Income Distribution and Social Security in an OECD Perspective

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Abstract
The last two decades show an trend towards a less equal income distribution in OECD. There are many causes for this trend. This paper analysis whether changes in social security systems are one of these causes. For some OECD-countries we find a relationship between changing welfare state policies (as measured by expenditure ratios and replacement rates) and changing income inequality, but for others not. Especially the United Kingdom and the Netherlands combined an above average rise in inequality with a reduction in the generosity of the welfare system.
For this reason we studied the case for the Netherlands in more detail. A budget incidence analysis for the period 1981-1997 indicates that changes in social policy indeed explain a large part of the increase in income inequality.

JEL-classification: D31, H22, and H55
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1 Introduction

In recent years considerable progress has been made in empirical research on income inequality in industrialized countries (see e.g. Gottschalk et al. 1997). An important development has been the launching of the Luxembourg Income Study (LIS) in which micro data sets from various countries have been harmonized. Thus there are good possibilities for studying how income inequality varies cross-countries (see Atkinson et al. 1995). However, the advancement in methods of measurement and in empirical knowledge is contrasted with the lack of insight into causes for differences in equality over time (Gustafsson & Johansson, 1999). This should perhaps not come as a surprise as the distribution of income in a country is the outcome of numerous decisions made by households, firms, organizations and the public sector. One could think of an almost infinite number of micro-level causes for differences and changes in income inequality (Gottschalk & Smeeding, 1997; Atkinson et al. 1995).

In this paper, we investigate whether social policy measures have contributed to changes in inequality among OECD countries. Our hypothesis is that reforms of the social system, such as benefit cuts or more strict eligibility criteria, have made the income distribution more unequal. Of course, this is only the case when (pre-reform-) social transfers are mainly directed at lower income groups (or when the transfers to lower income groups are cut more than the transfers to higher income groups). When, on the other hand, the benefits of the welfare system are rather evenly spread between income groups, reforms will not have a strong impact on income (re)distribution.

Using comparative international time-series data we will analyze whether there is some correlation between changes in social expenditures and welfare generosity, and changes in the income distribution. A more detailed study will be performed for the Netherlands, which is an interesting case, because the Dutch welfare system has been reformed rather fundamentally in recent years. Also income inequality has increased relatively more than in most other OECD countries (Gottschalk & Smeeding, 1998). We use the traditional budget incidence approach to study the combined effects of all taxes and transfers on the income (re)distribution. The distribution of primary or wage and salary income is compared with the distribution of income after tax and after social transfers.

The paper is organized as follows. In section 2 we summarize literature on the (changes in the) income distribution in OECD countries. In section 3 we investigate the proposition that social policy is one of the causes of increasing inequality. Section 4 presents a more detailed budget incidence approach for the Netherlands. Section 5 concludes the paper. Details on the comparative databases used are listed in Annex A.

2 Empirical Evidence

2.1 Data on Income Inequality

Data availability, data consistency, and many factors in different studies make it hard to compare levels or even trends of income inequality across countries (differences in income concepts, the income units, (summary) measures, equivalence adjustments and other factors).[1] The most promising tool to analyze changes in the income distribution are high quality time-series panel data. However, cross-national studies based on several years of panel data are just beginning to appear (see e.g. Headey et al. 1997).[2] Second-best seems the cross-nationally comparable collection of the Luxembourg Income Study (LIS). LIS was created specifically to improve consistency across countries. The LIS data are a collection of micro data sets obtained from the range of income surveys in various countries. The advantage of these data is that extensive effort has been made by country specialists to make information on income and household characteristics as comparable as possible across a large number of countries. The LIS data sets can be used to compare the distribution of disposable income in 25 nations over a 20-year period, though not all periods are available for all nations.[3]

2.2 Differences in Inequality across OECD Countries

This section reviews the evidence on cross national comparisons of annual disposable income inequality over twenty wealthy nations. The analysis is mainly descriptive and relies on the empirical evidence from Gottschalk & Smeeding (1997 and 1998), and others using data from the Luxembourg Income Study (LIS).[4] We summarize empirical results by both analyzing absolute *levels* and *trends* of income inequality across countries. We start by comparing levels (around the mid 1990's) and short-run trends in inequality (1980's) and then shift to trends from 1979 onwards.

- Levels of Income Inequality around the mid 1990's

Levels of inequality can be shown in several ways, e.g. by Lorenz curves, specific points on the percentile distribution (P10 or P90), decile ratios (P90/P10), and Gini coefficients or many other summary statistics of inequality. All (summary) statistics of inequality can be used to rank income inequality in OECD countries, but they do not always tell the same story.
Table 1 shows two summary measures of the income distribution - the P90/P10-ratio and the Gini coefficient. Countries are listed in order of their P90/P10-ratio from smallest to largest.

Table 1 Summary Measures of the Income Distribution

Country	*P90 /P10 -ratio*	*Gini coefficient*
Sweden 1995	2.59	0.222
Finland 1995	2.68	0.226
Belgium 1992	2.76	0.230
Norway 1995	2.84	0.240
Denmark 1992	2.84	0.240
Luxembourg 1994	2.92	0.235
Netherlands 1994	3.08	0.282
Germany 1994	3.18	0.300
France 1994	3.32	0.290
Taiwan 1995	3.36	0.277
Switzerland 1982	3.39	0.323
Canada 1994	3.90	0.286
Spain 1990	3.96	0.306
Israel 1992	4.12	0.305
Japan 1992	4.17	0.315
Ireland 1987	4.20	0.330
Australia 1994	4.22	0.317
United Kingdom 1995	4.52	0.346
Italy 1995	4.68	0.346
United States 1997	5.64	0.375

note: Data refer to adjusted disposable income based on data from LIS; Gini coefficients are based on income which are bottom-coded at 1 percent of median disposable income and top coded at 10 times the median disposable income.

source: Gottschalk & Smeeding (2000: figure 1, p. 211)

The highest inequality is found in the United States, while Nordic countries are the most equal nations. Although other inequality indices would alter the country-ranking to some extent, roughly the same pattern of overall inequality is observed in other analyses of inequality (Atkinson et al. 1995)

We see that according to the Gini coefficient, The Netherlands is grouped with four other countries (Luxembourg, Germany, France, and Taiwan) with quite low coefficients compared to Switzerland, Canada, Spain, Israel, and Japan with somewhat larger coefficient, and five other countries with the largest coefficients, indicating the highest degree of inequality.

Table 1 indicate that a wide range of inequality exists across rich nations, with the nation with the highest inequality coefficient (United States) almost twice as high as the nation with the lowest coefficient (Sweden).

- Trends in Income Inequality during the 1980's

Table 2 summarizes the results of cross-national comparisons of earnings and income inequality. Note that disposable income is equal to market income plus transfers minus taxes. So, table 2 gives some information on social policy as well. Countries have been listed in order of changes in disposable income inequality as measured by the change in the Gini coefficient from largest to smallest change. It should, however, be noted that this country-ranking depends rather strongly on the inequality index used (Gini) and the specific time-intervals applied. Any (small) difference in specification could alter both the magnitude of inequality and the country-ranking to an wide

extend. However, the direction of the changes in inequality in the period 1980-1995 as shown in Table 2 is more or less in line with results of other analyses (*cf*. Ruiz-Huerta et al. 1999). As far as disposable income is concerned, it is certainly wrong to think in terms of a world-wide trend towards increased income inequality in the 1980's (*cf*. Atkinson, 1996: 43).

Table 2 Changes in Market and Disposable Income Inequality During the 1980's

Country	*years*	*market income inequality*	*disposable income inequality*
United Kingdom	1981 - 91	+++	++++
United States	1980 - 93	+++	+++
Sweden	1980 - 93	+++	+++
Australia	1980 - 90	+	+
Denmark	1981 - 90	+	+
New Zealand	1981 - 89	+	+
Japan	1981 - 90	+	+
The Netherlands	1981 - 89	+	+
Norway	1982 - 89	+	+
Belgium	1985 - 89	+	+
Canada	1980 - 92	+	0
Israel	1979 - 92	+	0
Finland	1981 - 92	+++	0
France	1979 - 89	0	0
Portugal	1980 - 90	0	0
Spain	1980 - 90	n.a.	0
Ireland	1980 - 87	+	0
West Germany	1983 - 90	+	0
Italy	1977 - 91	-	-

note: Change is based Gini coefficient of disposable income (income concept, method of equivalence scale and computation may differ by country).

Designation	Range of change in Gini coefficient
-	-5 percent or more
0	-4 to +4 percent
+	5 to 10 percent
++	10 to 15 percent
+++	16 to 29 percent
++++	30 percent ore more

methodology: the above result emerges from extensive reading and interpretation of comparative studies of the level and trend in inequality by Gottschalk & Smeeding

source: Gottschalk & Smeeding (1997, table 4, p. 666)

The extensive survey by Gottschalk and Smeeding (1997) covers many aspects of income inequality. The following stylized facts can be traced from their study:

I Almost all countries experienced some increase in wage inequality during the 1980's. Changes in household income inequality in most countries were smaller than changes in earnings inequality. In all OECD-countries post-tax and transfer disposable income is more equally distributed than market income.

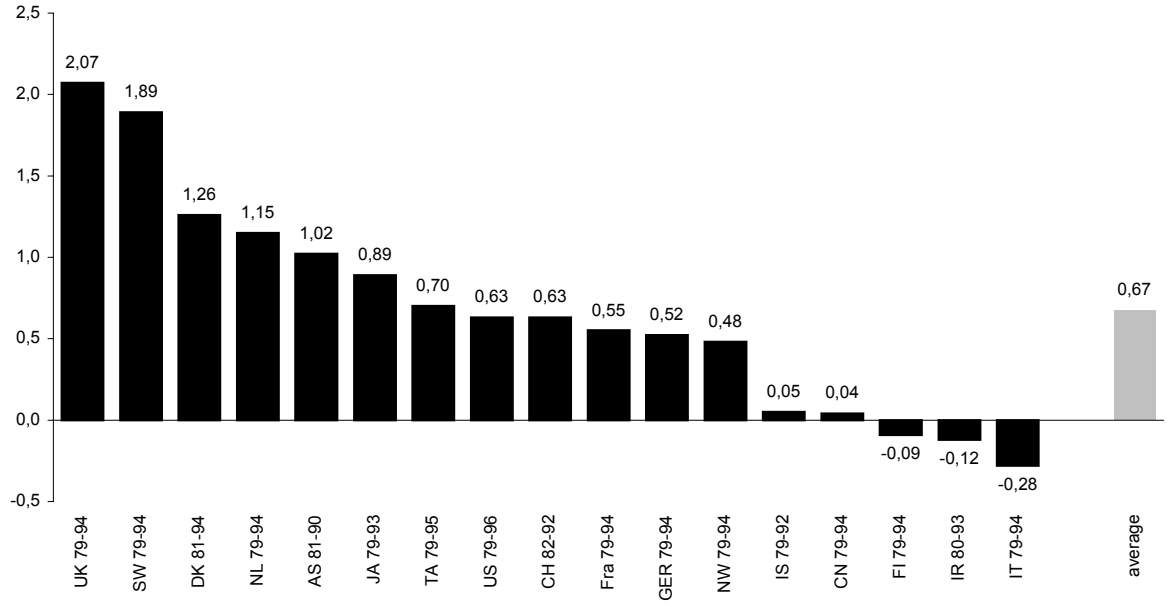
II Changes in taxes paid and transfers received - due to changes in tax and transfer structures in many countries - largely offset the changes in the distribution of markets income (pre-tax and pre-transfer).

III However, the changes in the distribution of income are the result of a complicated set of forces. The links between changes in tax and transfer policy and the distribution of disposable income in different countries are not well understood at this stage.

➢ Trends in Income Inequality: 1979-1995

When we turn to long-run trends in inequality, the picture as set in table 2, alters substantially for several countries. We rely on data from another paper by Gottschalk & Smeeding (1998) who list countries in order of *yearly* percentages changes in disposable income inequality (as measured by the change in the Gini coefficient) from largest to smallest change. Disposable income inequality increased dramatically in a number of countries, but this trend was not universal. Income inequality did *not* rise in 5 of the 17 nations examined from 1979 to 1995. See figure 1.

Figure 1 Trends in Disposable Income Inequality 1979-1995
Average Percentage Change of Gini Coefficient per Year



note: Average percentage change per year equals the percentage change in the Gini coefficient over the time frame indicated divided by the number of years in the interval.

source: Gottschalk & Smeeding (1998, figure 4, p.56 and appendix tables A-2, p.64); and own calculations

Inequality increased by more than 1 percent a year in five countries over this period. The United Kingdom, Sweden, Denmark, the Netherlands and Australia are on top of the list in descending order. Compared to table 2, the United States fall back dramatically, while e.g. the Netherlands show a remarkably sharp increase. Moreover, household income inequality increased in several countries in the period 1979-1995, but the timing of changes was markedly different.

2.3 Conclusion

While even the LIS-data are by no means perfect, they produce some consistent patterns. The range of income inequality in OECD countries seems very wide at any point in time. The Gini coefficient in the most unequal country (United States) is almost twice as large as that found in the most equal country (Sweden). Income inequality has increased dramatically in a number of countries, particularly in the United Kingdom, but also in The Netherlands,

Denmark, Sweden, Australia, and seven other nations. While income inequality rose in 12 of the 17 nations examined from 1980 to 1995, this trend was not universal. In almost all countries inequality declined through the 1970s and started to increase in the 1980s and 1990s. Country specific trends in income inequality are more similar, though not universally so. The large majority of nations have experienced rising income inequality over the last decade or longer.

3 The Role of Social Policies

3.1 Causes of change. Is it social policy?

The increasing income inequality observed for most – but not all – Western economies over the last decades has coincided with many structural changes in the economic system. The world economy has been hit by oil crises twice, there has been a tendency towards more free market oriented policies, and more women have been participating in the labor market. For many countries the main forces behind growing disposable income inequality are the growth of inequality of earned market income, demographic changes, changes in household size and composition, and other endogenous factors. Atkinson (2000: 17) concludes that we should not expect the same development in all countries, because the distribution of income is subject to a wide variety of forces. The evolution of income inequality is not simply the product of common economic forces: it also represents the impact of institutions and national policies. We focus on social policy to that end, and look for a relationship, if any, between social policy and income inequality.

One could argue that one of the explanations of the dissimilarity in country-ordering in table 2 compared to figure 1 could be the welfare state reform. In some countries the welfare state (tax and transfer systems) has been reformed rather drastically in recent years. Cutting back public spending and increasing income inequality could be correlated.

On basis of the LIS-data presented by Ervik (1998) we find mixed evidence. Ervik presents for eight countries the trend in the Gini coefficients corresponding with several income concepts; moving from earned market income, via gross income (also including social transfers) to net disposable income (gross income minus social contributions and taxes). For any year (and country) the magnitude of welfare states' total redistributive effort is represented by the reduction of the Gini coefficient between market income and net disposable income (p.30). This budget incidence approach indicates that the tax and transfer system does redistribute income in such a way that a substantial reduction in overall income inequality is accomplished in all of the eight countries under consideration. How did this distributing effort by social policy vary over time in different countries? In some countries the redistributive effect of transfers and taxes decreased in the last ten to fifteen years (Sweden, the United Kingdom, Finland and the United States), whereas in other countries the redistributive effect of transfers and taxes increased (Denmark, Australia, Germany and Norway). However, this study does not deal with the possible relationship between welfare state *policies* and changes in the income distribution.

3.2 Empirical Evidence from a Straightforward Approach

How do we measure changes in social policy or changes in "generosity" of social security systems? A range of indicators are used in comparative studies (Whiteford, 1995). We look at only two of these indicators in our straightforward approach (see also sections 4 and 6); *(a)* social security expenditures as percentage of GDP, and *(b)* replacement rates of unemployment benefits.

Social Security Transfers as percentage of GDP

It's well known that social security systems are very difficult to compare. Countries often use different definitions of social security and of specific social risks, such as unemployment or disability. Moreover, benefits may be provided by either public institutions or market institutions. In the latter case, market provision may be regulated by government in such a way as to make it equivalent to public provision. These different forms of social protection may not be included consistently in national statistics. A specific statistical problem is related to the tax treatment of social benefits. In some countries benefits are taxable as a rule, in others not. Also, benefits can take the form of tax relief. These tax features can make a big difference in the statistics.

Also, changes in expenditure ratios often do not reflect policy changes. Higher outlays can simply be the result of aging, rising unemployment, etceteras. Expenditure ratio's can thus only be considered as rough indicators of welfare state policies.

Gottschalk and Smeeding (1997) use this indicator to analyze the impact of social policy in the 1980's. They conclude that there is a noticeable correlation between public cash transfer expenditures and disposable income inequality. While the level of social spending is negatively correlated with changes in income inequality, they fount little relationship between retrenchment and increases in inequality in most countries (p. 673). Reductions in social welfare spending for the non-aged and regressive changes in the structure of income taxes for some countries during the 1980's account for only a small part of the trend in post-tax and transfer inequality in most nations.

Following Gottschalk and Smeeding, we look at expenditure ratios for a somewhat longer period. Table 3 shows that in almost all modern welfare states social security transfers as percentage of GDP rose in the period 1979-1994. Using the Comparative Welfare State Data Set (LIS/OECD), we found only two countries with a non-positive change in social security transfers over this time interval: Germany and the Netherlands.

Table 3 Social Security Transfers as percentage of GDP

	around 1979	*around 1994*	*total change*	*average annual change*
Australia 81-94	19.5	21.8	+2.3	+0.18
Canada 79-94	9.6	15.2	+5.6	+0.37
Denmark 81-94	17.8	22.0	+4.2	+0.32
Finland 79-94	9.4	25.1	+15.7	+1.05
France 80-93	18.6	23.3	+4.7	+0.31
Germany 79-94	16.5	16.1	-0.4	-0.03
Ireland 80-93	12.6	15.4	+2.8	+0.22
Italy 79-94	15.7	19.5	+3.8	+0.25
Japan 79-93	9.8	12.1	+2.3	+0.16
Netherlands 79-94	25.5	25.5	0.0	0.00
Norway 79-94	15.5	20.5	+5.0	+0.42
Sweden 79-94	17.6	24.9	+7.3	+0.49
Switzerland 82-92	13.2	15.9	+2.7	+0.27
United Kingdom 79-94	11.1	15.4	+4.3	+0.29
United States 79-93	10.0	13.2	+3.2	+0.23
average (unweighted)	*14.8*	*19.1*	*+4.3*	*+0.30*

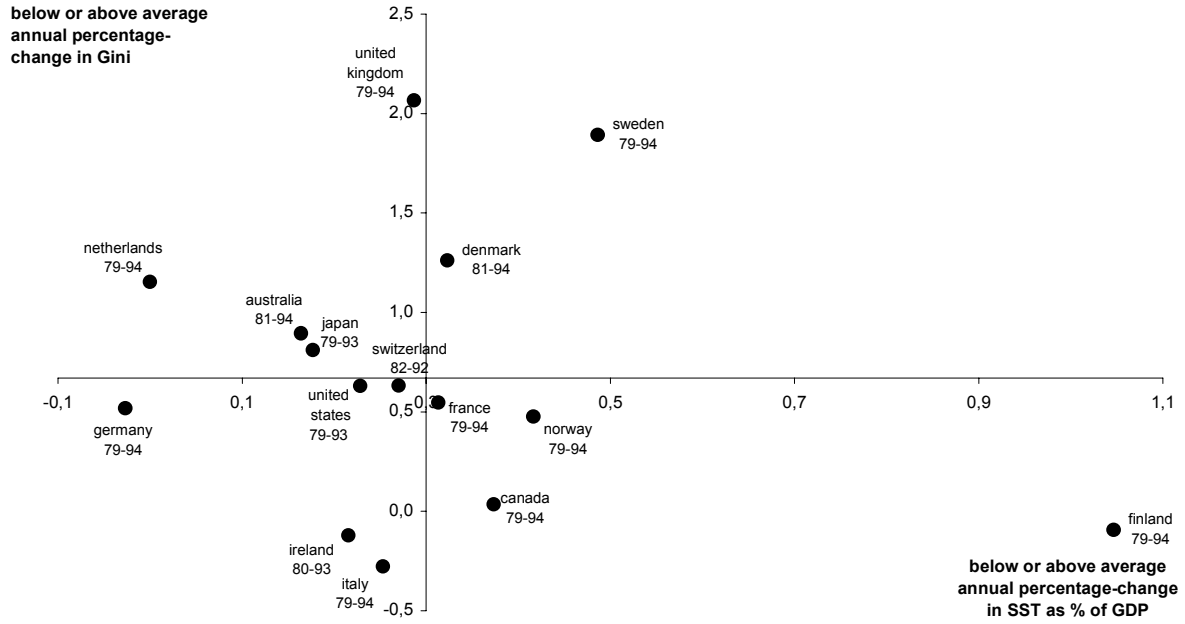
note: total change equals the change in social security transfers as percentage of GDP over the time frame indicated; average annual change is total change divided by the number of years in the interval

source: Comparative Welfare State Data Set LIS / OECD (http://lissy.ceps.lu/compwsp.htm); and own calculations

The expansion of social security systems and/or safety nets in most countries mitigated the observed trend of increasing (market) income inequality to some extent during the period under consideration. Although for most countries both income inequality and social security transfers rose (this seems to contradict with our hypothesis), the growth rates of social security transfers show variation across countries. Rising inequality in some countries *could* be associated with a *below average* change in social security transfers as percentage of GDP. This is analyzed in figure 2.

We have plotted the average percentage change of social security transfers as percentage of GDP and the average percentage change in the Gini coefficient for countries, where both data-items are available. Both averages are calculated over the period indicated (total change divided by the number of years in the interval) and are represented by the cross of both axes: 0.67 for Gini and social security transfers rose on average approximately 0.3 percentage-points per year among these fifteen countries. Several countries show growth rates in social security transfers above this average: Canada, France, and the four Nordic countries. Other countries show below average growth rates: Australia, Germany, Ireland, Italy, Japan, the Netherlands, Switzerland, the United Kingdom, and the United States.

Figure 2 Cross Country Changes in Social Security Transfers and Gini index 1979-1994



note and source Gini coefficient: see below figure 1; source Social Security Transfers: Comparative Welfare State data Set (LIS / OECD); and own calculations

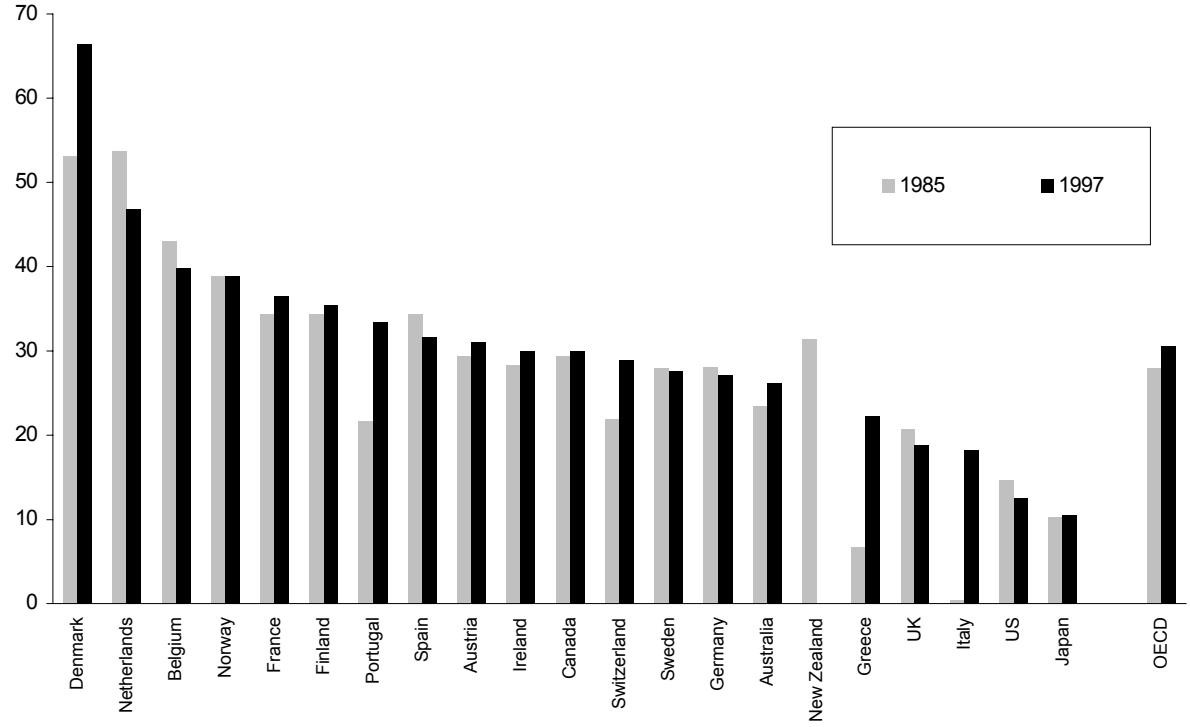
The plotted results for the United Kingdom, the Netherlands, Japan, and Australia seem in line with our hypothesis. These countries combine an above average rise in income inequality with a below average growth rate of social security transfers over the time interval indicated. Furthermore, Norway, Canada, France, and Finland combined an above average growth rate in social security transfers with a below average rise in income inequality. However, for the other countries we do not find a noticeable negative correlation between the change in the level of social security transfers and disposable income inequality. Especially Sweden and Denmark combine both an above average growth rate in social security transfers with a relatively large rise in income inequality. Note that a weak positive relationship between social security transfers and inequality can also be the result of the fact that social security transfers are not well-targeted towards the poor.

Replacement Rates

Comparative studies of social security systems have increasingly turned to the use of replacement rates as measures of the level of benefits in different countries and therefore of the degree of social protection offered by different welfare systems. However, also replacement rates can only be seen as limited indicators of the generosity of benefit systems (Whiteford, 1995). Some of the limitations are: 1) replacement rates are based on entitlement rules and often represent only the maximum payment available in the circumstances specified; 2) benefits are often not fully indexed, implying that benefits represent a decreasing percentage of wages; 3) not all relevant benefits may be reckoned with (such as housing subsidies or health care); 4) taxation can blur the picture; and 5) to monitor social policy developments in the OECD area, one should calculate a variety of replacement rates (differentiated to e.g. social security schemes, earnings levels, family situations, duration of spells). Bearing these limitations in mind,

we can look at figure 3, which presents only the gross replacement rates for unemployment benefits for 21 OECD countries in 1985 and 1997. All replacement rate calculations are based on the level of previous earnings defined with reference to the Average Production Worker (APW), taking as the two most significant cases the APW level of earnings and two thirds of the APW level of earnings.

Figure 3 Gross Replacement Rates Unemployment Benefits OECD 1985 and 1997



note: Replacement rates (i.e. benefits before tax as a percentage of previous earnings before tax) as defined by legislated entitlements averaged across various circumstances in which an unemployed person may be. Countries are ranked in descending order of this average in 1997.

Explanation: Benefit entitlements have been estimated for two earnings levels (average earnings and two-thirds of average earnings), three family situations (single, with dependent spouse, with spouse in work) and three durations of unemployment spells (one year, 2 to 3 years, 4 to 5 years out of work). For every datayear between 1961 and 1997 the unweighted averages of these replacement rates are computed. The computations assume standard circumstances such as 40 years of age, involuntary loss of the former job, long previous work record, etc.

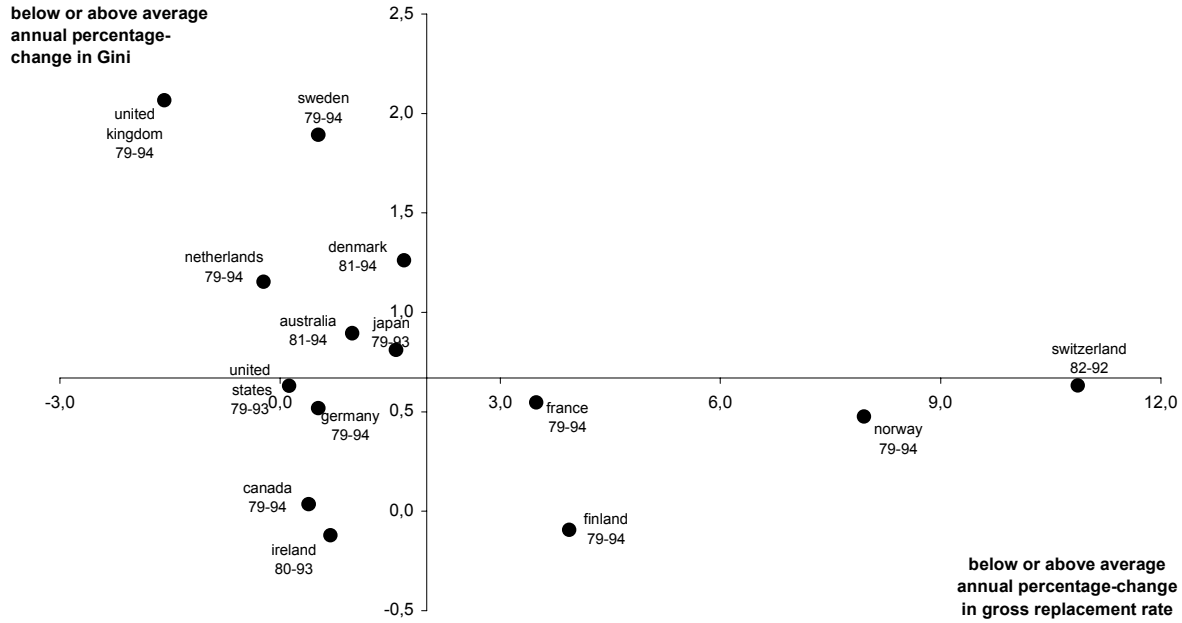
source: OECD (data provided by Glenn Cooper)

Seven countries show a decline in the replacement rates in the period 1985-1997: the Netherlands, Belgium, Spain, the United States, the United Kingdom, Germany and Sweden. All these countries are faced with an increasing income inequality as measured by the Gini coefficient (figure 1). This gives some support for our hypothesis.

In line with figure 2 we have plotted the average percentage change of the gross replacement rates and the average percentage change in the Gini coefficient for countries, where both data-items are available for the time interval indicated. Again, both axes cross at these averages: 0.67 for Gini and the replacement rose on average approximately 2 percentage-points per year among these countries. Figure 4 shows some indications that support our hypothesis. A negative relationship between the change in replacement rates and the change income

inequality can be found for the United Kingdom and the Netherlands. Other countries with a relatively sharp increase in income inequality (Sweden and Denmark) show relatively modest positive changes in the replacement rates. However, it is certainly wrong to think in terms of a world-wide explanation for the upward trend towards increased income inequality since the 1980's.

Figure 4 Changes in Gross Replacement Rates and Gini Index, around 1979 and 1994



note: Italy is excluded due to a strongly downward biased figure for the replacement rate in 1979

note and source Gini coefficient: see below figure 1; note and source gross replacement rates: see below figure 3; and own calculations

3.3 Relationship

The comparative data used in the analysis above are by no means perfect. They do not accurately indicate (the direction of) changes in social policy. The material presented is only descriptive, does not explain changes in the household income distribution, and therefor can not establish a *causal* relationship between changes in social policy and changes in the income distribution. Obviously, this straightforward analysis is much to simple to draw far-reaching conclusions.

Nevertheless, for some countries the data produce patterns for the period 1979-1994, which are consistent with our hypothesis; for others not though. Especially the UK and the Netherlands are interesting cases: these countries combine a relatively large increase in inequality with lower replacement rates and for the Netherlands also a non-positive change in the expenditure ratio. These are indications that support our hypothesis on a negative relationship between changes in income inequality and changes in social policies. A much more elaborate country-approach is needed, however, to be more conclusive, which we attempt for the case of the Netherlands.

4 A Budget Incidence Analysis for the Netherlands

4.1 Social Security Reform

The Dutch social protection system used to be characterized by generous open-ended benefits and lax administrative control. However, the expansion of the system caused severe and growing problems, starting in the 1970's. The number of benefit recipients and the financial burden of inactivity rose dramatically, as can be seen in table 4. Combined with a number of adverse macroeconomic shocks, a vicious cycle of increasing (non-wage) labor costs, erosion of employment and growing benefit dependency was set in motion. Reform of the social system was called for and was indeed initiated in the early 1980's. Actually, the change in policy stance occurred at a relatively early stage, compared to other European countries, because of the severity of the problems (Bovenberg, 2000).

Table 4 Key Figures on Social Security in the Netherlands

	1970	*1980*	*1990*	*1999*
Public expenditure on social security as % GDP [a]	17.2	26.4	25.8	20.7
Number of benefit recipients in millions	2.0	3.1	4.0	4.1
Same under age 65	0.7	1.4	2.0	1.9
Benefit recipients as % of employment	45	66	82	69
Real disposable income of welfare and old age benefits (index: 1973 = 100)		124	114	112

a Excluding supplementary labor pensions and housing subsidies, including public expenditure on health care

source: Ministry of Social Affairs (1995, p. 5) and (1999)

In the 1980's reform strategy was almost exclusively directed at cutting benefit levels. The (legally required) indexation of social benefits to wage development was suspended during almost the entire 1980's and partly in the first half of the 1990's. Actually, in many years no adjustment for inflation took place, that is benefits were frozen in nominal terms. Also, unemployment and disability benefits were cut from 80 percent to 70 percent of previous wages. As a consequence of these and other measures, real disposable income of many beneficiaries strongly fell since 1980, as shown in table 4.[5] The strategy was successful in containing expenditure growth. Public expenditure on social protection roughly stabilized in the 1980's, despite continuing growth of benefit volumes.

In the 1990's the reform strategy has been primarily directed at reducing the number of beneficiaries, through encouraging labor force participation, and discouraging and preventing benefit dependency. Important policy measures in this context have been the tightening of eligibility requirements in the unemployment and disability schemes, reform of the benefit administration, and the introduction of stronger financial incentives for employees and – especially – employers. The sickness benefit scheme has been privatized in the period 1994-

1996, which means that employers are now fully responsible for paying sickness benefits of 70 percent of wages during the first year of sick leave. This risk can be privately insured, which has actually occurred on a large scale. The disability scheme has also been changed fundamentally, through the introduction of experience rating. Also, the option was introduced for employers to private coverage of the disability risk during the first five years of disability. Radical changes have been made in the survivors scheme. Most people are now expected to privately insure against the risk of disease of relatives.

The reduction in statutory benefits have been offset mostly, because trade unions have negotiated supplementary benefits, especially sickness benefits and disability benefits. However, employees (and others) not taking part in these collective contracts do not profit from this.

The figures in table 4 show that these policies had some success in terms of a halting the rise in claimants under 65 years, but so far the rising trend has not been clearly reversed. A more positive development is that the ratio of benefit recipients to the number of employed is falling in recent years, as a consequence of rapid employment growth. Also, total expenditure on social security is declining in recent years. It goes without saying, however, that the reforms discussed will have a substantial impact on the income distribution. This will be analyzed in section 4.3.

4.2 Methodology

Social security schemes in the Netherlands, as in many countries, make low income earners better off after social policy than before. In general, income is transferred from high income earners to poor ones trough taxes and transfers. We analyze the effect of social policy on the distribution of income in line with the work of Musgrave et al. (1974). The distribution of primary or wage and salary income is compared with the distribution of income after tax and after social transfers. Summary statistics of income inequality before and after social policy are used to indicate the amount of distribution by social policy (*cf.* Ervik, 1998, and Duclos, 2000). Our measure of the redistributive impact of social security on inequality is straightforwardly based on a formula developed by Kakwani (1986) and Ringen (1991):

Redistribution by government = (primary income – disposable income) / (primary income)

This formula is used to estimate the reduction in inequality produced by social security, 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. The measures of both pre- and post-social security income are fare from ideal. At a conceptual level, no conceivable measure of pre-social security income could indicate what the income distribution would look like if social security did not exist.

The unit of analysis is an important issue in income distribution studies. Equivalence scales are widely used.[6] In our analysis for the Netherlands we use the results obtained by other researchers, where equivalence scale elasticity is around 0.5 (*cf*. most OECD-studies). Moreover, we analyze data for a long time period in which data-consistency for the adjustments

for household size and composition for market income is troublesome. For this reason we separately analyze the whole trajectory from original or market income to net disposable income with non-adjusted incomes to approach the impact of the tax and benefit system as part of the overall trend in income distribution.

We use the Mean Log Deviation (Theil index) as a summary measure of income inequality. It is generally agreed upon that this statistic is best suited to identify components of the change in inequality, that is for assessing the impact of taxes and benefits on inequality. The lower this statistic the more equal is the distribution. Mean Log Deviation can be meaningfully added and subtracted from another in a way that most other indices of inequality cannot. Of course, many other summary measures can be found in the literature and all imply some *a priori* value judgements about the distribution itself.

The important issue of tax/transfer shifting is totally ignored in analyses on budget incidence in such a classical framework. However, models that include all behavioral links are beyond the scope of existing empirical work (Gottschalk & Smeeding, 1998: 3). Therefore, researchers have restricted themselves largely to accounting exercises which decompose changes in overall inequality into a set of components. Despite the problem of tax shifting, analyses on statutory and budget incidence can be found for decades in literature on public finance.[7]

4.3 Results

We perform a budget incidence analysis for the period 1981-1997, because we measure the lowest level of inequality in the early 1980's (as most studies for the Netherlands do). Inequality especially rose during the 1980's. We analyze the trajectory from primary income to adjusted disposable income. Table 5 illustrates the main characteristics of the trend in inequality in the Netherlands.

As expected, adjusted disposable incomes are distributed much more equally than primary incomes. In the years shown, inequality was reduced by some 80 percent. By far the largest part of the overall reduction in inequality (about 60 percentage points) is due to social transfers. Note, however, that the redistributive effect of transfers has become smaller in the period under consideration. Taxes and social security contributions reduce inequality by some 7 to 10 percentage points. Finally, the use of equivalence scales reduces inequality by another 10 percentage points.

Table 5 Decomposition of Inequality in Household Income: Mean Log Deviation

	level			change	share in change
	1981	*1991*	*1997*	*1981-1997*	*1981-1997*
Primary income	0.532	0.540	0.545	+0.013	36%
effect transfers	-0.334	-0.324	-0.320	+0.014	39%
Gross income	0.198	0.216	0.225		
effect taxes	-0.054	-0.040	-0.045	+0.009	25%
Disposable income	0.144	0.176	0.180	+0.036	100%
adjustment for household size and composition	-0.048	-0.057	-0.056	-0.008	
Disposable income equivalence scale	0.096	0.119	0.124	+0.028	

source:
Data on the partial effects of transfers and taxes for 1981 are from Odink (1985); for 1991 from Jeurissen (1995) and for 1997 are own calculations. The partial effects of household size and composition are taken from Trimp (1993) and De Kleijn (1998). The data mentioned did not (always) correspond. For all data years we have postulated the same income concepts and used the same income units as Jeurissen (i.e. definitions from before a major tax reform in 1990) to arrive identical decomposition of income inequality for all data-years. Thereafter we re-weighted the partial effects (of taxes, transfers and household size and decomposition). Because of these transformations values in the table will differ from values as presented by Statistics Netherlands (and other studies).

Which are the main factors behind the changes in the income distribution? These are shown in the right part of table 5. In the period considered, the Mean Log Deviation for disposable income increased by 36 points, which is equivalent to a rise in overall inequality by 25 percent (29 percent when adjusted income is taken).
A major force behind the rise in overall inequality of disposable household income is a more unequal distribution of primary income (13 points or 36% of the total change). This is partly caused by the strong rise in the labor force participation of secondary earners (women). Another factor behind the increase in inequality is lower progressivity of the tax system (9 points or 25%).[8] But social transfers explain the largest part of the total increase in inequality (39%).[9]

We conclude that the change in social policies since the early 1980's has indeed made the income distribution less equal. Social transfers are a main force behind the rise in overall income inequality. It should be noted, however, that our results are only rough estimates (which depend rather strongly on the data used) given the limitations of the budget incidence method. Including the effect of behavioral responses would probably provide a different result. Transfers cuts have reduced replacement ratios which has stimulated labor force participation of benefit recipients.[10] This may have reduced income inequality. Moreover, one would analyze some effects in more detail (by scheme), e.g. the effect of shifting responsibility for social schemes from state to market institutions. Our analyses indicate that the reforms of the Dutch social system have made the Dutch income distribution more unequal *overall*. However, the partial effects of reforms of specific social schemes on inequality may have been dissimilar, depending on the altered conditions on benefits and eligibility (retrenchment or not) and the targeting of the pre- and post-reform social scheme (transfers mainly directed to lower or higher income groups).

5 Conclusions

In this paper, we investigated whether changes in the overall distribution of incomes in OECD countries can be attributed to social policy measures. Income inequality rose in 12 out of 17 OECD countries since the early 1980's. In some countries this rise was rather dramatic, especially in the United Kingdom and in Sweden and - to a lesser extent- in Denmark and the Netherlands. For some countries we find a relationship between changing welfare state policies (as measured by expenditure ratios and replacement rates) and changes in income inequality, but for others not. Especially the United Kingdom and the Netherlands combined and above average rise in inequality with a reduction in the generosity of the welfare system.

We performed a more elaborated country approach for the case of the Netherlands, which is interesting because this country combined a relative sharp increase in income inequality with a quite fundamental reform of the welfare state. We used the traditional budget incidence approach – despite some methodological problems – to study the combined effects of all taxes and transfers on the income (re)distribution. The distribution of primary or wage and salary income is compared with the distribution of income after tax and after social transfers. Summary statistics of income before and after social policy are used to indicate the redistributive effect of social policy. We find that inequality of disposable household income increased in the period 1981-1997 by roughly 25 percent as measured by the Mean Log Deviation. Almost 40 percent of the increase in inequality can be attributed to transfers. Our budget incidence analyses indicates that social security reforms have had an important impact on increasing income inequality in the Netherlands.

Annex A Comparative database: availability data around 1979 and 1994

COUNTRIES	*database 1* income inequality around 1995 LIS	*database 2* trend in income inequality around 1979-1995 LIS	*database 3* gross replacement rates OECD	*database 4* comparative welfare state data set LIS / OECD	*database 5* gross social transfers as % of GNP OECD Economic Outlook	qualified
1 Austria	n.a.	n.a.	x	x	x	no
2 Australia	x	x	x	x	x	yes
3 Belgium	x	n.a.	x	x	x	no
4 Canada	x	x	x	x	x	yes
5 Denmark	x	x	x	x	x	yes
6 Finland	x	x	x	x	x	yes
7 France	x	x	x	x	x	yes
8 Germany	x	x	x	x	x	yes
9 Greece	n.a.	n.a.	x	n.a.	x	no
10 Israel	x	x	n.a.	n.a.	n.a.	no
11 Ireland	x	x	x	x	x	yes
12 Italy	x	x	x	x	x	yes
13 Japan	x	x	x	x	x	yes
14 Luxembourg	x	n.a.	n.a.	x	n.a.	no
15 Netherlands	x	x	x	x	x	yes
16 New Zealand	x	n.a.	x	x	n.a.	no
17 Norway	x	x	x	x	x	yes
18 Portugal	n.a.	n.a.	x	n.a.	x	no
19 Spain	x	n.a.	x	n.a.	x	no
20 Sweden	x	x	x	x	x	yes
21 Switzerland	x	x	x	x	x	yes
22 Taiwan	x	x	n.a.	n.a.	n.a.	no
23 United Kingdom	x	x	x	x	x	yes
24 United States	x	x	x	x	x	yes
coverage	21	17	21	19	21	15

sources:

database 1: Gottschalk & Smeeding (2000, figure 1, p. 211)

database 2: Gottschalk & Smeeding (1998, figure 4, p. 56 and appendix tables A-2, p. 64)

database 3: OECD (data provided by Glenn Cooper, May 2000)

database 4: Comparative Welfare State Data Set LIS / OECD (internet http://lissy.ceps.lu/compwsp.htm)

database 5: Data Set OECD Economic Outlook (December 1998)

Trends in disposable income inequality Gini coefficient Index Gini (1979=100)

	year 1:	*year 2:*	*number of years*	*index*	*annual % change*
Australia	1981	1990	9	1.0730	0.81
Canada	1979	1995	16	1.0056	0.04
Denmark	1981	1990	9	1.1136	1.26
Finland	1979	1994	15	0.9858	-0.09
France	1979	1994	15	1.0820	0.55
Germany	1979	1995	16	1.0827	0.52
Ireland	1980	1994	14	0.9830	-0.12
Italy	1979	1995	16	0.9556	-0.28
Japan	1979	1993	14	1.1250	0.89
Netherlands	1979	1994	15	1.1731	1.15
Norway	1979	1995	16	1.0760	0.48
Sweden	1979	1994	15	1.2837	1.89
Switzerland	1982	1992	10	1.0632	0.63
United Kingdom	1979	1995	16	1.3306	2.07
United States	1979	1996	17	1.1071	0.63
average qualifiers	*1979.5*	*1993.7*	*14.2*	*1.0960*	*0.67*

source: Gottschalk & Smeeding (1998, figure 4, p. 56 and appendix tables A-2, p. 64); and own calculations

Social security transfers as percentage of GDP

	year 1:	*year 2:*	*variable year 1*	*variable year 2*	*index*	*change per year*
Australia	1981	1994	19.5	21.8	1.1179	0.18
Canada	1979	1994	9.6	15.2	1.5833	0.37
Denmark	1981	1994	17.8	22.0	1.2360	0.32
Finland	1979	1994	9.4	25.1	2.6702	1.05
France	1979	1994	18.6	23.3	1.2527	0.31
Germany	1979	1994	16.5	16.1	0.9758	-0.03
Ireland	1980	1993	12.6	15.4	1.2222	0.22
Italy	1979	1994	15.7	19.5	1.2420	0.25
Japan	1979	1993	9.8	12.1	1.2347	0.16
Netherlands	1979	1994	25.5	25.5	1.0000	0.00
Norway	1979	1991	15.5	20.5	1.3226	0.42
Sweden	1979	1994	17.6	24.9	1.4148	0.49
Switzerland	1982	1992	13.2	15.9	1.2045	0.27
United Kingdom	1979	1994	11.1	15.4	1.3874	0.29
United States	1979	1993	10.0	13.2	1.3200	0.23
average qualifiers	*1979.5*	*1993.5*	*14.83*	*19.06*	*1.2855*	*0.30*

source: Comparative Welfare State Data Set LIS / OECD (internet http://lissy.ceps.lu/compwsp.htm); and own calculations

Gross Replacement Rates

	year 1:	*year 2:*	*variable year 1*	*variable year 2*	*index*	*change per year*
Australia	1981	1995	22.1	27.0	1.2217	1.58
Canada	1979	1995	25.6	27.2	1.0625	0.39
Denmark	1981	1995	54.2	67.0	1.2362	1.69
Finland	1979	1995	26.5	43.2	1.6302	3.94
France	1979	1995	24.0	37.4	1.5583	3.49
Germany	1979	1995	25.1	27.2	1.0837	0.52
Ireland	1979	1993	28.1	30.8	1.0961	0.69
Italy	1979	1995	1.0	19.3	19.3000	114.38
Japan	1979	1993	8.7	9.9	1.1379	0.99
Netherlands	1979	1995	47.5	45.8	0.9642	-0.22
Norway	1979	1991	19.9	38.9	1.9548	7.96
Sweden	1979	1995	25.1	27.2	1.0837	0.52
Switzerland	1981	1993	12.8	29.5	2.3047	10.87
United Kingdom	1979	1995	23.8	17.8	0.7479	-1.58
United States	1979	1993	11.7	11.9	1.0171	0.12
average qualifiers	*1979.4*	*1994.2*	*23.74*	*30.67*	*1.2921*	*1.97*

source: OECD (data provided by Glenn Cooper, may 2000); and own calculations

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Notes

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1 Several studies try, however, to overcome the cross-country data-differences. See e.g. Dollar and Kraay (2000). The advanced econometric procedure used in their paper do not generate very precisely estimates for the adjustments needed (see the authors' note 8). Atkinson and Brandolini (1999) therefore criticized this types of adjustments and this type of large "secondary" datasets.

2 Presently there are a few countries for which panel data have been collected for ten years or more. Fully comparable data are available for only the United States, Germany, and the Netherlands and for only a few data years (1985-1989). Nevertheless, the approach by Headey et al. (1997) seems an attractive route in this kind of empirical research.

3 LIS is very useful for measuring differences in inequality at a point in time, but is less well suited for measuring changes in inequality over time across countries (Smeeding, 2000). Ideally data collection on income inequality is both consistent over time and across countries. However, such a project is daunting at this time (Atkinson et al. 2000: 1). In assessing trends across countries one should be aware of noisy data due to definitional differences in income, definitional differences in population coverage (immigrants), differences in survey collections practices, and differences in periodicity related to the business cycle (Smeeding, 2000: 214-219).

4 We do not review conceptual and measurement issues which should be addressed in any cross national comparison of survey based household income data (e.g. the definition of income, the unit of analysis, income sharing rules, the period of analysis, and income data quality and measurement errors), although some of this issues are addressed in section 4.

5 On the other hand, the increases of real disposable income of social security beneficiaries had been large in the 1970's.

6 An equivalence scale is a function that calculates adjusted income from income and a vector of household characteristics (cf. Figini, 1998). The general form of these equivalence scales is given by the following expression:

$$W = \frac{D}{S^{E}}$$

, where W is adjusted income, D is income (disposable income), S is size (number of persons in households) and E is equivalence elasticity. E varies between 0 and 1. The larger E, the smaller are the economies of scale assumed by the equivalence scales. Equivalence scales range from E=0 (no adjustment or full economics of scale) to E=1 (zero economies of scale). Between these extremes, the range of values used in different studies is very large, strongly affecting measured inequality. It has been shown that, within a wide range, choice of equivalence scales affects international comparisons of income inequality to a wide extend. Alternatively adjustment methods would definitely affect the ranking of countries, although the broad pattern remains the same (Atkinson et al. 1995: 52).

7 See for example Dalton (1936), Musgrave & Tun Thin (1948), Gillespie (1965), Kakwani (1977a, 1977b), Reynolds & Smolenskey (1977), Kiefer (1984) and Silber (1994), and more recent analyses based on the Luxembourg Income Study database (some of them are also listed in our references). See Smolensky et al. (1987) for a critical survey of efforts to measure budget incidence.

8 This is consistent with other research we did, see Caminada and Goudswaard (1996).

9 The growth in the number of one-person households since 1981 has made the non-adjusted distribution of disposable household income more unequal (*cf.* Trimp, 1999 and Sociaal en Cultureel Planbureau, 1998:109).

10 See e.g. Gelauff & Graafland (1994, chapter 10 on 'Cutting back the welfare state').