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Verhoeven, J.T.M.; Jansen, W.; Dessens, J.A.G.

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Losers in Market Transition: The Unemployed, the Retired, and the Disabled

Willem-Jan Verhoeven, Wim Jansen and Jos Dessens

The market transition debate is almost primarily focused on the 'winners' and on what happens to the formerly privileged during the market transformation process in post-Communist societies. This study emphasizes the impact of the market transformation process on the income of those who have few resources and are eligible for social benefits. Are these people the 'real' losers of the market transformation process in post-Communist societies? OLS regression models are estimated based on 50 standardized cross-sectional surveys on the Czech Republic, Hungary, Poland, Russia, and Slovakia covering a period from 1991 to 2002. The analyses show that the unemployed have the lowest income and that the income of retirement and disability pensioners is relatively protected, especially during the early transformation years. Education seems to be a helpful resource for the unemployed and pensioners, but not specifically during the turbulent early transformation years. Results on the income effect of urban residence are inconclusive.

Introduction

The fall of the Berlin wall and the decline of Communism in Central and Eastern Europe and the former Soviet Union have resulted in extensive political, economic, and social changes. Some social groups have been able to take advantage of these changes and improve their standard of living, while others have suffered more negative consequences and dropped below the line of minimum subsistence. These negative consequences of the market transformation process in post-Communist countries have frequently been reported in the news in Western European countries. Local newspapers report horrible stories from the East: 'Old and forgotten' and 'They live off bread and tomatoes, silently waiting to die'. The money available to people depending on social benefits, is not enough for medicine and food (which are priced at Western levels), let alone for paying rent and utility bills.

The influence of market reforms on socioeconomic attainment has often been framed in terms of 'winners' and 'losers' (Brainerd, 1998; Ganzeboom, 1998; Titma *et al.*, 1998; Gerber, 2002; Hauser and Xie, 2005). In contrast to the extensive literature on the winners during the transformation process and the privileged under Communism, only a few scholars have studied the impact of market transformation on the income situation of social groups at the bottom of the income distribution (Nee, 1991; Fodor, 1997; Gerber and Hout, 1998; Milanovic, 1999; Raymo and Xie, 2000; World Bank, 2000). The research problem of this study aims to contribute to this relatively under investigated topic and focuses on the income position of the 'losers': in particular the people who depend on social benefits.

Here, it is assumed that these people are the 'real' losers of the market transformation process. Have the incomes of people depending on social benefits changed in post-Communist countries? Additionally,

in line with the Market Transition Theory (Nee, 1989, 1991, 1996)—which states that changing economic institutions alter the value of various forms of capital and that having the right kind of resources provides advantages—having additional resources would be expected to enable these people to compensate their weak socioeconomic position. To what extent can change in the income of social benefit holders be explained by the resources they have?

Based on cross-sectional survey data, trends in the income of unemployed, and pensioners (whom we refer to as social benefit holders) are presented here for the period from 1991 to 2002 for five Central and Eastern European (CEE) countries: the Czech Republic, Hungary, Poland, Russia, and Slovakia. We compare these income trends to changes in the income of the working population and also investigate the feasibility of finding additional resources to compensate for low benefits. Income is regressed on employment status, human capital, place of residence, and the interactions between employment status and human capital and place of residence, controlling for several demographic characteristics. Interactions with time are included to capture across-time variation, which represents the influence of the reconstruction of the social safety net on the income of people depending on social benefits during the market transformation process.

The Social Safety Net

The socialist regimes proclaimed an ideology of equality manifested in destratification of society by way of political intervention. The large industrial sector depended on full employment of the labour force, resulting in low or non-existing unemployment. The command economy also promised 'cradle-to-grave' income security with generous pension benefits (Fox, 1998), which were collectively taken care of and provided by the state (Müller, 2002a). The Communist countries of Central and Eastern Europe were legally committed to providing universal welfare services, which applied to every citizen (Kornai, 1998). Welfare services provided from outside the central welfare system were not allowed. Although universal entitlements such as food, medicine, housing, day care, kindergartens, and after-school centres were promised, the public was disappointed with the low standard of services actually provided.

The 1989 transition changed many political and economic institutions, which, in turn, altered the allocation of resources. There were two major consequences of the market transformation process that influenced the socioeconomic position of social benefit holders. The first was that, during market reform, it became clear that the large public sector was inefficient and unsustainable and had to be scaled down. Subsequently, employment in state enterprises rapidly declined. The emerging and expanding private sector was unable to absorb all the jobless people, and unemployment has risen dramatically since the 1989 transition (Blanchflower, 2001; Rutkowski, 2003a, b). Unemployment rates in the Czech Republic increased from 4.1 per cent in 1991 to 7.5 per cent in 1998, and in Russia, unemployment increased from 0 to 12.4 per cent during the same period (European Bank for Reconstruction and Development, 1999).

This burgeoning unemployment forced the governments of CEE countries to implement new unemployment compensation systems (UCSs). By the end of 1991, all CEE countries had established a UCS, which shared six principal features (Ham *et al.*, 1998: 1121–1122): (i) to receive unemployment compensation, people needed to have been employed for a minimum period ranging from 6 months during the preceding year (Poland) to 1 year in the preceding 3 years (Czech Republic, Hungary, and Slovakia); (ii) the duration of unemployment compensation was similar for all workers; (iii) the amount of unemployment benefits was based on the replacement rate of the previous wage; (iv) the replacement rates dropped over the entitlement period (except in Poland); (v) a low maximum benefit level of 1.4–2.0 times the minimum wage was set; and (vi) there was no indexation of benefits for inflation.

The second major consequence of the market reforms that influenced the income position of social benefit holders was that existing sets of social security institutions were mainly left untouched, especially during the early years of transition, when macroeconomic and political reforms were given more attention than reforming the social safety net (Müller, 2002b). After several years, distribution and social security issues attracted greater attention. Pension reform, in particular, was inevitable. The public pension schemes are considered to have been very generous compared with those of some of the richest countries in the world (Fox, 1998). During the transformation process, the retirement age was still very low, resulting in a relatively long post-retirement life span. Furthermore, special provisions existed for people with disabilities and people from selected occupations. To make things worse, the downsizing and closing of firms resulted in people leaving the labour market to claim disability pensions and early retirement, placing heavy burdens on public

pension schemes. Subsequently, the percentage of the labour force contributing to public pensions declined rapidly, translating into plummeting coverage ratios, and eventually into gradual erosion of the social protection of the elderly.

It became clear that the existing social security system needed to be adjusted to cope with the changing economic situation. Desirable reform measures included increasing the retirement age, abolishing special privileges, separating pension schemes from other social insurance plans and from the state budget, and introducing employees' contributions along with automatic indexation to adjust to price and/or wage increases. During times of high inflation, this resulted in insufficient retirement incomes and serious distortions of the relative levels of benefits (Impavido, 1997; Müller, 2002b). Not surprisingly, the suggested reforms met with fierce resistance and policymakers were forced to compromise on the speed and/or scope of reform. In 1998 and 1999, further reforms were introduced in Hungary and Poland in the form of notional defined contribution (NDC) schemes (Müller, 2002b) and a public–private mix to supplement state pensions (Müller, 2002a). The NDCs tied benefits more closely to contributions and automatically adjusted the benefit level to a shortening of the period of contribution and/or an extension of the years of retirement.

Because of the negative economic growth during the first years of market reform, growing unemployment, and the unbearable costs of the pension systems, post-Communist countries faced heavy burdens on their state budgets, making their social security systems become unsustainable. The social security net had to be readjusted and redesigned in order to cut state expenditures. UCSs had to be established and public pay-as-you-go (PAYG) pension schemes had to be revised. At the same time, the governments of CEE countries had to guarantee an adequate social safety net, while reducing state intervention and controlling their budget deficits. This resulted in a reduction of the level of unemployment protection (Ham *et al.*, 1998).

Hypotheses

While the changing social security provisions had consequences for all social groups that depended on social benefits, this study is limited to specific social groups, whose socioeconomic situation has been clearly influenced by the market reforms and accompanying changes in the social security system: the unemployed and pensioners.

Social benefits provided by the state are sources of income that compensate people who do not receive an income from employment. In this respect, people who depend on the state to provide their income lack resources compared with people who are employed. Vecerník speculates that people living exclusively from official wages or those dependent on social transfers were disadvantaged by market reforms and the self-employed and businessmen are favoured (Vecerník, 2001).

Market reforms were accompanied by changes to the welfare system of the command economies of Central and Eastern Europe (see previous section). Price inflation and the erosion of welfare programmes and subsidies were typical features of market reforms in post-Communist countries. The IMF, World Bank, OECD, and EBRD predicted substantial hardships for many social groups in the population during the transformation due to the emergence of market mechanisms in the economies of CEE countries and the removal of existing governmental interventions (IMF *et al.*, 1991). That market reforms could disadvantage the weak and poor has already been pointed out by Szelenyi and Manchin, who claimed that in Hungary the 'real pauperization took place' for those at the 'bottom of the income hierarchy' (Szelenyi and Manchin, 1987, p. 122).

As a consequence of the retreat of the state and subsequent cuts in state budgets, one could expect the incomes of people dependent on social benefits to decrease in post-Communist countries as they went through the process of market reform. However, based on a study in China, Nee (1991, p. 272) pointed out that under the condition that market reforms result in economic growth, 'the poor instead may experience direct material gains'. China experienced economic growth during the transformations in the mid-1980s, but most post-Communist countries in Central and Eastern Europe experienced negative economic growth during the first years of market transformation (World Bank, 1996). Furthermore, economic growth may result in absolute gains for the poor, but in relative terms—compared with those with more resources—their income may increase less. Because marketization tends to favour those with more resources and would, therefore, tend to erode the welfare programmes and subsidies of the Communist states, the incomes of the people depending on social benefits would be expected to decrease—at least relative to the incomes of employed people.

When redesigning the institutions that allocate resources and persons, simultaneous readjustments to the social security system are essential, but these adjustments lagged behind the economic 'shock therapy'

reforms in CEE countries. The early years of transformation in post-Communist countries were mainly characterized by political reforms and macro-economic reforms like the liberalization of markets and the privatization of enterprises (Stern, 1998), leaving existing social security institutions mainly untouched (Müller, 2002b). As a result the pension schemes from the Communist era were maintained and during the first years of market reform the people depending on pensions found themselves in a relatively protected income situation. Later in the transformation process, the increasing burdens of the pension schemes inevitably forced CEE countries to adjust the pension schemes. This will affect the income of pensioners and we expect a decreasing trend later in the transformation process.

On the other hand, unemployment reemerged and UCSs had just been established. It takes some time before the established UCSs take effect, which left the unemployed in a vulnerable income situation. Thus we expect that the income of the unemployed will decrease during the early years of transformation.

Hypothesis 1A: The income of pensioners remained stable during the early stage of market transformation, while it will decrease later in the transformation process.

Hypothesis 1B: The income of the unemployed will decrease during the early stage of market transformation, a trend that will be reversed later in the transformation process.

The predicted trends in the income of social benefit holders are presented in Figure 1. Note that these trends are hypothetical. Because most CEE countries suffered from high inflation rates during the early 1990s, we plotted a slightly decreasing trend in the income of workers. The key argument is that late in the transformation process the income of pensioners decreased and that the income position of the unemployed decreased during the early years of market reform. Thus *Hypothesis 1A* will be confirmed if the estimated income of pensioners remain the same from 1992 to 1995 and show a decreasing trend from 1995 to 2002. *Hypothesis 1B* will be confirmed if the estimated income of the unemployed decrease from 1992 to 1995 and level off after 1995. In addition, presenting estimated incomes in this way will also reveal the income position of the social benefit holders relative to the incomes of workers. In this situation, the income of the unemployed is not necessarily expected to decrease in absolute terms, but because the incomes of workers increase, the income position of the unemployed becomes relatively worse. Thus, the unemployed may be losers in the market transformation process in either absolute terms or in relative terms compared with workers.

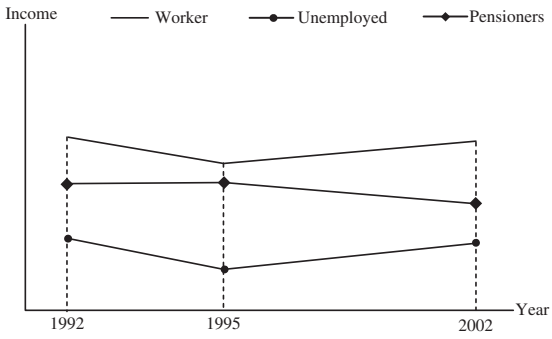


Figure 1 Hypothetical trends in the real incomes of workers and social benefit holders

Above we argued that the turbulent early transformation years in CEE countries were hard times especially for the unemployed. Now we argue that in such a situation, having additional resources would be helpful in preventing people from falling below the poverty line.

The market transition debate revolves around the Market Transition Theory, which predicts increasing returns to human capital at the expense of returns to political capital. It is argued that, during market reforms, human capital becomes more important for allocating resources (Nee, 1989, 1991, 1996). Education has proven to be a useful representation of human capital (Mincer, 1958; Schultz, 1963). Several synthesizing studies indicate that income returns to human capital increase during market transformation (Cao and Nee, 2000; Fleisher *et al.*, 2005; e.g. Nee and Cao, 1999; Nee and Cao, 2002; Verhoeven *et al.*, 2005). Thus, having a high level of education can be seen as an additional resource for people depending on social benefits.

One of the principal features of the UCSs established in CEE countries by the end of the 1990s was that the level of unemployment benefits was based on replacement rates for the previous wage (Ham *et al.*, 1998). If more education leads to higher incomes and more income leads to higher unemployment benefits, then unemployed people with more education will have had higher incomes than unemployed people with less education. It follows, then, that if income returns to education increase during market reform, unemployed people with more education will be better able to maintain their income position than unemployed people with less education.

Pension benefits can be supplemented if the elderly have much human and political capital (Xie and Hannum, 1996). Having human capital and/or market capital would have increased their possibilities

of participating in the post-retirement labour market and, subsequently, supplementing their pension income. In the former Communist countries, pension privileges (such as a lower retirement age and higher pensions) were granted for occupations of strategic importance (Müller, 2002b), which were mostly occupied by people with political capital.

Another important feature of why education can be regarded as being an additional resource is that higher educated social benefit holders might accumulate more savings before they left the labour market. Higher educated social benefit holders might also have more opportunities to find part-time jobs to supplement their income in case they are unwilling to leave the labour market.

Hypothesis 2: The higher educated social benefit holders are, the more income they will have, and the less their income will have decreased during the early stage of the transformation process.

Most of the studies in the market transition literature report lower incomes for people in rural areas, compared with urban dwellers (Boyle Torrey *et al.*, 1998). The reasons for this are that market developments tend to progress more rapidly in cities than in rural areas, rural areas suffer more from negative economic growth, and rural areas are more vulnerable to the impact of reductions in agricultural production (World Bank, 2004). Thus, people living in cities can be expected to have more opportunities for accumulating income. In this study, we assume that this also holds for social benefit holders. For pensioners this could mean participating in the post-retirement labour market (Raymo and Xie, 2000) or finding a job in the second economy. Note that rural areas may provide more opportunities to supplement state benefits by growing vegetables in a yard or to reduce expenditure through inexpensive housing. Thus, it may be the case that the income of social benefit holders is higher in urban areas but that the standard of living of social benefits holders in rural areas is equal to or even higher than their urban counterparts.

Hypothesis 3: Social benefit holders living in urban areas will have more income than social benefit holders living in rural areas, and the income difference will increase during the early stage of the transformation process.

Data

In this article, we have used 50 standardized cross-sectional surveys on the Czech Republic, Hungary, Poland, Russia, and Slovakia, covering a period from 1991 to 2002 (see Table A1 of the Appendix for an overview of the data sources). These surveys were selected because of their information on personal income, human capital, and demographic characteristics. Only respondents who were unemployed, retired, disabled, or employed were selected for the analyses in this study. Respondents in an employment category such as house keeping, student, military personnel, and 'other' have been left out of the analyses. This selection left a total of 81,914 individuals.[1]

Questions about individual or household income tend to result in a large number of missing values (Moore *et al.*, 2000), over all our 50 standardized data sets, 6,930 respondents did not report their income. Descriptive statistics showed that there were no problematic differences in the distributions of the independent variables between the respondents who did not give their income and the respondents who did. Removing those respondents and any with additional missing values on the independent variables left a final data set of 73,631 for the analyses.

Measures

Dependent Variable

Ideally, the dependent variable of this study would consist of the actual unemployment and pension benefits, which represent the personal income of the social benefit holders and can be compared with the personal income (salaries) of workers. This could then be regressed on personal characteristics like education, experience, age, gender, and so on. Unfortunately, the data used in this study do not contain information on the actual benefits that the unemployed and pensioners receive.

We use monthly personal income as the dependent variable. Measuring income is known to be problematic. People are reluctant or not able to report their income precisely. The loss of data is reduced by substituting the missing values on personal income by, when available, household income divided by 'OECD-modified scale' (Hagenaars *et al.*, 1994). Sensitivity analyses showed that this did not affect the results reported here.

Combining income data for several countries over time generates some comparability problems. First, CEE countries have been confronted with relatively large inflation rates, resulting in a decline in real income. Table 1 reports the mean monthly *nominal* personal incomes by country and by year. In all CEE countries, the mean monthly (nominal) personal income increased steadily. The effects of devaluating the currency—necessary to stop hyperinflation—in Poland in 1995 and in Russia in 1998—are clearly visible.

Table 1 Descriptive statistics of monthly (nominal) personal income in the Czech Republic, Hungary, Poland, Russia, and Slovakia, 1991–2002

	Czech Republic		Hungary		Poland		Russia		Slovakia	
	Mean	*N*	Mean	*N*	Mean	*N*	Mean	*N*	Mean	*N*
1991	–	–	–	–	–	–	286	2,363	–	–
1992	4,126	564	11,175	1,093	1,717,033	1,416	1,244	1,630	–	–
1993	4,360	5,044	14,609	4,296	–	–	29,644	5,652	3,968	4,128
1994	5,530	691	16,754	1,262	3,731,255	3,749	190,879	1,424	–	–
1995	6,092	663	19,995	865	–	–	–	–	5,160	1,186
1996	6,471	1,840	22,739	2,193	692	1,024	623,267	1,226	–	–
1997	8,111	803	24,176	1,242	705	1,030	608	1,249	–	–
1998	7,908	715	30,549	828	861	944	804	930	6,373	1,136
1999	8,428	1,455	37,148	956	869	936	762	1,200	8,967	940
2000	9,487	641	46,008	738	–	–	1,160	1,275	–	–
2001	9,021	814	–	–	1,012	1,059	2,260	7,354	–	–
2002	9,596	921	57,819	779	1,010	1,041	2,214	1,337	8,882	999
All years	6,415	14,151	23,374	14,253	1,466,467	11,200	47,952	25,638	5,607	8,389

To deal with the problem of high inflation rates, the monthly (nominal) personal income, for each country within each year, is divided by the mean monthly personal income of that country-year combination. This leaves a dependent variable, indicating relative (compared with the mean) income differences. Using this procedure, it is assumed that inflation affects the amount of income more severely than the distribution of income, which is reflected in changes in the mean income.[2] Hereafter, the variable is transformed to a logarithmic scale, which is a 'standard' procedure by now.

Explanatory Variables

All our analytical models focus on the income effects of unemployment and pensions (retirement and disability). Interactions with time are included to capture across-time variations in the income effects of unemployment and pensions. Additional resources are operationalized as education and living in urban areas of which the descriptive statistics are reported in Table 2. To save space, the descriptive statistics are given for the five CEE countries grouped together. Separate analyses showed that they were similar across all five countries.

Employment status

In all surveys, respondents were asked for their employment status. In this study, two groups of people who were dependent on social benefits are distinguished from workers, using dummy variables: *Unemployed* and *Pensioners* (*Employed* being the reference category). The category *Pensioners* holds retired as well as disabled people. We believe that, together, they form a different group from the unemployed people. The retirement and disability pensions were to some extent protected against inflation, while unemployment benefits were created during post-Communist times. Hence, the unemployment benefits tend to be low and follow changes in real incomes and pensions tend to remain close to socialist levels. Furthermore, disability and early retirement were defined differently across countries and in some countries early exit from employment through disability and retirement pensions was more frequent than in others (Blossfeld *et al.*, 2006). Table 2 shows that of the total respondents 65 per cent was employed, 5.8 per cent was unemployed, and 29.2 per cent was retired or disabled. The overall percentage of unemployed people in our data set was low because during the early 1990s unemployment levels were still relatively low. Furthermore, unemployment levels based on survey data tend to be lower than official registrations (Sánchez-Páramo, 2002).

Education

We measured *Education* as years of education reported by the respondents, which (except for the ISJP96 and the EE93 for Poland) is contained in most of our data sets. For these data sets, educational degrees were used to approximate the years of education.[3] Extreme values were recoded to a maximum corresponding to the standard duration to achieve the highest level of education given the country specific educational system. In the Czech Republic and Slovakia, people are generally 25 years in the educational system to finish university, in Hungary 24 years, and in Poland 23 years. On average, people in Central and Eastern Europe attend 11 years of education (Table 2).

Table 2 Descriptive statistics of respondents 18 years and older in the Czech Republic, Hungary, Poland, Russia, and Slovakia grouped together, 1991–2002

Variables	*N*	Minimum	Maximum	Mean	SD
Age 35	73,631	−17	64	11.34	15.76
Years of education	73,631	0	25	11.10	3.29
Time	73,631	0	11	4.41	3.56
Employment status					
Total	73,631				
Employed (%)	65.0				
Unemployment (%)	5.8				
Pensions[a] (%)	29.2				
Region					
Total	73,631				
Rural (%)	34.4				
Urban (%)	65.6				
Gender					
Total	73,631				
Men (%)	48.4				
Women (%)	51.6				
Marital status					
Total	73,631				
Single (%)	14.1				
Widowed (%)	19.1				
Married (%)	66.8				

Note: [a]*Disability and retirement pensions.*

Region

Not all data sets have information on the size of the place of residence and only distinguish between urban and rural regions. Therefore, a dichotomous variable *Urban* ('0' for rural and '1' for urban) was constructed for all surveys. Dividing place of residence into urban or rural regions is arbitrary. As a general rule of thumb, a cut-off point of 5,000 inhabitants was used for the Czech Republic and Slovakia:[4] areas with fewer than 5,000 inhabitants were rural and 5,000 and above were urban. For Hungary, Poland, and Russia, a cut-off point of 10,000 inhabitants was used. Table 2 shows that most respondents (66 per cent) lived in urban areas.

Time

The *Time* variable was computed as year 1992 for the Czech Republic, Hungary, and Poland; year 1991 was used for Russia; and year 1993 was used for Slovakia. This means that *Time* runs from 0 (1992) to 10 (2002) for the Czech Republic, Hungary, and Poland; 0 (1991) to 11 (2002) for Russia; and 0 (1993) to 9 (2002) for Slovakia. In the section on hypotheses, we theorize that the trends in income effects early in the transformation process were different from those later on in the transformation process. It is hard to determine the cut off point between early and late in the transformation process. Economic growth rates or inflation rates may provide a way to make this distinction. However, these data change wildly from year to year, making them unusable. Therefore, for the Czech Republic, Hungary, and Poland 1995 (*Time* = 3) was used to distinguish between early and late transformation. The argument is as follows: if the institutional changes of the early 1990s had an effect, this should be visible (at least partially) during the late 1990s. Because of the delayed market reforms in Russia we extended the early transformation process to 1997 (*Time* = 6).[5] For Slovakia we also used the period until 1997 as the early transformation period. This was necessary because otherwise there was only one data point available for the early transformation period (see Table A1 of the Appendix).

Control Variables

Besides the explanatory variables, several 'standard' control variables were included in the models.

Female

Men were coded as '0' and women as '1'. About 52 per cent of the respondents were women and about 48 per cent were men (Table 2).

Age

Respondents of 18 years and older were selected for the analysis. Age was centred on 35 years of age and a squared term was also included in the models. The oldest respondent in the stacked sample was 99 (64 + 35) years of age, and on average, the respondents were about 46 (11 + 35) years of age (Table 2).

Marital status

Marital status was coded into the dummy variables *Single* (reference category), *Widowed*, and *Married*. The dummy variable *Widowed* contained both widowed and divorced respondents. Some data sets also distinguish cohabitating couples from married couples. In these cases, the cohabiting couples were coded as married. More than half of the respondents were married, 19 per cent were widowed or divorced, and 14 per cent were single (Table 2).

Methods

The analytical strategy was to estimate two sets of OLS regression models (see models 1 and 2 in Table A2 in the Appendix) using the stacked data sets for the Czech Republic, Hungary, Poland, Russia, and Slovakia. First, model 1 assessed whether there was a linear trend in the income of social benefit holders with different resources. Second, model 2 is an interrupted linear regression model, which estimated a 'broken' trend in the income effects over time, as implied by *Hypotheses 1* through *3*. Such a model is referred to as *interrupted* because before and after a certain breaking point (called a 'knot') the slopes are allowed to be different (Marsh and Cormier, 2002).

An example of a 35-year-old, unemployed Czech man is used here to explain the interrupted linear regression model. To illustrate how such a model should be interpreted, let us first show how the ln(Income)[6] of the unemployed man with few resources changed when we assume a linear trend. Note that the 35-year-old unemployed man has no education and lives in a rural area. This means that only the coefficients of the *Intercept* (β_0), *Time* (β_1), *Unemployed* (β_6), and *Unemployed* × *Time* (β_7) of model 1 for the Czech Republic in Table A1 will be used. All other variables take the value '0' and are cancelled from the regression equation. This leaves the following equation:

$$\ln(\text{Income}) = \beta_0 + \beta_1 \text{Time} + \beta_6 \text{Unemployed} + \beta_7 \text{Unemployed} \times \text{Time} \quad (1)$$

Thus, the effect of *Time* depends on being unemployed. To illustrate this, (1) is reformulated to denote the ln(income) of the unemployed man with few resources as a function of *Time*:

$$\ln(\text{Income}) = (\beta_0 + \beta_6) + (\beta_1 + \beta_7) \times \text{Time} \quad (2)$$

From (2) it follows that changes over time in the ln(Income) of the unemployed man are assessed by coefficients β_1 and β_7, which is indicated by the slope of the line U_1U_2 in Figure 2. Using the coefficients reported in model 1 for the Czech Republic in Table A2 in the Appendix, the income of the unemployed man increases by $-0.006 + 0.132 = 0.126$ for each year that passes. Using the covariance matrix, the variance of the combined coefficient is calculated to determine whether the change over time is significant. To illustrate this, we can look at the change in ln(Income) of the unemployed man over the period from 1992 to 2002. During this period, his ln(Income) changes by $(-0.006 + 0.132) \times 10 = 1.260$. The variance of $(10\beta_1 + 10\beta_7)$ is computed from (3):[7]

$$\text{VAR}(10\beta_1 + 10\beta_7) = 10^2\text{VAR}(\beta_1) + 10^2\text{VAR}(\beta_7) + 2 \times 10 \times 10 \times \text{COV}(\beta_1, \beta_7) \quad (3)[8]$$

where the squared standard errors of β_1 and β_7 yield VAR(β_1) and VAR(β_7).

During 1992 and 2002, the ln(Income) of the unemployed Czech man increased by a significant 1.260 ($P < 0.05$).[9]

Let us now turn to the interrupted linear regression model. In this study, the knot for the Czech Republic

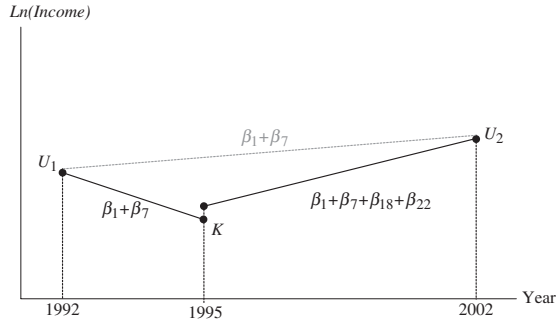


Figure 2 Illustration of a linear regression model and an unrestricted interrupted linear regression model

is placed at 1995 ($Time = 3$) and is depicted as *Knot* (see *K*, Figure 2). Note that $Knot = 0$ when $Time \leq 3$ and $Knot = 1$ when $Time > 3$. To estimate whether the trend in the ln(Income) of the unemployed man after 1995 was different from the trend up to 1995, the coefficient β_{18} of $Knot \times (Time - 3)$ and the coefficient β_{22} of $Unemployed \times Knot \times (Time - 3)$ are added to (1) (of which all coefficients are now retrieved from model 2 in Table A2 in the Appendix).

$$\begin{aligned}\ln(\text{Income}) = {} & \beta_0 + \beta_1 \text{Time} + \beta_6 \text{Unemployed} \\ & + \beta_7 \text{Unemployed} \times \text{Time} + \beta_{19} \text{Knot} \\ & + \beta_{18} \text{Knot} \times (\text{Time} - 3) \\ & + \beta_{22} \text{Unemployed} \\ & \times \text{Knot} \times (\text{Time} - 3) \end{aligned} \quad (4)$$

This equation may be evaluated for an unemployed male Czech with few resources as a function of *Time*. Up to 1995 ($Knot = 0$), the equation is as follows:

$$\ln(\text{Income}) = (\beta_0 + \beta_6) + (\beta_1 + \beta_7) \times \text{Time} \quad (5)$$

From (5) it follows that up to 1995, changes in the ln(Income) of the unemployed man are assessed by the coefficients β_1 and β_7, which is indicated by the slope of line U_1K in Figure 2. Using the coefficients from model 2 for the Czech Republic in Table A2 in the Appendix, the ln(Income) of the unemployed man increased by $-0.037 + 0.455 = 0.418$ for each year that passed until 1995. The change in the ln(Income) from 1992 to 1995 ($Time = 3 - 0 = 3$) of the unemployed man in the Czech Republic ($[-0.037 + 0.455] \times 3 = 1.254$) is significant ($P < 0.05$). This is the trend from 1992 to 1995 for the unemployed plotted in Figure 3A.

Equation (6) expresses the ln(income) of the unemployed Czech man as a function of *Time* after 1995 ($Knot = 1$).

$$\begin{aligned}\ln(\text{Income}) = {} & (\beta_0 + \beta_6 + \beta_{19}) + \\ & (\beta_1 + \beta_7 + \beta_{18} + \beta_{22}) \times \text{Time} \end{aligned} \quad (6)$$

Coefficients β_{18} and β_{22} [see (4)] indicate whether the trend in the ln(Income) of the unemployed Czech man after 1995 is different from the trend up to 1995. This means that the actual trend after 1995 is assessed by coefficients β_1, β_7, β_{18}, and β_{22} [see (6)], which is indicated by the slope of line KU_2 in Figure 2. The ln(Income) of the unemployed Czech man decreased after 1995 by $-0.037 + 0.455 + 0.023 - 0.421 = 0.020$ for each year that passed. The change in the ln(Income) from 1995 to 2002 ($Time = 10 - 3 = 7$) of the unemployed man in the Czech Republic ($[-0.037 + 0.455 + 0.023 - 0.421] \times 7 = 0.140$) is not significant. This is the trend from 1995 to 2002 for the unemployed plotted in Figure 3A. The other trends plotted in Figures 3–7 are constructed in the same way.

Results

Introduction

The results reported in Table A2 in the Appendix show that the increase in R^2 between the linear regression model (model 1) and the unrestricted interrupted linear regression model (model 2) is significant for all countries. This means that modelling the across-time variation as a linear interrupted trend increases the explained variation and is the preferred model for testing the hypotheses, therefore.

The full models with the numerous interaction effects among regressors, between regressors and time, and between the interactions among regressors and time (Gerber and Hout, 1998, p. 27) are very complex, making them hard to comprehend. Therefore, the changes in income of workers, the unemployed, and the pensioners are plotted in several figures. The changes in income of the people with few resources are plotted in figures (A), with 5 years of education in figures (B), with 10 years of education in figures (C), and living in urban areas in figures (D). We have used a 35-year-old person as an example to illustrate the income of workers and the unemployed. To illustrate the income of pensioners, a 55-year-old person is used as an example.

The Czech Republic

Figure 3 presents the trends in the incomes of workers, the unemployed, and pensioners for the Czech Republic. A striking result is that the unemployed people clearly had the lowest income. Furthermore, the incomes of the pensioners closely resembled those of the workers. Figure 3A shows that the income of the unemployed and pensioners with few resources increased during early transformation period, while the income of workers with few resources remained the same. In 1995, the unemployed still had the lowest income and the income of the pensioners was slightly higher than that of the workers (these differences were significant). These differences in income between the three groups remained the same after 1995 as no trends after 1995 were significant. The results show that the income position of the pensioners was relatively protected. Their income was comparable or even slightly higher than that of the workers. This is in line with *Hypothesis 1A*.

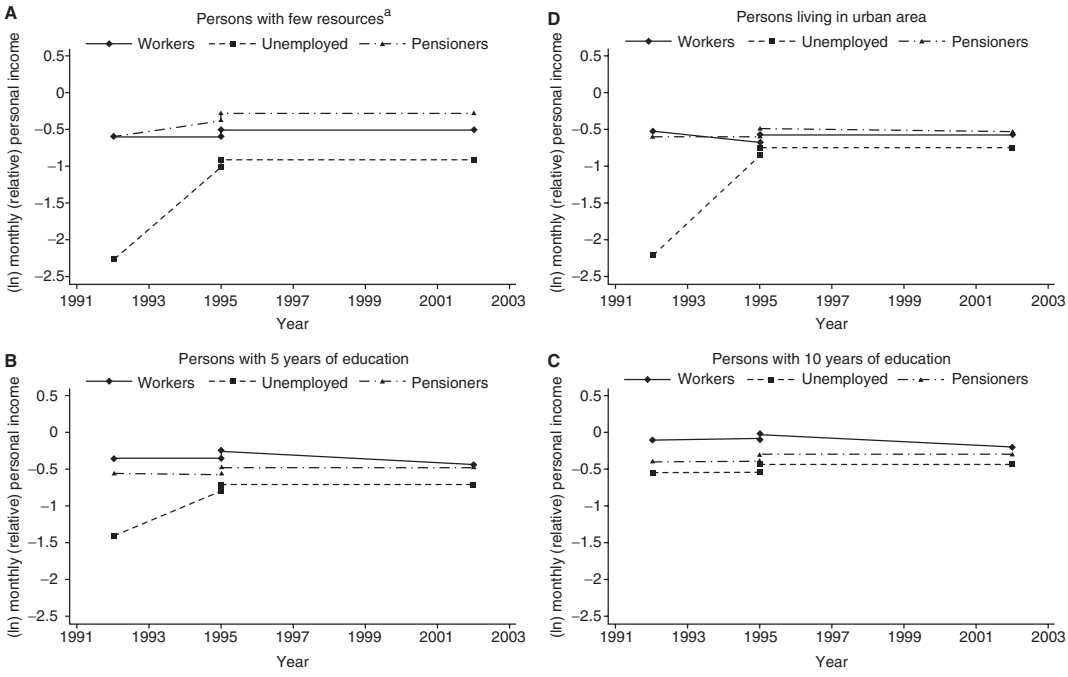


Figure 3 ln(Income) trends for workers, the unemployed, and pensioners in the Czech Republic, 1992–2002

The results on the unemployed reject *Hypothesis 1B*, which predicted the opposite: a decreasing trend in the income of the unemployed up to 1995 and an increasing trend thereafter.

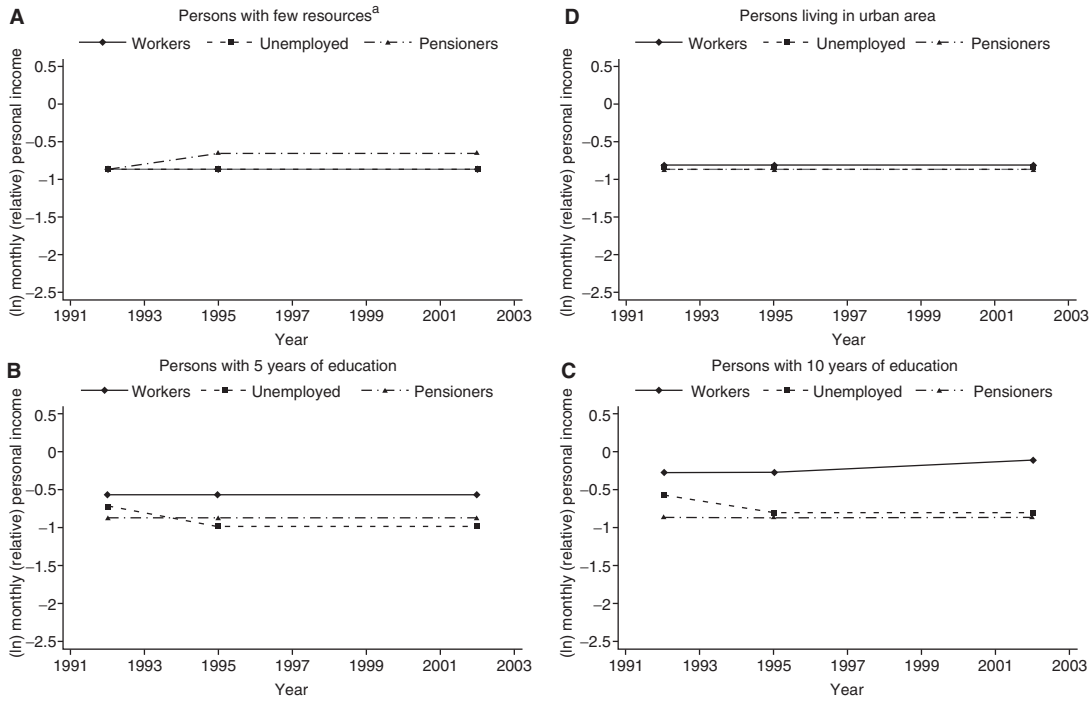
Figure 3B and C present the trends in the income of people who had 5 and 10 years of education. For all three groups education was a valuable resource, leading to a higher income. However, the sharp increase in income of the unemployed people from 1992 to 1995 only held for the uneducated unemployed and the effect of education on income for the pensioners did not change over time. The results show that education was important for people depending on social benefits, but not particularly during early transformation. Therefore, *Hypothesis 2* is partially supported.

The results of the income returns to living in urban areas, presented in Figure 3D, show that the income of unemployed people who lived in urban areas increased more from 1992 to 1995 than unemployed people who lived in rural areas. This is in line with *Hypotheses 3*. After 1995 the income of unemployed people remained the same. The income of pensioners who lived in urban areas remained the same from 1992 to 1995, while the income of pensioners who lived in rural areas increased. This contradicts *Hypothesis 3*. Based on these results the conclusion concerning *Hypothesis 3* are inconclusive.

Hungary

The trends in the income of workers, the unemployed, and pensioners with few resources in Hungary are presented in Figure 4A. The incomes of all three groups closely resembled to each other. The incomes of workers and the unemployed remained the same over the whole period, while the income of pensioners slightly increased from 1992 to 1995. The results are in line with *Hypothesis 1A* because the income position of pensioners was slightly better than the income position of the workers and the unemployed. The results show that the income situation of the unemployed with few resources was not worse than the income situation of workers with few resources. Based on these results, *Hypothesis 1B* has to be rejected.

The incomes of people with 5 and 10 years of education are presented in Figure 4B and C. Workers benefited from having more education. Especially during the late transformation period, highly educated worker saw their income increase. The figures also show that more education did not result in higher



Note: [a]*Persons with no education and who live in a rural area.*

Figure 4 ln(Income) trends for workers, the unemployed, and pensioners in Hungary, 1992–2002

income for the unemployed and pensioners. Only in 1992, the higher educated unemployed people had higher incomes than the lower educated unemployed people. This income advantage vanished from 1992 to 1995 and the income remained the same after 1995. Higher educated pensioners did not have higher incomes than lower educated pensioners and their income remained the same over the whole period. These results contradict *Hypothesis 2*.

Figure 4D presents the trends in the income of people who lived in urban areas. Again, only the workers benefited from living in urban areas. The income of workers living in urban areas was slightly higher than the income of workers living in rural areas and the income did not change over time. Urban residence had a negative effect on the income of pensioners. The income of pensioners living in urban areas remained the same over the whole period, while the income of pensioners living in rural areas slightly increased from 1995 to 2002. We found no significant income differences between the unemployed living in rural areas and the unemployed living in urban areas. The results indicate that urban residence does not function as an additional resource for social benefit holders in Hungary, which contradicts *Hypothesis 3*.

Poland

The trends in the incomes of workers, the unemployed and pensioners for Poland are presented in Figure 5. Figure 5A shows that the income of workers with few resources decreased from 1992 to 1995, while the income of pensioners remained stable. The same pattern can be seen from 1995 to 2002. This indicates that the income position of the pensioners was relatively protected in Poland, which confirms *Hypothesis 1A*. The income of the unemployed with few resources was clearly the lowest but remained the same over the whole period. Although the income position of the unemployed was poor it did not grow worse during the early years of the transformation process. Based on these results *Hypotheses 1B* is rejected.

Figure 5B and C present the trends in the income of people with 5 and 10 years of education. The figures clearly show that in Poland education was an important income determinant for all three groups. For the workers and the pensioners the income returns to education did

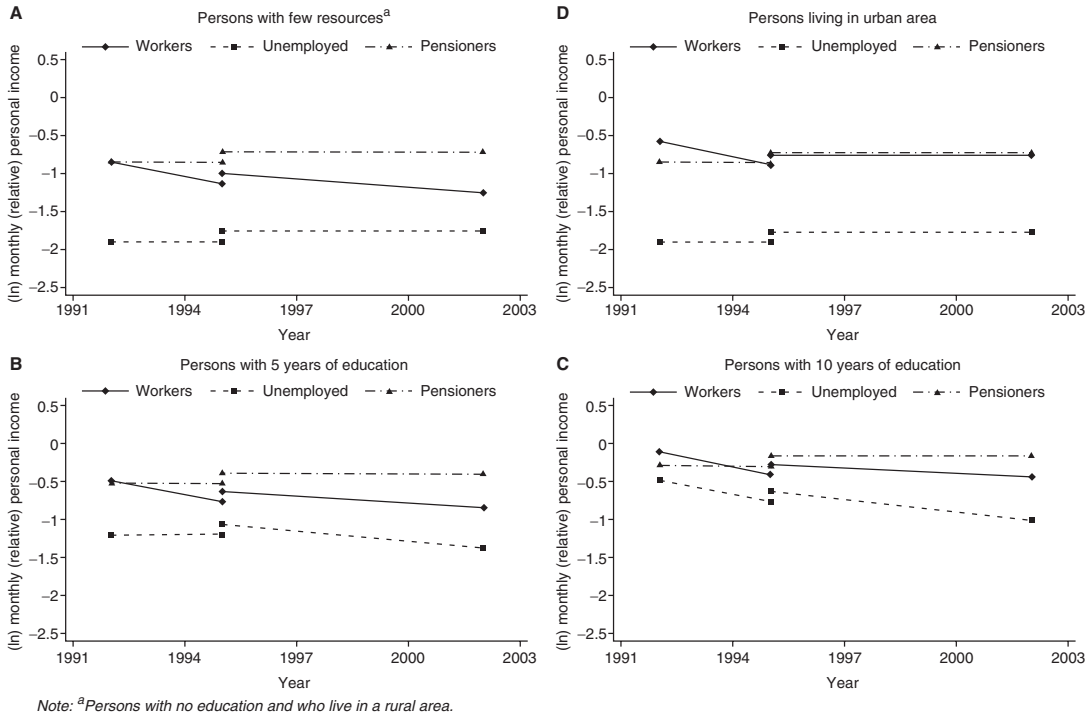


Figure 5 ln(Income) trends for workers, the unemployed, and pensioners in Poland, 1992–2002

not change during market reform. On the other hand, although education was beneficial for the unemployed, the income returns to education decreased during market reform. Thus, education was an important additional income resource for social benefit holders but it did not help the unemployed to maintain their income during the early years of market reform. These results are partly in line with *Hypothesis 2*.

The incomes of people living in urban areas are presented in Figure 5D. Workers who lived in urban areas had a higher income than workers who lived in rural areas and their income remained stable after 1995. No income differences were found between social benefit holders who lived in urban areas and social benefit holders who lived in rural areas. Thus, urban residence had no effect on the income of social benefit holders, which rejects *Hypothesis 3*.

Russia

Figure 6 presents the trends in the incomes of workers, the unemployed, and pensioners in Russia. Figure 6A shows that the income of workers decreased from 1991 to 1997. During the same period the income of pensioners remained the same. After 1997 the income of workers slightly increased and the income of pensioners remained stable. Thus, in relative terms the income of pensioners decreased. These results are in line with *Hypothesis 1A*. The income of the unemployed decreased even sharper from 1991 to 1997 than the income of workers. After 1997 this decreasing trend reversed. These results confirm *Hypothesis 1B*.

The incomes of people with 5 and 10 years of education are presented in Figure 6B and C. The results show that education was beneficial for all three groups. No significant trends in the income returns to education were found for the social benefit holders. Thus, although higher educated social benefit holders had more income than lower educated social benefit holders, their income did not decrease less during the early years of transformation. These results are partially in line with *Hypothesis 2*.

The results for the income returns to living in an urban area are presented in Figure 6D. Living in an urban area was beneficial for all three groups and especially for the unemployed during the early years of transformation. Urban residence protected the unemployed against the turbulent early transformation years. The results on the unemployed are in line with *Hypothesis 3*. The results on pensioners are partially

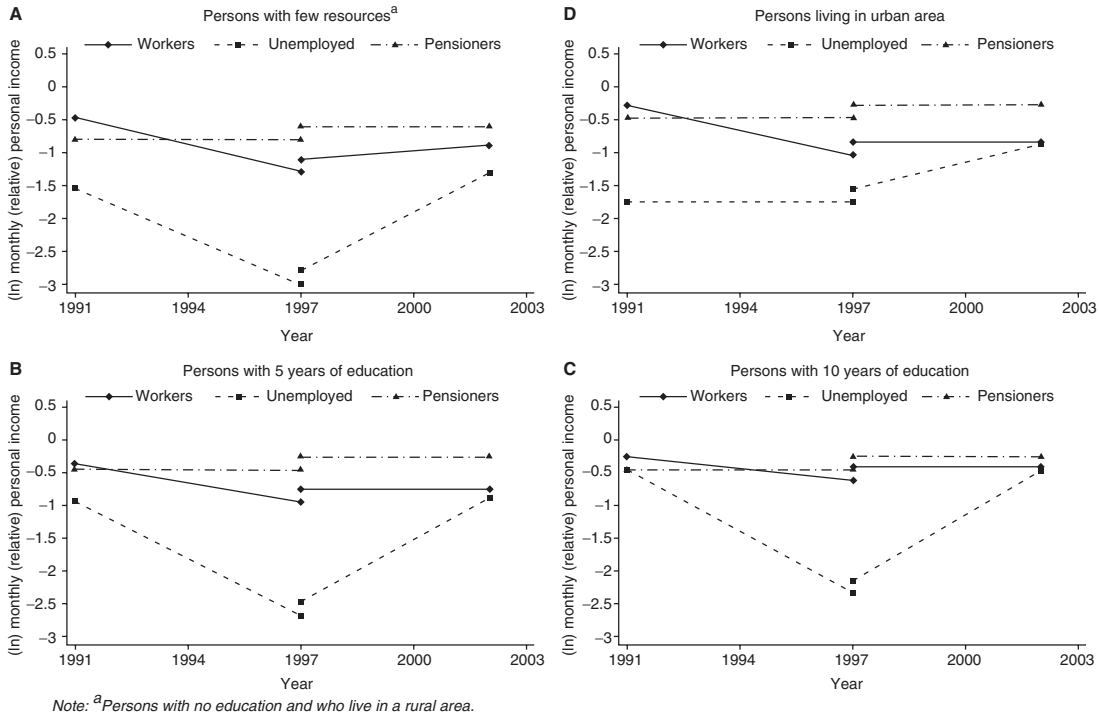


Figure 6 ln(Income) trends for workers, the unemployed, and pensioners in Russia, 1991–2002

in line with *Hypothesis 3*. Their income was higher when they lived in urban areas but the income effect of urban residence did not increase during the early transformation years.

Slovakia

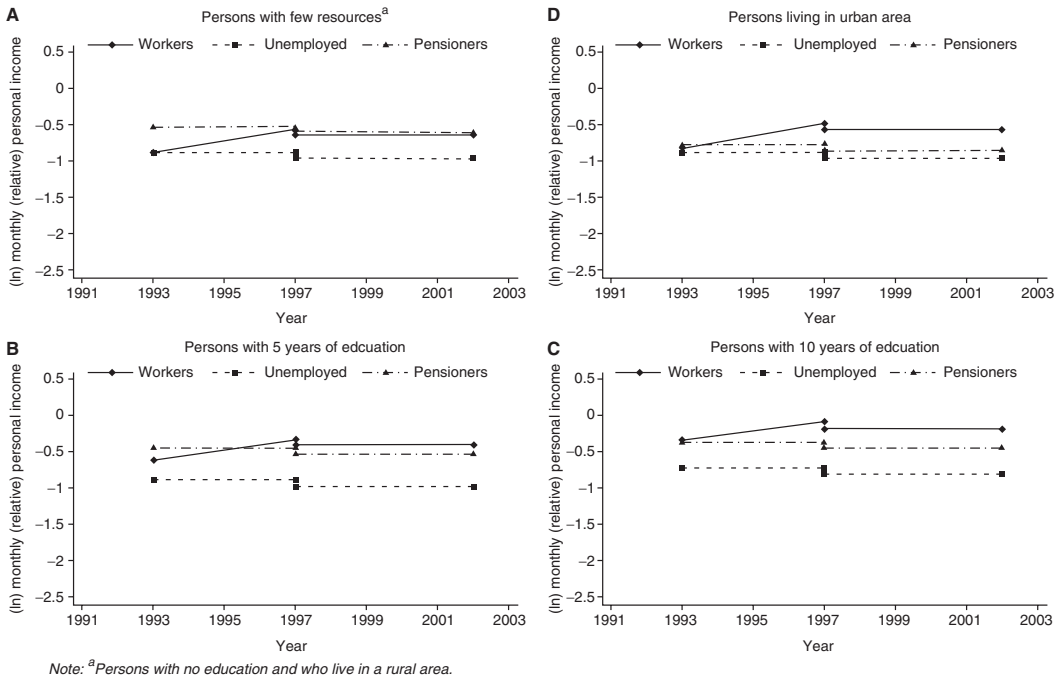
The Slovakian data are only available for five points in time. Therefore, the estimated coefficients provide only tentative results and conclusions are provisional. The results from the analysis are presented in Figure 7. Figure 7A shows that the income position of the pensioners was relatively protected. However, their income remained stable from 1993 to 1997, while the income of workers increased during that period. These results contradict *Hypothesis 1A*. The income of the unemployed was the lowest and their income remained stable from 1993 to 1997, while the income of workers increased. Thus, in relative terms their income position deteriorated during the early transformation years. After 1997 the income differences between the unemployed and workers remained the same. The results confirm *Hypothesis 1B*.

Figure 7B and C present the trends in the income of people with 5 and 10 years of education. All three groups benefited from having more education, but the workers benefited the most. Furthermore, no significant changes over time were found in the income returns to education. Thus, education was an important resource for social benefit holders to maintain their income but it did not help in particular during the early transformation years, partially confirming *Hypothesis 2*.

The incomes of people living in urban areas are presented in Figure 7D. Urban residence had only a positive effect on the income of workers. Furthermore, the income of pensioners living in urban areas was lower than the income of pensioners living in rural areas. This income difference remained the same during the whole period. No income differences were found between the unemployed living in urban areas and the unemployed living in rural areas. These results contradict *Hypothesis 3*.

Summary and Conclusions

Unlike most studies in the market transition debate, this study addressed the income position of the people who depended on the state to provide in their income: the social benefit holders. Much has changed for the social benefit holders since the 1989



Note: [a]*Persons with no education and who live in a rural area.*

Figure 7 ln(Income) trends for workers, the unemployed, and pensioners in Slovakia, 1993–2002

reforms. Rigorous institutional changes were inevitable, not only in the economic domain but also the social safety net had to be adjusted as well. Such a changeable and unstable situation will have had repercussions for the income position of social benefit holders.

Two questions were raised in this study. First, did the incomes of people depending on social benefits change in post-Communist countries? In general, the income of the unemployed with few resources tended to be clearly lower than the incomes of workers and pensioners with few resources (apart from Hungary). The low income of the unemployed is not surprising, because unemployment benefits tend to be low. The idea is that unemployed people are stimulated to go back to work when their benefits are kept low. The income of the unemployed with few resources changed in the Czech Republic and in Russia during the transformation process, but not necessarily for the worst. Only in Russia did we find a deterioration of the income of the unemployed with few resources, while in the Czech Republic in the income position got better during the early transformation years. It is known that real wages dropped in Russia during the early transformation years (Gerber and Hout, 1998); the same appears to be true for the incomes of the unemployed.

The income of pensioners with few resources more closely resembled the income of workers with few resources. Comparable results have been found in earlier studies where high social (cash) transfers were reported for Poland, especially with pensions (Keane and Prasad, 2002; Müller, 2002b). Furthermore, their income hardly changed in the five CEE countries over time and, apart from Slovakia, their income position improved in relative terms compared with workers during the early years of transformation. This seems to suggest that the income position of pensioners was relatively protected, even up to 2002. It is known that retirement and disability pensions were misused. People were pushed into early retirement and some used sick leave from their main job to work in the 'second economy' (Fajth, 1999; Müller, 2002b). This might be a reason for the relatively high income of pensioners, but it is difficult to assess the extent of this distortion.

Second, this study investigated whether social benefit holders found ways to maintain or supplement their income during the worst times. The second question addressed the idea that during the market transformation process, having additional resources would be beneficial in income attainment. In other words, to what extent can change in the income of social benefit holders be explained by the resources they have? Additional resources were approximated by education and living in an urban area. In general,

education provided income advantages for social benefit holders. The results on the trends in the effects of these income determinants are ambiguous. Education was especially beneficial for the unemployed in the Czech Republic during the early transformation years. On the other hand, the returns to education decreased for the unemployed in Hungary and Poland. For the unemployed in Russia and Slovakia and for pensioners no significant trends were found in the income returns to education.

The results on urban residence were inconclusive. Living in a city had a negative effect on the income of pensioners apart from Russia where pensioners living in urban areas had more income. Urban residence had a positive effect on the income of the unemployed in the Czech Republic and Russia and there was no income effect of urban residence in Hungary, Poland, and Slovakia.

To sum up, social benefit holders were to some extent successful in maintaining their income during the market transformation process. However, in relative terms—compared with the income of the minimum wage group—the income of the unemployed remained lower. Thus, this study has shown that the income of pensioners was relatively protected and that the unemployed were among the losers of the market transformation process. Still, they did have opportunities to maintain and supplement their income through education.

Notes

1. When weights were available, the data sets were weighted to correct for discrepancies between sample distributions of demographic variables and distributions of demographic variables retrieved from statistical offices.
2. Another way to deal with different currencies and inflation is to include dummy variables for each survey used in the analysis. However, the models become unnecessarily complex with all the dummy variables. It is also possible to deflate income by an inflation index (Gerber and Hout, 1998).
3. For example, in the Hungarian ISJP96 data set, education was coded in six categories: less than primary school, primary school, vocational training, secondary school, lower tertiary school, and higher tertiary school. A respondent who attended school 6 years or less was assigned 4 years of education, and respondents who attended primary school were assigned 6 years of schooling. Generally, it takes 11 years to finish vocational training in Hungary, 14 years to finish lower tertiary school, and 17 years to finish higher tertiary school. This was a better alternative to including all educational categories as dummy variables. The same procedure was used to approximate years of education in the other data sets, based on the educational system for each country.
4. Except for the Social Stratification in the Eastern Europe data set, where for Slovakia a cut-off point of 2,000 inhabitants was used.
5. We experimented with where to place to knot. Modelling the data using these knots resulted in models that fit the data best.
6. If income is used, it should be read as the monthly (relative) household income.
7. Equation (3) is a specific instance of the more general formula (Retherford and Kim Choe, 1993): $\mathrm{VAR}(\sum_i a_i X_i) = \sum_i a_i^2 \mathrm{VAR}(X_i) + 2\sum_{j>i} a_i a_j \mathrm{COV}(X_i, X_j)$.
8. $\mathrm{VAR}(10\beta_1 + 10\beta_7) = 10^2 \times 0.008^2 + 10^2 \times 0.038^2 + 2 \times 10 \times 10 \times -0.000046 = 0.142$.
9. $t = (10\beta_1 + 10\beta_7)/\sqrt{\mathrm{VAR}(10\beta_1 + 10\beta_7)} = 1.260/\sqrt{.142} = 3.344$.

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Authors' Addresses

Willem-Jan Verhoeven (to whom correspondence should be addressed), Faculty of Law/ Criminology, Erasmus University Rotterdam, PO Box 1738, 3000 DR Rotterdam, The Netherlands. Email: verhoeven@frg.eur.nl

Wim Jansen, Department of Methodology and Statistics/ICS, Utrecht University, Heidelberglaan 2, 3584 CS Utrecht, The Netherlands.

Jos Dessens, Department of Methodology and Statistics/ICS, Utrecht University, Heidelberglaan 2, 3584 CS Utrecht, The Netherlands.

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Appendix

Table A1 Acronyms by country and by year

	Czech Republic	Hungary	Poland	Russia	Slovakia
1991	–	–	–	RUS91i	–
1992	CZR92i	HUN92i	POL92i	RUS92i	–
1993	CZR93e	HUN93e	–	RUS93e RUS93i	SLO93e
1994	CZR94i	HUN94i	POL94e POL94i	RUS94i	–
1995	CZR95i	HUN95i	–	–	SLO95i
1996	CZR96i CZR96j	HUN96i HUN96j	POL96i	RUS96i	–
1997	CZR97i	HUN97i	POL97i	RUS97i	–
1998	CZR98i	HUN98i	POL98i	RUS98i	SLO98i
1999	CZR99i	HUN99i	POL99i	RUS99i	SLO99i
2000	CZR00i	–	–	RUS00i	–
2001	CZR01i	HUN01i	POL01i	RUS01i RUS01s	–
2002	CZR02i	HUN02i	POL02i	RUS02i	SLO02i

Table A2 OLS regression models of (ln) monthly household income, employment status, selected control variables, and interactions with time for the Czech Republic (1992–2002), Hungary (1992–2002), Poland (1992–2002), Russia (1991–2002), and Slovakia (1993–2002)

		Czech Republic		Hungary		Poland		Russia		Slovakia	
		Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
(β_0)	Intercept	−0.623*	−0.584*	−0.723*	−0.706*	−0.944*	−0.857*	−0.525*	−0.320*	−0.683*	−0.693*
(. . .)	Woman	−0.363*	−0.363*	−0.246*	−0.247*	−0.374*	−0.371*	−0.325*	−0.327*	−0.301*	−0.302*
(. . .)	Woman × Time	0.017*	0.017*	0.012*	0.013*	0.024*	0.024*	0.001	0.001	0.007*	0.007*
(. . .)	Age 35	0.004*	0.005*	0.007*	0.007*	0.007*	0.008*	0.003*	0.003*	0.005*	0.006*
(. . .)	Age 35 × Time	0.000*	0.000*	0.000	0.000	−0.001*	−0.001*	0.000*	0.000*	0.000	0.000
(. . .)	Age 35^2 (× 1000)	−0.220*	−0.274*	−0.132*	−0.128*	−0.225*	−0.248*	−0.326*	−0.329*	−0.293*	−0.319*
(. . .)	Age 35^2 × Time (× 1000)	0.028*	0.034*	0.019*	0.018*	0.050*	0.053*	0.045*	0.044*	0.019*	0.023*
Marital status (single):											
(. . .)	Separated	0.211*	0.193*	0.152*	0.150*	0.144*	0.143*	0.081*	0.098*	0.198*	0.192*
(. . .)	Separated × Time	−0.016*	−0.014*	−0.025*	−0.025*	−0.011	−0.010	−0.014*	−0.015*	−0.017*	−0.016*
(. . .)	Married	0.071*	0.069*	0.069*	0.072*	0.058*	0.055	0.044	0.055	0.070*	0.070*
(. . .)	Married × Time	−0.001	−0.001	−0.021*	−0.021*	0.006	0.007	−0.002	−0.001	−0.004	−0.004
(β_1)	Time	−0.006	−0.037	−0.019*	−0.036	−0.034*	−0.095*	−0.052*	−0.156*	0.025*	0.073*
(β_{18})	Knot × (Time-3[a])	–	0.023	–	0.023	–	0.060	–	0.181*	–	−0.095*
(β_{19})	Knot	–	0.097*	–	0.016	–	0.131*	–	0.196*	–	−0.076*
(β_2)	Education	0.051*	0.047*	0.062*	0.060*	0.070*	0.072*	0.032*	0.021*	0.055*	0.055*
(β_3)	Education × Time	0.000	0.003	0.003*	0.004*	0.001	0.000	0.003*	0.008*	−0.001	−0.002
(β_{20})	Education × Knot × (Time−3[a])	–	−0.004	–	−0.002	–	0.001	–	−0.012*	–	0.003
(β_4)	Urban	0.047*	0.076*	0.096*	0.052*	0.265*	0.281*	0.153*	0.176*	0.067*	0.067*
(β_5)	Urban × Time	0.006	−0.016	−0.003	0.029*	0.004	−0.010	0.025*	0.015	0.001	0.001
(β_{21})	Urban × Knot × (Time-3[a])	–	0.030	–	−0.046*	–	0.020	–	0.021	–	0.004
Employment status (employed):											
(β_6)	Unemployed	−1.104*	−1.664*	−0.095	−0.011	−0.725*	−1.052*	−2,286*	−1.077*	0.057	0.083
(β_7)	Unemployed × Time	0.132*	0.455*	−0.018	−0.057	0.038	0.232*	0.135*	−0.106	−0.075*	−0.146
(β_{22})	Unemployed × Knot × (Time−3[a])	–	−0.421*	–	0.048	–	−0.253	–	0.361*	–	0.163
(β_8)	Pension	0.092	−0.091	−0.007	−0.099	0.094	0.008	−0.097	−0.338*	0.131*	0.147*
(β_9)	Pension × Time	0.013	0.142*	0.013	0.077*	0.025*	0.067	0.041*	0.162*	−0.021	−0.055
(β_{23})	Pension × Knot × (Time−3[a])	–	−0.184*	–	−0.097*	–	−0.060	–	−0.275*	–	0.077
Education by employment status (employed):											
(β_{10})	Unemployed × Education	0.067*	0.123*	−0.031*	−0.028*	0.042*	0.069*	0.041	0.097*	−0.048*	−0.046*
(β_{11})	Unemployed × Education × Time	−0.014*	−0.047*	−0.001	−0.004	−0.006*	−0.023*	−0.001	−0.016*	0.003	0.005
(β_{24})	Unemployed × Education × Knot × (Time−3[a])	–	0.042*	–	0.005	–	0.022	–	0.023	–	−0.005

(continued)

Table A2 Continued

		Czech Republic		Hungary		Poland		Russia		Slovakia	
		Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
(β_{12})	Pension × Education	−0.034*	−0.019*	−0.030*	−0.027*	−0.021*	−0.023	−0.005	0.007	−0.035*	−0.037*
(β_{13})	Pension × Education × Time	−0.001	−0.011*	−0.002	−0.005	−0.002	−0.002	−0.003*	−0.009*	0.000	0.003
(β_{25})	Pension × Education × Knot × (Time−3[a])	–	0.014*	–	0.005	–	0.001	–	0.015*	–	−0.006
Region by employment status (employed):											
(β_{14})	Unemployed × Urban	0.114	−0.027	−0.026	−0.013	−0.171*	−0.201	0.011	−0.382	0.000	0.019
(β_{15})	Unemployed × Urban × Time	−0.030	0.051	−0.002	−0.011	0.019	0.040	0.003	0.085	−0.013	−0.029
(β_{26})	Unemployed × Urban × Knot × (Time−3[a])	–	−0.103	–	0.019	–	−0.030	–	−0.107	–	0.019
(β_{16})	Pension × Urban	−0.025	−0.077	−0.020	0.047	−0.082	−0.132	−0.168*	−0.108	−0.092*	−0.103*
(β_{17})	Pension × Urban × Time	−0.006	0.026	0.005	−0.042*	0.007	0.047	−0.007	−0.034	0.008	0.015
(β_{27})	Pension × Urban × Knot × (Time−3[a])	–	−0.043	–	0.066*	–	−0.055	–	0.056	–	−0.013
	Adjusted R^2	0.338	0.344	0.325	0.327	0.278	0.282	0.170	0.187	0.399	0.402
	F-change	268.436	12.200	254.666	5.595	160.662	6.768	195.005	50.698	207.258	4.832
	N	14,151	14,151	14,253	14,253	11,200	11,200	25,638	25,638	8,389	8,389

Note: [a]The knot is placed at 1997; for Russia (Time−6); for Slovakia (Time−4).
**P<0.05, two-tailed.*