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Has the redistributive effect of social transfers and taxes changed over time across countries?

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Abstract In most Member countries of the Organisation for Economic Co-operation Development (OECD), the income gap between rich and poor has widened over the past decades. This article analyses whether and to what extent income taxes and social transfers have contributed to this trend. Has the redistributive impact of different social programmes changed over time? We use microdata from the LIS Cross National Data Center in Luxembourg for the period 1982–2014 and study both the total population and the working-age population. In contrast to the results of some other studies, especially by the OECD, we do not find that redistribution has declined. Tax-benefit systems around 2013 are more effective at reducing income inequality compared to the mid-1980s

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and the mid-1990s, especially among the total population. Changes in social programmes are not a driver of greater income inequality across the countries included in this study.

Keywords welfare state, cash benefit, income redistribution, taxation, OECD

Introduction

The overall tendency over the past two or three decades has been for an increase in income inequality in the large majority of wealthy nations. In Member countries of the Organisation for Economic Co-operation Development (OECD), from the mid-1980s, greater inequality in primary income¹ has driven the widening of the income gap between rich and poor (OECD, 2008, 2011, 2015). Several explanations of income inequality have been introduced (Atkinson, 2015; Piketty, 2014). One of the main driving forces behind disposable income distribution is the reduction of inequality through the tax-transfer system (Atkinson and Brandolini, 2001; Smeeding, 2004). The overall redistributive effect can be divided into redistribution by transfers and by income taxes, but can also be detailed more specifically (Ferrarini and Nelson, 2003; Jesuit and Mahler, 2010, 2017; Wang, Caminada and Goudswaard, 2012). In the middle of the first decade of this millennium, the average redistributive effect achieved by public cash transfers was twice as large as that achieved through household taxes. Regardless, the example of the United States is noteworthy for achieving a greater part of its redistribution through taxes (OECD, 2008 and 2011; Whiteford, 2010; Wang and Caminada, 2011; Wang, Caminada and Goudswaard, 2012). As the tax-transfer system has only been able to offset a part of the rise in primary income inequality over the last 25 years, disposable income (i.e. income after income taxes and social benefits) has also become more unequal in many countries.

This article examines in detail the observed changes in the redistributive effects of social transfers and income taxes (including social contributions) for households. The extensive literature on “welfare state retrenchment” that has emerged over the last decades seems to imply that welfare states have become less redistributive. The OECD concludes that redistribution has in recent years

1. Primary income can be defined as income from work and capital and net transfers from other households. See: <www.oecd.org/els/soc/IDD-ToR.pdf>.

decreased in a majority of countries (Causa and Hermansen, 2017). Other studies, to the contrary, show that most welfare states became more redistributive in the 1980s and 1990s (Kenworthy and Pontusson, 2005; Wang, Caminada and Goudswaard, 2014). Welfare states have not compensated completely for the higher inequality in primary income among households, but most have done so to some degree. By and large, welfare states have worked the way they were designed to work. It is markets – not redistribution policies – that have become more inegalitarian. It is worth noting that, because tax-benefit systems are generally progressive, one could expect higher primary income inequality to lead automatically to more redistribution, even without policy actions (Immervoll and Richardson, 2011).

The growing interest in national and cross-national differences in earnings and income inequality has produced a wide range of studies. An important development has been the launching of the LIS Cross-National Data Center in Luxembourg (LIS), through which microdata-sets from various countries have been “harmonized”.² Consequently, it is possible to study income inequality across countries and years (see Atkinson, Rainwater and Smeeding, 1995). However, the improvement in methods of measurement and in empirical knowledge sits in contrast with the lack of insight into the causes of changes in equality over time.³ This should perhaps not come as a surprise, as the distribution of income in a country is the outcome of numerous decisions made over time by households, enterprises, organizations and the public sector (Gottschalk and Smeeding, 2000). For many countries, important forces behind growing disposable income inequality are the growth of inequality of earned primary income, demographic changes, changes in household size and composition, and other endogenous factors. The evolution of income inequality is not simply the product of common economic forces: it also represents the impact of institutions and national policies (Atkinson, 2000).

Our analysis of the level and the evolution of income distribution and fiscal redistribution uses LIS data on income in a standardized way across countries and over time. We focus here on the effect of several social transfers and income taxes (including social contributions) in redistributing income, and we analyse trends for the period 1982–2014 with the most recent data. We use the traditional budget incidence approach – despite some methodological problems that we will address – to study the combined effects of income taxes and transfers on income (re)distribution. The distribution of primary income is compared with the distribution of income after taxes and after social transfers.

2. LIS Cross-National Data Center. 2017. Luxembourg Income, *LIS Key Figures* and *LIS Database*, Luxembourg <www.lisproject.org>.

3. The OECD (OECD, 2008, 2011 and 2015) summarizes trends and driving factors in income distribution and poverty based on the responses to a harmonized questionnaire of OECD Member countries (i.e. distribution indicators derived from national micro-economic data).

The change in summary measures of inequality between pre- and post-government income represents direct government redistribution.

In this article, we elaborate on the work of Mahler and Jesuit (2006) and Wang, Caminada and Goudswaard (2014). We offer a user-friendly dataset, the *Leiden LIS budget incidence fiscal redistribution dataset on income inequality* (Wang and Caminada, 2017). A new database was asked for, because the LIS staff implemented a major database template revision. Most components of this revised template have been applied, retroactively, to all earlier waves of the microdata. The revised template increases comparability both over time and cross-nationally. The updated dataset covers all 47 LIS-countries and a longer period (1967–2014).

The remainder of the article is organized as follows. First, we summarize the literature on the redistributive effect of taxes and transfers in LIS countries. We then present our research method and our empirical results before offering conclusions.

Income inequality and the redistributive effects of taxes and transfers across countries

6

The relationship between income inequality and redistribution in a cross-country perspective is far from transparent (Lambert, Nesbakken and Thoresen, 2010). The main reason for this stems from differences in measurement strategies. Indeed, with three distributions involved (pre-tax-transfer income, post-tax-transfer income, and the tax-benefit system), and with different inequality measures to sum up these distributions, it is unsurprising that the literature offers a plethora of research methods and empirical results. We shall briefly review a number of studies, restricting ourselves to the Gini-based literature and its application, which is by far the most prevalent.

Several studies analyse income distribution across countries, indicating that the role of social policy (taxes and transfers) is important in the magnitude of income redistribution.⁴ Kenworthy and Pontusson (2005) examined the trend in primary income inequality and redistribution in OECD countries in the 1980s and 1990s, indicating that redistribution increased in most countries. Welfare state policies compensated for the rise in primary income inequality across countries.

A recent study by the OECD (Causa and Hermansen, 2017) using data up to 2014 concludes that redistribution through income taxes and cash transfers cushions income inequality among the working-age population on average by slightly more than one quarter in OECD countries (see also Immervoll and Richardson, 2011). In all countries, cash transfers account for the largest part of

4. Among others, Atkinson (2003), Atkinson and Brandolini (2001), Brandolini and Smeeding (2007), and Smeeding (2004).

redistribution and taxes for a smaller part. Social security contributions have weak regressive effects in a number of countries. However, the OECD study also finds that redistribution has declined on average and in the majority of the countries since the mid-1990s, especially between the mid-1990s and the mid-2000s. In particular, in some Nordic countries redistribution has reduced substantially. The decline in total redistribution is attributable mainly to transfers, with taxes playing a less important role.

Bargain et al. (2017) analyse the impact on inequality of the reform of tax-benefit programmes in response to the Great Recession, using microsimulation and household surveys. For the first stage of the crisis, they find that policy responses contributed to stabilizing or even decreasing inequality in the United Kingdom, France and Ireland. In Germany, policy effects on inequality were small. In the later stage of the crisis, policy reforms had mixed effects. During this period, tax-benefit changes increased inequality, especially in Ireland.

Most studies focus on overall redistribution; others have examined in more detail the impact of income components on overall inequality (Shorrocks, 1983; Lerman and Yitzhaki, 1985; Jenkins, 1995; Breen, García-Peñalosa and Orgiazzi, 2008). These suggest that income taxes and social benefits are important to reduce household income inequality. Plotnick (1984) calculates the redistributive impact of cash transfers in the United States in 1967 and in 1974. Caminada and Goudswaard (2001) performed a budget incidence analysis for the Netherlands to investigate the effect of transfers and taxes in 1981, 1991 and 1997. Ferrarini and Nelson (2003) focus on the effects of taxation and social insurance in ten countries around 1995, analysing inter- and intra- country comparisons of income (re)distribution. Mahler and Jesuit (2006) divide government redistribution into several components: the redistributive effects from unemployment benefits, from pensions, and from taxes. They applied their empirical exercise for 13 countries with LIS-data around the years 1999/2000. Caminada, Goudswaard and Wang (2012) and Wang, Caminada and Goudswaard (2012 and 2014) updated and extended the analyses of Mahler and Jesuit (2006) by taking into account many more benefits and taxes, and applied a budget incidence analysis to a wider range of 36 countries with LIS data up to around 2004. They conclude that transfers account for 75 per cent of redistribution, while direct taxes account for 25 per cent. More than half of the total redistribution owing to transfers comes from pension benefits, although the redistributive character of pension benefits varies across countries. Unemployment benefits are the second most important programme in terms of redistribution, but their redistributive impact is only one fifth of the effect of pension benefits. Another finding of Mahler and Jesuit (2006) is that redistribution relates more strongly to the size of social benefits than to the extent to which benefits target lower income groups (targeting efficiency). Studies that

apply tax-benefit instruments sequentially suggest that the redistributive effect of transfers is much more important than taxes (e.g. Immervoll et al., 2005; Mahler and Jesuit, 2006; Wang, Caminada and Goudswaard, 2012, 2014).

A number of studies use the EUROMOD microsimulation model for the European Union⁵ to analyse the distributional impact of transfers and taxes. De Agostini et al. (2014) analyse tax-benefit policy reforms implemented since the Great Recession. They find that the changes in direct taxes, pensions and cash benefits have had, broadly, inequality reducing effects, except in Germany. However, after including VAT, the policy package appears to have been more regressive. Hills et al. (2014) point out that most of the structural policy changes, especially those introduced in the 2007–2011 period of the crisis, had inequality increasing effects. Avram, Levy and Sutherland (2014) analyse different types of policies in reducing income disparities. They conclude that pension benefits and direct taxes have the strongest impact on redistribution, despite the low progressivity of these programmes in some countries. Thus, the size of the programmes matters more than their targeting on lower income groups. As suggested by Figari and Paulus (2015), the overall redistributive effect of the tax-benefit systems depends heavily on the income concept concerned. They introduce an extended income concept, which also includes indirect taxes, imputed rent and in-kind benefits. Applying this concept to three European countries (Belgium, Greece and the United Kingdom), they find that differences in redistribution across countries become smaller.

Research method

Measuring the redistributive effects of income taxes and social transfers

The standard method to calculate the impact of social transfers on income inequality is the statutory or budget incidence analysis (Musgrave, Case and Leonard, 1974). Through comparing pre-tax-transfer income inequality and post-tax-transfer income inequality, the redistributive effect of taxes and income transfers can be assessed (OECD, 2008, p. 98). Redistribution is simply the difference between primary income inequality and disposable income inequality. In this type of analysis, income inequality is measured by the Gini index. However, there are several indicators of income inequality, and these do not always tell the same story (see Atkinson, Rainwater and Smeeding, 1995).

There is a critical literature on budget incidence analyses; see Smolensky, Hoyt and Danziger (1987) for a critical assessment of efforts to measure budget

5. See <www.euromod.ac.uk>.

incidence. For example, analyses on budget incidence ignore the important issue of behavioural responses, and tax/transfer shifting in particular. Both the generosity and efficiency of the tax-transfer system may influence the level of pre-tax-transfer income inequality. However, models that include all behavioural links are beyond the scope of existing empirical work (Gottschalk and Smeeding, 2000). Therefore, researchers have restricted themselves largely to accounting exercises that decompose changes in overall inequality into a set of components (see Kristjánsson, 2011; Fuest, Niehues and Peichl, 2010; Paul, 2004). The criticisms leave the stylized conclusions of budget incidence analyses intact.

To assess the partial effects of specific social benefits and taxes on overall redistribution, we apply a sequential accounting decomposition technique to the Gini. It should be noted, however, that this procedure is somewhat arbitrary since the choice of benchmark income affects the outcome. Applying the redistribution from, say, taxes on gross income rather than primary income alters the outcome to some extent. Since taxes are levied on gross income (primary income plus social benefits), the redistributive effects may be underestimated. Nevertheless, the logic of this decomposition of the Gini is that taxes are applied to gross income and benefits to primary income. This approach has been, among others, advocated by Kakwani (1986).

Our sequential accounting decomposition approach of income inequality follows studies by Mahler and Jesuit (2006), Kristjánsson (2011) and Kammer, Niehues and Peichl (2012), with inequality indices accounted sequentially in order to determine the effective distributional impact of different income sources. Other techniques of the decomposition of the Gini coefficient by income source are found in the literature as well,⁶ but the sequential accounting approach is the most straightforward.

Disentangling inequality by income source could be affected by the ordering effect. For example, the partial redistributive effect of a specific social transfer will be highest (smallest) when computed as the first (last) social programme. The order of the calculations affects the results. We correct for this as follows: we first consider every specific social transfer as the first programme to be added to primary income and then the last programme following all other transfer programmes. Consequently, we get two results for the Gini. When we take the mean of the decomposition results across countries, the sum of all partial redistributive effects amount to (a little) over 100 per cent due to missing observations. We rescaled the redistributive effects of each programme by applying an adjustment factor to correct for this effect; see Caminada et al. (2017) for details.

6. See, for example, Lerman and Yitzhaki (1985), Stark, Taylor and Yitzhaki (1986), Kim (2000), Creedy and van de Ven (2001).

Data

LIS is the largest available income database of harmonized microdata collected from 47 countries in Europe, North America, Latin America, Africa, Asia, and Australasia spanning five decades. LIS data are available for ten waves, centred on 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2004, 2007 and 2010. However, not every country is represented in every wave and some countries include more than one year in a single wave. Harmonized into a common framework, LIS datasets contain household- and person-level data on labour income, capital income, social security and private transfers, income taxes and contributions, demography, employment, and expenditures (Ravallion, 2015). The LIS database allows scholars to access the microdata, so that income inequality measures and fiscal redistribution (and the partial effect per social programme) can be derived consistently from the underlying data at the individual and household level. LIS microdata seem to be the best available data for describing how income inequality and the redistributive effects of income taxes and social transfers vary across countries and over time (Nolan and Marx, 2009; Smeeding and Latner, 2015; Nieuwenhuis, Munzi and Gornick, 2016). We apply a cross-national analysis using comparable income surveys for all countries of LIS from 1982–2014. From nearly 300 variables in the dataset, we choose 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 income inequality and the redistributive effect across countries. In line with LIS convention and the work of Mahler and Jesuit (2006) and Wang and Caminada (2011), we have eliminated observations with a zero or a missing value of disposable income from LIS data. Household weights are applied for the calculation of Gini coefficients.

Country-comparative and trend analyses of income distribution based on LIS gross/net datasets should be undertaken with caution. LIS provides gross income data in most countries and years while providing income data that are net of (income) taxes in others. Of the 293 LIS datasets available at the time of writing, 194 are classified as gross, 84 as net and 15 as “mixed”.⁷

Choice of income unit

Conventionally, studies have used household income per capita to adjust total incomes according to the number of persons in the household. In the last decades, equivalence scales have come to be widely used in the literature on income distribution (Figini, 1998). An equivalence scale is a function that

7. See Documentation Guide in Wang and Caminada (2017).

calculates adjusted income from income and a vector of household characteristics. Equivalence scale elasticity for the LIS database is set around 0.5. This implies that in order to have an equivalent income of 100, a household of two persons must have an income of 140 to have equivalent incomes. Put alternatively, a one-person household must have 70 per cent of the total income of a two-person household to have equivalent income. However, it has been shown that the choice of equivalence scales affects international comparisons of income inequality to a wide extent. Alternatively, adjustment methods would definitely affect the ranking of countries, although the broad pattern remains the same (Atkinson, Rainwater and Smeeding, 1995, p. 52).

Focus on total population – including public pension schemes

Unlike most existing studies, this study focuses both on the total population and on the non-elderly population (those aged 18–64). Restricting the analysis to the non-elderly would avoid some of the problems inherent to comparisons of incomes between people who are at different stages in their lives. For instance, an essential function of old-age pensions is to redistribute inter-temporally over the life cycle; in this case, a focus on the non-elderly helps to understand the most important elements of interpersonal redistribution. However, we believe that the largest government transfer programme, public pensions, cannot be excluded from our analysis. Public pension plans are generally seen as part of the safety net, generating large antipoverty effects. Thus, state old-age pension benefits will be included in our analysis on redistribution. Clearly, countries differ in the public versus private provision of their pensions (OECD, 2008, p. 120). Occupational and private pensions are not redistributive programmes 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 the elderly (Been et al., 2017). In this study, we pragmatically follow the LIS Household Income Variables List: occupational and private pensions are earmarked and treated as social security transfers (see also Jesuit and Mahler, 2017).

Trends in the distribution of primary and disposable income in LIS countries

Inequality across countries 1982–2013

This section presents cross-national comparisons of primary and disposable income inequality across countries over time. We selected 15 countries with at

least three data points (around 1985, 1997 and 2010 or later). Moreover, we selected countries for which full information is available on the whole trajectory from primary income to disposable income. The changes in inequality levels are illustrated by the Gini coefficients. In order to give a general idea, we cluster the countries around 1985, 1997, and 2010 or later respectively, showing the average trends of inequality and redistribution. We show country profiles for all 15 LIS countries in Figure 1.

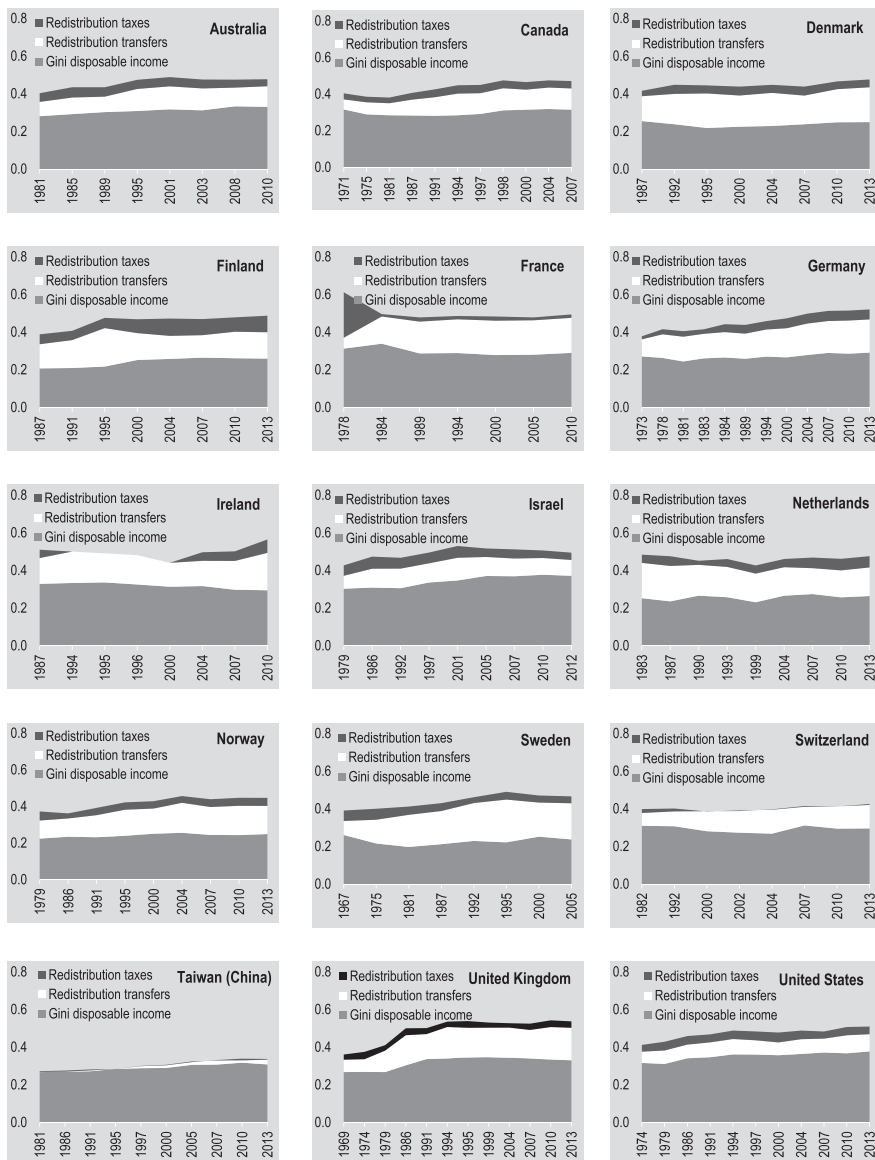
Table 1 shows the 15-country average trend of primary income and disposable income inequality from 1985 to 2014. This table highlights some significant differences across periods in a general way. When the total population is taken into account, income inequality increased markedly on average. This increase was stronger during 1997–2014 compared to 1985–1997. The widening of income gaps was driven by rising inequality in the distribution of primary income, which was partly offset by social transfers and income taxes and social security contributions. In the second decade, primary income inequality and disposable income inequality rose, more or less, in parallel.

We show that inequality of primary income has increased by 11 per cent over a 25-year period on average for the countries shown. This is a substantial increase over a relatively short period. Though primary income inequality has been a main driver of inequality trends in disposable incomes, the effect of fiscal redistribution remains to be determined. Between 1982 and 2013, redistribution systems compensated 63 per cent of the increase in primary income inequality. Primary income inequality rose by about 0.048 on average, while redistribution rose 0.030. Income taxes and social transfers reduced income inequality by about 38 per cent around 2013; this is slightly higher than in the mid-1980s (35 per cent). If we look at the working-age population only, the trends are similar: rising primary income inequality and a slightly lower increase in disposable income inequality. Fiscal redistribution among the working-age population has also increased, but to a lesser extent than among the total population.

Country-specific results are also presented in Table 1. Tax-benefit systems in Ireland, Germany, Sweden, Finland and Denmark achieve the greatest reduction in inequality, lowering the Gini value by 22.5 points or more around 2013. The smallest redistributive effect is seen in Taiwan (China), Israel, Switzerland, the United States and Australia (less than 15 points).

Through the entire period, disposable income inequality increased significantly in Israel and Finland, whereas it decreased in France, Ireland, Switzerland and Denmark. In the period around 1985–1997, higher disposable income inequality was mainly “caused” by higher primary income inequality (although primary income inequality declined in Israel and Sweden). In this period, government redistribution has offset the widening of income gaps through public cash transfers and household taxes either in full (e.g. Denmark, France, Ireland, the Netherlands

Figure 1. Trends in income inequality and fiscal redistribution in 15 LIS countries



Source: Wang and Caminada (2017) database based on LIS.

and Switzerland) or in part (in all others; see Figure 1). On average across countries, disposable income inequality hardly changed (+0.001). Cross-country variance has widened since the mid-1990s. Primary income inequality increased

Table 1. Trends in Gini indices of primary income and disposable income and fiscal redistribution, 1982–2013

A. Total population														
Gini primary income					Gini disposable income					Fiscal redistribution				
	around 1985	around 1997	around 2013	change 85-13	%	around 1985	around 1997	around 2013	change 85-13	%	around 1985	around 1997	around 2013	change 85-13
Australia (85-95-10)	0.434	0.474	0.477	0.043	10	0.292	0.308	0.330	0.039	13	0.143	0.166	0.147	0.004
Canada (87-97-10)	0.407	0.450	0.481	0.074	18	0.283	0.291	0.317	0.034	12	0.124	0.158	0.164	0.040
Denmark (87-95-13)	0.416	0.444	0.476	0.060	14	0.255	0.218	0.249	-0.005	-2	0.161	0.227	0.226	0.065
Finland (87-95-13)	0.388	0.475	0.487	0.099	26	0.207	0.216	0.259	0.052	25	0.181	0.259	0.228	0.047
France (84-94-10)	0.496	0.486	0.494	-0.002	0	0.338	0.288	0.289	-0.049	-14	0.158	0.197	0.204	0.047
Germany (84-94-13)	0.442	0.458	0.520	0.079	18	0.265	0.270	0.291	0.026	10	0.177	0.188	0.229	0.052
Ireland (87-96-10)	0.510	0.481	0.564	0.055	11	0.328	0.325	0.294	-0.034	-10	0.181	0.156	0.270	0.089
Israel (86-97-12)	0.473	0.495	0.494	0.021	4	0.309	0.336	0.371	0.063	20	0.165	0.159	0.123	-0.042
Netherlands (83-99-13)	0.483	0.426	0.475	-0.008	-2	0.252	0.231	0.264	0.011	5	0.231	0.196	0.212	-0.019
Norway (86-95-13)	0.362	0.422	0.446	0.085	23	0.234	0.239	0.248	0.015	6	0.128	0.183	0.198	0.070
Sweden (87-95-05)	0.429	0.490	0.466	0.036	8	0.212	0.221	0.237	0.025	12	0.218	0.268	0.229	0.011
Switzerland (82-00-13)	0.398	0.385	0.425	0.027	7	0.309	0.280	0.295	-0.014	-5	0.089	0.105	0.130	0.041
Taiwan (China) (86-97-13)	0.275	0.300	0.333	0.058	21	0.269	0.287	0.308	0.039	15	0.007	0.012	0.025	0.019
United Kingdom (86-99-13)	0.500	0.530	0.537	0.037	7	0.303	0.346	0.330	0.027	9	0.196	0.184	0.207	0.010
United States (86-97-13)	0.459	0.483	0.509	0.050	11	0.340	0.360	0.377	0.037	11	0.118	0.123	0.132	0.014
Mean-15	0.431	0.453	0.479	0.048	11	0.280	0.281	0.297	0.018	6	0.152	0.172	0.182	0.030

(Continued)

Table 1. Trends in Gini indices of primary income and disposable income and fiscal redistribution, 1982–2013 - Continued

B. Working-age population														
	Gini primary income				Gini disposable income				Fiscal redistribution					
	around 1985	around 1997	around 2013	change 85-13	%	around 1985	around 1997	around 2013	change 85-13	%	around 1985	around 1997	around 2013	change 85-13
Australia (85-95-10)	0.390	0.422	0.414	0.025	6	0.279	0.299	0.313	0.034	12	0.111	0.123	0.102	-0.009
Canada (87-97-10)	0.369	0.403	0.432	0.063	17	0.280	0.293	0.322	0.042	15	0.090	0.110	0.110	0.020
Denmark (87-95-13)	0.349	0.377	0.402	0.053	15	0.238	0.209	0.250	0.012	5	0.112	0.168	0.153	0.041
Finland (87-95-13)	0.342	0.430	0.408	0.066	19	0.203	0.222	0.260	0.057	28	0.139	0.207	0.148	0.009
France (84-94-10)	0.459	0.430	0.437	-0.021	-5	0.341	0.292	0.294	-0.047	-14	0.117	0.138	0.143	0.026
Germany (84-94-13)	0.361	0.377	0.419	0.058	16	0.254	0.267	0.296	0.042	16	0.107	0.109	0.123	0.016
Ireland (87-96-10)	0.503	0.436	0.517	0.014	3	0.346	0.316	0.294	-0.052	-15	0.157	0.120	0.224	0.067
Israel (86-97-12)	0.440	0.456	0.458	0.018	4	0.302	0.330	0.359	0.057	19	0.137	0.126	0.099	-0.039
Netherlands (83-99-13)	0.442	0.359	0.407	-0.035	-8	0.249	0.230	0.272	0.023	9	0.193	0.129	0.134	-0.059
Norway (86-95-13)	0.290	0.348	0.391	0.100	35	0.221	0.234	0.258	0.037	17	0.070	0.114	0.133	0.063
Sweden (87-95-05)	0.350	0.424	0.391	0.041	12	0.215	0.242	0.235	0.020	9	0.135	0.181	0.156	0.021
Switzerland (82-00-13)	0.340	0.328	0.346	0.006	2	0.304	0.279	0.285	-0.019	-6	0.036	0.048	0.061	0.025
Taiwan (China) (86-97-13)	0.276	0.287	0.308	0.032	11	0.270	0.282	0.296	0.026	10	0.007	0.005	0.012	0.005
United Kingdom (86-99-13)	0.434	0.457	0.459	0.026	6	0.299	0.339	0.335	0.036	12	0.134	0.118	0.124	-0.011
United States (86-97-13)	0.413	0.434	0.464	0.051	12	0.329	0.351	0.374	0.045	14	0.084	0.083	0.090	0.006
Mean-15	0.384	0.398	0.417	0.033	9	0.275	0.279	0.296	0.021	8	0.109	0.119	0.121	0.012

Notes: Ireland 1996: income data net of income taxes (marked italic). Sweden is included although latest data year available is 2005.

Source: Wang and Caminada (2017) database based on LIS, and own calculations.

in nearly all countries (with Israel and Sweden as exceptions), markedly so in Ireland, Germany, the Netherlands and Switzerland. Disposable income inequality increased in all countries except for Ireland and the United Kingdom. On average, only 37 per cent of the rise in income inequality was offset by redistribution through taxes and transfers in the period 1997–2013 (which compares with 93 per cent for 1985–1997).

Fiscal redistribution rose in 11 of our 15 countries in the period 1985–1997 and in nine countries in the period around 1997–2013. Moreover, since 1983 fiscal redistribution has risen in nearly all countries, with Israel and the Netherlands as exceptions.

Table 2 summarizes the results for trends in redistribution among the working-age population and the total population for 15 countries with full tax and benefit information for around 1985, around 1995 and around 2013. Since the mid-1980s, and again since the mid-1990s, fiscal redistribution has increased

Table 2. *Trends in fiscal redistribution among working-age and total population, 1982–2013*

	Total population			Working-age population		
	Gini primary income	Gini disposable income	Fiscal redistribution	Gini primary income	Gini disposable income	Fiscal redistribution
Around 1985	0.431	0.280	0.152	0.384	0.275	0.109
Around 1997	0.453	0.281	0.172	0.398	0.279	0.119
Around 2013	0.479	0.297	0.182	0.417	0.296	0.121
Change 1985–2013	0.048	0.018	+0.030	0.033	0.021	+0.012
Change 1985–1997	0.022	0.002	+0.020	0.014	0.004	+0.010
Change 1997–2013	0.026	0.016	+0.010	0.019	0.017	+0.002
Share of rise inequality primary income offset by fiscal redistribution			Share of rise inequality primary income offset by fiscal redistribution			
1985–2013	63%		37%			
1985–1997	93%		73%			
1997–2013	37%		10%			

Notes: Selected countries: Australia, Canada, Denmark, Finland, France, Germany, Ireland, Israel, Netherlands, Norway, Sweden, Switzerland, Taiwan (China), United Kingdom and United States.

Source: Wang and Caminada (2017) database based on LIS, and own calculations.

on average in the 15 countries considered. This is the case, both, when the working-age population and the total population is taken into consideration. This diverges from the results found by Causa and Hermansen (2017), who conclude that across OECD countries redistribution through taxes and transfers has declined over the last two decades. In our case, we find that benefit systems in the mid-2000s are even more effective at reducing inequality compared to the mid-1990s, although the difference is very small when only the working-age population is taken into account. Therefore, our results suggest that the claim that reduced redistribution is a main driver of widening income gaps since the mid-1990s overstates the situation. Further, Table 2 also shows that the *share* of the rise in primary income inequality that has been offset by fiscal redistribution has declined since the mid-1990s, both among the total population and among the working-age population.

Redistributive effect of taxes and transfers 1982–2013

Table 3 highlights that the trend of overall redistribution is mainly caused by social transfers. From the mid-1980s to the mid-1990s, total redistribution increased, driven by the stronger redistributive effect of transfers. In the decade from the mid-1990s to around 2013, hardly any change was observed in overall redistribution. The average total redistribution increased by 0.030 points in the 15 LIS countries from around 1985 to around 2013.

Figure 1 illustrates the trends of overall tax and transfers redistribution for each of the 15 LIS countries. From the mid-1980s to around 2013, total redistribution increased in all countries except Israel and the Netherlands. The additional redistribution of social transfers drove this. Tax systems became less redistributive in seven of the countries: Australia, Israel, Sweden, Switzerland, Taiwan (China), the United Kingdom and the United States.

From the mid-1990s to around 2013, the patterns of redistribution across countries are more diverse, both in overall redistribution and in tax and transfers redistribution. During this period, total redistribution hardly changed or fell in all countries (with Ireland as the exception).

Inequality and fiscal redistribution before and after the Great Recession

This section examines the impact of the economic crisis that started in 2008 on income distribution and fiscal redistribution. In total, 23 countries for which there is full information on income and taxes for the years before the Great Recession (around 2006–2007) and for 2012 and after were selected. As shown in Table 4, primary income inequality has increased in all countries since around

Has the redistributive effect of social transfers and taxes changed?

Table 3. *Redistribution across 15 LIS countries, 1982–2013*

	Fiscal redistribution			Partial effects: Changes 1985-2013		
	Around 1985	Around 1997	Around 2013	Change 85-13	From transfers	From taxes
Australia (85-95-10)	0.143	0.166	0.147	0.004	0.021	-0.017
Canada (87-97-10)	0.124	0.158	0.164	0.040	0.038	0.002
Denmark (87-95-13)	0.161	0.227	0.226	0.065	0.053	0.013
Finland (87-95-13)	0.181	0.259	0.228	0.047	0.012	0.036
France (84-94-10)	0.158	0.197	0.204	0.047	0.042	0.005
Germany (84-94-13)	0.177	0.188	0.229	0.052	0.041	0.011
Ireland (87-96-10)	0.181	0.156	0.270	0.089	0.062	0.027
Israel (86-97-12)	0.165	0.159	0.123	-0.042	-0.016	-0.026
Netherlands (83-99-13)	0.231	0.196	0.212	-0.019	-0.035	0.016
Norway (86-95-13)	0.128	0.183	0.198	0.070	0.054	0.016
Sweden (87-95-05)	0.218	0.268	0.229	0.011	0.016	-0.005
Switzerland (82-00-13)	0.089	0.105	0.130	0.041	0.057	-0.016
Taiwan (China) (86-97-13)	0.007	0.012	0.025	0.019	0.028	-0.009
United Kingdom (86-99-13)	0.196	0.184	0.207	0.010	0.013	-0.003
United States (86-97-13)	0.118	0.123	0.132	0.014	0.019	-0.005
Mean-15	0.152	0.172	0.182	0.030	0.027	0.003

Source: Wang and Caminada (2017) database based on LIS, and own calculations.

Table 4. Trends in Gini indices of primary income and disposable income and fiscal redistribution, 2006–2014

	Gini primary income			Gini disposable income			Fiscal redistribution					
	Before crisis	After crisis	Change 07-13	%	Before crisis	After crisis	Change 07-13	%	Before crisis	After crisis	Change 07-13	%
Austria 2007–2013	0.485	0.493	0.009	2	0.284	0.279	−0.005	−2	0.201	0.215	0.014	7
Brazil 2006–2013	0.558	0.542	−0.016	−3	0.487	0.450	−0.037	−8	0.071	0.093	0.021	30
Czech Republic 2007–2013	0.446	0.457	0.011	2	0.251	0.258	0.007	3	0.195	0.199	0.004	2
Denmark 2007–2013	0.438	0.476	0.038	9	0.238	0.249	0.011	5	0.200	0.226	0.027	13
Estonia 2007–2013	0.493	0.540	0.047	9	0.312	0.352	0.040	13	0.181	0.188	0.007	4
Finland 2007–2013	0.469	0.487	0.018	4	0.264	0.259	−0.005	−2	0.205	0.228	0.023	11
Germany 2007–2013	0.512	0.520	0.008	2	0.289	0.291	0.002	1	0.223	0.229	0.006	3
Greece 2007–2013	0.515	0.567	0.052	10	0.320	0.332	0.012	4	0.195	0.235	0.040	20
Guatemala 2006–2014	0.490	0.427	−0.063	−13	0.472	0.394	−0.078	−17	0.018	0.034	0.016	85
Israel 2007–2012	0.512	0.494	−0.018	−3	0.369	0.371	0.003	1	0.143	0.123	−0.020	−14
Korea, Rep. of 2006–2012	0.330	0.337	0.007	2	0.305	0.306	0.001	0	0.025	0.031	0.006	26
Luxembourg 2007–2013	0.456	0.475	0.020	4	0.276	0.283	0.007	3	0.180	0.192	0.012	7
Netherlands 2007–2013	0.468	0.475	0.007	2	0.274	0.264	−0.011	−4	0.194	0.212	0.018	9
Norway 2007–2013	0.439	0.446	0.008	2	0.244	0.248	0.005	2	0.195	0.198	0.003	1
Panama 2007–2013	0.516	0.514	−0.001	0	0.481	0.467	−0.014	−3	0.035	0.048	0.013	37

(Continued)

Table 4. Trends in Gini indices of primary income and disposable income and fiscal redistribution, 2006–2014 - Continued

	Gini primary income			Gini disposable income			Fiscal redistribution					
	Before crisis	After crisis	Change 07-13 %	Before crisis	After crisis	Change 07-13 %	Before crisis	After crisis	Change 07-13 %			
Peru 2007–2013	0.524	0.483	−0.041	−8	0.500	0.455	−0.045	−9	0.024	0.028	0.004	18
Poland 2007–2013	0.490	0.484	−0.006	−1	0.310	0.316	0.006	2	0.180	0.168	−0.012	−7
Slovakia 2007–2013	0.503	0.425	−0.078	−16	0.248	0.268	0.021	8	0.255	0.157	−0.099	−39
Spain 2007–2013	0.475	0.520	0.046	10	0.307	0.343	0.037	12	0.168	0.177	0.009	6
Switzerland 2007–2013	0.410	0.425	0.015	4	0.311	0.295	−0.016	−5	0.099	0.130	0.031	31
Taiwan (China) 2007–2013	0.329	0.333	0.004	1	0.307	0.308	0.001	0	0.022	0.025	0.003	15
United Kingdom 2007–2013	0.524	0.537	0.012	2	0.339	0.330	−0.009	−3	0.186	0.207	0.021	11
United States 2007–2013	0.483	0.509	0.027	6	0.371	0.377	0.006	2	0.111	0.132	0.020	18
Mean-23	0.472	0.477	0.005	1	0.329	0.326	−0.003	−1	0.144	0.151	0.007	5

Source: Wang and Caminada (2017) database based on LIS, and own calculations.

2007, except for Guatemala, Israel, Peru, Poland and Slovakia. However, the Gini for disposable income has decreased in a large number of countries, with a 1 per cent decrease on average. The most significant reduction in disposable income inequality (17 per cent) appears in Guatemala. Estonia and Spain, in contrast, are the countries with the largest increases in inequality of disposable income. We do not find that fiscal redistribution has been less effective since the Great Recession. On the contrary, the increase in fiscal redistribution has offset rising primary income inequality and led to more equal disposable income distribution.

On average, income inequality has decreased slightly and fiscal redistribution has risen since the Great Recession. The increase in fiscal redistribution comes mainly from social transfers while the redistributive effect of income taxes has been decreasing. Although all changes are rather small, our findings are not fully in line with the recent study by the OECD (Causa and Hermansen, 2017) that states that the economic recovery has not reduced income inequality, because redistribution has decreased recently in a majority of countries. However, both the OECD and this study find that fiscal redistribution dampened the increase in market income inequality since 2007, although there is a large variation across countries.

Programme size and targeting of transfers

Considering the programmes' redistributive effect of social benefits, a distinction can be made between programmes' size and the extent to which benefits are targeted toward low-income groups by means testing. Using LIS microdata, it is possible to calculate a measure of the average value of social transfers as a percentage of households' gross income: the larger the value, the greater the share of total income that is derived from transfers. It is also possible to calculate a summary index of the degree to which transfers are targeted toward low-income groups. To do so, we apply Kakwani's (1986) "index of concentration" to transfers. This index takes on the value of -1.0 if the poorest person receives all the transfer income, 0 if every person receives an equal share, and +1.0 if the richest person receives all the transfer income (cf. Korpi and Palme, 1998, p. 684). For the time series around 1985–2013, the figures for the size and target efficiency of social benefits are calculated for 15 LIS countries and are reported in Table 5.

There is considerable variance among countries in the average size of social benefits relative to total household income. For the mid-1980s, five countries (Denmark, France, the Netherlands, Sweden and the United Kingdom) achieve a high budget size of transfers (20 per cent or more), whereas it is low in Australia, Canada, Israel, Norway, Switzerland, Taiwan (China) and the United States (less

Table 5. *Budget size and targeting efficiency across 15 LIS countries, 1982–2013*

	Budget size (%)			Targeting		
	Around 1985	Around 2013	Change 85-13	Around 1985	Around 2013	Change 85-13
Australia (1985–2010)	10.7	12.9	2.2	–0.340	–0.318	0.022
Canada (1987–2010)	12.8	18.2	5.4	–0.184	–0.066	0.119
Denmark (1987–2013)	20.5	23.6	3.0	–0.122	–0.199	–0.077
Finland (1987–2013)	19.1	25.5	6.4	–0.150	–0.033	0.117
France (1984–2010)	23.0	29.1	6.1	0.026	0.082	0.056
Germany (1984–2013)	16.9	22.4	5.5	–0.250	–0.118	0.132
Ireland (1984–2010)	18.9	26.8	7.9	–0.149	–0.087	0.062
Israel (1986–2012)	14.6	14.8	0.2	–0.109	0.010	0.119
Netherlands (1983–2013)	29.0	22.2	–6.8	–0.003	–0.117	–0.114
Norway (1986–2013)	14.0	23.2	9.2	–0.244	–0.064	0.180
Sweden (1986–2005)	27.6	28.1	0.4	–0.030	–0.074	–0.044
Switzerland (1982–2013)	8.1	17.2	9.1	0.089	–0.144	–0.232
Taiwan (China) (1986–2013)	0.5	9.9	9.4	0.048	0.077	0.029
United Kingdom (1986–2013)	21.9	21.7	–0.1	–0.138	–0.123	0.016
United States (1986–2013)	10.9	13.8	2.9	–0.207	–0.091	0.116
Mean – 15	16.6	20.6	4.1	–0.118	–0.084	0.033

Source: Wang and Caminada (2017) database based on LIS, and own calculations.

than 15 per cent). For around 2013, more countries achieve a high budget size (20 per cent or more), while Australia, Canada, Israel, Switzerland, Taiwan (China) and the United States still have budget sizes less than 15 per cent. Over time, social benefits' size increased in all countries, with the exception of the Netherlands.

Targeting efficiency is more diverse across countries. In the mid-1980s, cash benefits are targeted most to the poor in Australia and Germany, and are more universally distributed in Sweden, the Netherlands and France. Around 2013, Australia targeted more to the poor than other countries. Transfers were spread more universally in 11 out of our 15 countries. Generally speaking, transfers are less targeted to the poor and more universally distributed around 2013 than in earlier periods. Nevertheless, we observe social benefits to be targeted more to the poor over time in Switzerland, the Netherlands, Denmark and Sweden.

Decomposition of the redistributive effects of social transfers and income taxes over time

How have the redistributive effects of the different parts of welfare states altered over time and across countries? This section presents trends of detailed redistributive effects across a selection of LIS countries for which we have full information on taxes and benefits. For this, eight countries are selected based on two criteria: (i) the country has full tax/benefit information for at least three data points (around 1985, around 1997 and 2010 or later); (ii) the category "Other transfers" amounts to less than 20 per cent of total fiscal redistribution.

We calculate the following (partial) redistributive effects over time, based on the LIS household income components list: old-age/disability/survivor transfers, sickness transfers, family/children transfers, education transfers, unemployment transfers, housing transfers, general/food/medical assistance transfers, other social security transfers and income taxes and social security contributions. As explained before, we consider state old-age pension benefits as part of our analysis, because they are part of the safety net and generate significant reduction in poverty and income inequality. Also taken into account are occupational and private pensions.

To illustrate the idea of the decomposition from primary to disposable income inequality, Table 6 reports the trends of the redistributive effects of the different parts of tax-benefit systems averaged for eight LIS countries from the mid-1980s to around 2013.

The dominant pattern was one of increasing fiscal redistribution. Increasing fiscal redistribution came from old-age/disability/survivor benefits and, to a lesser extent, from unemployment benefits and housing benefits. Old age/disability/

Table 6. *Decomposition of disposable income inequality for eight countries 1982–2013: Averages by periods*

	Gini around 1985	Gini around 1995	Gini around 2013	Change 1985–2013
(a) Gini primary income	0.447	0.460	0.485	0.039
(b) Gini disposable income	0.289	0.286	0.310	0.021
Overall redistribution (a–b)	0.158	0.174	0.176	0.018
Transfers	75%	78%	78%	3%
Old-age/Disability/ Survivor transfers	47%	52%	56%	9%
Sickness transfers	1%	1%	0%	–1%
Family/Children transfers	7%	8%	7%	0%
Education transfers	6%	2%	1%	–5%
Unemployment transfers	5%	7%	6%	1%
Housing transfers	1%	3%	2%	2%
General/food/medical assistance transfers	2%	3%	3%	0%
Other transfers	7%	3%	2%	–5%
Income taxes and social security contributions	25%	22%	24%	–1%
Residual	0%	0%	–2%	–2%
Overall redistribution	100%	100%	100%	

Note: Selected countries: Australia, Finland, France, Germany, Israel, Netherlands, Switzerland and the United Kingdom.

Source: Wang and Caminada (2017) database based on LIS, and own calculations.

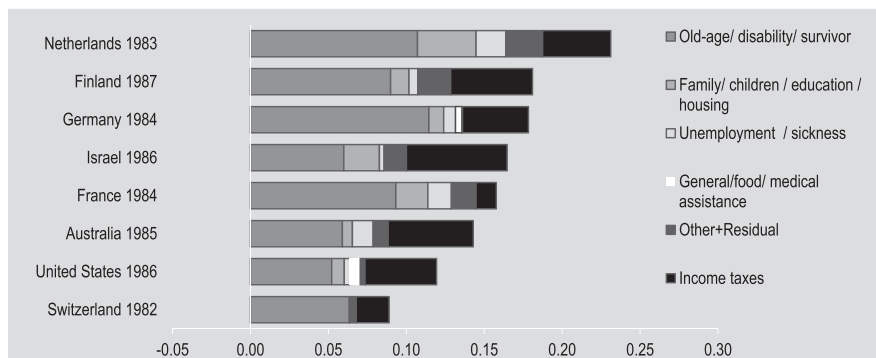
survivor benefits accounted for 47 per cent of total redistribution in the mid-1980s and for 58 per cent around 2013. Slightly less redistribution was generated by sickness benefits and income taxes. The share of education benefits in total redistribution declined more substantially, from 6 per cent around 1985 to only 1 per cent around 2013. Redistribution by other transfers has also fallen.

With respect to trends in the redistributive effects of several social programmes across countries, the results are diverse. Figure 2 presents how the fiscal redistribution of each social programme has changed over time across eight LIS countries. Countries are ranked in terms of fiscal redistribution, from highest to lowest.

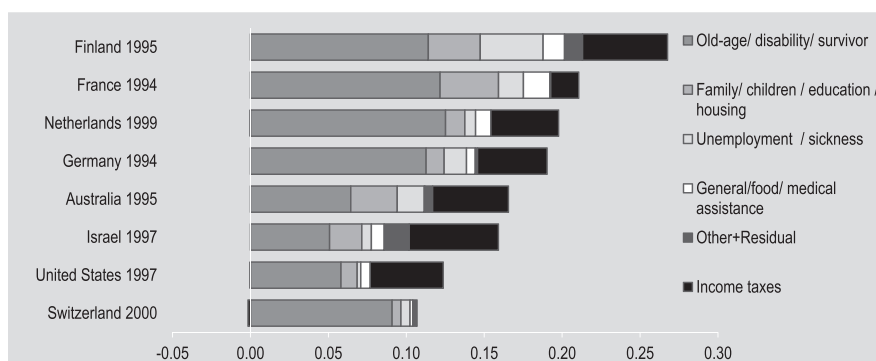
Over time, the Netherlands dropped in our country ranking on redistribution from first place to third. Germany's ranking changed from third to first. Finland is ranked second, with relatively high levels of fiscal redistribution. At the bottom

Figure 2. *Decomposition of fiscal redistribution of social transfers and taxes in eight countries, 1982-2013*

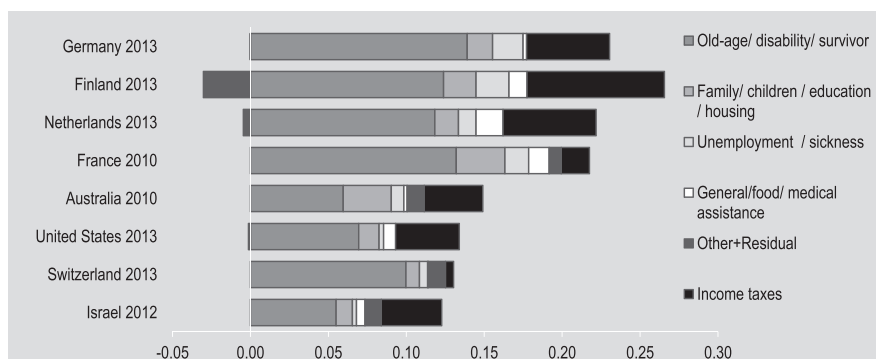
Panel A. Around 1985



Panel B. Around 1997



Panel C. Around 2013



Source: Wang and Caminada (2017) database based on LIS, and own calculations.

of the ranking, we find the United States, Switzerland and Israel, with the lowest levels of redistribution by social transfers and income taxes.

Old-age/disability/survivor benefits attribute most to redistribution in all countries around 2013 (35 per cent or more). From the mid-1980s to around 2013, the main pattern was the increasing contribution of these programmes to redistribution, except for Australia and Germany. Overall, old-age and survivor benefits account for 47 per cent of the total fiscal redistribution in our eight-country average for around 1985, and 56 per cent for around 2013.

The redistributive effect of benefits for family/children, education and housing varies across countries. Overall, these benefits account for 11 per cent of the total fiscal redistribution for our eight-country average in 2013; a decrease of 3 percentage points since 1985. The decrease comes mainly from education benefits.

The redistributive effect of unemployment compensation and sickness benefits decreased in half of the eight countries; namely Australia, France, the Netherlands and the United States. The overall contribution of unemployment and sickness benefits to total fiscal redistribution in our eight-country average was 6 per cent for around 1985 as well as for around 2013.

On average, income taxes attributed less to fiscal redistribution for the period 1985–2013 (25 per cent versus 24 per cent, in our eight-country average). However, cross-country differences are large. Income taxes became more progressive in Finland, France and the Netherlands – consistent with the trend towards greater primary-income inequalities, which, in itself, would increase taxation at the top end. However, tax progression declined in Australia, Germany, Israel, Switzerland and the United States.

Conclusions

We have investigated changes in income distribution over time and whether and to what extent social transfers and taxes have contributed to this trend, using the most recent micro household income data from the LIS Cross National Data Center in Luxembourg. We have provided trends of primary and disposable income inequality and of overall and disaggregated redistribution by social programmes in a comparative way, which offer an accurate and detailed picture of the redistribution of incomes through taxes and transfers across social welfare states.

We have applied a sequential budget incidence analysis for a selected group of 15 countries (with full tax/benefit information). Inequality of primary income has increased by 11 per cent over a 25-year period averaged for these countries. This is a substantial increase over a relatively short period. Primary-income inequality has been the main driver of inequality trends in disposable incomes.

However, fiscal redistribution compensated 63 per cent of the increase in primary-income inequality. In contrast to the results of other studies, especially by the OECD, we do not find that fiscal redistribution has declined. Tax-benefit systems around 2013 are more effective at reducing income inequality compared to the mid-1980s and the mid-1990s, especially when the total population is taken into account. As such, the claim that reduced redistribution is a main driver of widening income gaps appears to be overstated for the countries studied. Since the Great Recession, fiscal redistribution has increased.

Changes in redistribution can be related to changes in programme size or to changes in the targeting of benefits toward low-income groups. We find that programme size has increased in most countries, which contributed to fiscal redistribution. Moreover, in most countries, transfers for around 2013 are targeted less to the poor than in earlier periods, although there are some exceptions.

State old-age and survivors benefits (including disability schemes) attribute most to fiscal redistribution in the majority of countries; the main pattern was an increasing contribution of these programmes to redistribution in the period 1985–2013 (except for Germany and Finland). Overall, old-age and survivor benefits account for 47 per cent of the total fiscal redistribution in our eight-country average for around 1985, and 56 per cent for around 2013. Income taxes, on average, also attributed to fiscal redistribution in the period 1985–2013; 25 per cent (around 1985) versus 24 per cent (around 2013) in our eight-country average. Again, cross-country differences are large. Income taxes became more progressive in Finland and the Netherlands, but generated less fiscal redistribution in the United States, Australia and Israel. For some countries, the redistributive effect of benefits for family, children, education and housing is rather high and account for 15 per cent or more of the total fiscal redistribution, as in Australia and France. Overall, these benefits account for 11 per cent of the total fiscal redistribution among our country-average for around 2013, while it was 14 per cent for around 1985.

This empirical analysis does not show why benefits and income taxes have become more or less redistributive. It can be expected that, as primary income inequality rises, the tax-benefit systems will automatically have a more redistributive impact, because of the progressivity built into these systems. Yet, policy changes also will certainly explain a part of the changes in redistribution. Future research should shed some light on the impact of specific policy reforms in changing the redistributive effect of welfare states. To that end, we offer an Open Access Database allowing users to easily select income inequality variables and fiscal redistribution variables for (a group of) countries and/or specific data years for 47 countries in the period 1967–2014 (Wang and Caminada, 2017).

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