

**Social income transfers and poverty: a cross-country analysis for
OECD countries**

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Abstract

Poverty alleviation is an important policy objective in developed welfare states. This article analyses the association between social transfer policies and poverty. Several studies claim that high social effort goes along with low poverty levels across countries. But these studies follow a simple bivariate approach. Other factors such as demographic, economic and other conditions may also have an influence on poverty, which can affect the relationship between social spending and poverty in empirical studies. In this paper we empirically analyse the impact of social expenditure on poverty on a cross-country basis for the period 1985–2005, but, in addition to previous research, we control for demographic and macro-economic differences across countries.

We still find quite a strong negative relationship between the level of social expenditure and poverty. Ageing and unemployment rates have some explanatory power, but this does not seem to affect the association between social transfers and poverty. Thus, the multivariate approach we have chosen in this study confirms the results of earlier research.

Key words: poverty, welfare states, social transfers

Introduction

A sizeable proportion of the population lives in economic poverty in all industrial welfare states. According to the most common standards used in international poverty analyses, on average roughly one in ten households live in relative poverty in member countries of the Organisation for Economic Co-operation and Development (OECD) (Atkinson, Rainwater & Smeeding, 1995; Behrendt, 2002; OECD, 2008; Smeeding, 2005). The European Union (EU) especially encourages Member States to combat poverty as part of the Lisbon Agenda and the new strategy Europe 2020 (European Commission, 2010). In the EU people are said to be at risk of income poverty if their incomes are below 60 per cent of the median disposable income of households in their country, after adjusting for household size (equivalence scales). Based on this EU-agreed definition, the proportion of the population of the EU that is at risk of poverty in 2007 is 16 per cent. This means that around 78 million citizens are considered as being at risk of poverty; one fourth are children, one fifth are elderly, one fifth are working poor, 12 per cent are unemployed and one fourth are inactive people of working age (European Commission, 2009: 38). In the OECD, the poverty rate is often defined as the proportion of individuals with equivalised disposable income less than 50 per cent of the median income. On average some 10 per cent of the population in OECD countries falls below this threshold.

There are several ways to combat poverty, but income transfers seem to be an important instrument. A vast literature claims that high social effort goes along with low poverty levels across countries. The overall result of quantitative studies seems to be that there is strong negative correlation between poverty and social expenditures across European countries over the last 25 years (Behrendt, 2002). For example, the European Commission (2009: 27) states that across the EU, the countries with the lowest poverty rates are clearly those who spend most on social benefits. Smeeding claims in several papers (2006: 80; and 2005: 974) that higher levels of government spending as in Scandinavia and Northern Europe

and more careful targeting of government transfers on the poor as in Canada, Sweden and Finland produce lower poverty rates. Noland and Marx (2009: 329–330) stated that ‘there is a strong relationship at country level between the level of social spending and the incidence of poverty’ ... arguably one of the most robust findings in comparative poverty research’. The strong cross-country association between high welfare state effort and low poverty would suggest that increasing spending in currently low-effort countries would lead to a downward convergence in poverty outcomes.

Critics argue, however, that poverty is a multidimensional problem (Kakwani & Silber, 2007, 2008). And also, social expenditure ratios may not be good indicators for social policy efforts. One of the critics is that expenditure ratios do not capture the impact of the tax system and of private social arrangements (Adema, 2001; Esping-Andersen & Myles, 2009). Another problem, we will focus on in this article, is that social expenditure ratios will partly reflect demographic and economic conditions rather than social policy (Kühner, 2007). The relative share of children and elderly in the population will probably influence the relationship between social spending and poverty levels across countries. A higher share of children and elderly will make it more difficult to realise low poverty levels. The same holds for the number of unemployed. Existing studies that focus on the bivariate relationship between expenditure on social transfers and poverty may therefore produce biased results. An important question is whether the strong correlation between social transfers and poverty still holds, when other relevant variables are included in the analysis.

In this article we will investigate the familiar claim by performing a cross-country analysis of the relationship between poverty rates and social expenditure ratios. But in addition to existing studies, we control for the influence of demographic and macro-economic circumstances on poverty, using a multi linear regression model. We will perform several tests with the most recent data for the period 1985–2005.

The article is organised as follows. The next section presents the research design.

After a descriptive overview of poverty rates in highly-developed welfare states, the third section investigates the relationship between welfare state effort and poverty rates across countries. We address the question whether there is a correlation between the size of the welfare state as measured by social expenditure ratios and the incidence of poverty. The impact of demographic and macro-economic differences is examined in the fourth section. We developed and employed multiple linear regression models to analyse their (partial) contributions to poverty rates across countries. The final section is the conclusion.

Research design

The main question we address is whether there is a significant correlation between the size of the welfare state and the incidence of poverty. Are high social expenditure ratios associated with low poverty rates across countries? Our research design starts with the data to be used, because poverty rates and social expenditure ratios can be collected from several sources. Next, we discuss how to measure the association between social transfers and poverty rates in a cross-national perspective.

Measuring poverty incidence

For various reasons, we use poverty rates from different databases. The official EU-indicator for social cohesion is the at-risk-of-poverty rate after social transfers. This rate is defined as the share of persons with an equivalised disposable income below the risk-of-poverty threshold, which is set at 60 per cent of the national median equivalised disposable income. For this indicator, Eurostat data (ECHP/EU-SILC) are available for the period 1995–2007, but not for all member states. For a further comparison, we will use OECD poverty rates. The OECD poverty rate is usually defined as the proportion of individuals with equivalised disposable income less than 50 per cent of the median income, although other poverty lines are available as well. In this article, we use OECD poverty data from the mid-1980s until the year 2005, based on the OECD study (2008) entitled ‘Growing unequal? Income distribution

and poverty in OECD countries'. Finally, we use data from the Luxembourg Income Study (LIS). The LIS database contains income data files for 32 nations covering the period 1967 to 2005.

There are three common ways of setting the poverty line: an absolute standard, a relative standard, and a subjective standard. The U.S. poverty threshold is based on an absolute poverty standard (Orshansky-poverty), which remains fixed over time in real terms. The EU-agreed relative poverty line is set as a fixed percentage of the median income in each country, which may change over time if median income changes in real terms. The subjective poverty line is based on respondents' answers to questions regarding what they consider an adequate standard of living. Following international standards, we use the relative rather than the absolute or subjective approach in measuring income poverty. This means that we define those households that have an equivalent disposable income below a certain threshold representing the level of well-being of the population in a specific country as being poor. In our empirical analysis, we use several thresholds for a poverty line (40%, 50% and 60%).

It should be noted that there have been controversial arguments regarding the issues in the measurement of poverty. These arguments have their own merits and shortcomings, and there has been little professional consensus among researchers with regard to the theoretical superiority of a particular way of measuring poverty (Haveman, 2008). Moreover, the availability of data restricts the possibilities for conducting cross-national empirical research based on various poverty concepts. We refer to a vast literature on the sensitivity of measured results to the choice of income definitions, poverty lines, appropriate equivalence scales, and other elements that may affect results in comparative poverty research.¹

¹ Among others, see Atkinson (1987, 2002), Atkinson and Brandolini (2001), Atkinson et al. (1995), Authors 1&2 (2001), Förster (1993), Förster and Mira d'Ercole (2005), Förster and Pearson (2002), Gottschalk and Smeeding (1997, 2000), Hagenaars and De Vos (1987), Marcus and Danziger (2000), Smeeding (2005, 2006), OECD (2008) and (other) articles listed in our reference section using data from the Luxembourg Income Study. Recent comprehensive reviews on methodological assumptions underlying international levels and trends in

Measuring social effort

To investigate the relationship between social effort and poverty levels, we employ social expenditure ratios from the most recent OECD Social Expenditure Database (SOCX, 2008). The main social policy areas included are old age, widows and orphans, family, health and other social programmes. Both cash benefits and benefits in kind are included. In this article we will focus on gross public social expenditure only. In Authors 1,2 & 3 (2010), social expenditure ratios are corrected for the impact of private social arrangements and for the impact of the tax system.

As mentioned earlier, social expenditure indicators at the aggregate level have other limitations (Kühner, 2007): changes in expenditure ratios may not be caused by policy changes, but simply by the number of beneficiaries as a result of an ageing population or changes in unemployment levels due to cyclical factors. These factors may influence the linkage between spending on income transfers and poverty levels across countries. In our multivariate approach, we take these demographic and economic effects into account (see the section below on other effects, 1985–2005).

We include observations for OECD countries for which we have both measures of social spending and measures of income poverty.²

Tests on the linkages between social protection and poverty

We perform a cross-country analysis of the relationship between social expenditures and poverty rates. The material presented is only descriptive and does *not* explain poverty levels

inequality are found in Brandolini and Smeeding (2008). See Bourguignon, Pereira da Silva and Stern (2002) for a more elaborated article on the evaluation of poverty impact of economic policies.

² We excluded a few transitional economies. These countries started the process of designing their welfare states in the late 1980s and early 1990s in a mixture of ways (see e.g. Ferrani & Sjöberg, 2010) and are not really comparable to the developed welfare states.

and poverty structure. Such an analysis should ideally be based on a theory, which would have to address at least the following factors that may have an impact on the level of poverty: differences in labour markets that affect earnings of individual household members; demographic differences, such as the ageing of the population and growth of single parent households, which affect both family needs and labour market decisions; and differences across countries in tax and transfers policies that not only affect family income directly, but also may affect work and investment decisions (cf. Gottschalk & Smeeding, 2000: 263). It would require a fully-fledged model to assess the relative importance of all social, demographic and economic factors that have an impact on poverty. Moller, Huber, Stephens, Bradley and Nielsen (2003) use a multivariate regression model to explain poverty outcomes across welfare states based on LIS-data for the period 1970-1997. They incorporate many variables in their empirical analysis, although unfortunately social expenditures are not included (which is the focus of this study).

Another problem is that poverty is not a unidimensional phenomenon having only to do with income. Two recent seminal books edited by Kakwani and Silber (2007, 2008) present the many dimensions of poverty. The EU has also emphasised the multidimensional nature of deprivation, and has developed supplementary indicators of poverty based on social indicators and the broad concept of social exclusion (based on Atkinson, Cantillon, Marlier & Nolan, 2002). However, a multidimensional approach is a difficult route for empirical research (Haveman, 2008) and beyond the scope of this article.

Nevertheless, we do take into account that the relationship between social expenditure and poverty may be influenced by demographic and economic conditions. Variations in poverty levels will partly be driven by variations in ageing, unemployment and economic growth and these factors also put different constraints on income transfer systems. Therefore, we employ multiple regressions on the relationship between poverty rates and social expenditures and other commonsense control variables as the ratio of the elderly population

(for old age pensions), the unemployment rate (for the business cycle), and GDP per capita. This will be explained further in the fourth section.

Another important point to keep in mind is that we only analyse the impact of transfers on income poverty, while, as we mentioned before, several other strategies can be chosen to alleviate poverty. In fact, several EU member states are increasingly emphasising strategies to facilitate labour force participation of lower income groups (European Commission, 2008: 101). This may also be an effective strategy to tackle poverty.

Welfare state effort and the alleviation of poverty: an empirical analysis

Poverty rates: some descriptive statistics

In spite of differences in the measurement of poverty and the databases used, most studies have consistently found that there is a large difference in poverty rates among welfare states, depending on the poverty line applied (Authors 1&2, 2009). Reports on poverty profiles for EU and other OECD countries for the latest data year available from OECD (2008), LIS (2009), and Eurostat (2009) consistently show that Scandinavian and Benelux countries have the lowest poverty rates, followed by continental European countries. Anglo Saxon welfare states have relatively higher poverty rates. Among them, the level of poverty is highest in the United States. However, country clustering based on poverty rates is quite different from that of welfare state regimes. Among the countries with low poverty rates, we find representatives of the social democratic regime and the corporatist regime. Likewise, the nations with higher rates of poverty represent several regime types.

Table 1 reports poverty profiles for 28 industrialised countries for the latest data year available. In order to account for different intensities of poverty, three different poverty lines are applied. Households are deemed to live in ‘extreme poverty’ if their income remains below a poverty line of 40 per cent of median equivalent income; a poverty line of 50 per cent demarcates ‘severe poverty’, whereas households with an income between 40 and 50 per cent

of median equivalent income are considered as living in 'moderate poverty'. Households whose income exceeds the poverty line of 50 per cent, but remains below 60 per cent of median equivalent income are considered as living 'in poverty'.

Table 1 around here

A considerable share of the population lives in relative income poverty in all industrialised welfare states, yet with a large variation of poverty rates and structure across countries. All countries in this sample display poverty rates in a range of 10.0 to 23.9 per cent of the household population if the poverty line is set at 60 per cent of median equivalent household income. When large proportions of the population are clustered just around the threshold of 60 per cent, small changes in their income can lead to large changes in poverty. To examine the sensitivity of these results to alternative choices of the poverty line, Table 1 also shows poverty rates measured with lower thresholds. It turns out that, in all countries reviewed, a significant share of the population is clustered between the 50 and 60 per cent thresholds. This explains also why poverty statistics with a threshold of 50 per cent are much lower compared to the official EU-indicator (with a threshold of 60 per cent of median equivalised income).

Note that poverty indices from different sources alter the country-ranking in order to their level of poverty rates to some extent. For example, Denmark and Sweden rank on top of the list of countries with the lowest poverty when a poverty line of 50 percent is applied to the OECD-data, while LIS-data points at the Netherland, whereas Eurostat would rank Finland and the Netherlands on top of such a list. There are minor differences with regard to the methodology applied. The concept of disposable income is quasi-identical between the three data sources (OECD, 2008: 153). The equivalence scale used by Eurostat differs only slightly from the one used by the OECD and LIS, giving a somewhat higher weight to additional household members and distinguishing between adults and children. Poverty data

of OECD and LIS are highly correlated (around .93). Correlation coefficients for poverty rates between Eurostat and both OECD and LIS are lower and range from .75 to .94, depending on the poverty threshold applied. For most countries differences in poverty rates from OECD and from LIS do not exceed 2 percentage points, with exceptions for Germany, The Netherlands, and the United Kingdom. However, between Eurostat and both OECD and LIS, we find rather large differences in poverty rates exceeding 2 percentage points for Germany, Ireland, Netherlands, and the United Kingdom.

Linkages between poverty rates and social spending

As noted before, quantitative studies have found a strong negative relationship between poverty rates and the level of social expenditure over the last 25 years; this finding has now been well established in empirical studies.³ In other words, countries with a higher level of welfare expenditure are likely to have lower poverty rates.

Figure 1 illustrates that there is indeed a strong significant correlation between the level of social expenditure as a percentage of GDP in 2005 and poverty rates across countries around the years 2003–2005 ($p < .01$). Countries with higher social expenditure ratios in 2005 tend to have lower poverty rates than countries with lower expenditure ratios.

Figure 1 in about here

A sensitivity analysis with the LIS poverty data also produced the same result (not shown).

³ See Behrendt (2002), Brady (2004), Cantillon, Marx and Van den Bosch (2003), Förster (1993), Förster and Mira d'Ercole (2005), Förster and Pearson (2002), Kangas and Palme (2000), Kenworthy (1999), Kim (2000), Pestieau (2006: 16-17), Sainsbury and Morissens (2002), Scruggs and Allen (2005) and Smeeding (2005, 2006).

Taking into account other effects, 1985–2005

All OECD countries have experienced changes in their demographic profiles and the living arrangements of their populations over the last few decades. These changes have major implications not only for public budgets and other macro-economic aggregates, but also for the distribution of economic risks between individuals. This is because these changes alter the size of different demographic groups and the ways income is shared within households.

Changes in demographic structures and smaller household sizes have dampened the economic welfare of OECD populations (OECD, 2008: 57). The European Commission (2009: 25) noted that besides the generosity of the social protection system (in terms of both level and coverage), some of the factors that influence the level and development of social protection spending in the Member States are the demographic structure of the population, particularly in terms of age, the level of unemployment/non-employment, and the role of private social services. Indeed, at the aggregate level the social expenditure indicator has its limitations in empirical research. Changes in expenditure ratios may be caused by numerous factors, including the number of beneficiaries as a result of an ageing population or changes in unemployment levels due to cyclical factors. Obviously, changes in GDP as such can affect the size of expenditure ratios. It might be the case that expenditure ratios fall due to an increase in GDP, while expenditures are constant or increase at a smaller rate than GDP growth.⁴ For this reason, we ideally would control for demographic and cyclical factors. However, several methods to ‘standardise’ total social expenditures to control for changes in welfare demand (the number of beneficiaries) are criticised because of bias (Castles, 2002; Clayton & Pontusson, 1998).

General framework

To see whether demographic and other factors play a role, we include independent variables

⁴ See Adelantado & Calderón Cuevas (2006) for a discussion of such mechanisms.

in respective regression estimations measuring the ratio of the elderly population (for old age pensions), the unemployment rate of total labour force (for the business cycle), and GDP per capita US dollars current prices and PPS (as a proxy of rich countries). These seem to be the most relevant (control) variables to be examined in a cross country perspective (Cantillon et al., 2003; Nolan & Marx, 2009: 329; OECD, 2008: 147). We begin by specifying a reduced form equation to explore the relationship between social expenditures and poverty rates in equation (1):

$$\text{Poverty rates} = f \{ \text{Social expenditure, Proportion elderly, Unemployment rate, GDP per capita} \}. \quad (1)$$

Again, we regress level of poverty rates across countries (Y) with the level of gross social expenditure as percentage of GDP (X1), with and without all other variables mentioned (X2 ... Xn). Coefficients are estimated using a linear ordinary least square regression model of time-series cross-sectional data of the following form:

$$Y_{i,t} = A + \beta X1_{i,t} + \delta X2_{i,t} + \dots + \zeta Xn_{i,t} + u_{i,t} \quad (2)$$

The term on the left-hand side of equation (2) is the level of the poverty indicator of country i at time-period t . The level of social expenditure as percentage of GDP in country i at period t is given by $X1_{i,t}$, the percentage of population aged 65 and above $X2_{i,t}$, and so forth. $u_{i,t}$ is a disturbance term. If the coefficient β is negative, we say that social expenditures alleviate poverty across countries. A is the intercept. The higher the value of β , the larger will be the antipoverty effect of an additional point of GDP spent on social expenditure.

We are interested in the impact that social expenditure has on poverty rates; the remaining covariates are included as controls for various social, demographic, and economic institutions. For the empirical model comparable poverty rates are directly generated from

OECD (2008); a 50 per cent median income poverty line is applied. The dependent variables are from SOCX (2008) and our control variables come from OECD (2010). It should be noted that some control variables are reasonable proxies for factors that would almost automatically produce demand for social spending. One could argue that demographic variables – such as the per cent elderly – contaminate other covariates and should thus not be included in the empirical specifications below. Indeed, because the elderly receive a disproportionate share of the largest social expenditure categories – pensions and health care – there are spill over effects to the other covariates and to social spending. Nevertheless, we do include this variable in the regressions that follow.

Clearly, quite a few problems are involved in a single equation time-series cross-sectional model. For example, our framework addresses the effects of social spending on poverty rates, although the reverse causality begs our attention. For reasons explained below, we employ two approaches. We start with a straightforward approach: the relationship between poverty rates and social spending across countries is analysed for several moments in time (section 4.2). This approach allows us to test for (in)stability over the business cycle. However, the small N problem applies to this analysis. Outliers and other influential circumstances have to be dealt with, especially in empirical analyses comprising statistical techniques based on standard deviations, such as OLS-regressions. For this reason, we construct and employ a new model with a sampled set containing all data for 1985–2005 for all countries (section 4.3). Finally, we will employ a panel analysis to take into account spill over effects of social spending to several other covariates (section 4.4). All these approaches provide evidence that social spending appears to be a driving force as far as differences in poverty levels across countries is concerned, although other factors may have some effect too. Details on data and the descriptive summary statistics (e.g. mean values) for the variables we use in this paper are provided for in the Annex.

Straightforward approach for several moments in time

Our first estimation strategy is uncomplicated as we use an OLS approach to test the significance of the estimated coefficients, for around 1985, around 1995 and for around 2005. The estimations are presented in Table 2. Social spending appears to be important as far as differences in poverty levels across countries are concerned, although the proportion elderly (around 1995) and unemployment rates (around 1985 and around 2005) seem to have some effect too; compare columns 1 and 2.

Table 2 around here

Separately, several variables are significantly correlated with poverty levels across countries for all data years (1985, 1995, and 2005), with the exceptions of GDP per capita and the unemployment rate. Across countries unemployment is not well correlated with either market income poverty or disposable income poverty (Nolan & Marx, 2009: 328 and Smeeding, 2005: 973), although we find significant coefficients (for 1985 and 2005) if social expenditure is taken into account as well. Another example, we still find a pretty good fit for the social expenditure ratio in case a demographic control variable is taken into account, but the effect of the percentage of population aged 65 and above does *not* significantly differ from 0 (with the exception for the mid-1980s). This means that developments in the ageing of the population do not add that much to an explanation for differences in poverty outcomes across countries, although multicollinearity is involved in our multiple regression. The same holds for GDP per capita, and for several other insignificant control proxies we have applied (e.g. migration as percentage of total population as measured by the UN International Migration Report 2006; not shown). For the mid-1980s and the mid-2000s, we find a significant coefficient for the unemployment rate variable, but this result is not repeated for the mid-1990s, probably due to both lower unemployment rates and more generous benefits at that stage. All other results are rather steady over time (1985, 1995 and 2005).

Sampled data set model approach

In line with the work of Swabish, Smeeding and Osberg (2006), we have constructed a sample with 96 different sets of observations for our 22 countries, using data from OECD (2008, on poverty rates), SOCX (2008, on social expenditures), and OECD.StatsExtracts (2010, on control variables). A total of 20 countries enter with four or five observations (around 1985, around 1990, around 1995, around 2000 and around 2005), and 2 countries enter with less observations (Australia and Switzerland). This sampled data set model improves the degree of freedom substantially ($N*T=96$).

Following the single equation format outlined in the previous section, we present Pearson correlation coefficients for poverty rates with a set of several social expenditures ratios, and on a set of demographic and macroeconomic covariates; see Table 3. The results provide clear evidence: social spending does seem to matter as far as differences in poverty levels across countries is concerned, while the ageing of the population, unemployment rates and GDP per capita may have minor effects.

Table 3 around here

The correlation coefficient of the unemployment rate is statistically insignificant, meaning that unemployment is not well correlated with either market income poverty or disposable income poverty (cf. Smeeding, 2005: 973). Also our other control variable – GDP per capita as a proxy of rich countries – does not affect poverty levels in OECD countries.

Note that the correlation coefficient for the proportion of elderly does not statistically differ from zero. This may come as a surprise, because it was expected that the ageing of the population increases poverty. Even in Europe minimum safety nets are rarely sufficient to protect people from poverty; only a few countries provide workless households with a

minimum income and related (i.e. housing) benefits that are sufficient to lift them close to or above the poverty line. However, this result fits in with empirical findings by others. Osberg (2000), for example, showed that the fraction of elderly households in a nation does not affect income distribution comparisons across countries largely, because the elderly have levels of inequality that are similar to those of the non-elderly. A comprehensive study of demographic effects was carried out by Rainwater and Smeeding (2003). They took the demography of each nation (relative numbers of single parents, elders, families with children, childless adults, etc.) and its income package (taxes and benefits) and simulated the USA demography with the packages of each nation. The effects of demography were very small – the effects of the income package accounted for over 90 per cent of the differences across nations.

It should however be noted that establishing causation is problematic in such a single equation time-series cross-sectional model. One could argue that causation plausibly runs from the right hand side and thus a higher level of poverty rates may well produce greater needs for social expenditures. Moreover, analysis of multiple Pearson correlations illustrates that several independent variables are highly correlated, especially social expenditure ratios with the proportion of elderly among total population (not shown). Since the elderly receive a large share of the largest social expenditure categories – social retirement and health care – there are spill over effects to the other covariates of social spending. To tackle this problem, we will employ a method of ordinary least squares with panel-corrected standard errors and a first-order autocorrelation correction.

Panel analysis

So far, we analysed the data in different parts. To get a better understanding of the relationship between poverty and gross social expenditure, while taking into account the demographic features and economic cycles, the study uses a pooled time series cross-section analysis of the 22 countries and the five points in time. We analyse the data using Beck and

Katz's (1995) method of ordinary least squares with panel-corrected standard errors (OLS-PCSE) and a first-order autocorrelation correction (AR1).

The results of the pooled time series analysis are reported in Table 4. The model includes country and period dummies. Three specifications are shown. The results are quite consistent and robust. With regards to the effects of ageing, unemployment, and GDP per capita, the following can be concluded. Firstly, the panel analysis again shows that social expenditure is negatively related to poverty after controlling for other factors. As before, the coefficient of the social expenditure variable is significant at the 0.01 level (in model a) or at the 0.05 level (models b and c).⁵ Secondly, poverty levels are not significantly related to ageing, unemployment rates and GDP per capita (with the exception of model b, in which the unemployment variable is significant at the 0.05 level). This confirms the results of our sampled data set model.

Table 4 around here

Conclusion

Poverty alleviation is an important policy objective in developed welfare states. This article analyses the association between social transfer policies and poverty. A vast literature claims that high social effort goes along with low poverty levels across countries. But existing studies follow a simple bivariate approach, which may produce biased results. Demographic and economic conditions may also have an impact on poverty levels. The question addressed in this article is whether the rather strong negative correlation between expenditure on social transfers and poverty still holds when other relevant variables are included in the analysis. We analysed the impact of social expenditure on poverty for OECD-countries, but in addition to previous research, we controlled for demographic and macro-economic differences across countries. To that end, we developed and employed multiple linear regression models and

⁵ The coefficient of the social expenditure variable is lower than reported in Table 2. This can be explained by the technique used (first order auto-correlation correction).

performed several tests with the most recent data (LIS, OECD, and SOCX) for the period 1985–2005.

We find quite a strong negative relationship between the level of social expenditure and poverty among 22 OECD countries. Sensitivity analysis shows more or less the same results in case various poverty lines and databases are applied in the analysis. The ageing of the population, unemployment rates and GDP per capita have some explanatory power, but social spending is *the* driving force as far as differences in poverty levels across countries are concerned. Thus, based on broad data material regarding to the number of countries and time-period, the multivariate approach confirms the results of earlier studies, which were based on a bivariate approach.

Poverty certainly has many driving forces and many dimensions. And several strategies can be followed to tackle poverty. But our results suggest that public income transfers indeed seem to be an effective policy instrument in alleviating poverty.

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Table 1. Per cent poverty for total population in 22 countries based on data of OECD, LIS, and Eurostat, latest available year.

| | OECD (2003-2005) | | | LIS (around 2001) | | | EUROSTAT (2007) | | |
|----------------|------------------|-------|-------|-------------------|-------|-------|-----------------|-------|-------|
| | PL 40 | PL 50 | PL 60 | PL 40 | PL 50 | PL 60 | PL 40 | PL 50 | PL 60 |
| Australia | 4.6 | 12.4 | 20.3 | 5.4 | 12.2 | 20.4 | | | |
| Austria | 3.4 | 6.6 | 13.4 | 3.6 | 7.7 | 13.4 | 3 | 6 | 12 |
| Belgium | 3.1 | 8.8 | 16.2 | 3.7 | 8.1 | 16.1 | 4 | 8 | 15 |
| Canada | 7.0 | 12.0 | 19.0 | 7.7 | 13.0 | 19.9 | | | |
| Denmark | 2.1 | 5.3 | 12.3 | 2.3 | 5.6 | 13.2 | 3 | 6 | 12 |
| Finland | 2.8 | 7.3 | 14.8 | 2.5 | 6.5 | 13.5 | 2 | 5 | 13 |
| France | 2.8 | 7.1 | 14.1 | 2.8 | 7.3 | 13.7 | 3 | 7 | 13 |
| Germany | 6.3 | 11.0 | 17.2 | 4.6 | 8.4 | 13.4 | 5 | 10 | 15 |
| Greece | 7.0 | 12.6 | 19.6 | 8.6 | 14.3 | 21.4 | 8 | 13 | 20 |
| Ireland | 7.0 | 14.8 | 23.3 | 7.4 | 16.2 | 22.5 | 4 | 9 | 18 |
| Italy | 6.6 | 11.4 | 19.7 | 7.4 | 12.8 | 20.0 | 7 | 12 | 20 |
| Japan | 9.5 | 14.9 | 20.8 | | | | | | |
| Luxembourg | 3.1 | 8.1 | 13.2 | 3.2 | 8.8 | 13.7 | 2 | 7 | 14 |
| Netherlands | 4.0 | 7.7 | 14.4 | 2.5 | 4.9 | 11.1 | 3 | 5 | 10 |
| New Zealand | | 10.8 | 22.7 | | | | | | |
| Norway | 3.5 | 6.8 | 12.4 | 3.7 | 7.1 | 12.8 | 5 | 8 | 12 |
| Portugal | 7.4 | 12.9 | 20.7 | | | | 6 | 12 | 18 |
| Spain | 8.1 | 14.1 | 21.0 | 7.6 | 14.2 | 20.8 | 7 | 13 | 20 |
| Sweden | 2.5 | 5.3 | 11.4 | 2.6 | 5.6 | 12.0 | 4 | 6 | 11 |
| Switzerland | 4.8 | 8.7 | 15.2 | 3.5 | 7.6 | 14.4 | | | |
| United Kingdom | 3.7 | 8.3 | 15.5 | 5.4 | 11.6 | 19.2 | 6 | 12 | 19 |
| United States | 11.4 | 17.1 | 23.9 | 11.4 | 17.3 | 24.1 | | | |
| Mean | 5.3 | 10.2 | 17.3 | 5.0 | 10.0 | 16.6 | 4.5 | 8.7 | 15.1 |
| N (= 22) | 21 | 22 | 22 | 19 | 19 | 19 | 16 | 16 | 16 |

Note: Poverty rates are measured as the proportion of individuals with equivalised disposable income less than 40, 50, and 60 per cent of the median income of the entire population.

Sources: OECD (2008), LIS (2009) and Eurostat: ECHP/EU-SILC (2009).

Table 2. Regression analysis for OECD poverty rates (PL 50) and social expenditure, taken into account demographic and cyclical effects

| | Mid-1980s | | Mid-1990s | | Mid-2000s | |
|-----------------------------|----------------------|--------------------|----------------------|--------------------|----------------------|--------------------|
| | (1a) | (2a) | (1b) | (2b) | (1c) | (2c) |
| Social expenditure | -0.585** (-3.386) | | -0.699** (-7.223) | | -0.830** (-6.877) | |
| Population over 65 year (%) | 0.111 (0.249) | -0.743 (-1.580) | 0.802* (2.726) | -0.385 (-0.786) | 0.299 (1.329) | -0.302 (-0.771) |
| Unemployment rate | 0.502* (2.865) | 0.288 (1.372) | 0.146 (1.339) | -0.043 (-0.201) | 0.615* (2.435) | 0.092 (0.202) |
| GDP per capita, PPS | 0.375 (1.224) | 0.040 (0.107) | -0.083 (-0.872) | -0.231 (-1.237) | 0.002 (0.042) | -0.078 (-0.826) |
| Intercept | 10.256 (1.527) | 15.758 (1.880) | 13.945** (3.223) | 20.556* (2.425) | 20.104** (5.284) | 16.974* (2.378) |
| Adj R ² | 0.494 | 0.162 | 0.744 | -0.029 | 0.693 | -0.095 |
| F-statistic | 5.629** | 2.228 | 15.531** | 0.813 | 12.876** | 0.393 |

Notes:

- Dependent variable: OECD poverty rate (poverty line 50 percent of median income).
- N = 22. OLS-regression; standardized regression coefficients are reported; t-statistics in parentheses.
- ** Significant at the 0.01 level; * significant at the 0.05 level. Adj R² refers to the adjusted correlation coefficient.
- Selected countries: Australia (missing value for 1985), Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland (missing values for 1985 and 1995), the United Kingdom and the United States.

Sources: OECD (2008), SOCX (2008), OECD.StatsExtracts (2010); and own calculations.

Table 3. Sampled data set model: Pearson Correlation Tests of OECD poverty rates (PL 50) and social expenditure, taken into account demographic and cyclical effects.

| <i>All 22 countries</i> | |
|-------------------------------------|----------|
| Social expenditure | -0.690** |
| Population over 65 (%) | -0.153 |
| Unemployment % of total labor force | 0.177 |
| GDP per capita US dollars, PPS | -0.051 |
| N*T | 96 |

Notes:

- Dependent variable: OECD poverty rate (poverty line 50% of median income).
- Pearson Correlation Coefficient are reported. ** Significant at the 0.01 level; * significant at the 0.05 level.
- N*T = 96. Sampled dataset with observations around 1985 (N=20), around 1990 (N=11), around 1995 (N=21), around 2000 (N=22), and around 2005 (N=22).
- Selected countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the United States.

Sources: OECD (2008), SOCX (2008), OECD.StatsExtracts (2010); and own calculations.

Table 4. OLS-PCSE model of OECD poverty rates (PL 50).

| | (a) | (b) | (c) |
|--|---------------------|----------------------|----------------------|
| Social expenditure | -0.248* (-2.750) | -0.366** (-4.860) | -0.271** (-3.040) |
| Population over 65 (%) | 0.244 (1.450) | 0.203 (1.340) | 0.244 (1.480) |
| Unemployment % of total civilian labor force | 0.092 (1.320) | 0.130* (2.050) | 0.077 (1.120) |
| GDP per capita US dollars, PPS | 0.047 (0.030) | 0.005 (0.130) | 0.035 (0.780) |
| Intercept | 11.317** (3.357) | 14.533* (5.250) | 11.825** (3.680) |
| R ² | 0.904 | 0.459 | 0.468 |
| Wald | 660.510** | 34.42** | 6.560** |
| N*T | 96 | 96 | 96 |

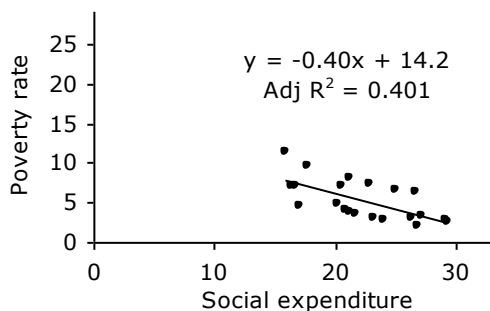
Notes:

- Dependent variable: OECD poverty rate (poverty line 50% of median income).
- Standardized Coefficients are reported. Standard Errors between brackets. ** Significant at the 0.01 level; * significant at the 0.05 level.
- N*T = 96. Sampled dataset with observations around 1985 (N=20), around 1990 (N=11), around 1995 (N=21), around 2000 (N=22), and around 2005 (N=22).
- Model (a): Country and period dummies included (autocorrelation corrected).
- Model (b): Period dummies included.
- Model (c): Country and period dummies included (non corrected estimations).
- Selected countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the United States.

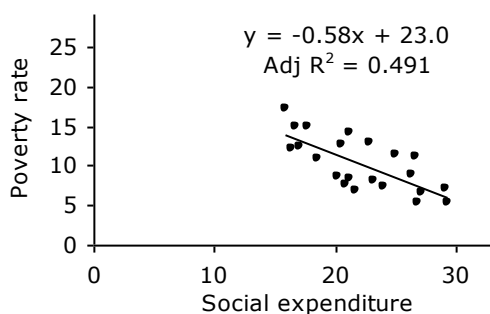
Sources: OECD (2008), SOCX (2008), OECD.StatsExtracts (2010); and own calculations.

Figure 1. Social expenditure and OECD poverty rates across 22 countries, around 2003–2005.

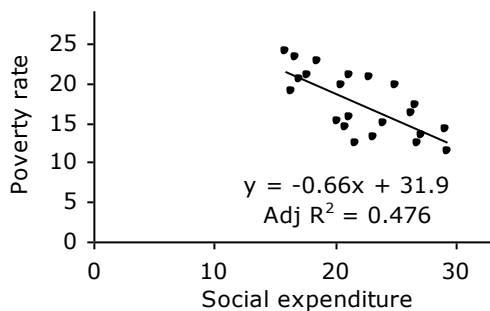
40 percent poverty line



50 percent poverty line



60 percent poverty line



Countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and United States.

Sources: OECD (2008), SOCX (2008), and own calculations.

Appendix:

Table A1. Data and descriptive statistics.

| | Poverty Rates (OECD, PL 50) | | | | | Population over 65 as % of population | | | | |
|--------------------|-----------------------------|-------|-------------|-------------|------------|---------------------------------------|-------|-------|-------|-------|
| | 1985 | 1990 | 1995 | 2000 | 2005 | 1985 | 1990 | 1995 | 2000 | 2005 |
| Australia | | | 11.4 | 12.2 | 12.4 | 10.3 | 11.1 | 11.9 | 12.4 | 12.9 |
| Austria | 6.1 | | 7.4 | 9.3 | 6.6 | 14.3 | 15.1 | 15.1 | 15.5 | 16.2 |
| Belgium | 14.6 | | <u>10.8</u> | 10.4 | 8.8 | 13.8 | 14.9 | 15.9 | 16.8 | 17.2 |
| Canada | 10.7 | | <u>9.5</u> | 10.3 | 12.0 | 10.2 | 11.3 | 12.0 | 12.6 | 13.1 |
| Denmark | 6.0 | 6.2 | 4.7 | 5.1 | 5.3 | 15.1 | 15.6 | 15.2 | 14.8 | 15.1 |
| Finland | 5.1 | | 4.9 | 6.4 | 7.3 | 12.5 | 13.4 | 14.2 | 14.9 | 15.9 |
| France | 8.3 | 7.2 | 7.5 | 7.2 | <u>7.1</u> | 12.9 | 14.1 | 15.2 | 16.1 | 16.5 |
| Germany | 6.3 | 6.6 | <u>8.5</u> | 9.2 | 11.0 | 14.8 | 15.3 | 16.1 | 17.2 | 19.2 |
| Greece | 13.4 | | 13.9 | 13.5 | 12.6 | 13.4 | 14.0 | 15.1 | 16.6 | 18.3 |
| Ireland | 10.6 | | 11.0 | 15.4 | 14.8 | 10.8 | 11.4 | 11.4 | 11.2 | 11.1 |
| Italy | 10.3 | 10.7 | <u>14.2</u> | 11.8 | 11.4 | 12.9 | 14.6 | 16.2 | 17.7 | 19.3 |
| Japan | 12.0 | | <u>13.7</u> | 15.3 | 14.9 | 10.3 | 12.1 | 14.6 | 17.4 | 20.2 |
| Luxembourg | 5.4 | | 5.5 | 5.5 | 8.1 | 13.2 | 13.4 | 14.1 | 14.1 | 14.1 |
| Netherlands | 3.5 | 5.9 | 6.3 | <u>6.8</u> | 7.7 | 12.1 | 12.8 | 13.2 | 13.6 | 14.2 |
| New Zealand | 6.2 | 9.0 | 8.4 | 9.8 | 10.8 | 10.3 | 11.1 | 11.5 | 11.8 | 12.0 |
| Norway | 6.4 | | 7.1 | 6.3 | 6.8 | 15.7 | 16.3 | 15.9 | 15.2 | 14.7 |
| Portugal | 13.0 | 13.8 | 14.6 | 13.7 | 12.9 | 12.0 | 13.6 | 14.8 | 16.4 | 17.0 |
| Spain | 14.1 | 10.7 | <u>11.8</u> | 13.7 | 14.1 | 12.0 | 13.6 | 15.3 | 16.8 | 16.7 |
| Sweden | 3.3 | 3.6 | <u>3.7</u> | 5.3 | 5.3 | 17.2 | 17.8 | 17.5 | 17.3 | 17.3 |
| Switzerland | | | | 7.5 | 8.7 | 14.6 | 15.0 | 15.2 | 15.8 | 15.9 |
| United Kingdom | 6.2 | 12.7 | 10.9 | <u>10.2</u> | 8.3 | 15.2 | 15.7 | 15.8 | 15.8 | 16.0 |
| United States | 17.9 | 18.1 | 16.7 | 17.1 | 17.1 | 11.9 | 12.5 | 12.7 | 12.4 | 12.4 |
| Mean | 8.97 | 9.50 | 9.64 | 10.09 | 10.18 | 12.98 | 13.86 | 14.50 | 15.10 | 15.70 |
| Standard Error | 0.93 | 1.27 | 0.80 | 0.77 | 0.72 | 0.42 | 0.39 | 0.36 | 0.43 | 0.52 |
| Median | 7.35 | 9.00 | 9.50 | 10.00 | 9.80 | 12.91 | 13.82 | 15.13 | 15.64 | 15.97 |
| Standard Deviation | 4.15 | 4.23 | 3.69 | 3.61 | 3.37 | 1.97 | 1.82 | 1.69 | 2.00 | 2.46 |
| Sample Variance | 17.26 | 17.86 | 13.59 | 13.05 | 11.37 | 3.88 | 3.31 | 2.84 | 3.98 | 6.06 |
| Kurtosis | -0.72 | 0.17 | -0.94 | -1.00 | -0.89 | -0.58 | -0.47 | -0.55 | -0.89 | -0.63 |
| Skewness | 0.53 | 0.69 | 0.16 | 0.30 | 0.33 | 0.26 | 0.10 | -0.57 | -0.59 | -0.08 |
| Range | 14.61 | 14.50 | 13.00 | 12.00 | 11.80 | 6.99 | 6.70 | 6.06 | 6.50 | 9.06 |
| Minimum | 3.33 | 3.60 | 3.70 | 5.10 | 5.30 | 10.25 | 11.10 | 11.41 | 11.21 | 11.10 |
| Maximum | 17.95 | 18.10 | 16.70 | 17.10 | 17.10 | 17.23 | 17.79 | 17.47 | 17.71 | 20.16 |
| Sum | 179 | 104 | 203 | 222 | 224 | 286 | 305 | 319 | 332 | 345 |
| N = | 20 | 11 | 21 | 22 | 22 | 22 | 22 | 22 | 22 | 22 |

Sources: OECD (2008), SOCX (2008), OECD.StatsExtracts (2010); and own calculations.

Appendix:

Table A2. Data and descriptive statistics.

| | Unemployment rate (% of civilian labor force) | | | | | GDP per capita US dollars, current prices and PPS | | | | |
|--------------------|--|-------|-------|-------|-------|---|---------|---------|---------|---------|
| | 1985 | 1990 | 1995 | 2000 | 2005 | 1985 | 1990 | 1995 | 2000 | 2005 |
| Australia | 8.3 | 6.9 | 8.5 | 6.3 | 5.0 | 13,958 | 17,225 | 21,541 | 27,266 | 33,963 |
| Austria | 3.6 | 3.2 | 3.7 | 3.6 | 5.2 | 14,597 | 19,457 | 23,502 | 28,773 | 33,409 |
| Belgium | 12.6 | 8.9 | 13.0 | 7.0 | 8.4 | 13,831 | 18,687 | 22,450 | 27,628 | 32,141 |
| Canada | 10.6 | 8.1 | 9.5 | 6.8 | 6.8 | 15,504 | 19,569 | 22,737 | 28,485 | 35,106 |
| Denmark | 7.3 | 8.4 | 7.1 | 4.6 | 5.0 | 14,742 | 18,462 | 22,993 | 28,826 | 33,196 |
| Finland | 5.0 | 3.2 | 15.4 | 9.8 | 8.4 | 13,017 | 17,699 | 18,773 | 25,671 | 30,644 |
| France | 9.5 | 8.3 | 10.4 | 8.6 | 8.9 | 12,885 | 17,277 | 20,222 | 25,276 | 29,692 |
| Germany | 7.3 | 4.8 | 8.2 | 7.8 | 11.2 | 13,611 | 18,389 | 22,493 | 25,952 | 31,366 |
| Greece | 7.8 | 7.0 | 10.0 | 11.2 | 9.6 | 10,304 | 12,574 | 14,679 | 18,412 | 24,641 |
| Ireland | 16.7 | 13.0 | 12.2 | 4.3 | 4.3 | 8,709 | 12,991 | 17,908 | 28,680 | 38,675 |
| Italy | 10.4 | 11.5 | 11.7 | 10.7 | 7.8 | 12,877 | 17,595 | 21,112 | 25,597 | 28,144 |
| Japan | 2.6 | 2.1 | 3.2 | 4.7 | 4.4 | 12,934 | 18,786 | 22,512 | 25,608 | 30,312 |
| Luxembourg | 1.6 | 1.1 | 2.3 | 1.9 | 3.1 | 18,823 | 30,408 | 38,842 | 53,383 | 68,313 |
| Netherlands | 11.1 | 7.6 | 7.1 | 2.7 | 4.7 | 13,145 | 17,630 | 21,552 | 29,409 | 35,111 |
| New Zealand | 4.2 | 7.8 | 6.3 | 6.0 | 3.7 | 12,483 | 13,822 | 17,143 | 20,706 | 24,626 |
| Norway | 2.6 | 5.3 | 5.0 | 3.5 | 4.6 | 14,303 | 17,887 | 23,597 | 36,130 | 47,319 |
| Portugal | 8.7 | 4.6 | 7.2 | 4.0 | 7.7 | 6,828 | 10,678 | 13,071 | 17,089 | 20,656 |
| Spain | 21.6 | 16.3 | 23.0 | 13.9 | 9.2 | 9,175 | 13,269 | 15,989 | 21,323 | 27,377 |
| Sweden | 3.1 | 1.8 | 9.2 | 5.9 | 7.8 | 14,876 | 19,319 | 21,867 | 27,761 | 32,298 |
| Switzerland | 0.9 | 0.5 | 3.4 | 2.6 | 4.3 | 18,774 | 24,448 | 26,622 | 31,622 | 35,478 |
| United Kingdom | 11.3 | 6.9 | 8.6 | 5.5 | 4.7 | 11,954 | 16,322 | 19,716 | 26,074 | 32,724 |
| United States | 7.2 | 5.6 | 5.6 | 4.0 | 5.1 | 17,546 | 23,003 | 27,606 | 35,051 | 42,494 |
| Mean | 7.91 | 6.50 | 8.66 | 6.15 | 6.36 | 13,403 | 17,977 | 21,678 | 27,942 | 33,986 |
| Standard Error | 1.08 | 0.83 | 0.99 | 0.67 | 0.48 | 630 | 908 | 1,112 | 1,556 | 2,052 |
| Median | 7.58 | 6.89 | 8.35 | 5.68 | 5.12 | 13,378 | 17,793 | 21,710 | 27,447 | 32,511 |
| Standard Deviation | 5.05 | 3.90 | 4.66 | 3.12 | 2.27 | 2,954 | 4,258 | 5,215 | 7,299 | 9,622 |
| Sample Variance | 25.55 | 15.24 | 21.75 | 9.74 | 5.17 | 9.E+06 | 2.E+07 | 3.E+07 | 5.E+07 | 9.E+07 |
| Kurtosis | 1.25 | 0.64 | 3.07 | 0.37 | -0.92 | 0.51 | 2.58 | 4.95 | 6.64 | 7.44 |
| Skewness | 0.93 | 0.64 | 1.35 | 0.91 | 0.50 | -0.19 | 1.00 | 1.50 | 1.96 | 2.28 |
| Range | 20.72 | 15.85 | 20.65 | 12.06 | 8.13 | 11,994 | 19,730 | 25,771 | 36,294 | 47,657 |
| Minimum | 0.89 | 0.47 | 2.32 | 1.86 | 3.10 | 6,828 | 10,678 | 13,071 | 17,089 | 20,656 |
| Maximum | 21.60 | 16.32 | 22.96 | 13.92 | 11.22 | 18,823 | 30,408 | 38,842 | 53,383 | 68,313 |
| Sum | 174 | 143 | 191 | 135 | 140 | 294,874 | 395,496 | 476,925 | 614,723 | 747,683 |
| N = | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 |

Sources: OECD (2008), SOCX (2008), OECD.StatsExtracts (2010); and own calculations.