Cross-Country Differences in Intergenerational Transmission of Poverty in Europe: Macro-Economic and Institutional Determinants

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ABSTRACT

The intergenerational transmission of poverty (ITP) is a very relevant problem, since income in the extremes of the distribution tends to be particularly persistent across generations. This paper contributes to the literature on the determinants of differences in the intensity of ITP across countries by explicitly testing how macro/aggregate features shape it. To that aim a multilevel *logit* model is estimated on a sample of around 30 European countries taken from the EU-SILC 2011 module on *Intergenerational transmission of disadvantages,* enriched with a set of macro/aggregate indicators. Our results show that (a) the heterogeneity of ITP processes across countries is quite relevant; (b) ITP is more intensive in countries where there is a higher intra-generational income inequality or weak investments in the reduction of inequality; (c) public expenditure aimed at providing equality of opportunities in access to higher education is related with less intensive ITP; (d) public policies aiming at reducing the impact of job losses on households' income are also correlated with a reduction in the intensity of ITP.

Keywords: Intergenerational transmission of poverty, European Union Statistics on Income and Living Conditions, multilevel logit model.

JEL codes: I32

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1. Introduction

The transmission of income across generations is a well-known and spread phenomenon: parents transmit endowments of different types of capital (financial, human, social,…) to their children, who will be, as a result, likely to live in similar economic conditions to their parents' as they reach adulthood. Economists have paid much attention to this process in the income (im-)mobility literature, which demonstrates the positive and significant elasticity of adult children's income to their parents. The larger it is, the lower income mobility across generations will be, which denotes a deficit in equality of opportunities. Redistributive policies in general and education and health investments on children in particular play a crucial role in reducing poverty persistence across generations. Governments may contribute to children of low-income families accessing high quality education so that their income levels along the life-cycle will not be scarred by their family background.

With this paper we aim at providing evidence on the intergenerational transmission of poverty (hereinafter, ITP), which is a very relevant dimension of the intergenerational transmission of income: income in the extremes of the distribution tends to be more persistent across generations. We will define ITP as the larger risk of future adult poverty amongst currently poor children.

There is a vast evidence on intergenerational transmission of income but research on the lowest part of the income distribution (transmission of poverty) is scarcer. Whelan *et al*. (2013) is one of the very few empirical papers that explicitly address transmission of poverty by estimating the differential risk of poverty in the current generation in those who experienced economic problems while in their parental home. Most papers intend to adequately quantify the phenomenon and, when possible, exploring the underlying factors which explain the transmission of poverty and why it is more intense in some countries than in others. The present piece of work aims to contribute to this strand of literature by explicitly testing the role of macro/aggregate features on the intensity of the ITP processes.

Answering such question requires international and comprehensive data-sets which allow for proper comparisons across countries. To that aim, we deploy the 2011 module of the EU-SILC (European Statistics on Income and Living Conditions), which is specifically designed for the study of our topic of interest. We have enriched the micro-economic information at individual level with a set of macro/aggregate indicators referred to the distribution of income, the national authorities' capacity to redistribute households' income and to favour the equality of opportunities in tertiary education, together with the public effort to palliate the loss of income caused by job losses.

Our empirical strategy consists on a multilevel *logit* model to estimate the likelihood of a living in a poor household conditional to having a poor family background in around 30 European countries. Our results show that (a) the heterogeneity of ITP processes is quite relevant; (b) ITP is less intensive in countries where there is a strong investment in inequality reduction, measured via social protection aimed at families, coverage of the unemployment insurance system and the reduction; (c) public expenditure aimed at providing equality of opportunities in access to higher education is related with less intensive ITP; (d) public policies aiming at reducing the impact of job losses on households' income are also correlated with a reduction in the intensity of ITP.

The paper goes as follows: after a survey of the most relevant literature on intergenerational transmission of income, particularly from an international / comparative perspective, in Section 3 we briefly describe the data-set and the aggregate variables with which we intend to explain differences in ITP across countries. Section 4 is devoted to the description of the sample. The econometric strategy, a set of multivariate logit models, is explained in Section 5; the relevant results are discussed in Section 6 and Section 7 concludes.

2. The intergenerational transmission of income, poverty and disadvantages

The ITP is part of a broader phenomenon: the intergenerational transmission of income or, in other words, the lack of social mobility. Social mobility is analysed in a different way across disciplines: economists tend to study correlation in income levels across generations, while sociologists rather look at the similarities between parents and children in more qualitative outcomes, such as education attainment and occupation (for a survey of such research, see Breen and Jonsson, 2005); the latter being used as a proxy for social class.

The pioneer first theoretical approaches in the study of intergenerational mobility of income follow a Human Capital approach (Becker and Tomes, 1979; 1986): incomes of parents and children will be correlated as well-off parents are more likely to invest on their children's human capital, which will result in higher incomes. The transmission of income via investments on human capital is the most popular mechanism (Causa and Johansson, 2010) and has been heavily explored in the literature. The environment in which children are risen (quality of schools, neighbourhoods, school peers and friends, contact with culture and knowledge,…) will reinforce the effect of the investment itself (see the overarching framework in Haveman and Wolfe, 1995). In Franzini and Raitano (2009) similar "channels" for the transmission of income are mentioned: the living standard in which children are raised, their health status, individual behaviour, relational capital, and social networks. Other inheritable features that contribute to the transmission of economic and social outcomes are values and preferences (Black and Devereux, 2011), non-cognitive ("soft") skills (Bowles and Gintis, 2002), and even employers (Corak and Piraino, 2011).

All the above-mentioned channels operate within countries and families and cannot explain differences across countries. But one of the corollaries of the human capital approach to transmission of income is that the higher the private return to education will be, the stronger will the incentives for parents to invest on human capital and the more intensive the transmission of inequalities across generations will be (Corak, 2013). In order to palliate the negative impact of the high private return to education on income mobility, public expenditure on education is needed. Complementary investments on public health systems, among others, which would contribute to children from deprived families enjoying all sorts of educational opportunities. In line with this idea, several studies conducted by the OECD conclude that in order to enhance intergenerational social mobility in the future more attention must be paid to intra-generational equality through fiscal progressiveness and social protection schemes that contribute to equality of opportunities (OECD 2008, 2010). Such studies are in

line with Solon (2004), who formulates a wide range of income distribution enhancing policies which should contribute not only to the reduction of income inequality in the current generations but also in the coming generations.

International evidence on intergenerational transmission of income has been conditioned to the availability of adequate data, that is, internationally comparable data-sets. It has been driven as well by the concerns about social mobility in liberal (and unequal) societies, like the US and the UK, and the potential role of the institutional framework and public policies in our understanding of the phenomenon and what can be done about it. Comparative analyses between the US and other countries often comprise others in the Anglo-Saxon regime (Blandel *et al*., 2014) but also Scandinavian countries, which fiscal policies widely differ from the US' (Corak (2013); Corak *et al.* (2014); Herrington (2015); Holter (2015); Landersø and Heckman (2016)). Some others compare the US economy with relevant European Union countries representative of diverse welfare regimes (Corak (2006; 2013); Schnitzlein (2015)). Similar studies are done to compare the UK with Continental European countries (Serafino and Tonkin (2014); Jerrim (2015)).

The availability of EU-SILC modules in 2005 and 2011 on the *Intergenerational transmission of disadvantages* has considerably contributed to our knowledge of the differences in the transmission of income across countries and the potential influence of the institutional and macroeconomic context on those differences. The 2005 module is explored, among others, in Causa and Johansson (2009; 2010); Causa *et al*. (2009); Raitano (2009); Franzini and Raitano (2009); Esping – Andersen and Wagner (2012); Blanden (2013); Schnetzer and Altzinger (2013); Whelan *et al*., (2013). More recently, the 2011 module is analysed in Serafino and Tonkin (2014); Jerrim (2015); Raitano (2015) and Želinský *et al*. (2016).

The most common approach in comparative international pieces of work consist on the estimation of country-specific models and the inspection of the relevant coefficients across countries (Raitano *et al*. (2013); Serafino and Tonkin (2014); Jerrim (2015)), often interpreted in the light of the differences across welfare regimes (Schnetzer and Altzinger (2013); Esping-Andersen and Wagner (2012); Esping-Andersen (2015); Whelan *et al*. (2013)), such analyses show that countries in the Scandinavian Welfare model are very much characterised by equality of opportunities, while there is a strong persistence of income in the countries belonging to the liberal model (namely, UK) and to the Mediterranean countries (Causa and Johansen (2010); Blanden (2013)). Very limited evidence exists on Eastern and Baltic European countries (one example is Želinský *et al.,* 2016).

In addition, several pieces of work have explored the mediating role of education and the occupational choices in the correlation between economic outcomes across generations, and the way it varies across welfare regimes. This is done by estimating personal income from employment and subsequently controlling for education attainment and occupation, always in the presence of variables indicating parental income or socio-economic background (Raitano, 2009). This kind of analysis shows that there is no transmission of inequalities in Nordic European countries, while education fully explains the transmission of social class in countries from the Continental cluster; still, there is a persistent effect of parental background even in the presence of the intervening mechanisms in Liberal (Anglo-Saxon)

countries and Southern, Mediterranean ones, though for different reasons[2] (Raitano and Vona (2015a); Raitano and Vona (2015b); Raitano (2015)). The impact of family background on income via education attainment or occupational choice is labelled as "indirect" while the remaining impact (if any) in the presence of education and occupation fixed effects is labelled as "direct" (sometimes, as "residual"). Sometimes the decomposition into direct and indirect effects is done in two (or more) steps: first, education attainment and occupation status are related with family background and, afterwards, with income. This strategy is deployed in Franzini *et al*. (2013) on eight EU countries, representing different welfare regimes. In Raitano and Vona (2015a) the impact of parental income on children outcomes is also decomposed in two intervening factors - educational and occupational attainment – and a residual, "direct" effect. The authors find that in some immobile countries (the UK) the transmission of parental background is sometimes provided by a penalization of upward mobility across generations while in others (Mediterranean/Southern) it acts as a sort of insurance against downward mobility.

An alternative strategy to the search for global scenarios described by the welfare regimes typologies, consist on comparative intercountry analyses where patterns in ITP are studied and institutional differences are pointed at as explanations for those differences across countries (Causa and Johansson (2009; 2010) and Causa *et al*. (2010)). Their results point at part of ITP resulting from institutional and macroeconomic features. To date, such studies have provided researchers with several broad stylised facts around national-specific features that define differences in equality of opportunities. The first one is that unequal societies tend to be also unequal in the future (Blanden (2013); Causa *et al.* (2009); Corak (2013)): current inequalities are crucial to define future ones because, the more intensive inequality is, the more difficult will be for those in the bottom of the income distribution to improve their position within the distribution when they become adults. Similarly, those countries with lower levels of effort in the reduction of inequalities are also more affected by intergenerational transmission of income. The second one is that strong public levels of investment on education contribute to reduce intergenerational transmission of poverty in the future: educational mobility across generations is negatively correlated with income persistence across generations (Raitano, 2009). Other inequality correction mechanisms may reduce the future risk of poverty in children of currently poor families, such as family and unemployment related benefits, among others.

The approach adopted here intends to widen that strand of literature by exploring the drivers of the intercountry variation in the ITP with multivariate models where we explicitly introduce macro/aggregate variables at country level to describe their potential influence on ITP processes. In our analysis we try to find patterns across countries that explain the size of that direct or residual effect of family background on economic outcomes during adult life. We are not aware, at this stage of our research, of other papers with the same empirical approach/strategy. We may find similarities with two pieces of research were the transmission of income is modelled in different ways: Jerrim and Macmillan (2015) and Holter (2015). The former exploits the Programme for International Assessment of Adult

[2] The persistence of inequalities across generations in Anglo-Saxon countries are explained in Raitano (2009) – among other pieces of work – by the strong stratification in the access to higher education in those countries, together with the different profiles of private and public school attendees. In Southern European countries family ties are very important in all spheres of life, including the labour market, and societies tend to be less meritocratic than others across Europe (Raitano, 2015).

Competencies (PIAAC) data set to test the existence of the so-called *Great Gatsby Curve*[3] and the extent to which it may be explained by a stronger association between parental education and offspring's earnings or higher returns to education in more unequal countries. The latter compares the tax system and credit constraints in the US and Norway and hypothesizes the level of intergenerational transmission of income in the US if the tax system were more progressive. The role of public expenditure on education, particularly on tertiary education, is also stressed, as it is correlated with more access to tertiary education for individuals from low income families.

3. Data-set: the EU-SILC and macro-indicators

The EU-SILC (European Statistics on Income and Living Conditions) is designed for the study of economic well-being of families and it allows for comparison of those well-being patterns across about 30 countries, comprising both the EU and the European Economic Area. The questionnaire has a common large set of questions/variables (stable across years/waves) and a final year-specific module, focused on one particular problem. The EU-SILC module in 2011 (and its predecessor in 2005), *on intergenerational transmission of disadvantages*, directly addressed the transmission of economic and social outcomes. Adults aged 25 to 59 years were asked about their socio-economic background as well as the living conditions in their parental households when they were around 14 years old. The number of observations per country ranges from 1,744 in Iceland and 19,443 in Italy; it is displayed in Table 1.

Unfortunately, since the EU-SILC 2011 module is not provided with information on income in the parental household, we cannot compute income elasticities, unlike most empirical papers on intergenerational transmission of income do. The questionnaire includes instead questions on the economic strains the parental household suffered, which will act as proxies of permanent income. We take one of them[4], "financial situation of the household", with values ranking from 1 ("very bad") to 6 ("very good") and group them into "bad economic situation" (very bad, bad or moderately bad) and "good economic situation" (moderately good, good and very good). We will identify the first one with "having a poor family background". Our main dependent variable is living in a poor household, i.e., where the equivalised disposable income is below the 60% of the country-specific median. Both variables referring to economic strains in the parental and at the present household are briefly described in Table 1.

---------- Table 1 about here ----------

Table 1 shows that the experience of economic difficulties in the parental household varies widely across countries: it ranges from 14.6 % in Norway to 54.56% in Slovenia. As for poverty in the current household for 25-59 year olds, the dispersion is smaller, with the minimum value corresponding

[3] The *Great Gatsby Curve* (concept labelled by Alan Krueger) refers to the upward – sloping line that describes the well-documented fact that greater economic inequality (usually measured through the Gini coefficient) is associated with a higher level of intergenerational transmission of income.

[4] An alternative variable, deployed in Raitano (2015) is difficulties to make ends meet experienced in the parental household when the interviewee was around 14 years old. Similarly, in Franzini and Raitano (2009) parental households' financial distressed at that age is deployed as a proxy for poor family background.

to Norway (13.14%) and the maximum to Lithuania (25.05%). The current risk of poverty is higher amongst interviewees who reported poor background, but the differential risk (in percentage points) is negligible in some Social-Democratic/Nordic countries (Norway, Finland) and very tiny in others (Denmark, Iceland); while in Mediterranean countries is rather high (the poverty gap is around 10 percentage points). The differential in Liberal countries ranges between 3.3 and 5.6 p.p.; within the Conservative (Continental-Central Europe), Former USSR and Post-communist countries there are important differences in the raw impact of poor parental background on current poverty risk.

One popular strategy to look into differences across countries as regards the ITP process is estimating country-specific models from which the relevant parameters (namely, the coefficients of the variable capturing poor family background) are somehow compared. They are sometimes compared with the "raw" correlation between the economic conditions in the two generations under study. We may as well follow that strategy, which entails classifying countries in accordance to their institutional framework, which are often summarised through some classification of welfare regimes in Europe. The one we adopt in this paper is Fenger (2007). The literature commonly finds a stronger intergenerational persistence of income in Southern/Mediterranean countries and Liberal/Anglo-Saxon countries, no persistence at all in The Social Democratic/Nordic countries and certain initial persistence in Corporatist/Conservative regime countries which is fully wiped away when human capital investments in the offspring generation are controlled for.

Figures 1 and 2 display the marginal increase in the predicted probability of being poor due to having a poor family background. They have been obtained in country-specific logit models[5] where the risk of poverty is predicted from a set of variables at the individual level (basic socio-demographic features like gender, age, nationality, limitation in daily activities because of health problems, educational attainment, labour market status and having a poor family background) and household composition (presence of partner in the household and his/her education attainment, number of children present in the household, employment intensity within the household). All of them will be described in the next section.

---------- Figures 1 and 2 about here ----------

In Figure 1 the marginal average increase in the predicted probability of being poor due to having a poor family background (and its 95% confidence intervals) in each country is displayed. It shows that, after controlling for individual characteristics and household composition, individuals from poor background in Bulgaria are 6 p.p. more likely to live in poverty than those who were brought up in non-poor families, whereas in none of the countries in the Social Democratic regime the impact of poor background significantly affects the risk of poverty as an adult (all confidence intervals comprise the zero value). The 29 countries of the analysis are grouped in welfare regimes, in a figure inspired in part of the literature surveyed in the prior section: we find the expected non-significant ITP in Nordic countries and the relatively high ITP in Southern ones. The intensity of ITP in the Liberal/Anglo-Saxon

[5] The full sets of estimates are not displayed for space reasons but available from the authors upon request.

countries is lower than what we expected from our revision of the relevant literature. ITP in Conservative countries tends to be lower than the average and the results for Former USSR and Post-communist, though diverse, tend to describe levels of ITP higher than the average in the whole sample (1.9 p.p.). In all groups except the Nordic one, though, there is at least one country that deserves further attention as the ITP differs widely from others within the same institutional context[6].

We also compare the level of ITP described in Figure 1 with the raw differential risk of poverty displayed at Table 1. The former may be seen as is a "net" impact of poor background after controlling for a comprehensive list of observables at the moment of the interview while the latter is the equivalent to a "gross" effect to be "corrected" by observable variables. In Figure 2 the "gross" and the "net" impacts are scatterplot and a trend-line is defined: the determination coefficient of 0.75 means that around three fourths of the inter-country variability in estimated net ITP is explained by initially observed levels of ITP, and only one fourth would be explained by the factors we control for in the country-specific estimations. We also learn that in some countries, like Spain, the "net" ITP is lower what might be registered according to their set of observables, whereas in the UK, the remaining "net" ITP in the presence of controls for individual and household variables is higher than would be expected.

Although this strategy allows us to quantify the phenomenon in most European countries, the most distinguishing feature of this paper is that we entail to identify the institutional and macro-economic conditions that shape differences in its intensity. From the revision of the relevant literature we have learnt that the intensity of the ITP processes varies with inequality in the currently adult generation and the ability of the public authorities to reduce it. The public effort to increase equality of opportunities, particularly in access to higher education and the public effort to reduce the impact of unemployment on households' income. The macro/aggregate indicators which have been tested in the multivariate analysis are displayed in Table 2, and grouped in four clusters: the first one is on the prevalent distribution of households' income (S80-S20, Gini coefficient and poverty rate); the second one is for variables describing the potential of the public sector to redistribute households' income (expenditure on social protection, income taxes in % GDP, redistributive capacity of taxes and social transfers[7], reduction of Gini and poverty rates via taxes and social transfers[8]); a third group is related to the access to education and the equality of opportunities (inequality of opportunities indicator[9] and public expenditure on higher education); the fourth one is about the capacity the public sector has to

[6] Those results are currently under revision with specifically designed weighting factors that may as well explain the odd results in Ireland, Belgium, Malta and Latvia.

[7] This variable has been computed as follows: from EU-SILC information on net and gross household income we have estimated the difference between gross income and disposable income (net of taxes and transfers of all kinds). This difference is a proxy for income taxes net of social transfers. The capacity of redistributing income is the former indicator expressed as a share of the gross, initial income. The deployed indicator is the nation-wide median value of this percentage.

[8] Eurostat publishes Gini coefficient and at-risk-of poverty rates for disposable, net income from taxes and transfers of all kinds but also for gross, market income and for counterfactual distributions of disposable income after taxes and social transfers (excluding pensions). We substract the Gini coefficient / poverty rate for disposable household income (pensions excl.) from the Gini coefficient / poverty rate computed for gross household income and the outcome are expressed in percentage points.

[9] The difference between the share of adults with non-poor background who achieved tertiary education attainment and the share of adults with poor background who hold tertiary education is computed in every country. If access (and success) in higher education were independent of parental background, the indicator of inequality of opportunities would hold value 0.

palliate the impoverishment of the unemployed (expenditure on passive labour market policies as a percentage of GDP and net replacement ratio of the unemployment benefits).

---------- Table 2 about here ----------

In order to visually explore the potential explanatory power of these macro/aggregate variables as drivers of international differences, a set of scatterplots will be displayed. Needless to say, they are only intended to show potential trends, not cause-effects, and need to be taken with caution. We will organize the description of the figures following the same order as in Table 2: inequality indicators, redistributive capacity indicators, equal opportunities and labour market policies addressing the loss of income by the unemployed.

We may mimic the well-known *Great Gatsby Curve* by displaying the connection between country-wide income inequality (measured by the Gini coefficient, the inter-quintile ratio (S80-S20) and the risk-of-poverty rate) and the "raw" correlation[10] between having a poor background and living in poverty as an adult, which is a crude indicator of persistence of poverty. Figures 1 to 3 show that, regardless the way in which it is measured, there is a clearly positive correlation between inequality and ITP. The coefficients of determination in the relevant Excel-computed trend-lines range between 0.32 and 0.37: in the case of the Gini coefficient this would mean that one third of the variation in the ITP levels across countries is potentially explained by the variation in the Gini coefficient.

---------- Figures 3-4-5 about here ----------

A second mechanism which may contribute to explain cross-country differences in the correlation between poor background and current poverty risk is taxation on income. Taxation levels affect the private returns to education, which has a direct impact on the correlation of income if educated workers are well-off and make larger investments in human capital for their children; moreover, if taxes are progressive, they reduce the attractiveness of investments in human capital at least for high-ability individuals (Holter, 2015). Figures 6 to 8 display scatterplots for different measures of the impact of taxes on gross household's income. Figure 6 provides a picture of income taxes as a percentage of the GDP versus correlation between past and current poverty. Unfortunately, we have not been able to obtain a proper measure of tax progression for all the countries in our sample; Figure 7 displays the redistributive capacity of taxes and social transfers, i.e., the share of gross HH income which is taken away (or contributed for) by the national authorities via taxes and social transfers (other than pensions). Both the weight of income taxes in overall GDP and the redistributive capacity of taxes and social transfers are negatively correlated with the ITP: the more redistributive economies at the moment of the interview are featured by a higher level of social mobility (a lower level of correlation in poverty across generations). In a similar vein, the reduction in Gini coefficients (in percentage points) or in poverty rates (also in percentage points) is positively correlated with income mobility: the more the effective reduction in inequality or in risk-of-poverty rates, the lower the connection between poor backgrounds and adult poverty.

[10] For the sake of simplicity we have just computed within-country Pearson's piecewise correlation index.

---------- Figures 6-7-8-9 about here ----------

The third mechanism is equality of opportunities in access to higher education. We display to complementary ways of expressing this concept: one is a proxy of the inputs/efforts from the public authorities for the provision of tertiary education for larger shares of the population (public expenditure on tertiary education as a percentage of the GDP) and the other is a proxy for the output: an inequality of opportunities indicator (i.e., the difference in tertiary education attainment between adults with non-poor and poor background). Both measures, plotted in Figures 10 and 11, are found to explain about 40% of intercountry variation of the crude ITP indicator: the larger the public effort on tertiary education and the larger the levels of equality in access to higher education, the milder the ITP processes.

---------- Figures 10-11 about here ----------

Since unemployment is one of the most relevant sources of inequality, protection against income loss caused by job destruction is also potentially relevant in the reduction of inequality via the provision of an income floor for those who are out of employment. Generosity in pubic efforts to palliate income losses in the unemployed is measured here in two ways: public expenditure on passive labour market policies (i.e., benefits and early retirement subsidies) as a percentage of the GDP and *net replacement ratio* (NRR) of the unemployment benefits. Both are plotted against "raw" ITP in Figures 12 and 13.

---------- Figures 12-13 about here ----------

The size of expenditure on passive labour market policies as a share of GDP is an indicator of the size of the problem (i.e., unemployment) rather than on effective ability to reduce inequality caused by job losses. This is why in Figure 12 a positive link between raw ITP and expenditure on unemployment benefits is found. In order to measure the effective effort to make unemployment benefits able to reduce inequality, we display in Figure 13 the net replacement ratio of unemployment benefits obtained from OECD (Benefits and Wages - Statistics). In this case a clear negative correlation is found, with most countries where unemployment benefits are able to replace a larger share of previous employment earnings registering a lower way ITP indicator, with the exception of Belgium, Portugal and Luxembourg.

4. Description of the sample

The sample under study is made up by 25-to 59-aged adults, both males and females[11], living independently from their parents, who in the EU-SILC 2011 Module provide information on the "financial situation of their household" when they were around 14 years old, out of from which we construct the main explanatory variable of our multivariate analysis. We also need complete

[11] Evidence on Intergenerational Transmission of income is often obtained on sub-samples of males because the dependent variable tends to be income from work; given that our dependent variable captures the risk of poverty, which is measured at the household level and defined from income of all sources, we keep both males and females in the sample.

information in the interviewees' household total disposable income that allows to identify the household as poor or non-poor at the moment of the interview. The whole size of the sample is 216,159; after dropping observations with missing information on the individual or household-specific explanatory variables, the remaining sample has 207,071 observations.

---------- Table 3 about here ----------

As mentioned above, the risk of poverty has been predicted out of several socio-demographic individual and household – level variables: in Table 3 country-level average values are displayed for all of them.

5. Multivariate strategy: multilevel analysis

In order to address the potential inter-country variability in the impact of our main explanatory variable (poor background) on the risk of living in poverty during adult life, we estimate a set of multilevel models for dichotomous responses, namely, a binary logit model with random intercept and random slope. Multilevel models in comparative analyses on harmonized data-sets with thousands of individual records in a limited set of countries is quite a popular strategy amongst social scientists to capture "country effects" in their estimations (Bryan and Jenkins, 2016) and preferable to just clustering standard errors around the country. The parameter estimates and their standard errors would be biased if the multilevel structure of the data-set were ignored, since observations are not independent within clusters/countries. The most relevant advantage of multi-level analysis for our purposes is that it "encourages systematic analysis of how covariates measured at various levels of a hierarchical structure affect the outcome variable and how the interactions among covariates measured at different levels affect the outcome variable" (Guo and Zhao, 2000: p. 444). As a matter of fact, one frequently examined cross-level interaction effects in this type of regressions is aimed at studying how the macro context affects the impact of a covariate at the micro level. That is, precisely, our target: examining to which extent certain macro/aggregate variables may alter the intensity in the transmission of poverty to the following generation.

The basic specification for this model may be described as follows (adapted from Guo and Zhao, 2000): let y_{ij} be a binary response variable (living in a poor household at the moment of the interview) for person *i* in country *j* and x_{ij}, an explanatory variable at the person level (level 1). We define the probability of the response equal to one (i.e., being poor) as $p_{ij} = Pr\ (y_{ji} = 1)$, and p_{ij} will be modelled using a logit link function. The standard assumption is that y_{ij} has a Bernoulli distribution. The two-level model can be written as:

$$Log[p_{ij}(1-p_{ij})] = \beta_{0j} + \beta_{1j} poorback_{ij} + \sum_{2}^{n} \beta_n X_{nij} + u_j \qquad (1)$$

where u_j is the random effect at the country level (level 2) and it is assumed to be normally distributed, with the expected value 0 and the variance σ^2_u (the variance at level 1 in a logit model is fixed and equal to $\pi^2/3$). Without u_j, (1) would be a standard logistic regression model. Conditional on

u_i, y_{ij}s are assumed to be independent. In this specification, the ICC (intra-class correlation[12]) is estimated as $\rho = \sigma_u^2/(\sigma_u^2 + \pi^2/3)$. Amongst the set of explanatory variables we are particularly interested in the coefficient of the dichotomous variable (*poorback*$_{ij}$) that takes value 1 if the interviewee reports a poor background and 0 otherwise. The rest of the explanatory variables vary at level 1 (they are socio-demographic and variables that describing the size and composition of the household). Our model allows both the intercept (β_0) and the slope of the variable *poorback* (β_1) to vary across countries. This is:

The intercept follows a distribution like:

$$\beta_{0j} = \beta_0 + u_{0j} \tag{2}$$

in a similar fashion, the slope of our main explanatory variable would follow the next expression:

$$\beta_{1j} = \beta_1 + u_{1j} \tag{3}$$

This model results in three parameters of interest: the variance of u_{0j}, the variance of u_{1j} and the covariance between u_{0j} and u_{1j}. The size of u_{0j} and u_{1j} and of the LR test of multilevel versus logit models, which follows a Chi^2 distribution, allows the analyst to acknowledge the superiority of the multilevel estimation on the pooled binary logit. In a second specification of the model, we subsequently add one macro-indicator from the vector $M_j = \{M_{1j}, M_{2j}, \dots, M_{kj}\}$, each of which measures income inequality, redistributive capacity via taxes and social transfers, passive labour market policies or equality of opportunities in access to higher education (see Table 2 for a description of their value ranges):

$$Log[p_{ij}(1-p_{ij})] = \beta_{0j} + \beta_{1j} poorback_{ij} + \sum_2^n \beta_n X_{nij} + \gamma_1 Mj + u_j \tag{4}$$

In order to find out if the macro/aggregate variable helps to shape the differences in the ITP processes across countries, in our last specifications we add interactions between the variable *poorback*$_{ij}$ and each one of the macro/aggregate indicators, $M_j = \{M_{1j}, M_{2j}, \dots, M_{kj}\}$. We have therefore estimated *2*k* multivariate logit models, all of which entail random effects in the intercept and the slope of our main explanatory variable (*poorback*$_{ij}$). Each macro-aggregate indicator is included in two of the *2*k* specifications: in the first one, the impact of *poorback*$_{ij}$ and M_j are observed independently, and in the second one, a cross-level interaction term between the macro/aggregate variable and the *poorback*$_{ij}$ level 1 variable is added:

$$\begin{aligned} Log[p_{ij}(1-p_{ij})] &= \beta_{0j} + \beta_{1j} poorback_{ij} \\ &+ \sum_2^n \beta_n X_{nij} + \gamma_1 Mj + \gamma_2 poorback_{ij} * Mj + u_j \end{aligned} \tag{5}$$

[12] The intra-class correlation coefficient is the ratio of the between-cluster variance to the total variance.

Despite a very spread strategy, the use of multilevel variables to identify patterns of country effects is no *panacea*, as Bryan and Jenkins (2016) explain: a small number of units at level 2 may have severe consequences on the accuracy and reliability of the estimators because when the number of groups is small, regardless of the group sizes, estimates of the variance components and of their standard errors are imprecise and likely to be biased downwards. The authors survey the discussion about the minimum number of groups for multilevel models to be reliable and find that it well depends on the problem at hand, with 30 units being one of the most consensual values in the literature. Our models are currently estimated with 29 units[13] as a first, exploratory approach for our study, but we are exploring the possibilities of macro/aggregate variables at NUTS1 as level 2 in order to overcome the potential problems derived of a small number of level 2 units in our specifications.

6. Results of the multivariate analysis

The results of the multivariate models are displayed in Table 4 and Table 5. Table 4 shows the coefficients of variables at individual only in four different specifications, conducted to show the appropriateness of the multilevel approach. Table 5 displays a summary of the coefficient of the poor family background variable, expressing "net" ITP, in the presence of a selection of macro/aggregate variables and the interactions across levels, aimed at explaining potential patterns in the ITP processes across countries.

The four models fully specified by level 1 variables only differ in the distributional assumptions under which they are built: a binary logit on a pooled sample of countries with clustered errors around countries; a binary logit model with country fixed effects; a multilevel model with random intercept and; finally, a multilevel model with random intercept and slope - the coefficient for the poor background variable aimed to describe "net" ITP. The risk of poverty at the moment of the interview is explained by gender, age, educational attainment, nationality, labour force status, limitations in daily activities due to health problems, presence of partner in the household (and his/her educational attainment), number of children in the household and labour market composition of the household and, finally, the dummy expressing poor background. The latter is positive and significant in all specifications, pointing at the existence of net ITP in average in the whole sample. All the coefficients are quite robust across specifications; only the ITP coefficient varies slightly across them.

---------- Table 4 about here ----------

Overall, the risk of poverty at the moment of the interview, is lower for women, decreases with age (though at a decreasing pace), is higher the lower the level of education, is higher for foreign-born individuals and also amongst those who are limited in any way in their daily activities because of health problems. Labour force status is, as expected, very much related to the risk of poverty, with

[13] In order to use 29 units we have renounced to deploy the intergenerational weighting factor distributed by Eurostat in the micro-data set because it is not available in some countries (namely, Bulgaria, Cyprus, Denmark, Greece, Croatia and Romania). In the next versions of the paper, if we are able to conduct our analysis at NUTS1 as level 2, we intend as well to properly weight all observations at the expense of missing some countries sub-samples.

unemployed individuals being more vulnerable than the rest[14]. The size and composition of the household is also necessarily connected with the poverty risk as poverty is measured at the household level: low educated partners, the presence and number of children in the household and the presence of non-employed adults in the household are obviously linked to a higher risk of poverty.

Our variable of interest, the poor background dummy, holds always positive and significant coefficients. The coefficient on poor background is one of the most affected by the inclusion of country fixed effects, meaning that there are relevant differences across countries not only in the risk of poverty but also in the way family background affects this risk. The significance of the variance for the intercept in the multilevel model with random intercept shows how relevant it is to acknowledge the fact that the base-risk of poverty significantly differs across countries. In model 4 the slope for the poor background variable is allowed to vary as well. The significance of its variance also means that there are indeed relevant differences across countries on the way poor background affects the risk of poverty in adult life. Still, the intra-class correlation coefficient in models 3 and 4 reflects that only 3% of the overall variability in the model is explained by the differences across countries.

---------- Table 5 about here ----------

Table 5 captures a summary of the most relevant coefficients in multilevel logit models[15] where the macro/aggregate variables have been subsequently introduced, one by one. All of them share the same control variables, which are exactly the same as in the models displayed in Table 4. Columns 1 and 2 reproduce the coefficients for the net ITP indicator and the variable at level 2 when they are used independently. Columns 3 and 4 refer to the same coefficients in the specification where a cross-level interaction between poor background and the macro/aggregate variable displayed in column 5 is introduced. Columns 6, 7 and 8 register, for the latter specification / model[16], three relevant parameters in the multi-level context: the variance for the intercept, the variance for the slope (random coefficient for the poor background variable) and the covariance between the errors in the slope and the intercept. The first two variances are always significant, and the LR test describing the improvement in the multilevel model compared with a standard pooled cross-section binary logit prove that taking into account the multilevel structure of the data is very relevant and that there are relevant differences both in the basic risk across countries and in the ITP processes.

The macro-variables are aimed to find whether poverty risk is higher/lower under certain institutional-macroeconomic conditions. When interacted with the main explanatory variable (poor family background) the relevant coefficient is aimed to inform on the potential of these macro/aggregate variables to effectively shape the ITP processes. The macro-aggregate indicators are

[14] Although students appear as a very vulnerable group, given the age of the interviewees, this sub-sample is very tiny.

[15] Because the estimation of multivariate models with random intercept and slopes are highly computational demanding, all the models have been estimated on a 25% random simple by country. We have estimated only a few of the models displayed in Table 5 on the whole sample and results are pretty much equivalent to the ones presented here. In future versions of the paper the models will be run on the whole sample.

[16] For space reasons, we omit the equivalent parameters in the previous specification, before the cross-level interactions are introduced. They look really similar to the ones already displayed in Table 5.

displayed in the same order as in Table 2: income inequality; redistributive capacity; access to higher education and effort in passive labour market policies.

From all macro-aggregate indicators, only the ones describing income inequality and the poverty rates hold a significant effect on the individual risk of poverty. When interacted with poor background, the interaction terms cancel its significance, meaning that the variation in the ITP processes across countries is due to differences in levels of inequality in the distribution of income across countries. It may be interpreted in the following way: in the presence of the interaction term the coefficient for poor family background represents the impact having poor family background would have on current poverty risk in the scenario where inequality held minimum values: in that case, a poor background would have no impact at all on poverty risk. Its impact would be positive and would increase along the values of the inequality indicators, so that the impact of poor family background is more relevant the more unequal societies are.

The coefficient for social protection expenditure as a share of the GDP is also significant, but negative: the risk of poverty is lower in countries where social protection expenditures are high, but the average level of social expenditure does not explain the variability in the ITP intensity: the interaction term between social protection and poor family background is not statistically significant. Therefore, when social protection holds minimum values, the impact of poor background is very high, and social protection itself contributes to a reduction in the risk of poverty, but does not significantly alter the elasticity (slope) of the current risk of poverty to poor family background. The relevant coefficient is negative but non-significant.

In a similar fashion, the inclusion of the rest of macro-indicators of redistributive capacity in the models do not alter the size and significance of the coefficient for the poor family background. When interacted with poor background, the indicators of the reduction in the Gini coefficient or in the poverty rate due to social transfers remain non-significant and neither the interaction does, but in their presence the size of the poor family background coefficient increases: in the scenario where the redistributive capacity of social transfers are minimum, the elasticity of current poverty risk towards poverty during childhood is very large. Still, it seems that the evolution of that coefficient along the capacity to reduce Gini and poverty is not relevant strong enough to be significant. As for the overall redistributive capacity of the economy via income taxes and social transfers, results are somehow puzzling and deserve more attention.

Concerning the measures of access to tertiary education, we obtain somehow puzzling results, since neither public expenditure on tertiary education nor inequality of opportunities indicator hold significant coefficients in the presence of ITP. In combination with the ITP indicator, they remain non-significant but “wipe away” the effect of the ITP, while expenditure on tertiary education considerably increases the size of the relevant coefficient. This points at the relevance of differences in human capital investments across individuals of different backgrounds as drivers of the ITP. This result is very much in line with most of the literature that decompose the transmission of income in two components: one indirect, via investments in human capital and one “direct”, residual in the presence of human capital (Raitano and Vona, 2015a; 2015b). The interaction between poor family background and public

expenditure on tertiary education shows that the elasticity of current poverty to poor background is really high in the countries where this kind of expenditure holds minimum values. The level of expenditure itself registers a negative, though non-significant, coefficient, and the interaction term – interpreted with caution because of its low significance level - shows that the higher the level of expenditure on higher education, the lower the connection between current poverty status and past poverty will be.

In the last two specifications, the indicators of expenditure on unemployment benefits and the net replacement of previous earnings by unemployment benefits are explored. Expenditure on passive labour market policies (as a % of GDP) is not directly linked to a lower individual risk of poverty, but when interacted with the poor background variable it can be seen that it contributes to reduce the intensity of ITP (though very mildly). As for the NRR, the aggregate indicator is correlated with a lower risk of living in a poor household, but the cross-level interaction term is negative though no significant. In the scenario with the lowest NRR the ITP net effect tends to be large, and if the coefficient for the interaction were more significant, we might effectively affirm that the NRR contributes to reduce (or, at least, is negatively correlated with) the intensity of the ITP.

7. Conclusions

The present piece of work constitutes a first exploration of the potential drivers of differences across countries in the intergenerational transmission of economic disadvantage. We study the influence of poverty in the parental home on the risk of monetary poverty during adult life in a set of around 30 European Union and European Economic Area countries and describe how it varies across countries. To that aim we exploit the EU-2011 Module on Intergenerational Transmission of Disadvantage through a multivariate strategy that allows for the explicit inclusion of macro/aggregate indicators describing institutional and public policy contexts that may intervene in the inheritance of poor economic conditions across generations.

Our results are quite in line with previous exploratory analyses (Corak, 2013; Causa *et al*., 2009; Causa and Johansson, 2010): in more unequal societies there is a more intensive transmission of inequality across generations; consequently, the more effective societies are in the redistribution of households' income and the correction of inequalities the more socially mobile they are as well. Similarly, the public effort aimed to increasing access to higher education also favours social mobility (though some extra attention needs to be devoted to the results for inequality of opportunities in access to tertiary education). Finally, wherever the unemployed are strongly supported in their loss of income, the risk of poverty is not only lower, but the mechanism of transmission of inequalities is also milder.

We have two lines for future research. The first one is, once we have confirmed evidence on variables and indicators that had been previously explored in the literature, would be widening the

current analysis with new indicators for which evidence is much scarcer, namely, the private return to higher education and the assortative mating (homogamy) in societies. The former is expected to be positively related with the intensity of ITP; as for the latter, the intergenerational transmission of inequalities should be more pronounced in countries where new families are formed by individuals from the same economic or educational background. The second way in which we aim to improve our research is by changing our level 2 observations from country to NUTs 1. In doing so we will considerably increase the number of level 2 units and, in this way, improving the reliability of the multilevel models by enlarging variability in level 2. This will mean turning the macro/aggregate indictors from country- to NUTs 1- level whenever possible, and deploying the intergenerational weighting factor provided by the EU-SILC. Both strategies should result in a better, more comprehensive understanding of the variability in the ITP processes around Europe.

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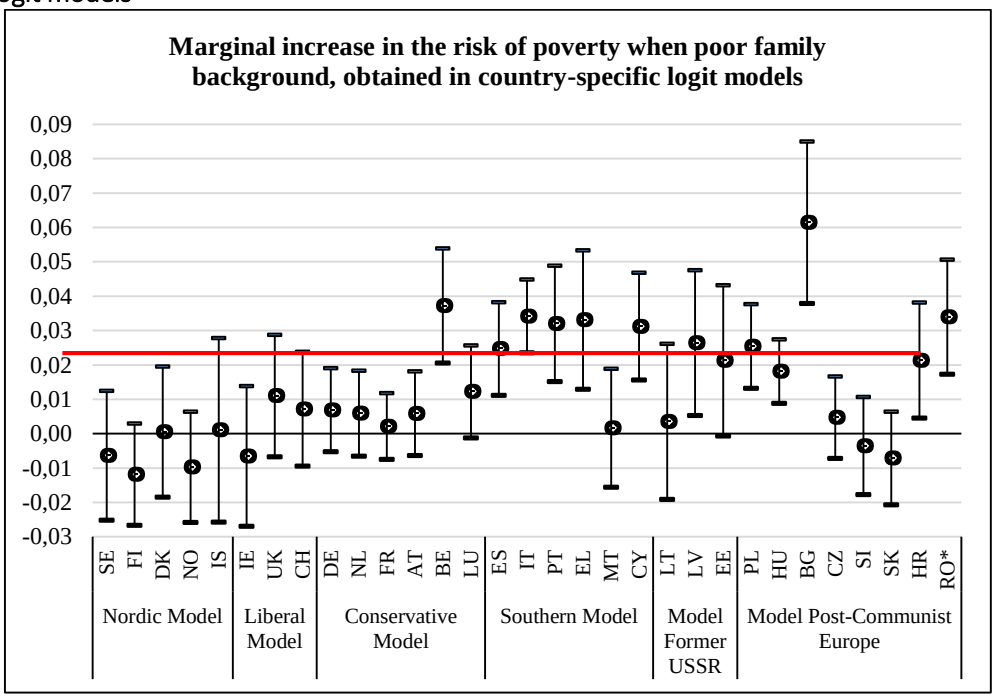
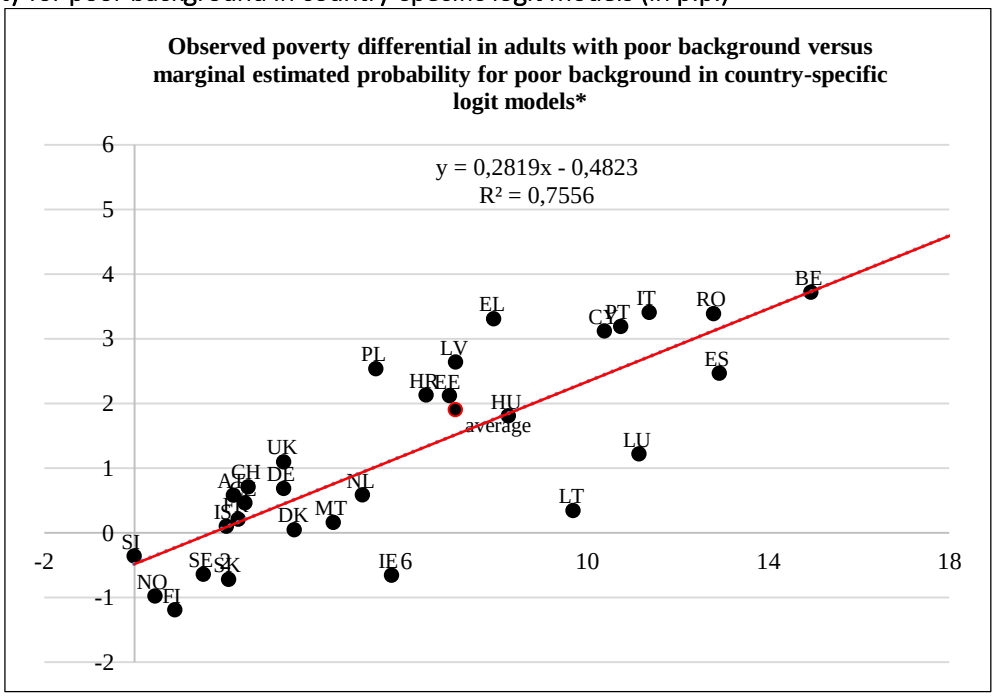
Figure 1. Marginal increase in the risk of poverty when poor family background, obtained in country-specific logit models



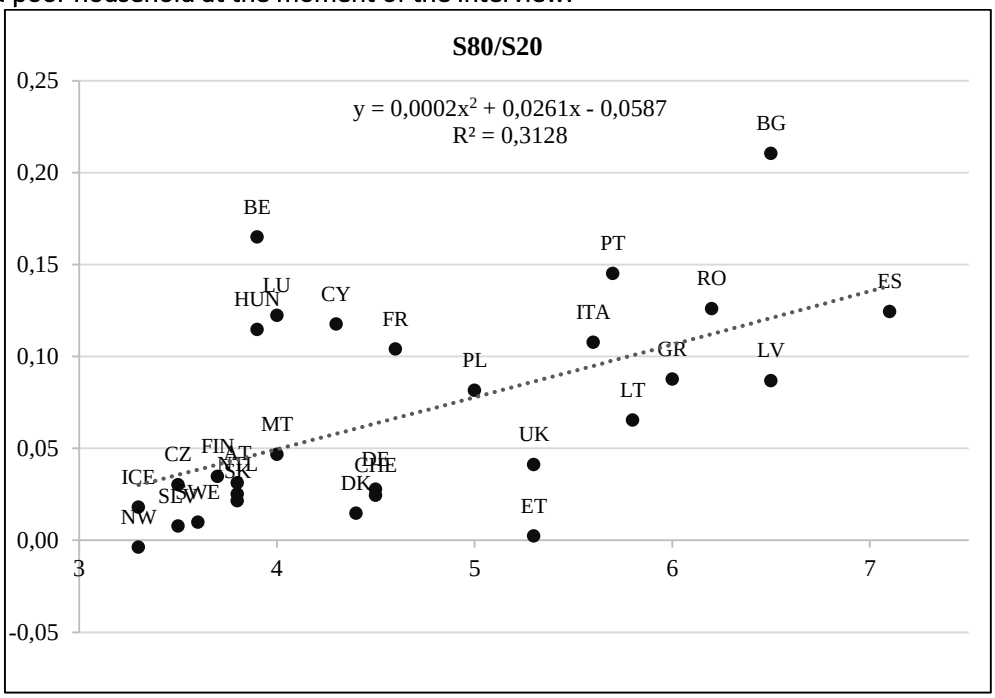
Source: EU-SILC module 2011 on Intergenerational transmission of disadvantages (Eurostat)

Figure 2. Observed poverty differential in adults with poor background versus marginal estimated probability for poor background in country-specific logit models (in p.p.)



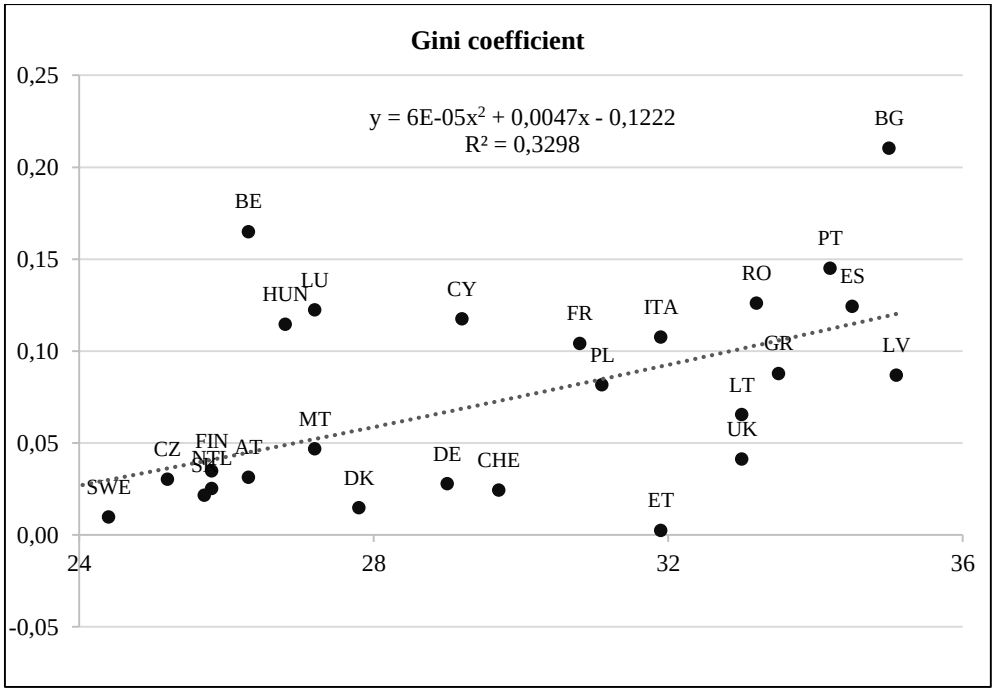
Source: EU-SILC module 2011 on Intergenerational transmission of disadvantages (Eurostat)
*: the information for Bulgaria is not shown for the sake of clarity as it holds extreme values (24.66 p.p. and 6.14 p.p.), but it is used to compute the trend-line.

Figure 3. Inter-quintile ratio (S80/S20) and piecewise correlation between poor family background and living in a poor household at the moment of the interview.



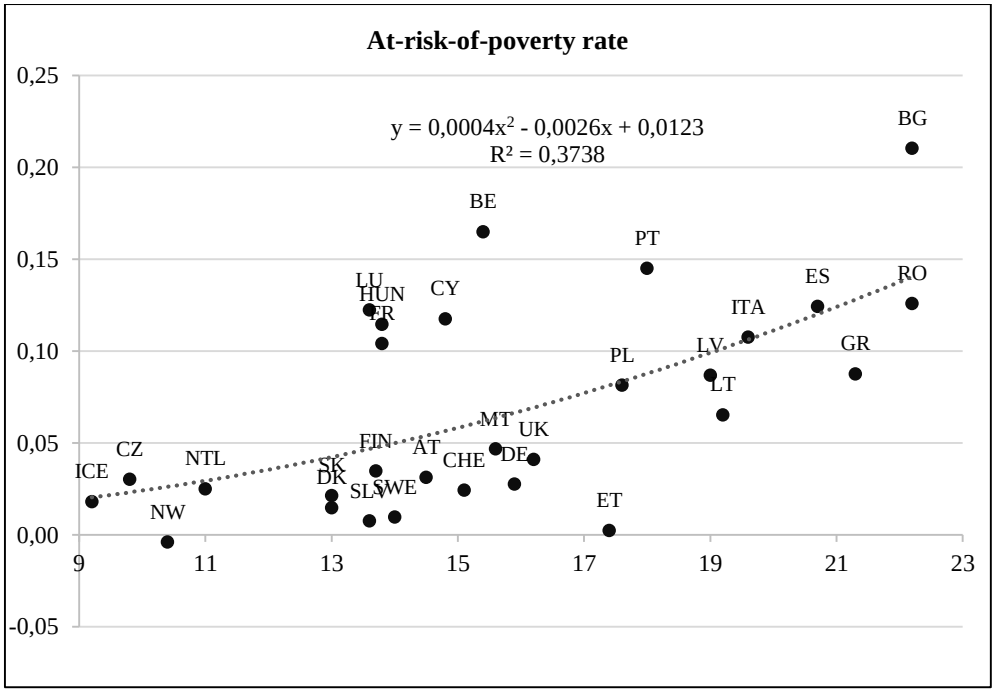
Source: EU-SILC module 2011 on Intergenerational transmission of disadvantages and Eurostat - Living Conditions and Welfare Statistics

Figure 4. Gini coefficient and piecewise correlation between poor family background and living in a poor household at the moment of the interview.



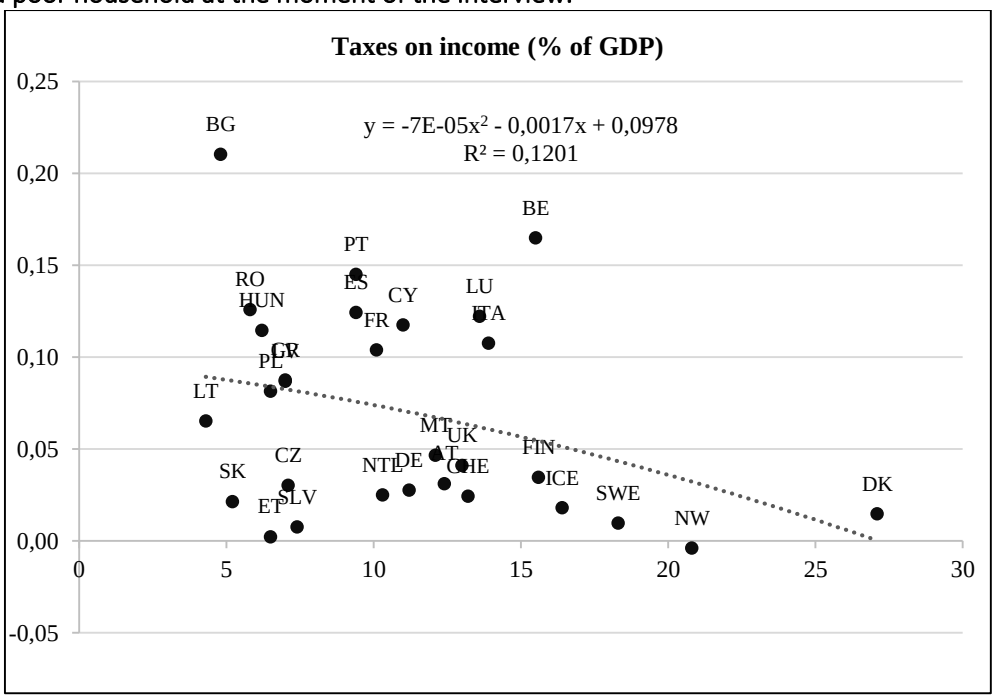
Source: EU-SILC module 2011 on Intergenerational transmission of disadvantages and Eurostat - Living Conditions and Welfare Statistics

Figure 5. At risk-of-poverty rates and piecewise correlation between poor family background and living in a poor household at the moment of the interview.



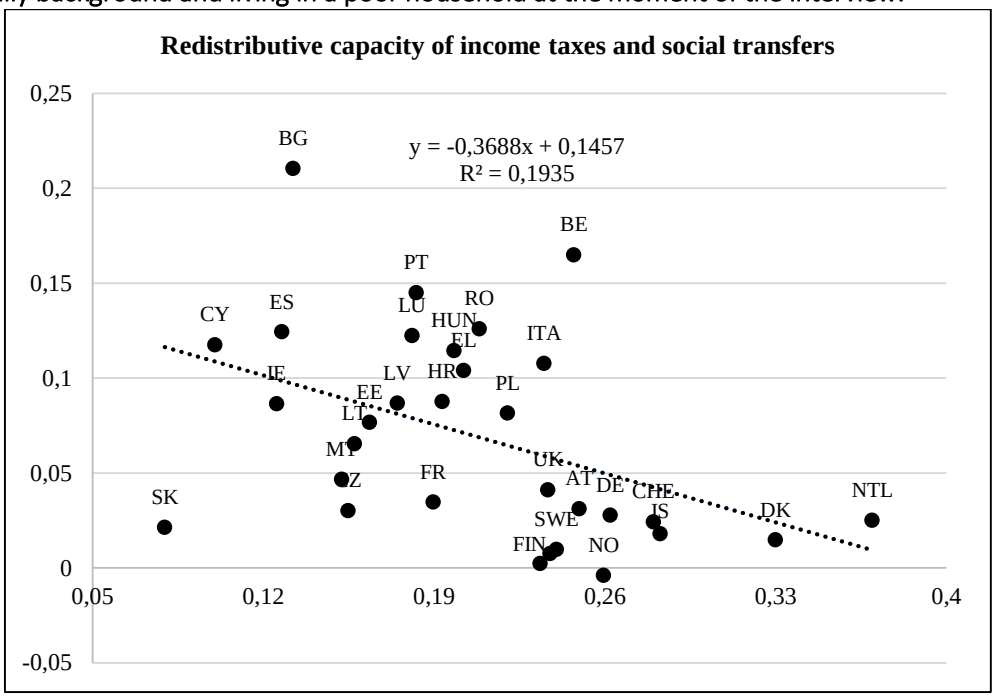
Source: EU-SILC module 2011 on Intergenerational transmission of disadvantages and Eurostat - Living Conditions and Welfare Statistics

Figure 6. Taxes on income (as % of GDP) and piecewise correlation between poor family background and living in a poor household at the moment of the interview.



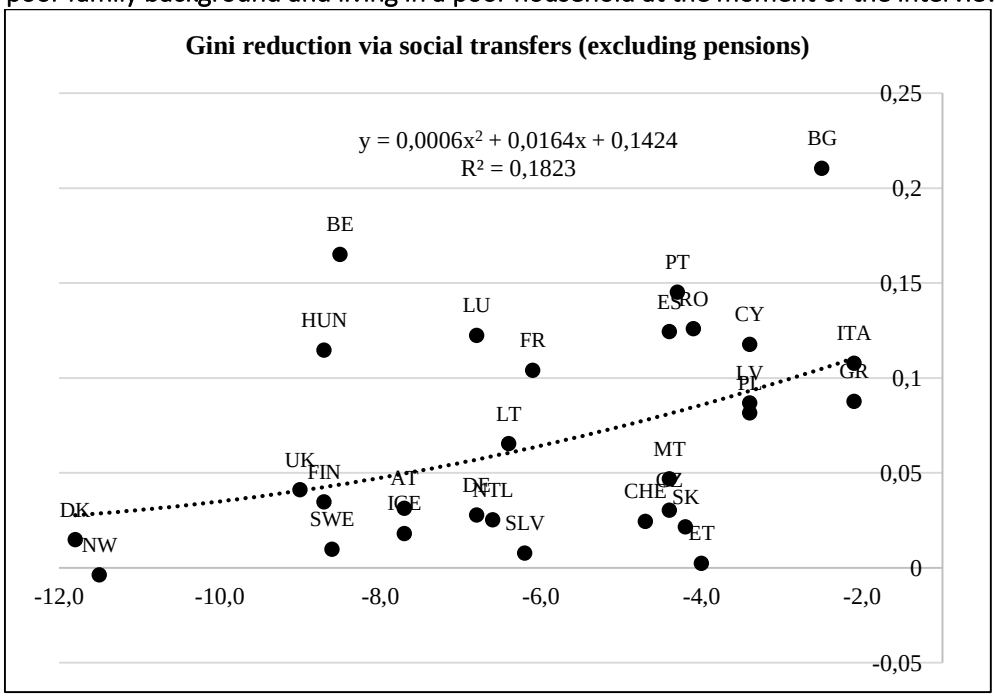
Source: EU-SILC module 2011 on Intergenerational transmission of disadvantages and Eurostat – National Accounts

Figure 7. Redistributive capacity of income taxes and social transfers and piecewise correlation between poor family background and living in a poor household at the moment of the interview.



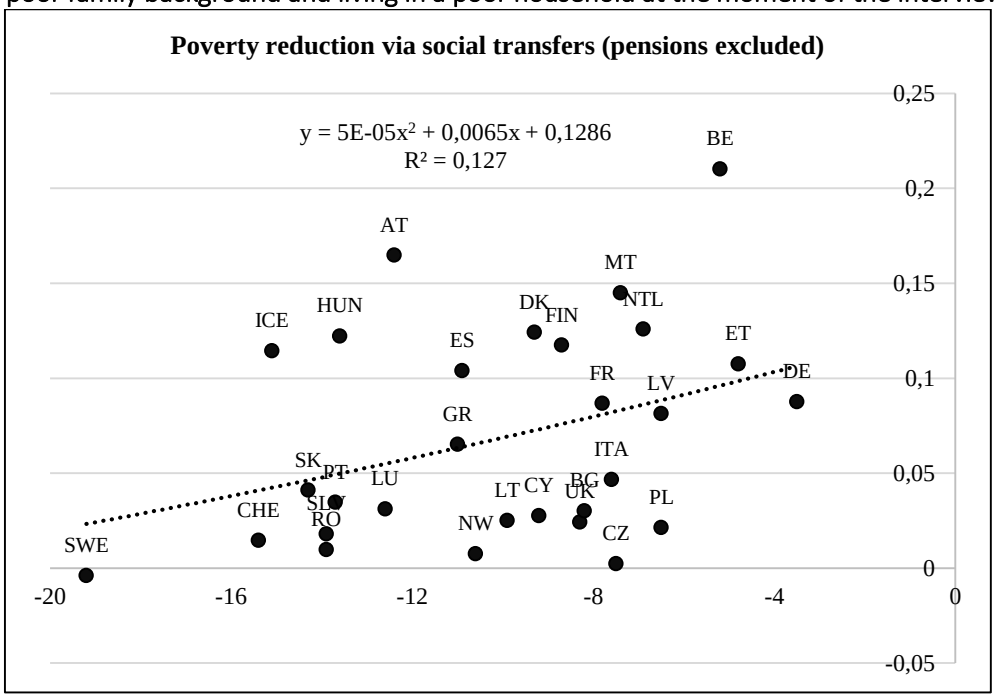
Source: EU-SILC module 2011 on Intergenerational transmission of disadvantages.

Figure 8. Gini reduction via social transfers - excluding pensions – (in p.p.) and piecewise correlation between poor family background and living in a poor household at the moment of the interview.



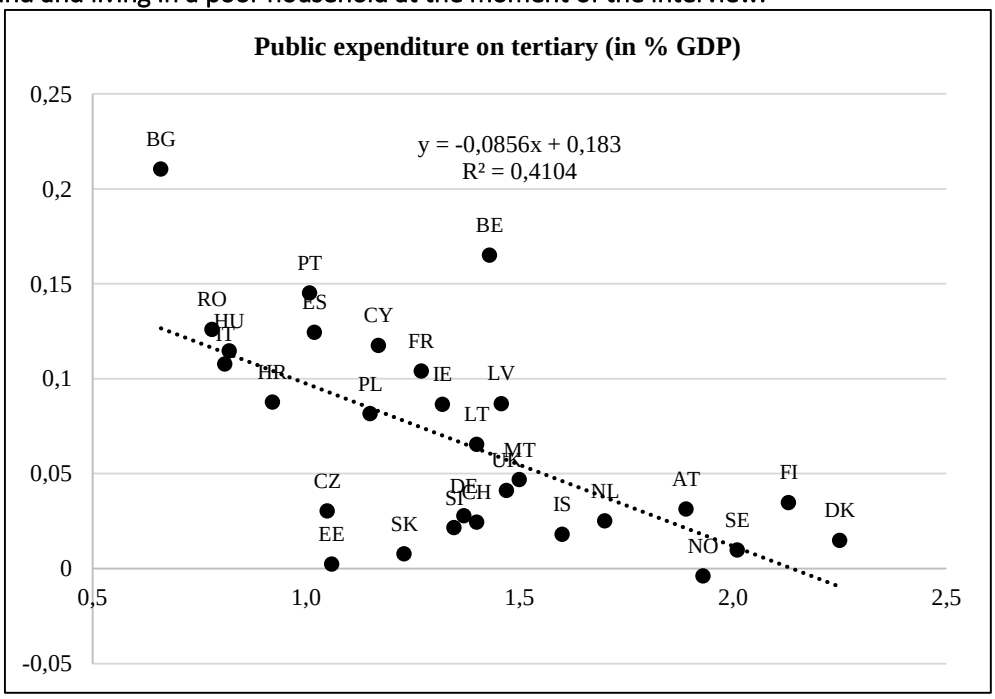
Source: EU-SILC module 2011 on Intergenerational transmission of disadvantages and Eurostat - Living Conditions and Welfare Statistics

Figure 9. Poverty reduction via social transfers - excluding pensions – (in p.p.) and piecewise correlation between poor family background and living in a poor household at the moment of the interview.



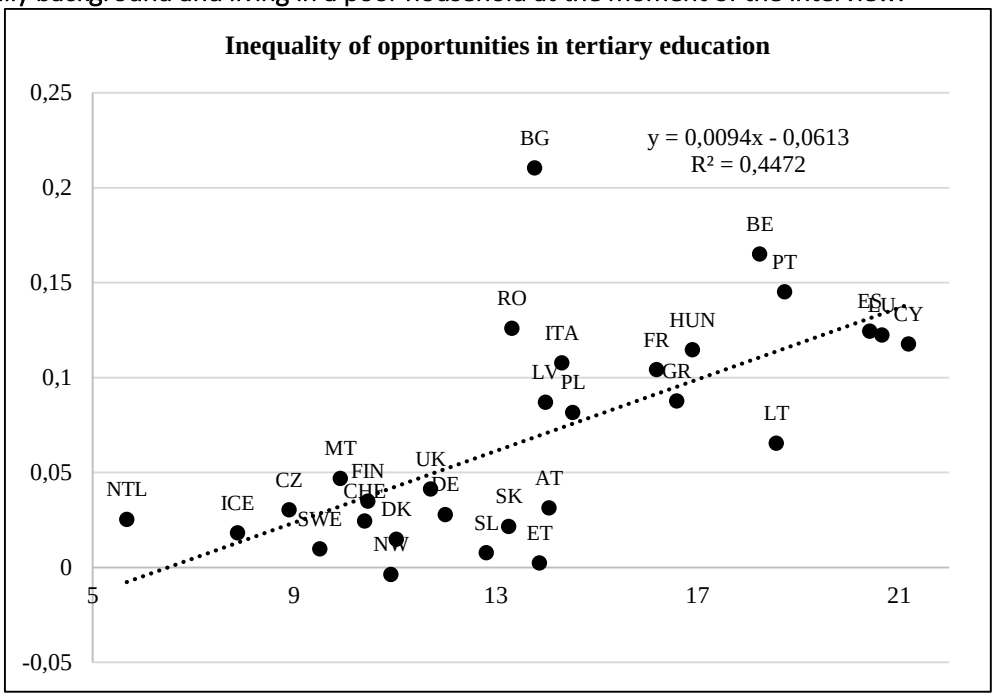
Source: EU-SILC module 2011 on Intergenerational transmission of disadvantages and Eurostat - Living Conditions and Welfare Statistics

Figure 10. Public expenditure on tertiary (in % GDP) and piecewise correlation between poor family background and living in a poor household at the moment of the interview.



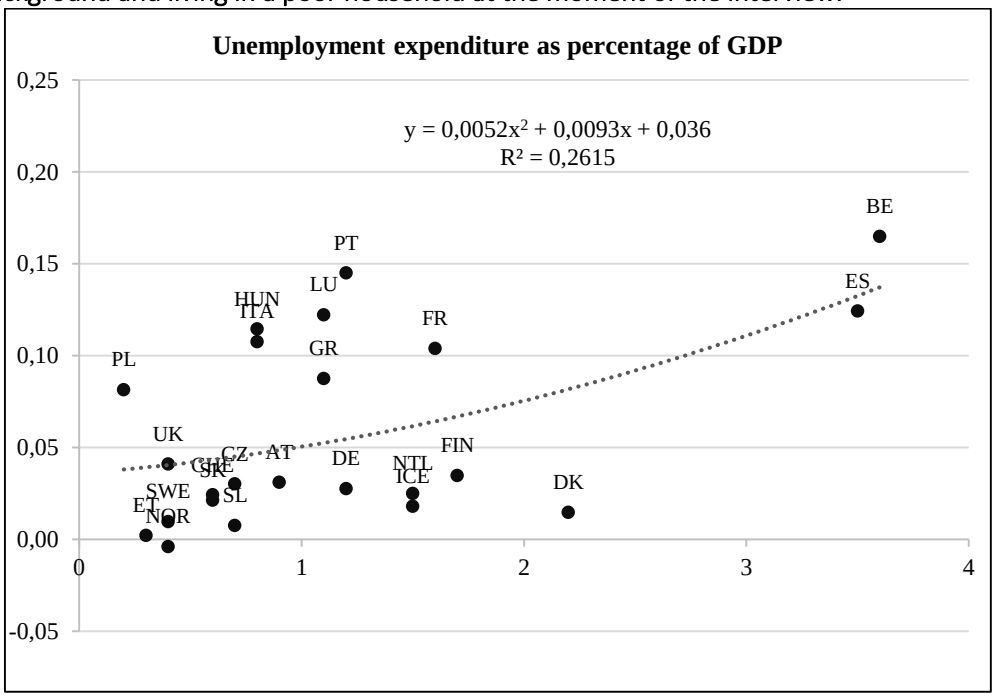
Source: EU-SILC module 2011 on Intergenerational transmission of disadvantages and Eurostat – Education and Training Statistics

Figure 11. Inequality of opportunities in tertiary education (in p.p.) and piecewise correlation between poor family background and living in a poor household at the moment of the interview.



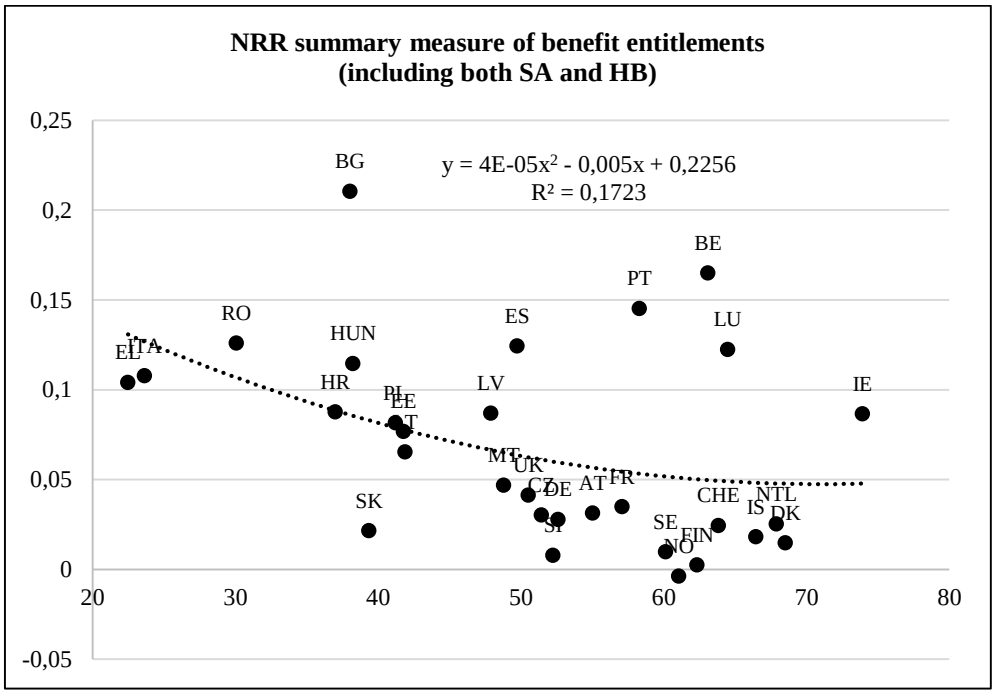
Source: EU-SILC module 2011 on Intergenerational transmission of disadvantages

Figure 12. Unemployment expenditure as percentage of GDP and piecewise correlation between poor family background and living in a poor household at the moment of the interview.



Source: EU-SILC module 2011 on Intergenerational transmission of disadvantages and Eurostat – Labour Market Statistics

Figure 13. Net Replacement Ratio - summary measure of benefit entitlements (including social assistance and household benefits), in p.p. - and piecewise correlation between poor family background and living in a poor household at the moment of the interview.



Source: EU-SILC module 2011 on Intergenerational transmission of disadvantages and OCED – Benefits and Wages Statistics

Table 1. Incidence of poverty in parental household (poor background, %) and living in poverty at the moment of the interview (in p.p.).

	Mean (Poor background)	Mean (Living in a poor household) if			Difference = B – A (in p.p.)	Number of observations
		Overall	Non-Poor background (A)	Poor background (B)		
SE	18.40	12.49	12.34	13.18	0.84	3,218
FI	24.27	15.40	15.35	15.55	0.20	4,982
DK	16.38	10.10	9.58	11.26	1.68	2,820
NO	14.43	9.48	9.49	9.21	-0.28	2,709
NL	14.53	9.26	8.96	11.05	2.09	6,165
IS	23.61	11.35	11.03	12.17	1.14	1,744
IE	28.58	19.02	16.89	24.39	7.50	3,284
UK	25.83	17.48	16.56	20.13	3.57	6,481
DE	28.03	16.82	16.17	18.48	2.31	12,453
FR	29.73	13.32	12.55	15.14	2.59	11,063
AT	42.21	13.17	12.27	14.41	2.14	6,363
BE	21.98	16.23	13.01	27.66	14.65	6,119
LU	27.02	15.36	12.68	22.62	9.94	6,907
CH	19.58	13.65	13.23	15.36	2.13	6,981
ES	32.40	23.82	20.15	31.48	11.33	14,510
IT	32.00	20.76	17.77	27.13	9.36	19,443
PT	53.54	19.08	12.96	24.39	11.43	5,514
EL	40.18	22.66	19.09	27.98	8.89	5,657
MT	31.04	18.34	17.13	21.04	3.91	4,149
CY	41.99	15.35	11.74	20.33	8.59	4,639
HR	45.47	21.62	18.33	25.58	7.25	5,804
LT	30.08	22.36	20.57	26.51	5.94	5,117
LV	27.38	23.97	21.69	30.01	8.32	6,330
EE	26.56	20.52	18.66	25.68	7.02	5,233
PL	28.58	19.20	17.17	24.28	7.11	14,379
HU	37.94	16.31	13.00	21.73	8.73	13,039
BG	18.42	21.83	17.70	40.12	22.42	6,400
RO	44.82	23.64	18.81	29.58	10.77	7,188
CZ	28.94	11.92	11.30	13.46	2.16	6,776
SI	57.21	14.18	13.87	14.41	0.54	4,550
SK	32.24	14.75	14.22	15.86	1.64	6,142
Overall sample	31.14	17.71	15.50	22.59	7.09	216,159
Source: EU-SILC module 2011 on Intergenerational transmission of disadvantages (Eurostat).						

Table 2. **Explanatory variables at level 2 in multilevel logit models. Country-specific averages.**

Variable	Min.	Country	Mean	Max.	Country
S80S20	3.30	IS/NO	4.69	7.10	ES
Gini coefficient(p.p.)	22.90	NO	29.18	35.10	LV
Poverty rate (p.p.)	9.20	IS	15.64	22.2	BG/RO
Income taxes as % of GDP	4.30	LT	10.92	27.10	DK
Social Protection as % of GDP	15.10	LV	24.81	34.20	DK
Households' income redistribution via taxes and social transfers (share of total gross household income).	0.08	SK	0.21	0.37	NL
Reduction in Gini coeff. via taxes and social transfers (in p.p.)	-11.8	DK	-5.95	-2.10	EL/IT
Reduction in Poverty rates. via taxes and social transfers (in p.p.)	-19.2	NO	-10.13	-3.50	EL
Self-computed measure of inequality of opportunities in higher education (in p.p.)	5.70	NL	13.80	21.20	CY
Public expenditure on tertiary education as a % of GDP	0.66	BG	1.36	2.25	DK
Expenditure on passive labour market policies as a % of GDP	0.24	RO	0.90	2.82	ES
Net replacement ratio of unemployment benefits (as % of previous gross earnings)	22	EL	51	74	IE
Source: EU-SILC module 2011 on Intergenerational transmission of disadvantages, Eurostat (Living Conditions and Welfare Statistics, National Accounts, Education and Training Statistics, Labour Market Statistics) and OECD (Benefits and Wages Statistics)					

Table 3. **Explanatory variables at level 1 in multilevel logit models. Country-specific averages.**

Variable	Min.	Country	Mean	Max.	Country
Living in a poor household (depvar)	*9.26*	*NL*	*17.71*	*23.97*	*LV*
Poor background (bad economic situation in parental home)	14.43	NO	31.14	57.21	SI
Male	40.58	CZ	45.88	53.56	NO
Female	46.44	NO	54.12	59.42	CZ
Age	42.15	SE	44.08	46.37	HR
Primary education (or less)	0.00	FI	7.58	51.47	PT
Lower secondary education	0.03	PL	14.73	52.42	MT
Upper secondary education	15.03	PT	45.41	74.17	CZ
Tertiary education	13.51	PT	31.87	61.27	LT
Education attainment - missing	0.00	several	0.41	3.71	RO
Born in the country of residence	46.10	LU	89.63	99.86	RO
Born in a different country	0.14	RO	10.37	53.90	LU
Employed - full-time	45.80	IE	63.77	78.07	SI
Employed - part-time	1.10	HR	10.34	36.46	NL
Unemployed	1.48	NO	7.57	17.57	HR
Student or trainee	0.05	MT	0.68	3.50	IS
Other inactive	5.66	SE	16.11	35.02	MT
Other LM statuses	0.27	MT	1.53	3.90	IS
No limited in any activity because of health problems	51.93	HR	80.04	92.55	MT
Limited in activities because of health problems	5.28	MT	13.72	22.39	SK
Strongly limited in activities because of health problems	1.53	BG	4.64	9.14	SI
Partner: Primary education (or less)	0.00	AT/FI	6.11	42.66	PT
Partner: Lower secondary education	0.06	PL	11.45	45.19	MT
Partner: Upper secondary education	12.57	PT	35.62	56.71	CZ
Partner: Tertiary education	10.70	PT	24.49	47.82	LT
Partner: education attainment - missing	0.00	several	0.79	4.54	RO
No partner	15.54	EL	21.54	31.04	LV
No children in the household	21.64	SK	34.53	48.92	FI
One child in the household	17.15	NL	27.21	37.89	BG
Two children in the household	21.04	FI	28.12	36.42	MT
Three or more children in the household	3.13	BG	10.13	21.51	CY
All adults in the household in employment	17.33	HR	41.24	68.37	NL
Both employed and inactive adults in the household	26.07	SE	41.73	64.45	MT
Both employed and unemployed adults in the household	1.95	MT	8.54	16.05	LV
Employed, unemployed and inactive adults in the household	0.81	NL	8.49	25.10	HR
Source: EU-SILC module 2011 on Intergenerational transmission of disadvantages (Eurostat).					

Table 4. . Multivariate logit models on risk of poverty at the moment of the interview (with only explanatory variables at level 1)		**Binary logit, clustered errors**	**With country fixed effects**	**Multilevel (random intercept)**	**Multilevel (random intercept & slope)**
Ref. Non poor background	**Poor background**	**0.139*** **	**0.0845*** **	**0.128*** **	**0.101*** **
		(0.0344)	**(0.0142)**	**(0.0143)**	**(0.0374)**
Ref. Male	Female	-0.313***	-0.410***	-0.311***	-0.311***
		(0.0267)	(0.0142)	(0.0145)	(0.0145)
	Age	-0.0246***	-0.0561***	-0.0255***	-0.0254***
		(0.00332)	(0.000653)	(0.000819)	(0.000820)
	Age squared	0.00204**	0.00689***	0.00219***	0.00221***
		(0.000798)	(0.000577)	(0.000560)	(0.000561)
Ref. Tertiary education	Primary education (or less)	0.981***	1.240***	1.162***	1.159***
		(0.105)	(0.0331)	(0.0333)	(0.0335)
	Lower secondary education	0.839***	0.879***	0.931***	0.930***
		(0.0874)	(0.0259)	(0.0264)	(0.0265)
	Upper secondary education	0.497***	0.411***	0.522***	0.524***
		(0.0543)	(0.0204)	(0.0213)	(0.0214)
	Not answer	0.646***	0.504***	0.545***	0.546***
		(0.200)	(0.105)	(0.106)	(0.106)
Ref. Born in the country of residence	Born in a different country	0.537***	0.526***	0.695***	0.698***
		(0.0874)	(0.0207)	(0.0209)	(0.0210)
Ref. Employed - part-time	Employed - part-time	0.824***	0.779***	0.848***	0.847***
		(0.0758)	(0.0232)	(0.0233)	(0.0233)
	Unemployed	1.722***	1.678***	1.702***	1.704***
		(0.0838)	(0.0233)	(0.0232)	(0.0233)
	Student or trainee	1.771***	1.357***	1.819***	1.818***
		(0.127)	(0.0610)	(0.0619)	(0.0619)
	Other inactive	1.109***	1.167***	1.107***	1.105***
		(0.0623)	(0.0197)	(0.0197)	(0.0197)
	Other LM statuses	1.095***	0.969***	1.076***	1.073***
		(0.101)	(0.0437)	(0.0438)	(0.0438)
Ref. Not limited in any activity because of health problems	Limited	0.0952***	0.154***	0.0907***	0.0922***
		(0.0300)	(0.0186)	(0.0186)	(0.0186)
	Strongly limited	0.150**	0.242***	0.168***	0.171***
		(0.0707)	(0.0278)	(0.0276)	(0.0276)
Ref. Partner: Tertiary education	Partner: Primary education (or less)	0.749***	0.603***	0.847***	0.845***
		(0.0677)	(0.0363)	(0.0374)	(0.0374)
	Partner: Lower secondary education	0.771***	0.506***	0.816***	0.814***
		(0.0807)	(0.0294)	(0.0311)	(0.0311)
	Partner: Upper secondary education	0.443***	0.141***	0.444***	0.445***
		(0.0751)	(0.0236)	(0.0259)	(0.0259)
	Not answer	0.981***	0.622***	0.889***	0.885***
		(0.174)	(0.0777)	(0.0779)	(0.0780)
	No partner	1.416***	1.023***	1.450***	1.450***
		(0.0971)	(0.0230)	(0.0257)	(0.0258)
Ref. No children in the household	One child in the household	0.0213	-0.197***	0.0188	0.0194
		(0.0486)	(0.0180)	(0.0186)	(0.0186)
	Two children in the household	0.349***	0.0981***	0.385***	0.386***
		(0.0728)	(0.0180)	(0.0190)	(0.0190)
	Three or more children in the household	0.837***	0.608***	0.906***	0.906***
		(0.0727)	(0.0227)	(0.0236)	(0.0236)
Ref. All adults in the household in employment	Both employed and inactive adults	0.671***	0.594***	0.632***	0.633***
		(0.0605)	(0.0181)	(0.0187)	(0.0187)
		1.103***	1.004***	1.061***	1.060***

	Both employed and unemployed adults	(0.0965)	(0.0248)	(0.0252)	(0.0252)
	Employed, unemployed and inactive adults	1.292***	1.269***	1.216***	1.216***
		(0.0925)	(0.0253)	(0.0255)	(0.0255)
	Constant	-2.978***		-3.070***	-3.075***
		(0.130)		(0.0759)	(0.0758)
	Observations	207,071	207,071	207,071	207,071
	Number of groups	29	29	29	29
	chi2	10334	16996	7629	7502
	ll	-20167	-20349	-19939	-19934
	LR test vs. logistic model: chibar2(01)			456.0	466.1
	p-value (Chi2)			0.000	0.000
	ll_c			-20167	-20167
	Random-effects Parameters				
	variance (intercept)			0.1149	0.1143
				(0.0307)	(0.0308)
	variance (slope)				0.0313
					(0.0107)
	cov (intercept, slope)				-0.001
					(0.0126)
	ICC (intra-class correlation)			0.034	0.034
Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1					
Source: EU-SILC module 2011 on Intergenerational transmission of disadvantages (Eurostat).					

Table 5. Multilevel logit models on risk of poverty at the moment of the interview with macro/aggregate indicators – summary of the parameters of interest.

	Specification 1.: Before cross-level interaction		Specification 2.: With cross-level interaction			Specification 2.: With cross-level interaction			Specification 2.: With cross-level interaction Random effects parameters			
	Coeffient *poorback*	Coeff. *macro indicator*	Coeffient *poorback*	Coeff. *macro indicator*	Coeff. *cross-level interact.*	variance (intercept)	variance (slope)	covariance (intercept, slope)	rho = ICC	Number of obs.	Number of groups	LR test (vs logistic model)
S80S20	0.121***	0.0340***	-0.0430	0.0253**	0.0146**	0.1013	0.0183	-0.0175	0.0299	54,017	29	388.89
	(0.0424)	(0.00990)	(0.0847)	(0.0101)	(0.00660)	(0.0286)	(0.0115)	(0.0136)				0.000
Gini coefficient	0.121***	0.0259***	-0.0565	0.0198**	0.0120**	0.1044	0.0191	-0.0159	0.0308	54,017	29	399.11
	(0.0426)	(0.00841)	(0.0949)	(0.00853)	(0.00574)	(0.0294)	(0.0119)	(0.0137)				0.000
Poverty Rate	0.120***	0.0749***	-0.347*	0.0558***	0.0284**	0.0907	0.0164	-0.0214	0.0268	51,744	29	313.10
	(0.0439)	(0.0163)	(0.196)	(0.0170)	(0.0116)	(0.0265)	(0.0113)	(0.0133)				0.000
Income taxes as % of GDP	0.120***	0.00827	-0.0255	0.00439	0.00907**	0.1229	0.0179	-0.0078	0.0360	54,017	29	511.61
	(0.0432)	(0.00805)	(0.0824)	(0.00783)	(0.00442)	(0.0341)	(0.0122)	(0.0144)				0.000
Social Protection as % of GDP	0.120***	-0.0179**	0.211**	-0.0154**	-0.00621	0.1085	0.0239	-0.0128	0.0319	54,017	29	438.34
	(0.0433)	(0.00744)	(0.0847)	(0.00757)	(0.00507)	(0.0304)	(0.0138)	(0.0147)				0.000
HHs' income redistribution	0.120***	-1.233	0.148	-1.194	-0.140	0.1240	0.0278	-0.0080	0.0363	51,744	29	498.88
	(0.0451)	(1.056)	(0.162)	(1.077)	(0.778)	(0.0354)	(0.0151)	(0.0164)				0.000
Reduction in Gini coeff. via taxes and social transf	0.122***	0.0371	0.268**	0.0279	0.0266	0.1242	0.0237	-0.0103	0.0364	51,744	29	463.09
	(0.0450)	(0.0267)	(0.108)	(0.0267)	(0.0181)	(0.0355)	(0.0139)	(0.0160)				0.000
Reduction in Poverty rates. via taxes & social tr	0.122***	0.0322*	0.287**	0.0258	0.0171	0.1209	0.0240	-0.0121	0.0354	51,744	29	435.05
	(0.0449)	(0.0185)	(0.127)	(0.0186)	(0.0125)	(0.0347)	(0.0138)	(0.0159)				0.000
Inequality of opportunities in higher education	0.121***	0.00491	-0.0688	0.000904	0.0131	0.1284	0.0251	-0.0052	0.0376	51,744	29	494.82
	(0.0451)	(0.0178)	(0.177)	(0.0179)	(0.0118)	(0.0368)	(0.0143)	(0.0167)				0.000
Public expend on tertiary edu GDP	0.103**	-0.103	0.364**	-0.108	-0.206*	0.0827	0.0252	(0.0115)	0.0245	50,863	29	371.44
	(0.0464)	(0.149)	(0.156)	(0.143)	(0.119)	(0.0246)	(0.0142)	(0.0130)				0.000
Expend. on passive LMP as % GDP	0.114***	-0.130	0.207***	-0.128	-0.102*	0.0913	0.0207	0.0075	0.0270	53,519	30	436.59
	(0.0437)	(0.0925)	(0.0662)	(0.0875)	(0.0578)	(0.0262)	(0.0134)	(0.0125)				0.000
NRR unempl. benefits (p.p.)	0.0909**	-0.0142***	0.282*	-0.0148***	-0.00401	0.0797	0.0202	0.0169	0.0237	50,791	28	350.29
	(0.0430)	(0.00466)	(0.161)	(0.00449)	(0.00329)	(0.0244)	(0.0145)	(0.0127)				0.000

Source: EU-SILC module 2011 on Intergenerational transmission of disadvantages (Eurostat). Macro-aggregate indicators come from diverse sources: Eurostat (Living Conditions and Welfare Statistics, National Accounts, Education and Training Statistics, Labour Market Statistics), OECD (Benefits and Wages Statistics) and some are self-computed from EU-SILC micro-data.

Note: Control variables in both specifications are gender, age (and its square), education attainment, country of birth, labour force status, limited in daily activities because of health problems, partner's educational attainment, number of children in the household, household labour market composition.