

# LIS

## Working Paper Series

No. 581

I

### Disentangling Income Inequality and the Redistributive Effect of Taxes and Transfers in 20 LIS Countries Over Time

Koen Caminada, Kees Goudswaard and Chen Wang

September 2012



CROSS-NATIONAL  
DATA CENTER  
*in Luxembourg*

---

Luxembourg Income Study (LIS), asbl

---

# Disentangling income inequality and the redistributive effect of taxes and transfers in 20 LIS countries over time

## KOEN CAMINADA

Professor of empirical analysis of social and tax policy

Economics Department  
Leiden University

E-mail:  
[c.l.j.caminada@law.leidenuniv.nl](mailto:c.l.j.caminada@law.leidenuniv.nl)

## KEES GOUDSWAARD

Professor of economics and social security

Economics Department  
Leiden University

E-mail:  
[k.p.goudswaard@law.leidenuniv.nl](mailto:k.p.goudswaard@law.leidenuniv.nl)

## CHEN WANG

PhD candidate  
(corresponding author)

Economics Department  
Leiden University

E-mail:  
[c.wang@law.leidenuniv.nl](mailto:c.wang@law.leidenuniv.nl)

### Abstract

In most OECD countries the gap between rich and poor has widened over the past decades. This paper analyzes whether and to what extent taxes and social transfers have contributed to this trend. Has the redistributive power of different social programs changed over time? The paper contributes to the literature by disentangling several parts of fiscal redistribution in a comparative setting.

We use micro-data from the Luxembourg Income Study to examine household market inequality, redistribution from transfers and taxes, and the underlying social programs that drive the changes, for 20 countries from the mid-1980s to mid-2000s. The contribution of each program is estimated using a sequential accounting budget incidence decomposition technique. The aim of this paper is to offer detailed information on the redistributive impact of social transfer programs. We focus on changes in fiscal redistribution of 13 different social programs and taxes.

We observe a sizeable increase in primary household inequality in all 20 countries over the last 25 years (except Ireland). In most countries, the extent of redistribution has increased too. Tax-benefit systems have offset two-third of the average increase in primary income inequality, although they appear to have become less effective in doing so since the mid-1990s.

We find that the public old age pensions and the survivors scheme attribute 60 percent to the increase of redistribution during the period 1985-2005 for a subset of countries considered (with full tax/benefit information). Social assistance accounts for 20 percent, and the benefits for sickness, disease, and disability account for around 13 percent of the total increase in redistribution. Other transfers (invalid career benefits, education benefits, child care cash benefits and other child and family benefits) account for 22 percent of the total increase in redistribution. On the contrary, taxes slowed down redistribution by 17 percent during 1985-2005.

Key words: welfare states, social income transfers, inequality, Gini coefficient, LIS

JEL-codes: H53, H55, and I32

September 10<sup>th</sup>, 2012

---

This study is part of the research program 'Reforming Social Security'. Financial support of Foundation Instituut GAK is gratefully acknowledged. Chen Wang is funded by the Chinese Scholarship Council. This paper was presented at the International Research Seminar of Foundation for International Studies on Social Security (Sigtuna, Sweden, June 2012), Luxembourg Income Study Workshop (Luxembourg, July 2012) and the 68<sup>th</sup> congress of the International Institute of Public Finance (Dresden, Germany, August 2012). We thank Paul Alkemade, Tony Atkinson, Jonathan Bradshaw, Bea Cantillon, Louis Chauvel, Janet Gornick, Kan Ji, Ive Marx, Teresa Munizi, Kenneth Nelson, Piotr Paradowski, Peter Saunders, David Staton, David Vaus and Kuriko Watanabe for their useful comments and suggestions. We thank Janet Gornick (Director of the Luxembourg Income Study) to accommodate the preparation of LIS Budget Incidence Fiscal Redistribution Dataset. This dataset, assembled by Chen Wang and Koen Caminada, presents the disentanglement of income inequality and the redistributive effect of social transfers and taxes in 36 LIS countries for the period 1970-2006 (177 LIS datasets, Waves I - Wave VI of LIS). The database and documentation are posted at the website of LIS ([www.lisdatacenter.org/resources/other-databases](http://www.lisdatacenter.org/resources/other-databases)) and at our website ([www.hsz.leidenuniv.nl](http://www.hsz.leidenuniv.nl)).

## 1. Introduction

Two OECD studies *Growing Unequal?* (2008) and *Divided We Stand* (2011) show that in most countries income inequality rose and the extent of redistribution by public cash transfers and income taxes and social security contribution has increased too over the period mid 1980s - mid 2000s as a whole. The tax-benefit system has offset rising market income inequality to some extent, but not fully. This paper contributes to the literature by disentangling several parts of fiscal redistribution in a comparative setting. To what extent has the redistributive power of different social programs changed over time?

The overall tendency over the past two or three decades has been for an increase in income inequality in the large majority of rich nations.<sup>1</sup> In OECD countries, the widening of the income distribution has been mainly driven by greater inequality in market income from the mid-1980s to the mid-1990s. Market income inequality also rose from the mid-1990s to the mid-2000s, but at a slower pace (OECD, 2008 and 2011). Several explanations of income inequality have been introduced by comparative researchers in sociology, economics, and political science.<sup>2</sup> One of the main driving forces behind disposable income distribution is the reduction of inequality through the tax-transfer system.<sup>3</sup> The overall redistributive effect can be divided into redistribution by transfers and by taxes, or even into more details.<sup>4</sup> In the mid-2000s, the average redistributive effect achieved by public cash transfers is twice as large as that achieved through household taxes, although for example the United States stands out for achieving a greater part of redistribution by taxes (OECD, 2008 and 2011; Whiteford, 2010, Wang and Caminada, 2011; and Wang et al, 2012). As the tax and transfer system was only able to offset a part of this rise in market income inequality over the last 25 years, disposable income (i.e. after taxes and social benefits) has also become more unequal in many countries.

This paper examines changes in the redistributive effects of taxation and income transfers to households in detail. Former, extensive literature on "welfare state retrenchment" that has emerged over the last decades seems to imply that welfare states have become less redistributive. Recent studies and data, to the contrary, show that most welfare states became more redistributive in the 1980s and 1990s (see also Kenworthy and Pontusson, 2005). Welfare states have not compensated completely for the rise in inequality of market 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 should be noted here that because tax-benefit systems are generally progressive, one

---

1 Among others Chen et al (2011) and Brandolini and Smeeding (2009).

2 Among others Kuznets (1955), Blinder and Esaki (1978), Blank and Blinder (1986), Harrison and Bluestone (1988), Blank and Card (1993), Nielsen and Alderson (1997), Gustafsson and Johansson (1999), Mocan (1999), Morris and Western (1999), Chevan and Stokes (2000), McCall (2001).

3 Among others Danziger et al (1981), O'Higgins et al (1990), Gottschalk and Smeeding (1997, 1998 and 2000), Ervik (1998), Atkinson and Brandolini (2001), Smeeding (2000, 2004 and 2008), Caminada and Goudswaard (2001, 2002, 2005, 2009 and 2010), Caminada et al (2012), Atkinson (2003), Brady (2004), Brandolini and Smeeding (2007a and 2007b), Heisz (2007).

4 Among others Plotnick (1984), Ferraini and Nelson (2003), Caminada and Goudswaard (2001 and 2002), Kristjánsson (2011), Fuest et al (2010), Paul (2004), Chen et al (2011), Wang and Caminada (2011).

could expect that higher market income inequality automatically leads to more redistribution, even without policy actions (Immervoll and Richardson, 2011).

Under the circumstance of increasing income inequality and public expenditure cuts in the 1980s and 1990s, attention needs to be paid to the design of welfare states. How good is the tax-benefit system as a whole and its programs in narrowing income distribution? What is the trend of redistribution over time?

In a recent study, Immervoll and Richardson (also published in OECD, 2011) examine the impact of tax and transfer systems on income inequality in the past 25 years across countries. They find that in most countries tax-benefit policies offset some of the large increases in market income inequality, although they appear to have become less effective at doing so since the mid-1990s. Until the mid-1990s, tax-benefit systems in many LIS countries offset more than half of the rise in market income inequality. However, while market income inequality continued to rise after the mid-1990s, the redistributive effect of taxes and benefits on household income inequality declined. As a result, tax-benefit systems are now less effective at reducing inequality compared to the mid-1990s. After the mid-1990s, reduced redistribution has been the main driver of widening income gaps. However, the analysis of Immervoll and Richardson (2011) does not cover the total population, but is restricted to the working-age population. They exclude the largest government transfer program, public pensions. Especially this program has a strong redistributive impact ( Wang et al, 2012)

This paper elaborates on the work of Immervoll and Richardson (2011) and on Jesuit and Mahler (2004 and 2006). Jesuit and Mahler divide government redistribution into several components: the redistributive effects from unemployment benefits, pensions, and taxes, and performed an empirical exercise for 13 countries with LIS-data around the years 1999/2000. Their study provided relatively new insights. However, the data used are not very recent, the number of countries is rather small and only two specific social programs are included in the analysis. Moreover, their analysis was restricted to one moment in time (around 1999). In this paper we will make further steps on these points.

In our paper we compute the changes in the redistributive effects of different social programs and taxes over time among the *total* population. This is meant as an extension of previous work (Wang and Caminada, 2011; and Wang et al, 2012). At the program level, we examine the redistributive trends of sickness benefits, disability benefits, state old age and survivors benefits, child/family benefits, unemployment compensation benefits, social assistance cash benefits, other social insurance benefits, mandatory payroll taxes and income taxes. We use the data from Luxembourg Income Study (LIS) and analyze the tax-benefit distributional effects across 20 LIS countries from the mid-1980s to the mid-2000s. The redistributive effect of each program is measured sequentially using a budget incidence approach. Our contribution to the literature is that we provide trends of the redistribution across countries at program level.

The paper is organized as follows. Section 2 provides our research method and data. Section 3 presents the results of a cross country comparison. In section 4 we decompose total redistribution through the tax-benefit system into the redistributive effects of 11 social transfers and several taxes from the mid-1980s to the mid-2000s in a comparative setting. Section 6 concludes the paper.

## 2. Research method

### 2.1 Data from Luxembourg Income Study (LIS)

The growing interest in national and cross-national differences in earnings and income inequality (over time) has produced a wide range of studies (see Gottschalk and Smeeding, 1997; Brandolini and Smeeding, 2007; OECD, 2008 and 2011; Lambert et al, 2010 and Immervoll and Richardson, 2011). An important development has been the launching of LIS in which micro datasets from various countries have been "harmonised".<sup>5</sup> Consequently it is possible to study income inequality across countries, and over time (see Atkinson et al, 1995). LIS micro data seems to be the best available data for describing how income inequality and the redistributive effects of taxes and transfers vary across countries, and over time (Nolan and Marx, 2009; Smeeding, 2008).

There exist several detailed national studies of redistribution trends. International comparisons tend to focus on specific parts of the tax-benefit system. Multi-country comparative studies that consider the entire tax-benefit system are rare (Immervoll and Richardson, 2011). Point-in-time comparisons are sometimes thought problematic since large institutional differences between countries, notably in terms of the balance between public and private provision or cash transfers versus benefits in-kind, make it difficult to interpret country differences in terms of a particular portion of the redistribution system. However, this is less of an issue when we focus on comparing changes across countries, as overall institutional setups (as well as measurement choices in the underlying data) tend to vary less over time than they do cross-nationally.

From nearly 300 variables in the LIS 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 redistribution across countries. In line with LIS convention and the work of Mahler and Jesuit (2006), we have eliminated observations with zero or a missing value of disposable income from LIS data. We use the Gini coefficient as an overall measure of income inequality.<sup>6</sup> Household weights are applied for the calculation of Gini coefficients, the equivalence scale is the square root of the number of household members (LIS' equivalence scale). Another measurement decision made in this paper concerns top and bottom coding. We bottom code datasets at 1 per cent of equivalized mean income and top code at 10 times the median of non-equivalized income for the nation sample (cf. Gottschalk and Smeeding 1997:661). This procedure limits the effect of extreme values at either end of the income distribution.

---

<sup>5</sup> See survey information LIS at <http://www.lisdatacenter.org/>.

<sup>6</sup> It could be argued that the Gini coefficient is rather sensitive to the middle part of the income distribution compared to other indicators. E.g. Atkinson's index ( $\alpha=1.0$ ) and Mean Log Deviation are relatively more sensitive to the changes in the lower tail of the income distribution. For this reason, we did a sensitivity analysis for several global indicators of income inequality; see Annex A. All indicators follow the same pattern at one moment in time (for different countries) with the largest redistribution given by Mean Log Deviation and the lowest redistribution given by the Atkinson's index ( $\alpha=0.5$ ). In most cases the empirical results *on redistribution* do not alter using a specific global income inequality indicator. However, especially if a social program is targeted towards a certain group, for instance to the lower tail of the income distribution, the result vary slightly, depending on the indicators used.

## 2.2 Measuring the redistributive effects of taxes and social transfers

Usually, the impact of social policy on income inequality is calculated in line with the work of Musgrave, Case and Leonard (1974), i.e. statutory or budget incidence analysis. A standard analysis of the redistributive effect of taxes and income transfers is to compare pre-tax-transfer income inequality and post-tax-transfer income inequality (OECD 2011: 268). Our measure of the redistributive impact of social security on inequality is straightforwardly based on formulas developed by Kakwani (1986) and Ringen (1991):

$$\text{Redistribution by taxes and social transfers} = \text{primary income inequality} - \text{disposable income inequality}$$

This formula is used to estimate the reduction in inequality produced by taxes and social transfers, where primary income inequality is given by a summary statistic of pre-tax, pre-transfer incomes and disposable income inequality is given by the same summary statistic of disposable equivalent incomes. When calculating inequality indices for both primary and disposable income, people are ranked by their primary and disposable incomes respectively, so that the re-ranking effect is included in our results (see Plotnick, 1984; the same method is applied by Immervoll and Richardson, 2011 and by Wang and Caminada, 2011).

Table 1 presents the framework for accounting income inequality and redistribution through various income sources.

**Table 1 The income inequality and redistribution accounting framework**

Income components	Income inequality and redistributive effect
Gross wages and salaries + Self-employment income + cash property income + Occupational and private pensions + Private transfers + Other cash income = <b>Primary income</b>	<b>Income inequality before social transfers and taxes</b>
+ Social security cash benefits	-/- Redistributive effect of social transfers
<b>= Gross income</b>	<b>= Income inequality before taxes</b>
-/- Pay Roll (Mandatory payroll taxes) -/- Income taxes	-/- Redistributive effect of taxes
<b>= Disposable income</b>	<b>= Income inequality after social transfers and taxes</b>

*Note:* For 12 countries (Australia, Canada, Denmark, Finland, Germany, Israel, the Netherlands, Norway, Sweden, Switzerland, the United Kingdom and the United States), full information is available of the entire tax-benefit system in LIS. For another 8 countries (Belgium, France, Ireland, Italy, Luxembourg, Mexico, Poland and Spain), we use net wages and salaries instead of gross wages and salaries where gross variables are not available for all data years in LIS.

Source: Wang and Caminada (2011)

The budget incidence analysis is not without problems; see a critical survey of efforts to measure budget incidence by Smolensky et al (1987). The pre-transfer inequality is compared to the post-transfer inequality keeping all other things equal – namely,

assuming unchanged household and labor market structures, thus disregarding any possible behavioral changes that the situation of absence of social transfers would involve (Frick et al, 2000; Palme, 1996). However, behavioral responses may obviously be important. It is likely that in the absence of social transfers more people will work (more) thereby earning higher incomes. Kim (2000b) showed that both the generosity and efficiency of the tax/transfer system may influence the level of pre-tax-transfer income inequality. Budget incidence calculations can therefore only be seen as an approximation of the redistributive effects because the assumption that agents behave similar in situations with and without social transfers and social security. This implies that estimates for redistribution through taxes and transfers should be regarded as upper bounds. Despite this problem, analyses on statutory and budget incidence can be found for decades in literature on public finance.<sup>7</sup>

It should be noted that our analysis captures, but does not isolate the direct effect of policy reforms. Showing the direct effects of policy reforms on measured redistribution requires holding everything else constant. A way to identify the relative contribution of policy changes and automatic effects of trends in market income inequality on redistribution would be to calculate tax burdens and benefit entitlements for representative samples of households for different periods. Unfortunately, such an analysis is currently not feasible for a larger group of countries as the required microsimulation models are not readily available (OECD, 2011: 288-289).

With respect to the inequality measure we use the Gini coefficient. The change in the Gini between pre- and post-government income reflects redistribution through taxes and transfers. The Gini coefficient of equivalized disposable household income is often used as a summary measure of income distribution. The Gini coefficient lies between 0 (no inequality) and 1 (maximum inequality).

We sequentially decompose the Gini coefficient in order to calculate the partial redistributive impact of transfers and taxes; see Wang and Caminada (2011) for details. The results obtained for the specific transfers and taxes are corrected for the ordering effect.<sup>8</sup>

The sequential accounting decomposition approach has been, among others, advocated by Kakwani (1986) and is also followed by Mahler and Jesuit (2004) and Mahler and Jesuit (2006), Immervoll et al (2005) and Whiteford (2008). Other techniques of the decomposition of the Gini coefficient by income source can be found in the literature as well; see e.g. Lerman and Yitzhaki (1985), Stark et al (1986), Kim (2000a). In the literature two techniques of decomposing inequality are distinguished; the *sequential accounting decomposition* and the *factor source decomposition* approach. When comparing both approaches, they lead to the same estimates of disposable income

---

7 See for example Musgrave and Tun Thin (1948), Gillespie (1965), Kakwani (1977), Reynolds and Smolensky (1977), Mitchell (1991) and OECD (2008 and 2011).

8 The ordering of programs has influence on the results when using the sequential accounting decomposition method. The partial redistributive effect of a specific social transfer will be highest (smallest) when computed as the first (last) social program. We corrected for this effect as follows. We consider every specific social transfer as the first program to be added to primary income and every direct tax as the first tax to be subtracted from gross income. In that case, the sum of all partial redistributive effects amounts to (a little) over 100 percent. So we rescaled the redistributive effects of each program by applying an adjustment factor, which is defined as the overall redistribution (100%) divided by the sum of all partial redistributive effects of all programs (a little over 100%).

inequality, but to contradictory results with respect to the importance of benefits for redistributing income (see Fuest et al, 2010). Inequality analysis based on the *sequential accounting decomposition* approach (as applied in this paper) suggests that benefits are the most important factor in reducing inequality in the majority of countries. The *factor source decomposition* approach, initiated by Shorrocks (1982), however, suggests that benefits play a much smaller role, while taxes and social contributions are more important contributors to income inequality reduction. Fuest et al (2010) explain these partly contradictory results. The most important difference between the two approaches is that the accounting approach applies tax benefit instruments sequentially, whereas the decomposition approach accounts for them simultaneously. See also Kammer et al (2012). We follow the sequential decomposition approach, which fits in a strand of empirical literature, among which the recent OECD-work.

### *2.3 Measuring change over time*

In line with Kenworthy and Pontusson (2005), we believe that it is more informative to measure changes in inequality in absolute terms (the ending value minus the beginning value) rather than in percentage terms (absolute change divided by the beginning value). This issue arises as well when we compare redistribution at any given point in time. We adopt an absolutist approach by measuring absolute change in inequality.

Absolute measures of change may be easier to interpret than relative measures. For example, suppose that taxation and transfers reduce inequality by the same amount in two countries that have different distributions of market income. When the change is measured in relative terms, we observe a larger reduction of inequality in the country with the more equal distribution of market incomes. "Do we really want to say that the welfare state in the country with the more egalitarian distribution of market income is more redistributive?" (Kenworthy and Pontusson, 2005: 450). These problems with relative measures are especially complex when we compare changes over time in redistribution, since the relative measure becomes "percentage change in percentage change." It is straightforward to measure redistribution as the absolute difference between inequality before and after taxes and transfers, and to measure change in redistribution as the difference in these amounts between two points in time.

### *2.4 Focus on total population – including public pension schemes*

This paper extends and deepens the analyses of both Immervoll and Richardson (2011) and Wang et al (2011), using the tax-benefit models across countries over time to show the combined redistributive effects of taxes and transfer systems. It attempts to gauge the effects of several taxes and benefits over a longer time period and for as many countries as data permit.

Unlike most existing studies, it explicitly focuses on the total population, and not to the non-elderly population (those aged 15-64).<sup>9</sup> Indeed, restricting the analysis to the non-elderly would avoid some of the problems inherent to comparisons of incomes between

---

<sup>9</sup> Tony Atkinson gave some helpful comments on the choice of different age groups. He supported our idea to take the total population into account (LIS Summer Workshop 2012). The definition of working age population is open to debate because of growing late retirement, so the range of working-age population is not easy to decide.



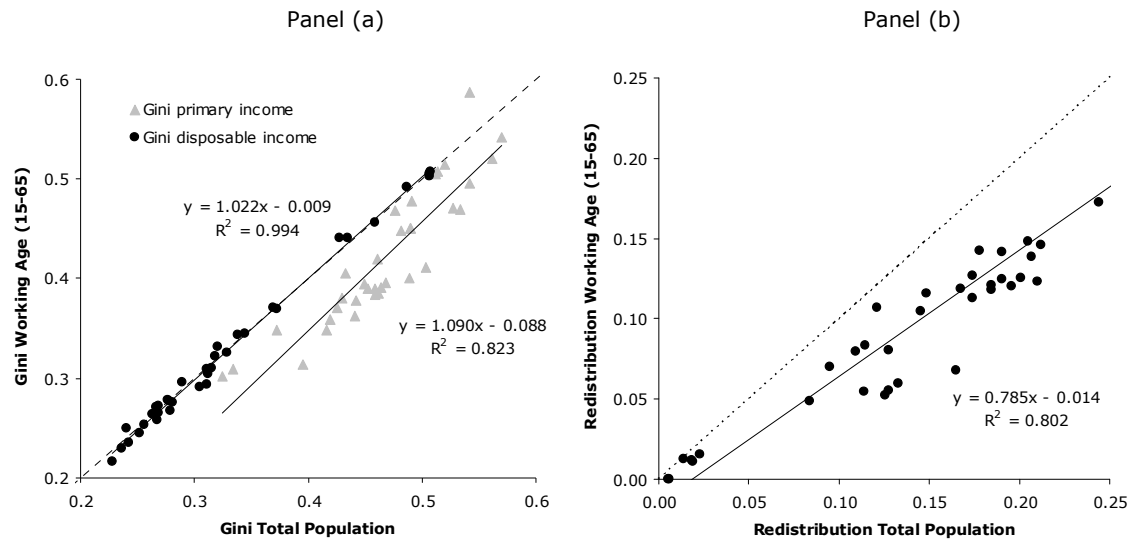
people who are at different stages in their lives. For instance, an essential function of old-age pensions is to redistribute intertemporally over the life cycle; in that case a focus on the non-elderly helps in understanding the most important elements of interpersonal redistribution. However, we believe that in our analysis the largest government transfer program, public pensions, can not be excluded. Public pension plans are generally seen as part of the safety net, generating large antipoverty effects. So, state old-age pension benefits will be included in our analysis on redistribution. But countries differ to a large extent in public versus private provision of their pensions (OECD, 2008:120). Occupational and private 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 the elderly.<sup>10</sup> 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. Overcoming this bias requires a choice: should pensions be earmarked as market income or as a transfer? We deal with this bias rather pragmatically by following the LIS Household Income Variables List: occupational and private pensions are earmarked and treated as market income.

It should be noted that our results could be biased by the focus on the total population instead of non-elderly population (those aged 15-64). Income redistribution among the total population is higher compared to the redistribution within the working-age population. However, the correlation between inequality (and redistribution) of total population and inequality (and redistribution) of working-age population is rather high; see Figure 1. Figure 1 (panel a) plots Gini coefficients of primary income and disposable incomes for both population groups; panel (b) plots figures for redistribution for both population groups. This suggests that focusing on the total population will not give a strong bias.

---

10 See Van Vliet et al (2012) for such an analysis. Preferably, however, the redistributive effects of occupational and private pensions should be analyzed on a life time basis.

**Figure 1 Linkage income inequality total population and working-age population (15-65) across 36 LIS countries, mid-2000s**



Source: Database Wang and Caminada (2011), and own calculations

### 2.5 Country selection

In empirical studies, the selection of countries and data-years differ due to the consideration of data quality and data availability. We apply a cross-national analysis using comparable income surveys for most countries in the LIS data base. LIS data contains information for 36 countries for one or more data years (from wave 0 to wave VI), allowing researchers to make comparisons in a straightforward manner, and the information is still updating and expanding. This paper uses the data of 20 LIS countries, with at least three data points (around 1985, 1995 and 2005).<sup>11</sup> We distinguish two groups of countries (based on data quality):

- Countries for which full information is available on the whole trajectory from primary income to disposable income (12 countries): Australia, Canada, Denmark, Finland, Germany, Israel, Netherlands, Norway, Sweden, Switzerland, the United Kingdom, and the United States.<sup>12</sup>
- For another 8 countries data is available only on an after-tax basis (we use net wages and salaries): Belgium, France, Ireland, Italy, Luxembourg, Mexico, Poland, and Spain.

11 Namely Australia (1985, 1995, 2005), Belgium (1985, 1995, 2000), Canada (1987, 1994, 2004), Denmark (1987, 1995, 2004), Finland (1987, 1995, 2004), France (1981, 1994, 2005), Germany (1984, 1994, 2004), Ireland (1987, 1995, 2004), Israel (1986, 1997, 2005), Italy (1986, 1995, 2004), Luxembourg (1985, 1994, 2004), Mexico (1984, 1996, 2004), the Netherlands (1983, 1994, 2004), Norway (1986, 1995, 2004), Poland (1986, 1995, 2004), Spain (1980, 1995, 2004), Sweden (1987, 1995, 2005), Switzerland (1982, 1992, 2004), the United Kingdom (1986, 1995, 2004), and the United States (1986, 1994, 2004).

12 In line with Immervoll and Richardson (2011), we do not take Taiwan into consideration.

### **3. Empirical results**

#### *3.1 Trends in the distribution of primary and disposable income in LIS countries*

This section reviews the evidence on cross national comparisons of primary and disposable income inequality across 20 nations over time. This section is mainly descriptive and relies on the empirical evidence from LIS for the levels of income inequality from around 1980 to the mid-2000s. The changes in inequality levels are illustrated by the Gini coefficients. In order to give a general idea, we cluster the countries around 1985, 1995, and 2005 respectively, showing the average trends of inequality and redistribution. We show country profiles for all 20 LIS countries later in Figure 2.

Table 2 shows the 20 country-average trend of primary income and disposable income inequality from 1985 to 2005. This figure highlights some significant differences across periods in a general way. On average, income inequality increased markedly. This increase was stronger during the first decade. The widening of income gaps was driven by rising inequality in the distribution of primary income, which was partly offset by public cash transfers and households taxes. In the second decade, the rising of primary income inequality and disposable income inequality are in parallel.

OECD (2011: 268-271) has indicated that market incomes of non-elderly people have become more unequal in most countries. Table 2 shows inequality trends for primary incomes (including any private transfers) and disposable incomes (primary incomes plus cash benefits minus income taxes) for the total population and confirm most, but not all findings of OECD (2011). Using the data reported in Table 2, averaging across countries, it can be shown that inequality of primary income has increased by 13% over a twenty-year period across the countries shown. This is a substantial increase over a relatively short period of time.

**Table 2 Trends in income inequality and redistribution**

	Gini Primary Income					Gini Disposable Income					Absolute Fiscal Redistribution				
	around 1985	around 1995	around 2005	Change 85-05	%	around 1985	around 1995	around 2005	Change 85-05	%	around 1985	around 1995	around 2005	Change 85-05	%
Australia (85-03)	0.420	0.464	0.461	0.041	10	0.293	0.308	0.312	0.019	6	0.126	0.156	0.149	0.023	18
<i>Belgium (85-00)</i>	<i>0.414</i>	<i>0.462</i>	<i>0.542</i>	<i>0.128</i>	<i>31</i>	<i>0.227</i>	<i>0.266</i>	<i>0.279</i>	<i>0.052</i>	<i>23</i>	<i>0.187</i>	<i>0.195</i>	<i>0.263</i>	<i>0.076</i>	<i>41</i>
Canada (87-04)	0.393	0.424	0.433	0.040	10	0.288	0.289	0.318	0.030	11	0.105	0.136	0.114	0.010	9
Denmark (87-04)	0.398	0.421	0.419	0.021	5	0.254	0.218	0.228	-0.026	-10	0.144	0.203	0.191	0.047	33
Finland (87-04)	0.332	0.384	0.464	0.132	40	0.209	0.217	0.252	0.044	21	0.123	0.168	0.212	0.089	72
<i>France (81-05)</i>	<i>0.364</i>	<i>0.487</i>	<i>0.449</i>	<i>0.085</i>	<i>23</i>	<i>0.288</i>	<i>0.288</i>	<i>0.281</i>	<i>-0.007</i>	<i>-3</i>	<i>0.076</i>	<i>0.199</i>	<i>0.168</i>	<i>0.092</i>	<i>121</i>
Germany (84-04)	0.444	0.450	0.489	0.044	10	0.265	0.270	0.278	0.013	5	0.179	0.180	0.210	0.031	17
<i>Ireland (87-04)</i>	<i>0.500</i>	<i>0.493</i>	<i>0.490</i>	<i>-0.010</i>	<i>-2</i>	<i>0.328</i>	<i>0.336</i>	<i>0.312</i>	<i>-0.017</i>	<i>-5</i>	<i>0.172</i>	<i>0.157</i>	<i>0.178</i>	<i>0.006</i>	<i>4</i>
Israel (86-05)	0.449	0.474	0.491	0.041	9	0.308	0.336	0.370	0.062	20	0.142	0.139	0.121	-0.021	-15
<i>Italy (86-04)</i>	<i>0.425</i>	<i>0.454</i>	<i>0.503</i>	<i>0.078</i>	<i>18</i>	<i>0.306</i>	<i>0.338</i>	<i>0.338</i>	<i>0.032</i>	<i>10</i>	<i>0.119</i>	<i>0.116</i>	<i>0.165</i>	<i>0.046</i>	<i>38</i>
<i>Luxembourg (85-04)</i>	<i>0.377</i>	<i>0.388</i>	<i>0.452</i>	<i>0.075</i>	<i>20</i>	<i>0.237</i>	<i>0.235</i>	<i>0.268</i>	<i>0.031</i>	<i>13</i>	<i>0.140</i>	<i>0.153</i>	<i>0.184</i>	<i>0.044</i>	<i>31</i>
<i>Mexico (84-04)</i>	<i>0.446</i>	<i>0.487</i>	<i>0.476</i>	<i>0.031</i>	<i>7</i>	<i>0.445</i>	<i>0.477</i>	<i>0.458</i>	<i>0.013</i>	<i>3</i>	<i>0.001</i>	<i>0.010</i>	<i>0.018</i>	<i>0.017</i>	<i>2301</i>
Netherlands (83-04)	0.435	0.420	0.459	0.023	5	0.260	0.257	0.263	0.003	1	0.176	0.162	0.196	0.020	11
Norway(86-04)	0.352	0.400	0.430	0.078	22	0.233	0.238	0.256	0.023	10	0.119	0.162	0.174	0.055	46
<i>Poland (86-04)</i>	<i>0.365</i>	<i>0.527</i>	<i>0.527</i>	<i>0.163</i>	<i>45</i>	<i>0.271</i>	<i>0.318</i>	<i>0.320</i>	<i>0.050</i>	<i>18</i>	<i>0.094</i>	<i>0.208</i>	<i>0.207</i>	<i>0.113</i>	<i>121</i>
<i>Spain (80-04)</i>	<i>0.416</i>	<i>0.501</i>	<i>0.441</i>	<i>0.025</i>	<i>6</i>	<i>0.318</i>	<i>0.353</i>	<i>0.315</i>	<i>-0.003</i>	<i>-1</i>	<i>0.098</i>	<i>0.148</i>	<i>0.126</i>	<i>0.028</i>	<i>28</i>
Sweden (87-05)	0.428	0.460	0.442	0.013	3	0.218	0.221	0.237	0.019	9	0.211	0.239	0.205	-0.006	-3
Switzerland (82-04)	0.381	0.376	0.395	0.015	4	0.309	0.307	0.268	-0.042	-13	0.071	0.068	0.128	0.056	79
UK (86-04)	0.476	0.503	0.490	0.014	3	0.303	0.344	0.345	0.041	14	0.173	0.158	0.145	-0.028	-16
USA (86-04)	0.434	0.473	0.482	0.047	11	0.338	0.365	0.372	0.034	10	0.096	0.108	0.109	0.013	14
Mean-20	0.412	0.452	0.467	0.054	13	0.285	0.299	0.304	0.019	7	0.128	0.153	0.163	0.036	28
Mean-12	0.412	0.437	0.454	0.043	10	0.273	0.281	0.292	0.018	7	0.139	0.157	0.163	0.024	17
<i>Mean-8</i>	<i>0.413</i>	<i>0.475</i>	<i>0.485</i>	<i>0.072</i>	<i>17</i>	<i>0.303</i>	<i>0.327</i>	<i>0.321</i>	<i>0.019</i>	<i>6</i>	<i>0.111</i>	<i>0.148</i>	<i>0.164</i>	<i>0.053</i>	<i>48</i>

Note: For 12 countries full tax and benefit information is available in LIS. For other 8 countries (marked *italic*) net wages and salaries are used because gross variables are not available for all data years in LIS.

Source: Database Wang and Caminada (2011), and own calculations

Primary-income inequality has been the main driver of inequality trends in disposable incomes, but did redistribution policies have a substantial effect as well? Between the mid-1980s and the mid-2000s, redistribution systems compensated two-third of the increase in primary-income inequality. The upwards trend in primary-income inequality continued after the mid-1990s, although at a lower rate. In absolute terms, redistribution increased across countries. Over the two decades as a whole, primary-income inequality rose by about 0.054, while redistribution rose 0.036. Taxes and transfers now reduce inequality by about 35%; more than in the mid-1980s (31%).

Country-specific results are also presented in Table 2. Tax-benefit systems in Belgium<sup>13</sup>, Finland, Germany, Poland and Sweden achieve the greatest reduction in inequality, lowering the Gini value by 20 points or more in the mid-2000s, while the smallest redistributive effect is seen in Mexico, the United States and Canada (less than 12 points). Through the entire period, disposable income inequality became significantly larger in Belgium, Finland and Israel, whereas it decreased in Denmark, France, Ireland, Spain and Switzerland. In the period 1985-1995, higher disposable income inequality was mainly 'caused' by higher primary income inequality (although primary income inequality declined in Ireland, the Netherlands and Switzerland). In this period, government redistribution has offset the widening of income gaps through public cash transfers and household taxes either in full (e.g. Canada, Denmark, France and Germany) or in part (in all others; see Figure 2).

Cross-country variance is larger since the mid-1990s. Primary income inequality increased markedly in Belgium and Finland, and to a lesser extent in Germany, Israel, Italy, Luxembourg, the Netherlands, Norway, Switzerland, while it was almost stable in Australia, Canada, Denmark, Ireland, Poland and the United States. Primary income inequality decreased in France, Mexico, Spain, Sweden and the United Kingdom between 1995 and 2005. Disposable income inequality increased in all countries except for France, Ireland, Mexico, Spain and Switzerland. A large part of this rise of income inequality was offset by redistribution through taxes and transfers. Israel is an outlier due to both increasing primary income inequality and declining redistribution since 1995, generating a relatively sharp increase in Israel's' disposable income inequality.

In contrast to the results in Immervoll and Richardson (2011; also published in OECD, 2011), we do not confirm their finding that tax-benefit policies have become less effective in redistribution since the mid-1990s when the total population (instead of the working-age population) is taken into consideration. Among the total population both primary income inequality and redistribution continued to rise after the mid-1990s; we do not find that the fiscal redistribution effect of taxes and benefits on household income inequality stabilized (or declined). As a result, among the total population tax-benefit systems in the mid-2000s are even more effective at reducing inequality compared to the mid-1990s. So, the claim that reduced redistribution is a main driver of widening income gaps since

---

13 Belgium (2000) seems to be an outlier. We have noticed that there are many zeros of net wages and salaries in the dataset.

the mid-1990's must be toned down. Moreover, our finding is a stimulus to analyze several programs (parts) of the redistribution system in more detail.

Table 3 summarizes the results of Immervoll and Richardson (2011) for trends in the redistribution among the working-age population and our findings for the total population for 12 countries with full tax and benefit information for mid-1980s, mid-1990s and mid-2000s.

**Table 3 Trends in redistribution among working-age and total population**

	Total population				Working-age population			
					Immervoll and Richardson			
	Gini primary income	Gini disposable income	Absolute redistribution	(Relative redistribution)	Gini primary income	Gini disposable income	Absolute redistribution	(Relative redistribution)
Mid-1980s	0.412	0.273	0.139	(33.7)	0.362	0.267	0.095	(26.4)
Mid-1990s	0.437	0.281	0.157	(35.8)	0.392	0.274	0.117	(29.9)
Mid-2000s	0.454	0.292	0.163	(35.8)	0.398	0.283	0.114	(28.7)
Change 85-05	0.043	0.018	0.024		0.036	0.016	0.019	
Change 85-95	0.026	0.008	0.018		0.030	0.007	0.022	
Change 95-05	0.017	0.011	0.006		0.006	0.009	-0.003	

Note: For 12 countries full tax and benefit information is available in the LIS dataset.

Source: Immervoll and Richardson (2011) and Wang and Caminada (2011)

In contrast to Immervoll and Richardson (2011) and OECD (2011: 268-271), we find for the total population (instead of the non-elderly) that disposable incomes have become more equal over time in some countries: Denmark, France, Ireland, Poland and Switzerland. Finally, our analysis points at a lower level of redistribution among the total population around 2005 than it was around 1985 for Israel, Sweden and the United States.

### 3.2 Redistributive effects of taxes and transfers over time

Table 4 highlights that the trend of overall redistribution is mainly caused by 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 the mid-2000s, no change was observed in overall redistribution in the first five years, followed by a tiny increase from around the mid-2000s. Redistribution by taxes declined in the first five years, then increased up to the peak in 1995, followed by a continuous decline till the mid-2000s. The average total redistribution increased by 0.036 point in 20 LIS countries from around 1985 to around 2005.

Figure 2 illustrates the trends of overall, tax and transfers redistribution for each 20 LIS country. In all countries, total redistribution was mainly driven by transfer redistribution. The redistribution achieved by public cash transfers was more than twice as large as that achieved through taxes, except for Canada, Israel, and the United States.

**Table 4 Redistribution across 20 LIS countries over time**

Country	Redistribution				Partial effects: change 1985-2005	
	around 1985	around 1995	around 2005	Change 1985-2005	from transfers	from taxes
Australia (85-95-03)	0.126	0.156	0.149	0.023	0.030	-0.007
<i>Belgium (85-95-00)</i>	0.187	0.195	0.263	0.076	0.014	<i>0.063</i>
Canada (87-94-04)	0.105	0.136	0.114	0.010	0.007	0.003
Denmark (87-95-04)	0.144	0.203	0.191	0.047	0.033	0.014
Finland (87-95-04)	0.123	0.168	0.212	0.089	0.098	-0.009
<i>France (81-94-05)</i>	0.076	0.199	0.168	0.092	0.075	0.017
Germany (84-94-04)	0.179	0.180	0.210	0.031	0.023	0.008
<i>Ireland (87-95-04)</i>	0.172	0.157	0.178	0.006	0.005	0.002
Israel (86-97-05)	0.142	0.139	0.121	-0.021	0.000	-0.021
<i>Italy (86-95-04)</i>	0.119	0.116	0.165	0.046	0.046	<i>0.000</i>
<i>Luxembourg (85-94-04)</i>	0.140	0.153	0.184	0.044	0.007	<i>0.037</i>
<i>Mexico (84-96-04)</i>	0.001	0.010	0.018	0.017	0.017	<i>0.000</i>
Netherlands (83-94-04)	0.176	0.162	0.196	0.020	0.020	0.000
Norway(86-95-04)	0.119	0.162	0.174	0.055	0.051	0.004
<i>Poland (86-95-04)</i>	0.094	0.208	0.207	0.113	0.108	<i>0.005</i>
<i>Spain (80-95-04)</i>	0.098	0.148	0.126	0.028	0.026	<i>0.001</i>
Sweden (87-95-05)	0.211	0.239	0.205	-0.006	-0.003	-0.002
Switzerland (82-92-04)	0.071	0.068	0.128	0.056	0.077	-0.021
UK (86-95-04)	0.173	0.158	0.145	-0.028	-0.012	-0.015
USA (86-94-04)	0.096	0.108	0.109	0.013	0.013	0.000
Mean-20	0.128	0.153	0.163	0.036	0.032	0.004
Mean-12	0.139	0.157	0.163	0.024	0.028	-0.004
<i>Mean-8</i>	<i>0.111</i>	<i>0.148</i>	<i>0.164</i>	<i>0.053</i>	<i>0.037</i>	<i>0.016</i>

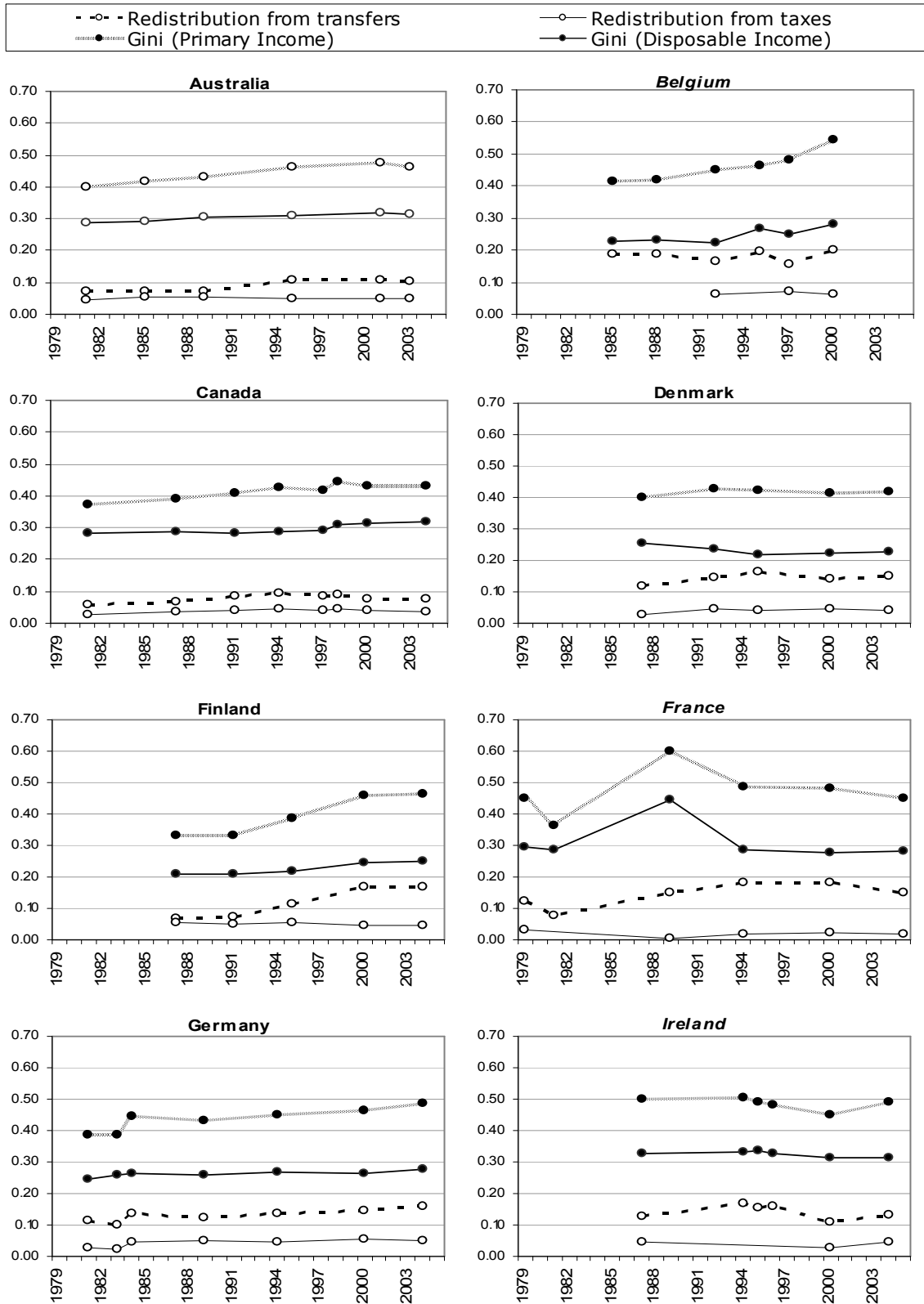
Note: For 12 countries full tax and benefit information is available in LIS. For other 8 countries (marked *italic*) net wages and salaries are used because gross variables are not available for all data years in LIS.

Source: Database Wang and Caminada (2011), and own calculations

From the mid-1980s to the mid-1990s, total redistribution increased in all countries except the Netherlands and the United Kingdom. Redistribution by transfers also increased in all countries except Italy, the Netherlands and the United Kingdom. Redistribution achieved by the tax system fell in all countries but rose in Canada, Denmark, Finland and the United States.

From the mid-1990s to the mid-2000s the patterns of redistribution across countries are more diverse, both in overall redistribution and in tax and transfers redistribution. In this decade, total redistribution fell in many countries but increased significantly in Belgium, Finland, Germany, Italy, Luxembourg and the Netherlands, and to a lesser extent in Ireland and Norway. The trends of transfer redistribution across countries followed the total redistribution pattern. However in Ireland and Luxembourg, the decrease of transfer redistribution did not lead to a decreasing total redistributive effect, because of the rising redistribution through the tax system in those countries. See figure 2.

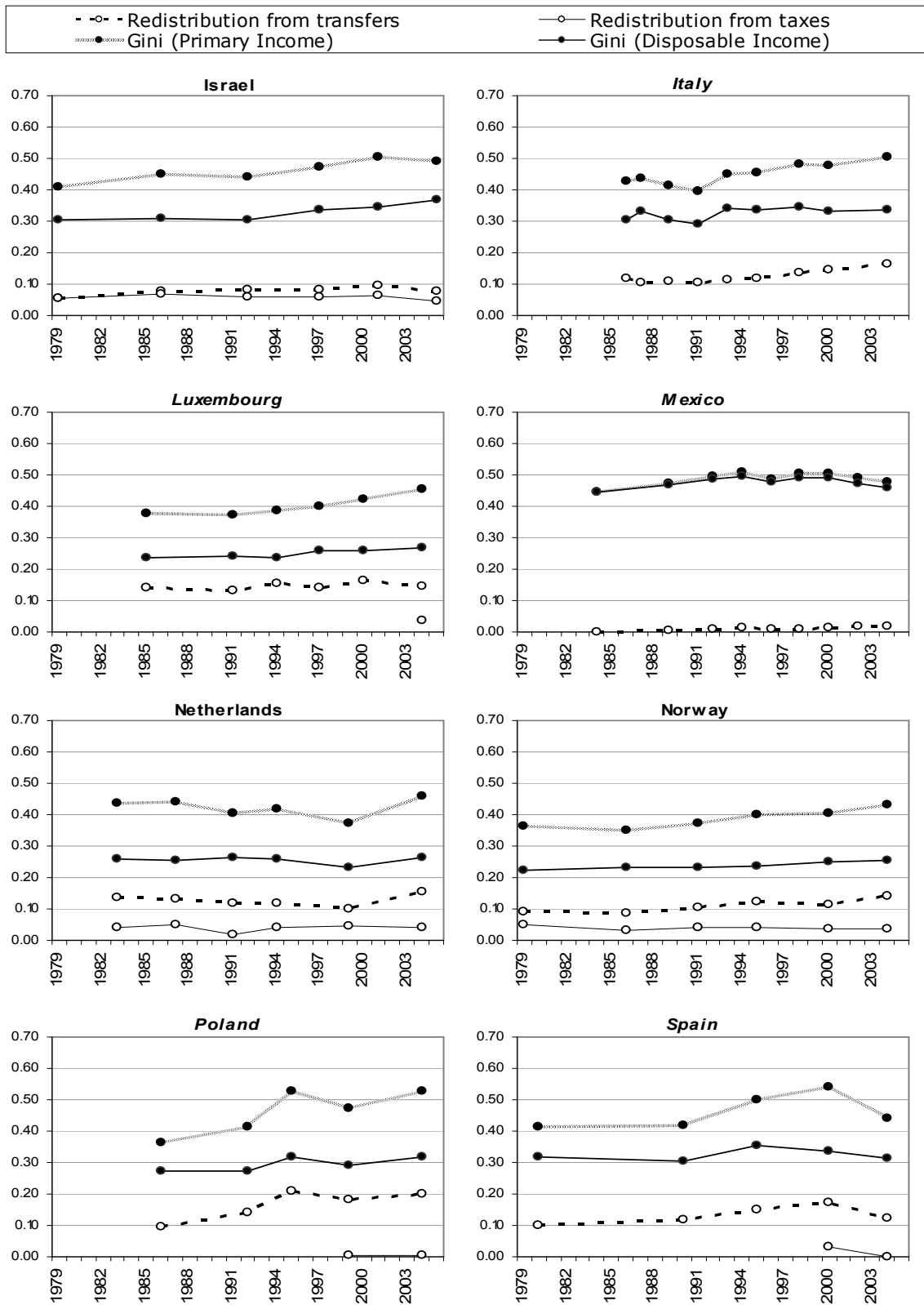
**Figure 2 Trends in inequality and redistribution in 20 LIS countries**



Source: Database Wang and Caminada (2011), and own calculations

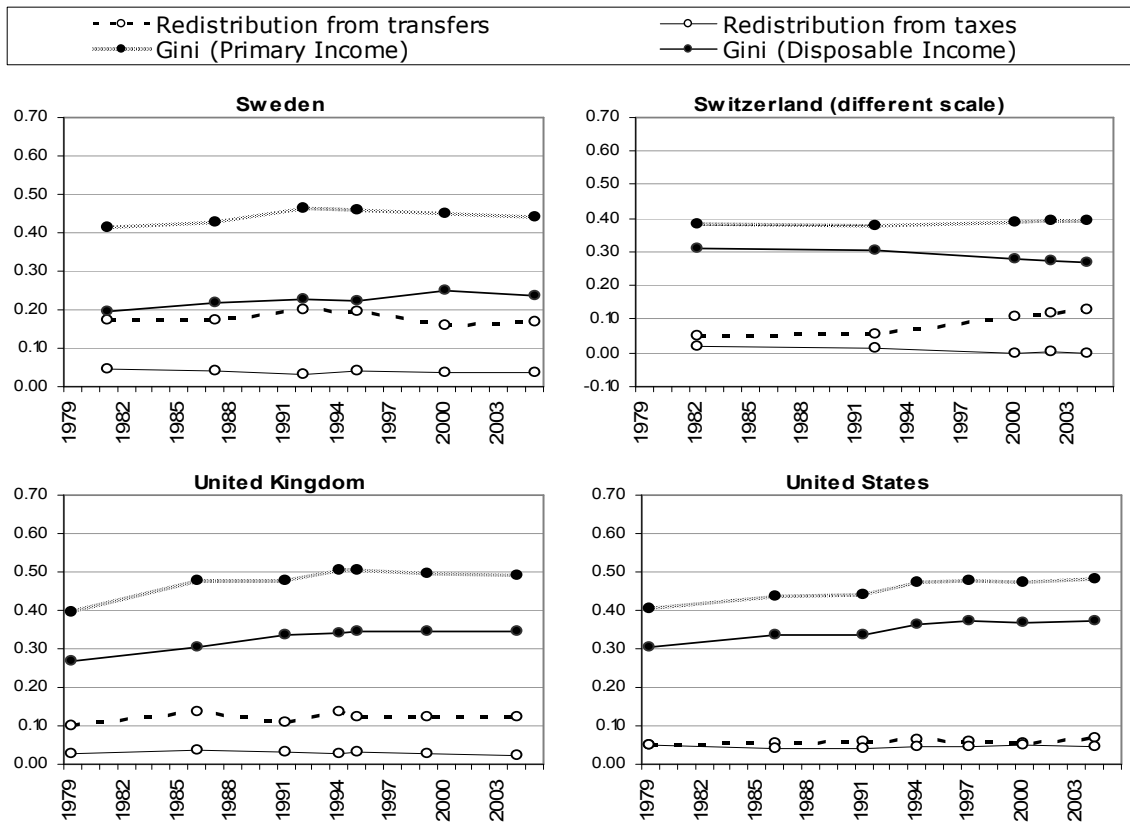


**Figure 2 Trends in inequality and redistribution in 20 LIS countries (continued)**



Source: Database Wang and Caminada (2011), and own calculations

**Figure 2 Trends in inequality and redistribution in 20 LIS countries (final)**



Note: For 12 countries full tax and benefit information is available in LIS. For other 8 countries (marked *italic*) net wages and salaries are used because gross variables are not available for all data years in LIS.

Source: Database Wang and Caminada (2011), and own calculations

### 3.3 Program size and targeting of transfers

Considering the redistributive effect of social benefits, a distinction can be made between programs' size and the extent to which benefits are targeted toward low-income groups by means-testing. In a seminal paper by Korpi and Palme (1998: 663), they have posited a "paradox of redistribution" whereby "the more we target benefits to the poor . . . the less likely we are to reduce poverty and inequality." The paradox arises from the fact that highly targeted programs have the support of a small and isolated political base. As they put it, targeted programs offer "no rational base for a coalition between those above and below the poverty line. In effect, the poverty line splits the working class and tends to generate coalitions between better-off workers and the middle class against the lower sections of the working class" (Korpi and Palme, 1998: 663). Comprehensive programs, on the other hand, even when they are organized according to social insurance principles, tend to encourage coalitions between the working and middle classes that leave low income groups less isolated. With this background in mind, it is useful to explore empirically these two aspects of transfers with reference to the LIS database. Is redistribution associated with transfers' overall size or with their target efficiency? Is

there, as is often suggested, a tradeoff between the two? Using LIS micro data it is possible to calculate a measure of the average value of social transfers as a percentage of households' pre-tax 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. This is done by applying Kakwani's (1986) 'index of concentration' to transfers. This index takes on the value of -1.0 if the poorest person gets all transfer income, 0 if everybody gets an equal amount, and +1.0 if the richest person gets all transfer income (cf. Korpi and Palme, 1998: 684). Figures for the size and target efficiency of social benefits are calculated for all 20 LIS countries and are reported in Table 5 for around 1985 and around 2005.

**Table 5 Budget size and targeting efficiency across 20 LIS countries over time**

Country	Budget size (%)			Targeting		
	around 1985	around 2005	Change	around 1985	around 2005	Change
Australia (85-03)	8.4	11.1	2.7	-0.376	-0.404	-0.028
<i>Belgium (85-00)</i>	26.7	7.9	-18.8	-0.095	-0.244	-0.148
Canada (87-04)	9.9	10.9	1.0	-0.230	-0.193	0.038
Denmark (87-04)	18.4	18.9	0.5	-0.056	-0.306	-0.251
Finland (87-04)	11.2	23.2	12.0	-0.221	-0.127	0.094
<i>France (81-05)</i>	12.2	26.2	14.0	-0.119	0.077	0.196
Germany (84-04)	17.0	21.2	4.2	-0.165	-0.110	0.056
<i>Ireland (87-04)</i>	16.5	17.3	0.8	-0.218	-0.205	0.014
Israel (86-05)	10.7	11.0	0.3	-0.191	-0.125	0.066
<i>Italy (86-04)</i>	20.3	25.4	5.1	0.099	0.126	0.026
<i>Luxembourg (85-04)</i>	22.5	23.4	0.9	0.032	0.035	0.003
<i>Mexico (84-04)</i>	2.1	6.0	3.9	0.624	0.386	-0.238
Netherlands (83-04)	17.7	21.3	3.5	-0.156	-0.041	0.114
Norway(86-04)	12.6	20.2	7.7	-0.237	-0.155	0.082
<i>Poland (86-04)</i>	15.2	32.5	17.3	-0.068	0.157	0.224
<i>Spain (80-04)</i>	15.2	20.7	5.5	0.024	0.068	0.045
Sweden (87-05)	26.9	24.6	-2.3	-0.015	-0.128	-0.113
Switzerland (82-04)	6.5	17.5	11.1	-0.300	-0.066	0.235
United Kingdom (86-04)	17.9	14.3	-3.6	-0.228	-0.313	-0.085
United States (86-04)	7.2	9.9	2.7	-0.199	-0.060	0.138
Mean-20	14.7	18.2	3.4	-0.105	-0.081	0.023
Mean-12	13.7	17.0	3.3	-0.198	-0.169	0.029
<i>Mean-8</i>	<i>16.3</i>	<i>19.9</i>	<i>3.6</i>	<i>0.035</i>	<i>0.050</i>	<i>0.015</i>

*Notes:*

- For 12 countries full tax and benefit information is available in LIS. For other 8 countries (marked *italic*) net wages and salaries are used because gross variables are not available for all data years in LIS.
- As suggested by the LIS Staff and Louis Chauvel, the budget size of France around 1985 and Poland (1986) can be seen as outliers. Moreover, we think that figures for Belgium (2000) should be interpreted with cautious as well.

Source: Database Wang and Caminada (2011), and own calculations

There is considerable variance among countries in the average size of social benefits relative to total household income. In the mid-1980s, four countries (Belgium, Italy, Luxembourg and Sweden) achieve a high budget size of transfers (20% or more), followed by Denmark, Germany, Ireland, the Netherlands, Poland, Spain and the United Kingdom (above 15%), whereas it is low in Australia, Canada, Mexico, Switzerland, and the United States (less than 10%). In the mid-2000s, more countries achieve a high budget size (20% or over), namely Finland, France, Germany, Italy, Luxembourg, the Netherlands, Norway, Poland, Spain and Sweden, while Belgium, Mexico, and the United States have budget sizes less than 10%. Over time social benefits size increased in all countries, with exceptions for Belgium, Sweden and the United Kingdom.

Targeting efficiency is more diverse across countries. In the mid-1980s, cash benefits are most targeted to the poor in Australia and Switzerland (values less than -0.300), and more universally distributed in Belgium, Italy, Luxembourg, Poland, Spain and Sweden (values between -0.01 and +0.01). In the mid-2000s, Australia, Denmark and the United Kingdom targeted more to the poor than other countries (respectively -0.404, -0.306 and -0.313). Transfers were spread more universally in France, Luxembourg, the Netherlands, Spain, Switzerland, and the United States. Generally speaking, transfers are less targeted to the poor around 2005 than in earlier periods.

#### **4. Decomposition of the redistributive effect of social transfers and taxes across LIS countries from the mid-1980s to the mid-2000s**

How have the redistributive effects of the different parts of welfare states altered over time and across countries? This section shows trends of detailed redistributive effects across a selection of those 12 LIS countries with full information on taxes and benefits. We elaborate on the work of Mahler and Jesuit (2006), Immervoll and Richardson (2011) and OECD (2011). However, we refine their approach (see Wang and Caminada, 2011 and Wang et al, 2012), decomposing the trajectory of the Gini coefficient from primary to disposable income inequality in several parts: we will distinguish 11 different social benefits, income taxes and social contributions in our empirical investigation. We calculate the following (partial) redistributive effects over time, based on the LIS household income components list: sickness benefits, occupational injury and disease benefits, disability benefits, state old-age and survivors benefits, child/family benefits, unemployment compensation benefits, maternity and other family leave benefits, military/veterans/war benefits, other social insurance benefits, social assistance cash benefits, near-cash benefits, mandatory payroll taxes and income taxes.

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. Occupational and private pensions are not taken into account.

To illustrate the idea of decomposition from primary to disposable income inequality, Table 6 reports the trends of redistributive effects of the different parts of tax-benefit system averaged for 12 LIS countries from the mid-1980s to the mid-2000s.<sup>14</sup>

---

<sup>14</sup> It should be noted that our results are hardly affected by the ordering effect. The partial redistributive effect of a specific social transfer will be highest (smallest) when computed as the first (last) social program. A sensitivity analysis shows that changing the order of adding a specific benefit to primary

**Table 6 Decomposition of disposable income inequality for 12 countries from the mid-1980s to the mid-2000s: averages by periods**

	Gini around 1985	Gini around 1995	Gini around 2005	Change 85-05
(a) Gini primary income	0.412	0.437	0.454	+0.043
(b) Gini disposable income	0.273	0.281	0.292	+0.018
Overall redistribution (a-b)	0.139	0.157	0.163	+0.024
Partial effects	Share	Share	Share	Change
Transfers	71%	74%	78%	+7 points
Sickness benefits	1%	1%	2%	+1 points
Occupational injury and disease benefits <sup>a</sup>	6%	0%	1%	-5 points
Disability benefits <sup>b</sup>	5%	6%	8%	+3 points
State old-age and survivors benefits <sup>c</sup>	34%	33%	38%	+4 points
Child/family benefits <sup>d</sup>	6%	7%	6%	+1 points
Unemployment compensation benefits <sup>e</sup>	6%	8%	5%	0 points
Maternity and other family leave benefits <sup>f</sup>	1%	1%	2%	+1 points
Military/veterans/war benefits	1%	1%	1%	0 points
Other social insurance benefits <sup>g</sup>	3%	4%	3%	0 points
Social assistance cash benefits <sup>h</sup>	9%	9%	9%	0 points
Near-cash benefits <sup>i</sup>	1%	4%	3%	+2 points
Taxes	29%	26%	22%	-7 points
Mandatory payroll taxes <sup>j</sup>	1%	1%	0%	-1 points
Income taxes	28%	25%	22%	-6 points
Overall redistribution	100%	100%	100%	

a Short-term occupational injury and disease benefits, Long-term occupational injury and disease benefits; Occupational injury and disease benefits.

b Disability pensions; Disability allowances; Disability benefits.

c Universal old-age pensions; Employment-related old-age pensions; Old-age pensions for public sector employees; Old-age pensions.; Early retirement benefits; Survivors pensions; State old-age and survivors benefits.

d Child allowances; Advance maintenance; Orphans allowances; Child/family benefits.

e Unemployment insurance benefits; (Re)training allowances; Placement/resettlement benefits; Unemployment compensation benefits.

f Wage replacement; Birth grants; Child care leave benefits; Maternity and other family leave benefits.

g Invalid career benefits; Education benefits; Child care cash benefits; Other social insurance benefits.

h General social assistance benefits; Old-age and disability assistance benefits; Unemployment assistance benefits; Parents assistance benefits; Social assistance cash benefits.

i Near-cash food benefits; Near-cash housing benefits; Near-cash medical benefits; Near-cash heating benefits; Near-cash education benefits; Near-cash child care benefits; Near-cash benefits.

j Mandatory contributions for self-employment; Mandatory employee contributions.

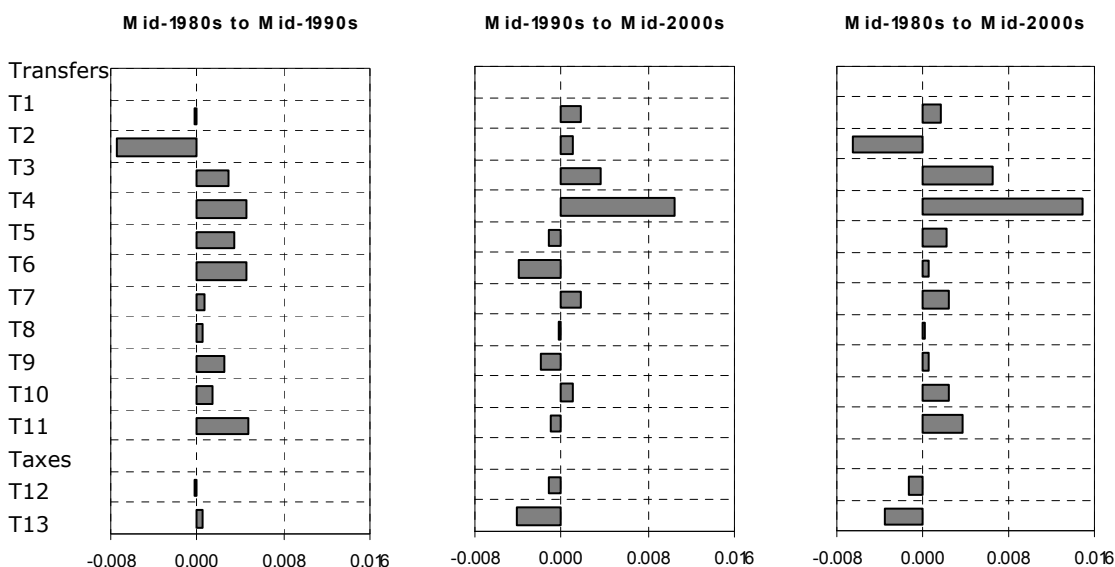
Note: 12-country-average; Australia, Canada, Denmark, Finland, Germany, Israel, Netherlands, Norway, Sweden, Switzerland, the United Kingdom, and the United States.

Source: own calculations based on LIS

income (or subtracting tax from gross income) does change the partial effect of this transfer (or tax) in total redistribution only slightly. In case we consider a specific social transfer as the last (instead of the first) program to be added to primary income distribution, the computed partial redistributive effect changes up to 1%-point at the highest.

From a policy perspective, comparisons of absolute changes in redistribution are often more appealing than comparisons of shares (see section 2.3). Figure 3 highlights differences in redistributive effects of 13 transfers and taxes on the average level of 12 LIS countries across different periods.

**Figure 3 Trends in the redistributive effects of 13 types of transfers and taxes for 12 countries (point changes in the Gini coefficient)**



- |    |   |     |                                    |
|----|---|-----|------------------------------------|
| T1 | Sickness benefits                         | T8  | Military / veterans / war benefits |
| T2 | Occupational injury and disease benefits  | T9  | Other social insurance benefits    |
| T3 | Disability benefits                       | T10 | Social assistance cash benefits    |
| T4 | State old age and survivors benefits      | T11 | Near cash benefits                 |
| T5 | Child / family benefits                   | T12 | Mandatory payroll taxes            |
| T6 | Unemployment compensation benefits        | T13 | Income taxes                       |
| T7 | Maternity and other family leave benefits |     |                                    |

Source: own calculations based on LIS

In the decade from the mid-1980s to the mid-1990s, the dominant pattern was that of more redistribution. This was especially evident for state old age and survivors benefits (T4), to a lesser extent for disability benefits (T3), child and family benefits (T5), unemployment compensation benefits (T6), social assistance cash benefits (T10) and near cash benefits (T11). Less redistribution was generated by occupational injury and disease benefits (T2), mandatory payroll taxes (T12) and income taxes (T13). In this decade overall redistribution increased by 0.017 point for our 12-country-average.

In the second decade between 1995 and 2005, redistribution as a whole was rather stable. We observe a moderate decline for child / family benefits (T5), unemployment compensation benefits (T6), military / veterans / war benefits, other social insurance benefits, near cash benefits (T11), mandatory payroll taxes (T12) and income taxes (T13). However, redistribution increased in this period rather strongly for state old age and survivors benefits (T4), and to a lesser extent for sickness benefits (T1), occupational injury and disease benefits (T2), disability benefits (T3), maternity and

other family leave benefits (T7) and social assistance cash benefits (T10). The average change in total redistribution during this decade was only 0.006 point.

Over the entire period 1985-2005, there was more diversity in patterns. A significant increase of redistribution can be attributed to disability benefits (T3) and the state old age and survivors benefits (T4), whereas less redistribution comes via occupational injury and disease benefits (T2), mandatory payroll taxes (T12) and income taxes (T13). The cumulative change in total redistribution during the entire period was of around 0.024 points.

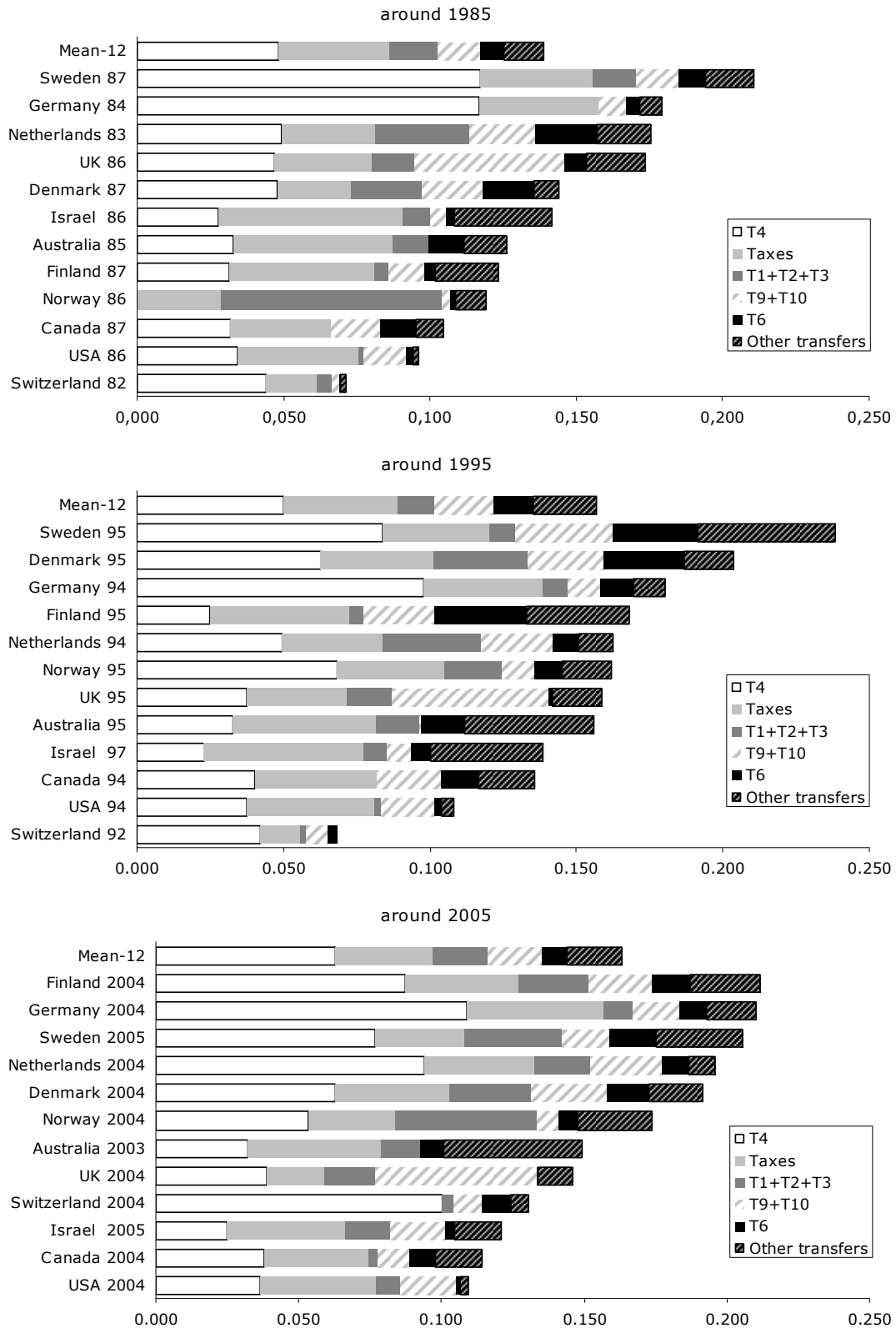
With respect to trends in the redistributive effects of several social programs across countries, the results are diverse. Figure 4 presents how the redistributive effect of each social program changed over time across 12 LIS countries. Here, we focus on only five grouped social transfer schemes and on taxes (see Annex B and Annex C for more details):

- T4: state old-age and survivors benefits;
- T1+T2+T3: benefits for sickness, occupational injury and disease, and disability;
- T9+T10: social assistance cash benefits, near-cash benefits;
- T6: unemployment compensation benefits;
- Other transfers (child/family benefits, maternity and other family leave benefits, military/veterans/war benefits, other social insurance benefits); and
- Taxes (income taxes and mandatory payroll taxes).

Countries are ranked in order to their redistribution from highest to lowest. For example, Sweden ranks first in descending order of redistribution around 1985 and 1995, but ranks third around 2005. On the other extreme, Switzerland ranks at the bottom of our list of redistribution around 1985 and 1995, but climbs several places to rank ninth in 2004. The United States has the lowest redistribution in 2004.

Note that Finland made remarkable progress over time on the list, mainly due to (additional) redistribution by the public old age and survivors scheme. Finland ranked eighth around 1985, while it is on top of the list of redistributive welfare states around 2005.

**Figure 4 Decomposition of redistribution of social transfers and taxes in 12 LIS countries 1985-2005**





State old age and survivors benefits attribute most to redistribution in the majority of the countries (around one third). From the mid-1980s to mid-1990s, the main pattern was a stable or declining contribution of these programs to redistribution, except for Canada, Denmark and Norway. In the last decade, the pattern changed: redistribution increased in eight countries and decreased in Canada, Norway and Sweden. The contribution of the old age and survivors program increased during this decade. Overall, state old age and survivors benefits account for around 60 percent of the total increase in redistribution among our 12-country-average between 1985 and 2005.

Social assistance benefits, the main form of income support for jobseekers who are not qualifying for other benefits, represent a relatively high share of total redistribution comparing to other benefits because this program is specifically targeted to low-income groups. Higher levels of inequality reduction in the mid-1990s were achieved comparing to earlier years in all countries. During the period 1995-2005 redistribution only fell in Canada, Finland, Norway and Sweden. But in these countries regional or local authorities may also provide supplementary programs on top of those which are nationally coordinated, compensating partly for the declining redistribution. Overall, social assistance and near-cash benefits account for 20 percent of the total increase in redistribution among our 12-country-average between 1985 and 2005.

The redistributive effect of benefits for sickness, occupational injury and disease, and disability varies across countries. Through the entire period, it has risen in Canada, Germany, and the United Kingdom, while it declined in the Netherlands and Norway. Other countries experienced an increase (decrease) before the mid-1990s and then a decrease (increase) until the mid-2000s. Overall, benefits for sickness, occupational injury and disease, and disability account for around 13 percent of the total increase in redistribution among our 12-country-average between 1985 and 2005.

During the first decade the redistributive effect of unemployment compensation benefits increased in most countries except for the Netherlands and the United Kingdom, while it declined slightly in most countries in the period 1995-2005 (with the Netherlands, Switzerland and the United States as exceptions). The overall contribution of unemployment benefits to the total increase in redistribution among our 12-country-average between 1985 and 2005 is modest.

Among the other transfers, we have to mention a sharp increase in redistribution for Australia and Sweden in the period 1985-1995 due to invalid career benefits, education benefits, child care cash benefits and other child and family benefits in those countries. This variety of family-related benefits accounts for 22 percent of the total increase in redistribution among our 12-country-average between 1985 and 2005.

Taxes attributed less to redistribution in the period 1985-2005 on average. However, cross-country differences are large. Changes in the redistributive effect of taxes may be caused by tax reforms. Tax reforms did have several aspects. Income taxes became more progressive in Denmark, Germany, the Netherlands and Norway – consistent with the trend towards greater primary-income inequalities, which, in itself, would increase taxation at the top end. Reforms that have broadened the tax base may also have resulted in some tax-burden increases for higher-income groups. Effective income-tax rates faced by households, on average, have, however, declined in Australia, Finland, Israel, Sweden, Switzerland and the United Kingdom. In these countries the effect of

flattening of the rate structures has been accompanied by lower tax burdens resulting in lower redistributive capacity of taxes.

Table 7 summarizes our results of the decomposition of the change in disposable income inequality across 12 countries during the period 1985-2005.

**Table 7 Components of change in disposable income inequality for 12 countries from the mid-1980s to the mid-2000s**

	Gini around 1985	Gini around 2005	Change 85-05	
(a) Gini primary income	0.412	0.454	+0.043	
(b) Gini disposable income	0.273	0.292	+0.018	
Overall redistribution (a-b)	0.139	0.163	+0.024	= 100
o State old-age and survivors benefits			+0.015	60
o Social assistance cash and near benefits			+0.005	20
o Benefits for sickness, occupational injury and diseases			+0.003	13
o Unemployment compensation benefits			+0.001	2
o Other transfers <sup>a</sup>			+0.005	22
o Taxes			-0.004	-17

a Child/family benefits, maternity and other family leave benefits, military/veterans/war benefits, other social insurance benefits.

Source: own calculations based on LIS

## 5. Conclusion

Different welfare systems and different social policies lead to various outcomes in changes of income inequality. This paper investigates income distribution and redistribution attributed to social transfers and taxes across 20 LIS countries from around 1985 to the mid-2000s, based on the micro household income data from LIS. We have provided trends of primary and disposable income inequality, overall and disaggregated redistributions by social programs in a comparative way, across much more countries

than that have been studied before, offering an accurate, detailed picture of redistribution of incomes through taxes and transfers across social welfare states.

We have applied a sequential budget incidence analysis and find that the welfare states on average reduce inequality by one third around 2005. Social benefits have a much stronger redistributive impact than taxes. As far as social programs are concerned, public pensions account for the largest reduction in income inequality, although the pattern is diverse across countries. To a lesser extent, social assistance, disability and family benefits also contribute to smaller income disparities.

We observe a sizeable increase in primary household inequality in all 20 countries over the last 25 years with the exception of Ireland. In most countries, the extent of redistribution has increased as a whole too. Tax-benefit systems offset two-third of the increase in primary income inequality, although they appear to have become less effective in doing so since the mid-1990s.

Our approach differs from earlier studies in that the total population is taken into consideration, in stead of the working-age population only. In contrast to the results in OECD (2011) and Immervoll and Richardson (2011), we do not find that tax-benefit policies have become less effective in redistribution since the mid-1990s. Among the total population both primary income inequality and redistribution continued to rise after the mid-1990s; we do not find that the fiscal redistribution effect of taxes and benefits on household income inequality stabilized (or declined). As a result, the tax-benefit systems in the mid-2000s are even more effective at reducing inequality compared to the mid-1990s. So, the claim that reduced redistribution is a main driver of widening income gaps since the mid-1990's must be toned down.

We find that within rising overall redistribution, the public old age pensions and the survivors scheme attribute 60 percent to the increase of redistribution during the entire period 1985-2005. Social assistance accounts for 20 percent, and the benefits for sickness, occupational injury and disease, and disability account for around 13 percent of the total increase in redistribution among our 12-country-average. Other transfers (invalid career benefits, education benefits, child care cash benefits and other child and family benefits) account for 22 percent of the total increase in redistribution. On the contrary, taxes slowed down redistribution by 17 percent during 1985-2005.

This empirical analysis does not show why benefits and taxes have become more or less redistributive. It can be expected that, as market income inequality rises, the tax-benefit systems will automatically have a more redistributive impact, because of the progressivity built into these systems. But also policy changes 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.

## References

- Atkinson, A. B., L. Rainwater, and T.M. Smeeding (1995), 'Income Distribution in OECD Countries: Evidence from the Luxembourg Income Study', *OECD Social Policy Studies* 18, Paris.
- Atkinson, A.B. (1996), 'Seeking to Explain the Distribution of Income', in: J. Hills (ed.), *New Inequalities*, Cambridge University Press, Cambridge.
- Atkinson, A.B. (2003), 'Income Inequality in OECD Countries: Data and Explanations', *CESifo Economic Studies* 49(4): 479-513.
- Atkinson, A.B. and Brandolini, A. (2001), 'Promise and Pitfalls in the Use of Secondary Data-Sets: Income Inequality in OECD Countries as a Case Study', *Journal of Economic Literature* 39(3) (September): 771-800.
- Blank, R.M. and A.S. Blinder (1986), 'Macroeconomics, Income Distribution, and Poverty', in: S. Danziger and D. Weinberg (eds.), *Fighting Poverty: What Works and What Doesn't*, Cambridge, MA, Harvard University Press: 180-208.
- Blank, R.M., D. Card, F. Levy and J.L. Medoff (1993), 'Poverty, Income Distribution, and Growth: Are They Still Connected?', *Brookings Papers on Economic Activity* 2: 285-339.
- Blinder, A.S. and H.Y. Esaki (1978), 'Macroeconomic Activity and Income Distribution in the Postwar United States', *The Review of Economics and Statistics* 60: 604-609.
- Brady, D. (2004), 'The welfare state and relative poverty in rich western democracies, 1967-1997', *LIS Working Paper Series* 390.
- Brandolini, A. and T.M. Smeeding (2009), 'Income Inequality in Richer and OECD Countries', in: Salverda, W., B. Nolan and T.M. Smeeding (eds.), *The Oxford Handbook of Economic Inequality*, Oxford University Press.
- Brandolini, A., and T.M. Smeeding (2007a), 'Inequality Patterns in Western-Type Democracies: Cross-Country Differences and Time Changes', *LIS Working Paper Series* 458.
- Brandolini, A., and T.M. Smeeding (2007b), 'Inequality: International Evidence', in: S.N. Durlauf and L.E. Blume (eds.), *The New Palgrave Dictionary of Economics*, Basingstoke: Palgrave Macmillan: 1013-1021.
- Caminada, C.L.J., and K.P. Goudswaard (2005), 'Are public and private social expenditures complementary?', *International Advances in Economic Research* 11(2): 175-189.
- Caminada, K., and K.P. Goudswaard (2001), 'International Trends in Income Inequality and Social Policy', *International Tax and Public Finance* 8(4): 395-415.
- Caminada, K., and K.P. Goudswaard (2002), 'Income Distribution and Social Security in and OECD Perspective', in: R. Sigg and C. Behrendt (eds.), *Social Security in the Global Village*, International Social Security Series, Volume 8, Transaction Publishers: New Brunswick/Londen: 163-188.
- Caminada, K., and K.P. Goudswaard (2009), 'Effectiveness of Poverty Reduction in the EU15. A Descriptive Analysis.', *Poverty & Public Policy* 1(2), Article 5: 1-51.
- Caminada, K., and K.P. Goudswaard (2010), 'How well is social expenditure targeted to the poor?', in: P. Saunders and R. Sainsbury (eds.), *Social Security, Poverty and Social*

- Exclusion in Rich and Poorer Countries*, International Studies on Social Security, volume 16, Mortsel, Belgium: Intersentia: 97-112.
- Caminada, K., K. Goudswaard and F. Koster (2012), 'Social income transfers and poverty: A cross-country analysis for OECD countries', *International Journal of Social Welfare* 21(2): 115-126.
- Chen, W.H., M. Förster and A. Llana-Nozal (2011), 'Trends in Households Earnings Inequality: The Role of Changing Family Formation Practice', in *Divided We Stand: Why Inequality Keeps Rising*, Paris: Organisation of Economic Co-operation and Development: 193-224.
- Chevan, A. and R. Stokes (2000), 'Growth in Family Income Inequality, 1970-1990: Industrial Restructuring and Demographic Change', *Demography* 37:365-380.
- Danziger, S., R. Haveman and R. Plotnick (1981), 'How Income Transfer Programs Affect Work, Savings and Income Distribution: A Critical Assessment', *Journal of Economic Literature* 19 (September): 975-1028.
- Ervik, R. (1998), 'The Redistributive Aim of Social Policy. A Comparative Analysis of Taxes, Tax Expenditure Transfers and Direct Transfers in Eight Countries', *LIS Working Paper Series* 184.
- Ferrarini, T., and K. Nelson (2003) 'Taxation of Social Insurance and Redistribution: a Comparative Analysis of Ten Welfare States', *Journal of European Social Policy* 13(1): 21-33.
- Förster, M. (2000), 'Trend and Driving Factors in Income Distribution and Poverty in the OECD Area', *Labour Market and Social Policy Occasional Papers* no. 42, OECD, Paris.
- Frick, J.R., F. Büchel, and P. Krause (2000), 'Public transfers, income distribution, and poverty in Germany and the United States' in: R. Hauser and I. Becker (eds.) *The Personal Distribution of Income in an International Perspective*, Berlin, Germany, Springer-Verlag: 176-204.
- Fuest, C., J. Niehues, and A. Peichl (2010), 'The Redistributive Effects of Tax Benefit Systems in the Enlarged EU', *Public Finance Review* 38(4): 473-500.
- Gillespie, W.I. (1965), 'Effects of Public Expenditures on the Distribution of Income' in: R. Musgrave (eds.), *Essays in Fiscal Federalism*, The Brookings Institution, Washington.
- Gottschalk, P., and T.M. Smeeding (1997), 'Cross-National Comparisons of Earnings and Income Inequality', *Journal of Economic Literature* 35(2): 633-687.
- Gottschalk, P., and T.M. Smeeding (1998), 'Empirical Evidence on Income Inequality in Industrialized Countries', *LIS Working Paper Series* 154 (revised), Luxembourg.
- Gottschalk, P., and T.M. Smeeding (2000), 'Empirical Evidence on Income Inequality in Industrialized Countries', in: A.B. Atkinson and F. Bourguignon (eds.), *Handbook of Income Distribution*, Amsterdam: North-Holland, 261-308.
- Gustafsson, B. and M. Johansson (1999), 'In Search of Smoking Guns: What Makes Income Inequality Vary over Time in Different Countries?', *American Sociological Review* 64: 585-605.
- Harrison, B. and B. Bluestone (1988), *The Great U-Turn: Corporate Restructuring and the Polarizing of America*. NY: Basic Books.

- Hauser, R. and I. Becker (1999), 'Changes in the distribution of pre-government and post-government income in Germany 1973 – 1993', in: R. Hauser and I. Becker (eds.), *The Personal Distribution of Income in an International Perspective*, Berlin: Springer-Verlag, 72-98.
- Heisz, A. (2007), 'Income Inequality and Redistribution in Canada: 1976 to 2004', *Analytical Studies Branch Research paper Series*, No. 298.
- Immervoll, H. and L. Richardson (2011), 'Redistribution Policy and Inequality Reduction in OECD Countries: What Has Changed in Two Decades?', *OECD Social, Employment and Migration Working Papers*, No. 122, OECD Publishing.
- Immervoll, H., H. Levy, Ch. Lietz, D. Mantovani, C.O. Donoghue, H. Sutherland, and G. Verbist (2005), 'Household incomes and redistribution in the European Union: Quantifying the equalising properties of taxes and benefits', *EUROMOD Working Papers* EM9/05.
- Kakwani, N. (1986), *Analyzing Redistribution Policies: A Study Using Australian Data*, Cambridge: Cambridge University Press.
- Kakwani, N.C. (1977a), 'Measurement of Tax Progressivity: An International Comparison', *Economic Journal* 87:71-80.
- Kakwani, N.C. (1977b), 'Applications of Lorenz Curves in Economic Analysis', *Econometrica* 45 (3):719-727.
- Kammer, A., and J. Niehues (2011), 'Fiscal Redistribution in Modern Welfare States. Dynamic Evidence from Germany and the United Kingdom', paper presented at the 18th International Research Seminar of the Foundation for International Studies on Social Security, Sigtuna, Sweden.
- Kenworthy, L., and J. Pontusson (2005), 'Rising Inequality and the Politics of Redistribution in Affluent Countries', *Perspectives on Politics* 3(3): 449-471
- Kim, H. (2000a), 'Anti-Poverty Effectiveness of Taxes and Income Transfers in Welfare States', *International Social Security Review* 53(4): 105–129.
- Kim, H. (2000b), 'Do welfare states reduce poverty? A critical shortcoming in the standard analysis of the anti-poverty effect of welfare states', *LIS Working Paper Series* 233.
- Korpi, W., and J. Palme (1998), 'The Paradox of Redistribution and Strategies of Equality: Welfare State Institutions, Inequality, and Poverty in the Western Countries', *American Sociological Review* 63: 661-687.
- Kristjánsson, A.S. (2011), 'Governmental Income Redistribution in Iceland. Development and European Comparison', paper presented at the 18th International Research Seminar of the Foundation for International Studies on Social Security, Sigtuna, Sweden.
- Kuznets, S. (1955), 'Economic Growth and Income Inequality', *American Economic Review* 45: 1-28.
- Lambert, P. J. (1993), *The distribution and redistribution of income: A mathematical analysis*, Manchester: Manchester University Press.
- Lambert, P.J., R. Nesbakken, and T.O. Thoresen (2010), 'On the Meaning and Measurement of Redistribution in Cross-Country Comparisons', *LIS Working Paper Series* 532.

- Lerman, R.I., and S. Yitzhaki (1985), 'Income Inequality Effects by Income Source: A New Approach and Applications to the United States', *The Review of Economics and Statistics* 67(1): 151-156.
- Luxembourg Income Study (LIS) Database, <http://www.lisdatacenter.org> (multiple countries; microdata runs completed on 27 August 2012). Luxembourg: LIS.
- Mahler, V.A., and D.K. Jesuit (2006), 'Fiscal redistribution in the developed countries: new insights from the Luxembourg Income Study', *Socio-Economic Review* 4: 483-511.
- McCall, L. (2001), *Complex Inequality: Gender, Class, and Race in the New Economy*. NY: Routledge.
- Mitchell, D. (1991), *Income Transfers in Ten Welfare States*, Aldershot: Avebury.
- Mocan, N. (1999), 'Structural Unemployment, Cyclical Unemployment, and Income Inequality', *The Review of Economics and Statistics* 81: 122-134.
- Morris, M. and B. Western (1999), 'Inequality in Earnings at the Close of the Twentieth Century', *Annual Review of Sociology* 25: 623-57.
- Musgrave, R.A., and Tun Thin (1948), 'Income Tax Progression, 1929-48', *Journal of Political Economy* 56: 498-514.
- Musgrave, R.A., K.E. Case, and H.B. Leonard (1974), 'The Distribution of Fiscal Burdens and Benefits', *Public Finance Quarterly* 2(July): 259-311.
- Nielsen, F. and A.S. Alderson (1997), 'The Kuznets Curve and the Great U-Turn: Patterns of Income Inequality in U.S. Counties, 1970-1990', *American Sociological Review* 62: 12-33.
- Nolan, B., and I. Marx (2009), 'Economic Inequality, Poverty, and Social Exclusion' in: W. Salverda, B. Nolan and T.M. Smeeding (eds.), *The Oxford Handbook of Economic Inequality*, New York: Oxford University Press: 315-341.
- O'Higgins, M., G. Schmaus, and G. Stephenson (1990), 'Income Distribution and Redistribution: A Microdata Analysis for Seven Countries', in: T. Smeeding, M. O'Higgins and L. Rainwater (eds.), *Poverty, Inequality, and Income Distribution in Comparative Perspective*, Harvester Wheatsheaf, Hemel Hempstead.
- OECD (2008), *Growing unequal? Income distribution and Poverty in OECD Countries*, Paris: OECD.
- OECD (2011), *Divided We Stand: Why Inequality Keeps Rising*, Paris: OECD.
- Palme, M. (1996), 'Income Distribution Effects of the Swedish 1991 Tax Reform: An Analysis of a Microsimulation Using Generalized Kakwani Decomposition', *Journal of Policy Modeling* 18(4): 419-443.
- Paul, S. (2004), 'Income sources effects on inequality', *Journal of Development Economics* 73: 435-451.
- Plotnick, R. (1984) 'The Redistributive Impact of Cash Transfers', *Public Finance Quarterly* 12: 27-50.
- Reynolds, M., and E. Smolensky (1977a), *Public Expenditures, Taxes and the Distribution of Income: The United States 1950, 1961, 1970*, Academic Press, New York.

- Reynolds, M., and E. Smolensky (1977b), 'Post Fisc Distributions of Income 1950, 1961, and 1970', *Public Finance Quarterly* 5:419-438.
- Ringen, S. (1991), 'Households, standard of living and inequality', *Review of Income and Wealth* 37:1-13.
- Shorrocks, A.F. (1982), 'Inequality decomposition by factor components', *Econometrica* 50:193-211.
- Smeeding T. (2008), 'The LIS/LES Project: Overview and Recent Developments', *LIS Working Paper Series* 294.
- Smeeding, T. (2000), 'Changing Income Inequality in OECD Countries: Updated Results from the Luxembourg Income Study (LIS)', in: R. Hauser and I. Becker (eds.) *The Personal Distribution of Income in an International Perspective*, Berlin, Germany, Springer-Verlag: 205-224.
- Smeeding, T.M. (2004), 'Twenty Years of Research in Income Inequality, Poverty and Redistribution in the Developed World: Introduction and Overview', *Socio-Economic Review* 2: 149-163.
- Smolensky, E., W. Hoyt, and S. Danziger (1987), 'A Critical Survey of Efforts to Measure Budget Incidence' in: H.M. van de Kar, B.L. Wolfe (eds.), *The Relevance of Public Finance for Policy-Making*, Proceedings IIFP Congress 1985, Detroit:165-179.
- Stark, O., J. E. Taylor, and S. Yitzhaki (1986), 'Remittances and inequality', *Economic Journal* 96: 722-740.
- Van Vliet, O., J. Been, K. Caminada and K. Goudswaard (2012), 'Pension reform and income inequality among the elderly in 15 European countries', *International Journal of Social Welfare*, DOI: 10.1111/j.1468-2397.2012.00873.x.
- Wang, C., and K. Caminada (2011), 'Disentangling Income Inequality and the Redistributive Effect of Social Transfers and Taxes in 36 LIS Countries', *LIS Working Paper Series* 567.
- Wang, C., K. Caminada and K. Goudswaard (2012), 'The redistributive effect of social transfer programs and taxes: a decomposition across countries', *International Social Security Review* 65(3): 27-48.
- Whiteford (2010), 'The Australian Tax-Transfer System: Architecture and Outcomes', *The Economic Record* 86 (275): 528-544.
- Whiteford, P. (2008), 'How much redistribution do governments achieve? The role of cash transfers and household taxes, growing unequal: income distribution and poverty in OECD countries', in: *Growing unequal? Income distribution and poverty in OECD countries*, Paris: Organisation of Economic Co-operation and Development: 97-121.



## **Annex A Sensitivity analysis for redistribution using different global income inequality indicators**

Literature shows that different indicators of income inequality are sensitive to different parts of the income distribution.<sup>15</sup> In order to offer a broader picture of the redistributive effect of income transfers, we not only use the Gini coefficient, but also other widely used indicators, namely Atkinson's index ( $\alpha=1.0$  and  $\alpha=0.5$ ), Mean Log Deviation and Theil index. Indicators more sensitive to the middle part of the income distribution are the Gini coefficient, Atkinson's index ( $\alpha=0.5$ ) and Theil index, while Atkinson's index ( $\alpha=1.0$ ) and Mean Log Deviation are relatively more sensitive to the changes in the lower tail of the income distribution. The figures below show the results of the sensitivity analysis on the partial redistributive effects of income transfers for 4 countries (Germany, the Netherlands, Sweden and the United States) from around 1985 to around 2005.

This sensitivity analysis is presented in three dimensions. The first dimension is the redistributive effect across countries at one moment in time, which is shown in Figure A1. It presents the level of redistribution in Germany, the Netherlands, Sweden and the United States around 2005. In each country, all indicators follow the same pattern; the largest redistribution is given by Mean Log Deviation, the lowest by the Atkinson's index ( $\alpha=0.5$ ). The second dimension concerns the partial redistributive effects at one moment in time across countries in Figure A2. Here, we see some differences for the various indicators. The highest redistribution always comes from state old-age and survivors benefits (T4), but the share of taxes and social assistance benefits (T9+T10) slightly changes depending on the indicators used. Thirdly, the trends of decomposed redistribution are similar using different indicators in most cases, although there are some exceptions; see Figure A3, A4, A5 and A6.

To sum up, in most cases the empirical result is not affected by using different global income inequality indicators. However, especially if the social program is targeted towards a certain group, for instance the lower tail of the income distribution, the results vary slightly, depending on the indicators used.

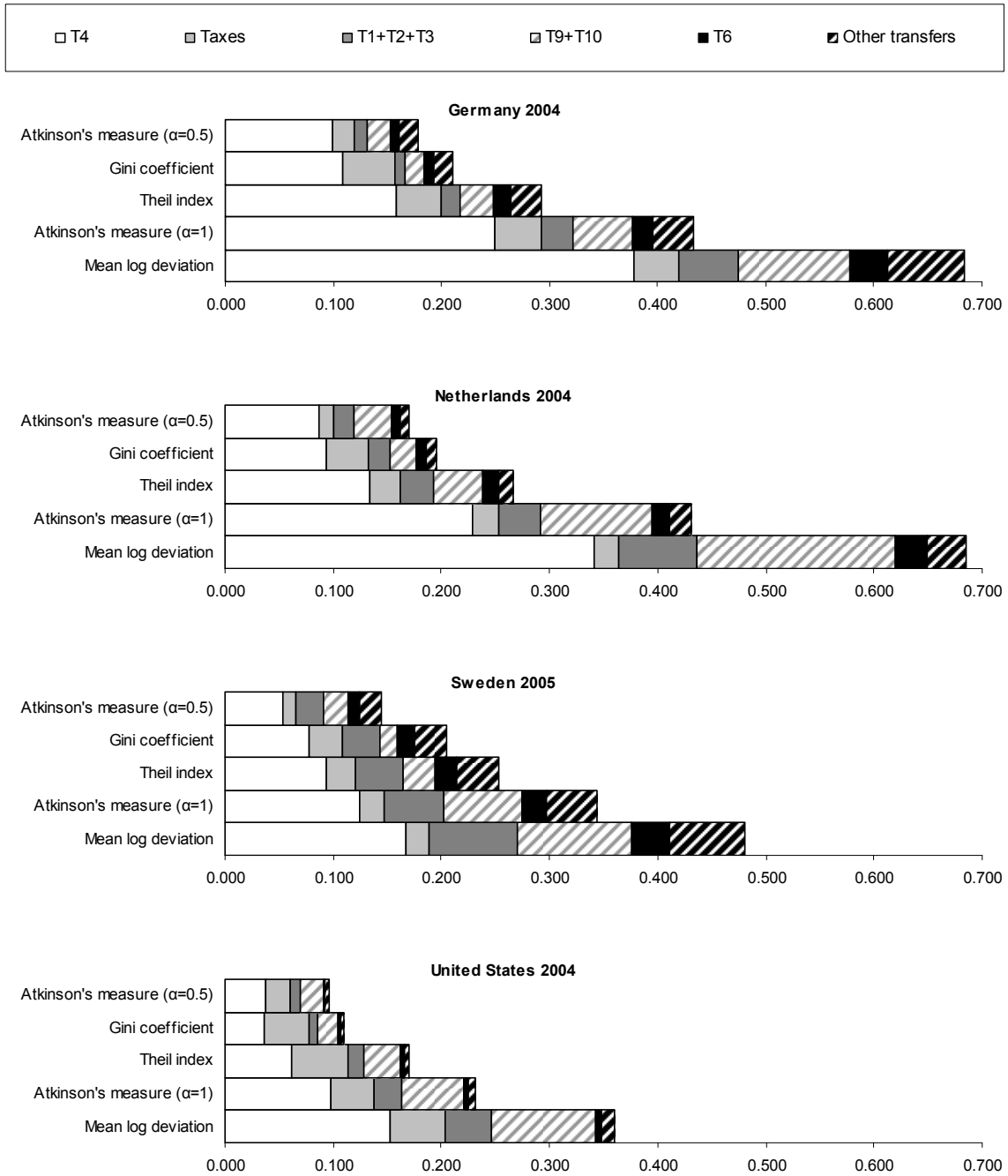
Social programs presented in the Figure below are listed here:

- T4: state old-age and survivors benefits;
- T1+T2+T3: benefits for sickness, occupational injury and disease, and disability;
- T9+T10: social assistance cash benefits, near-cash benefits;
- T6: unemployment compensation benefits;
- Other transfers (child/family benefits, maternity and other family leave benefits, military/veterans/war benefits, other social insurance benefits); and
- Taxes (income taxes and mandatory payroll taxes).

---

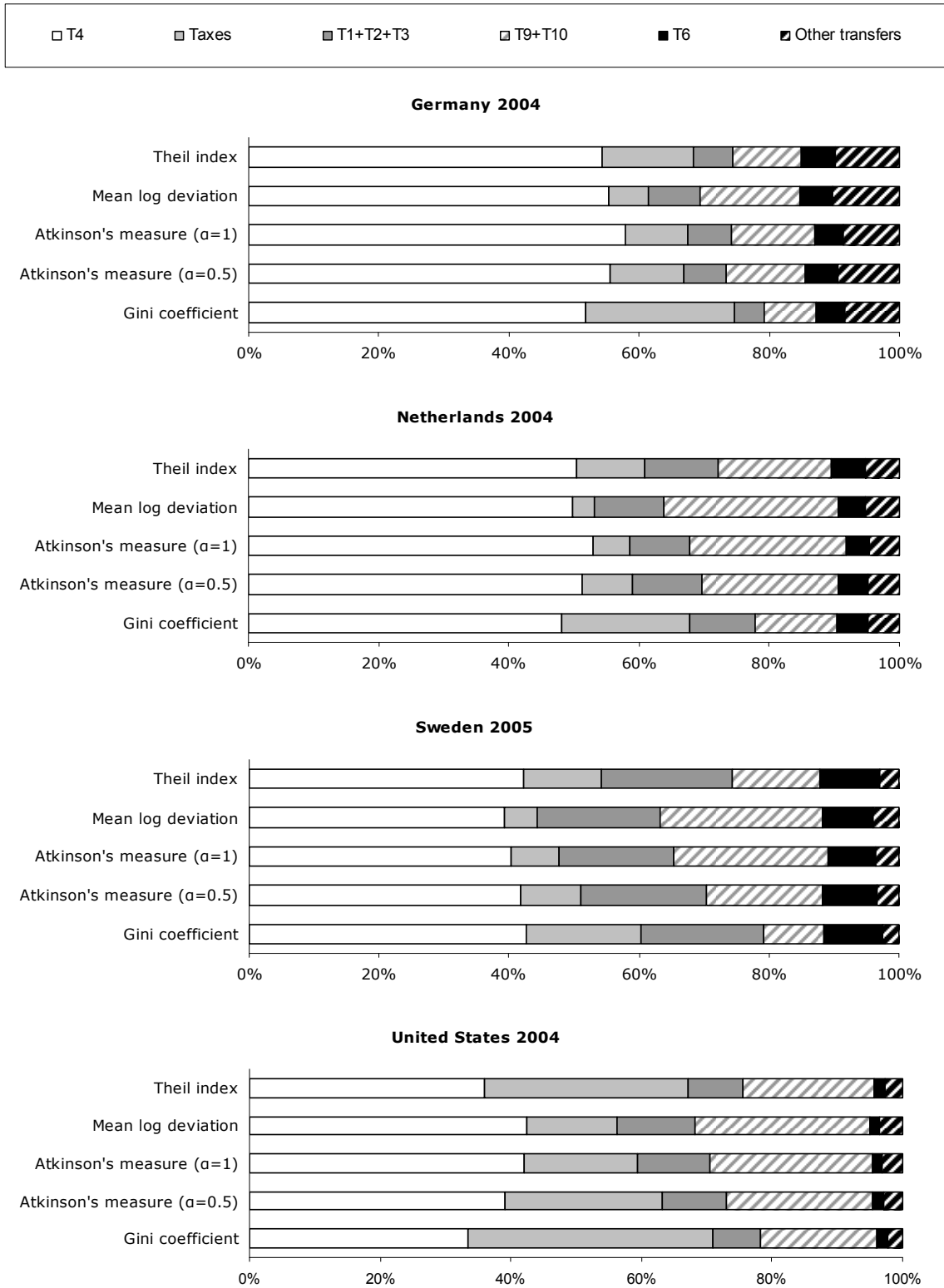
<sup>15</sup> Among others, see Atkinson et al (2000), Föster (2000), Hauser and Becker (1999) and Lambert (1993).

**Figure A1 sensitivity analysis for partial redistributive effects around 2005 (levels)**



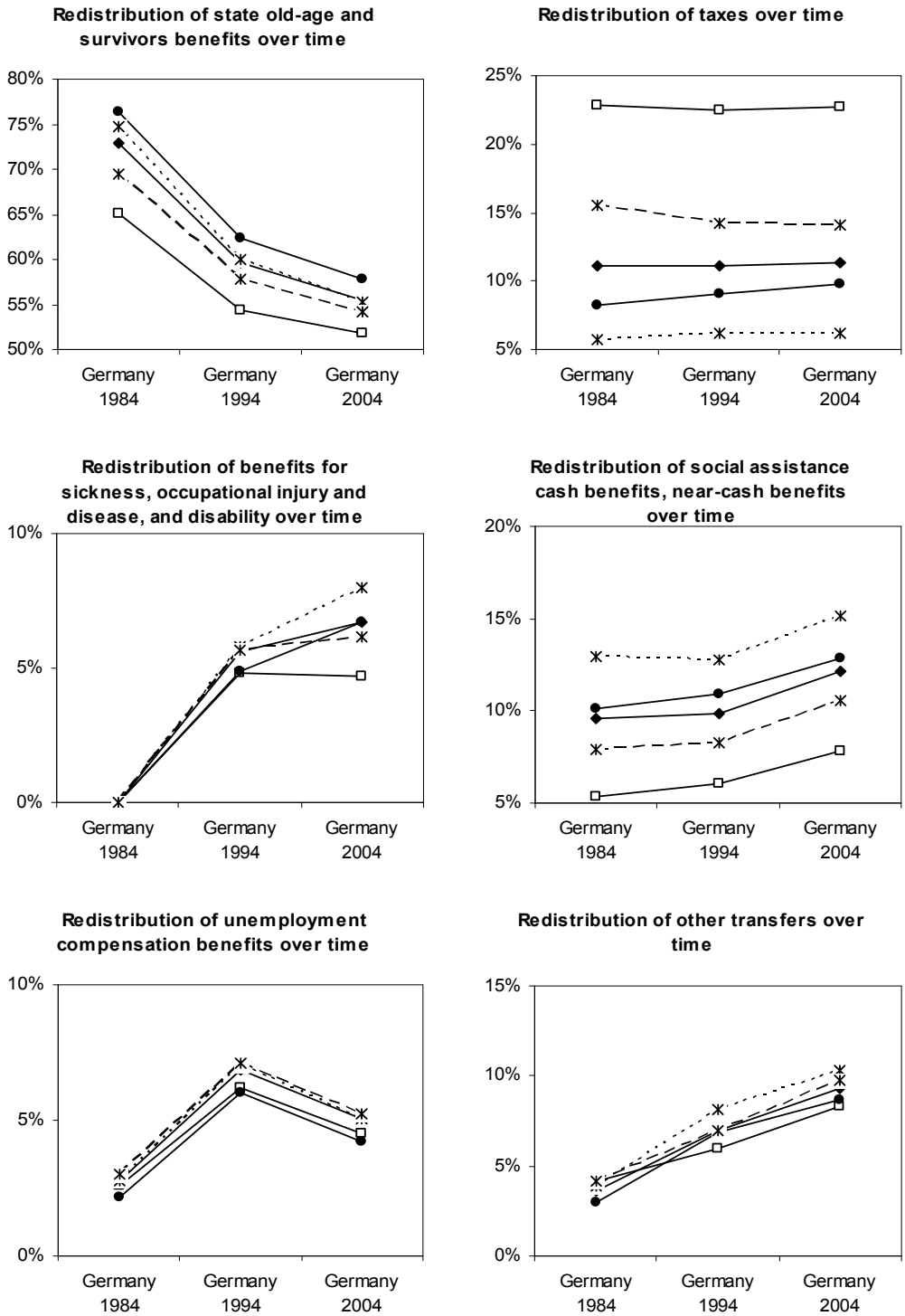
Source: Database Wang and Caminada (2011), and own calculations

**Figure A2 sensitivity analysis for partial redistributive effects around 2005 (shares)**



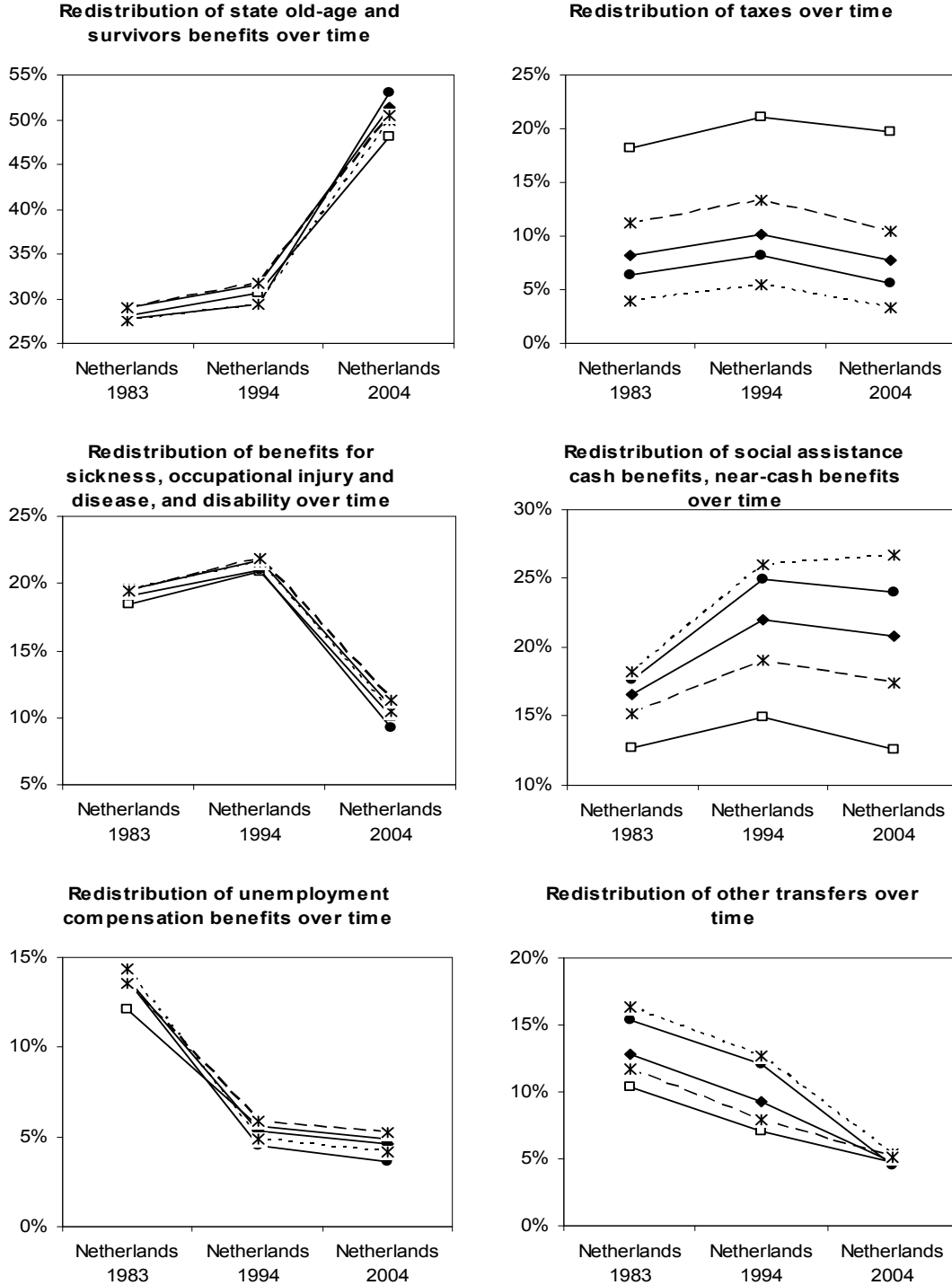
Source: Database Wang and Caminada (2011), and own calculations

**Figure A3 sensitivity analysis for partial redistributive effects in Germany over time**



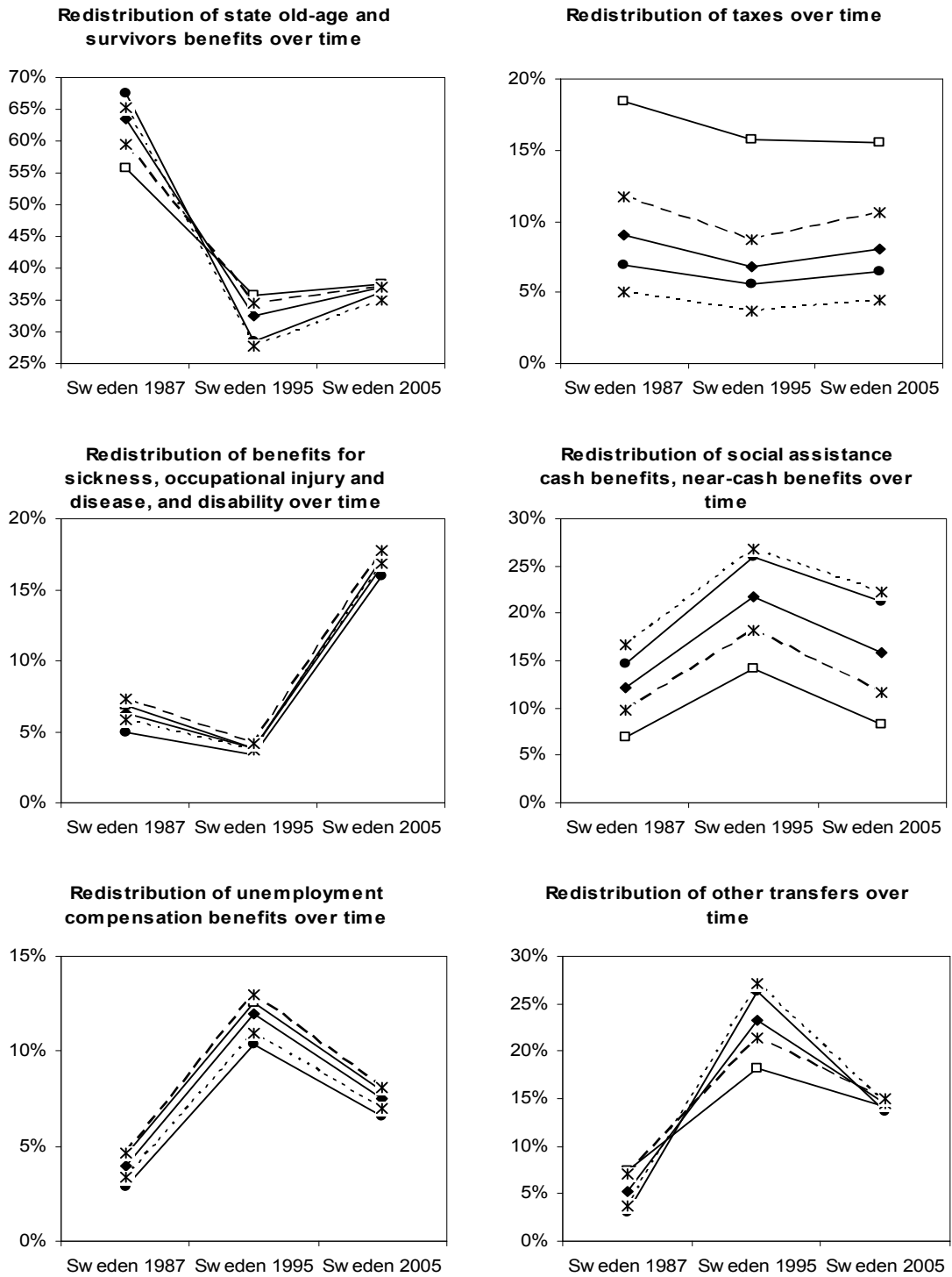
Source: Database Wang and Caminada (2011), and own calculations

**Figure A4 sensitivity analysis for partial redistributive effects in the Netherlands over time**



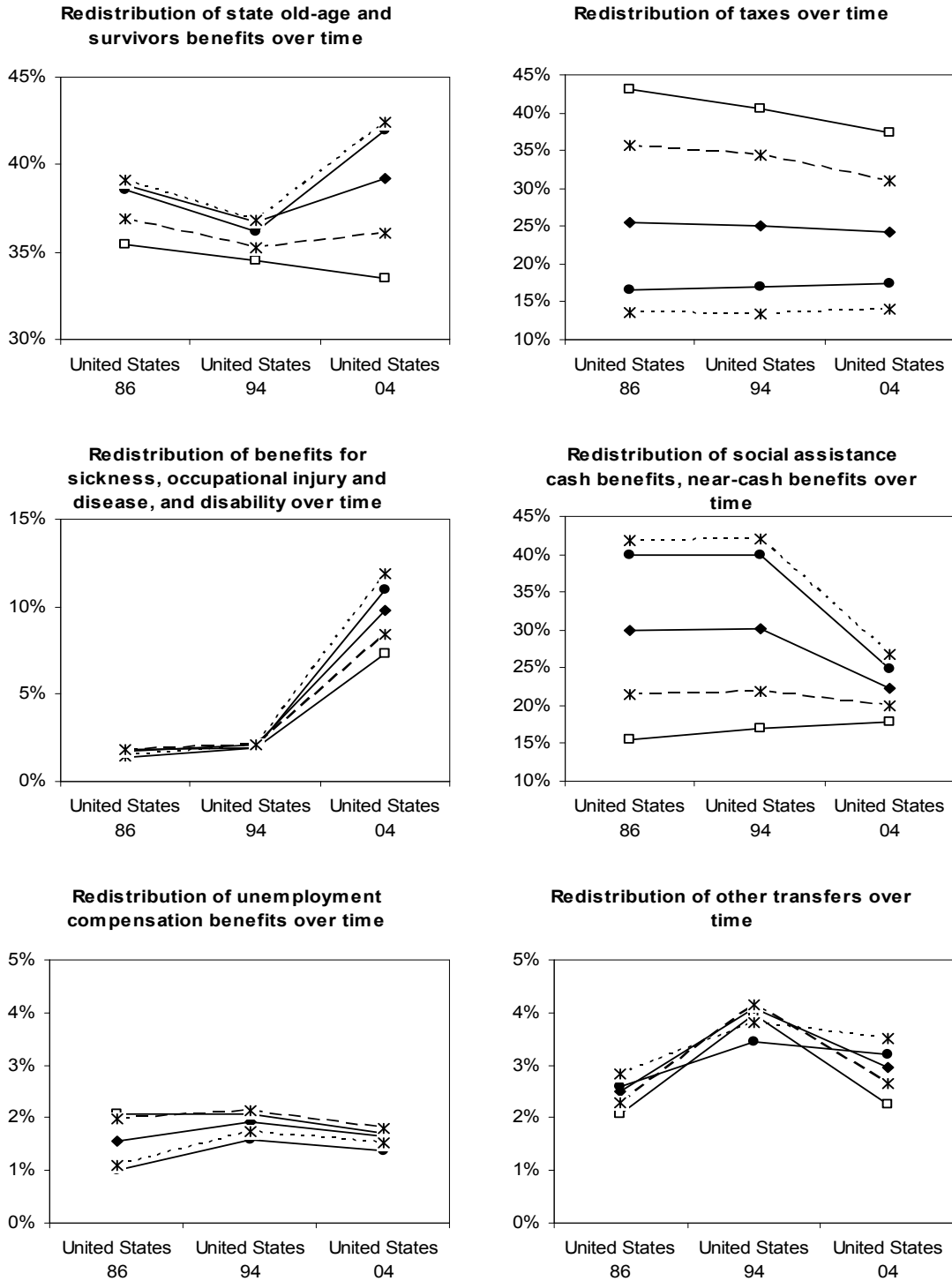
Source: Database Wang and Caminada (2011), and own calculations

**Figure A5 sensitivity analysis for partial redistributive effects in Sweden over time**



Source: Database Wang and Caminada (2011), and own calculations

**Figure A6 sensitivity analysis for partial redistributive effects in the United States over time**



Source: Database Wang and Caminada (2011), and own calculations

**Annex B Decomposition of income inequality and redistributive effect of social transfers and taxes in 20 LIS countries 1979-2005**

		<i>Partial effects</i>																			
Country	Year	(a) Gini primary income	(b) Gini disposable income	Absolute redistribution (a-b)	(Relative redistribution)	Transfers	Sickness benefits	Occupational injury and disease benefits	Disability benefits	State old-age and survivors benefits	Child/family benefits	Unemployment compensation benefits	Maternity and other family leave benefits	Military/veterans/war benefits	Other social insurance benefits	Social assistance cash benefits	Near-cash benefits	Taxes	Mandatory payroll taxes	Income taxes	Ordering effect
Australia	1981	0.401	0.285	0.116	29%	0.072	0.002	0.001	0.006	0.032	0.006	0.009	-	0.007	0.009	-	-	0.046	-	0.046	0.001
	1985	0.420	0.293	0.126	30%	0.072	0.002	0.002	0.008	0.033	0.006	0.012	-	0.001	0.008	-	-	0.055	-	0.055	0.001
	1989	0.432	0.307	0.126	29%	0.076	0.002	0.001	0.009	0.025	0.005	0.010	-	0.010	0.002	0.011	-	0.050	-	0.050	0.000
	1995	0.464	0.308	0.156	34%	0.108	0.001	0.001	0.013	0.033	0.025	0.015	0.001	0.010	0.007	0.000	-	0.049	-	0.049	0.001
	2001	0.475	0.317	0.158	33%	0.112	0.000	0.003	0.013	0.034	0.021	0.009	0.015	0.009	0.008	0.000	-	0.049	-	0.049	0.002
	2003	0.461	0.312	0.149	32%	0.104	0.000	0.002	0.012	0.033	0.020	0.008	0.013	0.008	0.008	0.000	-	0.047	-	0.047	0.002
<i>Belgium</i>	<i>1985</i>	<i>0.414</i>	<i>0.227</i>	<i>0.187</i>	<i>45%</i>	<i>0.201</i>	<i>0.014</i>	<i>0.002</i>	-	<i>0.116</i>	<i>0.031</i>	<i>0.033</i>	-	-	<i>0.001</i>	<i>0.004</i>	<i>0.000</i>	<i>0.000</i>	-	-	<i>0.014</i>
	<i>1988</i>	<i>0.420</i>	<i>0.232</i>	<i>0.188</i>	<i>45%</i>	<i>0.202</i>	<i>0.014</i>	<i>0.002</i>	<i>0.003</i>	<i>0.116</i>	<i>0.029</i>	<i>0.036</i>	-	-	<i>0.001</i>	<i>0.001</i>	<i>0.000</i>	<i>0.000</i>	-	-	<i>0.015</i>
	<i>1992</i>	<i>0.449</i>	<i>0.224</i>	<i>0.226</i>	<i>50%</i>	<i>0.171</i>	-	-	<i>0.017</i>	<i>0.107</i>	<i>0.021</i>	<i>0.025</i>	-	-	-	<i>0.001</i>	-	<i>0.055</i>	<i>0.011</i>	<i>0.043</i>	<i>0.000</i>
	<i>1995</i>	<i>0.462</i>	<i>0.266</i>	<i>0.195</i>	<i>42%</i>	<i>0.208</i>	<i>0.001</i>	<i>0.001</i>	<i>0.014</i>	<i>0.129</i>	<i>0.024</i>	<i>0.032</i>	<i>0.000</i>	-	-	<i>0.005</i>	<i>0.001</i>	<i>0.000</i>	-	-	<i>0.012</i>
	<i>1997</i>	<i>0.481</i>	<i>0.250</i>	<i>0.231</i>	<i>48%</i>	<i>0.164</i>	-	<i>0.001</i>	<i>0.013</i>	<i>0.107</i>	<i>0.016</i>	<i>0.022</i>	-	-	-	<i>0.004</i>	<i>0.001</i>	<i>0.065</i>	<i>0.007</i>	<i>0.058</i>	<i>-0.002</i>
	<i>2000</i>	<i>0.542</i>	<i>0.279</i>	<i>0.263</i>	<i>49%</i>	<i>0.205</i>	<i>0.003</i>	<i>0.001</i>	<i>0.006</i>	<i>0.156</i>	<i>0.013</i>	<i>0.022</i>	<i>0.001</i>	-	-	<i>0.004</i>	<i>0.001</i>	<i>0.063</i>	<i>0.063</i>		<i>0.005</i>
Canada	1981	0.370	0.284	0.086	23%	0.059	-	-	-	0.027	0.005	0.009	-	-	0.004	0.014	-	0.029	-	0.029	0.002
	1987	0.393	0.288	0.105	27%	0.072	-	-	-	0.032	0.004	0.012	-	-	0.006	0.017	-	0.035	-	0.035	0.003
	1991	0.409	0.285	0.124	30%	0.088	-	-	-	0.036	0.004	0.018	-	-	0.009	0.021	-	0.040	-	0.040	0.004
	1994	0.424	0.289	0.136	32%	0.097	-	-	-	0.041	0.010	0.013	-	-	0.010	0.023	-	0.043	-	0.043	0.004
	1997	0.417	0.291	0.126	30%	0.088	-	-	-	0.043	0.010	0.008	-	-	0.010	0.017	-	0.041	-	0.041	0.003
	1998	0.442	0.311	0.132	30%	0.092	-	0.004	-	0.041	0.012	0.010	-	-	0.005	0.021	-	0.043	-	0.043	0.004
	2000	0.430	0.315	0.115	27%	0.079	-	0.003	-	0.039	0.012	0.007	-	-	0.005	0.013	-	0.038	-0.002	0.040	0.001
	2004	0.433	0.318	0.114	26%	0.079	-	0.004	-	0.038	0.012	0.009	-	-	0.005	0.011	-	0.037	-0.002	0.039	0.002
Denmark	1987	0.398	0.254	0.144	36%	0.127	0.006	-	0.019	0.051	0.006	0.019	-	-	0.002	0.023	-	0.027	0.000	0.027	0.010
	1992	0.426	0.236	0.190	45%	0.155	0.007	-	0.022	0.057	0.007	0.029	-	-	0.008	0.025	-	0.045	0.000	0.045	0.011
	1995	0.421	0.218	0.203	48%	0.175	0.007	-	0.027	0.067	0.008	0.029	0.004	-	0.005	0.017	0.010	0.041	0.000	0.041	0.013
	2000	0.413	0.225	0.188	46%	0.150	0.006	-	0.023	0.064	0.008	0.015	0.002	0.000	0.006	0.017	0.009	0.045	0.001	0.044	0.007
	2004	0.419	0.228	0.191	45%	0.158	0.007	-	0.024	0.066	0.008	0.015	0.003	0.000	0.008	0.017	0.010	0.041	0.000	0.041	0.009

Note: For 12 countries full tax and benefit information is available in LIS. For other 8 countries (marked *italic*) net wages and salaries are used because gross variables are not available for all data years in LIS.

Source: Database Wang and Caminada (2011), and own calculations



**Annex B Decomposition of income inequality and redistributive effect of social transfers and taxes in 20 LIS countries 1979-2005 (continued)**

Country	Year	(a) Gini primary income	(b) Gini disposable income	Absolute redistribution (a-b)	(Relative redistribution)	Partial effects															
						Transfers	Sickness benefits	Occupational injury and disease benefits	Disability benefits	State old-age and survivors benefits	Child/family benefits	Unemployment compensation benefits	Maternity and other family leave benefits	Military/veterans/war benefits	Other social insurance benefits	Social assistance cash benefits	Near-cash benefits	Taxes	Mandatory payroll taxes	Income taxes	Ordering effect
Finland	1987	0.332	0.209	0.123	37%	0.076	0.002	0.000	0.003	0.032	0.009	0.004	0.003	0.006	0.004	0.012	-	0.051	0.002	0.049	0.004
	1991	0.331	0.210	0.122	37%	0.079	0.002	0.000	0.003	0.027	0.014	0.008	0.004	0.004	0.002	0.015	-	0.047	0.003	0.044	0.004
	1995	0.384	0.217	0.168	44%	0.126	0.002	0.001	0.002	0.026	0.022	0.033	0.005	0.004	0.005	0.017	0.009	0.050	0.007	0.043	0.008
	2000	0.460	0.246	0.214	46%	0.182	0.002	0.002	0.023	0.086	0.013	0.015	0.008	0.003	0.004	0.018	0.008	0.043	0.004	0.039	0.012
	2004	0.464	0.252	0.212	46%	0.180	0.003	0.003	0.021	0.092	0.011	0.014	0.008	0.002	0.004	0.016	0.007	0.042	0.004	0.038	0.010
France	1979	0.452	0.294	0.159	35%	0.129	-	-	-	0.079	0.020	-	-	-	-	0.030	-	0.034	-	0.034	0.005
	1981	0.364	0.288	0.076	21%	0.085	-	-	0.003	0.010	0.023	0.007	-	-	0.003	0.022	0.017	0.000	-	-	0.009
	1989	0.599	0.445	0.154	26%	0.156	-	-	0.001	0.094	0.023	0.017	-	-	0.004	0.003	0.014	0.004	-	0.004	0.005
	1994	0.487	0.288	0.199	41%	0.194	0.003	-	0.010	0.117	0.021	0.015	0.001	0.002	0.002	0.004	0.017	0.018	-	0.018	0.014
	2000	0.481	0.278	0.204	42%	0.194	0.003	-	0.007	0.113	0.020	0.015	0.003	0.001	0.003	0.013	0.017	0.022	-	0.022	0.013
2005	0.449	0.281	0.168	37%	0.162	0.003	-	0.006	0.084	0.019	0.016	0.002	0.001	0.002	0.012	0.016	0.017	-	0.017	0.011	
Germany	1981	0.388	0.245	0.143	37%	0.121	-	0.013	-	0.084	0.008	0.002	-	0.005	0.000	0.002	0.006	0.030	-0.002	0.031	0.008
	1983	0.385	0.260	0.125	32%	0.100	-	0.001	0.001	0.077	0.005	0.005	0.000	0.002	0.003	0.005	-	0.026	-0.003	0.029	0.001
	1984	0.444	0.265	0.179	40%	0.137	-	-	-	0.116	0.007	0.005	0.000	-	-	0.006	0.003	0.041	-0.002	0.043	-0.001
	1989	0.431	0.258	0.173	40%	0.128	-	0.001	-	0.104	0.006	0.005	0.001	0.003	-	0.004	0.003	0.044	-0.003	0.047	-0.001
	1994	0.450	0.270	0.180	40%	0.140	-	0.002	0.007	0.098	0.006	0.011	0.003	0.002	-	0.008	0.003	0.041	0.001	0.040	0.001
2000	0.464	0.266	0.199	43%	0.152	-	0.001	0.011	0.105	0.012	0.009	0.002	0.001	0.001	0.008	0.003	0.049	-0.002	0.050	0.003	
2004	0.489	0.278	0.210	43%	0.165	-	0.001	0.009	0.111	0.014	0.010	0.002	0.001	0.002	0.012	0.005	0.049	0.002	0.047	0.003	
Ireland	1987	0.500	0.328	0.172	34%	0.134	0.010	0.000	0.009	0.021	0.013	0.017	0.000	-	0.003	0.061	-	0.043	0.003	0.040	0.005
	1994	0.502	0.333	0.169	34%	0.180	0.006	0.000	0.014	0.051	0.014	0.009	0.000	-	-	0.080	0.005	0.000	-	-	0.011
	1995	0.493	0.336	0.157	32%	0.166	0.006	0.000	0.013	0.050	0.014	0.007	0.000	-	-	0.071	0.005	0.000	-	-	0.009
	1996	0.483	0.325	0.158	33%	0.168	0.005	0.001	0.014	0.049	0.015	0.012	0.000	-	-	0.067	0.005	0.000	-	-	0.011
	2000	0.451	0.313	0.138	31%	0.114	0.004	0.001	0.013	0.045	0.009	0.006	0.000	-	-	0.035	0.002	0.000	-	-	-0.024
2004	0.490	0.312	0.178	36%	0.140	0.005	0.000	0.007	0.036	0.021	0.007	0.000	-	0.002	0.052	0.008	0.045	0.004	0.041	0.007	

Note: For 12 countries full tax and benefit information is available in LIS. For other 8 countries (marked *italic*) net wages and salaries are used because gross variables are not available for all data years in LIS.

Source: Database Wang and Caminada (2011), and own calculations

**Annex B Decomposition of income inequality and redistributive effect of social transfers and taxes in 20 LIS countries 1979-2005 (continued)**

Country	Year	(a) Gini primary income	(b) Gini disposable income	Absolute redistribution (a-b)	(Relative redistribution)	Partial effects															
						Transfers	Sickness benefits	Occupational injury and disease benefits	Disability benefits	State old-age and survivors benefits	Child/family benefits	Unemployment compensation benefits	Maternity and other family leave benefits	Military/veterans/war benefits	Other social insurance benefits	Social assistance cash benefits	Near-cash benefits	Taxes	Mandatory payroll taxes	Income taxes	Ordering effect
Israel	1979	0.411	0.303	0.108	26%	0.055	-	-	0.005	0.022	0.019	-	0.000	0.002	0.005	0.003	0.001	0.055	-0.003	0.057	0.001
	1986	0.449	0.308	0.142	32%	0.078	-	0.000	0.009	0.027	0.024	0.003	-	0.002	0.007	0.005	0.000	0.063	0.004	0.059	-0.001
	1992	0.443	0.305	0.138	31%	0.084	0.006	-	0.006	0.023	0.016	0.007	-	-	0.020	0.006	-	0.055	0.003	0.053	0.002
	1997	0.474	0.336	0.139	29%	0.084	-	-	0.008	0.023	0.022	0.006	-	-	0.017	0.008	-	0.054	0.001	0.053	-0.001
	2001	0.506	0.346	0.160	32%	0.100	-	0.001	0.011	0.025	0.024	0.008	-	0.001	0.004	0.026	-	0.060	0.003	0.056	0.000
Italy	2005	0.491	0.370	0.121	25%	0.080	-	0.001	0.015	0.025	0.012	0.003	-	0.001	0.003	0.020	-	0.042	0.002	0.039	0.001
	1986	0.425	0.306	0.119	28%	0.124	-	-	-	0.115	-	-	-	-	0.008	-	-	0.000	-	-	0.005
	1987	0.437	0.332	0.105	24%	0.111	-	0.000	0.020	0.082	-	-	-	0.000	0.000	0.008	-	0.000	-	-	0.006
	1989	0.412	0.303	0.109	26%	0.115	-	0.000	0.017	0.091	-	-	-	0.001	0.000	0.006	-	0.000	-	-	0.005
	1991	0.395	0.290	0.105	27%	0.111	-	0.001	0.014	0.088	-	-	-	0.000	0.000	0.007	-	0.000	-	-	0.006
	1993	0.450	0.339	0.112	25%	0.118	-	0.001	0.012	0.094	-	-	-	0.000	0.000	0.011	-	0.000	-	-	0.007
	1995	0.454	0.338	0.116	26%	0.124	-	0.001	0.015	0.097	-	0.004	-	0.001	0.000	0.007	-	0.000	-	-	0.008
	1998	0.483	0.346	0.137	28%	0.146	-	0.002	0.016	0.116	-	0.003	-	0.001	0.000	0.007	-	0.000	-	-	0.009
	2000	0.477	0.333	0.143	30%	0.152	-	0.002	0.013	0.123	-	0.003	-	0.000	0.000	0.010	-	0.000	-	-	0.009
	2004	0.503	0.338	0.165	33%	0.172	-	0.002	0.007	0.143	0.005	0.003	-	0.001	0.000	0.011	-	0.000	-	-	0.007
LUX	1985	0.377	0.237	0.140	37%	0.145	0.000	0.003	0.023	0.100	0.015	0.002	0.000	-	0.001	0.002	-	-0.002	-0.002	-	0.003
	1991	0.372	0.239	0.133	36%	0.141	0.002	-	0.020	0.094	0.013	0.000	0.000	0.001	0.002	0.007	-	0.000	-	-	0.007
	1994	0.388	0.235	0.153	39%	0.161	0.001	-	0.020	0.106	0.019	0.002	0.001	0.001	0.002	0.010	-	0.000	-	-	0.009
	1997	0.400	0.260	0.140	35%	0.150	0.002	0.002	0.023	0.084	0.018	0.003	0.002	0.001	0.008	0.007	-	0.000	-	-	0.010
	2000	0.423	0.260	0.163	39%	0.173	0.001	0.003	0.022	0.111	0.021	0.002	0.005	0.000	0.001	0.007	-	0.000	-	-	0.009
Mexico	2004	0.452	0.268	0.184	41%	0.153	0.001	-	0.016	0.101	0.022	0.008	-	-	0.000	0.005	0.001	0.037	-	0.037	0.006
	1984	0.446	0.445	0.001	0%	0.001	-	-	0.000	0.001	-	-	-	-	0.000	-	-	0.000	-	-	0.000
	1989	0.472	0.466	0.006	1%	0.006	-	-	0.000	0.006	-	-	-	-	0.000	-	-	0.000	-	-	0.000
	1992	0.493	0.485	0.008	2%	0.008	-	-	0.000	0.008	-	-	-	-	0.000	-	-	0.000	-	-	0.000
	1994	0.509	0.495	0.013	3%	0.014	-	-	-	0.007	-	-	-	-	0.007	-	-	0.000	-	-	0.000
	1996	0.487	0.477	0.010	2%	0.010	-	-	0.000	0.006	-	-	-	-	0.004	-	-	0.000	-	-	0.000
	1998	0.503	0.492	0.010	2%	0.010	-	-	0.000	0.007	-	-	-	-	0.003	-	-	0.000	-	-	0.000
	2000	0.504	0.491	0.013	3%	0.013	-	-	0.000	0.006	-	-	-	-	0.007	-	-	0.000	-	-	0.000
	2002	0.490	0.471	0.019	4%	0.019	-	-	-	0.008	-	-	-	-	0.003	0.009	-	0.000	-	-	0.001
	2004	0.476	0.458	0.018	4%	0.019	-	-	-	0.008	-	-	-	-	0.003	0.008	-	0.000	-	-	0.001

Note: For 12 countries full tax and benefit information is available in LIS. For other 8 countries (marked *italic*) net wages and salaries are used because gross variables are not available for all data years in LIS.

Source: Database Wang and Caminada (2011), and own calculations

**Annex B Decomposition of income inequality and redistributive effect of social transfers and taxes in 20 LIS countries 1979-2005 (continued)**

Country	Year	(a) Gini primary income	(b) Gini disposable income	Absolute redistribution (a-b)	(Relative redistribution)	Partial effects															
						Transfers	Sickness benefits	Occupational injury and disease benefits	Disability benefits	State old-age and survivors benefits	Child/family benefits	Unemployment compensation benefits	Maternity and other family leave benefits	Military/veterans/war benefits	Other social insurance benefits	Social assistance cash benefits	Near-cash benefits	Taxes	Mandatory payroll taxes	Income taxes	Ordering effect
Netherl.	1983	0.435	0.260	0.176	40%	0.143	-	-	0.032	0.049	0.013	0.021	-	-	0.005	0.022	-	0.032	0.003	0.028	-0.001
	1987	0.440	0.256	0.184	42%	0.146	-	-	0.034	0.046	0.011	0.013	-	-	0.006	0.028	0.009	0.039	0.002	0.037	0.001
	1991	0.405	0.266	0.139	34%	0.130	0.003	-	0.028	0.051	0.010	0.010	-	-	0.000	0.018	0.009	0.020	-	0.020	0.012
	1994	0.420	0.257	0.162	39%	0.126	0.002	-	0.032	0.049	0.011	0.009	-	-	0.000	0.018	0.006	0.033	-0.004	0.037	-0.004
	1999	0.373	0.231	0.142	38%	0.101	0.001	-	0.022	0.051	0.008	0.004	-	-	0.000	0.010	0.004	0.036	0.001	0.035	-0.006
Norway	2004	0.459	0.263	0.196	43%	0.163	0.002	-	0.018	0.098	0.006	0.010	-	-	0.003	0.020	0.006	0.040	-	0.040	0.008
	1979	0.364	0.223	0.141	39%	0.092	-	0.083	-	-	0.007	-	-	-	-	-	0.002	0.047	0.005	0.042	-0.002
	1986	0.352	0.233	0.119	34%	0.092	-	0.076	-	-	0.008	0.002	-	-	0.002	0.002	0.001	0.029	0.005	0.024	0.002
	1991	0.374	0.231	0.142	38%	0.107	-	-	0.019	0.065	0.012	-	-	-	0.002	0.007	0.001	0.037	0.005	0.032	0.001
	1995	0.400	0.238	0.162	41%	0.128	-	-	0.020	0.069	0.013	0.010	0.001	-	0.003	0.007	0.004	0.037	0.006	0.031	0.003
Poland	2000	0.402	0.250	0.152	38%	0.120	0.007	0.001	0.024	0.057	0.010	0.005	0.008	-	0.003	0.004	0.002	0.035	0.003	0.031	0.002
	2004	0.430	0.256	0.174	41%	0.149	0.024	0.000	0.028	0.056	0.012	0.007	0.009	-	0.005	0.006	0.002	0.032	0.003	0.030	0.007
	1986	0.365	0.271	0.094	26%	0.099	-	0.000	0.025	0.054	0.002	-	0.001	-	0.017	-	-	0.000	-	-	0.005
	1992	0.414	0.274	0.141	34%	0.148	-	-	-	0.099	0.021	0.028	0.001	-	-	-	-	0.000	-	-	0.008
	1995	0.527	0.318	0.208	40%	0.235	-	-	0.080	0.100	0.019	0.022	0.000	-	0.002	0.011	-	-0.009	-	-0.009	0.017
Spain	1999	0.475	0.289	0.186	39%	0.197	0.001	-	0.054	0.113	0.010	0.010	0.002	-	0.001	0.006	0.000	0.005	0.000	0.006	0.017
	2004	0.527	0.320	0.207	39%	0.220	0.001	-	0.048	0.138	0.015	0.007	0.002	-	-	0.009	0.000	0.005	0.000	0.005	0.018
	1980	0.416	0.318	0.098	24%	0.098	-	-	-	-	-	-	-	-	0.098	-	-	0.000	-	-	0.000
	1990	0.420	0.303	0.117	28%	0.125	-	-	0.019	0.081	-	0.016	-	-	0.001	0.006	0.001	0.000	-	-	0.007
	1995	0.501	0.353	0.148	29%	0.157	0.004	0.001	0.020	0.104	0.003	0.010	0.000	-	0.002	0.013	0.000	0.000	-	-	0.009
Sweden	2000	0.541	0.336	0.205	38%	0.182	0.001	0.000	0.017	0.143	0.001	0.005	0.000	-	0.001	0.013	0.000	0.000	-	-	-0.024
	2004	0.441	0.315	0.126	29%	0.130	0.003	-	0.009	0.105	0.001	0.011	-	-	0.001	0.000	0.000	0.001	-	0.001	0.005
	1981	0.411	0.197	0.214	52%	0.185	0.012	-	-	0.118	0.007	0.006	0.005	-	0.002	0.006	0.029	0.047	-0.003	0.050	0.017
	1987	0.428	0.218	0.211	49%	0.184	0.016	-	-	0.126	0.008	0.010	0.008	-	0.001	0.015	0.000	0.042	-0.002	0.044	0.015
	1992	0.462	0.229	0.232	50%	0.217	0.013	-	-	0.122	0.011	0.026	0.011	-	0.005	0.008	0.021	0.031	-	0.031	0.016
Sweden	1995	0.460	0.221	0.239	52%	0.221	0.009	-	0.001	0.093	0.011	0.033	0.010	-	0.026	0.012	0.025	0.041	-	0.041	0.023
	2000	0.448	0.252	0.196	44%	0.173	0.014	0.002	0.018	0.076	0.010	0.019	0.006	-	0.007	0.008	0.012	0.034	0.001	0.033	0.011
	2005	0.442	0.237	0.205	46%	0.184	0.012	0.002	0.022	0.082	0.009	0.017	0.009	-	0.013	0.008	0.010	0.034	0.001	0.033	0.013

Note: For 12 countries full tax and benefit information is available in LIS. For other 8 countries (marked *italic*) net wages and salaries are used because gross variables are not available for all data years in LIS.

Source: Database Wang and Caminada (2011), and own calculations

**Annex B Decomposition of income inequality and redistributive effect of social transfers and taxes in 20 LIS countries 1979-2005 (final)**

Country	Year	(a) Gini primary income	(b) Gini disposable income	Absolute redistribution (a-b)	(Relative redistribution)	Partial effects																	
						Transfers	Sickness benefits	Occupational injury and disease benefits	Disability benefits	State old-age and survivors benefits	Child/family benefits	Unemployment compensation benefits	Maternity and other family leave benefits	Military/veterans/war benefits	Other social insurance benefits	Social assistance cash benefits	Near-cash benefits	Taxes	Mandatory payroll taxes	Income taxes	Ordering effect		
Switzerl.	1982	0.381	0.309	0.071	19%	0.053	-	-	0.005	0.044	-	0.001	-	0.000	0.002	0.002	-	0.017	0.000	0.017	-0.001		
	1992	0.376	0.307	0.068	18%	0.057	0.001	-	0.000	0.044	-	0.003	-	0.000	-	0.006	0.001	0.015	-0.002	0.016	0.003		
	2000	0.386	0.280	0.106	28%	0.112	0.001	0.001	0.000	0.090	0.006	0.004	-	0.000	0.001	0.008	0.000	-0.002	-0.010	0.008	0.003		
	2002	0.393	0.274	0.119	30%	0.119	0.002	0.002	0.000	0.096	0.006	0.005	-	0.000	0.001	0.007	0.000	0.001	-0.009	0.010	0.001		
	2004	0.395	0.268	0.128	32%	0.134	0.002	0.002	0.000	0.103	0.006	0.010	-	0.000	0.001	0.010	0.000	-0.003	-0.011	0.008	0.003		
UK	1979	0.396	0.270	0.126	32%	0.105	0.001	0.001	0.008	0.048	0.014	0.007	0.002	0.000	0.002	0.018	0.004	0.027	0.003	0.023	0.006		
	1986	0.476	0.303	0.173	36%	0.147	0.002	0.001	0.012	0.049	0.016	0.008	0.001	0.001	0.003	0.041	0.013	0.035	0.005	0.030	0.009		
	1991	0.475	0.336	0.139	29%	0.113	0.001	0.001	0.014	0.041	0.009	0.002	0.000	0.000	0.004	0.039	0.000	0.037	0.006	0.031	0.011		
	1994	0.502	0.339	0.163	32%	0.143	0.000	0.001	0.020	0.043	0.011	0.003	-	0.001	0.004	0.033	0.028	0.028	0.004	0.024	0.008		
	1995	0.503	0.344	0.158	32%	0.132	0.002	0.001	0.014	0.040	0.012	0.001	0.000	0.001	0.005	0.035	0.022	0.036	0.006	0.030	0.009		
	1999	0.497	0.347	0.150	30%	0.133	0.000	0.001	0.020	0.042	0.010	0.001	0.000	0.001	0.003	0.030	0.025	0.024	0.003	0.021	0.007		
	2004	0.490	0.345	0.145	30%	0.133	0.000	0.001	0.018	0.041	0.009	0.000	0.000	0.001	0.003	0.036	0.023	0.021	0.004	0.016	0.008		
	1979	0.405	0.305	0.100	25%	0.054	-	0.001	0.005	0.026	-	0.002	-	0.004	-	0.012	0.004	0.046	0.000	0.046	-0.001		
USA	1986	0.434	0.338	0.096	22%	0.054	-	0.002	-	0.034	-	0.002	-	0.002	-	0.011	0.004	0.041	0.000	0.041	-0.001		
	1991	0.439	0.338	0.101	23%	0.060	-	0.002	-	0.035	-	0.003	-	0.002	-	0.013	0.005	0.040	0.001	0.038	-0.001		
	1994	0.473	0.365	0.108	23%	0.064	0.000	-	0.002	0.037	-	0.002	-	0.001	0.003	0.011	0.007	0.043	0.001	0.043	-0.001		
	1997	0.476	0.372	0.103	22%	0.060	-	-	0.001	0.038	-	0.002	-	0.002	-	0.013	0.005	0.042	-0.001	0.043	-0.001		
	2000	0.473	0.368	0.105	22%	0.057	-	0.001	0.005	0.034	0.000	0.001	-	0.002	0.000	0.010	0.003	0.047	-0.001	0.048	-0.001		
	2004	0.482	0.372	0.109	23%	0.068	-	0.001	0.007	0.037	0.000	0.002	-	0.002	0.000	0.014	0.005	0.041	0.000	0.041	0.000		
	<b>20 country-average</b>																						
	around 1985		0.412	0.285	0.128	31%	0.106	0.003	0.004	0.007	0.051	0.009	0.008	0.001	0.001	0.009	0.012	0.002	0.025	0.001	0.025	0.004	
around 1995		0.452	0.299	0.153	34%	0.136	0.002	0.000	0.015	0.066	0.012	0.013	0.001	0.001	0.005	0.014	0.006	0.025	0.001	0.024	0.007		
around 2005		0.467	0.304	0.163	35%	0.140	0.003	0.001	0.014	0.078	0.011	0.009	0.002	0.001	0.003	0.014	0.005	0.029	0.004	0.027	0.006		
<b>12 country-average</b>																							
around 1985		0.412	0.273	0.139	34%	0.103	0.002	0.007	0.007	0.049	0.008	0.008	0.001	0.001	0.003	0.013	0.002	0.039	0.001	0.038	0.003		
around 1995		0.437	0.281	0.157	36%	0.121	0.002	0.000	0.010	0.052	0.012	0.014	0.002	0.002	0.007	0.014	0.007	0.040	0.001	0.039	0.005		
around 2005		0.454	0.292	0.163	36%	0.133	0.004	0.001	0.015	0.065	0.010	0.009	0.004	0.001	0.004	0.014	0.006	0.035	0.000	0.035	0.005		
<b>8 country-average</b>																							
around 1985		0.413	0.303	0.111	27%	0.111	0.003	0.001	0.007	0.052	0.010	0.007	0.000	-	0.016	0.011	0.002	0.005	0.000	0.005	0.005		
around 1995		0.475	0.327	0.148	31%	0.157	0.002	0.000	0.021	0.089	0.013	0.012	0.000	0.000	0.002	0.015	0.003	0.001	-	0.001	0.010		
around 2005		0.485	0.321	0.164	33%	0.150	0.002	0.000	0.012	0.096	0.012	0.009	0.001	0.000	0.001	0.013	0.003	0.021	0.008	0.014	0.007		

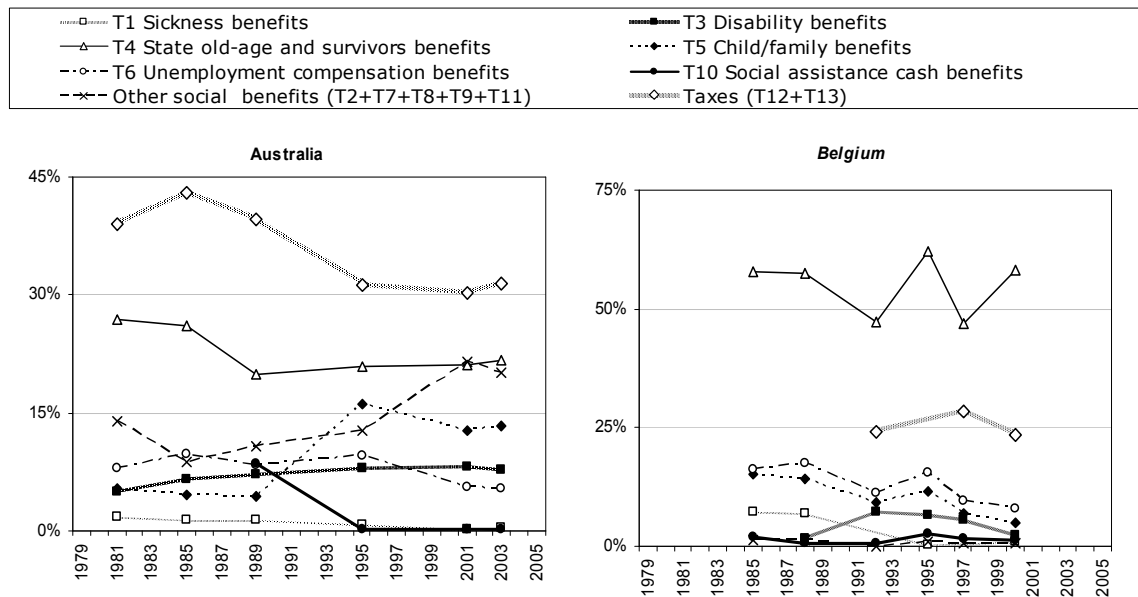
Note: For 12 countries full tax and benefit information is available in LIS. For other 8 countries (marked *italic*) net wages and salaries are used because gross variables are not available for all data years in LIS.

Source: Database Wang and Caminada (2011), and own calculations

## Annex C Trends in redistributive effect of social transfers (shares) in 20 countries 1979-2005

The Figure below presents country specific profiles for all 20 LIS countries, and for all data years available between 1979 and 2005. In this Annex B, we focus on only six main social transfer schemes (child/family benefits, disability benefits, unemployment compensation benefits, sickness benefits, social assistance cash benefits and state old age and survivors benefits), because the remaining transfers attribute for a small share to total redistribution. Moreover, also taxes are taken into consideration.

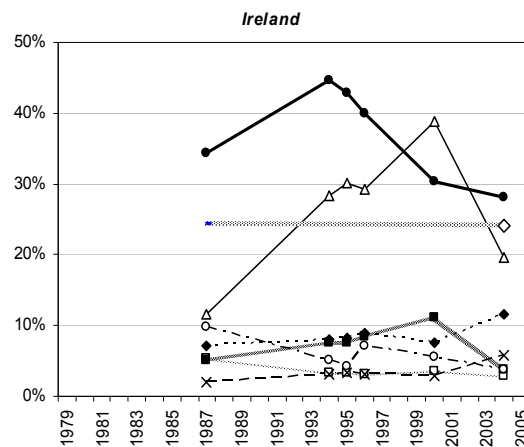
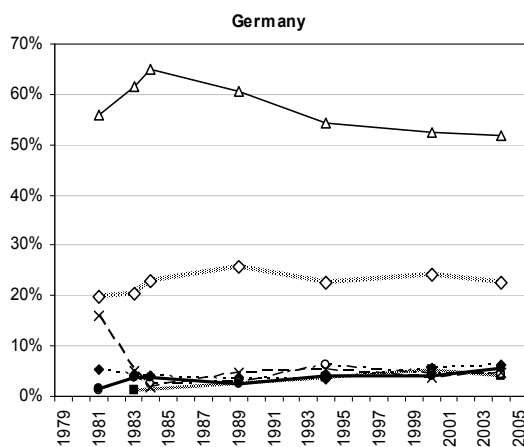
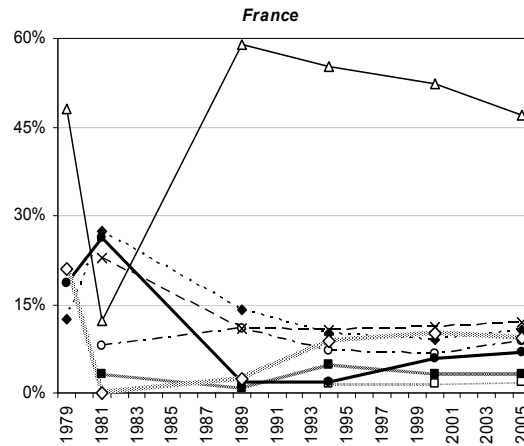
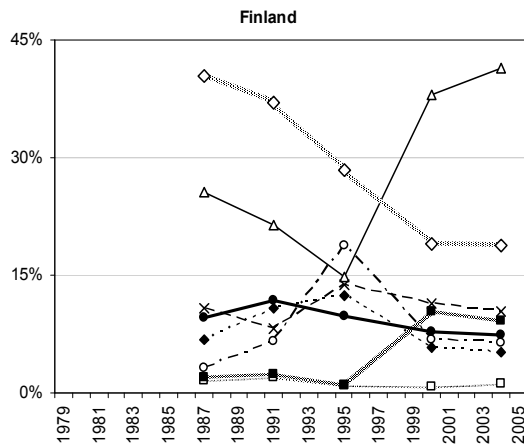
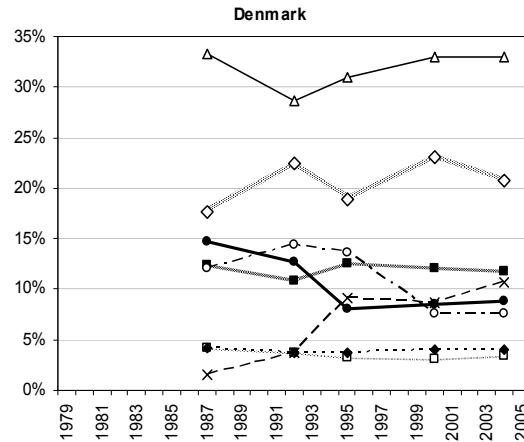
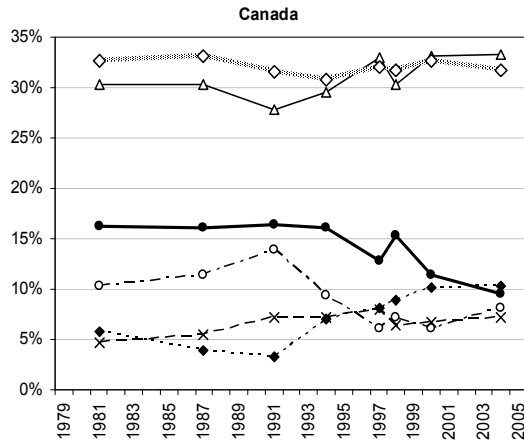
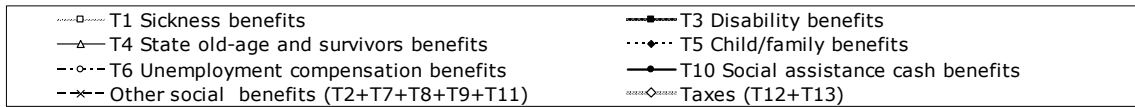
We use the partial redistributive effect for transfers and taxes from Annex A. A sequential budget incidence technique will compute the partial redistributive effect of a specific social transfer highest (smallest) as the first (last) social program. The partial effects of these transfers in total redistribution could be computed in several orders. We consider every specific social transfer as the first program to be added to primary income distribution, and every direct tax as the first tax to be subtracted from gross income. In that case, the sum of all partial redistributive effects amount (a little) over or less than 100 percent. We rescaled all redistributive effects of each program by applying an adjustment factor, which is defined as the overall redistribution divided by sum of all partial redistributive effects of all programs (over or less than 100%), in order to correct for an over- or underestimated effect.



Note: For 12 countries full tax and benefit information is available in LIS. For other 8 countries (marked *italic*) net wages and salaries are used because gross variables are not available for all data years in LIS.

Source: Database Wang and Caminada (2011), and own calculations

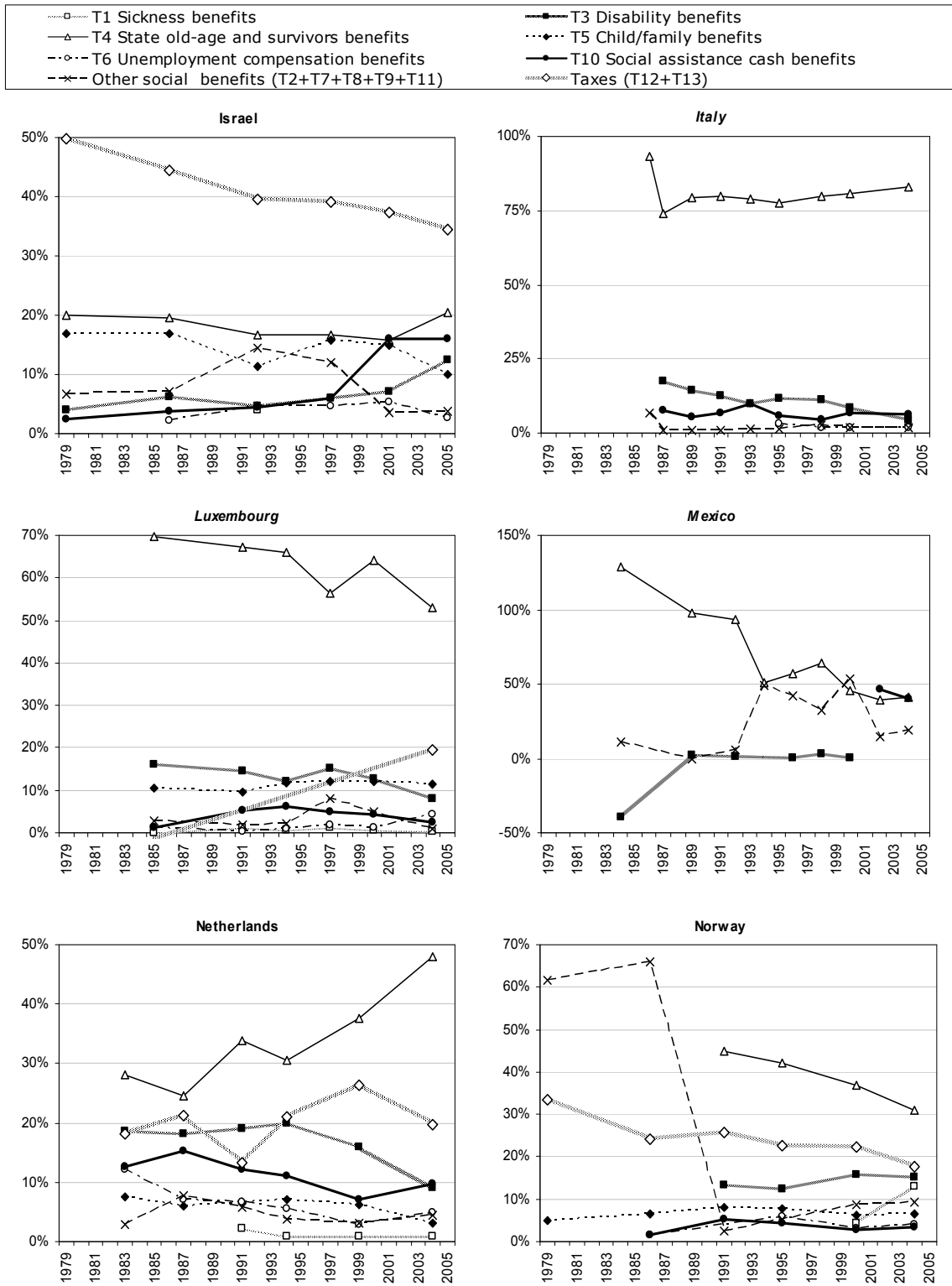
## Annex C Trends in redistributive effect of social transfers (shares) in 20 countries 1979-2005 (continued)



Note: For 12 countries full tax and benefit information is available in LIS. For other 8 countries (marked *italic*) net wages and salaries are used because gross variables are not available for all data years in LIS.

Source: Database Wang and Caminada (2011), and own calculations

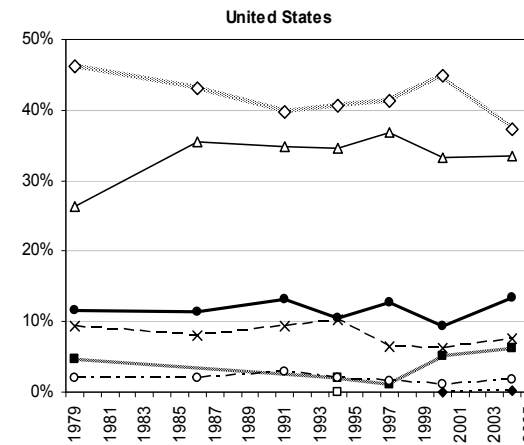
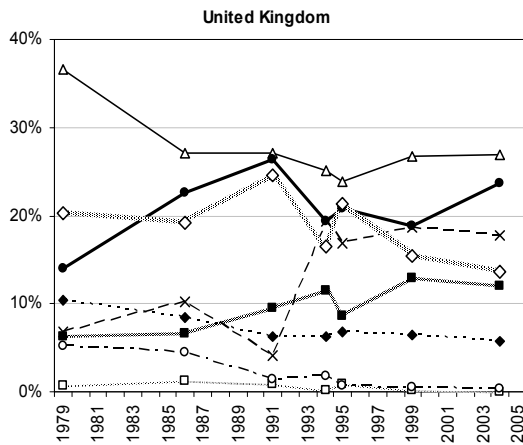
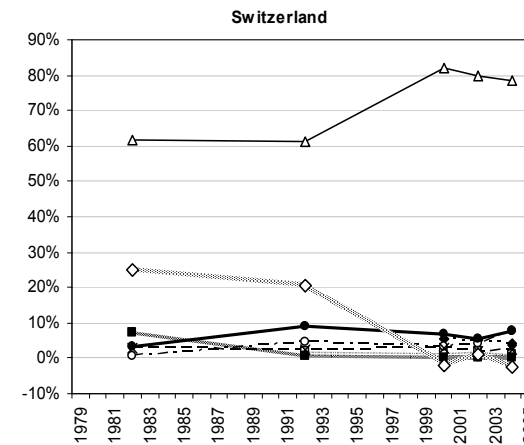
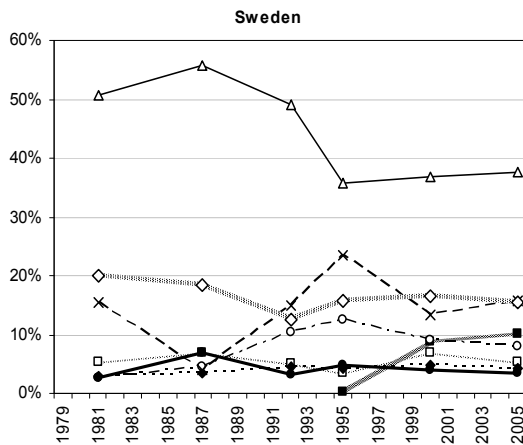
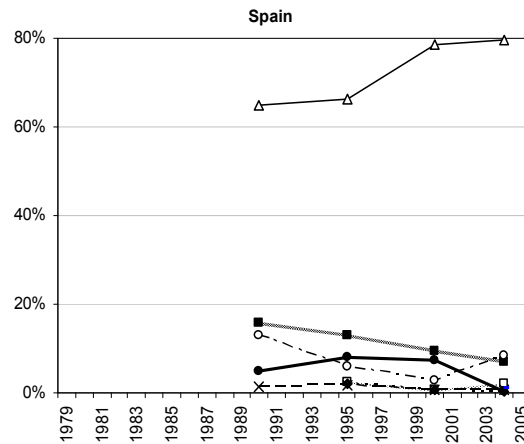
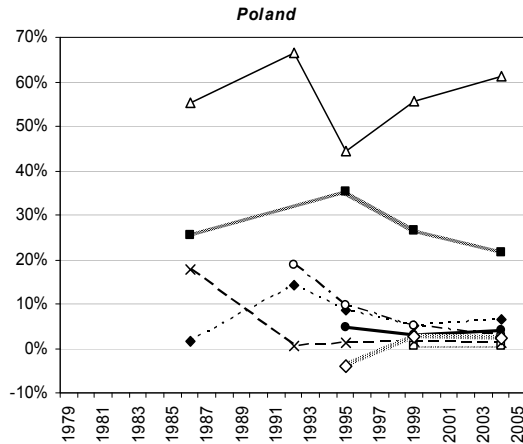
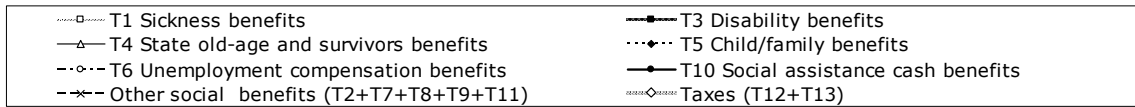
## Annex C Trends in redistributive effect of social transfers (shares) in 20 countries 1979-2005 (continued)



Note: For 12 countries full tax and benefit information is available in LIS. For other 8 countries (marked *italic*) net wages and salaries are used because gross variables are not available for all data years in LIS.

Source: Database Wang and Caminada (2011), and own calculations

## Annex C Trends in redistributive effect of social transfers (shares) in 20 countries 1979-2005 (final)



Note: For 12 countries full tax and benefit information is available in LIS. For other 8 countries (marked *italic*) net wages and salaries are used because gross variables are not available for all data years in LIS.

Source: Database Wang and Caminada (2011), and own calculations