, education and sex. For example, a positive coefficient for an age group suggests that

[9] As this decomposition requires additive sources, pension wealth is converted into logs, and hence the log of pension wealth will be equal to the sum of the sources given by the logs of pension and annuity price.

marginally increasing the share of this age group –and holding the distribution of all the other covariates constant- would lead to an increase in the Gini index. The size of this coefficient would indicate the size of the increase in the Gini index if all individuals were to belong to that age group.

In a more formal way, let $v(F)$ be a statistic of interest (a function) calculated in the distribution $F$ of variable $y$. In the analysis, the inequality metric is the Gini index but it could be the mean, median, the Atkinson index, a top income share, etc. The influence function of $v$ is a function of income $y$ and $F$ and is defined as:

$$IF(y; v, F) = \lim_{\in \to 0} \frac{v\left((1-\epsilon)F + \epsilon\Delta_y\right) - v(F)}{\epsilon} \qquad (5)$$

The IF captures the effect on $v(F)$ of an infinitesimal contamination of $F$ at point mass $y$. Expressions for $IF(y; v; F)$ exist (or can be derived) for a wide range of statistics. See, for example, Essama and Lambert (2012) for a catalogue of IF relevant to income distribution analysis. The re-centred influence function (RIF) is obtained by adding the statistic of interest to the IF. Using the RIF assures that the change in the average value of the RIF over time is equal to the change in the statistic of interest (Davies *et al.* 2017). The formula for the case of the RIF of Gini is the following:

$$RIF(y; G) = 2\frac{y}{\mu}G + 1 - \frac{y}{\mu} + \frac{2}{\mu}\int_0^y F(z)dz \qquad (6)$$

Where $G$ is the Gini index and $\mu$ refers to the mean of the variable $y$. The complete results of the RIF-Gini regressions for each country and year are reported in Tables A2 and A3 of the Appendix, while Figures 2 and 3 cast the effects of two important predictors for pension wealth inequality. The dependent variable in the RIF-Gini regressions is the influence function (IF, previously estimated in a first stage) of each household in the Gini index of pension wealth. The covariates of the regression equation are the age groups 60-64, 65-69 and 70-74 (75-79 is the reference group), the educational groups secondary education and tertiary education (primary education or less is the reference group), and the household categories 'single male pensioner', 'single female pensioner', 'both spouses are pensioners' (the reference group is 'only one pensioner within the couple'). In this case, the utilized measure of pension wealth only includes obligatory pensions and is computed with SES life tables.

Figure 2 plots the regression coefficients for the variable 'tertiary education' of the Gini-RIF regressions for 2006 and 2014 (reported in tables A2 and A3 in the Appendix) divided by 100 and the Gini index of the corresponding country and year. These ratios are expressed in percentages. So, a figure of 1% means that an increase of 1% in the proportion of households with tertiary education in the country is associated with an increase of 1% in the Gini index of pension wealth inequality. In most of the countries the effect of tertiary education on inequality is positive, i.e. an increase in the share of households with this type of education increases pension wealth inequality. This occurs in 19 countries in 2006 and 18 countries in 2014. Only in Bulgaria, Estonia, Hungary and Slovakia (all of them ex-communist countries) has the effect of tertiary education on inequality been negative in both years. In line with previous results regarding the diminishing effect of SES mortality on pension wealth inequality, a decline in the influence of tertiary education on pension wealth inequality in most of the countries between 2006 and 2014 is also observed in Figure 2.

Figure 3 plots the regression coefficients for the variable 'female single pensioner'. The idea behind the selection of this variable is studying to what extent female single pensioners (mostly widows) drive the level of pension wealth inequality up or down. Females tend to live longer than their spouses and receive a lower pension. Given the reduction of mortality across cohorts, it is important to assess the evolution of the influence of female pensioners on pension wealth inequality. It is clear from Figure 3 that the share of households composed by a female single pensioner increases the level of inequality in both years, with the exception of a few countries (UK, Iceland and Denmark in both years, Ireland in 2006 and the Netherlands in 2014). However, looking at statistically significant coefficients (reported in Table A2 and A3), only in the UK in 2006 and Denmark in 2014, did the share of households with female single pensioners reduce the level of inequality. This could happen because these households are located, in average, nearer to the middle of the IF curve than the reference type of households: households with only one pensioner within the couple. This means that households composed of female single pensioners are relatively better off than households composed of only one pensioner within the couple in the UK in 2006 and Denmark in 2014, but these are only two country-year points from a total of 52. Between 2006 and 2014, the influence of households with single female pensioners strengthened in a number of countries: Spain, Belgium, Cyprus, Sweden and Estonia.

Finally, it is also interesting to look at the role of private pension plans on the level of pension wealth inequality. In this case, new RIF-Gini regressions are applied to total pension wealth (compulsory pensions plus private pension plans) and a dummy variable -indicating that the household receives private pension plans- is added to the second step equation. Similar to previous

figures, Figure 4 plots the regression coefficients for the variable 'having private pension plan'. The effect of having a pension plan on inequality is only statistically significant in 7 countries in 2006 and 6 countries in 2014 (the coefficients of the RIF-Gini regressions are reported in tables A4 and A5 in the Appendix). Overall, having a private pension plan contributes to increasing pension wealth inequality, but if one focusses only on the statistically significant results, there are only 7 countries in each period where the effect is significant. In 2006, the effect was positive in Austria, Bulgaria, Spain and Sweden, but in Cyprus, Latvia and Lithuania the effect was negative. In 2014, the effect was positive in Austria, Czech Republic, Lithuania, Portugal and Spain, but negative in Bulgaria and Poland.

## 6. Conclusions

This paper studies pension wealth inequality in elderly households for 26 European countries over the period 2006-2014. The results reveal an important positive effect of life expectancy inequalities due to SES on the distribution of pension wealth. However, the strength of this effect weakens in the period of analysis. Furthermore, there is a positive influence of the share of households with single female pensioners on the level of pension wealth inequality for 2006 and 2014, with the exception of few countries. Regarding the role of voluntary private pension plans, the results suggest that these plans lead to more pension wealth inequality in both years of analysis, although the effect tend to be small for most countries, with the exception of Spain and Sweden. However, the analysis reveals that the contribution of these pensions to pension wealth inequality has increased for most countries in the period analysed.

To assess the role of mortality inequalities on pension wealth inequality, this paper proposes a procedure to estimate complete sets of life tables distinguishing by sex, birth cohort group, educational level, country and year with auxiliary data drawn from the human capital database of the Wittgenstein Centre for Demography and Global Human Capital. Beyond the use for this paper, these tables could also be useful to other cross-country studies that need to control for life expectancy inequalities.

The estimation of pension wealth inequality performed in this paper can easily be replicated for other periods and countries and, in this sense, it can add an extra dimension to the study, classification and comparison of pension systems. In a further analysis, which is beyond the scope of the present study, it would be interesting to investigate how different pension systems perform according to the levels of pension wealth inequality arising from life expectancy inequalities and other dimensions such as financial sustainability, fiscal cost, coverage and generosity.

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# Tables and Graphs

Table 1. Number of households in the sample

| country | 2006 | 2014 | Total |
|---|---|---|---|
| Austria | 1,962 | 1,817 | 3,779 |
| Belgium | 1,354 | 1,522 | 2,876 |
| Bulgaria | 1,801 | 2,159 | 3,960 |
| Cyprus | 944 | 1,303 | 2,247 |
| Czech Republic | 3,382 | 3,157 | 6,539 |
| Denmark | 1,172 | 1,845 | 3,017 |
| Estonia | 1,689 | 2,019 | 3,708 |
| France | 2,751 | 3,454 | 6,205 |
| Greece | 1,958 | 4,869 | 6,827 |
| Hungary | 3,119 | 3,081 | 6,200 |
| Iceland | 435 | 576 | 1,011 |
| Ireland | 1,750 | 1,514 | 3,264 |
| Italy | 7,183 | 6,026 | 13,209 |
| Latvia | 1,886 | 2,426 | 4,312 |
| Lithuania | 1,944 | 1,919 | 3,863 |
| Luxembourg | 787 | 897 | 1,684 |
| Netherlands | 2,200 | 2,407 | 4,607 |
| Norway | 1,071 | 1,614 | 2,685 |
| Poland | 4,336 | 4,105 | 8,441 |
| Portugal | 1,561 | 3,031 | 4,592 |
| Romania | 2,791 | 3,126 | 5,917 |
| Slovakia | 1,603 | 2,233 | 3,836 |
| Slovenia | 2,865 | 3,110 | 5,975 |
| Spain | 3,613 | 3,523 | 7,136 |
| Sweden | 1,575 | 1,626 | 3,201 |
| United Kingdom | 2,750 | 2,645 | 5,395 |
| Total | 58,482 | 66,004 | 124,486 |

Table 2. Gini indices of obligatory pension wealth

| Country | 2006 | | | 2014 | | | % change 2006-2014 | |
|---|---|---|---|---|---|---|---|---|
| | without SES mortality | with SES mortality | % change | without SES mortality | with SES mortality | % change | without SES mortality | with SES mortality |
| Austria | 0.372 | 0.375 | 1.0% | 0.361 | 0.365 | 1.1% | -2.8% | -2.7% |
| Belgium | 0.355 | 0.364 | 2.7% | 0.339 | 0.345 | 1.8% | -4.3% | -5.1% |
| Bulgaria | 0.338 | 0.343 | 1.4% | 0.339 | 0.343 | 0.9% | 0.3% | -0.1% |
| Cyprus | 0.502 | 0.521 | 3.6% | 0.476 | 0.492 | 3.3% | -5.2% | -5.6% |
| Czech Republic | 0.268 | 0.269 | 0.5% | 0.267 | 0.267 | 0.0% | -0.1% | -0.5% |
| Denmark | 0.330 | 0.335 | 1.6% | 0.350 | 0.356 | 1.9% | 6.0% | 6.3% |
| Estonia | 0.267 | 0.269 | 0.9% | 0.259 | 0.261 | 0.5% | -2.7% | -3.1% |
| France | 0.362 | 0.372 | 2.8% | 0.326 | 0.333 | 2.0% | -9.8% | -10.4% |
| Greece | 0.422 | 0.436 | 3.3% | 0.357 | 0.370 | 3.9% | -15.5% | -15.1% |
| Hungary | 0.305 | 0.309 | 1.2% | 0.322 | 0.323 | 0.5% | 5.5% | 4.7% |
| Iceland | 0.345 | 0.354 | 2.6% | 0.326 | 0.334 | 2.7% | -5.6% | -5.5% |
| Ireland | 0.366 | 0.378 | 3.3% | 0.384 | 0.393 | 2.6% | 4.8% | 4.0% |
| Italy | 0.389 | 0.400 | 2.8% | 0.383 | 0.393 | 2.6% | -1.7% | -1.8% |
| Latvia | 0.291 | 0.295 | 1.2% | 0.378 | 0.381 | 0.6% | 29.9% | 29.1% |
| Lithuania | 0.297 | 0.302 | 1.8% | 0.308 | 0.313 | 1.7% | 3.7% | 3.7% |
| Luxembourg | 0.317 | 0.326 | 2.6% | 0.342 | 0.348 | 1.8% | 7.6% | 6.7% |
| Netherlands | 0.360 | 0.370 | 2.6% | 0.375 | 0.381 | 1.8% | 4.0% | 3.2% |
| Norway | 0.304 | 0.305 | 0.2% | 0.296 | 0.299 | 1.0% | -2.6% | -1.8% |
| Poland | 0.346 | 0.353 | 2.0% | 0.333 | 0.337 | 1.3% | -3.9% | -4.5% |
| Portugal | 0.525 | 0.542 | 3.3% | 0.489 | 0.506 | 3.4% | -6.9% | -6.8% |
| Romania | 0.399 | 0.407 | 1.9% | 0.384 | 0.389 | 1.4% | -3.8% | -4.2% |
| Slovakia | 0.290 | 0.292 | 0.8% | 0.267 | 0.267 | 0.3% | -8.0% | -8.5% |
| Slovenia | 0.363 | 0.368 | 1.2% | 0.340 | 0.343 | 1.0% | -6.4% | -6.6% |
| Spain | 0.369 | 0.385 | 4.3% | 0.361 | 0.375 | 3.8% | -2.2% | -2.7% |
| Sweden | 0.331 | 0.335 | 1.3% | 0.365 | 0.369 | 1.1% | 10.4% | 10.2% |
| United Kingdom | 0.403 | 0.407 | 1.0% | 0.404 | 0.408 | 1.1% | 0.4% | 0.4% |
| Overall average | 0.354 | 0.362 | 2.0% | 0.351 | 0.357 | 1.7% | -0.3% | -0.6% |
| Overall median | 0.350 | 0.359 | 1.8% | 0.346 | 0.352 | 1.6% | -2.4% | -2.2% |
| Avg. of pos. changes | | | | | | | 7.3% | 7.6% |
| Avg. of neg. changes | | | | | | | -5.1% | -5.0% |
| Median of pos. changes | | | | | | | 5.2% | 4.7% |
| Median of neg. changes | | | | | | | -4.1% | -4.5% |

Note: The Gini indices of this table utilises pension wealth originated only from obligatory pensions.

Table 3. Gini indices of obligatory and total pension wealth

| Country | 2006 | | | 2014 | | | % change 2006-2014 | |
|---|---|---|---|---|---|---|---|---|
| | obligatory pension wealth | total pension wealth | % change | obligatory pension wealth | total pension wealth | % change | obligatory pension wealth | total pension wealth |
| Austria | 0.375 | 0.380 | 1.1% | 0.365 | 0.374 | 2.3% | -2.7% | -1.6% |
| Belgium | 0.364 | 0.366 | 0.5% | 0.345 | 0.348 | 0.8% | -5.1% | -4.9% |
| Bulgaria | 0.343 | 0.343 | 0.0% | 0.343 | 0.342 | 0.0% | -0.1% | -0.2% |
| Cyprus | 0.521 | 0.519 | -0.4% | 0.492 | 0.494 | 0.5% | -5.6% | -4.7% |
| Czech Republic | 0.269 | 0.270 | 0.4% | 0.267 | 0.269 | 0.7% | -0.5% | -0.2% |
| Denmark | 0.335 | 0.335 | 0.0% | 0.356 | 0.356 | 0.0% | 6.3% | 6.3% |
| Estonia | 0.269 | 0.269 | 0.0% | 0.261 | 0.263 | 0.9% | -3.1% | -2.2% |
| France | 0.372 | 0.372 | 0.0% | 0.333 | 0.333 | 0.0% | -10.4% | -10.4% |
| Greece | 0.436 | 0.436 | 0.1% | 0.370 | 0.371 | 0.0% | -15.1% | -15.1% |
| Hungary | 0.309 | 0.309 | 0.1% | 0.323 | 0.323 | 0.0% | 4.7% | 4.6% |
| Iceland | 0.354 | 0.354 | 0.0% | 0.334 | 0.334 | 0.0% | -5.5% | -5.5% |
| Ireland | 0.378 | 0.381 | 0.6% | 0.393 | 0.397 | 0.8% | 4.0% | 4.2% |
| Italy | 0.400 | 0.402 | 0.5% | 0.393 | 0.393 | 0.0% | -1.8% | -2.3% |
| Latvia | 0.295 | 0.295 | 0.0% | 0.381 | 0.381 | 0.1% | 29.1% | 29.2% |
| Lithuania | 0.302 | 0.302 | -0.1% | 0.313 | 0.314 | 0.2% | 3.7% | 3.9% |
| Luxembourg | 0.326 | 0.326 | 0.1% | 0.348 | 0.348 | 0.1% | 6.7% | 6.8% |
| Netherlands | 0.370 | 0.371 | 0.3% | 0.381 | 0.382 | 0.2% | 3.2% | 3.1% |
| Norway | 0.305 | 0.308 | 1.1% | 0.299 | 0.302 | 0.9% | -1.8% | -2.0% |
| Poland | 0.353 | 0.353 | 0.0% | 0.337 | 0.337 | 0.0% | -4.5% | -4.5% |
| Portugal | 0.542 | 0.543 | 0.0% | 0.506 | 0.511 | 1.0% | -6.8% | -5.9% |
| Romania | 0.407 | 0.407 | 0.0% | 0.389 | 0.389 | 0.0% | -4.2% | -4.2% |
| Slovakia | 0.292 | 0.293 | 0.2% | 0.267 | 0.268 | 0.1% | -8.5% | -8.6% |
| Slovenia | 0.368 | 0.368 | 0.0% | 0.343 | 0.344 | 0.2% | -6.6% | -6.5% |
| Spain | 0.385 | 0.394 | 2.2% | 0.375 | 0.396 | 5.8% | -2.7% | 0.7% |
| Sweden | 0.335 | 0.352 | 5.2% | 0.369 | 0.380 | 2.9% | 10.2% | 7.8% |
| United Kingdom | 0.407 | 0.408 | 0.2% | 0.408 | 0.408 | 0.0% | 0.4% | 0.2% |
| Overall average | 0.362 | 0.364 | 0.5% | 0.357 | 0.360 | 0.7% | -0.6% | -0.5% |
| Overall median | 0.359 | 0.360 | 0.1% | 0.352 | 0.352 | 0.1% | -2.2% | -1.8% |
| Avg. of pos. changes | | | | | | | 7.6% | 6.7% |
| Avg. of neg. changes | | | | | | | -5.0% | -4.9% |
| Median of pos. changes | | | | | | | 4.7% | 4.4% |
| Median of neg. changes | | | | | | | -4.5% | -4.6% |

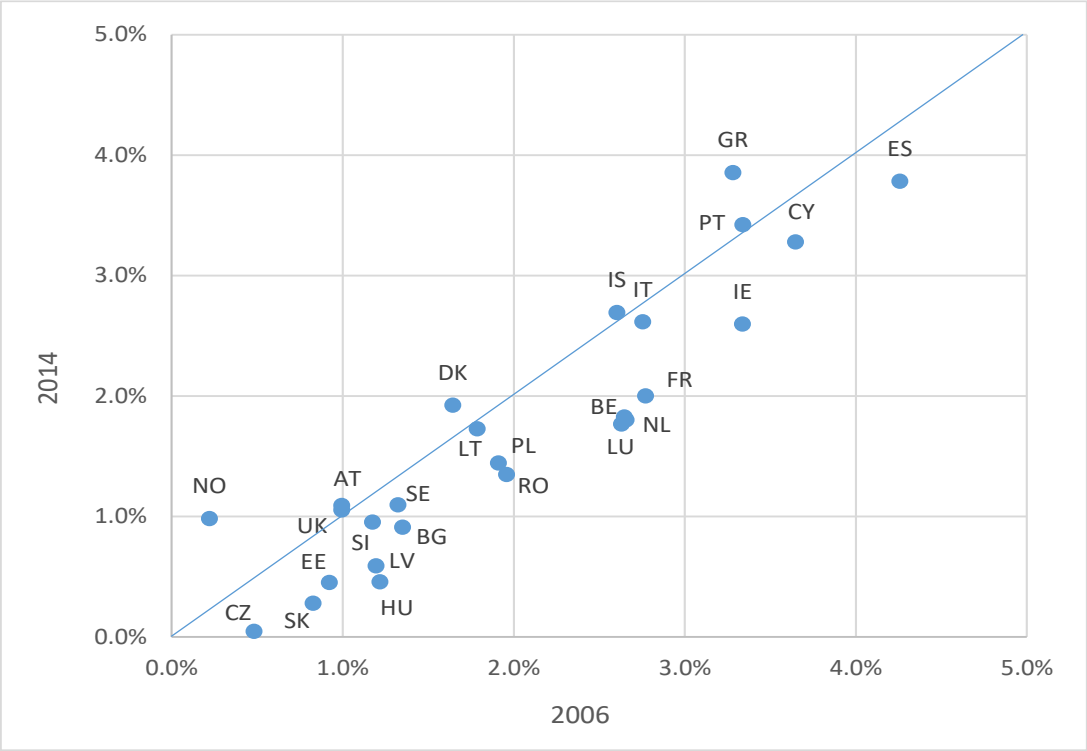
Note: Pension wealth is computed with SES life tables. Total pensions include obligatory and voluntary pensions.

Table 4. Elasticity of the Gini index of pension wealth with respect to pensions

| Country | 2006 | 2014 | diff 2014-2006 |
|---|---|---|---|
| Austria | 0.018% | 0.069% | 0.051% |
| Belgium | -0.056% | -0.024% | 0.031% |
| Bulgaria | -0.040% | 0.060% | 0.100% |
| Cyprus | 0.014% | 0.074% | 0.060% |
| Czech Republic | -0.130% | -0.052% | 0.078% |
| Denmark | 0.074% | 0.106% | 0.032% |
| Estonia | -0.120% | -0.046% | 0.074% |
| France | 0.048% | 0.099% | 0.051% |
| Greece | 0.019% | -0.020% | -0.039% |
| Hungary | -0.085% | 0.002% | 0.086% |
| Iceland | 0.143% | 0.143% | 0.000% |
| Ireland | 0.017% | 0.082% | 0.065% |
| Italy | 0.037% | 0.072% | 0.035% |
| Latvia | -0.076% | 0.058% | 0.134% |
| Lithuania | -0.040% | -0.006% | 0.035% |
| Luxembourg | -0.081% | 0.033% | 0.114% |
| Netherlands | 0.026% | 0.114% | 0.088% |
| Norway | 0.030% | 0.075% | 0.045% |
| Poland | -0.059% | -0.015% | 0.044% |
| Portugal | 0.056% | 0.079% | 0.023% |
| Romania | 0.036% | 0.009% | -0.027% |
| Slovakia | -0.170% | -0.088% | 0.082% |
| Slovenia | -0.021% | 0.011% | 0.032% |
| Spain | 0.014% | 0.059% | 0.045% |
| Sweden | 0.045% | 0.117% | 0.071% |
| United Kingdom | 0.154% | 0.165% | 0.012% |

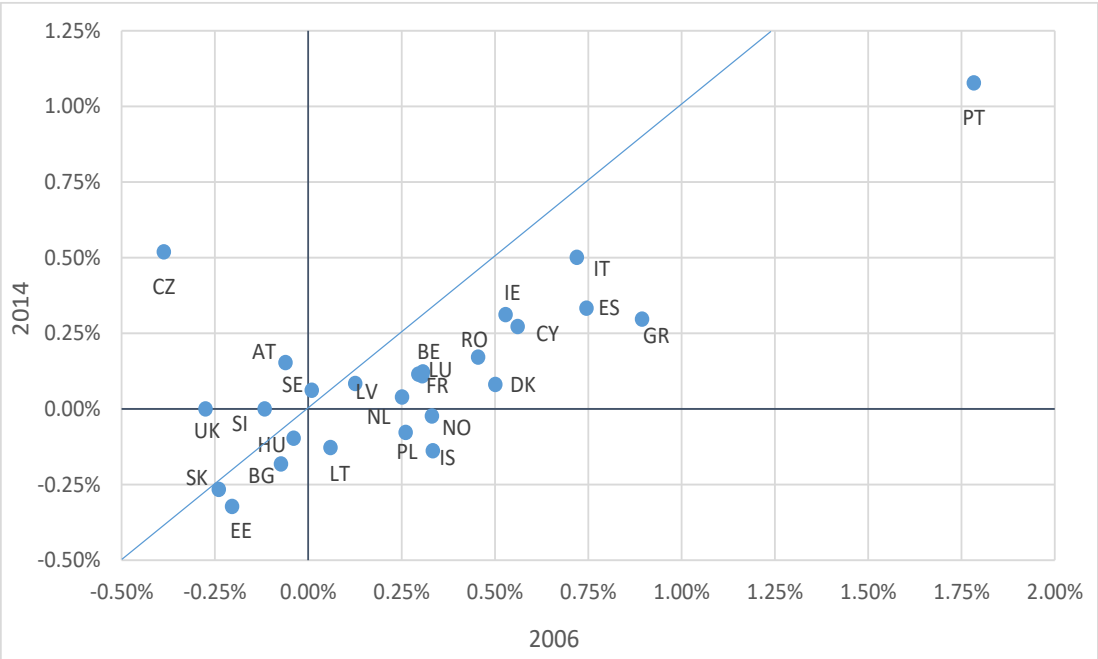
Note: The Gini elasticity measures the effect of an increase of 1% in pensions on the Gini index of pension wealth. The procedure utilises obligatory pension wealth computed with SES life tables in logs.

Figure 1. Effects SES mortality on the Gini of pension wealth in 2006 and 2014



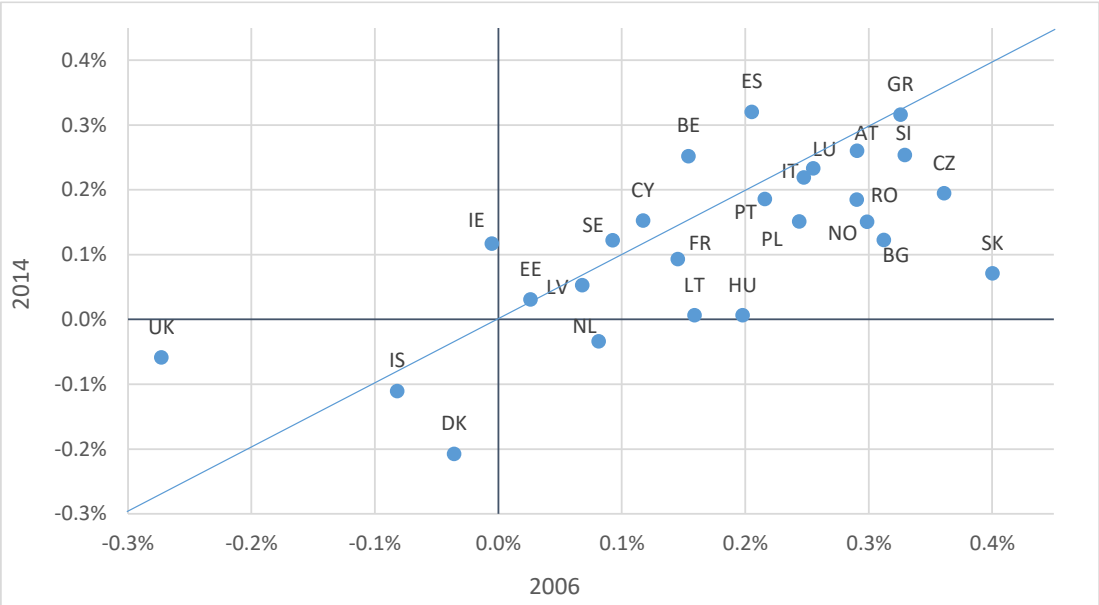

Note: The values in this figure correspond to the percentage variation between the Gini indices computed with and without SES specific mortality for each year ($Gini\_ses/Gini - 1$). These percentages are reported in column 3 and 6 of Table 2.

Figure 2. Effects of tertiary education on the Gini of pension wealth



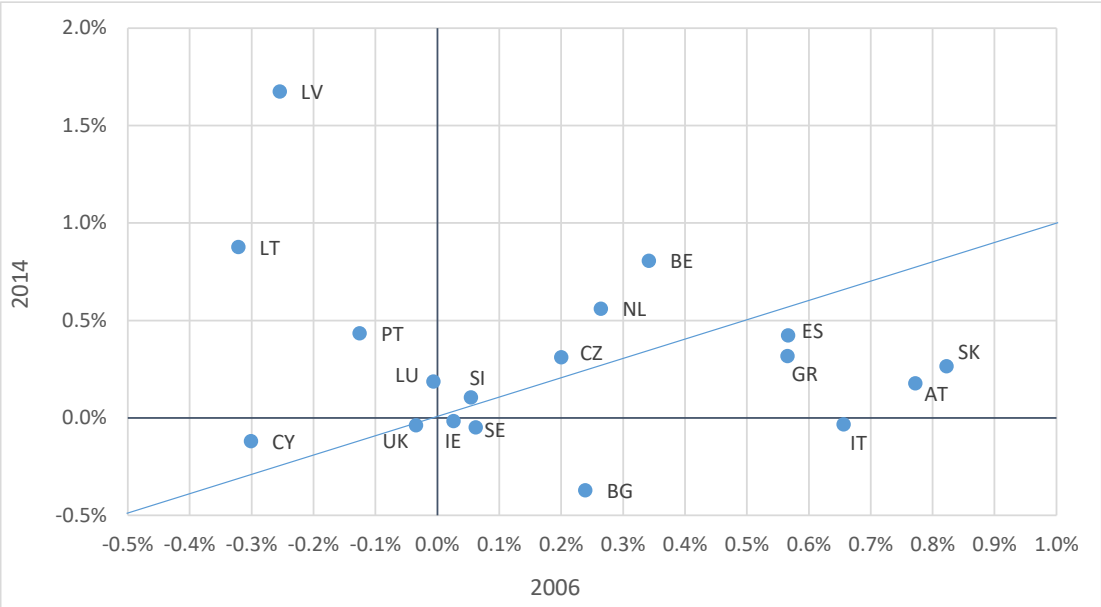

Note: The figure shows the coefficients for the tertiary education of the Gini RIF regressions for 2006 and 2014 (reported in tables A2 and A3 in the Appendix) divided by 100 and the Gini index of the corresponding country and year. These ratios are expressed in percentages. So, a figure of 1% means that an increase of 1% in the proportion of households with tertiary education in the country is associated with an increase of 1% in the Gini index of pension wealth inequality. Pension wealth is computed with SES life tables and only includes obligatory pensions.

Figure 3. Effects of being 'female single pensioner' on the Gini of pension wealth




Note: The figure shows the coefficients for 'female single pensioner' of the Gini RIF regressions for 2006 and 2014 (reported in tables A2 and A3 in the Appendix) divided by 100 and the Gini index of the corresponding country and year. These ratios and are expressed in percentages. So, a figure of 1% means that an increase of 1% in the proportion of 'female single pensioner' in the country is associated with an increase of 1% in the Gini index of pension wealth inequality. Pension wealth is computed with SES life tables and only includes obligatory pensions.

Figure 4. Effects of having a private pension plan on the Gini of pension wealth




Note: The figure shows the coefficients for 'having private pension plan' of the Gini RIF regressions for 2006 and 2014 (reported in tables A2 and A3 in the Appendix) divided by 100 and the Gini index of the corresponding country and year. These ratios and are expressed in percentages. So, a figure of 1% means that an increase of 1% in the proportion of household with private pension plans in the country is associated with an increase of 1% in the Gini index of pension wealth inequality. Pension wealth is computed with SES life tables and includes obligatory pensions and private pension plans.

# Appendix

Table A1. Legal share (parameter $\theta$) of pension benefit for spouse

| country | Parameter $\theta$ | Assumed 0.5 |
|---|---|---|
| Austria | 0.600 | No |
| Belgium | 0.800 | No |
| Bulgaria | 0.500 | No |
| Cyprus | 0.600 | No |
| Czech Republic | 0.500 | No |
| Denmark | 0.500 | Yes |
| Estonia | 0.500 | No |
| France | 0.540 | No |
| Greece | 0.550 | No |
| Hungary | 0.600 | No |
| Iceland | 0.500 | Yes |
| Ireland | 0.500 | Yes |
| Italy | 0.600 | No |
| Latvia | 0.500 | No |
| Lithuania | 0.500 | Yes |
| Luxembourg | 1.000 | No |
| Netherlands | 0.500 | Yes |
| Norway | 0.500 | Yes |
| Poland | 0.850 | No |
| Portugal | 0.600 | No |
| Romania | 0.500 | No |
| Slovakia | 0.600 | No |
| Slovenia | 0.700 | No |
| Spain | 0.520 | No |
| Sweden | 0.550 | No |
| United Kingdom | 0.500 | Yes |

Source: SSA (2016). It is assumed $\theta$=0.5 when information is unavailable.

Table A2. Gini RIF regression coefficients for ‘obligatory pension wealth’ inequality in 2006

| Country regression | age 60-64 | age 65-69 | age 70-74 | single male pensioner | single female pensioner | spouses both pensioners | secondary education | tertiary education | constant | obs | R2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AT | -0.074*** | -0.062*** | -0.069*** | 0.065*** | 0.109*** | 0.036** | -0.109*** | -0.023 | 0.460*** | 1961 | 0.054 |
| BE | -0.010 | -0.045*** | -0.057*** | 0.099*** | 0.056*** | 0.152*** | -0.034*** | 0.111*** | 0.316*** | 1353 | 0.104 |
| BG | -0.069*** | -0.079*** | -0.104*** | 0.122*** | 0.107*** | 0.027 | -0.072*** | -0.025 | 0.391*** | 1800 | 0.128 |
| CY | 0.155** | -0.073*** | -0.042** | 0.082 | 0.061 | -0.029 | 0.067* | 0.292*** | 0.432*** | 943 | 0.065 |
| CZ | -0.069*** | -0.094*** | -0.090*** | 0.161*** | 0.097*** | 0.014 | -0.109*** | -0.104** | 0.385*** | 3381 | 0.218 |
| DK | 0.087** | -0.010 | -0.051*** | -0.003 | -0.012 | -0.010 | 0.000 | 0.168*** | 0.317*** | 1171 | 0.106 |
| EE | -0.078*** | -0.075*** | -0.066*** | 0.111*** | 0.007 | 0.080*** | -0.066*** | -0.055*** | 0.341*** | 1688 | 0.175 |
| FR | -0.066*** | -0.082*** | -0.062*** | 0.058*** | 0.054*** | -0.002 | -0.035*** | 0.114*** | 0.403*** | 2750 | 0.068 |
| GR | 0.016 | -0.060*** | -0.076*** | 0.140*** | 0.142*** | 0.061** | 0.018 | 0.390*** | 0.357*** | 1957 | 0.163 |
| HU | -0.046*** | -0.075*** | -0.075*** | 0.097*** | 0.061*** | 0.044*** | -0.076*** | -0.012 | 0.361*** | 3118 | 0.082 |
| IS | 0.089** | 0.058* | -0.024 | 0.023 | -0.029 | -0.057* | 0.019 | 0.118** | 0.330*** | 434 | 0.088 |
| IE | 0.056* | -0.026 | -0.051*** | 0.027 | -0.002 | -0.052 | 0.014 | 0.200*** | 0.362*** | 1749 | 0.082 |
| IT | -0.008 | -0.023** | -0.029*** | 0.070*** | 0.099*** | 0.041*** | 0.008 | 0.288*** | 0.337*** | 7182 | 0.069 |
| LV | -0.052*** | -0.056*** | -0.072*** | 0.108*** | 0.020 | 0.101*** | -0.065*** | 0.037 | 0.329*** | 1885 | 0.114 |
| LT | -0.036** | -0.059*** | -0.064*** | 0.129*** | 0.048** | 0.071*** | -0.057*** | 0.018 | 0.309*** | 1943 | 0.085 |
| LU | 0.054 | -0.012 | -0.031 | 0.125*** | 0.083** | -0.007 | -0.044** | 0.096** | 0.294*** | 786 | 0.114 |
| NL | 0.013 | -0.085*** | -0.077*** | -0.026 | 0.030 | -0.055** | -0.053*** | 0.093*** | 0.436*** | 2199 | 0.088 |
| NO | 0.004 | -0.032* | -0.052*** | 0.092*** | 0.091*** | 0.020 | 0.026 | 0.101** | 0.234*** | 1070 | 0.059 |
| PL | -0.003 | -0.029*** | -0.018** | 0.113*** | 0.086*** | 0.093*** | -0.035*** | 0.092*** | 0.285*** | 4335 | 0.053 |
| PT | 0.034 | -0.030 | -0.048*** | 0.114** | 0.117*** | 0.043 | 0.051* | 0.967*** | 0.420*** | 1560 | 0.323 |
| RO | -0.031 | -0.071*** | -0.055*** | 0.094*** | 0.118*** | 0.082*** | -0.116*** | 0.185*** | 0.418*** | 2790 | 0.153 |
| SK | -0.074*** | -0.107*** | -0.089*** | 0.209*** | 0.117*** | 0.064*** | -0.089*** | -0.070*** | 0.347*** | 1602 | 0.154 |
| SI | -0.078*** | -0.072*** | -0.081*** | 0.087*** | 0.121*** | 0.001 | -0.121*** | -0.043** | 0.471*** | 2864 | 0.162 |
| ES | 0.030 | -0.050*** | -0.072*** | 0.070*** | 0.079*** | 0.051** | 0.025* | 0.287*** | 0.338*** | 3612 | 0.116 |
| SE | 0.048** | -0.032** | -0.065*** | -0.012 | 0.031 | -0.030 | -0.043*** | 0.003 | 0.383*** | 1574 | 0.053 |
| UK | 0.103*** | -0.027* | -0.061*** | -0.045 | -0.111*** | -0.114*** | -0.218* | -0.112 | 0.685*** | 2749 | 0.083 |

*** p<0.01 ** p<0.05 * p<0.10. Each row contains the coefficients of OLS regressions by country. The dependent variable is the Influence Function (IF) of each household in the Gini index of pension wealth. The reference variable for age groups is 'age 75-79', for education is 'primary education' and for households is 'only one pensioner within the couple'. Pension wealth only includes obligatory pensions and is computed with SES life tables.

Table A3. Gini RIF regression coefficients for ‘obligatory pension wealth’ inequality in 2014

| Country regression | age 60-64 | age 65-69 | age 70-74 | single male pensioner | single female pensioner | spouses both pensioners | secondary education | tertiary education | constant | obs | R2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AT | -0.030* | -0.038** | -0.044*** | 0.045** | 0.095*** | -0.008 | -0.031 | 0.056 | 0.366*** | 1816 | 0.057 |
| BE | -0.057*** | -0.009 | -0.048*** | 0.118*** | 0.087*** | 0.056*** | -0.044*** | 0.038* | 0.320*** | 1521 | 0.052 |
| BG | -0.017 | -0.035** | -0.076*** | 0.059*** | 0.042** | 0.037* | -0.086*** | -0.062*** | 0.413*** | 2158 | 0.029 |
| CY | 0.058 | -0.036* | -0.047*** | 0.136** | 0.075*** | 0.017 | -0.018 | 0.134*** | 0.444*** | 1302 | 0.057 |
| CZ | -0.069*** | -0.077*** | -0.073*** | 0.101*** | 0.052*** | -0.013 | 0.135*** | 0.139*** | 0.166*** | 3156 | 0.137 |
| DK | 0.058* | -0.021 | -0.056*** | -0.002 | -0.074*** | -0.082*** | -0.031** | 0.029 | 0.436*** | 1844 | 0.046 |
| EE | -0.013 | -0.041*** | -0.039*** | 0.104*** | 0.008 | 0.075*** | -0.093*** | -0.084*** | 0.333*** | 2018 | 0.119 |
| FR | -0.004 | -0.018 | -0.022 | 0.065*** | 0.031** | 0.029* | -0.085*** | 0.041** | 0.355*** | 3453 | 0.058 |
| GR | -0.018 | -0.065*** | -0.045*** | 0.097*** | 0.117*** | 0.100*** | -0.056*** | 0.110*** | 0.333*** | 4868 | 0.117 |
| HU | -0.034*** | -0.034** | -0.051*** | 0.043** | 0.002 | 0.034* | -0.067*** | -0.031 | 0.395*** | 3080 | 0.023 |
| IS | 0.047 | 0.012 | -0.009 | 0.056 | -0.037 | -0.039 | -0.063 | -0.046 | 0.395*** | 575 | 0.040 |
| IE | 0.033 | 0.006 | -0.015 | 0.075*** | 0.046** | 0.018 | -0.009 | 0.123*** | 0.322*** | 1513 | 0.055 |
| IT | 0.010 | 0.001 | -0.047*** | 0.056*** | 0.086*** | 0.049*** | -0.049*** | 0.197*** | 0.358*** | 6025 | 0.069 |
| LV | 0.077*** | 0.016 | -0.043*** | 0.080** | 0.020 | 0.092** | -0.090*** | 0.032 | 0.379*** | 2425 | 0.044 |
| LT | 0.012 | -0.012 | -0.046*** | 0.085*** | 0.002 | 0.077*** | -0.075*** | -0.040** | 0.349*** | 1918 | 0.068 |
| LU | -0.041 | -0.047* | -0.068*** | 0.050* | 0.081*** | 0.032 | -0.094*** | 0.040 | 0.382*** | 896 | 0.078 |
| NL | 0.117*** | -0.062*** | -0.061*** | -0.019 | -0.013 | -0.092*** | -0.077*** | 0.015 | 0.485*** | 2406 | 0.057 |
| NO | -0.016 | -0.044*** | -0.054*** | 0.048** | 0.045*** | -0.031** | -0.036 | -0.007 | 0.351*** | 1613 | 0.051 |
| PL | -0.028*** | -0.019** | -0.007 | 0.106*** | 0.051*** | 0.035*** | -0.073*** | -0.026* | 0.351*** | 4104 | 0.064 |
| PT | -0.042* | -0.041** | -0.071*** | 0.083*** | 0.094*** | 0.033 | -0.016 | 0.545*** | 0.441*** | 3030 | 0.244 |
| RO | -0.068*** | -0.080*** | -0.055*** | 0.083*** | 0.072*** | 0.048*** | -0.148*** | 0.067* | 0.491*** | 3123 | 0.156 |
| SK | -0.086*** | -0.100*** | -0.093*** | 0.095*** | 0.019 | -0.000 | -0.122* | -0.071 | 0.441*** | 2232 | 0.098 |
| SI | -0.092*** | -0.064*** | -0.048*** | 0.102*** | 0.087*** | -0.021* | -0.036** | 0.000 | 0.389*** | 3109 | 0.114 |
| ES | 0.013 | -0.030*** | -0.040*** | 0.060*** | 0.120*** | 0.091*** | -0.018** | 0.125*** | 0.315*** | 3522 | 0.095 |
| SE | 0.139*** | 0.018 | -0.024** | 0.035 | 0.045** | -0.041* | -0.046*** | 0.023 | 0.374*** | 1625 | 0.080 |
| UK | 0.135*** | 0.017 | -0.013 | 0.015 | -0.024 | -0.044* | -0.095*** | 0.000 | 0.471*** | 2644 | 0.076 |

*** p<0.01 ** p<0.05 * p<0.10. Each row contains the coefficients of OLS regressions by country. The dependent variable is the Influence Function (IF) of each household in the Gini index of pension wealth. The reference variable for age groups is 'age 75-79', for education is 'primary education' and for households is 'only one pensioner within the couple'. Pension wealth only includes obligatory pensions and is computed with SES life tables.

Table A4. Gini RIF regression coefficients for ‘total pension wealth’ inequality in 2006

| Country regression | age 60-64 | age 65-69 | age 70-74 | single male pensioner | single female pensioner | spouses both pensioners | secondary education | tertiary education | Private pension plans | constant | obs | R2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AT | -0.076*** | -0.059*** | -0.068*** | 0.063*** | 0.113*** | 0.037* | -0.114*** | -0.020 | 0.292* | 0.460*** | 1961 | 0.080 |
| BE | -0.009 | -0.046*** | -0.058*** | 0.097*** | 0.057*** | 0.147*** | -0.037*** | 0.108*** | 0.125 | 0.319*** | 1353 | 0.105 |
| BG | -0.069*** | -0.079*** | -0.104*** | 0.122*** | 0.107*** | 0.027 | -0.072*** | -0.026 | 0.082*** | 0.391*** | 1800 | 0.129 |
| CY | 0.128 | -0.077*** | -0.045** | 0.065 | 0.059 | -0.038 | 0.050 | 0.276*** | -0.156** | 0.450*** | 943 | 0.059 |
| CZ | -0.070*** | -0.095*** | -0.091*** | 0.161*** | 0.097*** | 0.014 | -0.110*** | -0.105** | 0.054 | 0.387*** | 3381 | 0.217 |
| DK | 0.087** | -0.010 | -0.051*** | -0.003 | -0.012 | -0.010 | 0.000 | 0.168*** | 0.000 | 0.317*** | 1171 | 0.106 |
| EE | -0.078*** | -0.075*** | -0.066*** | 0.111*** | 0.007 | 0.080*** | -0.066*** | -0.055*** | 0.000 | 0.341*** | 1688 | 0.175 |
| FR | -0.067*** | -0.082*** | -0.062*** | 0.058*** | 0.052*** | -0.002 | -0.036*** | 0.111*** | -0.000 | 0.405*** | 2750 | 0.068 |
| GR | 0.010 | -0.060*** | -0.076*** | 0.139*** | 0.137*** | 0.059* | 0.014 | 0.390*** | 0.247 | 0.360*** | 1957 | 0.165 |
| HU | -0.046*** | -0.076*** | -0.075*** | 0.097*** | 0.061*** | 0.045*** | -0.076*** | -0.012 | 0.258 | 0.361*** | 3118 | 0.083 |
| IS | 0.089** | 0.058* | -0.024 | 0.023 | -0.029 | -0.057* | 0.019 | 0.118** | 0.000 | 0.330*** | 434 | 0.088 |
| IE | 0.035 | -0.038* | -0.050*** | 0.036 | -0.001 | -0.053 | 0.008 | 0.165*** | 0.010 | 0.368*** | 1749 | 0.062 |
| IT | -0.006 | -0.025** | -0.030*** | 0.063*** | 0.093*** | 0.030** | 0.005 | 0.301*** | 0.264 | 0.343*** | 7182 | 0.074 |
| LV | -0.052*** | -0.056*** | -0.072*** | 0.108*** | 0.020 | 0.101*** | -0.065*** | 0.037 | -0.075*** | 0.329*** | 1885 | 0.114 |
| LT | -0.036** | -0.059*** | -0.064*** | 0.131*** | 0.050*** | 0.073*** | -0.056*** | 0.018 | -0.097*** | 0.307*** | 1943 | 0.086 |
| LU | 0.054 | -0.011 | -0.031 | 0.125*** | 0.083** | -0.007 | -0.044** | 0.095** | -0.002 | 0.294*** | 786 | 0.113 |
| NL | 0.006 | -0.085*** | -0.077*** | -0.026 | 0.030 | -0.053* | -0.055*** | 0.084*** | 0.098 | 0.437*** | 2199 | 0.083 |
| NO | -0.000 | -0.038** | -0.053*** | 0.087*** | 0.093*** | 0.017 | 0.018 | 0.098** | -0.000 | 0.247*** | 1070 | 0.063 |
| PL | -0.003 | -0.029*** | -0.018** | 0.113*** | 0.086*** | 0.093*** | -0.035*** | 0.092*** | 0.000 | 0.285*** | 4335 | 0.053 |
| PT | 0.031 | -0.029 | -0.050*** | 0.114** | 0.117*** | 0.044 | 0.054* | 0.965*** | -0.068 | 0.421*** | 1560 | 0.321 |
| RO | -0.031 | -0.071*** | -0.055*** | 0.094*** | 0.118*** | 0.082*** | -0.116*** | 0.185*** | 0.000 | 0.418*** | 2790 | 0.153 |
| SK | -0.075*** | -0.107*** | -0.088*** | 0.205*** | 0.112*** | 0.058*** | -0.089*** | -0.072*** | 0.241 | 0.353*** | 1602 | 0.161 |
| SI | -0.077*** | -0.070*** | -0.080*** | 0.090*** | 0.123*** | 0.004 | -0.119*** | -0.041** | 0.020 | 0.464*** | 2864 | 0.161 |
| ES | 0.018 | -0.056*** | -0.076*** | 0.073*** | 0.076*** | 0.039* | 0.023* | 0.306*** | 0.223*** | 0.341*** | 3612 | 0.135 |
| SE | 0.029 | -0.033** | -0.072*** | 0.015 | 0.054*** | -0.016 | -0.046*** | 0.002 | 0.024* | 0.373*** | 1574 | 0.050 |
| UK | 0.078*** | -0.029* | -0.067*** | -0.025 | -0.092*** | -0.101*** | -0.131*** | -0.023 | -0.014 | 0.593*** | 2749 | 0.068 |

*** p<0.01 ** p<0.05 * p<0.10. Each row contains the coefficients of OLS regressions by country. The dependent variable is the Influence Function (IF) of each household in the Gini index of pension wealth. The reference variable for age groups is 'age 75-79', for education is 'primary education' and for households is 'only one pensioner within the couple'. Total pension wealth includes obligatory pensions and private pension plans and is computed with SES life tables.

Table A5. Gini RIF regression coefficients for ‘total pension wealth’ inequality in 2014

| Country regression | age 60-64 | age 65-69 | age 70-74 | single male pensioner | single female pensioner | spouses both pensioners | secondary education | tertiary education | Private pension plans | constant | obs | R2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AT | -0.030 | -0.043*** | -0.044*** | 0.040* | 0.084*** | -0.030 | -0.033 | 0.053 | 0.067* | 0.378*** | 1816 | 0.065 |
| BE | -0.056*** | -0.009 | -0.048*** | 0.118*** | 0.088*** | 0.056*** | -0.046*** | 0.037* | 0.295 | 0.321*** | 1521 | 0.058 |
| BG | -0.017 | -0.035** | -0.076*** | 0.059*** | 0.042** | 0.037* | -0.086*** | -0.063*** | -0.127*** | 0.413*** | 2158 | 0.029 |
| CY | 0.037 | -0.033* | -0.044** | 0.126* | 0.075*** | 0.017 | -0.029 | 0.125*** | -0.062 | 0.454*** | 1302 | 0.053 |
| CZ | -0.075*** | -0.079*** | -0.074*** | 0.094*** | 0.044*** | -0.023* | 0.128*** | 0.134*** | 0.084** | 0.182*** | 3156 | 0.139 |
| DK | 0.058* | -0.021 | -0.056*** | -0.002 | -0.074*** | -0.082*** | -0.031** | 0.029 | 0.000 | 0.436*** | 1844 | 0.046 |
| EE | -0.019 | -0.046*** | -0.041*** | 0.099*** | 0.001 | 0.073*** | -0.095*** | -0.088*** | 0.240 | 0.342*** | 2018 | 0.123 |
| FR | -0.004 | -0.018 | -0.022 | 0.067*** | 0.033** | 0.031* | -0.086*** | 0.042** | 0.064 | 0.353*** | 3453 | 0.060 |
| GR | -0.017 | -0.065*** | -0.045*** | 0.098*** | 0.117*** | 0.100*** | -0.056*** | 0.109*** | 0.139 | 0.333*** | 4868 | 0.117 |
| HU | -0.034*** | -0.034** | -0.051*** | 0.043** | 0.002 | 0.034* | -0.067*** | -0.031 | 0.000 | 0.395*** | 3080 | 0.023 |
| IS | 0.047 | 0.012 | -0.009 | 0.056 | -0.037 | -0.039 | -0.063 | -0.046 | 0.000 | 0.395*** | 575 | 0.040 |
| IE | 0.037 | 0.010 | -0.013 | 0.081*** | 0.057*** | 0.024 | -0.017 | 0.103*** | -0.006 | 0.323*** | 1513 | 0.050 |
| IT | 0.010 | 0.001 | -0.047*** | 0.056*** | 0.086*** | 0.049*** | -0.049*** | 0.197*** | -0.013 | 0.357*** | 6025 | 0.068 |
| LV | 0.076*** | 0.014 | -0.043*** | 0.081** | 0.020 | 0.091** | -0.090*** | 0.026 | 0.494 | 0.379*** | 2425 | 0.052 |
| LT | 0.004 | -0.012 | -0.046*** | 0.079*** | -0.007 | 0.069*** | -0.074*** | -0.046** | 0.265** | 0.358*** | 1918 | 0.080 |
| LU | -0.039 | -0.046* | -0.068*** | 0.047 | 0.081*** | 0.032 | -0.095*** | 0.040 | 0.061 | 0.382*** | 896 | 0.080 |
| NL | 0.116*** | -0.062*** | -0.062*** | -0.018 | -0.013 | -0.092*** | -0.077*** | 0.013 | 0.208 | 0.485*** | 2406 | 0.057 |
| NO | -0.021 | -0.047*** | -0.053*** | 0.048** | 0.044*** | -0.032** | -0.035 | -0.005 | -0.005 | 0.355*** | 1613 | 0.053 |
| PL | -0.028*** | -0.019** | -0.007 | 0.104*** | 0.051*** | 0.034*** | -0.073*** | -0.026** | -0.196*** | 0.352*** | 4104 | 0.064 |
| PT | -0.039* | -0.043** | -0.064*** | 0.079*** | 0.094*** | 0.025 | -0.027** | 0.540*** | 0.236** | 0.443*** | 3030 | 0.247 |
| RO | -0.068*** | -0.080*** | -0.055*** | 0.083*** | 0.072*** | 0.048*** | -0.148*** | 0.067* | 0.000 | 0.491*** | 3123 | 0.156 |
| SK | -0.088*** | -0.101*** | -0.093*** | 0.096*** | 0.020 | 0.000 | -0.123* | -0.073 | 0.078 | 0.441*** | 2232 | 0.101 |
| SI | -0.094*** | -0.064*** | -0.048*** | 0.102*** | 0.088*** | -0.021* | -0.034** | 0.000 | 0.039 | 0.386*** | 3109 | 0.117 |
| ES | -0.008 | -0.037** | -0.055*** | 0.085*** | 0.139*** | 0.074*** | -0.025** | 0.125*** | 0.167*** | 0.321*** | 3522 | 0.102 |
| SE | 0.105*** | 0.002 | -0.029** | 0.034 | 0.046** | -0.037* | -0.044*** | 0.023 | -0.016 | 0.393*** | 1625 | 0.067 |
| UK | 0.113*** | 0.024* | -0.011 | 0.029 | -0.001 | -0.031 | -0.079*** | 0.000 | -0.015 | 0.444*** | 2644 | 0.055 |

*** p<0.01 ** p<0.05 * p<0.10. Each row contains the coefficients of OLS regressions by country. The dependent variable is the Influence Function (IF) of each household in the Gini index of pension wealth. The reference variable for age groups is 'age 75-79', for education is 'primary education' and for households is 'only one pensioner within the couple'. Total pension wealth includes obligatory pensions and private pension plans and is computed with SES life tables.

Table A6. Gini indices of obligatory pension wealth, utilizing different discount rates for the annuity price

| Country | 2006 | | | | | | | | | 2014 | | | | | | | | | % change 2014-2006 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | without SES mortality | | | with SES mortality | | | % change | | | without SES mortality | | | with SES mortality | | | % change | | | without SES mortality | | | with SES mortality | | |
| | r=1% | r=2% | r=3% | r=1% | r=2% | r=3% | r=1% | r=2% | r=3% | r=1% | r=2% | r=3% | r=1% | r=2% | r=3% | r=1% | r=2% | r=3% | r=1% | r=2% | r=3% | r=1% | r=2% | r=3% |
| Austria | 0.377 | 0.372 | 0.367 | 0.381 | 0.375 | 0.371 | 1.07 | 0.99 | 0.92 | 0.366 | 0.361 | 0.357 | 0.370 | 0.365 | 0.361 | 1.19 | 1.09 | 1.00 | -2.92 | -2.79 | -2.65 | -2.81 | -2.70 | -2.57 |
| Belgium | 0.361 | 0.355 | 0.349 | 0.371 | 0.364 | 0.357 | 2.80 | 2.66 | 2.52 | 0.345 | 0.339 | 0.334 | 0.352 | 0.345 | 0.340 | 1.94 | 1.80 | 1.67 | -4.50 | -4.33 | -4.16 | -5.29 | -5.12 | -4.95 |
| Bulgaria | 0.344 | 0.338 | 0.333 | 0.349 | 0.343 | 0.338 | 1.43 | 1.35 | 1.27 | 0.343 | 0.339 | 0.336 | 0.347 | 0.343 | 0.338 | 0.99 | 0.91 | 0.72 | -0.15 | 0.33 | 0.78 | -0.59 | -0.11 | 0.23 |
| Cyprus | 0.509 | 0.502 | 0.497 | 0.528 | 0.521 | 0.514 | 3.86 | 3.65 | 3.44 | 0.480 | 0.476 | 0.473 | 0.496 | 0.492 | 0.488 | 3.51 | 3.28 | 3.07 | -5.71 | -5.24 | -4.82 | -6.03 | -5.58 | -5.15 |
| Czech Rep | 0.275 | 0.268 | 0.261 | 0.276 | 0.269 | 0.263 | 0.40 | 0.48 | 0.56 | 0.273 | 0.267 | 0.263 | 0.273 | 0.267 | 0.263 | -0.01 | 0.05 | 0.13 | -0.72 | -0.07 | 0.50 | -1.13 | -0.51 | 0.07 |
| Denmark | 0.334 | 0.330 | 0.327 | 0.340 | 0.335 | 0.332 | 1.77 | 1.64 | 1.53 | 0.352 | 0.350 | 0.347 | 0.359 | 0.356 | 0.354 | 2.02 | 1.92 | 1.83 | 5.62 | 6.03 | 6.40 | 5.88 | 6.33 | 6.72 |
| Estonia | 0.272 | 0.267 | 0.262 | 0.275 | 0.269 | 0.264 | 0.97 | 0.92 | 0.88 | 0.264 | 0.259 | 0.255 | 0.266 | 0.261 | 0.256 | 0.48 | 0.45 | 0.43 | -2.89 | -2.66 | -2.41 | -3.36 | -3.11 | -2.84 |
| France | 0.366 | 0.362 | 0.358 | 0.377 | 0.372 | 0.367 | 2.93 | 2.77 | 2.61 | 0.329 | 0.326 | 0.324 | 0.336 | 0.333 | 0.330 | 2.16 | 2.00 | 1.86 | -10.07 | -9.75 | -9.45 | -10.74 | -10.42 | -10.11 |
| Greece | 0.429 | 0.422 | 0.417 | 0.444 | 0.436 | 0.430 | 3.47 | 3.28 | 3.10 | 0.364 | 0.357 | 0.351 | 0.379 | 0.370 | 0.363 | 4.09 | 3.86 | 3.63 | -15.18 | -15.53 | -15.83 | -14.67 | -15.06 | -15.40 |
| Hungary | 0.311 | 0.305 | 0.299 | 0.315 | 0.309 | 0.303 | 1.23 | 1.22 | 1.28 | 0.327 | 0.322 | 0.317 | 0.328 | 0.323 | 0.319 | 0.42 | 0.46 | 0.49 | 5.06 | 5.51 | 5.95 | 4.21 | 4.72 | 5.12 |
| Iceland | 0.347 | 0.345 | 0.343 | 0.357 | 0.354 | 0.351 | 2.77 | 2.60 | 2.45 | 0.327 | 0.326 | 0.325 | 0.336 | 0.334 | 0.333 | 2.77 | 2.69 | 2.61 | -5.86 | -5.58 | -5.31 | -5.86 | -5.49 | -5.16 |
| Ireland | 0.371 | 0.366 | 0.362 | 0.384 | 0.378 | 0.373 | 3.51 | 3.34 | 3.17 | 0.386 | 0.384 | 0.381 | 0.397 | 0.393 | 0.390 | 2.80 | 2.60 | 2.42 | 4.25 | 4.79 | 5.28 | 3.53 | 4.04 | 4.51 |
| Italy | 0.395 | 0.389 | 0.385 | 0.406 | 0.400 | 0.395 | 2.90 | 2.75 | 2.61 | 0.388 | 0.383 | 0.379 | 0.398 | 0.393 | 0.388 | 2.75 | 2.62 | 2.45 | -1.81 | -1.67 | -1.50 | -1.96 | -1.80 | -1.65 |
| Latvia | 0.296 | 0.291 | 0.287 | 0.300 | 0.295 | 0.291 | 1.27 | 1.19 | 1.12 | 0.383 | 0.378 | 0.374 | 0.386 | 0.381 | 0.376 | 0.64 | 0.59 | 0.54 | 29.46 | 29.86 | 30.22 | 28.66 | 29.09 | 29.47 |
| Lithuania | 0.302 | 0.297 | 0.293 | 0.308 | 0.302 | 0.298 | 1.90 | 1.79 | 1.68 | 0.313 | 0.308 | 0.304 | 0.318 | 0.313 | 0.309 | 1.87 | 1.73 | 1.60 | 3.58 | 3.71 | 3.85 | 3.55 | 3.65 | 3.77 |
| Luxembourg | 0.325 | 0.317 | 0.310 | 0.334 | 0.326 | 0.317 | 2.76 | 2.63 | 2.49 | 0.347 | 0.342 | 0.337 | 0.353 | 0.348 | 0.343 | 1.90 | 1.77 | 1.64 | 6.58 | 7.64 | 8.90 | 5.69 | 6.74 | 8.00 |
| Netherlands | 0.365 | 0.360 | 0.356 | 0.376 | 0.370 | 0.365 | 2.80 | 2.65 | 2.50 | 0.378 | 0.375 | 0.372 | 0.385 | 0.381 | 0.378 | 1.96 | 1.83 | 1.71 | 3.50 | 4.00 | 4.47 | 2.65 | 3.17 | 3.66 |
| Norway | 0.309 | 0.304 | 0.300 | 0.309 | 0.305 | 0.301 | -0.06 | 0.22 | 0.11 | 0.299 | 0.296 | 0.294 | 0.302 | 0.299 | 0.296 | 1.09 | 0.98 | 0.89 | -3.18 | -2.56 | -2.18 | -2.07 | -1.82 | -1.41 |
| Poland | 0.353 | 0.346 | 0.341 | 0.360 | 0.353 | 0.347 | 2.05 | 1.96 | 1.86 | 0.337 | 0.333 | 0.329 | 0.342 | 0.337 | 0.333 | 1.44 | 1.35 | 1.26 | -4.29 | -3.91 | -3.56 | -4.87 | -4.48 | -4.13 |
| Portugal | 0.527 | 0.525 | 0.521 | 0.545 | 0.542 | 0.537 | 3.53 | 3.34 | 3.16 | 0.492 | 0.489 | 0.486 | 0.510 | 0.506 | 0.501 | 3.67 | 3.42 | 3.20 | -6.54 | -6.86 | -6.71 | -6.42 | -6.78 | -6.68 |
| Romania | 0.405 | 0.399 | 0.394 | 0.413 | 0.407 | 0.401 | 2.01 | 1.91 | 1.81 | 0.389 | 0.384 | 0.379 | 0.395 | 0.389 | 0.384 | 1.52 | 1.44 | 1.37 | -3.84 | -3.81 | -3.78 | -4.30 | -4.25 | -4.19 |
| Slovakia | 0.297 | 0.290 | 0.283 | 0.300 | 0.292 | 0.285 | 0.90 | 0.83 | 0.76 | 0.272 | 0.267 | 0.262 | 0.273 | 0.267 | 0.263 | 0.35 | 0.28 | 0.22 | -8.51 | -8.01 | -7.52 | -9.01 | -8.51 | -8.01 |
| Slovenia | 0.369 | 0.363 | 0.358 | 0.374 | 0.368 | 0.362 | 1.27 | 1.17 | 1.08 | 0.344 | 0.340 | 0.336 | 0.348 | 0.343 | 0.339 | 1.04 | 0.96 | 0.88 | -6.80 | -6.43 | -6.06 | -7.01 | -6.63 | -6.25 |
| Spain | 0.375 | 0.369 | 0.364 | 0.391 | 0.385 | 0.379 | 4.34 | 4.26 | 4.15 | 0.365 | 0.361 | 0.357 | 0.379 | 0.375 | 0.371 | 3.83 | 3.79 | 3.72 | -2.57 | -2.21 | -1.89 | -3.05 | -2.66 | -2.30 |
| Sweden | 0.335 | 0.331 | 0.327 | 0.340 | 0.335 | 0.331 | 1.40 | 1.32 | 1.25 | 0.368 | 0.365 | 0.363 | 0.372 | 0.369 | 0.366 | 1.18 | 1.10 | 1.02 | 9.79 | 10.45 | 11.00 | 9.55 | 10.20 | 10.75 |
| UK | 0.406 | 0.403 | 0.400 | 0.410 | 0.407 | 0.403 | 1.08 | 0.99 | 0.92 | 0.407 | 0.404 | 0.402 | 0.412 | 0.408 | 0.406 | 1.16 | 1.06 | 0.96 | 0.22 | 0.37 | 0.50 | 0.30 | 0.43 | 0.55 |
| Overall average | 0.360 | 0.354 | 0.350 | 0.368 | 0.362 | 0.357 | 2.09 | 2.00 | 1.89 | 0.355 | 0.351 | 0.348 | 0.362 | 0.357 | 0.353 | 1.80 | 1.69 | 1.59 | -0.67 | -0.34 | 0.00 | -0.97 | -0.64 | -0.31 |
| Overall median | 0.357 | 0.350 | 0.346 | 0.366 | 0.359 | 0.354 | 1.96 | 1.85 | 1.75 | 0.350 | 0.346 | 0.342 | 0.356 | 0.352 | 0.348 | 1.70 | 1.59 | 1.48 | -2.73 | -2.39 | -2.04 | -2.44 | -2.24 | -1.97 |

LUXEMBOURG INSTITUTE OF
SOCIO-ECONOMIC RESEARCH

11, Porte des Sciences
Campus Belval
L-4366 Esch-sur-Alzette

T +352 58 58 55-1
F +352 58 58 55-700

**www.liser.lu**