

ANNEX: Data and Sensitivity Analysis

Title: The relationship between alternative measures of social spending and poverty rates

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DATA

Our research hypothesis is that the level of public social expenditure and poverty across countries are negatively correlated, while private social expenditure may have a non-negative anti-poverty effect. To analyze this hypothesis we include countries in our data set on the basis of data availability on both poverty measures and public and private social expenditure measures (gross and/or net). We computed correlation test for countries where all data items are available. For most, but not all, countries both data of gross and net social expenditure are available from SOCX (2011), so we put figures for gross and net social expenditures in separate data sets. Moreover, we used data on poverty measures from both the Luxembourg Income study (LIS) and the OECD-study Growing Unequal (2008). As a result we have performed regression analyses with several data sets.

LIS Key Figures on Poverty

- LIS 36 countries
- Data year: most recent data year available (Wave V around 2000 and Wave VI around 2004)
- Poverty rates at PL 40, at PL 50, and at PL 60
- Source: Luxembourg Income Study (LIS, 2011)
- URL: <http://www.lisproject.org>
- Download: last accessed 14 October 2011

OECD Poverty Rates

- OECD-30 and EU-15
- Data years: 2003, 2004, and 2005
- Poverty rates at PL 40, at PL 50, and at PL 60
- OECD-28, and EU-15
- Source: OECD (2008)
- URL: www.oecd.org/els/social/inequality/GU
- Download: last accessed 14 October 2011

Gross public and private social expenditure (% GDP)

- OECD-30 and EU-15
- Data year: 2007
- Breakdown total expenditures: Old age, Survivors, Family, Health, Other social policy areas
- Source: OECD Social Expenditure Database (SOCX, 2011)
- URL: www.oecd.org/els/social/expenditure
- Download: last accessed 14 October 2011

Gross and net social expenditure (% GDP)

- OECD-25 and EU-14
- Data year: 2007
- Gross public social expenditure
- Net public social expenditure
- Gross total social expenditure
- Net total social expenditure
- Source: Adema (2001); Adema and Ladaique (2005); Adema (2010); Net Social Expenditure, 2011 edition
- URL: www.oecd.org/els/social/expenditure
- Download: last accessed 14 October 2011

KEY DATA

	Poverty total population						Gross and net social expenditure % GDP, 2007														
	OECD (2003-2005)			LIS (around 2004)			SOCX (2011), based on methodology Adema						Corrected for indirect taxes		Gross cash benefits			Gross benefits in kind			
	PL 40	PL 50	PL 60	PL 40	PL 50	PL 60	Gross public	Net public	Gross total	Net total	gross private	impact tax system	Net public	Net total	Public	Private	total	Public	Private	total	
Australia	4.6	12.4	20.3	5.4	12.2	20.4	16.0	16.0	19.8	18.7	3.8	-1.0	16.8	19.7	7.4	0.5	7.9	8.3	0.0	8.3	
Austria	3.4	6.6	13.4	3.5	7.1	13.4	26.4	21.7	28.2	23.0	1.8	-5.2	24.2	25.8	17.5	0.8	18.4	8.2	0.0	8.2	
Belgium	3.1	8.8	16.2	3.7	8.1	16.1	26.3	23.3	31.1	27.1	4.7	-4.0	25.7	30.1	16.0	0.0	16.0	9.1	0.0	9.1	
Canada	7.0	12.0	19.0	7.7	13.0	19.9	16.9	17.3	22.2	21.4	5.3	-0.7	18.1	22.5	6.7	0.0	6.7	9.9	0.0	9.9	
Czech Republic	3.0	5.8	11.5	3.0	5.8	11.4	18.8	17.2	19.2	17.5	0.4	-1.7	19.4	19.7	11.8	0.2	12.0	6.7	0.0	6.7	
Denmark	2.1	5.3	12.3	2.3	5.6	13.2	26.1	20.1	28.7	21.4	2.6	-7.2	22.6	24.4	12.6	0.2	12.8	12.2	0.0	12.2	
Finland	2.8	7.3	14.8	2.5	6.5	13.5	24.9	20.0	26.0	20.7	1.1	-5.3	22.4	23.2	14.3	0.0	14.3	9.7	0.0	9.7	
France	2.8	7.1	14.1	2.8	7.3	13.7	28.4	25.7	31.3	28.3	2.9	-3.0	28.1	31.0	17.1	0.3	17.4	10.4	0.0	10.4	
Germany	6.3	11.0	17.2	3.9	8.5	14.3	25.2	23.5	28.0	25.1	2.9	-2.9	25.6	27.5	14.6	1.1	15.7	9.8	0.0	9.8	
Greece	7.0	12.6	19.6	7.0	12.5	19.7	21.3		22.9		1.5				13.9	0.0	13.9	7.3	0.0	7.3	
Hungary	3.7	7.1	12.3	4.1	7.4	12.5	22.9		23.1		0.2				14.5	0.0	14.5	8.2	0.0	8.2	
Ireland	7.0	14.8	23.3	5.6	13.2	22.0	16.3	14.7	17.8	15.8	1.5	-2.0	16.6	17.8	8.9	0.0	8.9	6.8	0.0	6.8	
Italy	6.6	11.4	19.7	6.9	12.1	20.3	24.9	21.1	27.0	22.8	2.1	-4.2	22.9	24.8	16.8	1.6	18.4	7.6	0.0	7.6	
Japan	9.5	14.9	20.8				18.7	18.2	22.3	21.6	3.6	-0.8	18.9	22.5	10.4	0.6	11.0	8.1	0.0	8.1	
Luxembourg	3.1	8.1	13.2	3.2	8.8	13.7	20.6	16.8	21.6	17.4	0.9	-4.2	19.5	20.3	12.2	0.3	12.5	7.9	0.0	7.9	
Mexico	12.7	18.4	25.3	12.6	18.4	25.3	7.2	8.1	7.4	8.1	0.2	0.7	8.3	8.3	2.3	0.0	2.3	4.9	0.0	4.9	
Netherlands	4.0	7.7	14.4	3.8	6.3	11.6	20.1	17.7	27.0	22.3	6.9	-4.6	19.3	24.8	10.1	0.6	10.7	8.9	0.0	8.9	
New Zealand		10.8	22.7				18.4	16.1	18.8	16.5	0.4	-2.3	17.3	17.7	9.4	0.0	9.4	8.7	0.0	8.7	
Norway	3.5	6.8	12.4	3.7	7.1	12.8	20.8	17.1	22.8	18.3	2.0	-4.5	19.2	20.7	10.1	1.2	11.3	10.2	0.0	10.2	
Poland	9.3	14.6	20.8	6.4	11.5	17.7	20.0	16.3	20.0	16.3	0.0	-3.7	18.7	18.7	14.2	0.0	14.2	5.1	0.0	5.1	
Portugal	7.4	12.9	20.7				22.2	20.2	23.9	21.7	1.7	-2.2	22.6	24.2	14.8	0.4	15.1	7.2	0.0	7.2	
Slovakia	4.5	8.1	13.7	3.9	7.0	12.1	15.7	14.3	16.7	15.1	1.0	-1.6	15.8	16.7	9.4	0.0	9.4	6.1	0.1	6.2	
Spain	8.1	14.1	21.0	7.8	14.1	20.6	21.6	19.3	22.1	19.5	0.5	-2.6	20.9	21.1	13.1	0.0	13.1	7.7	0.0	7.7	
Sweden	2.5	5.3	11.4	2.6	5.6	12.0	27.3	21.9	30.2	23.6	2.9	-6.6	23.9	26.2	12.8	0.4	13.1	13.4	0.0	13.4	
Switzerland	4.8	8.7	15.2	4.3	8.0	14.8	18.5		26.8		8.3				10.7	7.2	17.9	7.2	0.0	7.2	
Turkey	11.4	17.5	24.3				10.5	9.7	10.5	9.7	0.0	-0.7	10.5	10.5	6.3	0.0	6.3	4.2	0.0	4.2	
UK	3.7	8.3	15.5	5.3	11.6	19.2	20.5	19.4	26.3	23.7	5.8	-2.6	20.7	25.7	9.9	0.8	10.7	10.3	0.0	10.3	
USA	11.4	17.1	23.9	11.4	17.3	24.1	16.2	17.3	26.7	25.6	10.5	-1.1	17.6	26.1	8.0	0.2	8.1	8.1	0.1	8.2	
Mean	5.8	10.6	17.5	5.1	9.8	16.4	20.5	18.1	23.2	20.1	2.7	-3.0	19.8	22.0	11.6	0.6	12.2	8.3	0.0	8.3	

Sources: OECD (2008), SOCX (2011), LIS (2011), and own calculations

SENSITIVITY ANALYSIS CORRELATION TESTS ACROSS COUNTRIES

1. Our paper separates EU-15 countries from the other thirteen non-EU15 countries. This non-EU15 control group is open to debate. Separating rich countries from postsocialist and poor ones is an option as well. Moreover, one could argue that the weak downward sloping line for the non-EU15 countries appears to be the result of outliers with rather low net total social expenditure and rather high poverty (Mexico and Turkey). Also the United States is an outlier, because of high private health expenditure. Although we are generally opposed to the idea of excluding outliers, we have done an sensitivity analysis for a selection of 20 affluent countries; see Table A7. Our findings are rather similar. Correlation coefficients and significance of all linkages between social expenditure and poverty rates across countries are rather insensitive for poverty lines applied (threshold of 40, 50 or 60 percent of median income) and/or data sets for poverty employed (OECD or LIS). However, the results are sensitive for the social indicator used. We find pretty good fits for gross public social expenditures. However, the inclusion of private social expenditures alters the picture (lower correlation coefficients). We do not find a significant fit for net social spending and poverty rates.
2. Another point open to debate is that social expenditures include services (benefits in kind), and the value of services is not included in income measures on which poverty rate calculations are based. However, these kind of conceptual or methodological problems frequently arise in comparative analysis using aggregate data of social spending. If we want to look at the correlation between social spending variables and poverty rates, we would want a poverty measure that incorporates the effects of the factors that have been added to (or subtracted from) the social spending measure. However, data on such poverty measures are not available on a cross-country basis. Moreover, this is beyond the scope of our paper since we are only looking at the correlations between different published aggregate measures of social spending by SOCX (2011) and the OECD and LIS key figures on poverty rates.
3. But it is possible to do the analysis excluding health expenditure, the most important service item. Indeed, international comparison of social spending is rather sensitive with respect to expenditures related to health care programs. Thus, we run the regressions excluding health expenditure from gross social expenditure. Unfortunately, there are no data available in SOXC on net total social expenditure excluding health. So, we can only make the first step in the correction of the expenditure measure (from gross public expenditure to gross total expenditure). Table A6 shows the result of this analysis. Two points should be mentioned. Firstly, if health expenditure is excluded, the fits are better, especially for non-EU15 countries. The main reason is that the United States is an outlier with relatively high social expenditures for (private) health programs. Secondly, if private social expenditure is included, the correlation between social spending other than health and poverty rates becomes weaker for non-EU15 countries, but stronger for EU15 countries. This confirms our earlier finding that in the EU, private social programs seem to matter as far as poverty reduction is concerned.

4. Pursuing this point - what would happen if we remove social expenditures on services and indirect taxation from the aggregate public and total social expenditures measures (both items are available from the OECD social expenditure database)? To test for the effect of indirect taxes, we removed the correction for indirect taxation from net social expenditures. We calculated the linkage between poverty rates around 2003-2005 and net public and net total social expenditure indicators for 2007. We find the same results for net social spending indicators with or without the correction for indirect taxes. The magnitude of indirect taxes is rather small, and the correlation coefficient between net social spending with and without the correction for indirect taxes amounts over .98; see Table A5.
5. To test for the effect of social expenditures on services, we removed in kind benefits from the gross social expenditures measures. When we restrict our analysis to cash benefits instead of social expenditures (= cash benefits, plus benefits in kinds, plus an residual term), the picture alters completely. Gross cash benefits accounts roughly for only half of total social spending (on average 12.2 versus 23.2 percent of GDP) although cross countries variance is large. Moreover, the correlation between social expenditures and (only) cash transfers is .55. As a consequence our linkage exercises on both public and total cash transfers and poverty rates across countries show poor fits, especially for EU15 countries. Furthermore, it should be noted that the disentanglement of social expenditures in SOCX (2011) into cash benefits and benefits in kinds is troublesome in several respects. For example, cash benefits and benefits in kind add up to only 75% of social spending for Canada, 73% for the Netherlands and 61% for USA. Across all countries 11% of social spending is not labeled as cash benefits or benefits in kind (residual part of social spending). Finally, the labeling of cash transfers or benefits in kinds in SOCX (2011) is problematic. See Table A4.
6. Other tests for robustness of the relationship between poverty rates and social expenditures across countries. We employed several sensitivity analyses. First, we performed the same analysis with poverty data from the Luxembourg Income Studies (LIS 2011) instead of OECD (2008). The results are almost the same. For example, when we run the regressions using LIS-poverty data, we do not find any significant fit with the net social expenditure variable ($p > .115$), independent of the poverty line applied. See Tables A2.1 and A2.2.
7. To test for (in)stability over the business cycle, we linked poverty rates and several gross social expenditure indicators for a few moments in time for all countries where all relevant data items are available (around 1985, around 1995, and around 2005). Our findings are rather steady over time for several gross social expenditure ratios. Unfortunately, net social expenditure data are not available as time-series. See Table A3.

BI-VARIATE CORRELATION TESTS ACROSS COUNTRIES

A1.1: REGRESSION ANALYSIS FOR OECD POVERTY RATES AND GROSS AND NET SOCIAL SPENDING, AROUND 2003-2007

	<i>Non-EU15</i>			<i>EU-15</i>			<i>All 28 countries</i>		
	Int.	X1	Adj R2	Int.	X1	Adj R2	Int.	X1	Adj R2
PL 40	16.4** (4.94)	-0.548* (-2.88)	0.398	12.3** (3.50)	-0.327* (-2.20)	0.214	14.3** (7.72)	-0.416** (-4.74)	0.453
PL 50 <i>Gross public social expenditure</i>	24.1** (6.07)	-0.720** (-3.17)	0.429	23.0** (4.78)	-0.576* (-2.85)	0.336	21.4** (9.04)	-0.532** (-4.72)	0.441
PL 60	31.9** (6.76)	-0.783* (-2.89)	0.381	31.1** (5.42)	-0.623* (-2.58)	0.287	28.6** (10.06)	-0.545** (-4.03)	0.361
PL 40	12.4** (3.51)	-0.267 (-1.55)	0.113	13.7** (4.34)	-0.345* (-2.89)	0.345	13.3** (6.56)	-0.323** (-3.83)	0.344
PL 50 <i>Gross total social expenditure</i>	18.4** (4.23)	-0.330 (-1.56)	0.106	24.8** (5.94)	-0.587** (-3.72)	0.478	20.0** (7.78)	-0.407** (-3.78)	0.329
PL 60	25.9** (5.21)	-0.369 (-1.52)	0.098	32.8** (6.36)	-0.626** (-3.20)	0.398	27.2** (9.05)	-0.420** (-3.33)	0.272
PL 40	13.7** (4.83)	-0.484* (-2.43)	0.309	12.7** (5.08)	-0.418** (-3.26)	0.407	13.3** (8.40)	-0.451** (-4.95)	0.474
PL 50 <i>Gross total social expenditure other than Health</i>	19.8** (5.74)	-0.595* (-2.42)	0.287	23.1** (7.31)	-0.713** (-4.39)	0.566	19.8** (10.02)	-0.563** (-4.87)	0.457
PL 60	28.2** (7.32)	-0.711* (-2.59)	0.323	30.9** (7.66)	-0.755** (-3.64)	0.466	27.4** (11.76)	-0.599** (-4.42)	0.407
PL 40	10.6* (2.51)	-0.166 (-0.71)	-0.058	9.2* (2.46)	-0.213 (-1.28)	0.046	12.0** (4.71)	-0.305* (-2.49)	0.184
PL 50 <i>Net total social expenditure</i> ^a	15.5* (3.07)	-0.171 (-0.60)	-0.068	17.8** (3.26)	-0.383 (-1.59)	0.105	18.0** (5.66)	-0.367* (-2.38)	0.162
PL 60	22.7** (4.03)	-0.188 (-0.59)	-0.069	25.1** (3.88)	-0.399 (-1.39)	0.067	25.2** (6.99)	-0.373* (-2.14)	0.130

Notes:

- ^a *Net* social expenditures are not available for Greece, Hungary, and Switzerland.
- Dependent variable: OECD poverty rate (poverty line 40, 50 or 60 percent of median income).
 - N = 28. 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, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Luxembourg, Mexico, Netherlands, New Zealand (missing value PL 40), Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and United States.

Source: OECD (2008), SOCX (2011), and own calculations

A1.2: REGRESSION ANALYSIS FOR **OECD POVERTY RATES** AND GROSS AND NET SOCIAL SPENDING, AROUND **2003-2005**

	<i>Non-EU15</i>			<i>EU15</i>			<i>All 28 countries</i>		
	Int.	X1	Adj R ²	Int.	X1	Adj R ²	Int.	X1	Adj R ²
PL 40	17.5** (5.21)	-0.597** (-3.18)	0.452	13.0** (3.99)	-0.345* (-2.58)	0.288	14.8** (8.11)	-0.430** (-5.11)	0.491
PL 50	25.4** (6.23)	-0.772** (-3.40)	0.468	23.8** (5.51)	-0.595** (-3.36)	0.423	22.1** (9.49)	-0.549** (-5.09)	0.480
PL 60	33.3** (6.84)	-0.837** (-3.09)	0.416	33.0** (6.60)	-0.685** (-3.34)	0.420	29.5** (10.63)	-0.574** (-4.46)	0.412
PL 40	13.3** (3.59)	-0.303 (-1.72)	0.152	14.1** (5.08)	-0.350** (-3.44)	0.436	13.9** (7.03)	-0.340** (-4.24)	0.395
PL 50	19.3** (4.24)	-0.367 (-1.69)	0.133	25.2** (7.23)	-0.587** (-4.58)	0.588	20.8** (8.33)	-0.428** (-4.21)	0.382
PL 60	26.9** (5.16)	-0.408 (-1.64)	0.123	34.2** (8.14)	-0.660** (-4.27)	0.552	28.2** (9.68)	-0.450** (-3.79)	0.331
PL 40	14.1** (4.94)	-0.498* (-2.55)	0.334	12.5** (5.82)	-0.400** (-3.72)	0.478	13.4** (8.83)	-0.444** (-5.23)	0.503
PL 50	20.1** (5.74)	-0.599* (-2.46)	0.295	22.8** (8.99)	-0.682** (-5.37)	0.666	20.0** (10.64)	-0.559** (-5.23)	0.494
PL 60	28.2** (7.17)	-0.698* (-2.55)	0.314	31.5** (10.1)	-0.764** (-4.89)	0.621	27.6** (12.57)	-0.601** (-4.82)	0.451
PL 40	9.5 (1.73)	-0.120 (-0.41)	-0.12	9.7* (2.66)	-0.227 (-1.45)	0.078	11.6** (4.07)	-0.286* (-2.16)	0.143
PL 50	13.6 (2.13)	-0.084 (-0.24)	-0.12	18.5** (3.55)	-0.405 (-1.81)	0.148	17.6** (5.00)	-0.345* (-2.09)	0.128
PL 60	21.4* (2.95)	-0.130 (-0.33)	-0.11	27.0** (4.44)	-0.471 (-1.80)	0.146	25.3** (6.35)	-0.380 (-2.03)	0.120

Notes:

^a Net social expenditures are not available for Greece, Hungary, Switzerland, and Turkey.

- Dependent variable: OECD poverty rate (poverty line 40, 50 or 60 percent of median income).

- N = 28. 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, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Luxembourg, Mexico, Netherlands, New Zealand (missing value PL 40), Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and United States.

Source: OECD (2008), SOCX (2008), and own calculations

A2.1: REGRESSION ANALYSIS FOR LIS POVERTY RATES AND GROSS AND NET SOCIAL SPENDING, AROUND 2004-2007

		Non-EU15			EU-15			All 24 countries		
		Int.	X1	Adj R2	Int.	X1	Adj R2	Int.	X1	Adj R2
PL 40	<i>Gross public social expenditure</i>	16.2**	-0.576*	0.477	10.8**	-0.272	0.208	13.0**	-0.375**	0.443
		(4.81)	(-3.03)		(3.49)	(-2.10)		(7.09)	(-4.39)	
PL 50		23.7**	-0.748*	0.444	21.6**	-0.532*	0.335	20.0**	-0.485**	0.388
		(5.10)	(-2.86)		(4.69)	(-2.75)		(7.56)	(-3.95)	
PL 60		31.8**	-0.850*	0.431	29.3**	-0.567*	0.242	26.7**	-0.490**	0.288
		(5.89)	(-2.80)		(4.93)	(-2.27)		(8.13)	(-3.21)	
PL 40	<i>Gross total social expenditure</i>	10.6*	-0.211	0.015	11.2**	-0.260*	0.255	11.3**	-0.259**	0.243
		(2.52)	(-1.07)		(3.78)	(-2.33)		(5.18)	(-2.90)	
PL 50		15.9*	-0.253	-0.013	22.9**	-0.527**	0.439	18.0**	-0.344*	0.224
		(2.81)	(-0.94)		(5.48)	(-3.34)		(5.91)	(-2.76)	
PL 60		22.3**	-0.253	-0.040	30.7**	-0.560*	0.321	24.2**	-0.327*	0.138
		(3.37)	(-0.81)		(5.52)	(-2.68)		(6.56)	(-2.17)	
PL 40	<i>Gross total social expenditure other than Health</i>	13.4**	-0.504*	0.330	10.0**	-0.290*	0.244	11.8**	-0.387**	0.405
		(4.22)	(-2.33)		(3.99)	(-2.28)		(7.01)	(-4.08)	
PL 50		19.8**	-0.639	0.283	21.1**	-0.620**	0.479	18.8**	-0.526**	0.395
		(4.51)	(-2.13)		(6.23)	(-3.60)		(8.08)	(-4.01)	
PL 60		26.7**	-0.678	0.224	28.5**	-0.650*	0.340	25.3**	-0.515**	0.273
		(5.09)	(-1.90)		(6.20)	(-2.77)		(8.60)	(-3.11)	
PL 40	<i>Net total social expenditure^a</i>	7.8	-0.060	-0.158	7.4*	-0.146	0.005	9.5**	-0.214	0.079
		(1.48)	(-0.21)		(2.32)	(-1.03)		(3.50)	(-1.65)	
PL 50		11.9	-0.021	-0.166	16.4**	-0.337	0.088	15.4**	-0.268	0.059
		(1.70)	(-0.05)		(3.15)	(-1.47)		(4.09)	(-1.50)	
PL 60		17.7	0.013	-0.166	23.6**	-0.352	0.041	21.4**	-0.237	0.015
		(2.22)	(0.03)		(3.63)	(-1.23)		(4.89)	(-1.14)	

Notes:

- ^a Net social expenditures are not available for Greece, Hungary, and Switzerland.
- Dependent variable: LIS poverty rate (poverty line 40, 50 or 60 percent of median income).
- N = 24. 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, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Mexico, Netherlands, Norway, Poland, Slovak Republic, Spain, Sweden, Switzerland, the United Kingdom, and the United States

Source: LIS (2011), SOCX (2011), and own calculations

A2.2: REGRESSION ANALYSIS FOR LIS POVERTY RATES AND GROSS AND NET SOCIAL SPENDING, AROUND 2004-2005

	Non-EU15			EU15			All 24 countries		
	Int.	X1	Adj R ²	Int.	X1	Adj R ²	Int.	X1	Adj R ²
PL 40	16.8** (5.71)	-0.591** (-3.68)	0.583	11.7** (4.25)	-0.302* (-2.69)	0.324	13.5** (8.08)	-0.388** (-5.13)	0.524
PL 50 <i>Gross public social expenditure</i>	24.3** (5.81)	-0.760** (-3.33)	0.528	22.5** (5.45)	-0.553** (-3.28)	0.429	20.5** (8.36)	-0.500** (-4.50)	0.455
PL 60	32.2** (6.45)	-0.847* (-3.11)	0.490	31.1** (5.94)	-0.627* (-2.92)	0.368	27.5** (8.94)	-0.515** (-3.70)	0.355
PL 40	11.5* (2.86)	-0.248 (-1.34)	0.081	11.6** (4.37)	-0.268* (-2.76)	0.338	11.8** (5.80)	-0.272** (-3.36)	0.309
PL 50 <i>Gross total social expenditure</i>	17.0* (3.10)	-0.297 (-1.17)	0.041	23.1** (6.18)	-0.517** (-3.79)	0.507	18.6** (6.50)	-0.358** (-3.15)	0.280
PL 60	23.3** (3.62)	-0.296 (-1.00)	-0.001	31.9** (6.62)	-0.588** (-3.35)	0.439	25.1** (7.21)	-0.354* (-2.56)	0.194
PL 40	13.3** (4.58)	-0.489* (-2.53)	0.376	10.2** (4.60)	-0.292* (-2.68)	0.321	11.8** (7.63)	-0.376** (-4.45)	0.450
PL 50 <i>Gross total social expenditure other than Health</i>	19.5** (4.76)	-0.607 (-2.23)	0.306	20.9** (7.13)	-0.595** (-4.10)	0.549	18.7** (8.69)	-0.508** (-4.30)	0.432
PL 60	26.2** (5.29)	-0.632 (-1.92)	0.230	29.1** (7.46)	-0.663** (-3.43)	0.454	25.4** (9.32)	-0.509** (-3.41)	0.316
PL 40	7.9 (1.80)	-0.068 (-0.28)	-0.152	7.6* (2.41)	-0.149 (-1.10)	0.018	9.4** (3.99)	-0.204 (-1.86)	0.109
PL 50 <i>Net total social expenditure^a</i>	12.6 (2.16)	-0.063 (-0.19)	-0.160	16.0** (3.10)	-0.312 (-1.41)	0.075	15.0** (4.64)	-0.250 (-1.65)	0.080
PL 60	18.6* (2.78)	-0.037 (-0.10)	-0.165	24.2** (3.83)	-0.371 (-1.37)	0.068	21.4 (5.66)	-0.235 (-1.33)	0.037

Notes:

- ^a Net social expenditures are not available for Greece, Hungary, Switzerland, and Turkey.
- Dependent variable: LIS poverty rate (poverty line 40, 50 or 60 percent of median income).
- N = 24. 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, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Mexico, Netherlands, Norway, Poland, Slovak Republic, Spain, Sweden, Switzerland, the United Kingdom, and the United States

Source: LIS (2011), SOCX (2008), and own calculations

A3: CORRELATION TESTS BETWEEN POVERTY RATES AND GROSS SOCIAL SPENDING OVER TIME

To test for (in)stability over the business cycle, we present the linkage between poverty rates and several social expenditure indicators for a few moments in time for all countries where all relevant data items are available. Our findings are rather steady over time. Note that the correlation coefficients and significance of all linkages between social expenditure and poverty rates across countries are rather insensitive for poverty lines and/or data sets employed. However, the results are sensitive for the social indicator used. We find pretty good fits for gross public social expenditures, both for non-EU15 and EU15 countries. However, the inclusion of private social expenditures alters the picture. Still, we find a significant negative relationship between social spending and poverty rates for all countries and for EU15 countries, but not for non-EU15 countries separately. We find a fit again for non-EU15 countries when social expenditures for health programs are excluded from social spending.

Panel (a): Correlation OECD poverty rates (PL 50) and gross social expenditure ratios

		Non-EU15			EU15			All 24 countries		
		Int.	X1	Adj R ²	Int.	X1	Adj R ²	Int.	X1	Adj R ²
1985	Gross public social expenditure	21.6**	-0.729*	0.661	19.4**	-0.519*	0.321	20.0**	-0.559**	0.592
		(7.89)	(-3.56)		(4.65)	(-2.76)		(10.15)	(-5.61)	
1995		21.6**	-0.729*	0.661	26.2**	-0.782**	0.631	24.1**	-0.606**	0.453
	(7.89)	(-3.56)		(7.50)	(-3.83)		(5.77)	(-3.55)		
2005		20.0**	-0.559**	0.592	20.0**	-0.559**	0.592	23.4**	-0.588**	0.638
	(10.15)	(-5.61)		(10.15)	(-5.61)		(11.65)	(-6.44)		
1985	Gross total social expenditure	19.5**	-0.496	0.323	20.3**	-0.526**	0.438	19.7**	-0.501**	0.551
		(5.15)	(-1.97)		(5.61)	(-3.45)		(9.52)	(-5.18)	
1995		21.8**	-0.511*	0.557	21.2**	-0.476**	0.502	21.5**	-0.490**	0.634
	(7.22)	(-3.33)		(6.45)	(-3.89)		(11.50)	(-6.39)		
2005		21.0**	-0.382	0.281	26.0**	-0.611**	0.619	23.2**	-0.502**	0.579
	(5.24)	(-2.03)		(7.56)	(-4.87)		(10.44)	(-5.72)		
1985	Idem, excluding Health	20.1**	-0.793*	0.489	19.6**	-0.651**	0.450	19.2**	-0.641**	0.597
		(6.35)	(-2.60)		(5.85)	(-3.53)		(10.55)	(-5.67)	
1995		21.6**	-0.719**	0.761	19.5**	-0.536**	0.516	20.2**	-0.583**	0.701
	(11.09)	(-5.15)		(6.98)	(-3.99)		(13.89)	(-7.41)		
2005		21.5**	-0.617*	0.543	23.4**	-0.706**	0.695	21.9**	-0.633**	0.720
	(7.91)	(-3.24)		(9.43)	(-5.73)		(14.74)	(-7.76)		

Selected countries (24): Australia (missing value for 1985), Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland (missing value for 1985), Turkey, the United Kingdom, and United States.

Panel (b): Correlation LIS poverty rates (PL 60) and gross social expenditure ratios

		Non-EU15			EU15			All 20 countries		
		Int.	X1	Adj R ²	Int.	X1	Adj R ²	Int.	X1	Adj R ²
1985	Gross public social expenditure	29.3**	-0.832*	0.655	35.9**	-0.966**	0.539	28.4**	-0.658**	0.598
		(8.24)	(-3.24)		(6.57)	(-4.02)		(11.39)	(-5.41)	
2005		33.3**	-0.844*	0.670	33.2**	-0.707**	0.414	30.5**	-0.614**	0.556
	(7.72)	(-3.34)		(6.09)	(-3.19)		(10.95)	(-4.98)		
1985	Gross total social expenditure	27.7**	-0.604	0.424	34.0**	-0.824**	0.542	28.7**	-0.616**	0.583
		(6.11)	(-2.16)		(6.84)	(-4.05)		(10.95)	(-5.25)	
2005		28.1**	-0.404	0.202	35.0**	-0.696**	0.530	31.0**	-0.547**	0.499
	(4.66)	(-1.51)		(7.21)	(-3.96)		(9.66)	(-4.46)		
1985	Idem, excluding Health	28.1**	-0.935**	0.615	32.2**	-0.980**	0.529	27.4**	-0.747**	0.605
		(8.12)	(-3.00)		(6.94)	(-3.95)		(11.99)	(-5.48)	(
2005		27.7**	-0.524	0.273	31.7**	-0.762**	0.548	29.6**	-0.655**	0.543
	(5.38)	(-1.70)		(8.14)	(-4.10)		(11.10)	(-4.86)		

Selected countries (20): Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Mexico, Netherlands, Norway, Spain, Sweden, Switzerland, the UK, and the USA.

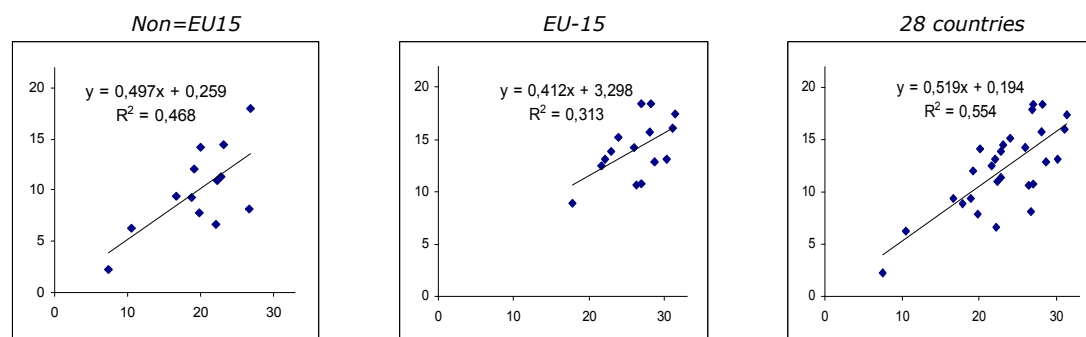
Note: Dependent variable: Poverty rate (several sources and poverty lines). OLS-regression; standardized regression coefficients are reported; t-statistics in parentheses. ** Significant at the 0.01 level; * significant at the 0.05 level. Data years: around 1985, around 1995, and around 2005.

Source: LIS (2009), OECD (2011), SOCX (2008), and own calculations

A4: THE EFFECT OF **IN KIND BENEFITS** ON THE CORRELATION BETWEEN OECD POVERTY RATES AND GROSS SOCIAL SPENDING AROUND 2003-2007

One can argue that social expenditures include a lot of services, and the value of services is not included in income measures on which poverty rate calculations are based. To test for the effect of social expenditures on services, we removed in kind benefits from the gross public and the gross total expenditures measures. Below we present the linkage between poverty rates around 2003-2005 and gross public and gross total *cash* social expenditure indicators for 2007.

When we restrict our analysis to *cash* benefits instead of social expenditures (= cash benefits + benefits in kinds + residual), the picture alters completely. Gross cash benefits accounts for only half of total social spending (across countries on average 12.2 versus 23.2 percent of GDP). Moreover, the correlation between social expenditures and (only) cash transfers is .55. As a result our linkage exercises on both public and total cash transfers and poverty rates across countries show poor fits, especially for EU15 countries. Finally, it should be noted that the disentanglement of social expenditures in SOCX (2011) into cash benefits and benefits in kinds is troublesome in several respects. For example, cash benefits and benefits in kind add up to only 75% of social spending for Canada, 73% for the Netherlands and 61% for USA. Across all countries 11% of social spending is not labeled as cash benefits or benefits in kind (residual part of social spending).



Linkage gross public / total cash social expenditure and OECD poverty rates, around 2003-2007

	Non-EU15			EU-15			All 28 countries		
	Int.	X1	Adj R2	Int.	X1	Adj R2	Int.	X1	Adj R2
PL 40	12.3**	-0.560	0.228	5.3	-0.049	-0.073	10.7**	-0.420**	0.230
	(4.59)	(-2.06)		(1.74)	(-0.22)		(6.14)	(-2.96)	
PL 50	19.2**	-0.785*	0.294	11.8*	-0.172	-0.054	16.8**	-0.537**	0.226
	(6.08)	(-2.45)		(2.62)	(-0.53)		(7.67)	(-2.98)	
PL 60	27.3**	-0.933*	0.326	18.6**	-0.158	-0.062	24.0**	-0.564*	0.194
	(7.77)	(-2.61)		(3.59)	(-0.42)		(9.57)	(-2.74)	
PL 40	11.9**	-0.475	0.258	5.1	-0.035	-0.075	10.6**	-0.393**	0.237
	(5.05)	(-2.19)		(1.73)	(-0.17)		(6.28)	(-3.01)	
PL 50	18.4**	-0.652*	0.315	11.8*	-0.171	-0.051	16.8**	-0.514**	0.246
	(6.67)	(-2.55)		(2.71)	(-0.56)		(8.01)	(-3.14)	
PL 60	26.3**	-0.767*	0.339	18.7**	-0.157	-0.061	24.1**	-0.547**	0.218
	(8.51)	(-2.67)		(3.70)	(-0.45)		(10.05)	(-2.92)	

Notes:

- Dependent variable: OECD poverty rate (poverty line 40, 50 or 60 percent of median income).
- N = 28. 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 = adjusted correlation coefficient.
- Selected countries: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Luxembourg, Mexico, Netherlands, New Zealand (missing value PL 40), Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Turkey, the UK, and USA.

Source: OECD (2008), SOCX (2011), and own calculations

A5: **THE EFFECT OF INDIRECT TAXES** ON THE CORRELATION BETWEEN OECD POVERTY RATES AND NET SOCIAL SPENDING AROUND 2003-2007

One can argue that that net social expenditures should not be corrected for indirect taxes, because those indirect taxes are not included in income measures on which poverty rate calculations are based. To test for the effect of indirect taxes, we removed the correction for indirect taxation from the net public and the net total expenditures measures. Below we present the linkage between poverty rates around 2003-2005 and net public and net total social expenditure indicators for 2007, where we removed the correction for indirect taxes in our net social spending ratio's.

We find the same results for net social spending indicators with or without the correction for indirect taxes. The magnitude of indirect taxes is rather small, and the correlation coefficient between net social spending with and without the correction for indirect taxes amounts over .98.

Linkage net public / total xxx social expenditure and OECD poverty rates, around 2003-2007

		<i>Non-EU15</i>			<i>EU-15</i>			<i>All 25 countries</i>		
		Int.	X1	Adj R2	Int.	X1	Adj R2	Int.	X1	Adj R2
PL 40	<i>Net public xxx social expenditure</i>	16.9**	-0.568	0.285	9.4*	-0.219	0.024	14.9**	-0.457**	0.397
		(3.83)	(-2.14)		(2.18)	(-1.15)		(6.43)	(-4.02)	
PL 50		24.4**	-0.718*	0.293	18.5*	-0.411	0.086	21.9**	-0.565**	0.370
	(4.59)	(-2.27)		(2.95)	(-1.49)		(7.42)	(-3.89)		
PL 60		31.9**	-0.755	0.246	26.4**	-0.451	0.067	29.1**	-0.577**	0.308
	(5.20)	(-2.06)		(3.58)	(-1.39)		(8.49)	(-3.42)		
PL 40	<i>Net total xxx social expenditure</i>	11.9*	-0.225	0.004	10.6*	-0.247	0.106	13.1**	-0.329**	0.273
		(2.79)	(-1.02)		(2.74)	(-1.60)		(5.43)	(-3.10)	
PL 50		17.3**	-0.254	-0.010	19.7**	-0.423	0.166	19.4**	-0.397**	0.244
	(3.38)	(-0.95)		(3.53)	(-1.90)		(6.40)	(-2.95)		
PL 60		24.8**	-0.285	-0.009	27.3**	-0.447	0.123	26.7**	-0.410*	0.205
	(4.34)	(-0.95)		(4.10)	(-1.68)		(7.74)	(-2.68)		

Notes:

- Dependent variable: OECD poverty rate (poverty line 40, 50 or 60 percent of median income).
- N = 25. 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 = adjusted correlation coefficient.
- Selected countries: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Luxembourg, Mexico, Netherlands, New Zealand (missing value PL 40), Norway, Poland, Portugal, Slovakia, Spain, Sweden, Turkey, the United Kingdom, and United States.

Source: OECD (2008), SOCX (2011), and own calculations

A6: ANALYSIS EXCLUDING HEALTH EXPENDITURE

We run the regressions excluding health expenditure from gross social expenditure. Unfortunately, there are no data available in SOCX on net total social expenditure excluding health. So, we can only make the first step in the correction of the expenditure measure (from gross public expenditure to gross total expenditure). Our table below shows the result of this analysis. Two points should be mentioned. Firstly, if health expenditure is excluded, the fits are better, especially for non-EU15 countries. The main reason is that the United States is an outlier with relatively high social expenditures for (private) health programs. Secondly, if private social expenditure is included, the correlation between social spending other than health and poverty rates becomes weaker for non-EU15 countries, but stronger for EU15 countries. This confirms our earlier finding that in the EU, private social programs seem to matter as far as poverty reduction is concerned.

Regression analysis for OECD poverty rates and gross public and total social spending excluding health, around 2003-2007

		Non-EU15			EU-15			All 28 countries		
		Int.	X ₁	Adj R ²	Int.	X ₁	Adj R ²	Int.	X ₁	Adj R ²
PL 50	Gross public social expenditure excluding health	21.4** (6.88)	-0.838** (-3.21)	0.437	20.6** (5.42)	-0.664* (-2.99)	0.362	19.6** (10.13)	-0.627** (-4.86)	0.456
PL 60	Gross public social expenditure excluding health	29.8** (8.52)	-0.976* (-3.33)	0.457	28.5** (6.21)	-0.712* (-2.66)	0.303	27.0** (11.86)	-0.663** (-4.36)	0.400
PL 50	Gross total social expenditure excluding health	19.8** (5.74)	-0.595* (-2.42)	0.287	23.1** (7.31)	-0.713** (-4.39)	0.566	19.8** (10.02)	-0.563** (-4.87)	0.457
PL 60	Gross total social expenditure excluding health	28.2** (7.32)	-0.711* (-2.59)	0.323	30.9** (7.66)	-0.755** (-3.64)	0.466	27.4** (11.76)	-0.599** (-4.42)	0.407

Notes:

- Dependent variable: OECD poverty rate (poverty line 40, 50 or 60 percent of median income).
- N = 28. 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, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and United States.

Source: OECD (2008), SOCX (2011), and own calculations

A7: ANALYSIS FOR 20 AFLUENT COUNTRIES

		<i>All 28 countries</i>			<i>20 affluent countries</i>		
		Int.	X1	Adj R2	Int.	X1	Adj R2
PL 50	Gross public social expenditure	21.4**	-0.532**	0.441	23.0**	-0.587**	0.438
		(9.04)	(-4.72)		(6.99)	(-3.97)	
PL 60	Gross public social expenditure	28.6**	-0.545**	0.361	31.8**	-0.661**	0.410
		(10.06)	(-4.03)		(8.16)	(-3.77)	
PL 50	Gross public social expenditure other than Health	19.6**	-0.627**	0.456	20.0**	-0.643**	0.485
		(10.13)	(-4.86)		(8.56)	(-4.35)	
PL 60	Gross public social expenditure other than Health	27.0**	-0.663**	0.400	28.5**	-0.730**	0.463
		(11.86)	(-4.36)		(10.33)	(-4.17)	
PL 50	Gross total social expenditure	20.0**	-0.407**	0.329	21.7**	-0.462*	0.246
		(7.78)	(-3.78)		(4.97)	(-2.68)	
PL 60	Gross total social expenditure	27.2**	-0.420**	0.272	31.9**	-0.582**	0.302
		(9.05)	(-3.33)		(6.55)	(-3.03)	
PL 50	Gross total social expenditure other than Health	19.8**	-0.563**	0.457	21.6**	-0.645**	0.488
		(10.02)	(-4.87)		(8.06)	(-4.37)	
PL 60	Gross total social expenditure other than Health	27.4**	-0.599**	0.407	31.1**	-0.777**	0.534
		(11.76)	(-4.42)		(10.52)	(-4.78)	
PL 50	Net total social expenditure	18.0**	-0.367*	0.162	14.0*	-0.176	-0.025
		(5.66)	(-2.38)		(2.66)	(-0.74)	
PL 60	Net total social expenditure	25.2**	-0.373*	0.130	23.7**	-0.295	0.009
		(6.99)	(-2.14)		(3.97)	(-1.09)	

Notes:

- Dependent variable: OECD poverty rate (poverty line 40, 50 or 60 percent of median income).
- Selected 28 countries: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and United States.
- 20 affluent countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, the United Kingdom, and the United States.

Source: OECD (2008), SOCX (2011), and own calculations