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Global Challenges and Policies of the European Union
– Consequences for the "New Member States"

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EFFICIENCY OF SOCIAL POLICY IN EQUALIZING DISPOSABLE INCOME AND ITS CHANGES IN TIME – A CROSS-NATIONAL COMPARISON

1. Introduction

In his famous book *Anarchy, State, and Utopia* R. Nozick notices that although it is often assumed inequality of possibilities should be fought, there are few arguments for such a fight [Nozick 1974]. But in the light of a very strong argument formulated earlier by J. Rawls in the revolutionary *A Theory of Justice* the problem seems to be rather how to justify any deviation from full equality. Rawls says that no arbitrary distribution of life conditions should affect individuals' life opportunities. Distribution of talents, disabilities, inherited goods or geographical conditions is arbitrary; therefore it is necessary to level their effects on human life [Rawls 1974].

A natural way of doing that would be redistribution, in modern countries usually achieved by taxes and transfers. This argument induces a vision of individuals and society where talents are common property of everyone. Their possessor has no bigger right to benefit from them than others and others have no less obligation to cope with disabilities' onerous consequences than their bearer. Frankfurt claims that poverty, not inequality, is unacceptable, which implies fewer philosophical conditions and implications [Frankfurt 1987]. Even if this argument is accepted, as long as poverty definition contains interpersonal comparisons, it entails a need of equality, but of course not as strict as in case of the previous line of reasoning. This is the motivation of this paper. If both equality and welfare are valuable, one of the purposes of social policy is the highest possible decrease in inequality achieved with the lowest possible public expenditures.

2. Data and method

This leads to the methodology and data description. As a proxy of life possibilities I use households' disposable income, which results from common practice and availability of data. The data come from Luxembourg Income Study which gathers income information from household surveys from several countries and harmonizes it by means of one scheme. Thus, cross-country comparisons are possible. Disposable income, as well as every transfer, is modified by equivalence scale, which in this case is a reciprocal of the square root of the number of persons in the household, and the household's weight. The extreme bottom of income distribution is recoded as 1% of equivalised mean income and the extreme top at ten times the median of non-equivalised income. Missing and zero incomes have been removed. Transfers are defined as those net positions from household's income which are paid directly by the state or by social insurance institutions, and their value does not positively depend on current or former remuneration. The main reason is that the aim of such payments is not to decrease inequality among the society, but mostly during one's whole lifetime. Therefore, in this study I do not consider pensions or wage replacements as transfers. Formally, transfers are defined as the sum of disability benefits, child/family benefits, unemployment compensation benefits, social assistance cash benefits and near-cash benefits from LIS harmonization scheme. As further variable for analysis I also consider social assistance transfers which contain the last two positions from this list.

The aim of this paper is to rate Polish social policy against other countries' policies. I try to achieve that by comparing transfers' efficiency in Poland over the past few years to four European countries and by studying whether governments use feedback information in designing the structure of transfers. I compare Poland to Hungary, Slovenia, Russia and Spain. Hungary, Slovenia and Russia were chosen because they are, like Poland, former communist states; Spain – because of similarity in terms of population, area, religion or the duration of democratic system.

As an inequality measure I employ Gini coefficient. I quantify the efficiency of transfer (or sum of transfers) with absolute change of Gini obtained from this transfer, divided by its share in aggregated disposable income. As feedback information for policy designers I use change in Gini coefficient after one additional currency unit per household spent on the transfer divided by mean disposable income. All calculations apply to equivalised income, so the results cannot be simply translated into government's spending.

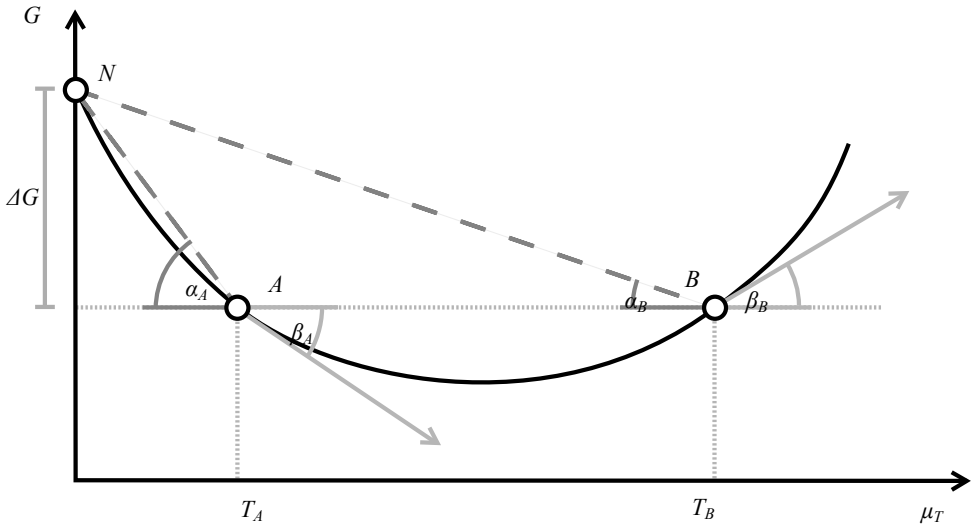


Figure 1. Relation between ΔG, μ, η and γ coefficients

Source: own calculations.

The method can be easily shown on a plot (Figure 1) whose coordinates are transfer's mean and Gini index values. The curve represents the dependence of inequality on transfer's mean. Point *N* stands for a situation when the transfer is void. Points *A* and *B* stand for two states of the same inequality. The value of Gini coefficient in case *A* is the result of a smaller expenditure than in case *B*, so the efficiency in *A* is higher than in *B*. Formally, let ΔG be the change of the Gini index, obtained from the transfer *T*, whose mean is marked as μ_T. Then efficiency is defined as

$$\eta_T = \operatorname{tg}\alpha \cdot \mu_{DPI} = \frac{\Delta G}{\frac{\mu_T}{\mu_{DPI}}} = \frac{\Delta G}{S_T}, \tag{1}$$

where μ_{DPI} is mean disposable income and thus S_T denotes transfers share in overall income. Change in Gini coefficient after one additional currency unit per household spent on the transfer, compared to mean income, is then

$$\gamma_T = \operatorname{tg}\beta \cdot \mu_{DPI} = \frac{\partial G}{\partial \mu_T}\mu_{DPI}. \tag{2}$$

The method of obtaining $\frac{\partial G}{\partial \mu_T}$ was shown by Yitzhaki and Lerman [Lerman, Yitzhaki 1989] Taking mean disposable income into account in γ_T does not change the results of the comparison between transfers in the same dataset, however it may allow cross-national comparisons. γ_T denotes the change of inequality caused by additional funds spent on the transfer, expressed as a share of mean income. Thus, this index can be interpreted as the remaining potential of the transfer to diminish inequality. Because Gini coefficient is scale independent, $\gamma_T \cdot t$ indicates how Gini index would change after a flat tax of rate t is imposed on current disposable income and all the collected funds are allocated for the transfer. Take two societies with the same income's share distribution (but different average incomes) and, therefore, the same Lorenz curve, Gini coefficient, the proportion of the ninth decile to the second decile or the fraction of incomes below the line of relative poverty. A flat tax will not affect each individual's share in aggregated income and transfer T will change those shares in the same way in both economies, so introducing transfer T will have the same effect on Lorenz curve for both societies. Therefore, this way of measuring the transfer's power of decreasing inequality is scale independent and can be used for cross-national comparisons.

The following conventions are accepted: changes from higher to lower inequality are reported as positive values, $\Delta G > 0$. Thus, $\eta > 0$ holds for incomes reducing inequality and the most effective income has the highest η. Also, because γ stands for a change in Gini coefficient entailed by a small change in transfer's mean, equalizing effect occurs for an increase in transfers with $\gamma > 0$ and the most effective is the transfer with the highest γ. The Gini index calculated for incomes including transfers is called *Gini net*, otherwise it is called *Gini gross*.

Figure 1 implies that there can be incomes which diminish inequality while their growth would augment it, as at point *B*. Usually, pensions belong to this sort of incomes. This study employs γ-index to check whether in consecutive years the government changed the structure of social expenditures in accordance with the best predicted efficiency change. If an aggregated transfer T is a composition of transfers U, W and V, the most effective way to decrease inequality by a change in T is to expand the budget of its component with the highest γ. If the budget constraint is constant, inequality can be reduced by transferring means from the component with lower γ. Of course, reducing the budget of a transfer with negative γ reduces inequality itself.

In the example illustrated by Figure 2 three components of a transfer are considered. Symbol $\Delta\mu$ stands for changes in transfers' mean. The best equalizing effect can be obtained from a change of transfer W, but it should be also noticed

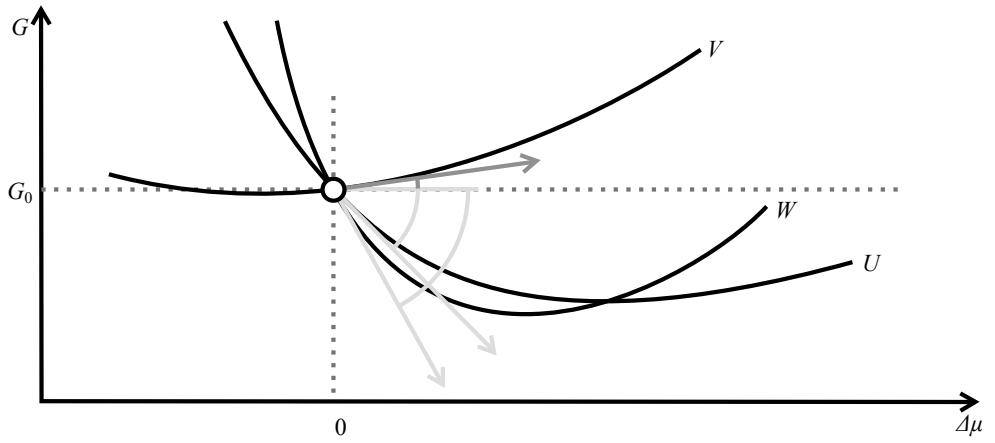


Figure 2. Decomposition of Gini coefficient

Source: own calculations.

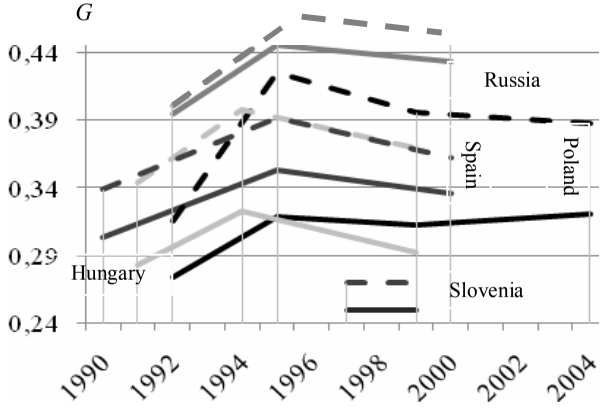
that there are changes of *W* increasing inequality while the same amount of money destined for *U* still decreases it. Therefore, the values of γ-indexes can be a premise only for small evolutionary modifications in social policy.

3. Aggregated transfers' efficiency

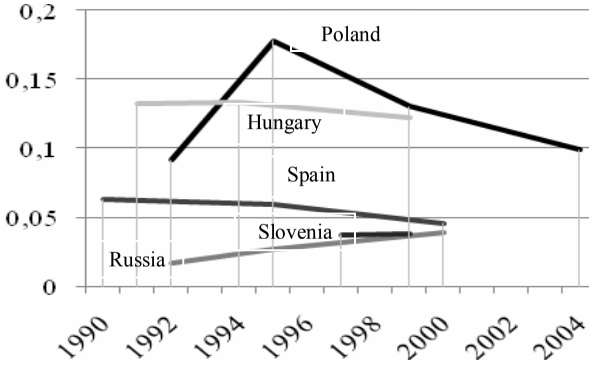
Table 1 contains values of *G*, *S* and also ΔG, η, γ and their relative equivalents for aggregated transfers. Those numbers are basis for Figures 3(a)-(h). Figure 3(a) visualises Gini gross and Gini net during the period examined, Figure 3(b) – shares of transfers in people's income. Figure 3(c) shows differences in Gini coefficient caused by transfers. Transfers' efficiency is presented in Figure 3(e) and the remaining potential to diminish inequality with transfers in their current form in Figure 3(g). Figures 3(d), 3(f) and 3(h) represent relative approach showing, respectively, Gini differences, efficiency with reference to Gini gross and the remaining power to reduce inequality with reference to Gini net.

These results allow to formulate the following conclusions. Three groups can be distinguished – Russia with the highest inequality, Spain, Poland and Hungary with average inequality and Slovenia with the lowest. In all the states, for which appropriate data are available, inequality grew from early 1990s to mid-1990s and then remained at about the same level or even decreased slightly. Social transfers' share or at least its trend seem to be very stable; only in Poland S increased significantly from 1992 to 1995 (8 pp.) and then decreased considerably as well. In Russia there is a growing trend and in Hungary, Slovenia and Spain the share remains the same or slightly diminishes.

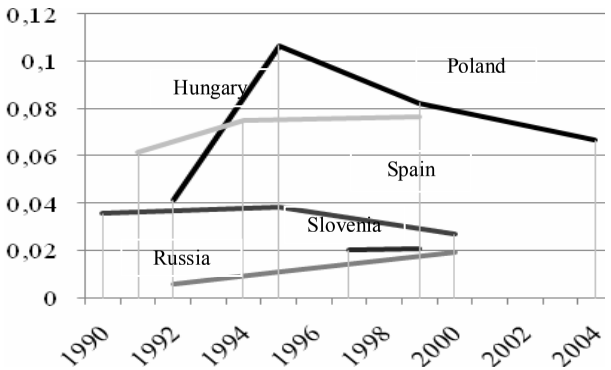
(a) G



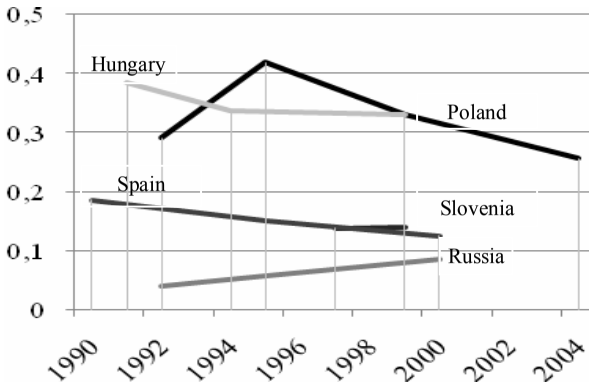
(b) S

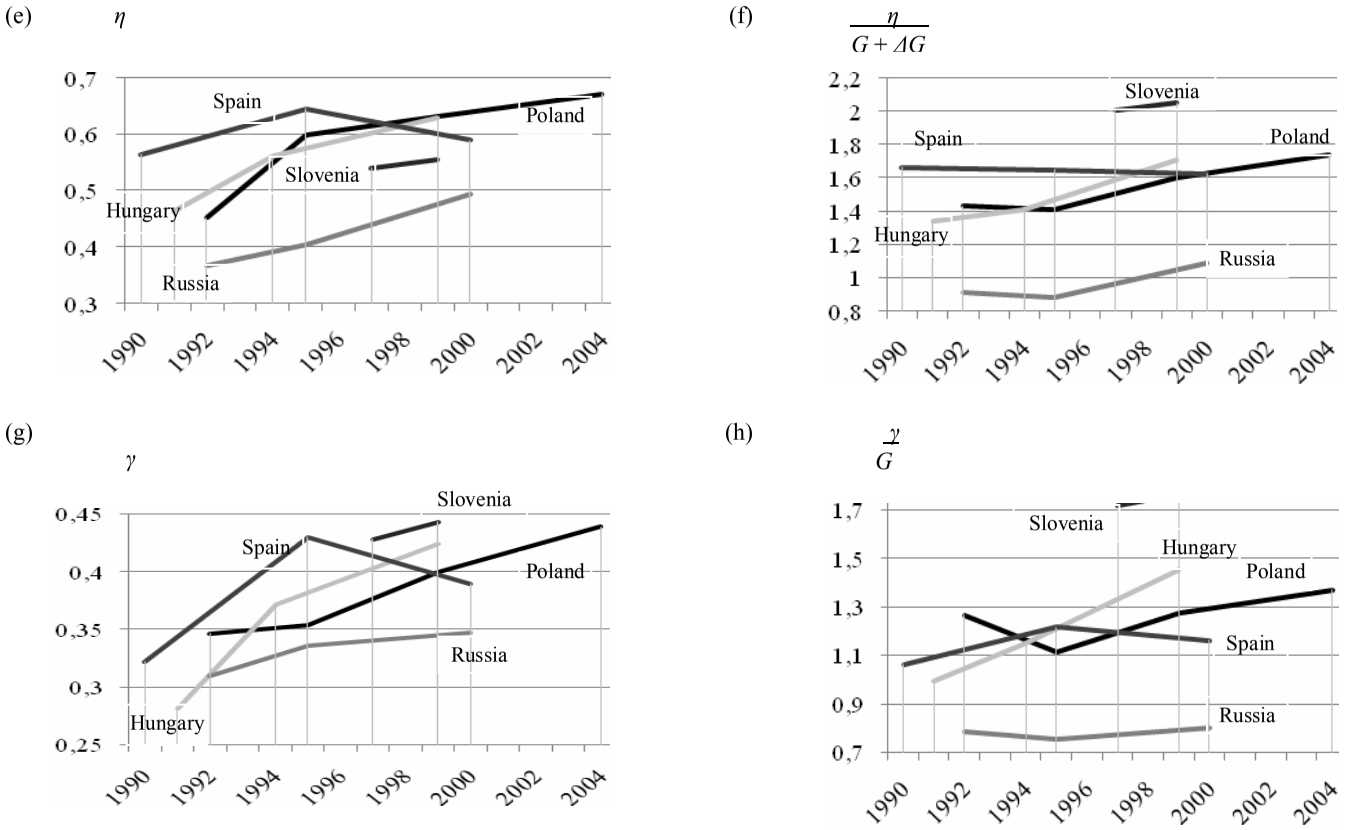


(c) ΔG



(d) $\frac{\Delta G}{G + \Delta G}$





Note: in the first plot the solid line stands for Gini net and the dotted one for Gini gross.

Figure 3. Changes of parameters' values for each country during the period examined

Source: own calculations on the basis of individual level data from Luxembourg Income Study.

Table 1. Indexes used for analysis of the influence of social transfer on income inequality

Country	Year	G	ΔG	$\frac{\Delta G}{G+\Delta G}$	S	$\eta=\frac{\Delta G}{S}$	$\frac{\eta}{G+\Delta G}$	γ	$\frac{\gamma}{G}$
Poland	1992	0.274	0.041	0.291	0.092	0.452	1.434	0.347	1.267
	1995	0.318	0.107	0.419	0.178	0.600	1.412	0.354	1.114
	1999	0.313	0.082	0.330	0.130	0.632	1.600	0.400	1.278
	2004	0.320	0.067	0.256	0.099	0.673	1.738	0.439	1.371
Hungary	1991	0.283	0.061	0.385	0.133	0.463	1.346	0.282	0.996
	1994	0.323	0.075	0.336	0.134	0.563	1.415	0.372	1.153
	1999	0.293	0.077	0.330	0.122	0.631	1.707	0.425	1.452
Russia	1992	0.395	0.006	0.041	0.016	0.367	0.916	0.310	0.785
	1995	0.447	0.011	0.059	0.027	0.404	0.883	0.336	0.753
	2000	0.434	0.019	0.086	0.039	0.494	1.089	0.348	0.800
Slovenia	1997	0.250	0.020	0.138	0.037	0.541	2.005	0.428	1.716
	1999	0.249	0.021	0.140	0.038	0.555	2.053	0.443	1.778
Spain	1990	0.303	0.036	0.186	0.063	0.565	1.668	0.322	1.063
	1995	0.354	0.038	0.151	0.059	0.646	1.649	0.430	1.217
	2000	0.336	0.027	0.125	0.046	0.590	1.627	0.390	1.162

Source: own calculations on the basis of individual level data from Luxembourg Income Study.

Both the absolute (ΔG) and the relative $\left(\frac{\Delta G}{G+\Delta G}\right)$ changes in inequality obtained from social transfers during the consecutive years draw a parallel to transfers' share. There are two distinct groups. Poland and Hungary strongly diminish their inequality using social transfers, whereas Russia, Spain and Slovenia do not. All the countries, except Poland, do not experience rapid changes in inequality difference caused by social policy. In Russia both absolute and relative differences increase, in Spain they rather decrease, in Hungary and Slovenia they have remained at the same level since the mid-1990s. In Poland both differences increased till the mid-1990s and then decreased.

The similarity between Figures 3(b) and 3(c) suggests a strong connection between inequality change obtained from social transfers and the share of those transfers in households' income. For two simple regression equations:

$$\Delta G = \alpha_a \cdot S + \beta_a, \tag{3}$$

$$\frac{\Delta G}{G+\Delta G} = \alpha_r \cdot S + \beta_r \tag{4}$$

the method of last squares gives the following estimations:

$$\Delta G = 0.6 \cdot S - 0.003, \tag{5}$$

$$\frac{\Delta G}{G+\Delta G} = 2.455 \cdot S + 0.02. \tag{6}$$

The coefficient of determination for both models is greater than 0.95, so the share of social transfers in overall income accounts for over 95% of the variability of both absolute and relative change in inequality.

Although the models explain inequality change obtained from transfers in terms of their share in overall income, the question of their efficiency still remains. The efficiency indexes measure the equalizing effect of the structure of transfers regardless of the amount of money assigned for them. In this case the results are very interesting. In all the countries except Spain absolute efficiency grew or remained at the same level. In Spain it grew till the mid-1990s and then decreased. Relative efficiency grew (Poland, Hungary and Russia since 1995) or did not change significantly (Spain, Slovenia and Russia till 1995). The biggest change in efficiency from the early till late 1990s was experienced by Poland, Hungary and Russia, but it does not prevent Russian social policy from being the most ineffective in comparison to other countries' policies.

Because of its low inequality, Slovenia has the second worse policy in terms of absolute efficiency, but the best in terms of relative inequality change. Using the relative measure requires the assumption that decreasing inequality by a given absolute value is harder (or morally less significant) if base inequality is low than if it is high.

Table 2. Distribution of shares of social transfers among income deciles

Country	Year	1	2	3	4	5	6	7	8	9	10
Poland	1992	0.105	0.120	0.116	0.109	0.105	0.105	0.091	0.098	0.074	0.075
	1995	0.081	0.111	0.116	0.113	0.111	0.111	0.100	0.092	0.082	0.081
	1999	0.086	0.123	0.129	0.122	0.114	0.108	0.093	0.090	0.081	0.054
	2004	0.195	0.151	0.100	0.098	0.114	0.074	0.066	0.083	0.057	0.061
Hungary	1991	0.067	0.104	0.111	0.108	0.111	0.102	0.121	0.106	0.089	0.080
	1994	0.098	0.114	0.106	0.109	0.106	0.100	0.114	0.102	0.075	0.077
	1999	0.141	0.116	0.123	0.112	0.108	0.088	0.086	0.091	0.089	0.045
Russia	1992	0.063	0.091	0.084	0.105	0.109	0.097	0.104	0.099	0.122	0.126
	1995	0.069	0.072	0.077	0.082	0.110	0.116	0.126	0.094	0.136	0.118
	2000	0.042	0.071	0.096	0.093	0.141	0.141	0.097	0.098	0.119	0.102
Slovenia	1997	0.144	0.151	0.111	0.125	0.103	0.074	0.101	0.088	0.069	0.035
	1999	0.148	0.145	0.126	0.114	0.098	0.107	0.087	0.079	0.064	0.032
Spain	1990	0.114	0.100	0.096	0.108	0.102	0.084	0.107	0.095	0.088	0.103
	1995	0.112	0.109	0.137	0.108	0.103	0.092	0.086	0.082	0.090	0.080
	2000	0.113	0.108	0.096	0.099	0.105	0.130	0.076	0.109	0.104	0.060

Source: own calculations on the basis of individual level data from Luxembourg Income Study.

The results for Poland, Hungary and Russia are interesting, because all of them are post-communist states whose economies started their transformation at about the same time. Since the late 1990s Hungarian and Polish social policies have been the most effective (in terms of absolute inequality differences) and have had the highest social expenditures in comparison to other households' incomes, whereas Russia has had both the lowest efficiency and share.

The efficiency is assumed to depend first of all on transfers' structure. The structure of social transfers is represented as the distribution of shares of social transfers among income deciles. The regression model is based on the equation

$$\eta = \sum_{i=1}^{10} \beta_i \cdot d_i \tag{7}$$

where d_i denotes the share of transfers assigned to decile i $\left(\sum_{i=1}^{10} d_i = 1\right)$. The estimation of constant coefficient is zero and therefore the parameter is omitted in the equation. The regression model explaining efficiency with decile distribution accounts for 83% of the variability of dependent variable. Figure 4 contains estimators' values.

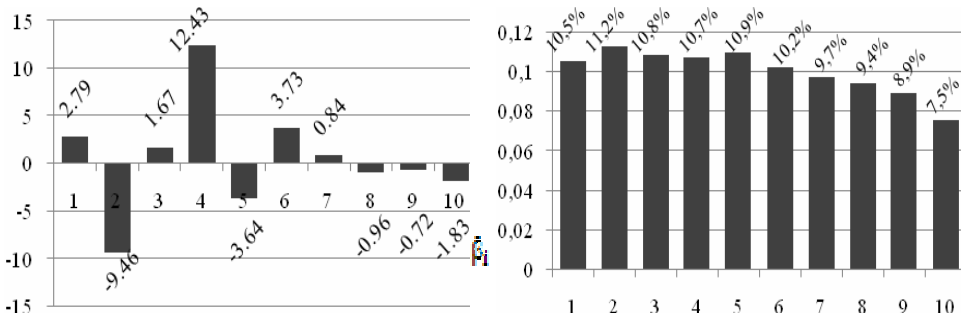


Figure 4. The estimators' values for the regression model (7) and the distribution of transfers – averaged for each decile

Source: own calculations on the basis of individual level data from Luxembourg Income Study.

The interpretation of the results is very interesting. Half of the weights are positive and half – negative. The transfers assigned to the last three deciles lessen the equalizing impact of social transfers, but the transfers in the second and the fifth decile have the most negative effect on equality change. The fact that the transfers from the fourth decile have the strongest positive impact and the transfers from the second decile the strongest negative impact may surprise because intuitively one might think that a transfer directed to lower deciles would have the most equalizing effect.

In Figure 4 there is also presented the distribution of transfers averaged for each decile. The second decile, and then the fifth decile receive more than the rest of the deciles, whereas the fourth decile gets the least among all the deciles below the median. Although it partially explains the estimators for the model (7), Gini index needs a further research itself as a measure of inequality.

4. Consistency of social policies

For each year examined, γ-index measures the ability of the present transfers' structure to diminish inequality by an additional amount financed by a flat tax. For

the consecutive years I check whether the government changed the expenditures on transfers according to the expected changes in inequality. For two countries – Hungary and Slovenia – I examined changes in expenditures on social transfers made in the last observed year in reference to the previous observed year, for Poland it was made for two changes: from year 1995 to 1999 and from 1999 to 2004. Table 4 contains the results. γ_{T-1} denotes γ-index for the previous year and for each country the table is sorted by this value. s_{T-1} denotes the share of a given transfer in aggregated transfers, and thus $s_T - s_{T-1}$ and $\frac{s_T - s_{T-1}}{s_{T-1}}$ indicate how the share changed from the previous to the last examined year (the first expression absolutely, in percentage points, the second relatively, in percent). The values in brackets indicate the position of the value if sorted.

Table 3. Changes in expenditures on social transfers according to γ-index

Country	Transfer	γ_{T-1} (%)	s_{T-1} (%)	$s_T - s_{T-1}$ (%)	$\frac{s_T - s_{T-1}}{s_{T-1}}$ (%)	Country	Transfer	γ_{T-1} (%)	s_{T-1} (%)	$s_T - s_{T-1}$ (%)	$\frac{s_T - s_{T-1}}{s_{T-1}}$ (%)
Poland	v21	0.47	15.44	–4.90(4)	–31.7(3)	Hungary	v25	0.50	12.78	2.39(2)	18.7(2)
’95→’99	v20	0.45	15.51	–2.70(3)	–17.4(2)	’94→’99	v21	0.46	11.47	–3.48(3)	–30.3(3)
	v25	0.36	7.27	–2.32(2)	–31.8(4)		v18	0.42	29.07	15.70(1)	54.0(1)
	v18	0.30	61.77	9.51(1)	15.4(1)		v20	0.28	46.68	–14.61(4)	–31.3(4)
	v26	–	–	0.40	–		v26	–	–	–	–
Poland	v25	0.70	4.96	4.2(2)	85.1(1)	Slovenia	v26	1.11	0.01	0.00(3)	–59.1(5)
’99→’04	v26	0.65	0.40	–0.1(3)	–35.7(5)	’97→’99	v25	0.83	4.89	1.44(2)	29.4(1)
	v20	0.61	12.81	4.4(1)	34.7(2)		v21	0.46	37.03	2.24(1)	6.1(2)
	v21	0.51	10.54	–2.3(4)	–22.1(4)		v20	0.38	52.72	–2.60(5)	–4.9(3)
	v18	0.32	71.28	–6.2(5)	–8.7(3)		v18	0.33	5.34	–1.08(4)	–20.2(4)

Note: v18 – disability benefits, v20 – child/family benefits, v21 – unemployment compensation benefits, v25 – social assistant cash benefits, v26 – near-cash benefits. Transfers are sorted from the highest to the lowest γ-index.

Source: own calculations on the basis of individual level data from Luxembourg Income Study.

The most consistent policy was made by Slovenia. With the exception of near-cash benefits (v26), which is only 0.01% of the total transfers, relative changes of transfers’ shares are the exact reflection of the order of γ. In Hungary there is no such relationship, but it should be noticed that the share of transfer with the lowest γ (0.28 against other values, which are greater than 0.4) was severely reduced. In Poland in 1999 the transfer with the lowest γ had the only positive change – the rest of transfers had higher γ, but were reduced. In 2004, however, the policy was much more consistent. The government increased the most effective transfer, social assistant cash benefits (v25), and also quite effective and the most popular (almost

13% of summarized transfers) child/family benefits (v20). If the government was to diminish social expenditures they chose transfers with lower efficiency: unemployment compensation benefits (v21) and disability benefits (v18). The only exception here are near-cash benefits which were efficient but were decreased.

However, in case of Poland and Hungary the accurateness of this analysis is lessened by the fact that the data were collected in intervals of four to five years. The interval between two Slovenian datasets is two years, which can partly explain the consistency of Slovenian policy against Hungarian and Polish policies in the late 1990s.

5. Conclusions

Despite what Polish economists often say about Polish social policy, it turned out that Poland has one of the most effective systems of social transfers compared to other countries examined. Moreover, its effectiveness constantly increased, although the share of transfers in overall income diminished in the last years examined. A country with very similar social policy – transfers' share and efficiency – is Hungary. Other countries – Russia, Spain and Slovenia – had less effective social policy in terms of absolute inequality change, although because of low inequality in terms of relative change Slovenian system was the most effective.

In 2004 Polish social policy was equality-oriented: with one exception transfers of high ability in reducing inequality were augmented and transfers with lower expected equalizing effect were lessened. In 1999 one cannot observe such a regularity.

Increasing transfers' effectiveness, decreasing their share in households' income without growing inequality and better consistency of Polish social policy indicate that Poland is improving its economic efficiency and income equality faster than other countries examined.

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