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## The Working Poor in Post-Communist EU: What can Social Policy Change?<sup>1</sup>

Pavol BABOS\*

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### Abstract

*Poverty research in post-communist Europe has been behind its western counterparts but it is recently catching up. However, research of in-work poverty in the post-communist EU members is still rather scarce. This paper contributes to filling that gap. Using EU-SILC microdata, supplemented by various country-level statistics, this paper has two aims. Firstly, it maps the development of in-work poverty in the post-communist EU and compares it to western countries. Secondly, it identifies factors that may influence the probability of becoming a member of the working poor. Using multilevel regression techniques it reveals that individual factors play a considerably larger role in influencing the In-work Poverty (IWP) than institutions. Additionally, the findings show that there were three institutional barriers which prevented workers from becoming poor before the crisis: parental leave, unemployment benefits and union density. However, these institutions lost their influence during the crisis and still have not restored it after the crisis.*

**Keywords:** Eastern Central Europe, In-work Poverty, social policy, industrial relations, economic crisis

**JEL Classification:** I32, J48, P51

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### Introduction

A decade ago, ten of the Eastern Central European countries were already members of the European Union. As their integration proceeded, the interest of social scientists in these countries has also grown. However, the in-work poverty (IWP) research in Eastern Central Europe (ECE) is rather scarce.

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This stems partly from the fact that research on poverty in general has lagged for several years. Up to 1989, during communist rule, measuring poverty and examining it in a scientific way was nearly, if not completely, impossible (Džambazovič and Gerbery, 2004). During the 1990s a few (mostly case) studies based on one-time surveys appeared (Stanovnik, 1992; Milanovic, 1998; Grootaert and Braithwaite, 1998). However, there was a lack of systemic collection of internationally comparable data in ECE. Another contributing factor is that the economies of ECE were heavily oriented towards industry and manufacturing before 1989 and many of them only completed the economic transition in the late 1990s. This is important to note, because IWP is rather a “post-industrial phenomenon, linked first and foremost to the growth of low-paid insecure employment in the service sector” (Marx and Nolan, 2012, p. 9).

It was only the ECE countries’ accession to the European Union and the European Union Statistics on Income and Living Conditions (EU-SILC) that allowed researchers to systematically study poverty-related issues in the region, including a comparison to Western Europe. However, while the number of publications on general poverty (including material deprivation) in ECE has grown, IWP seemed to be under the radar.

This study contributes to filling that gap. First, this paper describes the development of IWP since 2005 and also compares individual ECE countries. We show that the ECE region presents a rather heterogeneous set of countries. Second, we investigate which factors might be influencing the risk of IWP in 10 ECE countries. The explanations we seek could be divided into two groups: we investigate mechanisms contributing to in-work at-risk-of-poverty (IW AROP) at the individual and household level, and we also examine the influence of various institutional factors which vary across the region. Additionally, we compare the effects at three points in time, before the global economic crisis hit Europe (2006), during the crisis (2009), and after the crisis (2012).

We admit that the attempt to understand the issues of IWP would benefit from a complex analysis involving other than monetary indicators, i.e. material deprivation or social exclusion. However, this would be beyond the scope of a single academic article, therefore our research limits its objectives to monetary measures of poverty.

The next section maps the development of IWP in ECE and compares its level to Western Europe. After that we briefly explain the theoretical background of becoming working-poor and review relevant empirical literature. The third section introduces the data and methods used to study factors influencing IWP in ECE. The fourth section presents the findings of both the individual and institutional set of factors. Before concluding, the final section discusses the limits of these studies and possible lessons for policy-makers.

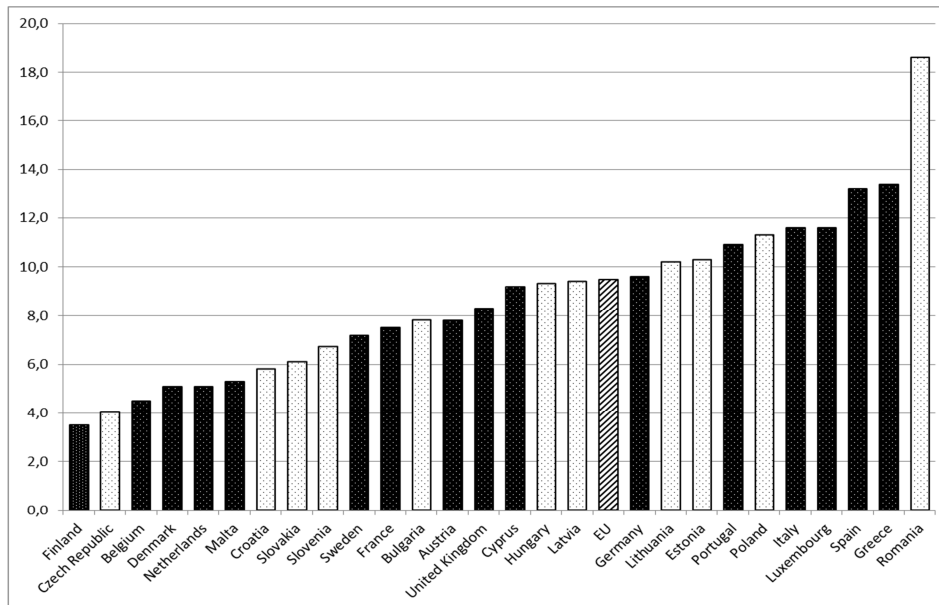
## In-work Poverty Development in Eastern Central Europe

There are many definitions and measures of IWP, as well as many organizations and institutions that established the measures in different parts of the world. For the sake of comparability with the majority of studies on European IWP we adopt the dominant approach in European research tradition. In-work poverty in this paper is understood as the status of a person who is working and simultaneously living in a household where the total income is below the at-risk-of-poverty (AROP) threshold. We follow Eurostat's definition of the AROP threshold, which is 60% of median income in a given country. This measure has not only become standard and is the most often used indicator in research of European IWP, but also plays "a central role in analysis and policy debate" (Marx and Nolan, 2012, p. 12).

What does IWP look like in Eastern Central Europe, especially when compared to its western partners in the European Union? Despite the fact that Eastern Central Europe is often presented as a single bloc of countries in welfare and political-economic academic literature (e.g. Amable, 2003; Kogan, Goebel and Noelke, 2008), it is certainly not the case when looking at IWP. Figure 1 presents the level of in-work at-risk-of-poverty rates in the EU as of 2015. Post-communist EU member countries are shown in white, while the states without communist history are in black, and the EU average in a striped column.

Figure 1

### In-work At-risk-of-poverty Rate, Full-time Workers, 2015



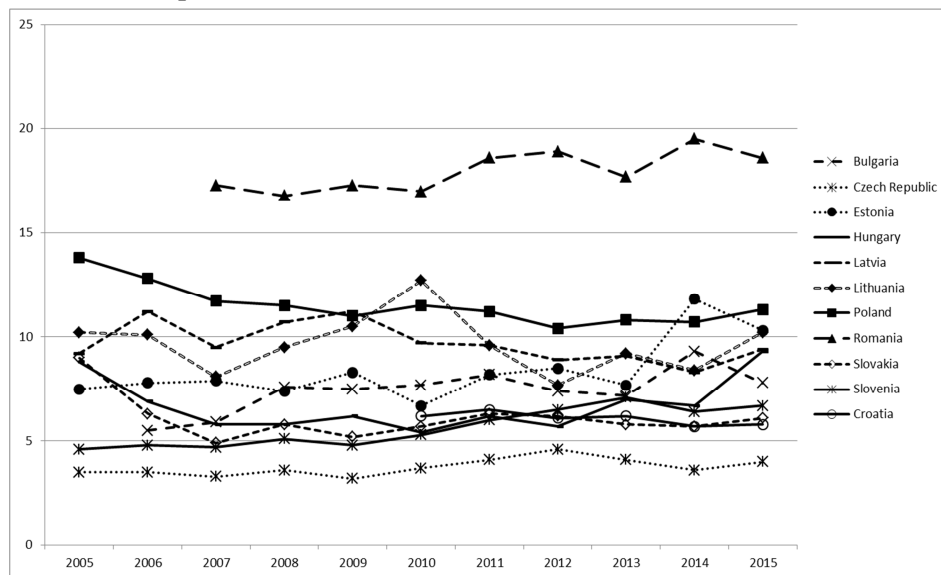
Source: Eurostat (2016).

There is a certain pattern among western European members when one thinks along the lines of traditional welfare regimes (Scandinavian states have rather low IWP rates, while the Mediterranean states have rather high IWP rates). However, we can hardly say that the post-communist countries could cluster together to create a homogeneous bloc of countries. While Romania has the highest IWP in the European Union, exceeding 18%, the Czech Republic is the second best performer with 4% (outperformed only by Finland).

In addition to a static picture of IWP in 2015, we also present a dynamic one. Figure 2 shows the IWP rates development in Eastern Central Europe since 2005 (or the earliest available). Various IWP trajectories only highlight the heterogeneity of the region. Most of the countries have rather fluctuating rates, although in some cases the IWP fluctuates in a relatively narrow band (e.g. Slovakia, 2 p.p.), while in others the fluctuation is somewhat stronger (e.g. Lithuania with peak-to-low difference of over 5 p.p.). There is also a country with continuously decreasing IW AROP rate (Poland), and a country with a smooth increase of IWP (Slovenia).

Figure 2

**Development of In-work At-risk-of-poverty Rates in Eastern Central Europe, as % of the Total Population**



Source: Eurostat (2016).

When looking at the global economic crisis effect on IWP development, we do not see a clear pattern that would allow intuitive judgement of the crisis impact. After 2007, IWP started growing in Lithuania, Estonia and to a small

extent, in Slovakia. On the other hand, Latvia witnessed a slight decrease in IWP between 2007 and 2010, while the situation in the Czech Republic and Hungary was relatively stable. In the remainder of this paper, we attempt to explain the variation of IWP among Eastern Central European countries.

## **Explaining New Europe's Differences**

### ***Mechanisms of Becoming a Member of the Working Poor***

To explain the relatively large differences in IWP across Eastern Central Europe, it is necessary to first understand the basic mechanisms of why a working person might fall below the in-work at-risk-of-poverty threshold. Second, what types of institutions do states usually set up to get working people above the poverty line? Although most of these mechanisms and institutions are explained in a rather detailed way elsewhere (Andreß and Lohmann, 2008; Fraser, Gutierrez and Pena-Casas, 2011; Marx and Nolan, 2012), we will also briefly review them here for two reasons. First, readers should be able to understand it without a need to read other sources. Second, these mechanisms also guide the selection of variables for empirical analysis.

Starting with the IWP definition, there are two broad obvious reasons why a working person's household might be below the poverty threshold. The first reason relates to income. Either a working member of the household earns too little, or one (or more) of the working member(s) loses their income. Lohmann (2008) also writes about the 'resources' issues in terms of human and social capital (education, health, previous work experience, etc.) that people use in order to be able to participate in labour markets and gain income. In addition to unemployment, there might be several reasons why a person cannot ensure income from labour market participation, despite high resources (e.g. maternity leave or taking care of an elderly family member).

The second set of reasons for a working person to find herself in a poor household relates to the household composition. Lohmann (2008) also speaks about 'needs' issues. Understandably, given a fixed salary, it is easier to provide living for oneself than for two children and a partner on maternity leave. In Lohmann's words "larger households have larger needs and these needs differ according to the age of the household members" (Lohmann, 2008, p. 51).

Modern welfare states, including ECE countries, developed various public schemes (whether a part of family policies, labour market policies, tax policies or social policies) to compensate for the loss of income and/or a person's smooth return to the labour markets. Textbook examples are unemployment benefits and family benefits schemes designed to replace the loss of income. The argument

used is that higher unemployment benefits and higher family benefits should lower the in-work at-risk-of-poverty rate by increasing household income. Although the unemployment benefit replacement rate is the most appropriate indicator for this type of research, data is not available for all countries and all examined time periods, therefore we opted for another unemployment benefit system indicator: public expenditures on unemployment benefits. In addition to this, we also use several other indicators for family policies: family allowance expenditures, parental leave expenditures and childcare expenditures.

In addition to policies that compensate for the drop in income caused by loss of employment, there are institutions that should prevent low-skilled working persons from earning too little. Strong trade unions are one example, and they are also supposed to address the IWP issues. In theory, stronger unions should be more successful in wage bargaining and protection of the worker, and thus prevent more workers from falling into the poverty trap. A minimum wage indicator bears a similar argument: a higher minimum wage pushes the income of full-time employees higher and should thus help them remain above the poverty threshold. Therefore, minimum wage is also included in the empirical analysis. There is also a relevant debate, as to whether a living wage would serve better in fighting the IWP. However, so far this has been contained to Western Europe (Bennett, 2014; Grover, 2005). Since union density is one of the most often used indicators of trade unions' strength, we include it in our analysis.

Female labour market participation should contribute to lower IWP rates as well. Higher female participation rates indicate higher dualisation of the labour markets and thus a lower number of households that rely on a single source of income. Tax policies can also be helpful in tackling IWP, especially if the income tax system is designed in a way that allows low earners to pay low to zero income tax. In our analysis we include an indicator of tax wedge on low wage earners.

### ***Scarcity of Empirical Research in Post-Communist Europe***

By 2016, a relatively large amount of research was published on poverty in Eastern Central Europe. Several descriptive studies comparing western Europe with Eastern Central Europe emerged as soon as the first comparative data were available (Förster, Tarcali and Till, 2004). Some scholars brought insights into what causes poverty in the EU (de Graaf-Zijl and Nolan, 2011) or how to combat poverty and which policies contribute to decreasing poverty levels (Cantillon, 2011). Others focus on regional variations of poverty (Peters, Sprout and Melzig, 2010) or development of poverty over time in a limited number of countries (Bartosova and Zelinsky, 2013). However, our survey of literature indicates that academic work focused exclusively on IWP in the ECE region is rather scarce.

One type of study we found, is a larger international comparison which includes post-communist European states. Maitre, Nolan and Whelan (2012) included seven post-communist states in their comparative study. Authors focused on the link between low pay and IWP. Maitre, Nolan and Whelan (2012) confirmed that the low-paid workers have much higher risks of falling below the poverty line. Regarding Eastern Central Europe, the authors found Estonia and Latvia to represent the highest risk for low-paid workers.

Along with this, there are one country case studies, most often from Poland. Safuta (2011) studied the roots of IWP in Poland and concluded that the main factors at the root of the extremely high incidence of IWP in Poland are low wage levels and insufficient welfare payments. Kuźmicz and Stasiowski (2008, p. 17) show that 52.2% of working poor households are dual earner households, and thus they argue that dual earnership protects less against IWP in Poland. Smith et al., (2008) focused on the working poor, however, only in two major cities in Poland and Slovakia: Krakow and Bratislava, respectively. One of their findings was that the working poor use their networks and informal skills, mostly to find a second, or an illegal, better-paid job to escape poverty. They highlight that in the areas the authors studied it is common that “many households combine multiple jobs – legal and illegal, full-time and part-time, local and international – in an attempt to sustain livelihoods” (Smith et al., 2008, p. 301). From an institutional point of view, several authors point out that in Poland, and we would extend this argument to other ECE countries as well – there are lacks of sufficient formal social institutions addressing childcare and elderly care. As a consequence, as Safuta (2011, p. 170) writes: “Families are thus impoverished through high formal care prices or through the loss of an income due to the pressure on female family members to withdraw from the labour market.”<sup>2</sup>

### ***Data and Methods***

The EU-SILC cross-sectional microdata are used as the source of individual data in our analysis. The EU-SILC dataset is currently the most appropriate European data collection for studying poverty. The sample is restricted to working people aged 18 to 64, either employed or self-employed. We include the key personal, household and job-related characteristics based on the mechanism how a working person most likely finds himself/herself below the poverty line. Those

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<sup>2</sup> On top of the reviewed studies there is also research on IWP in Eastern Central Europe published in local languages (e.g. Kozek, Kubisa and Ostrowski, 2005; Sirovatka & Mares, 2006; Kuźmicz and Stasiowski, 2008; Rochovska and Namesny, 2011). Some we found because it was cited in international research, some for the same origin as the authors. However, we decided not to review the few local studies as it is impossible to perform a systematic review of all countries in the region under examination.



include age, gender, education (reduced to three categories: low education defined as ISCED 0 – 2, medium education defined as ISCED 3 – 4 and high education, ISCED 5 – 6), health issues, household composition (whether a person is living alone or with a partner, as well as number of children), working hours and type of employment (temporary vs permanent job and self-employment).

In addition, there were three variables that might play a role in explaining IWP, but were not available for all the countries in all three years. Those are years of work experience (missing for Bulgaria, Hungary and Lithuania), type of occupation, and sector (missing for Romania). The amount of missing data posed a dilemma. The first alternative was to include the three variables and proceed with an analysis of only six countries (omitting Bulgaria, Hungary, Lithuania and Romania). The second alternative was to include all ten countries, but omit the three variables with missing values. We decided for the latter approach since we believe this provides a much better overall picture of the region. We believe that the loss of information is more than compensated for by including all post-communist EU members in the analysis (except for Croatia, where the first available data is only from 2010). Additionally, when we compared the coefficients after controlling for work experience and occupation type (where available), they did not substantially change the findings. On average, the statistical significance of the original predictors has not changed and the size effects were subjected to change at a third decimal place.

Country-level variables were taken from several sources. The primary goal was to minimise the number of sources and ensure the highest possible quality of data. Therefore, where possible, indicators come from Eurostat's database. Two exceptions were made with respect to the indicators of minimum wage level and union density. In the former case, there were no actual data at the time of writing, while the OECD database provided the necessary information. In the latter case, Eurostat does not provide such information on a yearly basis, therefore we used the Database on Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts (Visser, 2015) which is widely used and also serves as a data source for EU official reports on industrial relations.

One of this paper's aims was to compare the effects of several personal and institutional factors on IWP before, during, and after the crisis. By doing so, we had to make a few methodological decisions related to the nature of the EU-SILC. In the EU-SILC, most of the personal characteristics, such as whether a person lives with a partner, or has chronic health issues (self-reported) are reported as of the date of the interview. However, employment history and income is referred to as the year preceding the interview. Therefore, poverty status is also based upon and referred to as the year prior to the interview. This means that if we

look at the 2007 edition, the income level and poverty status will be as of 2006. When it comes to combining the macro-level variables with EU-SILC, we took the values corresponding with the EU-SILC income/poverty reference period. However, for several factors such as the abovementioned cohabitation status or health issues, we have to work under the assumption that these are stable at least between the income reference period and data collection.

Table 1

**List of Institutional Indicators and Sources**

Variable	Indicator	Source
Family allowances	Public expenditures in Euro per inhabitant	Eurostat (2016)
Parental Leave	Public expenditures in Purchasing Power Standard per inhabitant	Eurostat (2016)
Childcare	Public expenditures in Purchasing Power Standard per inhabitant	Eurostat (2016)
Unemployment Benefit	Public expenditure as % of gross domestic product	Eurostat (2016)
Union Density	Union membership as % of working population	Visser (2015)
Female Labour Market Participation	Female employment as % of total female labour force	Eurostat (2016)
Tax Wedge on Low Wage Earners	Tax rate on low wage earners: Tax wedge on labour costs	Eurostat (2016)
Minimum Wage	As % share of minimum wage on average wage in economy	OECD (2015)

Source: Author.

Regarding the analytical method, we follow the common approach to studying IWP that has been established in the previous comparative research in this field. Since the dependent variable is binary – the working person is either below or above the AROP threshold – we will apply models based upon logistic regression. At the individual level, we fit the logistic regression function, which takes the following linearised form:

$$\ln \left[ \frac{\pi}{1-\pi} \right] = b_0 + b_i X_i \quad (1)$$

On the left-hand side of the equation is the natural log of odds ratios. Symbol ' $b_i$ ' on the right-hand side of the equation presents the  $i$ -th effect of the corresponding  $i$ -th factor  $X$ . The symbol  $b_0$  is a regression constant.

In addition to this, we need to take into account the hierarchic nature of the data structure. By hierarchic data structure we mean that persons living in the same country have the same value of country-level factors, e.g. union density or family allowances. Thus, in order to investigate institutional effects in IWP we will use multilevel modelling. This also allows controlling for individual characteristics and composition of countries. Multilevel modelling is an appropriate approach to hierarchically structured data such as ours (Snijders and Bosker, 1999)

and is widely used in comparative IWP research (Goerne, 2011; Lohmann, 2008). The multilevel model has the following form:

$$\ln \left[ \frac{\pi_{ij}}{1 - \pi_{ij}} \right] = b_0 + b_i X_{ij} + u_j \quad (2)$$

where the left-hand side of the equation represents the natural log of odds ratios. Symbol ' $b_i$ ' stands for the effect of the corresponding  $i$ -th factor and  $u_j$  is the effect of being in group  $j$ .

## Empirical Results

### *Individual Characteristics*

Before proceeding to the results, we present descriptive statistics for individual level variables for pooled samples, i.e. all ten countries and three time periods (restricted to the subpopulation of persons with a paid job, Table 2). The average age of respondents was 42 years old, average number of weekly hours spent working was over 40, which corresponds to common, full-time employment. Average number of children was two, 64% of people lived with a partner in a shared household, almost 18% were suffering from a chronic illness, only 12% were self-employed and 12% had a temporary job.

Table 2

### Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Age	234 628	42.194	11.089	18	64
Number of children	234 443	2.185	2.525	0	11
Working hours	231 373	40.764	7.066	1	61
Education	234 443	1.184	0.605	0	2
Living with a partner	234 509	0.640	0.480	0	1
Gender (0 = female)	234 624	0.529	0.499	0	1
With a chronic illness (0 = no)	205 910	0.176	0.381	0	1
Self-employed (0 = no)	234 628	0.123	0.328	0	1
Temporary contract (0 = no)	177 646	0.121	0.326	0	1

Source: EU-SILC; author's calculation.

Several models were specified and tested to understand the IWP in Eastern Central Europe. Usually, it is common to present a single multilevel model with several higher-order variables. As we will show, several key variables in the argue that specifying a single multilevel model for interpreting effects of individual factors would lead to a loss of an enormous amount of information. IWP research have various effects in Eastern Central European countries. We Therefore, we

present and interpret individual effects on the IWP probability based on regression models for each individual country. Since there is no easy way to present regression coefficients of 30 regressions, the reader will find it in Appendix 1. Here we summarise the most relevant findings.

The populations of the ten countries we studied are somewhat different regarding the effects of personal characteristics on the probability of living in a poor household. Only two factors show a stable pattern across countries and over time, level of education and having a temporary job. Having finished secondary school, as opposed to primary school, decreased the chances of being poor by at least (approximately) 40% in Estonia and 85% in Bulgaria. A tertiary degree, compared to primary education, decreased the chances of falling into IWP at least by 65% in Estonia (before the crisis), to 90% in Slovenia and to almost 95% in Bulgaria and Romania (after the crisis).

Having a temporary job significantly increases the chances of being poor in all 10 countries. However, the effect size varies over time in individual countries. For example, in Slovakia the chances of falling into poverty for a temporary worker are about twice as high as for a permanent worker before the crisis. However, the chances were three times higher during the crisis and almost 3.7 times higher after the crisis. The size of the effect of the temporary contract grew over time and is also found in Latvia. On the other hand, we can see the decreasing size of the temporary job's effect in Estonia. Before the crisis, the chances of an Estonian temporary worker living in a poor household were 3.2 times higher when compared to a permanent worker. During the crisis, the chances for a temporary job holder were "only" about 2.7 times higher. After the crisis the difference between a temporary and a permanent worker was not significant. Generally, education level and job type, despite some minor fluctuations, are present in all countries with the effects as described in theory and more or less stable over time.

However, age and gender show no similar pattern. In Poland, age did not affect the risk of IWP before the crisis, but it gained in significance both during and after the crisis. Each year of physical age seemed to decrease the chances of living in a poor household by more than 1%, *ceteris paribus* (see Appendix 1, part of the table for Poland). This could indicate that the tighter labour market started to discriminate against older workers after the crisis in Poland. On the other hand, in Estonia, Lithuania, Latvia and Romania age was an important (and positive) factor before the crisis, but seemed to be insignificant in 2009 and 2012. In Romania, persons had a decreasing risk of IWP by about 1.5% each year as they grew older. In Hungary, age was important during the crisis, but not before or after it. During the crisis the Hungarian workers' chances of being

under the poverty line decreased by 1.3% with each year of physical age. In the Czech Republic, Bulgaria, Slovakia and Slovenia, age did not seem to influence IWP at all.

Estonia is the only country where gender impact on IWP probability is stable in all the years that were examined. Working men have about 50% lower chances of becoming poor than working women. In Latvia the effect was weaker during the crisis (approximately 30% in favour of men), and has intensified after the crisis (approximately 50%). In Romania, the gender effect size also grew, however, in the opposite direction. In 2006, Romanian working men had higher chances of becoming poor, by about two thirds. By 2012, the chances were twice as high for men as for women. Next to Romania, Hungary closes the circle of countries where the chances are higher for men than women to live in a poor household. In Hungary however, this effect is significant only after the crisis. On the other hand, in Poland the gender effect was significant only before the crisis when working men had higher chances (by about 14%) of being poor than working women. Gender seems to have never impacted IWP in Bulgaria, Slovakia and Slovenia.

The last factor we describe here is number of children. In Slovakia and Poland the chances of falling below the poverty line increases with a higher number of children in the household, which is in line with theory and is stable over time. In Romania there is a positive effect of number of children on IWP probability, both before and after the crisis, in Lithuania the effect is present only before the crisis, and in Bulgaria and Estonia we found this effect only in 2012. On the other hand, in Slovenia the “children effect” is present only in 2006 and it is negative. This could indicate rather generous family policies before the crisis. In Hungary, the same effect is found, however only in 2009. Finally, it seems that there was no “children effect” in the Czech Republic and Latvia at all.

### ***Institutions and Policies***

Table 3 provides information on descriptive statistics of macro indicators which we use in the further analysis. Information is based on pooled data this means the table combines the years 2006, 2009 and 2012. It shows, among other things, the means, minimum and maximum values of all three investigated time periods. This form of presentation was chosen for parsimony reasons, since the only indicator that differs considerably between the examined periods is public expenditure on unemployment benefits. While in 2007 it ranged from 0.1% to 0.7%, in 2009 it was running from 0.4% to 1.6%, and in 2012 the range decreased again to lie between 0.2% (minimum) and 0.8% (maximum) of GDP spent on unemployment benefits. This could be explained by the fact that ECE

economies were hit the most by the global economic crisis in 2009. Since very many people became unemployed, and thus eligible for unemployment benefits, an increased number of entitlements were claimed. An additional explanation is also that GDP declined and this could have contributed to the rise of unemployment benefits as a share of GDP.

Three different indicators reflect family policies and spending. These indicators also illustrate the heterogeneity of Eastern Central Europe by showing that while some countries spend more on some policies other countries choose to spend on different schemes. Lithuania serves as a good example. The country spends the most on parental leave, but the least on family allowances.

Childcare expenditures vary the most among countries. While several countries did not spend almost anything in this social scheme (Slovakia and Poland in 2006, the Czech Republic in 2012 and Estonia in all three years), Slovenia was the most generous country in childcare spending.

In seven of ten countries we examined, the parental leave benefit was higher in 2012 than in 2006 (adjusted for power purchase), which indicates that the benefit level generally increased. The highest spending was observed in Lithuania in 2009 (and the second and third highest observed values belonged to the Czech Republic), while the lowest spending was recorded in Estonia in 2009. In contrast to parental leave development, since 2006 family allowances show a slightly downward trend in most countries. The lowest expenditures were in 2013 in Lithuania, the highest in 2009 in Slovenia. Generally, there is no clear geographical pattern that would divide ten countries whether on the north-south line, post-communist vs post-soviet, or any other.

Union density ranges from as low as 6% (Poland) to 34.4% (Romania). Romania and Slovenia have relatively higher union density, as compared to the whole region, on average 33% and 27%, respectively. On the other hand, Estonia's and Lithuania's union density is on the other end of scale with, on average, 8.5% and 10%, respectively.

The minimum wage indicator is expressed as proportion of average monthly earnings. In many EU countries (Germany, Austria, Sweden and others) there is no single national minimum wage, which poses a methodological challenge in large comparisons.

Fortunately, this problem does not concern Eastern Central European countries. Minimum wage has increased in all ten countries between 2006 and 2012. The highest minimum wage was observed in Slovenia, the lowest one in Bulgaria. On the other hand, Bulgaria also had the lowest tax burden of low wage earners, while Slovenia scored rather high on this indicator. The highest tax burden on low wage earners was observed in 2012 in Hungary.

Female labour market participation is one of the most stable indicators, when we compare the development within countries and over time. However, there are differences across countries. Poland and Hungary have, on average, the lowest employment rates for women, at 51%. On the contrary, Estonia has undoubtedly the highest one, almost 65% on average.

Table 3  
**Descriptive Statistics of Institutional Variables**

Variable	Mean	Std. Dev.	Min	Max
Family allowance	52.565	40.413	9.05	124.32
Parental leave	70.383	43.242	15.6	183.4
Childcare	29.867	36.612	0.0	110.1
Union density	18.213	7.712	6.0	34.4
Minimum wage	0.429	1.829	0.209	0.595
Tax wedge on low earners	39.177	3.959	31.5	47.9
Female labour market participation	56.354	5.077	48.2	65.7
Unemployment benefits	0.609	0.286	0.1	1.6

Source: Eurostat (2016).

### *Institutional Influences*

Table 4 shows the findings of multilevel regression analysis. Each country-level variable was tested separately, one at a time. This means that the *ceteris paribus* assumption does not apply at the institutional level of analysis. In total we tested 8 institutional factors and similarly, as with individual characteristics, we compared their effects at three different points of time. All told, 24 multi-level-regression models were run.

For this reason, Table 4 does not show the number of observations for each model, as this would rather complicate the readability of the table. However, the number of observations was between 55,000 and 60,000 individuals in each of the models.

Before the crisis we found half of the indicators to be statistically significant at 0.05 level and another one at 0.1 level. In the years 2009 and 2012 there were only two statistically significant predictors at 0.1 level. Although 0.05 level is the usual acceptable standard in social sciences, we decided to also report slightly higher significance levels.

In 2006, higher spending on family policies was associated with lower risk of IWP showing that higher public expenditure on family allowance and parental leave seemed to decrease the risk of falling below the poverty threshold. The regression effect of spending on parental leave was even stronger than family allowance (Table 4, compare two items in column 1). We also found that higher spending on unemployment benefits seemed to contribute to lower risk of IWP in 2006.

Considering the public expenditure indicators, no policy proved to be significant during or after the crisis above the five per cent level. The coefficient for family allowances maintained the same size during the crisis at 10 per cent significance level. Similarly, the significance level of unemployment benefit spending in 2012 was only at 0.1 level.

Table 4

**Multilevel Regression Coefficients for Institutional Variables, Showed as Odds Ratios**

Institutional Indicator	Reference period		
	2006	2009	2012
Family allowance	0.993*	0.993 <sup>(a)</sup>	0.995
Parental Leave	0.985***	0.995	0.995
Childcare	0.993 <sup>(a)</sup>	0.996	0.996
Union Density	0.943***	0.956 <sup>(a)</sup>	0.960 <sup>(a)</sup>
Minimum Wage	0.822	1.592	1.025
Unemployment Benefit	0.984**	1.043	0.859 <sup>(a)</sup>
Tax wedge	0.998	0.996	1.021
Female LM participation	1.021	1.025	1.044

Note: \*\*\* – p-value < 0.001; \*\* – p-value < 0.01; \* – p-value < 0.05; (a) – p-value < 0.1.

Source: EU-SILC; author's calculations.

In addition to the public expenditure related indicators, we also analysed the impact of four other institutional factors. Minimum wage levels, tax burden on low wage earners and female participation rate seemed to have absolutely no effect on IWP in any of the examined time periods. On the other hand, we found the trade union's strength to be related to lower IWP rates. In 2006, the rise in union density by 1 percentage point was associated with a decrease in the risk of falling below the IW AROP line by 6.7% (see Table 4). Taking into account the range of union density level in ECE we consider this effect quite strong. However, we see the size of the union density effect becoming statistically weaker in 2009 and 2012, with the statistical significance only at 0.1 level.

In the next section we discuss what might lie behind our results and what implications our findings have for a fight against IWP in Eastern Central Europe.

## Discussion and Conclusion

This paper studied IWP in Eastern Central Europe. It presents an overall and systematic comparison of IWP development in the EU's post-communist countries and reveals the drivers and inhibitors of IWP.

First, we showed that 10 post-communist countries are somewhat heterogeneous. They differ in relation to the overall IWP rate, with the Czech Republic having one of the lowest IWP rates in the EU, while Romania has the highest.



Some countries managed to keep the IWP relatively low during the global economic crisis, while others experienced considerable rise in IWP rates. Finally, many individual risk factors that could increase the IWP probability, as the previous research showed, display the opposite effects.

The gender effects we found are in line with previous comparative studies. Hanzi-Weiss, Vidovic and Saunossi (2011) also found men to have higher risks of IWP than women in Romania and Poland, while the opposite is true in Latvia. The authors highlight that there is a difference between IWP and the labour market situation. While women tend to have more temporary or part-time jobs in vulnerable sectors, once they have a paid job, it is more likely that their partner (if any) will work as well. Put another way, when women work they are less likely to be affected by IWP, as dual-earning reduces the risk.

The fact that the age effect varies across countries is also nothing new. Hanzi-Weiss, Vidovic and Saunossi found the same in their 2011 report. Probably the most interesting finding of our analysis is that age played no role in influencing IWP in nine out of ten countries (Poland is the exception). A possible explanation is that various age groups are similarly vulnerable, although due to different reasons. Young people in their 20s usually start in non-standard, low paid jobs. Middle-aged workers are establishing families and due to underdeveloped family policies it is common that a single earner has to provide for the whole family. Finally, older people might have obsolete skills and are not able to get employment in the best paying sectors (services and the innovative business sector). The combination of the three reasons could explain why we see no clear age effect on IWP in Eastern Central Europe.

Findings on institutional influence are rather surprising. Unions seemingly played a positive role in lowering IWP before the crisis; however, in 2009 and 2012 the effect is significant only at 0.1 level. This finding is surprising for several reasons. Firstly, unions are generally considered to be relatively weak in ECE, when compared to Western Europe (Crowley and Ost, 2001).

Therefore, it is surprising to see unions' strength working against IWP on the other hand we see the effect weakening after the crisis. This might be due to the unions' inability to mobilise workers in Eastern Central Europe. Bernaciak (2010) argues that this is especially the case in privatised sectors, where unions lack power in negotiating vis-à-vis employers in both wage and non-wage issues. According to Hanzi-Weiss, Vidovic and Saunossi (2011), trade unions in Romania and Slovenia focused mainly on wage negotiations. It is impossible to say what the situation would be without trade unions in place. However, the fact is that ECE economies experienced quite large wage cuts and working hour reduction.

In addition to trade unions' strength it is interesting to see that no other institutional factors play a role in explaining IWP after the crisis. There is very low proportion of between-country variation as compared to within-country variation. The inter-class correlation coefficient showed that the variation in dependent variable between countries was fairly low and decreased over time: 2.50% in 2006; 2.39% in 2009, and 2.08% in 2012. Still, four institutional variables explained part of the 2006 puzzle, but did not contribute to understanding the later periods. Whether the reason behind it is that the examined institutions in fact do not help to combat IWP, or the effect is too small to show significance, there is a lesson to be had. In-work poverty in Eastern Central Europe is primarily a concern of household composition and the labour market structure of post-communist countries.

Our research was not without limitations. Dilemmas on whether to leave out some potentially influential variables, or countries with missing information were already discussed. Another methodological problem is that the relatively low number of countries does not allow the inclusion of several macro variables simultaneously into a single model. Therefore, we are not able to say whether higher parental leave expenditure would help, assuming that all countries would have the same, fixed level of childcare expenditures, or would it be vice versa? Another issue was raised by a case study approach (esp. Smith et al., 2008) which pointed at the individual rather than institutional paths out of IWP that leads through additional, often informal or illegal jobs to secure additional income. It is questionable to what extent survey methodology and regression modelling can take into account the fact that many of such practices are difficult, if not impossible, to record in large international surveys, such as EU-SILC.

As a matter of fact, IWP in Eastern Central Europe is affecting millions. Apart from the attention of social scientists, governments very rarely set up policies to tackle the problem, and if so, they are related to the fight against poverty in general (Hanzi-Weiss, Vidovic and Saunossi, 2011). Safuta (2011) indicates that avoidance of the IWP problems might be related to lack of recognition of the structural problems of labour markets. The argument is that poverty is often contextualised in relation to unemployment and/or ethnic minority issues. Therefore, it is not uncommon to blame poor people for being too lazy, or not educated enough to participate in the labour market. In other words, the problem is framed to lie on the individual levels. However, this narrative does not hold with IWP, since the affected persons are already working. Thus, admitting that IWP is a problem worth addressing would mean that the government admits that the market forces are not operating properly and there is a structural problem on the labour market.

The fact that we found no institutional effects influencing IWP after the crisis might also have policy implications. If we accept that it is not redistributive social policies and minimum wage that helps decrease IWP levels, but the composition of households and employment contracts, then this might also be the direction in which policy-makers should look. Therefore, our findings might reflect the poor design of social policies and that could be the reason for no institutional effects. Either way, those in power can do more for the powerless.

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## Appendix 1

### Regression Results in Form of Odds Ratios, by Countries and Years

Country	Bulgaria			Czech Republic		
	2006	2009	2012	2006	2009	2012
Reference Year						
Age	0,988(a)	0,998	0,998	0,993	1,001	0,988
No. of children	0,978	1,036	0,946*	1,054(a)	1,078*	1,082(a)
Work Hours	0,987	0,970**	0,960***	0,996	0,971*	0,944***
Secondary Education (compared to primary)	0,244***	0,197***	0,158***	0,282***	0,355***	0,417**
Tertiary Education (compared to primary)	0,081***	0,051***	0,058***	0,082***	0,096***	0,064***
Cohabitation status	1,260	1,012	1,100	0,428***	0,340***	0,373***
Men	0,858	0,841	0,997	0,837	0,628**	0,620*
With a chronic illness	1,297	0,894	1,348	1,375*	0,663(a)	0,880
Temporary Job	4,007***	4,146***	4,545***	2,747***	2,639***	2,169***
Constant	0,515	0,933	1,803	0,269*	0,540	2,063
Sample Size	3 017	5 191	3 976	7 701	5 943	4 554
Pseudo R <sup>2</sup>	0.149	0.153	0.193	0.093	0.103	0.110

Country	Estonia			Hungary		
Reference Year	2006	2009	2012	2006	2009	2012
Age	1,012**	1,002	0,995	0,995	0,988*	1,005
No. of children	1,037(a)	0,994	1,064**	1,015	1,073**	1,034(a)
Work Hours	0,986(a)	0,976**	0,974***	0,966***	0,952***	0,957***
Secondary Education (compared to primary)	0,616***	0,597**	0,622**	0,370***	0,360***	0,318***
Tertiary Education (compared to primary)	0,325***	0,263***	0,316***	0,115***	0,096***	0,077***
Cohabitation status	0,510***	0,728*	0,571***	0,824(a)	0,978	0,698***
Men	0,509***	0,485***	0,523***	1,103	1,214(a)	1,237**
With a chronic illness	1,011	1,030	1,293*	1,099	0,899	1,018
Temporary Job	3,181***	2,741***	1,752(a)	3,431***	3,328***	3,938***
Constant	0,374**	0,576	0,803	0,612	1,212	1,052
Sample Size	5 627	4 386	5 316	7 284	7 546	8 265
Pseudo R <sup>2</sup>	0.051	0.049	0.055	0.120	0.125	0.161
Country	Lithuania			Latvia		
Reference Year	2006	2009	2012	2006	2009	2012
Age	1,019**	0,996	0,992	1,012*	1,004	1,003
No. of children	1,077**	0,997	1,022	0,980	1,004	1,006
Work Hours	0,976**	0,987(a)	0,962***	0,971***	0,981**	0,963***
Secondary Education (compared to primary)	0,788	0,572**	0,515**	0,554***	0,399***	0,538***
Tertiary Education (compared to primary)	0,279***	0,265***	0,201***	0,257***	0,137***	0,171***
Cohabitation status	0,594***	0,758*	0,776(a)	0,731**	0,821(a)	0,646***
Men	0,819(a)	0,716**	0,743*	0,703**	0,713**	0,503***
With a chronic illness	0,744(a)	0,978	1,317(a)	1,395**	0,920	1,140
Temporary Job	2,983***	2,335***	2,300***	2,763***	4,269***	4,354***
Constant	0,263**	0,797	2,291(a)	0,617	0,756	1,546
Sample Size	4 738	4 331	3 952	4 124	4 571	4 830
Pseudo R <sup>2</sup>	0.073	0.042	0.066	0.064	0.097	0.106
Country	Poland			Slovakia		
Reference Year	2006	2009	2012	2006	2009	2012
Age	0,993(a)	0,983***	0,989**	0,991	1,003	1,006
No. of children	1,061***	1,065***	1,069***	1,075**	1,092***	1,050(a)
Work Hours	0,998	0,990*	0,988*	0,984	0,972*	0,960**
Secondary Education (compared to primary)	0,417***	0,399***	0,514***	0,392***	0,686	0,377**
Tertiary Education (compared to primary)	0,099***	0,090***	0,131***	0,128***	0,284***	0,157***
Cohabitation status	1,215*	1,214*	1,270**	1,000	1,135	0,916
Men	1,142*	0,995	1,081	0,915	0,783(a)	0,758(a)
With a chronic illness	0,896	0,958	0,988	1,166	1,509*	1,566**
Temporary Job	2,833***	2,044***	2,264***	2,111***	3,171***	3,695***
Constant	0,218***	0,609(a)	0,310***	0,278*	0,111**	0,320(a)
Sample Size	11 381	10 090	9 964	5 997	6 339	5 798
Pseudo R <sup>2</sup>	0.107	0.098	0.089	0.047	0.059	0.074
Country	Slovenia			Romania		
Reference Year	2006	2009	2012	2006	2009	2012
Age	1,001	0,991	0,997	0,985*	1,005	0,995
No. of children	0,914*	0,950	0,926(a)	1,056*	1,041	1,100***
Work Hours	0,981	0,998	0,946***	0,992	0,982	1,008
Secondary Education (compared to primary)	0,403***	0,390***	0,480***	0,328***	0,335***	0,330***
Tertiary Education (compared to primary)	0,074***	0,134***	0,136***	0,064***	0,079***	0,045***
Cohabitation status	1,051	0,846	1,108	1,161	0,982	1,302
Men	1,181	1,186	1,370(a)	1,679***	1,850***	1,977***
With a chronic illness	0,847	0,773	0,705	1,038	0,465(a)	0,766
Temporary Job	2,512***	3,525***	2,529***	3,534***	2,355*	3,362***
Constant	0,196*	0,127*	0,858	0,288*	0,192*	0,080***
Sample Size	3 877	3 941	3 597	5 371	4 920	4 840
Pseudo R <sup>2</sup>	0.079	0.120	0.148	0.103	0.074	0.062

Note: \*\*\* – p-value < 0.001; \*\* – p-value < 0.01; \* – p-value < 0.05; (a) – p-value < 0.1.

Source: EU-SILC; author's calculations.