Poverty reduction among older people through pensions: a comparative analysis[1]

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Abstract

Given the ageing of the populations in many Western countries, older people constitute an important group in the analysis of poverty. In this chapter, we examine the poverty incidence among older people across LIS countries, relying on data from the Luxembourg Income Study. The data show that poverty rates are substantially reduced by redistribution via tax/benefit systems (mainly via pension benefits). Furthermore, the data show that old-age poverty rates and the antipoverty effect of pensions vary substantially across countries. Finally, in almost all countries, the poverty rates based on disposable income declined between 1985 and 2013. The reason for this reduction in old-age poverty is the increase of the poverty reducing effect of pension benefits). Interestingly, the trend in the poverty rates of the working age population differs from that of older people; in most countries of our sample, the poverty incidence increased for the working age population. However, it should be noted that in most Western countries, poverty rates for older people are still at a higher level than for the working age population.

1. Introduction

In the analysis of the developments in monetary poverty, older people constitute an important group within populations. Older people who quit the labor market are, by definition, vulnerable to financial poverty, and with the ageing of many Western societies this group is

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growing rapidly. Interestingly in this respect, earlier research has shown that poverty rates among older people have declined in many European countries over the past few decades (Van Vliet et al., 2012). Poverty among older people is linked to several factors, such as gender, social class, age and marital status (Kangas and Palme, 2000; Price, 2006). Yet an important reason for the declining poverty rates over the past few decades is the expansion of pension systems and hence the increased expenditures on pension benefits. A study by the OECD (2008) concludes that the poverty reducing effect of transfers and taxes is the strongest for older people, because of the impact of pensions. Across OECD countries, the poverty reducing effect of the tax/benefit systems for people of retirement age is on average 1.5 times as high as for people of working age. Based on a comparative analysis across countries and over time, Been et al. (2017) concluded that high levels of public pension expenditures are associated with lower levels of income inequality and poverty in old age. Recently, Jacques et al. (2018) came to similar conclusions. Both studies examined the association between at-risk-of-poverty rates based on EU-SILC data and social expenditures data from the OECD or Eurostat with panel data regression analysis. An important advantage of this approach is that in addition to the redistributive effect of pensions, the effects of various other socio-economic developments, such as unemployment or aging of the population, can be taken into account too.

In the current study, we do not *estimate* the redistributive effect of pensions on poverty among older people. Instead, we *measure* the poverty reduction that results from redistribution via tax/benefit-systems (i.e. through pensions). We focus on the actual income redistribution for older people (65 and above), which is the difference between the market income (before income taxes and social benefits) and the disposable income (after income taxes and social benefits). For this analysis, we utilize a new dataset on fiscal redistribution and relative income poverty rates that is based on data from LIS: Cross-National Data Center in Luxembourg (Caminada and Wang, 2019).

The remainder of this chapter is organized as follows. First, we introduce and discuss the key concepts used in our analysis, being poverty incidence and the poverty reducing effect of social transfers and income taxes (i.e. lifting people out of poverty via tax/benefit systems). Then, we show the variation in old-age poverty rates across LIS countries and over the period 1985-2016. Furthermore, we employ a decomposition analysis to examine the underlying dynamics in redistribution by social transfers (mainly pensions) and income taxes.

2. Core concepts

Measuring poverty incidence

A *good* pension system protects people against poverty and smooths people's income over their life-cycle. To achieve these goals countries organize their pension system in different ways. Considerable effort has been made to compare pension systems across countries and to identify strengths and weaknesses of different systems. To be able to evaluate *adequacy* we need to know how much resources retirees need. A variety of standards can be chosen against which to judge adequacy (Knoef et al, 2016). A widely accepted standard in the literature is having a retirement income of 70 percent of previous earnings (Haveman et al, 2007). Another approach is to set a social standard for adequacy. In such an approach, retirement income could be considered *adequate* when it is equal to or greater than the poverty threshold.

There are three common ways of setting the poverty line: an absolute standard, a relative standard, and a subjective standard (see also Chapters 2-4). The U.S. poverty threshold is based on an absolute poverty standard, which remains fixed over time in real terms. The EU agreed upon a relative poverty line that is set as a fixed percentage of the median income in each country, which may change over time if median income changes in real terms. The subjective poverty line is based on respondents' answers to questions regarding what they consider an adequate standard of living. Following international standards, we use the relative rather than the absolute or subjective approach in measuring income poverty. This means that we define those households that have an equivalent disposable income below a certain threshold representing the level of well-being of the population in a specific country as being poor. In a number of comparative studies, the poverty threshold has been set at 50 percent of median equivalent disposable income. However, we employ the EU-agreed definition of poverty. The official EU indicator for social cohesion is the at-risk-of-poverty rate after social transfers. This rate is defined as the share of persons with an equivalized disposable income below the risk-of-poverty threshold, which is set at 60 percent of the national median equivalized disposable income.

Caminada et al (2019) performed a sensitivity analysis for all waves of the 49 LIS countries 1967-2016 when different poverty lines are applied. They found that all poverty lines (PL60, PL50, P40) follow more or less the same pattern. The country ranking changes only slightly when a threshold of 40 percent instead of 60 percent is applied (although there are some exceptions). As a result, in most cases empirical findings will hardly be affected by applying a 60 instead of a 40 or 50 percent poverty line.

It should be noted that there have been controversial arguments regarding the issues in the measurement of income poverty. These arguments have their own merits and shortcomings, and there has been little professional consensus among researchers with regard to the theoretical superiority of a particular way of measuring poverty. The aim of this chapter is not to review definitional issues that arise in assessing the extent of, and change in, income inequality and poverty across countries. We simply refer to a vast literature on the sensitivity of measured results to the choice of income definitions, inequality and poverty indices, appropriate equivalence scales, and other elements that may affect results in comparative research; see Caminada et al (2019a) and al papers cited therein.

Unit of analysis

The unit of analysis is an important issue in poverty and income distribution studies. It is evident that the ultimate source of concern is the welfare of the individual. However, an individual is often not the appropriate unit of analysis. For example, children and spouses working at home do not have recorded income, but may nevertheless be enjoying a high standard of living as a result of income sharing with parents/spouses. Traditionally, studies have used household income per capita to adjust total incomes according to the number of persons in the household. In recent decades, equivalence scales have been widely used in the literature on income distribution (Figini, 1998). Equivalence scale elasticity for the LIS database is set around 0.5. This implies that where the income of a household of one person is 100, a household of two persons must have an income of 140 to have equivalent incomes. Alternatively, a one-person household must have 70 percent of the total income of a two-person household to have equivalent income. In our comparative analysis we use this equivalence scale of LIS. Caminada et al. (2019c) show that the results of such an analysis are hardly influenced by the equivalence method used.[2]

Measuring the poverty reducing effects of social transfers and income taxes

Usually, the impact of social programs on poverty and income inequality is calculated in line with the work of Musgrave et al. (1974), i.e. statutory or budget incidence analysis. A standard analysis of the redistributive effect of income taxes and social transfers is to compare pre-tax-transfer poverty or income inequality and post-tax-transfer poverty or income

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[2] Caminada et al. (2019c) applied three widely used equivalence scales methods: from LIS (this study), OECD modified, and OECD original. Pearson correlation of levels of income inequality and fiscal redistribution via tax-benefit sytems across 31 countries for the three equivalence scales methods show values of .99 and over (not shown), indicating that the equivalence scale method used hardly matters.

inequality (OECD 2008: 98). A well-known critique of this approach is that pre-transfer poverty is compared to post-transfer poverty keeping all other things constant, thus disregarding any possible behavioral changes that the situation of absence of social transfers would involve. In particular, labor supply responses could be expected. However, in our analysis of poverty and the poverty reducing effects of tax/benefit systems among older people, labor supply effects are obviously less relevant, as older people have a very low labor supply.

In order to assess the partial effects of pensions and income taxes on the overall poverty reducing effect of tax/benefit systems, we apply a sequential accounting decomposition technique followed by Jesuit and Mahler (2010 and 2017) and Kammer et al. (2012). This enables us to calculate poverty rates without a certain type of social transfer or income tax. Consequently, we can determine the effective antipoverty impact of different income sources. Likewise, the poverty reducing effects of all income components on poverty within the trajectory between market income and disposable income can be calculated using this approach.

Data

For this chapter we use data from the Luxembourg Income Study. The LIS Cross-National Data Center in Luxembourg provides the largest available income database of harmonized microdata collected from 49 countries in Europe, North America, Latin America, Africa, Asia, and Australasia. Harmonized into a common framework, LIS datasets contain household- and person-level data on labor income, capital income, social security and private transfers, income taxes and social contributions, demography, employment, and expenditures (LIS, 2019). The LIS database allows scholars to access the microdata, so that income inequality measures and fiscal redistribution (and the partial effect per social program) can be derived consistently from the underlying data at the individual and household levels. LIS microdata seem to be the best available data for describing how poverty and the redistributive effects of taxes and transfers vary across countries (Nolan & Marx, 2009; Smeeding & Latner, 2015). However, country-comparative and trend analyses of income distribution based on LIS gross/net datasets should be done with caution (Gornick et al., 2013; Nieuwenhuis et al., 2017). LIS provides gross income data for most countries and years while providing income data that are net of (income) taxes in others. Of the 339 LIS datasets available at the time of writing, 214 are classified as gross, 103 as net and 22 as 'mixed'; see Caminada & Wang (2019, Documentation Guide) for a specification. Since we are interested in the redistributive

effects of pensions and income taxes and social contributions, this analysis only considers LIS-countries for which full tax-benefit information is available (classified by LIS as 'gross').

In the empirical literature, the selection of countries and data-years varies due to the consideration of data quality. From nearly 300 variables in the dataset, we select those related to household income (all kinds of income sources), total number of persons in a household and household weight (in order to correct sample bias or non-sampling errors) to measure poverty and the redistributive effect across countries. In line with LIS conventions and the work by Mahler & Jesuit (2017) and Caminada et al. (2017 and 2019b), we have included households which report zero market income (i.e., all of their income is derived from the state) but have excluded households that report zero disposable income.

How to deal with pensions?

An important choice in this analysis is whether pensions should be earmarked as market income or as transfers and therefore pension contributions as taxes. This choice is of vital importance for the results. Most studies conclude that the redistributive effect of transfers is much more important than the redistributive effect of taxes. But Guillaud et al. (2017) show that if pensions are categorized as market income rather than transfers, tax redistribution dominates transfer redistribution in most countries. Countries differ to a large extent in public versus private provision of their pensions (OECD, 2008: 120). Public pension plans are generally seen as part of the safety net, generating large antipoverty effects. Occupational and private pensions, on the other hand, generally aim to redistribute income inter-temporally over the life cycle. These pensions are not redistributive programs per se, although they too have a significant effect on redistribution when pre-tax-transfer inequality and post-tax-transfer inequality are measured at one moment in time, particularly among older people. The standard approach treats contributions to government pensions as a tax that finances the retirement pensions paid out in the same year, while contributions to private pensions are effectively treated as a form of private consumption. This may affect international comparisons of redistribution effects of social transfers and taxes. We deal with this bias rather pragmatically by following the LIS Household Income Variables List: occupational and private pensions are earmarked and treated as social transfers. Jesuit and Mahler (2017) also consider the pension system as whole, because the distinction between public and private pensions is somewhat artificial.[3] For a substantial number of LIS countries it is impossible to disaggregate income

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[3] For a more extensive discussion about the distinction between public and private pensions in empirical research, see Been et al. (2017).

from public and private schemes. The implication hereof is that the measured redistribution through pensions cannot be fully considered as interpersonal redistribution. Other transfers and benefits, such as housing transfers, for instance, are also included in the decomposition analysis; they are included in 'other transfers'.

3. Empirical analysis

Decomposition analysis

Because the data for a number of countries is not detailed enough for performing a decomposition analysis, the decomposition analysis is based on 25 LIS countries. Table 29.1 shows poverty rates and the antipoverty effect of social transfers and income taxes and social contributions around 2013. The numbers presented are unweighted averages of the values of 25 LIS countries, see list of countries in Table 29.1. The table indicates that the poverty rate based on market income is the lowest among the working-age population and the highest among older people. Among the working-age population, 26 percent of the population has a market income that lies below the risk-of-poverty threshold of 60 percent of the national median income. Among older people, 76 percent of the population has a market income that is lower than the poverty threshold. This difference in poverty rates reflects the fact that many older people are retired from paid work. The poverty rate based on disposable income is also lower for the working-age population than for older people, but the difference is much smaller; 17 percent for the working-age population versus 21 percent for older people. The reason why this difference in poverty rates is smaller is that the tax/benefit system has lifted many more people out of poverty in the case of older people than in the case of the working-age population. In the case of older people, 55 percent of the population has been lifted out of poverty via social transfers and income taxes. For the working-age population, income taxes and social benefits have lifted 9 percent of that population out of poverty. In contrast, for children the difference between the poverty rates based on market and disposable income amounts 8 percent and for the total population this is 16 percent.

The lower part of the table displays the results of the decomposition analysis. The overall poverty reducing effect of income taxes and social transfers presented in the upper part of the table is decomposed in order to determine the effective antipoverty impact of different income sources. The first income category that we use, consists of old-age, disability and survivor transfers. Further disentanglement of these three types of transfers is problematic

in the LIS-data, but for the group of older people we can reasonably assume that this category consists mainly of old-age transfers, being pensions. The results of the decomposition analysis show that in the case of the older people, the overall poverty reducing effect of tax/benefits systems can be almost completely attributed to old-age transfers. In other words, pension schemes are responsible for lifting roughly 55 per cent of the older population out of poverty.[4] Since we are mainly interested in the older population in this chapter, we do not go into detail about the social transfers which are mainly aimed at the working age population, such as family, unemployment and education transfers. Instead, we group them together into 'other transfers' as the second income source. Indeed, the table shows that for the older population only two percentage points of the poverty reduction via tax/benefits-systems can be attributed to these other transfers. This equals 4 percent of the overall poverty reduction via tax/benefits systems. Third, we present the distributional effect of income taxes and social security contributions. Since income taxes and social contributions reduce the disposable income, they may draw incomes below the poverty threshold, which is indicated by the negative sign. So for older people, income taxes and social security contributions contribute to an increase of the poverty rate based on disposable income with three percentage points on (unweighted) average.

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[4] More precisely: 55.7 percent of the older population is lifted out of poverty by pensions. Taking into account other transfers and income taxes and social security contributions, the calculation is as follows: 55.7 + 2.2 – 3.1 = 54.9.

Table 29.1   Poverty (alleviation) and poverty reducing effects of social programs in 25 LIS countries around 2013

	Total population		Working age population		Children		Older people	
(a) Poverty market income	35.0		25.5		30.4		76.3	
(b) Poverty disposable income	19.1		16.8		22.7		21.4	
Poverty reduction (a-b)	15.9		8.7		7.7		54.9	
		share		share		share		share
Old-age/disability/survivor transfers	13.1	82%	6.1	70%	2.3	30%	55.7	101%
Other transfers	5.9	37%	5.3	61%	8.9	116%	2.2	4%
Income taxes and social security contributions	-3.1	-19%	-2.7	-31%	-3.5	-45%	-3.1	-6%
Residual	0.0	0%	0.0	0%	-0.1	-1%	0.1	0%

Notes:
- When we take the mean of the decomposition results across countries, the sum of all partial antipoverty effects amounts to (a little) over 100 percent due to missing observations. We rescaled the antipoverty effects of each social program by applying an adjustment factor, which is defined as the overall poverty reduction (=100%) divided by sum of all partial antipoverty effects of all programs (over 100%), in order to correct for an over-estimated effect.
- LIS 25: Australia, Austria, Brazil, Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Guatemala, Iceland, Ireland, Israel, Luxembourg, the Netherlands, Norway, Panama, Peru, Slovakia, South Africa, Spain, Switzerland, the United Kingdom and the United States.
Source: Database Caminada & Wang (2019) based on LIS, and own calculations.

Cross-country variation

Figure 29.1 shows the cross-country variation in poverty rates and in poverty reduction by tax/benefits systems among older people for 32 countries around 2012.[5] The figure indicates that the poverty rates based on market income vary substantially across the countries. The highest poverty rate can be found in the Netherlands where 91 percent of the older people fall below the poverty threshold, followed by Sweden (89 percent), Finland (88 percent), Germany (87 percent) and the Czech Republic (87 percent). The countries with the lowest poverty based on market income are Guatemala (34 percent), Taiwan (45 percent), the Dominican Republic (46 percent) and Peru (53 percent). Subsequently, the figure also shows substantial variation in poverty rates based on disposable income. The countries with the highest poverty rates are South Korea (56 percent), Australia (50 percent) and Peru (42 percent) whereas the countries with the lowest poverty rates are the Netherlands (7 percent), Brazil (8 percent) and Luxembourg (8 percent).

Interestingly, the countries with the highest poverty rates based on market income are not the countries with the highest poverty rates on disposable income. The reason for this is

[5] The seven additional countries (compared to the 25 countries included in Table 29.1) are: Sweden, Japan, Canada, Taiwan, China, Dominican Republic and South Korea.

that there is substantial variation in the magnitude of poverty reduction (i.e. lifting older people out of poverty) via tax/benefits systems across countries, which is graphically indicated by the grey bars in the figure. The most notable example is the Netherlands, as this is the country with the highest poverty rate based on market income, the lowest poverty rate based on disposable income and the largest poverty alleviation. Here, 84 percent of the older people are lifted above the poverty line via social transfers. Also in Luxembourg, Czech Republic, Poland and Germany, the share of older people with a disposable income below the poverty threshold is more than 70 percentage points lower as a result of the tax/benefit-systems. The countries with the smallest antipoverty impact of social transfers are Guatemala, the Dominican Republic and South Korea. In these three countries, the difference between poverty rates before and after redistribution is smaller than 10 percentage points. It should be noted that these countries are among those with the lowest poverty rates before redistribution. Yet, with the small magnitude of redistribution by income taxes and benefits, these countries end up in the group of countries with the higher poverty rates based on disposable income.

Figure 29.1   Relative poverty rates (PL 60) among older people in LIS countries around 2012.
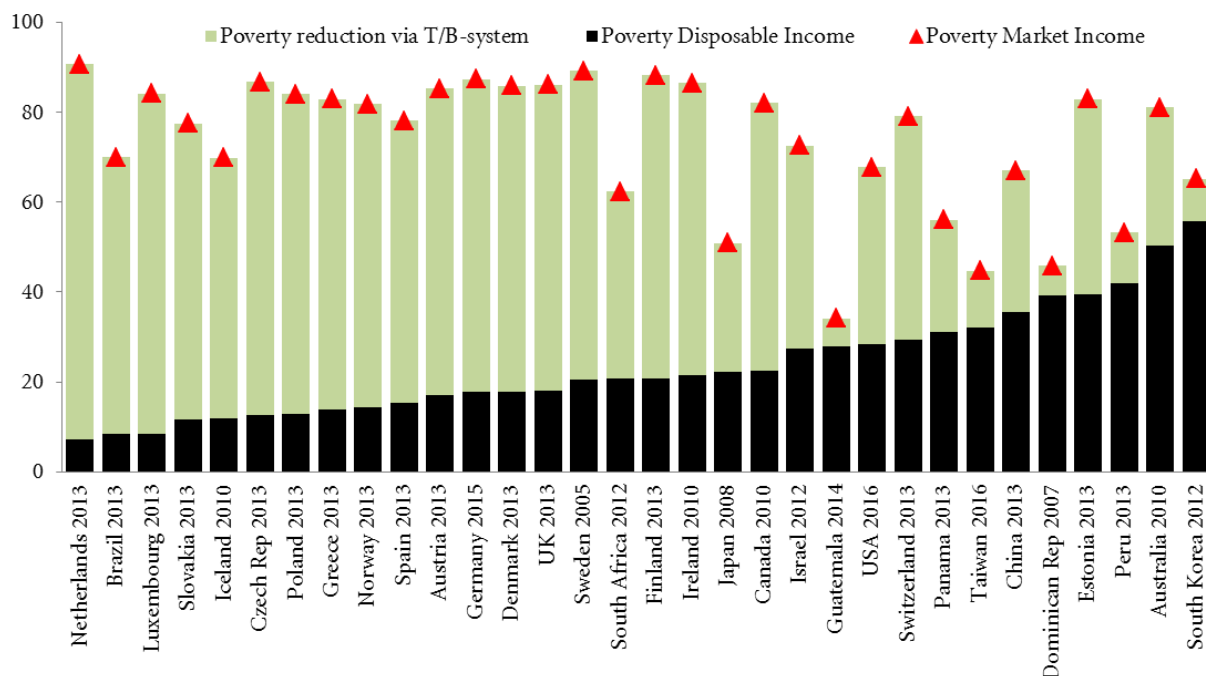
Source: Database Caminada & Wang (2019) based on LIS, and own calculations.

Developments over time

Subsequently, we examine the developments in old-age poverty and poverty reduction through pensions between 1985 and 2013 in Table 29.2a. In Table 29.2b, we present the same concepts but for the working-age population. The selection of countries for which at least three waves are available (around 1985, around 1997 and around 2013) limits the analysis to a sample of 14 LIS countries. Between 1985 and 2013, poverty rates among older people based on market income declined in only four countries, namely Denmark, Sweden, Switzerland and the U.S. In all other countries, the poverty rates among older people increased, with modest increases in the majority of the countries. In contrast, the poverty rates based on disposable income declined in almost all countries between 1985 and 2013. They only increased in Australia and Taiwan. A remarkable trend can be observed in Sweden, where the poverty rate declined from 21 to 8 percent and then increased to 21 percent again, which is probably related to the Swedish pension reform that was adopted in 1998.[6]

The antipoverty effect of tax/benefit systems (i.e. pensions) increased in all countries but the U.S., where the antipoverty effect slightly decreased from 40 to 39 percent. In a number of countries the poverty rates based on disposable income sharply declined as a result of strong increases in redistribution. For example, in Denmark the poverty rate dropped from 56 to 18 percent and the reduction of poverty via the tax/benefit system increased from 31 to 68 percent. Also Norway witnessed substantial declines in poverty rates as a result of an increased antipoverty effect of social transfers. In other countries, the increased antipoverty effect of tax/benefit systems was used to offset (to some extent) the increased poverty rates based on market income. In Ireland for instance, the poverty rate based on market income rose from 76 to 86 percent over the period 1985-2013, whereas the poverty rate based on disposable income declined from 25 to 22 percent. In Taiwan, the increase in poverty based on market income from 26 to 45 percent was translated into a relatively modest increase in poverty based on disposable income from 24 to 32 as a result of the increased antipoverty effect of the tax/benefit system.

Interestingly, the trends in poverty rates and the share of older people lifted out of poverty seem to follow a different path from the trends in poverty and antipoverty effects of tax/benefit systems among the working age population. The most notable difference between the two groups is that the old-age poverty rate based on disposable income declined in most countries whereas for the working age population it increased in most countries. The averages

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[6] Sweden transformed its public pension system to a notional defined-contribution plan; that is a defined-contribution plan financed on a pay-as-you-go basis.

of the country groups display similar trends. A remarkable case in this respect is the Netherlands. As a result of increased redistribution, the old-age poverty rate based on disposable income declined between 1983 and 2013, whereas in the working-age population the poverty rate increased as a result of smaller antipoverty effects of the tax/benefit system. Interestingly, in 2013 the poverty rate based on disposable income is even lower among older people (7 percent) than among the working-age population (13 percent). Yet it should be noted that the Netherlands is an exception in this respect, as in the other countries with such opposite trends between older people and the working-age population the poverty rate remains higher among older people. Finally, Norway is an interesting case. Here the opposite trends of old-age and working-age poverty after transfers converged to a similar poverty rate of 14 percent in 2013. However, the underlying dynamics differ significantly. In the case of older people, there was a relatively modest increase in the poverty rate based on market income and a substantial increase in the antipoverty effect of the tax/benefit system. In contrast, in the case of the working-age population there was a relatively large increase in the poverty rate based on market income and a relatively small increase in the share of people lifted out of poverty via the tax/benefit system.

Table 29.2a Poverty rates and poverty alleviation, older people, 14 LIS countries, 1985 - 2013

	Poverty market income (PL60)			Poverty disposable income (PL60)			Poverty alleviation		
	around 1985	around 1997	around 2013	around 1985	around 1997	around 2013	around 1985	around 1997	around 2013
Australia (85-95-10)	78	79	81	49	44	50	30	35	31
Canada (87-97-10)	77	81	82	25	17	22	52	63	60
Denmark (87-95-13)	88	89	86	56	35	18	31	54	68
Finland (87-95-13)	86	90	88	32	18	21	54	72	67
Germany (84-98-15)	87	89	87	23	16	18	65	73	70
Ireland (87-96-10)	76	*81*	86	25	*42*	22	50	*40*	65
Israel (86-97-12)	73	76	73	32	35	27	41	40	45
Netherlands (83-99-13)	90	94	91	14	15	7	77	79	84
Norway (86-95-13)	79	86	82	39	29	14	40	57	67
Sweden (87-95-05)	92	93	89	21	8	21	71	86	69
Switzerland (82-00-13)	83	83	79	37	28	29	46	55	50
Taiwan (86-97-16)	26	44	45	24	33	32	2	11	13
UK (86-99-13)	86	87	86	24	34	18	62	53	68
US (86-97-16)	70	74	68	31	30	28	40	44	39
Mean-14	78	82	80	31	28	23	47	54	57

Table 29.2b Poverty rates and poverty alleviation, working age population, 1985 - 2013

	Poverty market income (PL60)			Poverty disposable income (PL60)			Poverty alleviation		
	around 1985	around 1997	around 2013	around 1985	around 1997	around 2013	around 1985	around 1997	around 2013
Australia (85-95-10)	20	23	23	14	16	15	6	7	8
Canada (87-97-10)	20	24	28	15	17	19	6	8	9
Denmark (87-95-13)	19	22	23	11	8	12	8	14	12
Finland (87-95-13)	19	29	25	8	9	13	11	20	11
Germany (84-98-15)	18	20	23	11	10	16	7	10	7
Ireland (87-96-10)	33	*32*	39	22	*17*	15	11	*15*	24
Israel (86-97-12)	25	26	29	15	18	21	9	8	7
Netherlands (83-99-13)	25	19	22	9	10	13	16	9	9
Norway (86-95-13)	12	19	23	8	10	14	4	9	9
Sweden (87-95-05)	20	29	23	11	12	10	10	17	14
Switzerland (82-00-13)	10	12	12	10	10	11	1	2	1
Taiwan (86-97-16)	10	12	12	9	12	12	0	0	1
UK (86-99-13)	25	26	28	14	16	15	12	10	13
US (86-97-16)	22	22	25	19	19	21	3	3	4
Mean-14	20	22	24	13	13	15	7	9	9

Notes: Ireland 1996: income data net of income taxes (marked italic). Sweden is included although latest data year available is 2005.
Source: Database Caminada & Wang (2019) based on LIS, and own calculations.

Analysis of the results: the role of pensions

In response to the pressure stemming from the ageing of populations, pension reforms have been implemented in many Western countries over past years. More structural long-term reforms of the pension systems entail changes from the defined benefit to the defined contribution system (Barr & Diamond, 2009). In more recent years, many countries have opted for changes in the parameters of their pension systems. In particular, the retirement age has been changed in a number of countries.[7] Many countries have implemented automatic links between pension benefits and life expectancy. Other changes that have been implemented entail increases in employee contributions, changes in the tax incentives related to pensions, measures to increase the coverage of pensions, for instance by using auto-enrollment, or changes of the indexation rules (OECD 2017; Bridgen, 2018). Obviously, these institutional changes will affect the level of pension benefits and that might explain the varying incidence of old-age poverty and the varying extent of the share of older people lifted out of poverty via pensions as presented above.

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[7] Interestingly, in the Czech Republic and Poland the retirement age was reduced, which will directly lead to lower replacement rates (OECD, 2017).

First of all, the level at which the first layer of (public) pension benefits are set will be an important factor that might explain the variation in old-age poverty. In OECD countries this first layer consists of basic pensions, minimum pensions or social assistance; in some countries a combination of these programs can be seen. OECD data allow us to roughly compare, for a number of countries, old-age poverty with the benefit levels of these safety net schemes. The OECD (2017) provides these public benefit levels as a percentage of average economy-wide earnings (see Table 29.3, left panel). Several countries combine relatively high minimum level pension benefits with relatively high poverty alleviation and relatively low poverty rates: Luxembourg, Netherlands, Denmark, Norway, Sweden, Finland, Slovakia and Austria. The US, Japan and South Korea combine relatively low minimum benefit levels with relatively low poverty alleviation and relatively high poverty rates. Germany combines low minimum benefits with low poverty and high poverty alleviation. This implies that the second (or third) layer of the pension system is relatively important in this country. Australia on the other hand, combines relatively high minimum benefits with relatively low poverty alleviation. For some other countries, including Switzerland, the UK, Israel and Iceland we do not find a clear relationship between the level of minimum benefits and poverty rates and poverty alleviation.

Another comparison can be made between redistribution and old-age poverty on the one hand and replacement rates of pension benefits on the other hand. The replacement rate is defined as pension entitlement as a percentage of gross pre-retirement earnings. Replacement rates can be calculated in gross or in net terms. For the disposable income of older people, net replacement rates will matter more than gross rates. The OECD has calculated net replacement rates from public and private (mandatory) pension schemes for different levels of earnings: low, average and high (see Table 29.3, right panel).[8] It appears that most of the countries that show low old-age poverty rates and high poverty alleviation have relatively high replacement rates for low income earners. In Denmark, the Netherlands, Luxembourg, Austria, Czech Republic, Denmark, Slovak Republic and Brazil these low-income earner replacement rates lie above 85 percent. Australia and Israel remarkably combine relatively high replacement rates for low-income earners with relatively high old-age poverty rates and relatively small poverty alleviation. The targeting of pension benefits does not seem to be optimal in these countries. On the other hand, some countries, including Germany, Sweden,

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[8] It should be mentioned that these calculations are made for 'standard' workers, on the basis of various assumptions. For an analysis of replacement rates of actual workers in the Netherlands, using extensive micro data see Knoef et al. (2016).

Norway and the UK combine relatively low replacement rates for low-income earners with relatively low poverty and relatively large poverty alleviation. For these countries, replacement rates for low income earners are not a good indicator of the effectiveness of pensions to reduce poverty.[9] A few countries, including The Netherlands, Luxembourg, Austria, Denmark and Slovak Republic also have high replacement rates for average- and high-income earners. These countries have relatively universal and generous pension schemes, that also succeed in keeping most of the older people out of poverty.

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[9] For a more general discussion about the limitations of the use of replacement rates of pension benefits, see Chybalski and Marcinkiewicz (2016).

Table 29.3 Minimum pension benefits and net pension replacement rates

	Minimum pension benefits as a % of average earnings in a country, 2016			Net pension replacement rates for low, average and high earners (% of individual earnings)		
	basic	minimum	social assistance	low	average	high
Australia	27.6	-	-	95.0	42.6	45.4
Austria	-	-	27.8	92.2	91.8	90.9
Brazil				92.4	76.4	76.4
Canada	13.5	-	19.2	62.2	53.4	38.5
China				104.4	83.0	77.0
Czech Republic	8.9	11.7	12.4	88.3	60.0	48.7
Denmark	17.6	-	18.6	110.3	80.2	76.2
Estonia	14.7	-	14.7	73.7	57.4	51.1
Finland	17.4	-	21.0	66.9	65.0	65.1
Germany	-	-	20.1	54.7	50.5	49.8
Greece	23.0	-	-	60.7	53.7	54.1
Iceland	5.7	-	17.9	85.5	75.7	77.8
Ireland	34.1	-	32.4	70.0	42.3	32.4
Israel	12.9	-	23.5	100.4	75.1	54.9
Japan	15.3	-	19.0			
Luxembourg	9.8	36.7	28.8	98.3	88.4	83.6
Netherlands	26.3	-	-	105.1	100.6	100.2
Norway	32.5	-	-	64.8	48.8	41.3
Poland	-	22.2	15.2	37.2	38.6	37.9
South Africa				32.1	17.1	11.9
South Korea	-	-	5.5			
Slovak Republic	-	40.7	19.8	85.0	83.8	83.5
Spain	-	33.3	19.3	79.3	81.8	81.7
Sweden	22.3	-	-	62.4	54.9	67.6
Switzerland	-	16.5	22.6	57.4	44.9	31.5
UK	22.2	-	-	52.1	29.0	20.7
US	-	-	16.7	59.9	49.1	42.4

Note: Dashes indicate that a country does not have such a pension scheme; empty cells indicate that information is not available.
Source: OECD (2017), pp. 89 and 109.

4. Conclusion

Given the ageing of the populations in many Western countries, older people constitute an important group in the analysis of poverty. In this chapter, we examined the poverty incidence among older people across LIS countries, relying on data from the Luxembourg Income Study. The data show that poverty rates are substantially reduced via tax/benefit systems (mainly by pensions); on average 56 percent of older people are lifted out of poverty. These results are in line with the results of studies which are based on regression models (Been et

al., 2017; Jacques et al. 2018). Furthermore, the data show that old-age poverty rates and the redistribution through pensions vary substantially across countries. A closer look at minimum pension benefits and at pension replacement rates for different earnings levels provides insight into the varying incidence of old-age poverty and the varying magnitude of redistribution through pensions.

Finally, we examined the developments in the old-age poverty incidence over time. In almost all countries, the poverty rates based on disposable income declined substantially between 1985 and 2013. The reason for this substantial reduction in old-age poverty is the increase of the share of older people lifted out of poverty via tax/benefit systems, mainly through pensions. Interestingly, the trend in the poverty rates of the working-age population differs from that of older people; in most countries of our sample, the poverty incidence increased for the working-age population. However, it should be noted that in most Western countries, poverty rates for older people are still at a higher level than for the working-age population.

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