The redistributive effect of public and private social programs: a cross-country empirical analysis

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The redistributive effect of public and private social programmes: A cross-country empirical analysis

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Abstract A function of many national social protection systems is to substantially redistribute income. However, the size and nature of social protection programmes are changing. In a number of countries there has been a shift from public towards private social protection arrangements, with the latter substituting for, or complementing, public programmes. Developing earlier work, this present article analyses the redistributive impact on income of public versus private social protection programmes. Using recent data from the Organisation for Economic Co-operation and Development, we find a strong positive relationship between public social expenditures and income redistribution across countries. For private social expenditures, we find a weak, but statistically significant, negative relationship with the level of redistribution. In countries where a larger share of total social expenditure is accorded to private arrangements there is less income redistribution. We conclude that the choice between the relative weight of public and private provision of social protection affects the redistributive impact of the welfare state.

Keywords social protection, welfare state, public private mix, income redistribution, OECD

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Introduction

The welfare state aims to reduce income inequality among individuals. In the first instance, income inequality may arise as a result of differences in individual capacities, socio-economic background and "opportunities". With regard to the latter, the market process allocates varying levels of rewards for different activities and skill sets which, again, can result in large differences in levels of income. To varying degrees, governments achieve interpersonal redistribution of market incomes through the tax system and through social protection (cash and in-kind benefits) systems. In recent years, empirical research has made considerable progress in analyzing the impacts of social protection systems on levels of income inequality. But most analyses of social protection focus on the role of public programmes. However, social effort to reduce income inequality is not restricted to public social protection programmes; numerous private arrangements can substitute for, or complement, public programmes. The Organisation for Economic Co-operation and Development (OECD) has produced comprehensive measurements of public and private expenditure within national social protection systems (Adema, 2001; Adema and Ladaique, 2005). The OECD defines private programmes as "social" when they serve a social purpose and contain an element of interpersonal redistribution (which is often accomplished through government intervention). The data gathered by the OECD show that spending on private social programmes is considerable in many countries. In fact, in several countries, welfare-state reforms have resulted in a shift in the relative balance of social expenditure away from "public" towards "private" provision.

In earlier work, we have shown that accounting for private social benefits has an equalizing effect on levels of social protection (Caminada and Goudswaard, 2005). In the same work, we discussed the relationship between public and private expenditure and income inequality. In this article, we analyse "redistribution" through public and private social spending. Specifically, to what extent do social transfers involve a reduction of income inequality among households? And how different is the redistributive impact of private social spending from the impact of public social spending? It is likely that (most) private social protection programmes generate less redistribution from the rich to the poor, because these programmes usually do not contain measures of income solidarity that are typical of public programmes (including means testing, benefit ceilings, and flat-rate benefits financed through general taxation).

Using recently published OECD data, we will empirically investigate the relationship, if any, between cross-country differences in public and private social expenditure and the level of income redistribution in 25 OECD countries. In addition, we will also pay attention to different areas of social spending. For example, expenditures on health care may have a different redistributive impact in compari-

son with expenditures on cash transfers. Our purpose is to present a simple and intuitive analysis which builds on previous work.[1]

The article is structured as follows. The next section summarizes empirical evidence on income redistribution through the welfare state across countries. A discussion of the nature of private social expenditures then follows, and we present recent data on these expenditures. We then present our findings of several empirical analyses conducted on public versus private social expenditures and the redistribution of income. A final section presents our conclusions.

Empirical evidence on income redistribution

One reason why many nations have designed comprehensive systems of social protection is to shield their citizens against the risk of economic insecurity as a result of unemployment, divorce, disability, retirement, or the death of a spouse. Social protection systems also aim to reduce levels of income inequality among individuals and households. When evaluating the redistributive impact of social protection systems, important factors to consider are the scale and scope of benefit programmes, the nature of different sorts of social spending, and programme design. It is highly likely that the income redistribution effects of cash transfers are weaker in countries where social programmes rely mostly on earnings-related or flat-rate benefit schemes compared to countries that rely mostly on (public) means-tested transfers. A means-tested programme with benefits provided to the poorest involves more redistribution for a given amount of spending than a universal programme. As part of a universal programme, flat-rate benefits (financed through progressive taxation) achieve more redistribution than earnings-related programmes, because average benefits in the latter will be higher than minimum benefits. But earnings-related programmes may also involve redistribution from the rich to the poor, because of design features such as thresholds for contributions and ceilings for benefits.

Substantial differences in levels of income inequality across "welfare democracies" are well documented (for example, Förster, 2000; Atkinson, Rainwater and Smeeding, 1995; Gottschalk and Smeeding, 1997; Förster and Mira d'Ercole, 2005; OECD, 2008a). These differences are often attributed to the relative impacts of national social policies. The OECD's empirical analyses (2008a, pp. 115-117) show that, in most developed countries, between nine and 42 per cent of all public

1. The aim of the paper is not to explain household-income distribution across countries, nor will we discuss the direction of the causality of the relationship between cross-country differences in income redistribution and the levels of social spending. Such an analysis should be based on a theory that would have to address several cross-national differences explaining household-income distribution (see, Gottschalk and Smeeding, 1997). Such a comprehensive approach is far beyond the scope of this paper.

transfers go to the poorest 20 per cent of the population.[2] Generally, tax/transfer systems are deemed to reduce market-income inequality in all OECD countries (Brandolini and Smeeding, 2006). But there are large differences among countries in the overall level of income redistribution directed towards low-income households. Korpi and Palme (1998), for example, show that welfare states with generous social insurance programmes redistribute economic resources more effectively and have a more equal distribution of incomes than welfare states with less generous social insurance programmes.

It should be noted that social protection systems not only redistribute between the rich and the poor, but also redistribute individual income across the life cycle to provide support during periods when expenditure needs are greater or income is reduced, such as when families have young children or when individuals retire. Estimates suggest that more than half of the redistributive impact of the welfare state concerns intrapersonal reallocation of income over the life cycle, rather than redistribution between the rich and the poor (de Mooij, 2006).

Generally, the impact of social policy on the distribution of income is calculated in line with the work of Musgrave, Case and Leonard (1974) on statutory or budget incidence analysis. On this basis, in many studies the important issues of tax/transfer shifting and behavioural responses are ignored.[3] The measure of the redistributive impact of social protection on inequality is straightforwardly based on formulas developed by Kakwani (1986) and Ringen (1991): redistribution by government is equal to market income minus disposable income.

Levels of inequality can be shown in several ways, including by means of Lorenz curves, specific points on the percentile distribution (P10 or P90), decile ratios (P90/P10), and/or summary statistics of inequality. Summary statistics of inequality can be used to rank countries with regard to levels of income inequality. The most often used summary measure of income distribution is the Gini coefficient of equivalized disposable household income. Equivalized household income is income adjusted to reflect differences in household needs through an equivalence scale (the square root elasticity). The Gini coefficient lies between 0 (no inequality) and 1 (maximum inequality). The Gini coefficient can be calculated on the basis of micro-income data. The best cross-nationally comparable collection of income data is the

2. The countries where public cash transfers are most targeted towards the poorest 20 per cent of the population are Australia, Denmark, New Zealand, Finland, the Netherlands, Ireland and the United Kingdom, where they receive more than 30 per cent of all transfers (greater than 40 per cent in Australia). In Canada, the United States and Sweden the poorest 20 per cent receive 25 per cent of all transfers. Public cash transfers are least targeted towards the poorest 20 per cent in Poland, where they receive less than 10 per cent of all transfers.

3. For a critical survey of efforts to measure budget incidence, see Smolensky, Hoyt and Danziger (1985). However, models that include, for example, behavioral links are beyond the scope of existing empirical work (Gottschalk and Smeeding, 2000, p. 263). Therefore, researchers have restricted themselves largely to accounting exercises that decompose changes in overall inequality into a set of components.

Luxembourg Income Study (2008). The Luxembourg Income Study (LIS) was created specifically to improve consistency in undertaking cross-country comparisons (Smeeding, 2002). However, the LIS data of both the Gini coefficient of market income and the Gini coefficient of disposable income are not yet available for the most recent data years. Therefore, we use data from the OECD study "*Growing unequal?*" (2008a).

Table 1 shows the Gini coefficients in 25 OECD countries, based on the most recent income data. Column (1) shows the Gini coefficient of market income, which includes income from wages and salaries, self-employment, property, and occupational and private pensions. Column (2) shows the Gini coefficient of adjusted disposable income, which is defined as market income plus public and private transfers, as well as other types of cash income, minus personal income taxes and individual social security contributions. The table indicates that a wide range of inequality of disposable income exists across the countries under study, with the highest Gini coefficient in the United States and the lowest Gini coefficient in Denmark. In earlier studies (Caminada and Goudswaard, 2001 and 2002), we have shown that income inequality has risen since the early 1980s in the majority of the OECD countries, although it is wrong to think in terms of a worldwide trend (Atkinson, 2000; OECD, 2008a). But what is the impact of welfare states on income inequality? Smeeding (2002) showed that social policies, wage distribution, the length of the period in work, social and labour market institutions, and demographic profiles all have some influence on why there are large differences in income inequality among rich nations at any point in time. In this paper we focus on social protection systems only.

Columns (3) and (4) in Table 1 show the reduction in income inequality through taxes and social transfers. This is income redistribution achieved through the welfare state. Taxes and transfers reduce the Gini by on average 15 points or 33 per cent. For example Sweden, Denmark, and Belgium achieve a greater redistribution of economic resources (more than 44 per cent) compared to the Republic of Korea and the United States.

Table 1 does not show the redistributive impact of separate parts of the welfare state. Recent literature suggests that the determination of the relationship between social expenditures and inequality should be carried out on a disaggregated basis (see Swabisch, Smeeding and Osberg, 2006). Ferrarini and Nelson (2003) show that only a limited number of studies have attempted to identify the link between specific social transfer programmes and income inequality in a comparative setting. As a result, knowledge about the institutional structures that produce certain distributive outcomes is limited. To gain a deeper understanding of the redistributive mechanisms of the welfare state, it is necessary to disaggregate the social transfer system into programme-specific components. The LIS data (Mahler and Jesuit, 2006) show a rough disaggregation for a small number of countries. These data

Table 1. *Gini coefficients before and after taxes and transfers, mid-2000s*

	Gini Coefficient Market Income (1)	Gini Coefficient Disposable Income (2)	Income Redistribution (3) = (1) – (2)	Redistribution (percentage) (4) = (3) / (1)
Australia	0.458	0.301	0.157	0.34
Austria	0.433	0.265	0.168	0.39
Belgium	0.494	0.271	0.223	0.45
Canada	0.436	0.317	0.119	0.27
Czech Republic	0.474	0.268	0.206	0.43
Denmark	0.417	0.232	0.184	0.44
Finland	0.386	0.269	0.117	0.30
France	0.482	0.281	0.201	0.42
Germany	0.507	0.298	0.209	0.41
Iceland	0.368	0.280	0.089	0.24
Ireland	0.416	0.328	0.088	0.21
Italy	0.557	0.352	0.205	0.37
Japan	0.443	0.321	0.123	0.28
Republic of Korea	0.339	0.312	0.026	0.08
Luxembourg	0.454	0.258	0.196	0.43
Netherlands	0.423	0.271	0.152	0.36
New Zealand	0.473	0.335	0.138	0.29
Norway	0.433	0.276	0.157	0.36
Poland	0.568	0.372	0.196	0.34
Portugal	0.540	0.380	0.160	0.30
Slovakia	0.459	0.268	0.191	0.42
Sweden	0.432	0.234	0.198	0.46
Switzerland	0.352	0.276	0.077	0.22
United Kingdom	0.460	0.335	0.125	0.27
United States	0.457	0.381	0.076	0.17
Mean OECD-25	0.450	0.299	0.151	0.33

Note: The data refer to Gini coefficients of equivalized household income, i.e. income adjusted to reflect differences in household needs through an equivalence scale (square root elasticity). Market income: income from wages and salaries, self-employment and property plus occupational and private pensions. Disposable income: market income plus public and private transfers, as well as other types of cash income, minus personal income taxes and individual social security contributions.
Sources: OECD (2008a); own calculations.

indicate that, on average, 24 per cent of the redistributive impact of the welfare state can be attributed to taxes and 76 per cent to transfers. However, the differences between countries are quite large: in the United States 40 per cent of redistribution comes from taxes, while in Switzerland and France taxes account for less than 10 per cent of total redistribution. The OECD (2008a, p. 112) uses a different inequality measure (the concentration index) and concludes that redistribution achieved by public cash transfers is on average twice as large as that achieved through household taxes in 21 OECD countries. Again, the United States is an exception, achieving greater redistribution through the tax system than through cash transfers. The inequality reducing effect of public cash transfers is highest in Sweden, Belgium, and Denmark and lowest in the Republic of Korea, the United States, and Japan.

The LIS study of Mahler and Jesuit (2006) provides a breakdown of the redistributive impact of social transfers at the programme level for 13 OECD countries. Pensions have, by far, the strongest redistributive impact. More than half of the redistributive impact of social transfers comes from pensions. Especially in Switzerland and, to a smaller extent, in France and Germany, pensions have a relatively strong inequality-reducing effect. In contrast, unemployment programmes account for slightly less than 10 per cent of total redistribution through social transfers.

Public services (in-kind benefits) such as health care may also reduce inequality (OECD 2008a, pp. 223-251). One of the reasons given for this is that some health-care provisions are limited to elderly people or to individuals with fewer resources, as is the case in the United States. The OECD study concludes that health-care expenditure reduces inequalities in all OECD countries, but the redistributive effects are not very large.[4] In general, the inequality reduction due to in-kind transfers (including health care, education, and social housing) is, on average, substantially lower than that achieved by cash transfers and taxes.

Public and private social expenditures

The OECD (2007, p. 6) defines social expenditures as:

> the provision by public and private institutions of benefits to, and financial contributions targeted at, households and individuals in order to provide support during circumstances which adversely affect their welfare, provided that the provision of the benefits and financial contributions constitutes neither a direct payment for a particular good or service nor an individual contract or transfer.

Since only benefits provided by institutions are included in the social expenditure definition, other transfers to households — albeit of a social nature — are not

4. It should be noted that there are several conceptual and methodological problems with measuring the redistributive impact of health-care and other public services.

deemed to rest in the social domain. Social benefits, therefore, include cash benefits (e.g. pensions, support during periods of incapacity or maternity leave, and social assistance payments), social services (e.g. childcare and care for the elderly and disabled), and tax breaks with a social purpose (e.g. tax expenditures directed towards families with children or the favourable tax treatment of contributions made to private health-care or pension plans).

There are two main criteria that have to be simultaneously satisfied for an expenditure item to be classified as social: 1) the benefits have to be intended to address one or more social purposes; and 2) programmes regulating the provision of benefits have to involve either interpersonal redistribution or compulsory participation.

The distinction between public and private social protection is made on the basis of whoever controls the relevant financial flows; public institutions or private bodies.

Within the group of private social benefits, two broad categories can be distinguished: mandatory and voluntary private social expenditure. Mandatory private social expenditure is social support stipulated by legislation, but operated through the private sector; for example, direct sickness payments by employers to their absent employees as legislated by public authorities, or benefits accruing from mandatory contributions to private insurance funds. In some countries public disability benefits (and sometimes unemployment benefits) can be supplemented by private benefits with mandatory contributions, agreed upon in collective negotiations between employers and employees.

Voluntary private social expenditure concerns benefits accruing from privately-operated programmes that involve the redistribution of resources across households. These may include benefits provided by non-governmental organizations and benefits accruing from tax-advantaged individual plans and collective-support arrangements (that are often employment-related); for example, pensions, and, in the United States, employment-related health plans.

Table 2 summarizes which expenditures are deemed "social" and which are not.

Table 3 shows public and private social expenditure as a percentage of GDP, for the most recent data year 2005. Most social support is publicly-provided. In a majority of countries, the share of public social benefits in total social expenditures exceeds 90 per cent. However, the role of various private arrangements in substituting for public social protection expenditure is considerable in some OECD countries. In Canada, the Republic of Korea, the Netherlands, Switzerland, and the United Kingdom, the share of private social expenditure is more than 25 per cent, while in the United States the share is almost 40 per cent. In most cases, private expenditures are most commonly voluntary, but there are exceptions. In Switzerland, for example, mandatory private expenditures are very high. Figure 1 shows that, in a number of countries, private social expenditures have risen quite

Table 2. *Categorization of benefits with a social purpose*[a, b]

	Public		Private	
	Mandatory	Voluntary	Mandatory	Voluntary
Redistribution	Means-tested benefits, social insurance benefits	Voluntary participation in public insurance programmes. Self-employed "opting in" to obtain insurance coverage	Employer-provided sickness benefits or benefits accruing from mandatory contributions (e.g. to old-age pension or disability insurance)	Tax-advantaged benefits; for example, individual retirement accounts, occupational pensions, or employer-provided health plans
No redistribution	Benefits from publicly-managed individual saving schemes		Non-tax-advantaged, actuarially fair, pension benefits	Exclusive private benefits accruing from insurance plans bought at market prices according to individual preferences

a. By definition, transfers between individuals, even when of a social nature, are not considered to be within the social domain.
b. The shaded cells reflect benefits that are not classified as social.
Source: OECD (2007).

rapidly over the years.[5] Belgium, Canada, Japan, the Netherlands, Switzerland, and the United States show the highest increase in private social expenditure from 1985 to 2005.

There may be various explanations for these increases in private social expenditure. Lower public protection may induce a growth in private social arrangements. But a shift from the public to private provision of social protection can also be an explicit policy objective to alleviate public budgets or to strengthen incentives in the system. For example, the privatization of the Netherlands' sickness benefit programme was to increase incentives for employers to reduce the number of beneficiaries. Policy-makers may also want to realize efficiency gains through a shift from public to private provision, because private providers are assumed to have stronger incentives to reduce costs. Regardless, accounting fully for private social expenditures is important in order to judge a country's overall social effort and to evaluate the level of social protection provided.

But what about the redistributive effect of private social arrangements? Private insurance plans are normally "actuarially fair". This means that each individual is provided with benefits whose actuarial value is equal to his or her contributions, given the chance of the insured event occurring. Most private insurance plans are not earnings-related. Individual private pension plans, for example, are increasingly

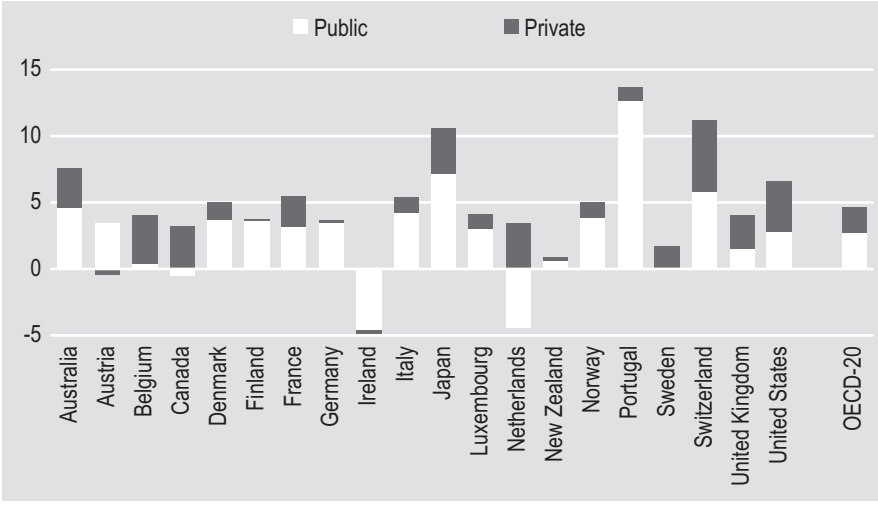
5. See Cornelisse and Goudswaard (2002) for an analysis of the development of public social spending across countries.

Table 3. *Public and private social expenditure (% of GDP), 2005*

	Public social expenditure (1)	Private social expenditure (2)	Total social expenditure (3) = (1) + (2)	Share private (2)/(3) *100
Australia	17.1	3.7	20.8	18
Austria	27.2	1.9	29.1	7
Belgium	26.4	4.5	30.9	15
Canada	16.5	5.5	22.0	25
Czech Republic	19.5	0.3	19.8	2
Denmark	26.9	2.6	29.5	9
Finland	26.1	1.1	27.2	4
France	29.2	3.0	32.2	9
Germany	26.7	3.0	29.7	10
Iceland	16.9	4.9	21.8	22
Ireland	16.7	1.3	18.0	7
Italy	25.0	2.1	27.1	8
Japan	18.6	3.8	22.4	17
Republic of Korea	6.9	2.4	9.3	26
Luxembourg	23.2	1.1	24.3	5
Netherlands	20.9	8.3	29.2	28
New Zealand	18.5	0.4	18.9	2
Norway	21.6	2.1	23.7	9
Poland	21.0	0.0	21.0	0
Portugal	23.1	1.9	25.0	8
Slovakia	16.6	1.0	17.6	6
Sweden	29.4	2.8	32.2	9
Switzerland	20.3	8.4	28.7	29
United Kingdom	21.3	7.1	28.4	25
United States	15.9	10.1	26.0	39
Mean OECD-25	21.3	3.3	24.6	14

Sources: OECD (2008b); own calculations.

Figure 1. *Change in public and private social expenditure (percentage-points of GDP), 1985-2005*



Sources: OECD (2008b); own calculations.

defined-contribution in character and, therefore, do not contain any elements of (ex ante) income redistribution. However, some private plans may provide earnings-related benefits. It is sometimes argued that earnings-related social insurance benefits only reproduce inequalities in market income since they do not redistribute economic resources across different income groups. This might be expected to be especially so for benefits provided by private earnings-related plans. However, private earnings-related plans may not be actuarially fair and may contain elements of solidarity. This is often the case when (supplementary) private, but mandatory, schemes are negotiated by the social partners in collective labour contracts for (a group of) workers. Defined-benefit pension schemes, for example, generally redistribute resources both within generations (for instance through redistributive mechanisms such as thresholds for contributions or ceilings for benefits) and across generations (as the younger and future generations partly absorb negative financial shocks to protect the pensions of older generations). Defined-benefit schemes for early retirement tend to redistribute income to scheme members who leave work before the official retirement age from those who work until the official retirement age. In fact, as mentioned in the previous section, private social programmes, by definition, contain elements of interpersonal redistribution.

Tax advantages (to households or to employers) can also be used to stimulate the provision of private benefits. This is often the case in supplementary pension programmes, where contributions are tax exempt. The fiscal advantages related to, for example, supplementary private pension plans are positively related to income

levels in most countries. Yet, on the whole, as Ferrarini and Nelson (2003, pp. 14-15) show, social programmes are less income equalizing after taxation in all countries.

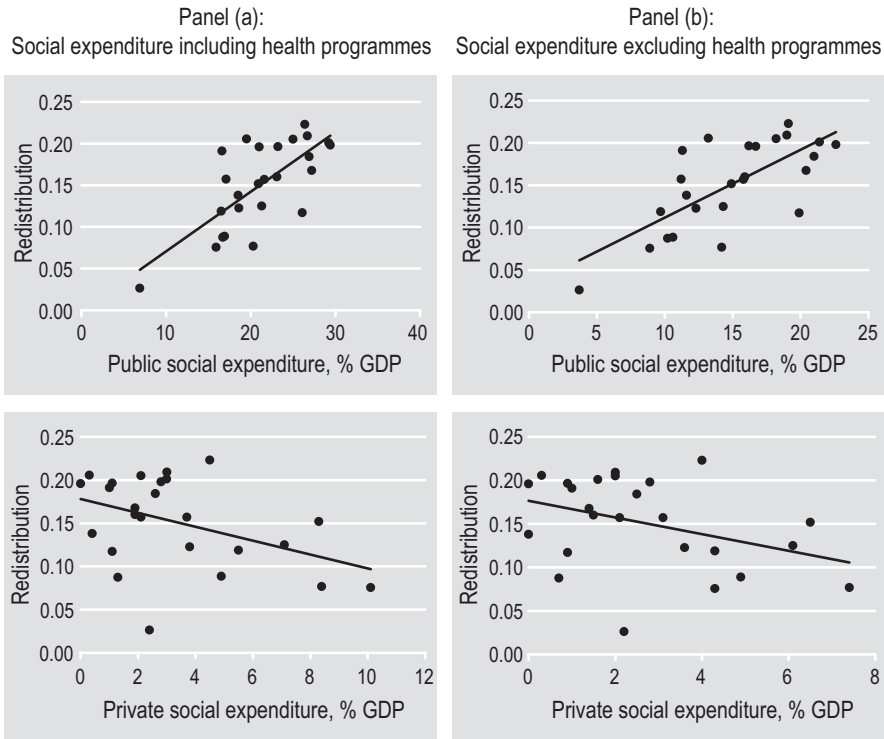
In general, it is expected that private schemes will generate less income redistribution than public programmes, although at this stage the distributional impact when private social schemes are taken into account in cross-country analyses is not fully clear. It is reasonable to suggest that mainly higher-income groups will make use of private social schemes (Casey and Yamada, 2002). Research by Swabisch, Smeeding and Osberg (2006) suggests that as income differences between higher-income groups and those with lower incomes widen, the former find it easier to opt out of public programmes and to buy substitutes for social insurance in the private market. Bearing in mind that private schemes often have favourable tax treatment (deductibility of contributions), which will predominately benefit those with higher incomes, it can be suggested that private social expenditure has a positive effect on income inequality. In other words, we expect income redistribution to be relatively high (low) in countries where the share of private arrangement in the total social benefits is relatively low (high).

The link between public and private social protection and income redistribution

We performed various cross-country analyses of the relationship between public and private social expenditures and the reduction in income inequality resulting from income transfers (income redistribution from taxes and social benefits as defined above). We include 25 OECD countries for which we have recent data (around 2005) for both income redistribution through the welfare state and for private social expenditures; see Tables 1 and 3. In Figure 2 (panel a), we have plotted the level of public social expenditure as a percentage of GDP and the reduction of income inequality as a result of the welfare state (the points difference between the Gini coefficients of market income and of disposable income). The expected relationship is found: a relatively high level of public social expenditure results in relatively more income redistribution across countries. We find a pretty good fit of an OLS-regression;[6] see Table 4. Obviously, public social transfers are well-targeted towards lower-income groups. For private social expenditure, we find a negative relationship with income redistribution. This relationship is statistically significant ($p = 0.038$). Countries with higher private social expenditure have less income redistribution. This may reflect that higher-income groups find it easier to "opt in" to private social programmes. For total social expenditure, we still find a positive and significant linkage with income redistribution, but this linkage is weaker than for public expenditure only. These findings are confirmed by an OLS-regression

6. Ordinary least squares regression.

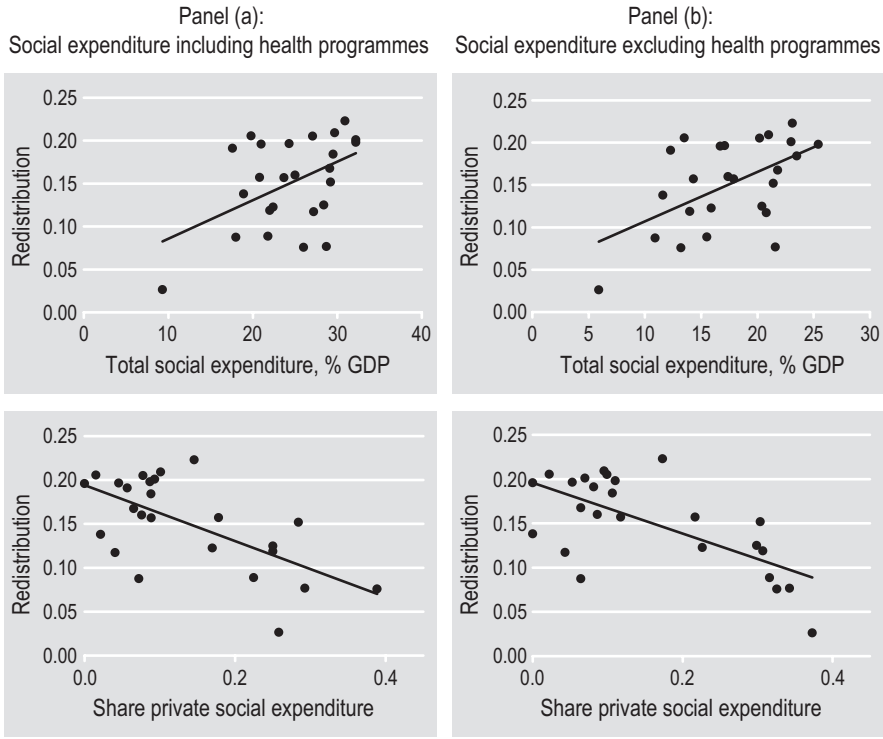
Figure 2. *Public and private social expenditure and the redistribution of income, around 2005*



between the share of private expenditure in total social expenditure and income redistribution, shown in the lowest part of Figure 2. We find a statistically significant negative relationship between the share of private expenditures and income redistribution ($R2 = 0.38$ and $p = 0.001$). This implies that countries that rely more heavily on private social arrangements achieve less income redistribution.

Earlier in this article, we argued that in-kind transfers (public services) may also have a redistributive impact, but one that is usually smaller than for cash transfers. Moreover, in-kind transfers are not taken into account as a component of the difference between market income and disposable income, which was the basis used to calculate the redistributive impact of taxes and transfers. So, to control for this, we performed a similar analysis with social expenditure excluding health programmes (by far the largest in-kind transfer included in the social expenditure data). This is reported in panel (b) of Figure 2 and in panel (b) of Table 4. The results are essentially the same as the results of the regressions with total social expenditures including expenditures on health care. Thus, we conclude that spending on services does not have a big influence on our results.

Figure 2. *Continued*



Source: OECD (2008a), OECD (2008b), and own calculations.

We also analysed the redistributive impact of separate social protection programmes, both public and private, in order to gain a better understanding of the different redistributive elements of the welfare state. The results are reported in Table 5. Public old-age programmes have, by far, the strongest redistributive impact; this confirms the findings of an earlier LIS study, reported above (Mahler and Jesuit, 2006). Also, active labour market programmes and unemployment programmes have a statistically significant positive relationship with the level of income redistribution. Health-care programmes, family programmes, and survivor programmes have only a statistically significant positive relationship with redistribution at the 10 per cent level. For private social programmes, we only find a statistically significant linkage between private pensions and redistribution at the 10 per cent level ($p = 0.081$). In this case, however, the relationship is negative: more private pension expenditure coincides with less income redistribution. Private pension systems, which are contributory, appear to benefit those with relatively higher incomes. For other private social programmes, we do not find a statistically significant relationship with income redistribution. But this may be due, in part, to a problem of data

Table 4. *Impact of public and private social expenditure (% of GDP) on income redistribution, around 2005*

		Intercept	Total social expenditure	Public social expenditure	Private social expenditure	Adj. R^2
	Panel (a): Social expenditure, % of GDP					
Redistribution: ($Gini_{pre}$ — $Gini_{post}$)	(1a)	0.041 (0.93)	0.004** (2.58)			0.191
	(2a)	–0.001 (–0.03)		0.007*** (4.94)		0.494
	(3a)	0.030 (0.93)		0.007*** (4.97)	–0.006** (–2.34)	0.577
	(4a)	0.178*** (11.52)			–0.008** (–2.22)	0.140
	Panel (b): Social expenditure excluding health programmes, % of GDP					
Redistribution: ($Gini_{pre}$ — $Gini_{post}$)	(1b)	0.049 (1.42)	0.006*** (3.07)			0.260
	(2b)	0.032 (1.27)		0.008*** (4.97)		0.497
	(3b)	0.057** (2.13)		0.008*** (4.92)	–0.007* (–1.98)	0.554
	(4b)	0.176*** (10.83)			–0.010* (–1.95)	0.105

Notes:
— Dependent variable: income redistribution: ($Gini_{pre}$ — $Gini_{post}$). N = 25. OLS-regression; standard regression coefficients are reported; t-statistics are shown in parentheses. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.
— Selected countries: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Iceland, Ireland, Italy, Japan, Republic of Korea, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Sweden, Switzerland, United Kingdom, and the United States.
— Gini index of market (pre-government private sector) income: $Gini_{pre}$ Gini index net disposable (post-government) income: $Gini_{post}$ Redistribution: ($Gini_{pre}$ — $Gini_{post}$)
Sources: OECD (2008a), OECD (2008b), and own calculations.

availability (small N-problem): not all of the countries included in our analysis have private social programmes in all the relevant categories.[7] As reported above, for all private social expenditure taken together, we find a statistically significant negative relationship with income redistribution.

It is well understood that empirical analyses of social protection are rather sensitive to the data used. To test the robustness of our results, we performed a sensitivity analysis with net rather than gross social expenditures. Differences in the

7. Only a small number of countries operate private survivors or family programmes. Private social unemployment programmes, active labor market programmes, and housing programmes are rare (at least in the OECD data base).

Table 5. *Impact of public and private social programmes on income redistribution, around 2005*

	Public social expenditures, % of GDP			Private social expenditures, % of GDP		
	Intercept	X1	Adj. R^2	Intercept	X1	Adj. R^2
Old-age programmes	0.070*** (3.28)	0.011*** (4.06)	0.393	0.170*** (11.82)	–0.011* (–1.82)	0.088
Survivors programmes	0.130*** (9.14)	0.028* (1.99)	0.110	0.154*** (14.70)	–0.099 (–1.34)	0.032
Incapacity-related programmes	0.117*** (4.91)	0.013 (1.57)	0.058	0.156*** (10.17)	–0.008 (–0.42)	–0.036
Health-care programmes	0.026 (0.40)	0.020* (1.97)	0.107	0.161*** (13.68)	–0.014 (–1.59)	0.059
Family programmes	0.106*** (4.39)	0.021* (2.02)	0.114	0.149*** (13.26)	0.142 (0.44)	–0.035
Active labor market programmes	0.114*** (6.50)	0.059** (2.54)	0.185			
Unemployment programmes	0.123*** (8.10)	0.028** (2.35)	0.159			
Housing programmes	0.149*** (10.34)	0.008 (0.25)	–0.041			
Other social policy areas	0.166*** (10.35)	–0.031 (–1.23)	0.021	0.157*** (12.44)	–0.018 (–0.84)	–0.013
Total social expenditure	–0.001 (–0.03)	0.007*** (4.94)	0.494	0.178*** (11.52)	–0.008** (–2.22)	0.140

Notes:
— Dependent variable: income redistribution: (Gini $_{pre}$ — Gini $_{post}$). N = 25. OLS-regression; standard regression coefficients are reported; t-statistics are shown in parentheses. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.
— Selected countries: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Iceland, Ireland, Italy, Japan, Republic of Korea, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Sweden, Switzerland, United Kingdom, and the United States.
— Gini index of market (pre-government private sector) income: Gini $_{pre}$ Gini index net disposable (post-government) income: Gini $_{post}$ Redistribution: (Gini $_{pre}$ — Gini $_{post}$)
Sources: OECD (2008), SOCX (2008), and own calculations.

tax treatment of social benefits make international comparisons of social protection systems difficult. We use data from the OECD study on social expenditure in which the impact of the tax system on social expenditure is accounted for (based on Adema and Ladaique, 2005). In all regressions, we find similar results (not reported): a statistically significant positive relationship between (net) public social expenditures and income redistribution, and a weaker but also statistically significant negative relationship between (net) private social expenditures and income redistribution. Consequently, the results reported here seem to be quite robust.

Finally, we would like to mention that, ideally, the outcomes of the public and private mix in the provision of social protection should also be analysed longitudinally. It would be important to know whether changes in the public and private mix have reduced the redistributive impact of welfare states over time. Unfortunately, this type of analysis cannot yet be done because of a lack of data. The number of countries for which we have the relevant data is too small for a cross-country time-series analysis. More detailed case studies would be required. So, this is a topic for further research.

Conclusions

Most analyses of social protection focus on public arrangements. But social effort is not restricted to the public domain; all kinds of private arrangements can substitute for, or complement, public programmes. Private arrangements are considered to be "social" when they serve a social purpose and when there is some kind of government involvement. Examples are supplementary employment-based and tax-advantaged pension plans and private health-insurance plans with legal stipulations. OECD data indicate that in several countries there has been a relative shift from public towards private social arrangements.

In this paper, we have analysed the redistributive effects of public and private social arrangements. Effecting income redistribution from the rich to the poor is one of the important objectives of the welfare state. In all OECD countries, the social protection system results in a more equal distribution of incomes. Taxes and transfers reduce the Gini coefficient by 8 to 46 per cent in OECD countries. Based on cross-country regressions, we find a positive relationship between public social expenditures and income redistribution. Welfare states with higher public social expenditure achieve more income redistribution. Also, the composition of public social spending matters: public old-age programmes have the strongest redistributive impact.

For private schemes, we find a weak, but statistically significant, negative relationship with income redistribution. At the programme level, this effect is found for private pensions. Private pension systems seem to favour those with higher incomes. In general, taking fully into account private social arrangements is necessary when seeking to evaluate the distributional impact of national social protection systems. Countries that rely more heavily on private social arrangements achieve less income redistribution.

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