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Abstract

Children are generally at a higher risk of poverty than the population as a whole, although the mechanisms that lead to their socioeconomic vulnerability vary widely across European countries. This paper assesses to what extent social transfers explain the variation in levels of child poverty across 30 European countries. Using a multilevel framework, we jointly examine individual characteristics and country-level factors, focusing on specific aspects of social transfer systems, namely generosity and targeting. We consider two types of targeting: pro-child (categorical selectivity) and pro-poor (income selectivity).We observe that the variation in child poverty is mainly due to contextual factors and to a lesser degree to individual factors. We conclude that, as stated in the literature, the generosity of social transfers matters in reducing child poverty. Nevertheless, our findings go further and demonstrate that targeting children is more effective in reducing the risk of poverty for children than targeting the lower end of income distribution, which should be borne in mind when determining and prioritizing policy orientations and measures for fighting child poverty.

Keywords: Child poverty, European countries, social transfers, generosity and targeting.

JEL Classification:

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1. INTRODUCTION

Child poverty has currently become one of the most important topics requiring attention in today's Europe. There is an imperative need to reduce child poverty in order to reach the European Union (EU) headline poverty reduction target set out by the Europe 2020 strategy. It is well documented in the literature that, on average, around one out of every five children is living in poverty in the EU (see Atkinson and Marlier, 2010; TÁRKI, 2010, 2011; among others). This highlights the paradoxical reality of child poverty in the developed world, aggravated in recent years by a growing income inequality.

Overall the extent to which child characteristics manifest themselves in high poverty rates mainly depends on the household and institutional settings in which those characteristics are experienced, revealing the need to combine individual and country factors in the study of poverty. Nevertheless, there are relatively few comparative studies that address both levels in the analysis of the potential impact of transfer policies on child poverty. Previous analyses have most often focused on macro relationships between institutions and outcomes, underlining the crucial role of family policy transfers in the alleviation of child poverty (see

Kangas and Palme, 2000; Matsaganis et al. 2006; TÁRKI, 2010) However, most of these studies have neglected the links between country-level factors and micro-level characteristics of children, despite the redistributive outcomes of a particular system are dependent on the characteristics of the underlying population (Marx et al., 2016).

One of the institutional mechanisms through which public policies may influence child poverty is social expenditure consisting of direct transfers to households, which act by increasing their income and thus reducing the intergenerational transmission of poverty. From a rationale perspective, it works as a redistribution device or as insurance against unexpected income loss (see, e.g., Corak, 2006). The most extended finding is that social transfer income packages as a whole play an important role in preventing against poverty. Nevertheless, there is no consensus on the optimal design of redistributive systems and the choice between universalism and targeting. Against those who believe that the more the non-poor benefit, the less redistributive the impact of benefits will be, the "paradox of redistribution" suggested by Korpi and Palme (1998) states that strong pro-poor targeting does not yield more income inequality reduction (see Marx et al., 2016). It is often argued that pro-poor targeting is administratively complex and costly, that

means-testing and the intrusion it brings into private life causes stigma and consequently non-take-up, and that it severely distorts work and family formation incentives (Van Oorschot 2002). In a line similar to Korpi and Palme (1998), in recent years numerous authors conclude that "targeting within universalism" yields the best outcomes (Corak et al., 2005; Figari et al., 2011; Van Lancker et al., 2015).

The purpose of this article is to address the potential impact of social transfer income packages on child poverty from a comparative perspective in order to assess to what extent social transfers explain European cross-national variations in child poverty levels by evaluating the significance of the generosity and targeting of social transfers. We consider two types of targeting: pro-poor targeting (income selectivity) and pro-child targeting (categorical selectivity). While pro-poor targeting is related to vertical equity objective ("unequal treatment of unequals"), pro-child targeting refers to horizontal equity objective ("equal treatment of equals") (see Verbist and Van Lancker, 2016). Our study is cross-national, which helps explore the effects of varied policy environments (see Valletta 2006). Moreover, we simultaneously combine demographic and socioeconomic characteristics of children and country-level factors related to social transfers, as well as to

country's living standard and labour market performance, so we explicitly consider characteristics of the underlying population when analysing the effect of contextual variables, and specifically the redistributive effect of social transfers.

We use the European Union Statistics on Income and Living Conditions (EU-SILC) data set for the 2012 wave, as well as some significant contextual variables from Eurostat for 30 European countries. This paper extends existing research on the identification and decomposition of the determinants of cross-national variations in child poverty by dealing with some of the shortcomings of earlier studies, mainly based on counterfactual analysis. In comparison with other recent studies, we adopt a more comprehensive framework to evaluate the effect of national social transfer systems in reducing child poverty and provide empirical evidence from a broader analysis in terms of countries, types of household and age range of the children examined. In addition, to the best of our knowledge, this is the first contribution in the literature addressing the dichotomy between pro-poor targeting and pro-child targeting of benefits. For this purpose, apart from the generosity of social transfer systems, we introduce two indicators relating to targeting: the share of social protection expenditure specifically

targeted at family/children (categorical selectivity) and the share of these benefits targeted at the bottom quintile of income distribution (income selectivity). We also test their significance even after taking into consideration labour market and overall economic performance.

To facilitate an approach that integrates individual and contextual dimensions, we take advantage of multilevel techniques. Multilevel models provide a suitable framework for accounting for these different levels of variation, allowing us to tackle parent, household and country characteristics simultaneously. In doing so, our central research questions are: Is it income selectivity or categorical selectivity that matters most in reducing child poverty? Does the previous answer hold if we control for indicators of labour market performance or for country's living standard? Does the generosity of social transfers explain the variation in levels of child poverty among European countries? To what extent do demographic and socioeconomic characteristics of parents and household explain variations in child poverty among European countries? Which of these aspects contribute most to the variation in child poverty levels across nations? The value of providing an answer to these questions is, on the one hand, to offer further evidence on the extent to which targeting policies can help most

in reducing child poverty rates and to identify the demographic and socioeconomic characteristics that are highly correlated with high child poverty risk in order to increase support to them. On the other hand, the results can help policymakers determine policy orientations and measures that might be implemented to reduce child poverty rates and to foster convergence in child poverty rates across European countries. The remainder of the paper is as follows. Section 2 reviews the literature and summarises the main findings. Section 3 describes the data and explanatory variables used in this work. Section 4 presents the methodology. Section 5 discusses the results, and section 6 concludes.

2. BACKGROUND

Previous literature has shown that poverty risk in general, and child poverty risk in particular, is shaped by the demographic and socioeconomic characteristics of household members. To begin with, it is very well documented that children are significantly more likely to be poor when they live with only one parent (Heuveline and Weinshenker, 2008; Social Protection Committee, 2008; Tai and Pixley, 2008; Atkinson and Marlier, 2010; Chzhen and Bradshaw, 2012).

Chen and Corak (2008) found that the proportion of children in jobless households is strongly correlated with child poverty rates. Whiteford and Adema (2007) and TÁRKI (2010) also highlighted that the stronger the labour market attachment of household members, the lower the poverty risk of children.

Some studies have shown that child outcomes differ greatly at different stages of childhood reflecting different developmental stages and childcare arrangements (TÁRKI, 2011). Moreover, child poverty risk is greater for children living in rented and subsidised housing than for those whose parents are homeowners, since child well-being is directly affected by the type and quality of the dwelling where the child lives (Cantó and Mercader-Prats, 2002; Burrows, 2003; TÁRKI, 2011).

Eurostat (2013) indicates that the risk of poverty is higher in thinly populated areas of the EU than in densely and intermediate populated ones, suggesting a strong location effect in the risk of poverty.

Furthermore, it has been shown that child poverty risk is significantly shaped by the demographic and socioeconomic characteristics of parents. Several authors advocate placing children at a somewhat higher risk of poverty depending on household's age composition (Rainwater and Smeeding, 2003; Chen and Corak, 2008; Chzhen and Bradshaw,

2012). Brady et al. (2009) found that households headed by young or old people are particularly vulnerable to poverty. According to TÁRKI (2010), children with a young mother are slightly over-represented among those at risk of poverty.

Other studies indicate the importance of parents' education, concluding that children that live with parents with a lower level of education are more likely to be poor than those whose parents have a higher level, since household income is influenced by the educational level of its members (Chen and Corak, 2008; Chzhen and Bradshaw, 2012; Gornick and Jäntti, 2012). In turn, parents' labour market participation is a fundamental determinant of child poverty, given that employment-generated income is the most important source of the household budget (Ferrarini, 2006; Chen and Corak, 2008;Munzi and Smeeding, 2008; Gornick and Jäntti, 2012). In addition, TÁRKI (2010) showed that when the mother is employed full time, children face less than half the average risk of poverty.

According to Strelitz and Lister (2008) and Atkinson and Marlier (2010), there is a significant relationship between poverty and health status and disability such that the presence of individuals with bad health and/or disabilities in the household increases the level of

necessary resources for a household to maintain its standard of living, since these households face extra costs.

There is also evidence of a greater risk of poverty among children whose parents are immigrants, especially if the parents were born outside the EU (TÁRKI, 2010). Specifically, TÁRKI (2011) emphasised the substantial gap between the situation of children with parents born in other EU-country and those with parents born in non-EU countries.

In addition to the demographic and socioeconomic characteristics of households, some studies highlight to what extent structural and institutional aspects particular to each country go some way towards explaining the wide variation in child poverty levels among countries. Researchers have pointed out the importance of social policy, particularly financial assistance aimed at reducing the risk of child poverty (Bradbury and Jäntti, 2001; Oxley et al., 2001; Kamerman et al., 2003; Rainwater and Smeeding, 2003; Waddoups, 2004; Ferrarini, 2006; Misra et al., 2007; Scott, 2008; Bäckman, 2009; Bäckman and Ferrarini, 2010; Chzhen and Bradshaw, 2012; Engster, 2012). In this sense, there is ample evidence that generous public support for families is significantly correlated to lower child poverty rates in countries

where such policies are implemented (Ferrarini, 2006; Engster and Stensöta, 2011; Engster, 2012). Few studies investigate the design of child benefits in relation to poverty reduction (Matsaganis et al., 2006; Notten and Gassmann, 2008). All in all, these studies confirm the importance of generosity, although the debate about the relevance of either universal or targeted benefits to reduce child poverty remains open. This has been a controversial issue for a long time, and theoretical arguments have been proposed favouring both sides (Kahn and Kamerman, 1975; Skocpol, 1991; Orloff, 1993). On the one hand, proponents of targeting benefits at the poor argue that it entails a more efficient use of resources because social spending goes to those who really need it (Besley, 1990). On the other hand, proponents of universalism argue that universal benefits are superior over selective ones because significant administrative costs, lower rates of take-up, and labour market and savings disincentives reduce their effectiveness in combating poverty (Atkinson, 1998; Notten and Gassmann, 2008; Bradshaw, 2012).

As regards the aforementioned "paradox of redistribution" arguing that more selective systems, paradoxically, have a smaller redistributive impact than universal systems, some recent studies claim that the link

between redistribution and universal provision has substantially weakened, or even reversed over time (Kenworthy, 2011). Marx et al. (2016) strengthen the finding that the relationship between the extent of targeting and redistribution may have weakened considerably.

Cross-country variation in the level of child benefit packages largely overlaps with the degree of low income targeting. This finding may in effect confirm and reinforce the assertion in the empirical literature that targeting may be not so bad, if embedded in a universal social insurance context, that is, "targeting with universalism" in Skocpol's (1991) words (see Corak et al., 2005; Whiteford, 2008; Kenworthy, 2011; Van Lancker and Ghysels, 2012; Van Mechelen and Marchal, 2013).

Other contextual factors having a particularly strong effect on child poverty are related to the labour market (Solera, 2001; Brady, 2006; Whiteford and Adema, 2007; Chen and Corak, 2008; Bäckman, 2009). In this context, countries with higher employment rates show lower child poverty rates.

Until now we have presented variables related to two key determinants of child poverty, namely government transfers and labour-market. However, GDP per capita has been also taken into account by different authors, although with contradictory conclusions. Thus, while Cantillon

(2009, 2011) finds that across the EU-27 relative income poverty tends to be lower in countries with higher GDP per capita, the opposite is highlighted by Engster (2012), who shows that higher GDP per capita is likely to generate higher median incomes and higher poverty thresholds, contributing to higher relative child poverty levels. In addition, Chzhen and Bradshaw (2012) conclude that the effect of GDP per capita on child poverty is not found to be statistically significant in lone parent families.

In line with previous analyses, such as those of Bradbury and Jäntti (2001), Rainwater and Smeeding (2003), Chen and Corak (2008) and Gornick and Jäntti (2012), it is worth noting that the factors that matter within countries are not necessarily the same as those that matter across countries, and that institutional factors are usually more explanatory than demographic ones.

Similarly to our work, although under a narrower framework, three studies have examined the impacts of social transfers on child poverty across countries, combining the micro and macro-economic perspectives through statistical multilevel modelling, namely Bäckman and Ferrarini (2010), Chzhen and Bradshaw (2012) and Chzhen (2014).

Bäckman and Ferrarini (2010) used the Luxembourg Income Study (LIS) database to analyse the role transfer policies play in families of 21 high- and middle-income countries, and restrict their analysis to pre-school children. Their results indicate that greater generosity of all types of family policy transfers at the macro level can be linked to lower poverty risks of households with young children at the micro level. They also point out that future research should endeavour to connect transfers to other labour market aspects.

Chzhen and Bradshaw (2012) measured the risk of child poverty exclusively in lone parent families. They conclude that lone parent and household characteristics do not explain all of the variation in the risks of child poverty though they find evidence of significant contextual country-level effects. The 24 countries studied differ in the extent to which their welfare states alleviate child poverty in lone parent families with out-of-work social transfers, although they do not control for labour market conditions or analyse other aspects of social transfers in addition to generosity.

In a recent study, Chzhen (2014) used separate multilevel models for the years 2008-2012 to analyse the effects of minimum income safety nets on children's poverty risks during the crisis. The author found that

children were significantly less likely to be poor in countries with more generous minimum income protection schemes in 2008-2012. However, once total social spending and working-age unemployment were accounted for, the effect of the minimum income protection indicator was no longer statistically significant.

Other studies do not explicitly combine the micro and macro perspectives in the analysis of variations in child poverty across countries. These studies have found that both national labour market patterns and social policy factors matter substantially, with this influence occurring via complex and interacting mechanisms (Bradbury and Jäntti, 2001; Rainwater and Smeeding, 2003; Chen and Corak, 2008). Chen and Corak (2008, p. 552) summed this up with a cautionary note to policymakers: 'there is no single road to lower child poverty rates. The conduct of social policy needs to be thought through in conjunction with the nature of labour markets'.

In this paper we develop a macro-to-micro perspective that analyses the effect of social policy taking into account a wider set of aspects of social transfer systems than previous studies, including categorical and income selectivity. In addition, our study is broader than preceding works in term of countries, types of household, and the age range of the

children analysed. We jointly examine the effect of households' demographic and socioeconomic characteristics and a number of contextual factors on child poverty risk, evaluating the effects of social transfer systems in terms of generosity, categorical selectivity (share of social protection expenditure specifically targeted at family/children) and income selectivity (share of family/children benefits targeted at children in the bottom quintile of income distribution),and verifying these effects even when controlling for other key country-level factors related to country's standard of living and labour market performance.

3. DATA AND VARIABLES

3.1. DATA

In this paper we use the EU-SILC data set, which is an instrument aimed at collecting timely and comparable cross-sectional and longitudinal multidimensional micro-data on income, poverty, social exclusion and living conditions. Contextual data stem from statistics collected by Eurostat for the countries involved in the analysis.

We conduct an original analysis with the 2012 wave dataset for 30 European countries (EU-28 plus Iceland and Norway). Our analysis is confined to children, defined as those under 18 years old living in the

household unit (see Chen and Corak, 2008; Chzhen and Bradshaw, 2012; Gornick and Jäntti, 2012; among others). The analysis pools the data from the 30 countries into one merged file that contains 66,882 households with 113,181 children.[1] Following Eurostat, our poverty measure is based on annual disposable household income.[2] To adjust for household size we use the modified Organisation for Economic Co-operation and Development (OECD) equivalence scale.[3] The child is classified as poor if he/she lives in a household with disposable household equivalent income below 60 per cent of the contemporary median equivalent income of the country where the household is located.

Figure 1 displays child poverty rates for the 30 countries. We observe a significant variation in child poverty rates across countries in 2012, ranging from 8.20% to 33.88%. Romania, Bulgaria and Spain display the highest child poverty rates, while the lowest ones are found in

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[1] To avoid methodological problems arising from the fact that children living in the same household are not statistically independent observations, we switch from the individual to the household level for the regression analyses.
[2] Disposable household income is defined as the sum, for all household members, of gross personal income components plus gross income components at the household level minus regular taxes on wealth and income, social insurance contributions and regular inter-household transfers paid. Income data correspond to the year prior to the survey for all countries except UK and Ireland.
[3] A value of 1 to the first adult in the household, 0.5 to each remaining adult, and 0.3 to each member younger than 14.

Norway, Iceland and Denmark. As a group, 19.14% of all children in these countries are poor.

****Insert Figure 1 around here****

We observe that most of the countries display a higher poverty rate for children than the overall population, with the remarkable exceptions of Denmark, Finland and Norway. In general, there is a significant positive correlation between child poverty rates and overall poverty rates. We also find that countries with higher child poverty rates present a large gap between child and overall poverty rates.

3.2. EXPLANATORY VARIABLES

As all children in the same household share the same particular characteristics of the household, we use data from households – stored in the household file – combined with data on the characteristics of fathers and mothers of children, recorded in the individual file.

We consider the following explanatory variables related to the household as a whole. The binary variables *lone-parent* and *jobless*, reflecting lone parenthood and households where no one works, respectively. We also take into account the number of children aged within several ranges: *Nch_2, Nch_3_5, Nch_6_11* and *Nch_12_17*. We

include the variable *owner* that takes the value 1 if the outright owner of the accommodation is a member of the household. Finally, the variable *thinly populated*, which takes the value 0 if clusters of contiguous grid cells of 1 km^2 have a density of at least 300 inhabitants per km^2 and a minimum population of 5,000, and 1 otherwise.

Besides household variables, researchers suggest that the characteristics of fathers and mothers are very relevant in explaining child poverty rates. We classify children as living with a *young father/mother* (younger than 30) and as living with *old father/mother* (older than 65). Secondly, we consider the variable *secondary father/mother* and *tertiary father/mother* to capture the effect of education on child poverty. Thirdly, parents' labour market participation is considered through the binary variable *father/mother working* full-time. We also incorporate the binary variable *health father/mother* that indicates if their general health status is bad or very bad. Finally, we categorise children as living with *EU immigrant father/mother* and *non-EU immigrant father/mother*.

Our main focus is to analyse the effect of social transfers. We present a set of contextual variables related to social transfers, as well as labour market and country's standard of living, whose influence can be

significant in child poverty rates according to the literature. All these variables introduced in the model are for 2011, which is the reference period for the household income.

Note that to examine the role of transfers in reducing poverty among children, we consider transfers other than old-age and survivor's benefits.[4] There are other ways to assess the generosity of social transfer in the EU, such as the model family method (Van Mechelen et al., 2011; SaMiP in Nelson, 2007, 2010). As discussed in Eardley et al. (1996), there are a number of problems with this method; the main one being that it works with a limited number of family types which vary greatly across countries and thus a representative sample for one country may not be representative of all of them. Moreover, data on the model family method is not available for the whole set of countries under consideration in this study. Consequently, we introduce social transfers and, in order to overcome some of the limitations of social transfers discussed in the literature, the influence of demographic and

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[4]Social transfers (excluding pensions) cover unemployment benefits, sickness benefits, disability benefits, education-related allowances, family- or child-related allowances, housing allowances and other social assistance benefits not classified elsewhere. They do not capture the impact of the tax system. We will control for the rate of employment in the country to overcome the possible effect of the business cycle on the amount of social transfers.

macroeconomic circumstances on poverty are controlled for using multilevel regression models.

It is worth stressing that in all countries except Greece, Spain and Poland, more than 60 per cent of families with children receive social transfers. These numbers are smaller if we refer to the proportion of overall families that receive transfers, although the same three countries have the smallest values. In all countries, child poverty rates would be higher if there were no transfers (Figure 2), although this analysis disregards any behavioural consequences of withdrawing them. These transfers appear to be most effective in reducing poverty in Iceland, Norway, Ireland, Denmark, and Finland, lowering child poverty by 50 per cent or more. Overall, social transfers make more difference to child poverty rates in the older EU member states, with the exception of Greece, Italy and Spain, whose transfers are some of the least effective. This is not surprising as social transfers reach fewer children in these countries.[5]

****Insert Figure 2 around here****

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[5] It should be remembered that social transfers include unemployment benefits, so they may appear to be most effective in countries where a larger share of parents is unemployed.

Assessment of the effect of transfers can be based on many output indicators. Cash spending as a percentage of Gross Domestic Product (GDP) is the most widely used measure of how much 'effort' is being made to directly redistribute income. Nevertheless, this is an imperfect indicator of policy intent and design. For instance, a high level of spending may result from very generous benefits flowing to small numbers of people, and not necessarily people at the bottom end of the distribution. Apart from considering generosity of transfers (*generosity*) as total expenditure on transfers in relation to GDP as provided by Eurostat, we take into account two types of targeting. First, we include the share of social protection expenditure specifically targeted at children by means of the variable *categorical_selectivity*, which is calculated from Eurostat data to measure the percentage of family/children transfers in relation to total transfers. Additionally, we also introduce in our empirical analysis the variable *income_selectivity*, which is estimated in the sample to measure the percentage of total transfers going to the bottom quintile of income distribution.

We also control for differences in the economic affluence of countries by introducing the variable GDP, which is the GDP per capita expressed in purchasing power standard as a percentage of the EU-28 average in

order to control for country-level living standard effect on child poverty risk and to test the robustness of the negative effect of social transfers. Other factors that have a particularly strong effect on child poverty, and are closely related to social transfers, are those referring to the labour market. Given that parental unemployment is one of the main determinants of child poverty, higher unemployment rates within countries are also likely to contribute to higher child poverty rates. Thus, if the negative effect of social transfers on child poverty is observed after controlling for country-level employment, it is a stronger test of the significance of social transfer packages in alleviating child poverty. The variable *employment* is calculated by dividing the number of employed persons aged 20 to 64 by the total population of the same age group and multiplying by 100. We expect that children who live in countries with high employment rates are less likely to be poor.

However, despite the fact that living in a country with a high employment rate is an effective way to secure oneself against the risk of poverty, it is clearly borne out by the evidence that having a job is not always sufficient to avoid poverty. The risk of poverty is conditioned more by work intensity and continuity in work than by having a job in itself. The in-work poor may owe their status to various

labour market problems such as unstable jobs, the inability to find full-time work or low wage rates, or to high needs. Along with the employment rate, the rate of in-work poverty in a country reflects the institutional country-level setting of the labour market and welfare state-related polices. In this respect, we take into account not only the employment rate but also the percentage of individuals who are classified as employed and are poor (*in-work-poverty*). We expect that children living in a country with a high rate of working poor tend to have higher child poverty rates. This way, if the negative effect of social transfers still remains even after controlling for the employment and in-work-poverty rate, it is a robust check of the significance of social transfers.

4. METHODOLOGY

Our main aim is to explain cross-national variations in child poverty levels by examining the macro-to-micro relationship and focusing on the effect of different aspects of social transfers. We therefore account for a hierarchical data structure involving two levels: children (level 1) nested into countries (level 2). Because of the idea that children may be influenced by their social and political context, we might expect that

two randomly selected children from the same country will tend to be more highly correlated than two children selected from different countries, and it is important to account for such unobserved country-level effects.

Conventional multivariate regression techniques may not be employed with hierarchical data since the standard errors of variables at higher levels will be underestimated given that the degrees of freedom are calculated as if they were at the first level. In order to capture the existing correlation between individuals at the same higher level, some alternative methodologies are not advisable in our study.[6] As country differences are of substantive interest in this paper, we need a model in which we can explore information beyond clustering. Thus, multilevel models are the appropriate alternative.

One of the main advantages when we use mixed or multilevel models is that we gain precision as compared to using aggregate (country-level) data only. In addition, the residual variation in multilevel modelling is treated as information that adds something to our understanding of the

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[6] We cannot properly evaluate the effect of country-level variables in separate country regressions or fixed effect models.

phenomenon in focus. Finally, it also permits controlling for country-level influences.

We use a random intercept model[7] in which the intercept is allowed to vary between countries.[8] We consider a latent continuous response, y_{ic}^*, representing the propensity for child i in country c to be poor as compared with not poor such that:

$$y_{ic} = \begin{cases} 1 \ if \ y_{ic}^* > 0 \\ 0 \ otherwise \end{cases} \qquad [1]$$

Let x_{ic} be a covariate. A linear regression model is specified for latent response y_{ic}^*

$$y_{ic}^* = \beta_0 + \beta_1 x_{ic} + \xi_c + \varepsilon_{ic} \qquad [2]$$

ξ_c is the random intercept which represents the difference between the mean of child poverty risk in a given country c and the overall mean, and ε_{ic} are the individual level residuals, that is the difference between the child poverty risk of the individual i and the averaged child poverty risk in his/her country c. We may identify the variance of child poverty risk between countries, σ_ξ^2, and the variance of child poverty risk between individuals within countries, σ_ε^2. The residuals ε_{ic} are

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[7] Regarding the exchangeability assumption required when treating cluster effects as random, we can assume it is satisfied as we include country-specific covariates.

[8] According to Bryan and Jenkins (2015), a minimum of 30 countries is necessary for non-linear multilevel models in order to obtain reliable results in relation to the contribution of the country effect. We fulfil this requirement.

distributed as a logistic distribution with mean 0 and variance $\pi^2/3$, and are independent of ξ_c, which follows a normal distribution with zero mean. The variance partition coefficient (VPC) is defined as the ratio of the variance of child poverty risk between individuals within countries to total variance.

We first fit Model A that includes household-level variables to test if international differences in the contribution of demographic and socioeconomic factors that place children in families with different poverty risks may have an effect on the international child poverty gap. We then add the three indicators regarding social transfers (Model B) to check how much of the unexplained variation is due to differences in their levels. Model C adds the GDP per capita in the previous model to control for living standard effects. Finally, Model D controls for the labour market effect in order to test if the negative effect of social transfer remains after controlling for labour market differences and the country's mean income.

5. RESULTS

The results of the estimations for the five logistic multilevel models[9] with random intercept (A, B, C, and D) are shown in Table 1.

****Insert Table 1 around here****

We first estimate Model A. The effects of household characteristics are very similar across the four estimated models. Our results are in line with the literature: a child living with only one parent is more likely to be poor than one living with two parents. We confirm that children in households where no one works have about three and a half times higher odds of being poor than those living in households where at least one person is working. The odds of being poor increase by around 30 per cent with each additional child and even more if the child is between 12-17 years old. A child's odds of being poor are lower if he/she is living in a household that does not have to pay for the dwelling. In line with Eurostat (2013), we find significant evidence that thinly populated areas in European countries are at a higher risk of poverty.

Regarding parents' characteristics, our results are aligned with previous results. We find that children living with a younger parent, a less

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[9]We have tested the convenience of using a multilevel model that captures the country effects on child poverty through likelihood ratio tests for all models.

educated parent or an unemployed parent are more likely to be poor. Contrary to our expectations, *the variable health father/mother* does not entail a significantly higher risk of child poverty.[10] Finally, children with an EU immigrant father/mother are more likely to be poor, even more in the case of living with non-EU immigrant father/mother.

As our objective is to analyse the effect of social transfers on differences in child poverty among countries in depth, we introduce the three aforementioned indicators of social transfers (*generosity, categorical_selectivity*, and *income_selectivity*) in Model B. As expected, the results show that there is a statistically significant relationship between the indicators of social transfers and the child's likelihood of being poor. The higher the generosity and targeting, either categorical or income selectivity, the lower the risk of child poverty, pro-child targeting (categorical selectivity), having a higher impact on child poverty risk. In particular, the child's odds of being poor significantly decrease by 7.6 per cent for each 1-unit increase in the percentage of family/children transfers in relation to total transfers in

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[10] This non-significant effect is net of other characteristics. In sensitivity analyses, we estimated a reduced form model and found that the odds of being poor were significantly greater for children living with parents with bad or very bad health. Nonetheless, perhaps unsurprisingly, higher poverty among those suffering from health problems can be accounted for by other variables introduced in the model, such as labour status or age of parents.

the country. Adding the social transfer indicators to the model reduces the percentage of the residual variation in the risk of child poverty due to country effects (VPC) from 6.4 to 2.2 per cent, which represents a 60.94 per cent reduction in relative terms. This implies that variations in social transfers account for more than half of the unobserved country-level heterogeneity in child poverty outcomes, something that must be regarded as quite substantial.

****Insert Figure 3 around here****

Figure 3 shows the intercept residuals before controlling for the effect of transfers versus intercept residuals after transfers (Model A *versus* Model B). We observe that the countries at the bottom left of the graph have a lower risk of child poverty, both before and after including transfer indicators. In contrast, countries such as Greece, Romania, Spain, and Poland, which according to TÁRKI (2010) belong to the group of countries with less-effective income support for families with children or with low levels of social transfers, are located at the top right of the graph. It is worth mentioning that none of these countries provided benefits to children within a universal system (targeting within universalism), which seems to be more effective in reducing poverty (Van Lancker and Van Mechelen, 2015). By contrast, all of them

present either strictly universal or strictly selective systems, according to EU's Mutual Information System on Social Protection, MISSOC.[11] In order to test the significance of social transfers, we control for GDP per capita in Model C and, additionally, for labour market outcome variables in Model D. We find that generosity, and categorical and income selectivity are still relevant aspects of social transfers regarding child poverty risk, as they are still statistically significant after controlling for contextual living standard effects, and, once again, categorical selectivity having the greatest impact. We also observe that the GDP per capita of the country where the child is living is not statically significant, in line with the results of Chzhen and Bradshaw (2012).

Model D provides a more demanding test by adding the effect of the labour market in the risk of child poverty. In particular, we include the employment rate and in-work poverty rate. Again, controlling for labour market effects does not alter our findings in what refers to social transfers. Our indicators of social transfers show, therefore, a high robustness to their effects on the risk of child poverty. Results also

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[11]Comparative data from MISSOC have been taken at midyear of 2011 since the income data used in the analysis correspond to this year.

indicate that the labour market variables affect child poverty risk. We find that the child's odds of being poor significantly increase by 5 per cent for each 1-unit increase in the working poor rate, and the odds of being poor significantly decreases by 2.2 per cent for each 1-unit increase in the employment rate. Therefore, there exists a statistically significant effect of both the employment rate and the in-work poverty rate on the child's likelihood of being poor, each variable in the expected direction, and the effect of the in-work poverty rate being higher than the effect of the employment rate. This shows that the level of integration in the labour market is important, but also the quality of this integration as measured through the capacity to avoid poverty. The findings of Marx et al. (2015) support this result as they argue that the determining labour market factor which causes a child to live in poverty is mainly based on the income received by their parents from the labour market, whether it is because their parents work part time or because they earn low wages, rather than on the situation of being employed or not.

In summary, we may state that once the cross-country variations in demographic and socioeconomic characteristics are accounted for, child poverty risks are still significantly lower in countries with more

generous social transfers and targeted to a larger degree at children and at the bottom of income distribution, the former (categorical selectivity) having the greatest impact. The association persists even after controlling for country's standard of living and for labour market performance, so that the characteristics examined of the social transfer income packages seem to yield an important explanation of cross-country differences in child poverty risks.

6. CONCLUSION

This paper aims to analyse the differences in child risk of poverty among European countries and evaluate the effects of social transfer income packages on child poverty. We find that the variation in child poverty outcomes across countries is mainly due to country factors, particularly related to social transfer systems, and to a lesser degree to micro factors related to the composition of households and characteristics of the parents. Child poverty levels are significantly lower in countries where social transfer income packages are more generous. More importantly, income selectivity towards the bottom of income distribution (pro-poor targeting) is also fundamental and even more so the categorical selectivity of social transfer systems towards

family/children benefits (pro-child targeting), also after controlling for country's living standard and labour market performance. In this way, we highlight that pro-child targeting, apart from its traditional justification of compensating for the costs associated with childrearing and minimizing the welfare loss relative to childless families, plays a significant role in reducing poverty, taking into account that horizontal equity and vertical equity may be interrelated. This is consistent with Verbist and Van Lancker (2016), who find that European countries succeeding in compensating a high share of the costs of childrearing for all families tend to succeed in reducing the poverty gap largely as well. In political terms, our empirical analysis highlights, first, the importance of social transfer policies to reduce child poverty in European countries, so that the correct functioning of appropriate policies improves the welfare of children living with scant economic resources. Our results are in line with other studies supporting 'targeting within universalism' (see Figari et al., 2011; Marx et al., 2015, 2016;Van Lancker and Van Mechelen, 2015), which demonstrate that the strongest redistributive impact is achieved by countries that combine comparatively high levels of spending with moderate to strong pro-poor targeting. Nevertheless, our findings go further and show that,

when determining and prioritizing policy orientations and measures to fight child poverty, it should be borne in mind that pro-child targeting (categorical selectivity) matters even more than pro-poor targeting (income selectivity), underlining the key role of family/children benefits in reducing child poverty. In fact, we should highlight that children are not randomly distributed over the population but tend to be overrepresented in families with lower disposable incomes, so that pro-child targeting also has a vertical redistributive impact by default.

Second, we conclude that some aspects related to labour market performance have a close link with the fact of living in poverty, even though social transfers still remain significant. The trickle-down effect from growth and jobs is frequently assumed to be the main strategy against poverty based essentially on boosting labour market participation. However, our study highlights that a high employment rate is clearly an insufficient condition for ensuring low poverty among the working-age population. Despite the fact that people may be working, in a context of low-paid and precarious jobs, they could have a low standard of living and thus may find themselves below the poverty threshold, including their children. In fact, numerous European countries have more than 20% of poor children living in households

with all working-age members unemployment, with child benefit packages failing to protect low-wage earners against poverty (Van Mechelen and Bradshaw, 2013). Thus, it seems evident that means-tested benefits should not be exclusively aimed at people not in work, but also at those in work in low-paid jobs.

Finally, concerning individual factors, we should specially stress the relevance of supporting jobless households, immigrant families, young parent households and single-parent families, as these groups are more socioeconomically vulnerable and exposed to a higher risk of child poverty.

Our findings provide new insight into the effects of social transfer income packages on child poverty in European countries from a broader perspective than previous analyses. These findings could be complemented in future research by in-depth country studies to promote social transfer policies for combatting child poverty under the particular circumstances of each country, digging into the specific mechanisms underlying the relationship between social transfer policies and child poverty reduction.

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Table 1. Odds ratio of child poverty (2012)

	Model A	Model B	Model C	Model D
Micro-variables				
lone-parent	1.227*	1.229**	1.228**	1.239**
	[0.128]	[0.127]	[0.127]	[0.129]
jobless	3.696***	3.678***	3.674***	3.653***
	[0.454]	[0.449]	[0.448]	[0.450]
Nch_2	1.288***	1.288***	1.287***	1.289***
	[0.102]	[0.102]	[0.102]	[0.102]
Nch_3_5	1.336***	1.337***	1.336***	1.337***
	[0.078]	[0.078]	[0.078]	[0.078]
Nch_6_11	1.313***	1.314***	1.314***	1.315***
	[0.054]	[0.054]	[0.054]	[0.054]
Nch_12_17	1.565***	1.567***	1.567***	1.567***
	[0.050]	[0.050]	[0.050]	[0.051]
owner	0.981	0.971	0.969	0.963
	[0.051]	[0.050]	[0.049]	[0.048]
thinly populated	1.422***	1.422***	1.421***	1.421***
	[0.110]	[0.108]	[0.108]	[0.107]
young father	1.205*	1.201*	1.200*	1.205*
	[0.120]	[0.121]	[0.120]	[0.120]
old father	0.301***	0.301***	0.301***	0.300***
	[0.054]	[0.054]	[0.054]	[0.054]
secondary father	0.850**	0.850**	0.849**	0.853**
	[0.069]	[0.069]	[0.069]	[0.069]
tertiary father	0.378***	0.379***	0.379***	0.381***
	[0.042]	[0.041]	[0.041]	[0.042]
work father	0.279***	0.280***	0.280***	0.281***
	[0.017]	[0.017]	[0.017]	[0.017]
health father	0.937	0.938	0.938	0.938
	[0.112]	[0.113]	[0.113]	[0.113]
EU immigrant father	1.627**	1.637**	1.649**	1.635**
	[0.347]	[0.342]	[0.349]	[0.345]
non-EU immigrant father	2.180***	2.182***	2.185***	2.182***
	[0.243]	[0.245]	[0.246]	[0.245]
young mother	1.632***	1.627***	1.626***	1.624***
	[0.122]	[0.121]	[0.121]	[0.121]
old mother	0.381***	0.379***	0.379***	0.379***
	[0.040]	[0.040]	[0.040]	[0.040]
secondary mother	0.647***	0.645***	0.644***	0.648***
	[0.065]	[0.065]	[0.065]	[0.066]
tertiary mother	0.301***	0.300***	0.299***	0.302***
	[0.033]	[0.033]	[0.033]	[0.033]
work mother	0.309***	0.308***	0.308***	0.309***
	[0.031]	[0.030]	[0.030]	[0.030]

health mother	0.900	0.901	0.901	0.902
	[0.087]	[0.087]	[0.087]	[0.087]
EU immigrant mother	1.574***	1.572***	1.582***	1.567***
	[0.265]	[0.271]	[0.271]	[0.265]
non-EU immigrant mother	1.775***	1.772***	1.777***	1.778***
	[0.119]	[0.119]	[0.120]	[0.120]
Macro-variables				
generosity		0.956***	0.964**	0.973***
		[0.011]	[0.014]	[0.008]
categorical_selectivity		0.924***	0.939***	0.966**
		[0.017]	[0.017]	[0.017]
income_selectivity		0.994***	0.994***	0.997**
		[0.002]	[0.002]	[0.001]
GDP			0.998	0.998
			[0.002]	[0.001]
employment				0.978**
				[0.011]
in-work poverty				1.050***
				[0.015]
Constant	0.373***	5.070***	4.224***	5.171**
	[0.057]	[1.642]	[1.382]	[3.925]
Var in intercept	0.225	0.076	0.072	0.040
VPC	0.064	0.022	0.021	0.012
Observations	66,882	66,882	66,882	66,882
Number of groups	30	30	30	30
Log likelihood	-10,523	- 10,508	- 1,0508	- 10,500

Sources: EU-SILC (cross-sectional version; 2012-3), Eurostat (2013).

Standard deviations in brackets.

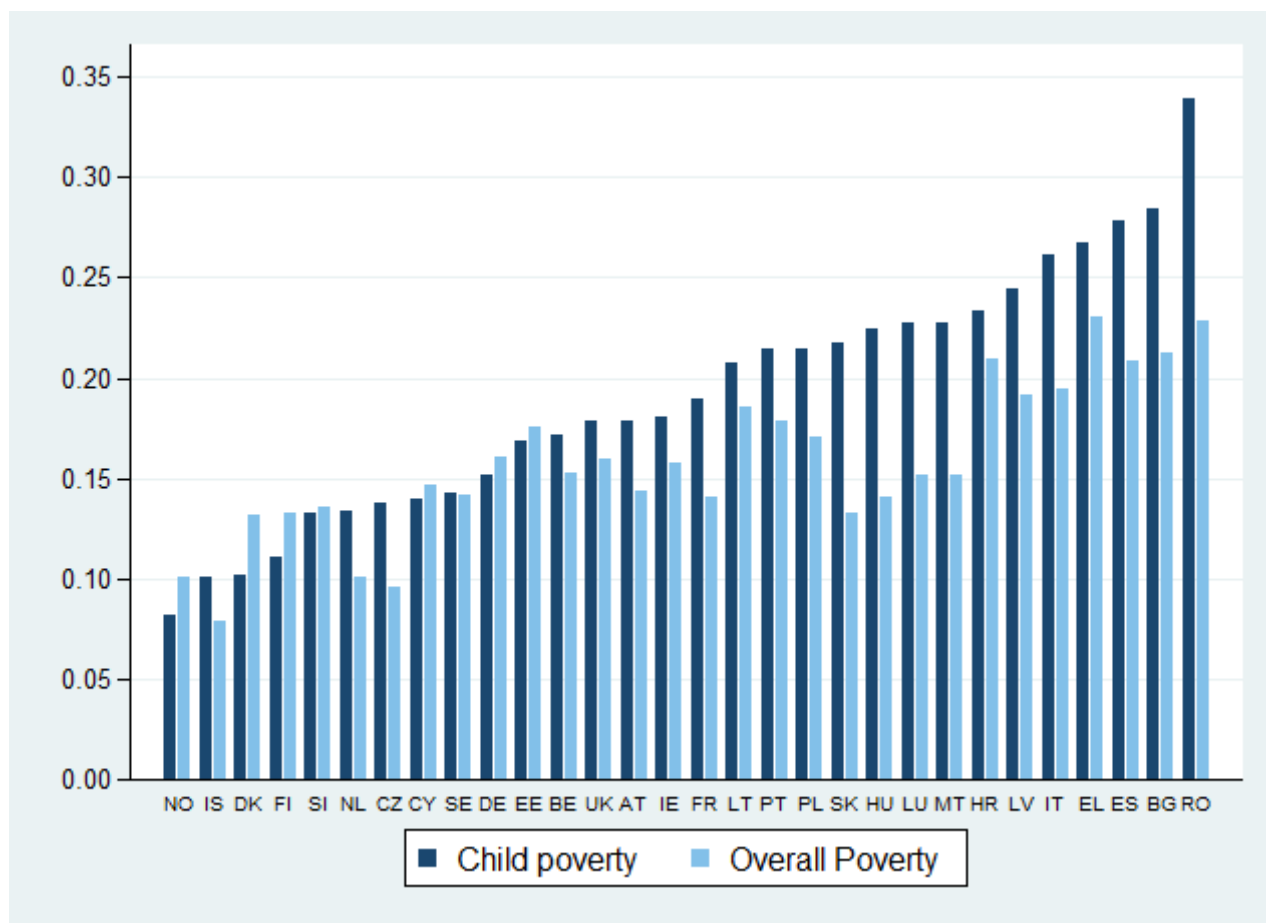*** p<0.01, ** p<0.05, * p<0.1

Figure 1. Child poverty rates. Source: EU-SILC (cross-sectional version 2012-3). Sorted by child poverty rate.

Note: AT: Austria; BE: Belgium; BG: Bulgaria; CY: Cyprus; CZ: Czech Republic; DE: Germany; DK: Denmark; EE: Estonia; EL: Greece; ES: Spain; FI: Finland; FR: France; HR: Croatia; HU: Hungary; IE: Ireland; IS: Iceland; IT: Italy; LT: Lithuania; LU: Luxembourg; LV: Latvia; MT: Malta; NL: The Netherlands; NO: Norway; PL: Poland; PT: Portugal; RO: Romania; SE: Sweden; SI: Slovenia; SK: Slovakia; UK: United Kingdom.
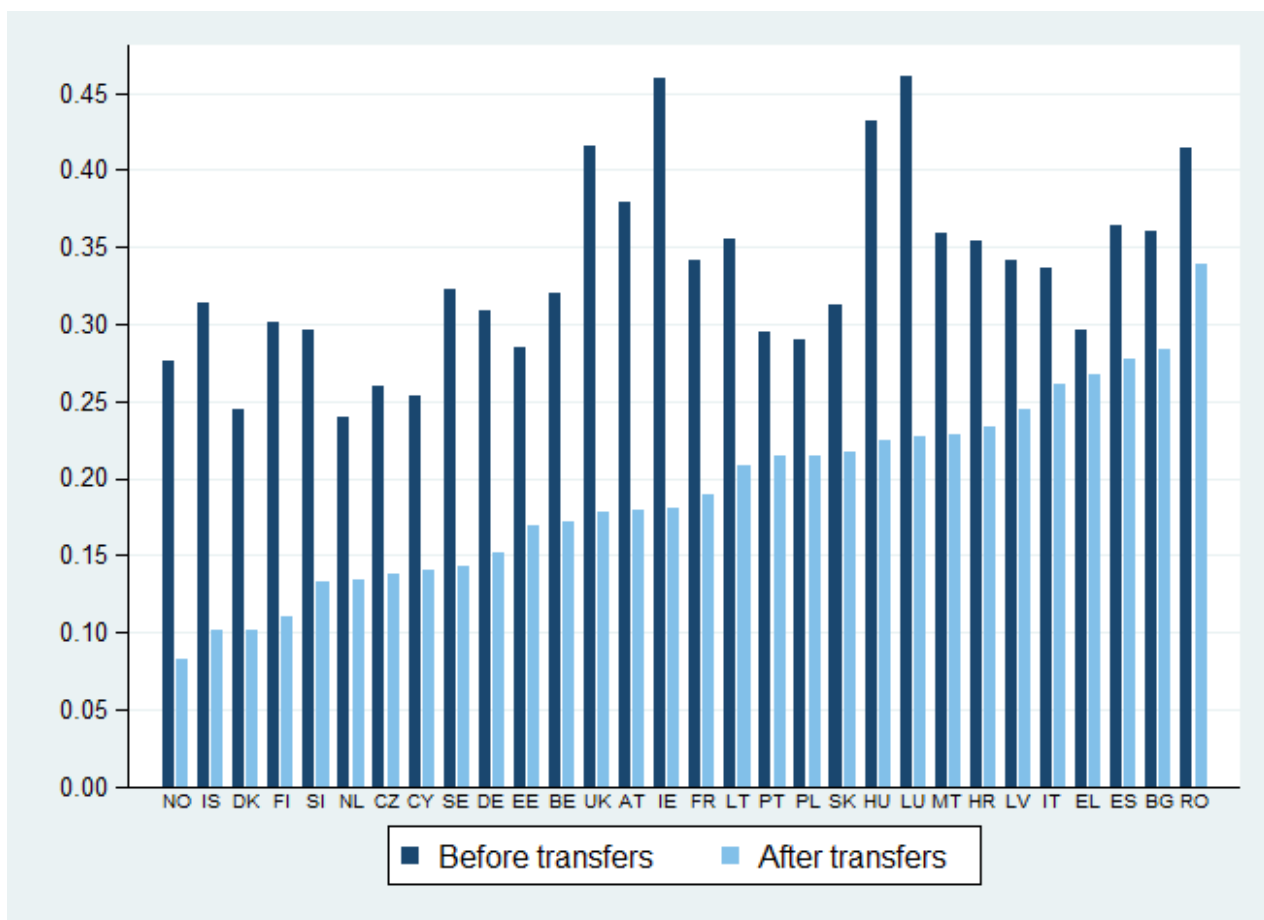
Figure 2. Child poverty rates before and after transfers.

Source: EU-SILC (cross-sectional version 2012-3). Sorted by child poverty rate after transfers.
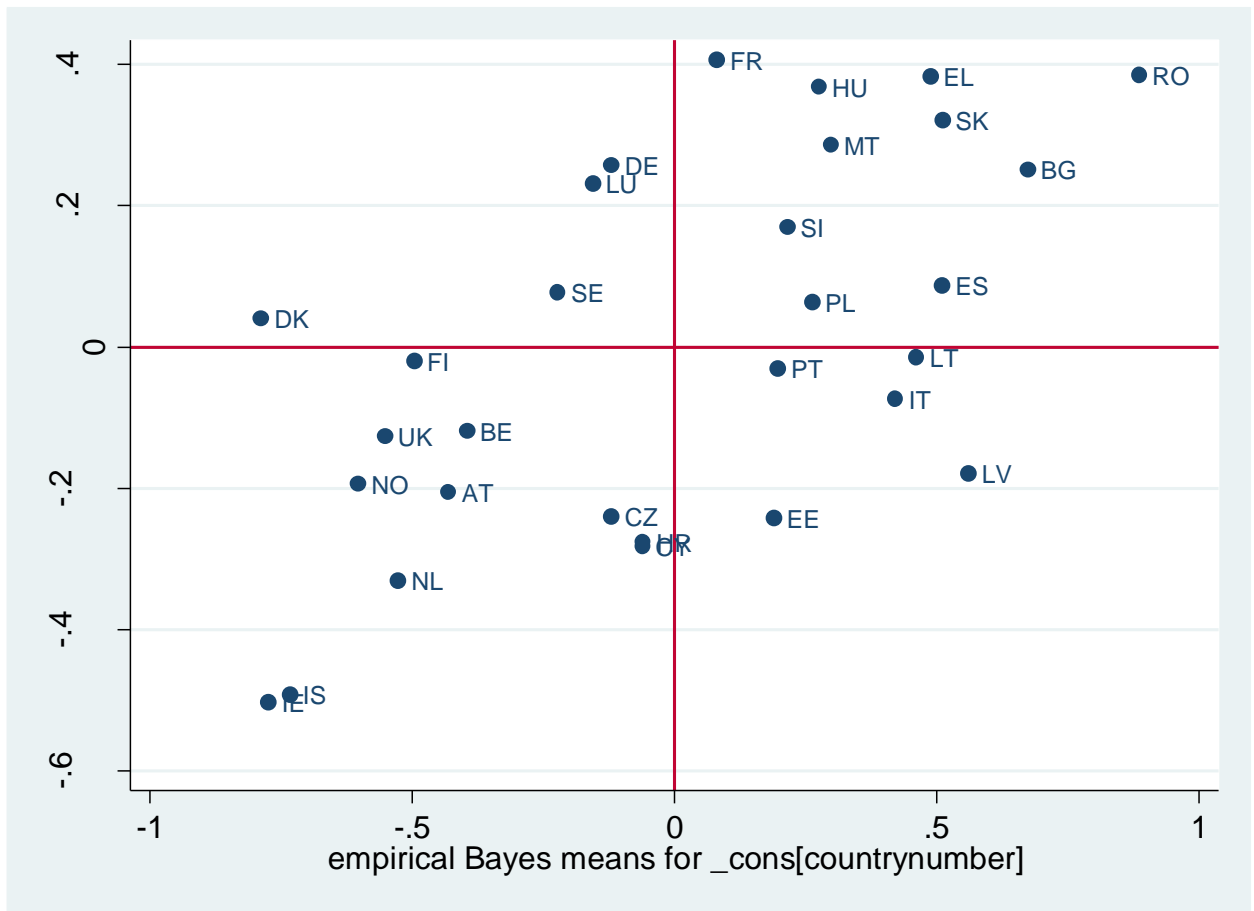
Figure 3. Predicted random intercepts (Model A versus Model B).

Source: Authors' estimations from EU-SILC data (cross-sectional version 2012-3).