ThE Papers

Dpto. Teoría e Historia Económica
Universidad de Granada

Working Paper n. 16/03

Child deprivation and social benefits: Europe in cross-national perspective

Elena Bárcena-Martín, Maite Blázquez,
Santiago Budría and Ana I. Moro-Egido
March 15, 2016

Child deprivation and social benefits: Europe in cross-national perspective

Elena Bárcena-Martín – Universidad de Málaga
Maite Blázquez – Universidad Autónoma de Madrid
Santiago Budría – ICADE, CEEAplA and IZA
Ana I. Moro-Egido – Universidad de Granada

January 2016

Abstract

In this paper, we examine the ability of social benefits to soften the level of child deprivation. We construct a dedicated child deprivation indicator which allows us to better capture children's circumstances and examine the effect on it of contextual and sociodemographic factors jointly through multilevel models. We contribute to the scarce literature on the effects of social spending on child-specific deprivation from a cross-national perspective. We separately estimate the effect of each social benefit function on child deprivation to evaluate the impact of those benefit functions directly targeted at children and those benefit functions with no explicit intention of child deprivation protection. Our findings suggest that in order to explain differences across European countries in the level of child deprivation, country-level determinants are crucial. Moreover, social benefits play a key role that remains even when controlling for country-level determinants. An additional finding is that the most effective social benefit functions are not necessarily those targeted at children.

JEL CODES: I32, J13
KEYWORDS: Child deprivation, social protection benefits, multilevel regression.

1. Introduction

Investing in children is desirable. Apart from moral and fairness considerations, the economic return to this investment is typically regarded as high, both for individuals and society as a whole (Asian Development Bank, 2001; Fajth, 2009; UNICEF et al., 2009; Roetten and Sabates-Wheeler, 2011). For this reason, understanding child deprivation to the fullest possible extent is vital. Being deprived in childhood can last a lifetime – rarely does a child get a second chance at an education or a healthy start in life. As such, child deprivation threatens not only the individual child, but is likely to be passed on to future generations, entrenching and even exacerbating inequality in society. The causes of child deprivation are typically regarded as being either individual and household-specific or contextual. Moreover, the relative contribution of each dimension is often unclear.

An additional debate regarding child welfare refers to the redistributive capacity of total transfer systems. To date, we know little about the deprivation-reducing scope of such policies among specific population groups. This is particularly true under a cross-country perspective, where deprivation levels differ substantially among countries with apparently similar transfer systems. There are very few studies that jointly consider household and country determinants of child deprivation, and none that addresses this question using data from a wide range of countries. This paper attempts to fill this gap.

The paper uses the 2009 wave of the Statistics on Income and Living Conditions (EU-SILC) that includes a specific child module. We employ multilevel techniques to examine the relative importance of household characteristics and contextual determinants in explaining cross-national variation in child deprivation in Europe. We use this information to examine the ability of social benefits to soften the level of child deprivation. Specifically, we estimate the effect of social benefits as a whole on child deprivation, and then evaluate the impact of each benefit function directly targeted at children and each benefit function with no explicit intention of child deprivation protection. Therefore, the paper contributes to the scarce literature on the effects of social spending on child material deprivation.

The strengths of this paper are, first, the use of a child deprivation index that allows us to better capture children's circumstances (De Neubourg et al. 2012; Guio et al. 2012). Second, the paper discriminates between deprivation levels (intensity) and the areas (extension) of deprivation. Most other papers disregard the intensity dimension. Third, the method of analysis takes advantage of multilevel techniques that are especially suited for the analysis of cross-national variation in child deprivation while controlling at the same time for household characteristics. Finally, the paper considers the influence of the so-called 'domain-specific' institutional measures. Specifically, it assesses the effect of the size of social protection benefits on child deprivation, and discriminates among the different social benefit functions to ascertain

which of them is more effective in tackling deprivation. We ask whether social benefit functions aimed at children are more relevant than more general benefit functions. As Dewilde (2008) has stated, there are two main reasons for this. First, most authors point to the considerable variations among countries that belong to the same regime cluster, leading them to conclude that it may be essential to incorporate country-specific features into the analysis (Maître et al., 2005). Secondly, in order to formulate meaningful policy recommendations, one needs to ascertain which policies are related to which individual outcomes, holding other things equal.

The main findings in the paper are that social protection systems significantly explain cross-country differences in child deprivation. This is so even after controlling for a wide range of country-level factors. We find that some benefit functions targeted at children do not have the intended reducing effect on deprivation, while other functions not explicitly targeted at children have an impact on the level of child deprivation, showing unintended effects. This result allows us to derive valuable policy lessons to reduce child deprivation.

The paper is structured as follows: section 2 reviews some significant papers on the study of material deprivation. Section 3 describes the data used, the deprivation index, the variables introduced in the study and the method of analysis. Section 4 presents and discusses the results of our analysis. The final section concludes.

2. Background

Much of the deprivation research is predominantly individually oriented and most of it is focused on a single country. A common result in all countries is that people living alone, lone parents and families with dependent children are especially vulnerable to material deprivation (Tsakloglou and Papadopoulos 2002; Boarini and D'Ercole 2006; Dewilde 2008). The neighborhood in which families reside also affects the risk of child deprivation (Daly et al. 2008; Tárki 2010; De Neubourg et al. 2012), while homeowners are less likely to report material deprivation than renters (Berthoud and Bryan 2011; Figari 2012). Bad health is also positively associated with deprivation, arguably because it increases the necessary resources for a household (Atkinson and Marlier 2010). Additionally, most studies find that women are generally more deprived than men, although this gender gap remains largely unexplained (Halleröd et al. 2006 and Muffels and Fouarge 2004). A vast amount of literature considers that unemployed, inactive people, long-term unemployed individuals or those working few hours have a high likelihood of deprivation (Layte et al. 2001a, 2001b; Whelan et al. 2001, 2004; Muffels and Fouarge 2004; Halleröd et al. 2006; Dewilde 2008; Figari 2012; Graaf-Zijl and Nolan 2011; Pilkauskas et al. 2012). In contrast, households with one or more self-employed or employed workers generally present lower deprivation scores (see, among others, Eurostat 2002; Berthoud and Bryan 2011). A highly consistent result across all countries is that a higher

education reduces deprivation (Whelan et al. 2004; Muffels and Fouarge 2004; Boarini and D'Ercole 2006; Berthoud and Bryan 2011; Figari 2012). Finally, there is a clear positive association between the age of the responsible person and deprivation and also between migrant status and level of deprivation (De Neubourg et al. 2012).

There are also multi-country deprivation studies, but most of them rely on research strategies (separate regressions, fixed effects models, etc.) that do not permit the inclusion of country-level explanatory variables such as the level of social spending and other contextual conditions. For instance, Layte et al. (2001b) examined the importance of individual characteristics when accounting for cross-national differences in deprivation. However, they controlled for country characteristics simply with dummy variables and interactions. The authors suggest that cross-national differences in deprivation might be due not only to variation in household and individual characteristics that are associated with disadvantage but also to the differential impact of such variables across countries and across welfare regimes. Muffels and Fouarge (2004) explained levels of deprivation by estimating Tobit panel regressions. They concluded that compositional factors play a dominant role in explaining cross-country differences in deprivation levels, although the effect of welfare regimes is significant and substantial. Separate estimations by country are provided in Figari (2012), where unobserved heterogeneity is accounted for by estimating linear fixed effects regressions. The results show that a relevant part of the deprivation gap among countries is attributable to a country-specific effect, thus revealing the importance of factors such as cultural attitudes and institutions. The need for research that combines micro and macro levels therefore becomes evident.

One attempt to control for these country-level variables is Dewilde (2008). Using a multinomial logit model controlling for country-level variables and cluster-robust standard errors, this paper concludes that the risk of multidimensional poverty can be explained by the policy context, even when taking compositional differences between countries into account. However, when they control for economic affluence, the effect of some often-used institutional indicators does attenuate and in some cases it even switches sign.

The literature closest to our paper is the comparative research that analyzes cross-country variation in deprivation through multilevel analysis with EU-SILC. As in the present paper, the multilevel approach allows combining micro- and macro-level determinants simultaneously and explicitly model the within-country correlation. For lone parent households in year 2009 using 24 countries, Chzhen and Bradshaw (2012) concluded that household characteristics do not explain all of the variation in child deprivation and found evidence of significant contextual country-level effects. The effect of transfers is found to be significant in alleviating material deprivation, but only when the differences in GDP per capita are not controlled for. Once the variation in country wealth is taken into account, the effect of social

transfers disappears, thus suggesting that out-of-work social transfer income packages appear to depend more on the overall standard of living in a country.

In the same line, Nelson (2012) used data of 26 countries in 2008 and found a significant and negative association between an individual's risk of material deprivation and levels of social assistance, even after controlling for GDP per capita. However, his analysis focused on household deprivation instead of child deprivation. For 26 countries in 2009, Whelan and Maître (2012a) found that adding contextual factors contributes relatively little in the way of explanatory power. In particular, their results reveal no significant impact of the Gini index,[1] but a highly significant influence of gross national disposable income per head on the level of household (not child) material deprivation. Finally, they provide evidence of the existence of a set of significant interactions between micro socioeconomic attributes and country-level gross national disposable income per capita, none of which are related to social transfers.

Israel and Spannagel (2013) considered 26 countries in 2010 and found that household (not child) material deprivation is especially prevalent for countries that feature a high degree of inequality, while national income seems to be of less relevance. The authors concluded that extremely low-income families in countries with a rather unequal economic structure suffer from material deprivation more than what would be proportional. They do not analyze the impact of social transfers on deprivation.

For 28 countries in 2007, Bárcena-Martín et al. (2014) showed that country-specific factors seem to be much more relevant than individual effects in explaining country differences in material deprivation (not specifically child deprivation). They found a negative and significant relationship between deprivation and social policy generosity and that countries with a more equal income distribution are associated with lower levels of deprivation. Through the analysis of interaction variables, they concluded that the effect of sociodemographic characteristics can be shaped by institutional and structural factors, especially by the level of GDP. Moreover, they found that social policy generosity reduces the effect of individual characteristics.

Chzhen (2014) investigated the effects of minimum income safety nets on children's deprivation risks during the crisis. The analysis controls for relevant household level and macroeconomic characteristics and finds evidence of minimum income protection schemes cushioning the blow of the crisis. Specifically, children were significantly less likely to be deprived in countries with more generous safety nets in 2008-2012. However, the effects of

[1] This result can be explained by the fact that the Gini index measures inequality but does not specifically weight the lower end of the distribution, which is the one especially influenced by material deprivation.

social safety nets were only significant when total social spending and unemployment were not accounted for. These two macroeconomic variables were found to have large significant effects on the risk of severe child deprivation.

Visser et al. (2014) used the European Social Survey (2010–2011) to analyze the effect of macro-economic circumstances and social protection expenditure on household economic deprivation (not child deprivation) through a linear multilevel regression. They concluded that in countries that perform worse economically, individual experiences of economic deprivation are more prevalent: the stronger the rise in the unemployment rate and the lower a country's wealth, the more economic deprivation individuals experience. They also found that in countries with high levels of social protection, people experience less economic deprivation as compared to countries with low levels of social protection. In turn, adverse economic conditions in a country temper these positive outcomes of social welfare arrangements. Finally, the strength of the relationship between a low income and economic deprivation varies strongly according to the economic circumstances in a country and the generosity of the welfare state.

Although there is some research on EU-wide comparative analysis on child deprivation, it is usually based on standard, household-level deprivation items. Nonetheless, it is widely accepted that child material deprivation needs to be studied at the level of the child rather than at the household level (Chzhen and Bradshaw, 2012, De Neubourg et al., 2012, Guio et al., 2012, Main and Bradshaw, 2012, and Chzhen, et al.,2015). There are few studies in the literature that investigate child and household deprivation jointly. Some of them suggest that children and parents experience parallel deprivation (e.g., Cantillon et al. 2004; Skevik 2008), while others have shown how parents and children may not experience deprivation to the same extent (e.g., Middleton et al. 1997; Daly and Leonard 2002; Gordon, et al. 2003; and Whelan and Maître 2012a) depending on whether parents prioritize their children's needs and wants. Using the Irish sample of the EU-SILC 2009, Gabos et al. (2011) found that child-specific deprivation variables and the standard, household-level deprivation variables did not necessarily identify the same children as deprived, with the degree of discrepancy varying across countries. Whelan and Maître (2012b) obtained a similar result for Ireland, that is, children exposed to childhood deprivation were only a sub-set of all children exposed to basic household deprivation.[2]

Besides the previous discussion on the unit of measurement of material deprivation, there is also some debate about the number and type of items that should be used. As suggested by De Neubourg et al. (2012) and Frazer and Marlier (2014), the material deprivation indicators currently used at the EU level have several limitations. The first one is the small number (nine)

[2] However, basic household deprivation was measured using a different set of items than those in the EU material deprivation indicator, so the conclusions cannot necessarily be generalized.

of items on which they are based. The second one is that the standard EU material deprivation indicator is not child-specific and mixes financial and non-financial aspects of well-being. Finally, the indicator does not form a sufficiently reliable scale for the sample of children. All these limitations constitute a primary reason why a thematic module on material deprivation was included in the 2009 wave of EU-SILC. A second important reason was the need to respond to the willingness of EU countries and the European Commission to complement the current set of EU social protection and social inclusion indicators with additional measures reflecting the situation of children. Thus, the EU-SILC 2009 material deprivation module includes specific child deprivation items.

There are some studies that have used this specific module to analyze the determinants of child deprivation. This is the case of De Neubourg et al. (2012), who proposed a child deprivation indicator based on 14 items from the specific child module included in EU-SILC 2009. At the same time, Guio et al. (2012) proposed their own revision of the EU material deprivation indicator. They advocated the adoption of two separate measures, one for the whole population and one for children aged 1-15.

In this paper, we use the EU-SILC (2009) module to provide a more precise definition of child deprivation. We explicitly examine the relationship between social transfers and child deprivation level through a comparative perspective using a multilevel technique that allows us to combine micro- and macro-level determinants simultaneously and explicitly model the within-country correlation. Nonetheless, we are interested in analyzing not only the overall effect of social benefits, but also the specific effect of the main functions of social benefits. That is the reason why we ultimately evaluate the impact of social benefit functions to unravel the intended and unintended effects of social benefits. This approach is expected to favor a deeper analysis that can serve as a guide to untangle the most effective way to reduce child deprivation.

To the best of our knowledge, the only studies on child deprivation that consider both level variables simultaneously are Chzhen and Bradshaw (2012) and Chzhen (2014). However, these studies chiefly differ from ours in the definition of the dependent variable and the estimation procedure. In particular, they measure child deprivation through standard household-level deprivation items, and their dependent variable is a binary variable that takes the value of 1 if the child is living in a household that reports the inability to afford at least three out of nine items rather than the intensity of deprivation. Moreover, Chzhen and Bradshaw (2012) only consider lone parents.

3. Data set and methodological considerations

3.1 Data set

The EU-SILC data set is an instrument aimed at collecting timely and comparable cross-sectional and longitudinal micro data on income, poverty, social exclusion and living conditions. However, we only make use of the 2009 wave, which is the only wave that contains a module on children's material deprivation. The specific child module only considers children aged below 16. Information is not collected from children themselves, but from the household respondent. According to the survey protocol, if in a given household at least one child does not have an item, it is then assumed that all the children belonging to that household lack that item. Therefore, our unit of measurement is the household, while the unit of analysis is the child.

We pool data for all countries in the EU-SILC 2009 wave and include contextual data from statistics collected by Eurostat for 2009. Our sample contains 35,941 observations from 26 countries.[3]

3.2 Child deprivation indicators

Treating the problem of deprivation as multidimensional requires the aggregation of indicators into a single index. Moreover, a composite index of deprivation requires judgment on the relative importance of each domain or indicator. In our analysis, we consider data-driven weights where the weight associated to each child-specific item corresponds to the percentage of children having access to the item in the country (frequency-based weighting approach). This choice is motivated first by the idea that not having access to widely spread items should be a more relevant determinant of deprivation than less widely spread items. Secondly, weights are constructed based on the distribution of achievements in society, without taking into consideration any value judgment about how the trade-offs between the items should be. Therefore, the advantages of this approach are threefold. First, it allows the deprivation score of a given child to increase if his/her conditions do not change and the conditions of all other improves. Second, the index takes into account economic conditions and social and cultural preferences in the access of items. Third, this approach is robust to the inclusion of items that are relevant only for a very small proportion of the population. To permit comparisons across countries, we normalize the index of deprivation and multiply it by 100 to easily interpret the index as the percentage of consumption items the person is lacking (it equals 0 if a child lacks no items and approaches 100 if a child lacks all items).

To compute the child deprivation index, we use the fourteen specific items included in the child-specific module of the EU-SILC 2009. These refer to the affordability of: some new clothes; two pairs of properly fitting shoes; fresh fruit and vegetables once a day; three meals a day; one meal with meat, chicken or fish; books at home suitable for their age; outdoor leisure

[3] The 2009 wave covers 30 countries, but we end up with 26 countries due to missing data in some variables of interest. Table 1 contains the full list of countries.

equipment; indoor games; regular leisure activities; celebrations of special occasions; inviting friends round to play and eat from time to time; participating in school trips or events that cost money; a suitable place to study; and outdoor space in the neighborhood to play safely.[4] The rest of the items are optional in the survey and there is no information on them for all the countries in the sample. The average level of child deprivation measured as the weighting index and the number of observations for each country are shown in Table 1.

------- Insert Table 1 around here -------

We find substantial differences in deprivation levels across European countries, with the index ranging from 0.6 in Iceland and Norway to more than 31 in Romania and Bulgaria.

3.3. Explanatory variables

As in the related literature, we include three different groups of determinants to explain child deprivation: sociodemographic characteristics of the household as a whole, the characteristics of the household reference person and contextual factors. The main descriptive statistics are reported in Table 2.

------- Insert Table 2 around here -------

In terms of the household and household responsible person characteristics, we consider the most common variables used in the related literature. An important determinant of child deprivation refers to the household composition in terms of age and number of children. To capture this effect, we include a set of four variables, *Nch_2*, *Nch_3_5*, *Nch_6_11* and *Nch_12_16*, to capture the number of children younger than three years old, between three and five years old, between six and eleven years old, and between twelve and sixteen years old, respectively.

To assess the impact of the household type, we include a dummy variable for households with only one parent (*Single*). We capture the impact of the degree of urbanization on child deprivation with the dummy *Urban*, *which* captures whether the household lives in a densely populated area.[5] The effect of whether the accommodation is owned or rented is included by means of a dummy variable (*Owner)* that takes the value of 1 to capture home

[4] See Table A in the Appendix for the complete list of items available in EU-SILC.
[5] Densely populated area implies a density greater than 500 inhabitants per square kilometer, where the total population for the set is at least 50,000 inhabitants.

ownership.[6] We also control for the ratio of household members who suffer from any chronic illness or condition,[7] (*Perc_chronic*). This variable ranges from 0 to 1.

Regarding the household reference person (RP),[8] we include a dummy variable concerning the gender (*Woman_RP*). We include a set of dummies to capture the reference person's labor status; specifically, we control if the reference person is working either full or part time (*Full_RP; Part_RP*), and the reference is being unemployed or inactive. We also include a dummy variable to capture tertiary education (*Tertiary_RP*). Moreover, we consider whether they are younger than 30 (*Young_RP)* or older than 65 (*Old_RP).* Hence, the reference category is being between 30 and 65. Finally, the effect of being an immigrant is captured with the dummy *Immigrant_RP*.

As regards the variables used to control for contextual factors, it is important to note that the wide variation in child deprivation levels observed in Table 1 shows that there is scope for political action. Partly for this reason social protection benefits have increasingly been the focus of attention in social and economic spheres in an attempt to look for solutions to the problem of child deprivation. This paper aims to contribute to the debate by capturing the effect of social protection benefits on child deprivation once controlling for the socioeconomic characteristics of the children and households.

Some studies that focus on the effects of social safety nets use the model family approach that calculates the net income available to stylized households who have no market income (see, for example, Nelson 2007, 2010). As we attempt to capture the effect of state support to families with children, we do not consider only the social safety net for those with no market income, but also for those who are recipients of social protection benefits even when receiving market income. Therefore, we consider all social protection benefits that are transfers, in cash or in kind, to households intended to relieve them of the financial burden of several risks and needs as defined in the European system of integrated social protection statistics (ESSPROS).

We analyze the effect of social protection benefits (*Soc_pro*) on child deprivation, measured as the amount of social protection benefits as a share of GDP. Notice that it could be an incomplete indicator. Assessing the impact of social benefits on child deprivation is a complex task since a broad range of functions influences the actual living standards of households with children. In order to determine the effect of different functions of social benefits in reducing child deprivation and to test which function of social benefits has a significant effect on child deprivation level, we classify social protection benefits according to

[6] A person is a homeowner if he or she holds a title deed independently of whether the house is fully paid or not.
[7] Chronic illness or conditions refer to permanent situations that are expected to require a long period of supervision, observation or care. Temporary problems are not considered.
[8] The reference person is the person responsible for the accommodation, that is, the person owning or renting the accommodation. If the accommodation is provided for free, the person to whom the accommodation is provided is the responsible person.

eight social protection functions (which represent a set of risks or needs): family/children; housing; social exclusion not classified elsewhere; unemployment; old age; survivors; sickness /health care; and disability.[9] EUROSTAT provides data on these functions, and they are usually aggregated into 6 different groups: parental responsibilities; housing; social exclusion; unemployment; the loss of a spouse or parent and old age; health care; and invalidity.

Social protection benefits can have intended effects if they have explicit child protection objectives, and they can also have unintended effects if children are not the focus of the benefits but they yield positive outcomes for children. By focusing on the part of social protection expenditure specifically targeted at children, we can have an indication of how part of the efforts of countries to support families relate across them. However, it is important to note that the focus on family/children benefits does not take account of other spending that can also impact the situation of children in general. Some studies on child poverty have found that social spending reduces child poverty, and that a large share of that reduction occurs through benefits that are not directly targeted at children (Corak et al. 2005).

We will consider the 6 aggregated functions mentioned above, measured as a share of the GDP. Family/children benefits (*Family_Children*) are primarily targeted at the group of our interest, children. Housing benefits (*Housing*), are intended to help households meet the cost of housing, and as social exclusion benefits (*Social_Exclusion*), also targeted at those in the lower end of the distribution, usually exhibit a high correlation with those with higher levels of deprivation. Unemployment benefits (*Unemployment*) are not directly targeted at children, but aim to support the incomes of jobless workers, and household with children are specifically affected by a low work intensity. Finally, we consider two benefits not directly connected to children: old age/survivors benefits (*Oldage_Survivor*) and sickness/healthcare and disability benefits (*Sickness_Disability*).

We test if our results remain throughout different specifications in order to assess to what extent the estimates in reduced models are confounded by other factors. To do so, we add a set of variables related to macro-economic forces. Specifically, we control for the economic affluence of countries through the variable *GDP*, which is the per capita GDP as a proportion of the EU-27 average based on PPS per inhabitant. We also include the rate of long-term unemployment as a control variable, as higher long-term unemployment rates within countries are likely to contribute to higher child deprivation levels. The variable *Long_unemp* represents people who are out of work and have been actively seeking employment for at least a year as a percentage of the active population. Finally, we control for inequality in the distribution of income in the country through the variable *s80s20*, which is the income quintile share. The main descriptive statistics of the contextual variables are reported in Table 2.

[9] More information on these functions is provided in Appendix B.

3.4. Econometric model

We account for the hierarchical structure of data using two levels, namely children (level 1) nested into countries (level 2). Moreover, to handle the issue of correlated observations within a country, and because we are mainly interested in country differences, we rely on multilevel regression.[10] Therefore, we explore the information beyond clustering and analyze the effect of country-level variables.[11]

We use a random intercept model in which the intercept is allowed to vary between countries.[12] We estimate alternative models to evaluate the relative importance of household and contextual determinants in explaining cross-national variation in child deprivation.[13] Let us then consider a two-level structure where children, i (first level), are nested into countries, c (second level). We model random effects in the form of random intercepts. Each random effect is summarized according to its estimated variance. Let D_{ic} denote the level of material deprivation for child i in country c, and the vectors X_{ic} and Z_{ic} contain explanatory variables of the first level (household characteristics) and the second level (contextual factors), respectively. To analyze our goals, we depart from the null model (*Model A)* specification, which does not include any explanatory variables and gives us information on whether there are country differences in child deprivation levels.

$$D_{ic} = \gamma_0 + \xi_{0c} + \varepsilon_{ic}$$

where ξ_{0c} designates the random intercept and ε_{ic} the child-level residuals. Both residuals are assumed to be independent and to follow normal distributions with zero mean. Therefore, we define the between-country variance, $\sigma^2_{\xi_0}$, and the within-country between-children variance, σ^2_{ε}. If the within-country variance were zero, all variability would be between countries. In contrast, if the between-country variance were zero, then there is only variability between children of the same country. However, if it is significantly different from zero, then we can say that country differences are present. As is usual in the literature, to set the proportion of the total variance due to differences between countries, we use the intra-class correlation coefficient (ICC) given by

[10] Traditional multivariate regression techniques may not be employed with hierarchical data since the standard errors of variables at higher levels of aggregation are underestimated. This is so because the degrees of freedom are calculated as if they were at the first level.

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

[12] Regarding the exchangeability assumption required when treating cluster effects as random, we can assume it is satisfied as we include country-specific covariates. See Rabe-Hesketh and Skrondal (2012).

[13] According to Bryan and Jenkins (2013), a minimum of 25 countries are necessary for linear multilevel models in order to obtain reliable results in relation to the contribution of the country effect. We fulfill this requirement.

$$ICC = \sigma^2_{\xi_0} / (\sigma^2_{\xi_0} + \sigma^2_{\varepsilon})$$

We extend the null model by gradually including household characteristics in Model B:

$$D_{ic} = \gamma_0 + \boldsymbol{\gamma}_1' \mathbf{X}_{ic} + \xi_{0c} + \varepsilon_{ic}$$

Finally, to check whether contextual-level determinants have an effect on differences among countries with respect to child deprivation levels, we propose Model C-H.

$$D_{ic} = \gamma_0 + \boldsymbol{\gamma}_1' \mathbf{X}_{ic} + \boldsymbol{\gamma}_2' \mathbf{Z}_c + \xi_{0c} + \varepsilon_{ic}$$

where Z_c is a vector of country-specific characteristics that present a different set of variables, defined above, from Model C to Model H.

4. Results

Child material deprivation and social protection benefits vary widely across European countries, as can be observed in Table 2. The results of the estimations for the random intercept models are shown in Table 3. In the bottom part of the table we report the percentage of the variation in child deprivation that is attributable to differences across countries (ICC).

------- Insert Table 3 around here -------

According to the null specification (Model A), the multilevel model is preferable to the one-level model, with approximately 25.74 per cent of the variation in child deprivation being attributable to differences across countries (ICC). When adding household characteristics (Model B), the estimated proportion of the residual variation in child deprivation due to country-specific effects increases to 29.05. This suggests that the household-level characteristics are not homogeneously distributed across countries and show some compositional effects.

The coefficients for the household-level variables have the expected signs and most of them are statistically significant. We find that there is a positive association between each additional child in the household and the level of child deprivation, no matter the age of the child. Child deprivation is also positively associated with lone parenthood (*Single*) and with higher proportions of people with a chronic (long-standing) illness or condition (*Perc_chronic*). Home ownership (*Owner*) is associated with lower levels of child deprivation. Regarding the characteristics of the household reference person (RP), we find, as expected, that children whose RP is working (either full or part time) and/or is more educated experience lower levels of child deprivation. When the RP is a woman, young[14] or an immigrant, the child endures higher levels of deprivation.

[14] Being an old RP has a non-significant effect, but this effect is the net of labor market characteristics. Using sensitivity analyses, we found that greater deprivation among children living with old household RPs can be accounted for by the labor market status.

In the next step we introduce macro-level indicators progressively. First (Model C), we control for the share of social protection benefits (*Soc_pro*). This coefficient is negative and statistically significant. This indicates that countries with more generous social benefits systems tend to have lower child deprivation levels. Jenkins (2000), Dewilde (2008), Whelan et al. (2008), Kenworthy et al. (2011) and Chzhen and Bradshaw (2012), among others, also found a significant relationship between social policy generosity and material deprivation in general, but not child-specific deprivation. Adding social benefits to the model reduces the variation in child deprivation at the country level that remains unexplained; specifically from 29.05 to 19.86. Thus, the social benefits system explains 31.63 percent of the cross-national variation in child deprivation levels once the micro-level determinants are controlled for.

The significant effect of social benefits could be questioned arguing that the proportion of social benefits could be confounded with the economic development of the country, the degree of concentration of income in the country and with the labor market situation, as social benefits comprise a large proportion of unemployment benefits. In order to test the robustness of the significance of social benefits on child deprivation net of other country factors, we control for the variables *GDP*, *S80S20* and *Long_unemp* in Model D. We find that social benefits exert a significant effect even when we control for potential confounding factors; a finding that reinforces the crucial role of social benefits in reducing child deprivation. The explanatory power of the model increases slightly, and 14.22 percent of the variation at the country level is left unexplained. As expected, higher levels of GDP and lower income inequality reduce the extent of child deprivation, whereas the unemployment rate has a non-significant effect. A candidate explanation is that individual attachment to the labor market is already controlled for at the household level.

Now we proceed to analyze the effect of the different functions of social benefits on child deprivation. As pointed out before, some benefits are directly targeted at children (*Family_Children*) or to those in the lower end of the distribution (*Housing* and *Social_Exclusion*). *Family_Children* benefits and *Social_Exclusion* benefits do not have a significant effect on child deprivation levels, while *Housing* benefits have a negative effect (Model E). Therefore, children living in a country with a higher share of housing benefits have lower levels of deprivation.

Although not targeted at children, *Unemployment* benefits are received to a high extent by households with children and, as shown in Model F, help to reduce child deprivation levels. The results in Table 3 show that *Oldage_Survivor* benefits reduce child deprivation levels (Model G); an observation that may be suggestive of the importance of housing arrangements among extended families as alternative protection to deprivation. However, the coefficient is significant only at the 10% level and non-significant in Model H. These results are in line with Diris et al. (2014), who showed that old age and survivor benefits, which constitute a significant

share of income for household with children in multiple European welfare states, may be as effective in reducing child deprivation as benefits specifically designed for children. Finally, *Sickness_Disability* benefits are negatively correlated with child deprivation. However, in this specification (Model H), the effect of *Housing* benefits fails to be significant. A candidate explanation is that housing and social exclusion benefits are mostly targeted at the lower end of the income distribution, as well as *Sickness_Disability* benefits, but the latter stands for a small amount of social benefits and their effect on deprivation is negligible. Moreover, policy instruments are seldom used in isolation, and children as well as adults are seldom exposed to a single social program (Sanfilippo et al. 2012). To put it differently, the effect of a single benefit may very well be influenced by their combination with other benefits.

All in all, the country-level variables reduce the variation in child deprivation from 29.05 to 11.67 at the country level, which remains unexplained once the micro-level determinants are controlled for. Thus, these variables explain 59.8 percent of the cross-national variation in child deprivation levels. Therefore, in order to explain differences across European countries in the level of child deprivation, country-level determinants are crucial. Social benefits also play their role even after controlling for country-level determinants. Somewhat surprisingly, the deprivation-reducing social benefit functions are not necessarily those targeted at children.

5. Conclusions

In this paper we jointly examine household and country-level determinants of child deprivation through a multilevel analysis. The determinants of child deprivation operate by means of a complex process that is the result of interactions between multiple variables, which can operate in multiple directions. None of the specific determinants can be evaluated strictly in isolation.

We showed that there is a strong and negative relationship between the amounts spent on social protection as a share of the GDP and child deprivation. Social protection benefits are important in explaining differences across European countries in the level of child deprivation, even when we control for the country-level determinants and the demographic composition of countries. Moreover, we showed that some benefit functions targeted at children do not have the intended reducing effect on deprivation, while other functions not explicitly targeted at children have an impact on the child deprivation level, showing unintended effects.

Our results have different policy implications. First, different types of benefits and functions of social benefits can shape welfare outcomes differently. We find that a relevant channel to reduce child deprivation is through benefits where children are not necessarily the focus of the intervention. Specifically, we found that, *ceteris paribus*, children in families with unemployment, sickness and disability benefits and, to a lesser extent, housing benefits are

better off. In light of this result, it is recommendable to design interventions considering the whole set of benefits, instead of developing single policy instruments. Second, the results showed that benefits directly targeted at children and social exclusion benefits may be ineffective in tackling child deprivation. With these two considerations in mind, we argue, in line with Sanfilippo et al. (2012), that policy design should evolve from a technocratic, almost mechanical perspective to a process where different channels are put at work simultaneously. Third, in order to understand the relation between welfare states, family interventions and individual welfare it is fundamental to acknowledge that family decisions typically arise from internal processes that are mostly disregarded by traditional economic models. For example, women tend to bear more than half of the cost of maintaining a child while they control less than half of household resources (Mangiavacchi and Rapallini, 2014, Caiumi and Perali, 2015). Moreover, the outcomes of these internal decision processes may be considered unequal. The results of this paper, which show a diverging effectiveness among benefit functions and policies, indicate that investigating the diverging processes that families follow when distributing resources within the household is compelling and included in our research agenda.

Acknowledgements

The financial support from the Government of Spain through grant ECO2012-33993 to all the authors; the Spanish Institute for Fiscal to Ana I. Moro-Egido and Elena Bárcena; and the Fundación Ramón Areces (Research Project: Determinants of social exclusion and recommendations for combating it) to Elena Bárcena, Maite Blázquez and Santiago Budría is gratefully acknowledged.

References

Asian Development Bank (ADB) (2010). Completion Report Project Number 32143. Kyrgyz Republic: Community-Based Early Childhood Development Project. Mandaluyong City, Asian Development Bank.

Atkinson, B.A. and Marlier, E. (2010). *Income and living conditions in Europe*. Luxembourg: Eurostat.

Bárcena-Martín, E., Lacomba-Arias, B., Moro-Egido, A.I. and Pérez-Moreno, S. (2014). "Country Differences in Material Deprivation in Europe", *Review of Income and Wealth*, 60(4), pp. 802-820

Berthoud, R. and Bryan, M. (2011). "Income, Deprivation and Poverty: A Longitudinal Analysis", *Journal of Social Policy*, 40(1), pp. 135-156

Boarini, R. and d'Ercole, M. M. (2006). "Measures of Material Deprivation in OECD Countries", *OECD Social, Employment and Migration Working Papers*, No. 37, OECD Publishing.

Bryan, M.L. and Jenkins, S.P. (2013). "Regression analysis of country effects using multilevel data: a cautionary tale", *IZA Discussion Papers* 7583, Institute for the Study of Labor (IZA).

Caiumi, A. and Perali F. (2015). Who bears the full cost of children? Evidence from a collective demand system, *Empirical Economics*, 49(1), pp. 33-64.

Cantillon, S., Gannon, B. and Nolan, B. (2004). *Sharing Household Resources: Learning from Non-monetary Indicators*. Dublin: Combat Poverty Agency/IPA

Chzhen, Y. (2014). "Child poverty and material deprivation in the European Union during the Great Recession", *Innocenti Working Paper*, 2014-06, UNICEF Office of Research, Florence.

Chzhen, Y. and Bradshaw, J. (2012). "Lone Parents, Poverty and Policy in the European Union", *Journal of European Social Policy*, 22(5), pp.487–506.

Chzhen, Y., de Neubourg, C., Plavgo, I. and de Milliano, M. (2015). "Understanding Child Deprivation in the European Union: The Multiple Overlapping Deprivation Analysis (EU-MODA) Approach", *Child Indicators Research* (forthcoming). DOI: 10.1007/s12187-015-9321-7

Corak, M., Lietz, C. and Sutherland, H. (2005). "The impact of tax and transfer systems on children in the European Union", *Discussion paper 1589*, IZA, Bonn.

Daly, M. and Leonard, M. (2002). *Against all odds: Family life on a low income in Ireland*. Dublin: Combat Poverty Agency/ Institute of Public Administration.

De Neubourg, C., Bradshaw, J., Chzhen, Y., Main, G., Martorano, B. and Menchini, L. (2012). "Child Deprivation, Multidimensional Poverty and Monetary Poverty in Europe", *Innocenti Working Paper*, 2012-02, Florence, UNICEF Innocenti Research Centre.

Dewilde, C. (2008). "Individual and Institutional Determinants of Multidimensional Poverty: A European Comparison", Social Indicators Ressearch, 86(2), pp. 233-256.

Diris, R., Vandenbroucke, F. and Verbist, G. (2014). "Child Poverty: What Can Social Spending Explain in Europe?", *KU Leuven Discussion Paper Series* DPS14.20.

Eurostat (2002). *European social Statistics. Income, poverty and social exclusion: 2nd report*. European Commission, Luxembourg.

Fajth, G. (2009). "Joint Statement on Child Sensitive Social Protection", presentation at Social Protection Floor Initiative, Turin October, 2009.

Figari, F. (2012). "Cross-national differences in determinants of multiple deprivation in Europe", *Journal of Economic Inequality*, 10 (3), pp. 397-418.

Frazer H. and Marlier, E. (2014). "Investing in children: Breaking the cycle of disadvantage. A study of national policies", CEPS/INSTEAD, coll. European Network of *Independent Experts on Social Inclusion*, N°2014/02

Gabos, A., Ozdemir, E. and Ward, T. (2011). "Material Deprivation among Children", Research note 7/2011, *Social Situation Observatory: Income Distribution and Living Conditions*.

Gordon, D., Nandy, S. Pantazis, C. Pemberto, S. and Townsend, P. (2003). "*Child poverty in the developing world", Townsend Centre for International Poverty Research WP*, Bristol University.

Graaf-Zijl, M. and Nolan, B. (2011). "Household joblessness and its impact on poverty and deprivation in Europe", *Journal of European Social Policy*, 21 (5), pp. 413-431

Guio, A.-C., Gordon, D. and Marlier, E. (2012). "Measuring Material Deprivation in the EU: Indicators for the whole population and child-specific indicators", *Eurostat Methodologies and Working Papers*, Luxembourg, Office for Official Publications of the European Communities.

Halleröd, B, Larsson, D. Gordon, D. and Ritakallio, V. (2006). "Relative deprivation: a comparative analysis of Britain, Finland and Sweden", *Journal of European Social Policy*, 16, pp. 328-345.

Israel, S. and Spannagel, D. (2013). "Material Deprivation: An Analysis of Cross-country Differences and European Convergence", Combating Poverty in Europe project (European Commission) accessed at http://cope-research.eu/wp-content/uploads/2013/05/Material_Deprivation.pdf

Jenkins, S. P. (2000). "Modeling household income dynamics", *Journal of Population Economics* 13, pp. 529-567.

Kenworthy, L., Epstein, J. and Duerr, D. (2011). "Generous social policy reduces material deprivation", in L. Kenworthy, L. *Progress for the Poor*, Oxford University Press

Layte, R., Maître, B., Nolan, B. and Whelan, C. T. (2001a). "Persistent and consistent poverty in the 1994 and 1995 waves of the European Community Household Panel Survey", *Review of Income and Wealth* 47, 4, pp. 427-449

Layte, R., Whelan, C. T., Maître, B. and Nolan, B. (2001b). "Explaining levels of deprivation in the European Union", *Acta Sociologica* 44, pp. 105-122.

Main, G. and Bradshaw, J. (2012). "A Child Material Deprivation Index", *Child Indicators Research*, 5(3), pp. 503–521.

Maître, B., Nolan, B. and Whelan, C. T. (2005). "Welfare regimes and household income packaging in the European Union", *Journal of European Social Policy*, 15, pp. 157–171.

Mangiavacchi, L. and Rapallini, C. (2014). "Self-reported Economic Condition and Home Production: Intra-household Allocation in Italy", *Bulletin of Economic Research*, 66(3), 279–304.

Middleton, S., Ashworth, K. and Braithwaite, I. (1997). *Small fortunes: spending on children, childhood poverty and parental sacrifice*. York: Joseph Rowntree Foundation.

Muffels, R. and Fouarge, D. (2004). "The role of European Welfare States in explaining resources deprivation", *Social Indicators Research*, 68, pp. 299–330.

Nelson, K. (2007). "Introducing SaMip: the social assistance and minimum income protection interim dataset", *Scandinavian Working Papers in Economics* (S-WoPEc) No 11/2007. Stockholm, Swedish Institute for Social Research, University of Stockholm.

Nelson, K. (2010). "Social assistance and minimum income benefits in old and new EU democracies", *International Journal of Social Welfare*, 19(4), pp. 367–378

Nelson, K. (2012). "Counteracting Material Deprivation: The role of social assistance in Europe", *Journal of European Social Policy*, 22(2), pp. 148–163.

Pilkauskas, N.V., Currie, J. and Garfinkel, I. (2012). "The Great Recession, public transfers and material hardship", *Social Service Review*, 3, pp. 401-427.

Rabe-Hesketh, S. and Skrondal, A. (2012). *Multilevel and Longitudinal Modeling Using Stata (Third Edition).* College Station, TX: Stata Press.

Roetten, K. and Sabates-Wheeler, R. (2011). A Child Sensitive Approach to Social Protection: Serving practical and strategic needs, paper presented at the conference "Social Protection for Social Justice". London, Institute of Development Studies, 13-15 April 2011.

Sanfilippo, M., C. de Neubourg and Martorano, B. (2012). "The Impact of Social Protection on Children: A review of the literature", *Working Paper* 2012-06, UNICEF Office of Research, Florence

Skevik, A. (2008). "Household Poverty and Deprivation Among Children. How strong are the links?", *Childhood*, 15(1), pp. 107-125

Tárki (2010). *Child Poverty and Child Well-being in the European Union*. Budapest: Tárki Social Research Institute.

Tsaklogou, P. and Papadopoulos, F. (2002). "Poverty, material deprivation and multidimensional disadvantage during four life stages: Evidence from ECHP", in M. Bargnes, C. Heady, S. Middleton, J. Millar, F. Papadopoulos, G. Room and P. Tsaklogou (eds): *Poverty and Social Exclusion in Europe*, Edward Elgar Publising Limited.

UNICEF et al. (2009). "Joint Statement on Advancing Child-Sensitive Social Protection", Available at http://www.unicef.org/aids/files/CSSP_joint_statement_10.16.09.pdf

Visser, M. Gesthuizen, M. and Scheepers, P. (2014). "The impact of macro-economic circumstances and social protection expenditure on economic deprivation in 25 European countries, 2007-2011", *Social Indicators Research*, 115, pp. 1179-1203.

Whelan, C.T. and Maître, B. (2012a). "Understanding material deprivation in Europe: A multilevel analysis", *Research in Social Stratification and Mobility*, 30, pp. 489-503.

Whelan, C. T., and Maître, B. (2012b). "Identifying Childhood Deprivation: How Well Do National Indicators of Poverty and Social Exclusion in Ireland Perform?" *The Economic and Social Review*, 43(2), pp. 251-272.

Whelan, C.T., Layte, R. and Maître, B. (2004). "Understanding the Mismatch between Income Poverty and Deprivation: A Dynamic Comparative Analysis", *European Sociological Review*, 20 (4), pp. 287-302.

Whelan, C.T., Layte, R., Maître, B. and Nolan, L. (2001). "Income, Deprivation, and Economic Strain. An Analysis of the European Community Household Panel", *European Sociological Review*, 17, pp. 357-372.

Whelan, C.T., Nolan, L. and Maître, B. (2008). "Measuring Material Deprivation in the Enlarged EU", *Economic and Social Research Institute (ESRI) Papers* WP249.

Tables and figures

Table 1. Average level of weighting and counting of child deprivation for each country

Countries	Number of observations	Child deprivation (weighting)
AT	987	3.8
BE	1199	4.4
BG	721	31.8
CY	781	4.6
CZ	1455	4.5
DE	2526	3.5
DK	882	1.4
EE	1059	5.5
ES	2926	4.7
FI	1818	1.2
FR	2231	4.2
HU	997	16.4
IE	730	2.0
IS	778	0.6
IT	4084	6.4
LT	768	9.7
LU	1147	3.4
LV	888	15.4
MT	851	5.2
NO	1259	0.6
PL	2662	9.6
PT	884	11.7
RO	1233	31.4
SE	945	1.2
SK	713	10.8
UK	1417	2.3
Total	35941	6.4

Note: AT: Austria; BE: Belgium; BG: Bulgaria; CY: Cyprus; CZ: Czech Republic; DE: Germany; DK: Denmark; EE: Estonia; ES: Spain; FI: Finland; FR: France; HU: Hungary; IE: Ireland; IS: Iceland; IT: Italy; LT: Lithuania; LU: Luxembourg; LV: Latvia; MT: Malta; NO: Norway; PL: Poland; PT: Portugal; RO: Romania; SE: Sweden; SK: Slovakia; UK: United Kingdom. Source: EU-SILC (cross-sectional version 2009-6).

Table 2. Descriptive statistics of the sociodemographic characteristics of the household and country-level variables

Variable	Mean	SD	95% confidence interval	
Household Characteristics				
Nch_2	0.217	0.002	0.212	0.222
Nch_3_5	0.359	0.003	0.353	0.364
Nch_6_11	0.929	0.004	0.920	0.937
Nch_12_16	0.560	0.004	0.552	0.567
Single	0.115	0.002	0.112	0.118
Urban (dense)	0.449	0.003	0.444	0.454
Owner	0.686	0.002	0.681	0.691
Perc_chronic	*0.177*	*0.002*	*0.174*	*0.180*
RP characteristics				
Woman_RP	0.338	0.002	0.333	0.343
Full_RP	0.589	0.003	0.584	0.594
Part_ RP	0.093	0.002	0.090	0.096
Tertiary_ RP	0.279	0.002	0.274	0.284
Young_ RP	0.046	0.001	0.044	0.048
Old_ RP	0.015	0.001	0.014	0.017
Immigrant_ RP	0.112	0.002	0.109	0.115
Contextual characteristics				
Soc_Pro	0.243	0.010	0.221	0.264
GDP	1.010	0.086	0.833	1.186
Longunemp	2.677	0.305	2.048	3.306
S80s20	4.731	0.212	4.293	5.168
Family_children	2.450	0.185	2.070	2.830
Housing	0.358	0.077	0.198	0.517
Socialexclusion	0.435	0.063	0.305	0.564

Table 3. Multilevel logistic regression of child deprivation level

	A	B	C	D	E	F	G	H
Nch_2		0.027***	0.027***	0.027***	0.027***	0.027***	0.027***	0.027***
		(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Nch_3_5		0.030***	0.030***	0.030***	0.030***	0.030***	0.030***	0.030***
		(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Nch_6_11		0.027***	0.027***	0.027***	0.027***	0.027***	0.027***	0.027***
		(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Nch_12_16		0.033***	0.033***	0.033***	0.033***	0.033***	0.033***	0.033***
		(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Single		0.021***	0.021***	0.021***	0.021***	0.021***	0.021***	0.021***
		(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Urban1		-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
		(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Owner		-0.045***	-0.045***	-0.045***	-0.045***	-0.045***	-0.045***	-0.045***
		(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Perc_Chronic		0.023***	0.023***	0.023***	0.023***	0.023***	0.023***	0.023***
		(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Woman_RP		0.012***	0.012***	0.012***	0.012***	0.012***	0.012***	0.012***
		(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Full_RP		-0.027***	-0.027***	-0.027***	-0.027***	-0.027***	-0.027***	-0.027***
		(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Part_RP		-0.019***	-0.019***	-0.019***	-0.019***	-0.019***	-0.019***	-0.019***
		(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Tertiary_RP		-0.034***	-0.034***	-0.034***	-0.034***	-0.034***	-0.034***	-0.034***
		(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Young_RP		0.018**	0.018**	0.018**	0.018**	0.018**	0.018**	0.018**
		(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Old_RP		-0.016	-0.016	-0.016	-0.016	-0.016	-0.016	-0.016
		(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Inmigrant_RP		0.029***	0.029***	0.029***	0.029***	0.029***	0.029***	0.029***
		(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Soc_Pro			-1.015***	-0.585***				
			(0.306)	(0.196)				
GDP				-0.059*	-0.096*	-0.077**	-0.074**	-0.065***
				(0.032)	(0.05)	(0.039)	(0.035)	(0.025)
Longunemp				0.000	-0.005	0.005	0.004	0.002
				(0.007)	(0.01)	(0.008)	(0.007)	(0.007)
S80s20				0.024*	0.025*	0.026**	0.026**	0.02
				(0.013)	(0.013)	(0.012)	(0.012)	(0.012)
Family_children					0.01	0.015	0.013	0.02
					(0.014)	(0.015)	(0.014)	(0.013)
Housing					-0.050*	-0.048*	-0.043*	-0.031
					(0.028)	(0.027)	(0.026)	(0.023)
Socialexclusion					-0.023	0.005	-0.001	-0.014
					(0.034)	(0.027)	(0.027)	(0.029)
Unemployment						-0.030***	-0.028***	-0.019*
							(0.01)	(0.01)
Oldage_Survivors							-0.004*	-0.002
							(0.002)	(0.002)

Sickness_Disability								-0.011** (0.004)
_Cons	0.075*** (0.016)	0.062*** (0.015)	0.308*** (0.082)	0.152* (0.084)	0.061 (0.081)	0.023 (0.07)	0.077 (0.076)	0.145 (0.091)
Var (intercept)	0.081*** (0.018)	0.083*** (0.019)	0.064*** (0.011)	0.053*** (0.009)	0.055*** (0.009)	0.051*** (0.009)	0.049*** (0.008)	0.047*** -(0.008)
ICC	0.2574	0.2905	0.1986	0.1422	0.1543	0.1329	0.1268	0.1167
Log Likelihood	20218.3	22460.9	22467.4	22472.6	22471.4	22473.7	22474.3	22475.6
N Obs.	35941							
N countries	26							

Standard errors in parentheses
* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

APPENDIX A: Non-monetary child deprivation indicators

Table A. Non-monetary child deprivation indicators (2009 module on material deprivation)

BASIC NEEDS
Some new (not second-hand) clothes
Two pairs of properly fitting shoes (including a pair of all-weather shoes
Fresh fruit and vegetables once a day
Three meals a day
One meal with meat, chicken or fish (or vegetarian equivalent) at least once a day
EDUCATIONAL OR LEISURE NEEDS
Books at home suitable for their age
Outdoor leisure equipment (bicycle, roller skates, etc.)
Indoor games (educational baby toys, building blocks, board games, computer games, etc.)
Regular leisure activity (swimming, playing an instrument, youth organizations, etc.)
Celebrations on special occasions (birthdays, name days, religious events, etc.)
Invite friends round to play and eat from time to time
Participate in school trips and school events that cost money
Suitable place to study or do homework
Outdoor space in the neighborhood where children can play safely
Optional: Go on holiday away from home at least 1 week per year
MEDICAL NEEDS
Optional: Unmet need for consulting a GP or specialist, excluding dentists and ophthalmologists
Optional: Main reason for unmet need for consulting a GP or specialist, excluding dentists and
Optional: Unmet need for consulting a dentist
Optional: Main reason for unmet need for consulting a dentist

Note. Variables from HD100 to HD265 in EU-SILC 2009.

APPENDIX B: Social protection benefits

Social protection benefits classified according to eight social protection functions (which represent a set of risks or needs):

- family/children benefits — including support (except healthcare) in connection with the costs of pregnancy, childbirth, childbearing and caring for other family members;
- housing benefits — including interventions by public authorities to help households meet the cost of housing;
- social exclusion benefits not elsewhere classified — including income support, rehabilitation of alcohol and drug abusers and other miscellaneous benefits (except healthcare).
- unemployment benefits — including vocational training financed by public agencies;
- sickness/healthcare benefits — including paid sick leave, medical care and the provision of pharmaceutical products
- disability benefits — including disability pensions and the provision of goods and services (other than medical care) to the disabled;
- old age benefits — including old age pensions and the provision of goods and services (other than medical care) to the elderly;
- survivors' benefits — including income maintenance and support in connection with the death of a family member, such as a survivors' pensions;