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after childbirth and divorce in Europe:
the role of social stratification and
tax-benefit policies**

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The probability of poverty for mothers after childbirth and divorce in Europe: the role of social stratification and tax-benefit policies*

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Abstract

This paper looks at the effects of tax-benefit systems and social stratification determinants on the probability of poverty among mothers after childbirth and divorce/separation. The analysis was carried out for twelve EU countries, which represent a variety of welfare regimes providing different degrees of defamilialisation. We applied the stress-testing methodology using microsimulation techniques as proposed by Atkinson (2009) and carried out a regression analysis of the simulated results. We show that the degree of income replacement provided by the welfare state is higher for childbirth than for divorce. Countries with low post-childbirth poverty include those with an explicit pro-natalist orientation and socio-democratic regimes. High post-childbirth poverty rates are found in pro-traditional and South European conservative countries, and especially in the liberal regimes. The same is true for the post-divorce poverty rates. Moreover, our findings confirm that the mother's occupational class has a statistically significant effect for predicting poverty in the case of both events, with a stronger social gradient in case of divorce. Cross-country variation in the social gradient for post-childbirth poverty was insignificant. For post-divorce poverty we find weaker social class effects in the highly defamilialised welfare systems (Scandinavian countries and France) and stronger social class effects in the UK and the post-socialist countries.

JEL: I32, I38, J18

Keywords: welfare state, life-course event, stratification, poverty, childbirth, parental separation, divorce, Europe

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Introduction

The probability of poverty has been traditionally associated with the position of an individual in the social stratification system, e.g. parameters such as gender, ethnicity, education, and social class (Duncan 1968, Townsend 1979, Erikson and Goldthorpe 1993, Grusky 1994, Breen 2005, Grusky and Weeden 2008). At the same time poverty might be triggered by life course events, such as leaving a parental home, childbirth, job loss, and divorce (Rowntree 1902, Rig and Sefton 2006). Some authors argued that the power of social stratification determinants has decreased in the context of general life course uncertainty (Beck 1992, Kemshall 2002, Taylor-Gooby 2004). Evidence suggests, however, that these two types of parameters are interlinked. First, life course risks appear to be unequally distributed across social groups (Härkönen and Dronkers 2006, McLanahan and Percheski 2008, Klesment, Puur et al. 2014). Second, although biographical events such as childbirth and divorce are widespread, their negative consequences are distributed unequally (Walker 1994, Layte and Whelan 2002, Dannefer 2003, Whelan and Maitre 2008, Vandecasteele 2011).

The welfare state may play an important role in reducing the negative consequences when biographical risks materialize by means of horizontal redistribution, as well as in reducing social inequalities through vertical redistribution. Comparative welfare state research originating in the works of Esping-Andersen (1990) highlights substantial differences in the institutional design of the tax-benefit systems across the EU. This results in different distributional outcomes for the population in general and for women with children in particular, i.e. female and child poverty rates (Lister 1994, Taylor-Gooby 1996, Esping-Andersen 1999, Bambra 2004).

The aim of this study is to disentangle the effects of tax-benefit systems, social stratification determinants, and life course events on the probability of poverty among women with children in

European countries. Reducing poverty among mothers is important not only for their own well-being, but also for improving the life chances of their children. It is also important for increasing the economic autonomy of women, e.g. their freedom not to continue a potentially repressive relationship because of economic dependency (Orloff 1993).

The contributions of this study are two-fold. First, we analyze how different types of EU welfare regimes contribute to mothers' capacity to avoid poverty after childbirth and divorce/separation¹. These are two widespread life course events that bring about substantial income shocks due to a loss of one's own or the partner's income. In other words, we are looking at how various tax-benefit systems support incomes of mothers with new-born children and single mothers. The analysis has been carried out in twelve countries representing different European welfare state regimes. We simulate the two life-course events and the related income shocks using the tax-benefit microsimulation model EUROMOD and the EU-SILC data. The reference period for the analysis is 2015.

The second contribution of the paper is to confirm whether there is a social gradient to poverty among mothers after childbirth and divorce/separation and whether it varies across different welfare systems. To assess the impact of mothers' social class on the probability of poverty after childbirth and divorce, we carry out a regression analysis of the simulated results.

From a methodological point of view, by focusing on demographic events, this paper offers an extension to the stress-testing methodology by Atkinson (2009). The approach is aimed at measuring the performance of the welfare state in providing an effective safety net to individuals after various income shocks. It was previously applied to study the effects of a rise in unemployment (Figari, Salvatori et al. 2011, Fernandez Salgado, Figari et al. 2013, Navicke 2015). The microsimulation approach to assessment of financial consequences of childbirth and

divorce is superior to other previously employed methods for this type of analysis. First, it enables us to assess the functioning of the tax-benefit system taking into account all its elements rather than separate tax-benefit components targeted at particular risks. Second, it helps obtain estimates that are representative for the whole population and study the distribution of welfare provisions and outcomes at the micro-level. Finally, simulations of the income shocks across the whole potentially vulnerable population helps avoid the problem of small samples and self-selection in survey data, where we observe mothers who have already experienced childbirth or divorce and have adjusted their behaviour to the new circumstances. Given the nature of our simulations, the results presented in this paper should be interpreted as first-order effects of the public policies before any behavioural adjustment occurs.

In the next section, we review literature on social stratification and life-course risks as poverty determinants and the role different welfare regimes play in moderating these factors. We then discuss methodological choices made for assessing the probability of poverty in the case of two life course events and its stratification gradient. Finally, we present our findings and the main conclusions of the study.

Social stratification, life-course risks and the welfare state policies as poverty determinants

Poverty is an experience bearing immediate and long-term negative consequences for individual life chances and society as a whole. The probability of experiencing poverty may vary considerably depending on micro-level factors (characteristics of individuals and their households) and on macro-level factors (economic situation, the welfare regime). The existing literature distinguishes between two broad groups of poverty determinants at the micro-level:

social stratification factors and life course risks. The effects of social stratification on poverty comes through the role of such factors as gender, ethnicity, education, or social class. These are characteristics that are unlikely to change during the individual life time, and can be transmitted across generations (Duncan 1968, Townsend 1979, Grusky 1994). Education and occupational status, in particular, are treated as the strongest predictors of life-long earnings and life chances in social stratification studies (Erikson and Goldthorpe 1993, Breen 2005, Grusky and Weeden 2008).

Another influential strand of research starting from (Rowntree 1902), emphasises the dynamic and transient nature of poverty, looking at income fluctuations caused by certain life-course events that affect almost everyone or large groups of the population. These are demographic and labour market related events that might lead to a loss of income and make individuals vulnerable to poverty, including childbirth, leaving one's parental home, divorce, death of a spouse, unemployment, or retirement (Rig and Sefton 2006).

It comes as no surprise that stratification factors and life course risks are closely interlinked. Their relation is, however, subject to discussion. The proponents of the individualisation thesis argue that the role of social stratification determinants have decreased in the context of general life course uncertainty. This is a result of the emergence and widespread incidence of new types of risks in the post-industrial era (including less stable employment careers and family life) cutting across traditional social structures (Beck 1992, Kemshall 2002, Taylor-Gooby 2004). Within this strand of literature, poverty is viewed as a relatively transient phenomenon, which becomes less dependent of traditional stratification determinants.

An opposite argument is that class may become less visible, but its importance is not less, but arguably far more decisive. First, life course risks appear to be unequally distributed across

social groups. For instance, the less educated individuals tend to be disproportionately affected by divorce and single motherhood (Härkönen and Dronkers 2006, McLanahan and Percheski 2008). They are more likely to have a higher number of children and start having children earlier in their life (Klesment, Puur et al. 2014)². Second, although biographical events such as childbirth and divorce are very widespread their negative consequences are distributed unequally (Walker 1994). In the case of more educated and wealthy individuals, the personal income losses due to life course events can be compensated by other types of financial resources available to them and may not necessarily trigger entry into poverty. The same events experienced by less educated people might lead to a cycle of cumulative disadvantage whereby the initial social inequalities are becoming stronger over the life course (Dannefer 2003). The findings of cross-country studies show that differences across educational and social classes in terms of their probability of income poverty did not seem to lose their relevance in the majority of European countries (Layte and Whelan 2002, Whelan and Maitre 2008, Vandecasteele 2011).

Persistently high rates of female and child poverty observed in industrialized countries imply that women with children are affected to a greater extent than men by various poverty triggers (Brady and Kall 2008, OECD 2009). Women with children are less likely to be in the labour market, tend to work fewer hours and earn lower wages than other women, or men. The wage differentials between mothers and non-mothers have often been referred to as the ‘family gap’ or ‘wage penalty for motherhood’ (Waldfogel 1998). In intact families the wage penalty and child costs are buffered by income pooling within the household. However, when income pooling comes to an end (in case of divorce, for instance), women are more likely to suffer from adverse consequences, being the main caretakers for children (Uunk 2004, Andreß, Borgloh et al. 2006, Aassve, Betti et al. 2007, Amato 2010, Brady and Burroway 2012, Brewer and Nandi 2014).

This effect, though, is likely to be driven by interactions between gender and low education or social class (McCall and Orloff 2005). Korpi, Ferrarini et al. (2013) argue that historically, gender inequalities have decreased hand-in-hand with class inequalities since the mid-nineteenth century. However, after the 1970s these two broad inequality trends have parted company. Class inequality, especially widening income differences, markedly increased; the decline of gender inequalities has accelerated. Hence, while gender differences become less prominent, inequalities between women from different social classes are potentially on the rise.

The comparative welfare state literature emphasizes the importance of public policies in mitigating the negative consequences of biographical risks and social inequalities, e.g. in preventing the downward mobility after life course events that are common sources of significant changes in living standards (DiPrete 2002). The two types of risks studied in this paper are most likely to be affected by the degree of ‘defamilialisation’ provided by the welfare system (Lister 1994). Defamilialisation refers to the extent to which the welfare regime lessens individuals’ reliance on the family (Esping-Andersen 1999)³ or facilitates the economic independence of women (Taylor-Gooby 1996)⁴. In both cases, a high degree of defamilialisation has been found in the *social-democratic* welfare cluster (Scandinavian countries), to a lower degree in the *conservative* cluster (continental European countries) and the lowest degree in *liberal* regimes (e.g. the UK). A number of studies emphasised important divisions within the conservative cluster. (Gauthier 1996) pointed at the existence of *pro-traditional* (e.g. Germany) and *pro-natalist* (e.g. France) welfare regimes. In terms of the level of defamilialisation, the latter are closer to the socio-democratic cluster and the former are closer to the liberal cluster. Moreover, a strong case has been made for adding a highly familialistic ‘*South European*’ welfare regime (Fererra 1996, Bonoli 1997, Arts and Gellissen 2002). More recently the addition of the *post-*

communist welfare cluster comprising the countries of Central and Eastern Europe, has gained a wide acceptance (Cerami 2006, Fenger 2007, Hacker 2009, Aidukaite 2009). Though these countries are typically considered as highly familialised, it might not pertain to childbirth, since the promotion of pro-natalist policies became a common trend in this region in the 2000s due to a decline in fertility.

We have selected two countries to represent each of the above welfare clusters for our subsequent analysis in order to maximize the variability in terms of policy designs and outcomes observed in the EU. The socio-democratic welfare regime is represented by Denmark and Finland, the conservative regime with pro-traditional family policies – by Austria and Germany, the conservative regime with pro-natalist focus – by Belgium and France, the liberal welfare regime – by Ireland and the United Kingdom, the conservative Southern European regime – by Italy and Spain, and the post-socialist welfare regime – by the Czech Republic and Lithuania.

Our subsequent analysis will attempt to assess the probability of income poverty among mothers with new-born children and single mothers in different welfare regimes. Based on the results of previous research discussed above we test the following hypotheses:

Hypothesis 1: The welfare regime (as a combination of the original income distribution, tax-benefit policies and family structures) is important in determining the chances of women to fall into poverty after childbirth and divorce/separation.

Hypothesis 2: The outcomes of childbirth and divorce/separation in terms of poverty differ depending on a woman's social class.

Hypothesis 3: The importance of social class in determining the poverty status of a mother after childbirth and divorce/separation differs across the welfare regimes.

Methodology: assessing the effects of tax-benefit policies and social stratification on probability of poverty

To assess the role of the welfare state in reducing the probability of poverty after childbirth and divorce we use the stress-testing approach originally developed in the field of finance (e.g. Jones, Hilbers et al. (2004)) and proposed by Atkinson (2009) for measuring the performance of the welfare state in mitigating the effects of various income shocks on individuals. The approach relies on tax-benefit microsimulation modelling which allows us to compare the distributional effects of the tax-benefit system while changing the socio-demographic characteristics of the population.

The analysis in this paper uses EUROMOD – the tax-benefit microsimulation model for the European Union (EU) (Sutherland and Figari 2013)⁵. EUROMOD uses cross-sectional EU-SILC data and simulates, in a fully comparable manner, the effects of taxes and social transfers on household incomes for each EU country. It has been previously employed to stress-test the welfare state response to a rise in unemployment in several EU countries (Figari, Salvatori et al. 2011, Fernandez Salgado, Figari et al. 2013) and to measure the hypothetical welfare state response in case of unemployment and childbirth in a single country (Navicke, 2015). In this paper we extend the use of the stress-testing approach to the assessment of the welfare state response to hypothetical income shocks after childbirth and divorce in twelve EU countries. Our analysis is based on policy rules effective in 2015 and the EU-SILC data for 2012. In order to account for time inconsistencies between the input datasets and the policy year, updating factors are used⁶.

Our approach to studying the financial consequences of these events is superior to the conventional macro-level approach based on comparison of some aggregate indicators as proxies

for the degree of defamilialisation, as they tell little about the distribution of social provisions and outcomes for women with children. The micro-level analysis based on the raw survey data is also limited, due to typically small samples of mothers with newborn children or undergoing divorce. In addition, in the survey data we can only observe women who have already given birth to a child or have divorced/separated from their partners. However, the propensities of both events and their outcomes may depend on individual characteristics of women and their partners (e.g. their economic resources) and the degree of social protection provided by the welfare state.

A model family approach that is frequently applied in comparative research on family policies (Skinner, Bradshaw et al. 2007, OECD 2016, Skinner, Meyer et al. 2017) gives a general idea about the impact of the analyzed programmes, but the results cannot be generalized to the whole population, so the overall welfare effect of a policy cannot be estimated. There was only one study known to us that applied a microsimulation approach to perform a cross-country analysis of the maternity and parental leave payments using EU-SILC data (Bártová and Emery 2016), but it was limited to the effectiveness of tax-benefit instruments specifically related to childbirth.

The application of the tax-benefit microsimulation model allows us to assess functioning of the tax-benefit system taking into account all its elements rather than individual tax-benefit components targeted at particular risks. Incomes of other household members are also taken into account, in line with a standard assumption on intra-household income sharing. As EUROMOD is a static microsimulation tool⁷, the results presented in this paper should be interpreted as the first order effects of childbirth or divorce/separation on mothers' incomes given that the welfare system functions as intended and before any behavioural adjustment took place. In case of the life course events considered in this study, behavioral effects can be significant. For instance, in order to overcome income losses after the divorce women may move in with their parents, re-

partner, increase hours of work, etc. These are beyond the scope of this study which focuses on comparing the welfare state effort in terms of mitigating the life course risks. Accounting for long-term changes in behavior using a microsimulation model is difficult because many other factors, apart from the design of policies, might be responsible for these (e.g. changes in social norms regarding the family life). Thus traditional research instruments such as the analysis of panel data are better equipped for studying the long-term effects of life course events.

The consequences of the two events – childbirth and divorce – are modelled separately. First, we model transitions for all potentially vulnerable individuals, i.e. in case of childbirth these are all women of reproductive age (18 – 45 years old) living with or without a partner⁸; in case of separation/divorce these are women living with partners and underage children (below 18 years old)⁹. In the latter case we have excluded childless women from the analysis because the observed high rates of post-divorce female poverty are associated mainly with single parenthood. Simulating transitions for all the potentially vulnerable women helps us avoid the problem of small sample sizes and self-selection. We then re-weight all simulated transitions based on predicted probabilities of, respectively, childbirth or divorce.¹⁰ The probabilities are estimated based on the original EU-SILC data¹¹. The re-weighting procedure includes calibrating the original sample weights w_i by predicted probabilities p_i to obtain weights that incorporate predicted selection probabilities: $\tilde{w}_i = p_i * w_i$ (1). Weighted estimates are further used for the analysis.

To assess the performance of the welfare system in case of the two life-course events, we have simulated additional policies in EUROMOD that are directly targeted at tackling the risk of childbirth and divorce. The scope of simulation in case of childbirth includes monetary amounts of *contributory* and *non-contributory maternity, paternity and parental leave payments* and

childbirth grants (see Table 1 for the main characteristics of these transfers in the selected countries). In the case of divorce, we have simulated monetary amounts of *private child support* (i.e. financial obligation by non-resident parents to their children mandated by the court) and *advance maintenance payments* (a minimum allowance provided by the state when non-resident parents do not meet their financial obligations) (see Table 2). Full descriptions of additional simulations are available from the authors upon request.

Modelling of other tax-benefit programs that are available to women on top of the benefits targeted to childbirth and divorce, e.g. child benefits, child allowances and tax credits, social assistance, housing benefits, etc. are based on the standard EUROMOD simulations¹². All the amounts are simulated in monthly terms.

We have calculated a set of indicators to measure the effects of the welfare state in terms of stabilizing incomes (output indicators) and reducing income poverty (outcome indicators) (Hoddinott and Quisumbing 2003). Following Bartova and Emery (2016), our income stabilization indicators include *replacement rate* (the ratio of payments directly targeted at childbirth and divorce compared to a mother's own earnings lost due to childbirth or father's earnings lost after the divorce) and *compensation rate* (the ratio of post-transition and pre-transition equivalised¹³ household disposable income). Replacement rates are estimated only for women with non-zero earnings in the case of childbirth and for women with non-zero partners' earnings in the case of divorce. Compensation rates are estimated for all women and therefore capture the effects both due to cross-country differences in the tax-benefit rules and due to differences in family composition and employment patterns. The poverty reduction effect (outcome indicator) is captured by the *post-transition poverty status* measured against a pre-transition poverty line. Individuals are considered poor if their equivalised disposable income

after the transition falls below a poverty line fixed at 60% of the median equivalised disposable income in the original population before the transition.

In the second part of our analysis these indicators are used to assess the impact of mothers' social class on the probability of poverty after divorce or childbirth. The dependent variable is the *post-transition poverty status of a mother*. We ran a logistic regression with country fixed effects on a pooled dataset of twelve countries. The mother's occupational status (ISCO-08) and education were used as proxies for her social class, the two measures that are available in EU-SILC and widely used in cross-national social stratification studies (Connelly, Gayle et al. 2016). The original ISCO occupational scale was collapsed due to small sample sizes in some countries, following the ILO definition of skill levels (ILO 2012). The occupational status variable used in the regression analysis includes four categories (corresponding ISCO categories are shown in brackets): level 4 (1 – senior officials and managers; 2 – professionals); level 3 (3 – technicians and associate professionals); level 2 (4 – clerks; 5 – service and sales workers; 6 – skilled agricultural; 7 – craft and trades workers; 8 – plant and machine operators); level 1 (9 – elementary occupations). A large number of women in some countries could not be classified in terms of occupation because they have never been employed and we opted for including that category in the occupational scale as “level 0”. The education variable was collapsed to include three categories: (1) lower secondary and below; (2) upper or post-secondary; and (3) tertiary.

To control for pre-existing differences in household economic resources, we included a pre-transition poverty status, house ownership status and the size of financial capital (in a logarithmic form). We also controlled for demographic characteristics that might be associated with poverty (mother's age, mother's age squared, number of children and – in the case of childbirth – whether the mother is single). The welfare state protection is controlled for by the

individual replacement rate (in a logarithmic form)¹⁴. Country dummy variables control for the effect of unobserved factors that are shared within each country. We then compare the predicted probabilities of post-event poverty for mothers by occupational status and education in the twelve countries.

Findings

Income replacement, compensation and poverty

We start the discussion of the results with the indicators of income stabilization (replacement and compensation rates) and poverty for mothers after childbirth and divorce across the twelve EU countries.

Figure 1 shows variation in replacement rates between and within countries in case of childbirth and divorce at the median as well as their 10th, 25th, 75th and 90th percentiles. As a reminder, the replacement rate is the ratio of payments directly targeted to mitigate costs associated with childbirth and divorce compared to a mother's own earnings lost due to childbirth or father's earnings lost after the divorce.

First of all, replacement rates appear to be substantially higher in case of childbirth as compared to divorce. For childbirth, median replacement rates range from about a third of the lost earnings in Belgium and Ireland to over 100% in France. This reveals striking differences in the generosity of maternity related benefits across the EU. Quite differently, child maintenance and guaranteed child support payments in case of divorce are of a more limited scope, with replacement rates at the median varying from zero to around 15% in Austria. Hence, divorce-related payments across countries appear to be less generous and more homogenous. The

replacement rates are close to zero in countries with no guaranteed maintenance payments and weak private child support (Ireland, Spain and Italy).

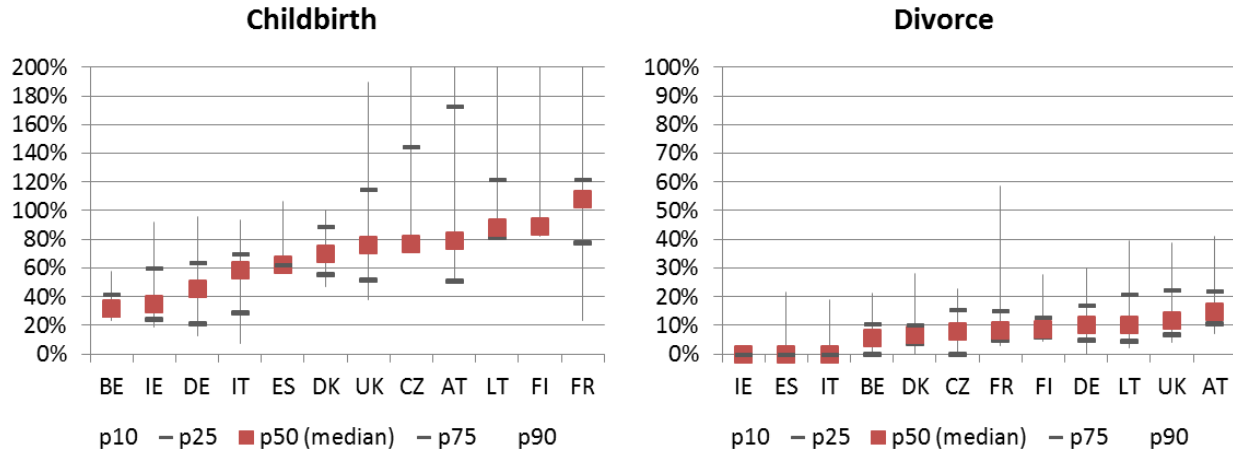


Figure 1. Percentile variation of replacement rates of mothers in case of childbirth or divorce by country

Note: graphs are not harmonized on y-axes.

As far as the variation of the replacement rates within countries is concerned, it is again higher in case of childbirth. Countries with the highest variation of replacement rates at childbirth are France, Finland, Lithuania, Austria, the Czech Republic and the UK. Yet in none of these countries do the replacements rates fall below 50%, as they have flat-rate benefit elements at childbirth, in addition to benefits replacing the mother’s earnings. The lowest levels of replacement for the 25th percentile of recipients are estimated in Ireland, Germany and Italy. In case of divorce, low median replacement rates are accompanied by less within-country variation compared to childbirth. The most dispersed replacement rates are observed in France, Lithuania, the UK and Austria.

High generosity of benefits as regards to their duration and/or amounts can be interpreted as support for higher level of ‘defamilialisation’, i.e. contributing towards women’s financial independence and reducing income volatility after the income shock. No clear clustering by welfare regimes can be observed for the replacement rates either in case of childbirth or in case of divorce. However, the estimates of the replacement rates only partially capture the functioning of the welfare systems. Other child-contingent elements of the system, i.e. child allowances, tax credits or social assistance benefits, may also serve as income stabilizers and should be taken into account. The latter elements are captured by the compensation rate, i.e. the ratio of post-transition and pre-transition equivalised household disposable income. Figure 2 shows the variation in the compensation rates between and within countries.

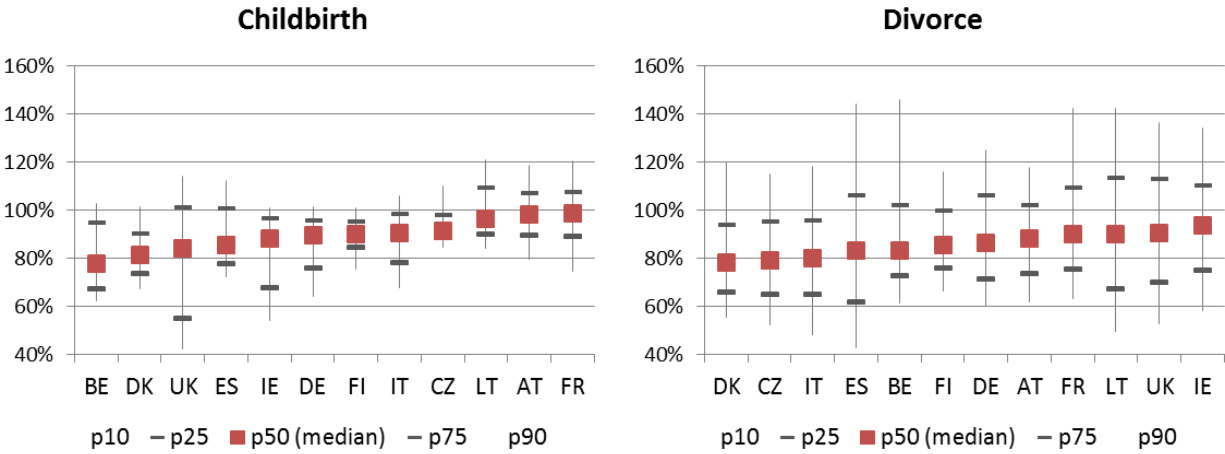


Figure 2. Percentile variation of compensation rates of mothers in case of childbirth or divorce by country

Despite the striking differences in the replacement rate patterns, the compensation rates are more alike in cases of childbirth and divorce. Annual compensation rates at the median vary from 77% in Belgium to 99% in France for childbirth and from 78% in Denmark to 93% in Ireland in the case of divorce. The UK and Ireland have the highest within-the-country variation of

compensation rates in case of childbirth, hence the lowest compensation rates for the bottom 25% of the vulnerable population. Spain and Italy have the lowest compensation rates for the bottom 25% of the vulnerable population in case of divorce. Overall, the 10th and 25th percentiles of the compensation rates in case of divorce are substantially lower compared to childbirth.

High median compensation rates in case of childbirth and divorce in all the analyzed countries imply that public policies are making a considerable effort in terms of protecting women with children from income losses after the analysed life course events. Again, no clear clustering by welfare regimes is observed for the two analysed life course events based on the variation of the compensation rates. The high compensation rates do not automatically translate into the low poverty rates (i.e. the share of people with incomes below a poverty line), as the latter are the result of a combined effect of tax-benefit policies, original distribution of earnings and the socio-demographic composition of the population.

Figure 3 shows that there are substantial differences in the poverty rates resulting from the two analysed events across the twelve countries. In this case we observe a more pronounced clustering of countries by welfare regimes. The highest post-childbirth poverty rate (over 20%) is observed in the countries with liberal welfare systems (the UK and Ireland), pro-traditional continental countries (Germany and Austria) and in South European countries (Italy and Spain). Countries with the lowest post-childbirth poverty rates in case of childbirth include welfare regimes with an explicit pro-natalist orientation (France, Belgium, Lithuania and Czech Republic) and socio-democratic regimes (Denmark and Finland), although Finland appears to be on the border between these two poverty clusters. The clustering of countries by post-divorce poverty rates appears to be quite similar, with the exception of the Czech Republic which moves

to the high poverty cluster (with poverty rates over 35%), and Austria which falls into the low poverty cluster.

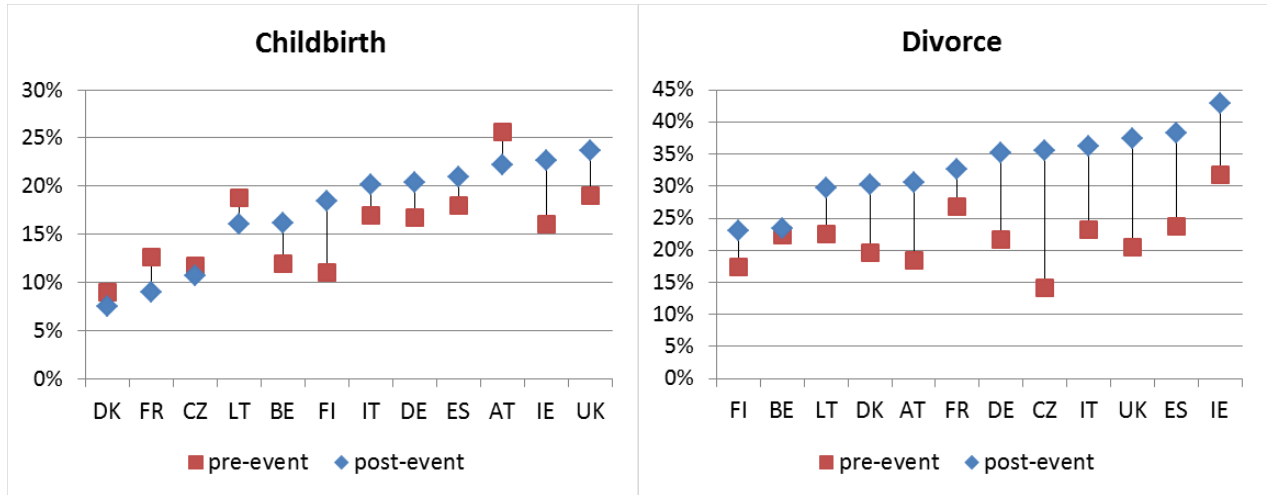


Figure 3. Poverty rates of mothers before and after childbirth and divorce by country

Note: Poverty rate is the percentage of individuals with incomes below a poverty line. Poverty line is fixed at 60% of the median equivalized disposable income before the event. Countries are ordered by post-event poverty rates.

Overall, these results support the first hypothesis that the welfare regime matters in determining the chances of women to become poor after childbirth and divorce/separation. Moreover, our results demonstrate that the probability of falling into poverty is substantially higher for mothers after the divorce (ranging 23 to 43%) than for mothers of newborns (8 to 24%). Our estimates show large increases in poverty rates after divorce in all countries with the exception of Belgium, with especially high increases in the Czech Republic, the UK and Spain. As far as Belgium is concerned, little change in the number of the poor after the transition to divorce means that those women with children who were initially poor remain poor after the divorce, while those who were initially non-poor are being protected from falling into poverty by the generous compensation rates (see Figure 2).

In contrast, in case of childbirth the increases in poverty rates are observed in fewer countries (the largest ones are in the UK, Ireland and Finland). Two countries manage to keep poverty rates relatively stable (Denmark and the Czech Republic) and in three countries poverty rates after the childbirth appear to be even lower than before the event (France, Austria, Lithuania).

The effects of social stratification on poverty in different welfare regimes

After having established that the welfare regime is important in mitigating poverty outcomes for women after childbirth and divorce (Hypothesis 1), we would like to test whether there is a social gradient to poverty after childbirth and divorce (Hypothesis 2) and whether it differs across countries with different types of welfare systems (Hypothesis 3). To do that we estimate logistic regressions for the effects of a mother's social class on the probability of poverty after either childbirth or divorce (see Table 3 for descriptive statistics and Table 4 for the results).

Figure 4 shows the predicted post-transition poverty rates from the models with a mother's occupational status and the mother's education, while the control variables are at their mean values¹⁵. These probabilities already take into account the selection effects, i.e. the variation in the probability of childbirth and divorce for women of different social backgrounds. Our estimates confirm Hypothesis 2: i.e. mother's social class has a statistically significant effect on the probability of poverty in the case of either type of event. Both the probability of poverty and the social gradient appear to be larger in case of divorce. Those mothers who were never active on the labour market seem to be especially vulnerable. The ratio of the predicted poverty rates for mothers with the lowest (level 1) and the highest occupational status (level 4) is equal to 2.3 times for divorce and 1.7 times for childbirth. The probability of poverty for mothers with the

lowest qualifications is 2.1 times as high after childbirth and 2.7 times as high after divorce, as compared to mothers with top qualifications.

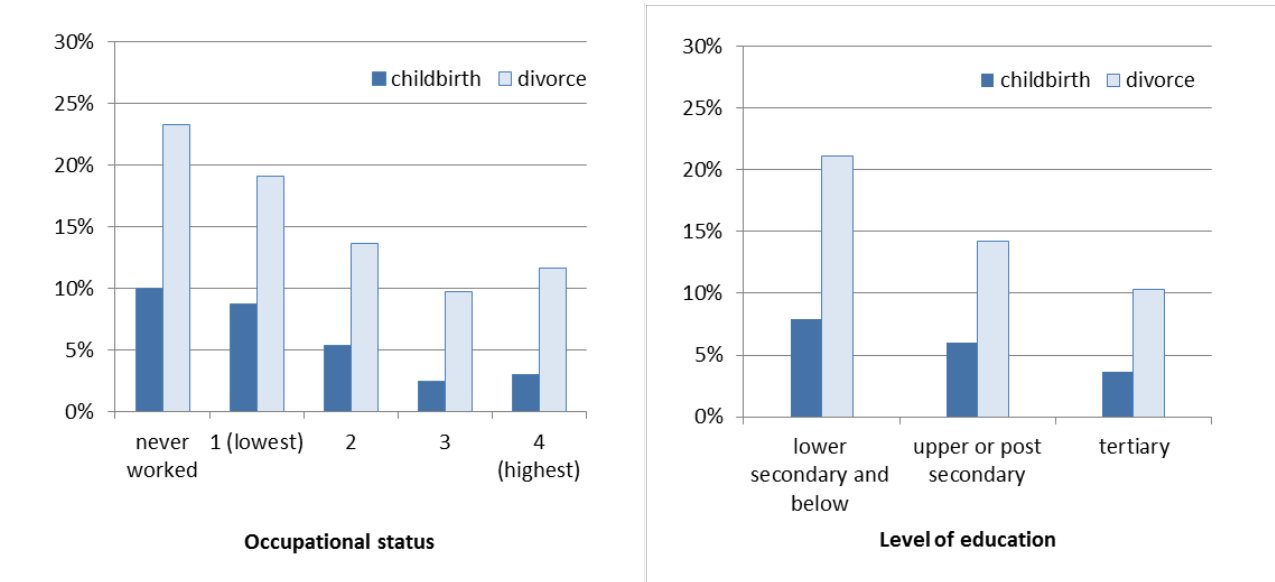


Figure 4. Predicted probabilities of poverty of mothers after childbirth and divorce, logistic regression on a pooled dataset with country fixed effects

Predicted probabilities of mothers' post-transition poverty by country are summarised in Figure 5. The analysis confirms that the social gradient in case of childbirth and divorce is present and statistically significant in all types of welfare systems. As far as post-childbirth poverty is concerned, the gap in probabilities for women with the lowest and the highest occupational status amounts to approximately 1.75 times in all countries; the gap in terms of education is about 2.1 times. The cross-country variation in social gradients is significantly higher for post-divorce poverty risk. In this case, the gap between women with the lowest and the highest occupational status ranges from 2.2 times in Finland to 2.5 times in the UK. The gap in probabilities for mothers with lowest and highest qualifications is even higher – 2.4 and 2.8 times. Apart from the UK, the top three countries with the highest occupational status gradient for poverty after divorce

includes the Czech Republic and Lithuania, and the bottom three (with the lowest gradient) includes Finland, France and Germany. If social class is measured by mothers' qualifications the top three comprises the UK, the Czech Republic and Spain, while the bottom three includes Belgium, Finland and France.

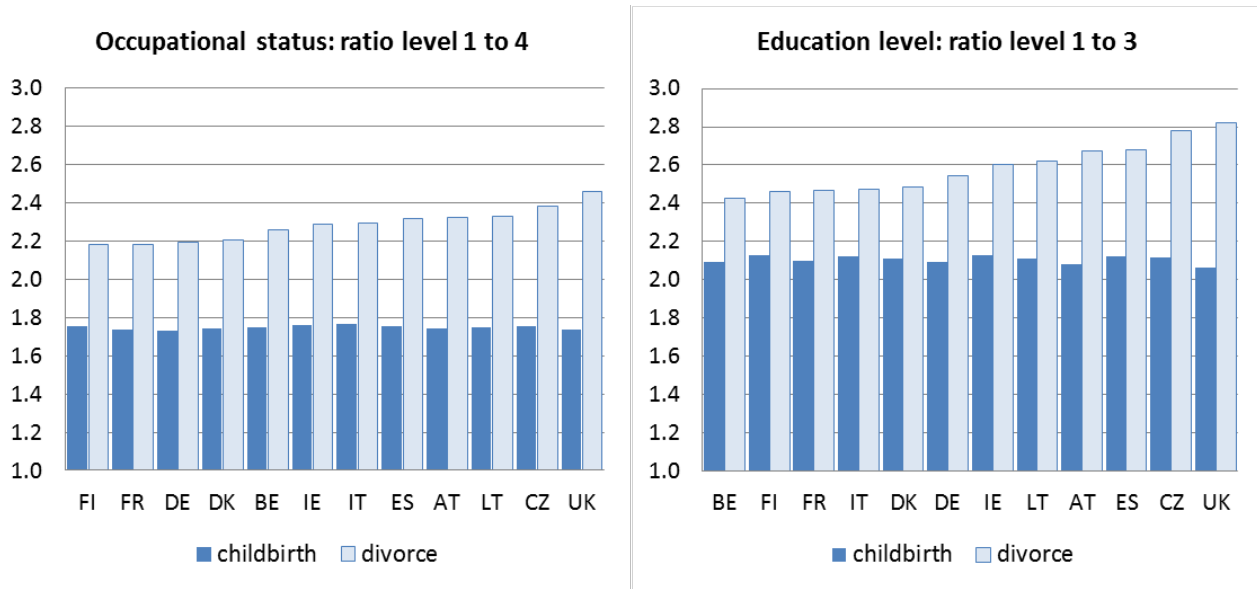


Figure 5. Ratio of predicted probabilities of poverty after childbirth and divorce for mothers with the highest and the lowest occupational status and qualifications, logistic regression on a pooled dataset with country fixed effects

Note: Counties are ordered by the post-divorce poverty ratios.

To sum up, we find empirical support for Hypothesis 2: i.e. mother's social class has a statistically significant effect on the probability of poverty in the case of both childbirth and divorce / separation. Both the probability of poverty and the social gradient appear to be larger in case of the latter type of event. With regards to Hypothesis 3, we do not see any substantial cross-national variation in terms of the social gradient for post-childbirth poverty. The variation appears to be more pronounced for post-divorce poverty, i.e. with stronger social class effects in

highly familialised welfare systems as in liberal (the UK), post-socialist and South-European countries, and weaker effect in countries with highly defamilialised welfare systems (socio-democratic and pro-natalist continental). Thus we find support for Hypothesis 3 only in case of post-divorce female poverty.

Discussion

This paper attempted to disentangle the effects of tax-benefit systems, social stratification determinants and life course events on the probability of poverty among women with children. The study offers several contributions to the existing literature. First, it explicitly compares the level of social protection available to mothers after two types of widespread life-course events: childbirth and divorce/separation. Second, it covers a whole variety of contemporary European welfare regimes characterized by different degrees of defamilialisation. Third, it looks at the variations in poverty outcomes within the welfare regimes, i.e. those driven by the social class of mothers. From a methodological point of view this paper extends the stress-testing methodology proposed by Atkinson (2009) for measurement of the performance of the welfare system in mitigating consequences of income shocks related to demographic events. Below we comment on the main findings of the paper and the three hypotheses that were tested.

First, our study confirms the conclusions of the welfare state and defamilialisation literature about the importance of the design of the welfare systems in mitigating poverty risks of women experiencing childbirth and divorce (Hypothesis 1). Countries with low post-childbirth poverty include those with an explicit pro-natalist orientation and socio-democratic regimes that are characterized as highly defamilialized. High post-childbirth poverty rates are found in pro-traditional and South European conservative countries, and especially in the liberal regimes

which are considered highly familialised. Similarly, high post-divorce poverty rates are found in liberal and South European regimes, while socio-democratic regimes and regimes with a pro-natalist orientation achieve the lowest post-divorce poverty.

Moreover, we demonstrate that the degree of income replacement provided by the European welfare states varies substantially by the type of the life course event. Indeed, replacement rates (i.e. the ratio of payments directly targeted at childbirth or divorce compared to women's own or her partner's lost earnings) in case of childbirth appear to be substantially higher and more variable within and between countries, ranging from one third to 100% of a mother's median earnings. Policies targeted at replacing the father's earnings after separation/divorce are of a more limited scope, more homogenous, with median replacement rates varying from around zero in some countries where there are no guaranteed child maintenance programmes to a maximum of 15%. Nevertheless, once the functioning of all the elements of tax-benefit systems is taken into account, the median compensation rates (i.e. the ratio of post-transition and pre-transition equivalised household disposable income) appear to be more similar for the two types of events and across the welfare regimes, varying from around 75% to around 95%.

Importantly, we have shown that the relationship between the generosity of the welfare system towards mothers after childbirth and divorce and female poverty is not linear. High compensation rates at the median do not necessarily translate into a low probability of poverty for all mothers. Within-country variation in compensation rates, in the original income distribution and in family characteristics results in heterogeneous income-stabilizing effects for different groups of vulnerable women with children. Higher within-country variation in compensation rates leads to higher poverty rates for mothers after divorce (ranging from 23 to 43% across the selected countries). Childbirth, with lower within-country variation in

compensation rates, has differential effects on poverty across countries and results in lower overall post-event poverty rates (ranging from 8% to 24%).

In accordance with the predictions borne out of social stratification studies we have confirmed the presence of a social gradient to mothers' poverty in case of both childbirth and divorce (Hypothesis 2). Our regression analysis has shown larger negative effects of low social class for divorce and these are especially high for economically inactive mothers. The estimates accounted for the selection effects, i.e. the variation in the probability of childbirth and divorce for mothers of different social backgrounds.

Finally, we find significant cross-national variation in the social gradient for post-divorce poverty, with weaker effects of a mother's social class in the highly defamilialised welfare regimes (socio-democratic and pro-natalist) and stronger effects in highly familialised liberal (the UK), post-socialist and South European welfare systems. We have not found substantial variation in the social gradient across different types of welfare systems for post-childbirth poverty risk. Thus we find support for Hypothesis 3 only in case of post-divorce female poverty. The policies targeted at new mothers appear to be more equalizing than policies protecting women with children after divorce.

Further research can address the limitations of the present analysis. First, as our current analysis relies on EUROMOD, which is a static microsimulation model, the results in this paper are first order effects of demographic events on the financial outcomes of women. We can expect the economic position of women to recover in the longer run, e.g. due to support from extended family, re-partnering, increasing work hours, etc. It would be interesting to study the role of social stratification determinants for the long-term economic recovery prospects across the welfare regimes. Second, the analysis has focused on cash programmes, omitting non-cash

policies which might play an important role. For instance, the availability of affordable and quality public childcare may increase women's incentives to work after childbirth or separation and, thus, reduce the negative financial consequences of these events in a long run. Taking the non-cash welfare provisions into account can be expected to strengthen the positive effects of cash transfers in some welfare regimes (e.g. socio-democratic) and mitigate the lack of those in other welfare regimes (e.g. post-communist). Finally, it would be valuable to investigate how the relationship between welfare systems, mothers' social class and poverty have changed over time. We can expect poverty among single mothers to become more transient and less dependent on traditional stratification determinants in socio-democratic regimes and regimes with pro-natalist orientation, but less so in highly familialised liberal, post-socialist and South European welfare systems.

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Table 1: Main characteristics of social transfers related to childbirth in the selected countries, 2015

	Maternity benefit	Birth grant	Paid parental leave	Paternity benefit
DK	4+14 weeks at 100% with ceilings	No	32 months up to 9 th birthday at 100% with ceilings	2 weeks 100% with ceiling
FI	105 weekdays 70-90%	No	6 months at 72%-32%	54 days at 72%-32%
AT	8+8(12) weeks, 100% replacement or €8.80 per day (if not qualify).	No	Flat-rate and income related models. Optional amounts and duration (max 36 months)	none
DE	6+8 weeks flat rate, low max daily rate (13 EUR)	No	14 months. 65% to 100% with ceilings	none
BE	6(8)+9 weeks, 82%-75% with ceilings	Universal lump sum benefit	4 months flat-rate monthly benefit	10 days, 100%-82% with ceilings
FR	16-46 weeks at 100% with ceilings	Means-tested flat rate benefit	6 months (12 for lone parents), variable amounts	11 (18) days at 100% with ceilings
IT	Non-contributory lump-sum benefit; contributory income-related benefit	Universal lump sum benefit	10-11 months 30%, 100% for 30 days for public sector; income testes flat-rate benefits	none
ES	Non-contributory (42 days flat rate) and contributory benefits (16 weeks 100%)	Regional means-tested multiple birth grants	No	13 days at 100% with ceilings
IE	26 weeks, flat rate	No	No	none
UK	6+33 weeks flat rate or income related with ceilings	Means-tested lump sum	No	2 weeks income related with ceilings
CZ	Compensation for working less; 8+20 weeks, variable amounts with ceilings	Means-tested lump sum benefit	Flat-rate, optional draw-down rates and durations (24, 36 or 48 months)	none
LT	10+8 weeks 100% with ceilings; non-contributory flat-rate benefit	Universal lump-sum benefit	Optional duration (1 or 2 years) and amount (100% or 70%/40%) with ceilings	1 month 100% with ceiling

Sources: MISSOC Comparative Tables Database (2015 July):

<http://www.missoc.org/MISSOC/INFORMATIONBASE/COMPARATIVETABLES/MISSOCDATABASE/comparativeTableSearch.jsp>) accessed 12/05/2016, EUROMOD country reports (<https://www.euromod.ac.uk/using-euromod/country-reports>) and information provided by EUROMOD national teams; Eurostat (tables by functions, aggregated benefits and grouped schemes - in % of the GDP [spr_exp_gdp]) accessed 13/05/2016).

Table 2: Main characteristics of social transfers related to divorce in the selected countries, 2015

	Responsibility for determining maintenance payments	Rules for determining amount of payments	Different arrangements for children of unmarried parents	Age at which support ends	Advance maintenance payments
DK	Parents or State County's Agency if parents disagree	Rules/ rigid formula	No	18 years	Yes
FI	Parents or Social Welfare Board and court if parents disagree (but residual role)	Mostly discretion, informal guidelines	No	18 years	Yes
AT	Parents with court approval	Formal guidelines and rules/rigid formula	No	18 years	Yes
DE	Parents or court if parents disagree	Mostly discretion, using 'support tables'	Yes	18 years	Yes
BE	Court	Mostly discretion	No	18 years	Yes
FR	Court	Mostly discretion	No	18 years	Yes
IT	Court	Mostly discretion	No	until the child is financially independent	No
ES	Court	Mostly discretion, using 'support tables'	No	18 years	No
IE	Parents or court if parents disagree	Legal guidelines but high level of court discretion	No	18 years or 23 years if in full-time education	No
UK	Parents or Child Support Agency if parents disagree or PWC in social assistance benefits	Rules/rigid formula	No	16 years or 19 years if in full-time education	No
CZ	Court	Mostly discretion based on guidelines given by law	No	until the child is economically independent	No
LT	Court	Mostly discretion	No	18 years	Yes

Sources: Skinner, Bradshaw et al. (2007); OECD Family database (<http://www.oecd.org/els/family/database.htm>) accessed 17/02/2016 and information received from EUROMOD national teams

Table 3: Descriptive statistics for variables in regression analyses

	Childbirth				Divorce/separation			
	Mean	SD	Min	Max	Mean	SD	Min	Max
<i>Dependent variable</i>								
post-transition poverty status	0.154		0.000	1.000	0.220		0.000	1.000
<i>Predictors</i>								
pre-transition poverty status	0.177		0.000	1.000	0.353		0.000	1.000
mother's occupational status								
never worked	0.212		0.000	1.000	0.201		0.000	1.000
level 1 (lowest)	0.080		0.000	1.000	0.120		0.000	1.000
level 2	0.372		0.000	1.000	0.406		0.000	1.000
level 3	0.138		0.000	1.000	0.124		0.000	1.000
level 4 (highest)	0.198		0.000	1.000	0.149		0.000	1.000
mother's education								
level 1 (lowest)	0.220		0.000	1.000	0.324		0.000	1.000
level 2	0.389		0.000	1.000	0.422		0.000	1.000
level 3 (highest)	0.391		0.000	1.000	0.254		0.000	1.000
ln of replacement rate	2.477	2.136	0.000	7.079	1.526	1.484	0.000	9.905
number of dependent children	0.909	0.968	0.000	10.000	1.545	0.723	1.000	11.000
mother's age	31.706	5.294	18.000	45.000	38.366	7.725	13.000	85.000
mother's age squared	1033.318	340.443	324.000	2025.000	1531.596	599.775	169.000	7225.000
single	0.098		0.000	1.000				
homeowner	0.475		0.000	1.000	0.370		0.000	1.000
ln of financial capital	3.796	4.406	0.000	19.547	3.271	4.230	0.000	19.547

	Childbirth				Divorce/separation			
	Mean	SD	Min	Max	Mean	SD	Min	Max
country								
DK	0.015		0.000	1.000	0.009		0.000	1.000
FI	0.015		0.000	1.000	0.008		0.000	1.000
AT	0.022		0.000	1.000	0.026		0.000	1.000
DE	0.156		0.000	1.000	0.164		0.000	1.000
BE	0.035		0.000	1.000	0.030		0.000	1.000
FR	0.193		0.000	1.000	0.161		0.000	1.000
IT	0.138		0.000	1.000	0.132		0.000	1.000
ES	0.132		0.000	1.000	0.114		0.000	1.000
IE	0.017		0.000	1.000	0.021		0.000	1.000
UK	0.244		0.000	1.000	0.290		0.000	1.000
CZ	0.027		0.000	1.000	0.034		0.000	1.000
LT	0.006		0.000	1.000	0.010		0.000	1.000
N	43,155				27,777			

Table 4: Logistic regression for the likelihood of falling into poverty for mothers after childbirth and divorce/separation, pooled dataset with country fixed effects

	Childbirth				Divorce/separation			
	Model 1		Model 2		Model 1		Model 2	
	B	SE	B	SE	B	SE	B	SE
mother's occupational status, ref: never worked								
level 1 (lowest)	-0.1501***	(0.0065)			-0.2552***	(0.0049)		
level 2	-0.6737***	(0.0051)			-0.6576***	(0.0042)		
level 3	-1.5002***	(0.0077)			-1.0345***	(0.0064)		
level 4 (highest)	-1.2829***	(0.0070)			-0.8399***	(0.0060)		
mother's education, ref: level 1 (lowest)								
level 2			-0.2982***	(0.0040)			-0.4790***	(0.0033)
level 3 (highest)			-0.8214***	(0.0046)			-0.8497***	(0.0043)
pre-transition poverty status	3.8806***	(0.0037)	3.8403***	(0.0036)	2.0583***	(0.0030)	2.1963***	(0.0029)
ln of replacement rate	-0.3482***	(0.0010)	-0.4112***	(0.0009)	-0.0288***	(0.0010)	-0.0272***	(0.0010)
number of dependent children	0.0668***	(0.0018)	0.0723***	(0.0018)	0.2551***	(0.0019)	0.2671***	(0.0019)
mother's age	-0.2005***	(0.0028)	-0.2183***	(0.0028)	-0.0854***	(0.0013)	-0.0911***	(0.0013)
mother's age squared	0.0031***	(0.0000)	0.0033***	(0.0000)	0.0011***	(0.0000)	0.0012***	(0.0000)
single	0.5247***	(0.0050)	0.5719***	(0.0050)				
homeowner	-0.5887***	(0.0037)	-0.6439***	(0.0036)	-0.3195***	(0.0033)	-0.3647***	(0.0033)
ln of financial capital	-0.0930***	(0.0005)	-0.0976***	(0.0005)	-0.1178***	(0.0004)	-0.1130***	(0.0004)

	Childbirth				Divorce/separation			
	Model 1		Model 2		Model 1		Model 2	
	B	SE	B	SE	B	SE	B	SE
Country dummies, ref: DK								
FI	-1.5419***	(0.0233)	-1.5627***	(0.0231)	0.1977***	(0.0220)	0.1765***	(0.0223)
AT	0.0552**	(0.0197)	0.3318***	(0.0195)	0.0498**	(0.0174)	0.0468**	(0.0175)
DE	-0.2279***	(0.0178)	-0.2638***	(0.0176)	0.4833***	(0.0152)	0.3836***	(0.0154)
BE	-0.9801***	(0.0200)	-0.7423***	(0.0198)	0.2643***	(0.0169)	0.4431***	(0.0170)
FR	0.7489***	(0.0177)	0.8877***	(0.0175)	0.7797***	(0.0152)	0.7781***	(0.0153)
IT	-1.0829***	(0.0178)	-0.6976***	(0.0175)	-0.3099***	(0.0152)	-0.1425***	(0.0153)
ES	-0.7803***	(0.0177)	-0.6342***	(0.0175)	-0.2528***	(0.0152)	-0.3189***	(0.0154)
IE	-1.4979***	(0.0211)	-1.4524***	(0.0211)	0.1128***	(0.0170)	0.1175***	(0.0172)
UK	-1.0476***	(0.0174)	-0.8224***	(0.0172)	-0.7114***	(0.0151)	-0.6206***	(0.0151)
CZ	-0.8230***	(0.0202)	-0.8244***	(0.0200)	-0.5751***	(0.0168)	-0.6279***	(0.0170)
LT	0.0857**	(0.0265)	0.0954***	(0.0262)	0.0929***	(0.0202)	0.1855***	(0.0204)
Constant	2.1032***	(0.0474)	2.2614***	(0.0473)	-0.1616***	(0.0289)	-0.1988***	(0.0291)
N	43,155		43,155		27,777		27,777	

Note: Standard errors in parentheses *** p<0.001, ** p<0.01, * p<0.05

¹ We use the term “divorce” throughout the paper to refer to all types of union dissolution, including married and cohabiting couples.

² Most recent studies suggest a U-shape relationship between female education and higher-order births, however the effect so far has been observed only in Northern and Western Europe (see Esping-Andersen and Billari (2015) for a review).

³ Degree of defamilialisation was measured through four indicators: family service expenditure as a percentage of GDP; the value of child tax allowances and benefits; the volume of child day-care; and the volume of home care for older people.

⁴ This defamilialisation measure was operationalized by Bamba (2004) using the following four indicators: relative female labour participation rate; maternity leave compensation; compensated maternity leave duration; average female wage.

⁵ Static microsimulation models, such as EUROMOD, allow quantifying the consequences at the micro-level of changes in tax-benefit policies, given that the characteristics of the underlying population remain constant, and vice versa. In practical terms, they represent a computer code that calculates disposable income for each micro-unit (individual or household) in a representative sample of the population. The calculation is made up of components of income taken from the micro-data directly (e.g. earnings) combined with the components simulated by the model (tax liabilities and benefit entitlements). Microsimulation models allow for a detailed analysis of the revenue and distributional effects of an individual policy, or of the whole policy system, before and after a real or a hypothetical reform. In contrast to the traditional analysis of raw survey data, microsimulation models are up-to-date in respect of the latest changes in policies and take full account of interactions between all elements of the tax-benefit system.

⁶ The original EU-SILC samples used in EUROMOD contain the following number of individuals: AT – 12517, BE – 12554, CZ – 18471, DE – 25475, DK – 11825, ES – 30063, FI – 22563, FR – 25469, IE – 10527, IT – 42654, LT – 11674, UK – 42027.

⁷ Static microsimulation models are adequate in evaluating the first-round distributional effects of changes in taxes and benefits under certain conditions. Namely if the reform is causing ‘marginal’ changes in the budget constraint faced by agents and all agents are optimizing under their sole budget constraint (Bourguignon & Sparado 2006). In order to study the second-round effects, arithmetic tax-benefit models need to be linked into behavioral models. The latter allow individuals to change their behavior as a result of endogenous factors within the model. The new simulated populations can be further used for the assessment of policy effects in the medium or long run using the static tax-benefit model.

⁸ The sample sizes for transition to childbirth are as follows: AT – 2,220, BE – 2,104, CZ – 2,840, DE – 3,960, DK – 1,752, ES – 4,975, FI – 3,481, FR – 4,184, IE – 1,885, IT – 7,183, LT – 1,504, UK – 7,090 .

⁹ The sample sizes for transition to divorce are as follows: AT – 1,289, BE – 1,314, CZ – 1,685 , DE – 2,354, DK – 1,486, ES – 3,252, FI – 2,791, FR – 2,917, IE – 1,243, IT – 4,331, LT – 840, UK – 4,290 .

¹⁰ If there is more than one potential transition in one household, the one with the highest probability is selected. This situation is possible in multi-unit or multi-generational households and is relatively rare.

¹¹ Logistic regressions were used to predict the likelihood of childbirth (i.e. being a mother with a child aged up to 1 year) and divorce/separation (i.e. being a non-widowed single mother with a child aged up to 18 years). The same set of predictors was used in both cases: mother’s age, mother’s age squared, number of dependent children, disability status, highest educational level, whether currently in education, whether currently employed, ln earnings, ln equivalised disposable income, ln financial capital, house ownership, number of rooms, level of urbanisation/region. In the regression for childbirth there was one additional predictor “whether lives with a partner”.

¹² For detailed descriptions see EUROMOD country reports: <https://www.euromod.ac.uk/using-euromod/country-reports>

¹³ Here and throughout the paper household disposable income is equivalised using the modified OECD equivalence scale.

¹⁴ We did not include the compensation rate in the models because of a problem of reverse causation. The measure accounts not only for transfers targeted at childbirth and divorce, but also for all other types of social transfers the household is eligible to due to the loss of earnings (of a mother or her partner), e.g. social assistance, family benefits.

Since these transfers are very likely to be means-tested, the compensation rate is positively associated with the poverty status of a household.

¹⁵ We have also estimated a model where both occupational class and education are included as predictors. The ratios between the most disadvantaged and least disadvantaged groups have somewhat decreased, but not to the extent that would change the conclusions about the significance of a social gradient of poverty. These results are available from the authors on request.