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# Childbearing under different family policy schemes

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**Abstract**

**Objective:** This study assesses whether and how changes in family policies are associated with first and second births in Finland, Germany and the United Kingdom, and whether these associations differ by women's education.

**Background:** Family policies are expected to impact the direct and indirect costs of childbearing by providing resources that influence the monetary and non-monetary costs of having children. The countries analysed here have undergone substantial changes in family policy throughout the two decades analysed, but each country has changed different aspects of their policies, and they have done so in different policy environments.

**Method:** We analysed women aged 18–44 and their transitions to first and second births using register data from Finland (N = 57,518 / 21,685) and panel data from Germany (G-SOEP, N=37,716 / 16,756) and the UK (BHPS and Understanding Society, N = 13,213 / 9,992) complemented with annual family policy information. The data were analysed using logistic regression models and interactions, and the results are presented as average marginal effects.

**Results:** The results suggest that the association between changes in family policies and transitions to first and second child birth varied by birth parity, women's education level, and between countries. For example in Finland, increases in paternity leave length were associated with greater propensities to transition to first birth for highly educated women, whereas increases in child allowances had a similar association for lower educated women. In Germany, reductions in maternity leave length were associated with increased transitions to first birth for higher educated women. In the UK, increases in maternity leave length were associated with greater transitions to first births among all women.

**Conclusion:** The results highlight that to the extent that family policies influence fertility, they do so depending on both the country context and often differentially within countries based on women's education level and birth parity.

**Key words:** fertility, family policy, educational differences, longitudinal analysis

## 1. Introduction

Declining fertility rates and the associated rapid ageing of the population are a cause for concern in a number of countries worldwide. Childbearing has become postponed to a later age (referred to as the tempo effect), partly due to rising levels of education (Ní Bhrolcháin & Beaujouan, 2012). This is not necessarily a cause for concern from a societal point of view: even if births are delayed in calendar time, completed fertility may still remain at the same level (Lesthaege, 2010; Lutz & Skirbekk, 2005). However, there is also clear evidence that women are giving birth to fewer children (the quantum effect), and in many societies, fertility has fallen below the population replacement level (Lutz & Skirbekk, 2005). Implicit in couples' childbearing decision is assumed to be a quantity/quality trade-off: couples can allocate resources to either increase the number of children (Becker & Lewis, 1973) or enhance the quality of life of their existing children (Barro & Becker, 1989) – or indeed their own quality of life. This is where family policies have the potential to influence fertility decisions: by improving the quality of life of parents and families, governments may make the transition into parenthood or higher child parity more appealing. However, families' needs differ, and given the social stratification of fertility, policies may have differential effects (see Baizan, 2021).

We study whether changes in family policies are consistently – or indeed differentially – associated with childbearing (specifically transitions to first and second births) by women's education level across three European countries: Finland, Germany and the United Kingdom. We examine changes in multiple types of family policies: the combined length of maternity, paternity and parental leaves, income replacement paid during parental leaves, monthly cash allowance for the first child and for the first and second child combined, and tax benefits and income transfers to families. We thus cover both monetary and non-monetary policies, with the assumption that families do not react to policy incentives in the same way. We expect that monetary benefits matter more for individuals with lower levels of education, whereas the ability to take longer parental leave may matter more for highly educated parents. It has also been argued that policies are often designed and delivered simultaneously, which is why their effect may be more visible when viewed as a package rather than individually (Gauthier, 2007a). Therefore, we also study changes in so-called policy packages.

Previous evidence from European countries regarding policy influences on fertility is mixed or modest in nature (Gauthier, 2007b; Lesthaeghe, 2010; Sobotka et al., 2020). One possible reason is that the influence of a single policy differs from country to country due to the broader national policy context and is thus observable only if the policy context is sufficiently taken into account (see also Neyer & Andersson, 2008). The selected countries represent diverse family policy schemes, thus making an ideal case for analysis. Welfare regimes may structure the way in which family policies and reforms thereof influence fertility (Bergsvik et al., 2021), and the three countries that we cover each represent a different welfare state regime (namely Nordic, Central European and Anglo-Saxon). While changes in family policies have taken place in each of the countries, somewhat different aspects of these policies have been changed for different reasons and in different policy environments. We will go into these details in a subsequent section, but shortly, in Germany the major family policy reform in 2007 reduced the length of parental leave but increased the remuneration level; the UK has implemented a number of changes, which have improved leaves, child allowances and tax benefits; and Finland has only made minor changes in all family policies during this period. These differences not only allow adequate variation in the data and the incorporation of time-variant and invariant controls but also justify exploring the repercussions of these changes (see Yu, 2015). Analysing transitions to first and second births using individual-level panel data from each country allows us to address the tempo and quantum dynamics of fertility to some extent: first-birth timing is related to tempo, whereas second births start to give us an indication of quantum. Nevertheless, as first births become substantially delayed (or forgone altogether), this may also have quantum implications.

Our study makes a threefold contribution. First, the period analysed (1995–2015) and the combination of countries makes the study unique. In particular, there is a relative scarcity of studies that examine the influence of family policies – at least in a quasi-experimental framework – in the Anglo-Saxon context (Bergsvik et al., 2021). Second, we analyse family policies individually and as packages in a micro–macro framework. This study is, therefore, ideally posited to uncover the interaction between macro-level mechanisms and micro-level factors. Third, we focus our attention on socioeconomic – specifically educational – differences in how the policies are associated with fertility, as these differences may tell us more about the mechanisms through which the different policies are likely to influence fertility.

## 2. Fertility and how it may be impacted by different family policies

The falling level of fertility is a part of the Second Demographic Transition, which, together with delayed marriage and childbearing, has also been characterised by a rising incidence of non-marital childbearing and divorce, higher cohabitation rates, increasing education, high youth unemployment, and increasing maternal employment (Lesthaege, 2010). Theories of family formation behaviour often arrive at the same main conclusion about the reasons leading to the decline in fertility: long-term family commitments and motherhood increase the opportunity cost of career fulfilment, and thus, smaller families are increasingly preferred (Esping-Anderson & Billari, 2015).

Family policies are expected to reduce the direct and indirect costs of childbearing by allowing the income effect of childbearing to overcome the substitution effect (Luci-Greulich & Thévenon, 2013). The income effect of childbearing refers to the positive effect on household fertility that may arise from a relaxation in the household budget constraint (Becker, 1960). The substitution effect of childbearing refers to the opportunity cost of childbearing, which may, for example, lead women to stay at home to care for their children. Therefore, institutional interventions may be especially relevant in altering the quantity/quality trade-off of childbearing. Family policies can provide parents with cash as well as in-kind resources and services that reduce the monetary and non-monetary costs of having children. This, in turn, can help parents realise their fertility intentions by allowing them to maintain their standard of living and balance the responsibilities of employment and child care (Gauthier, 2007b; Luci-Greulich & Thévenon, 2013). However, the policy environment may favour some forms of policies or aims over others, for example, needs-based policies to reduce child poverty (Thévenon, 2011).

We consider three types of policies that are relatively directly related to the financial aspect of childbearing: income replacement paid during parental leaves, monthly cash allowance for children, and tax benefits and income transfers to families (this last one also includes the monthly cash allowances). While the first of these is of a relatively short duration, it can nevertheless add up to a substantial sum. The latter two are longer-term commitments from the side of the state to support families with children. We also include the length of parental leaves as a family policy that is indirectly financial. A longer parental leave is likely to increase the possibility of combining employment and childbearing: parents can take time off for childcare without too much of a drop in income and they can return to the same job if they do not have to resign for childcare reasons. Nevertheless, it has also been argued that too long parental (and especially maternity) leaves are also problematic from this point of view since they take women away from the labour market for an extended period of time (D'Addio & D'Ercole, 2005; Farré & González, 2019). Policy reforms related to parental leave may also redistribute time costs between parents (Bergsvik et al., 2021). Increased paternity leave may shift time costs from mothers to fathers, thus increasing the fertility wishes of women. Yet, an increased expectation to take paternity leave may be seen as an increased opportunity cost by men, which may reduce men's fertility wishes (Farré & González, 2019). Childcare policies are also an important way for the state to support families with children and may thus influence fertility (Bergsvik et al., 2021; Kalwij, 2010; Luci-Greulich & Thévenon, 2013). However, we could not obtain an adequate measure of childcare provision for the period and countries analysed here and thus it is outside the scope of this study.

A growing number of studies have analysed the role that the policy environment and changes therein play for both fertility intentions and realised childbearing. Gauthier (2007b) concluded that the evidence of the effect of policies on fertility was mixed, with some studies finding small positive effects but others no statistically significant effect (see also Sobotka et al., 2020). Where effects were found, these tended to be on timing rather than completed fertility. Analysing these associations cross-nationally, Luci-Greulich and Thévenon (2013) found child allowances and the provision of childcare services to be more strongly related to fertility than parental leave lengths and payment levels in their sample of 18 OECD countries (spanning the years 1982–2007). They also concluded that the national policy context influenced the way in which policies were related to fertility. With a larger sample of 33 industrialised countries (1995–2011), Wesolowski and Ferrarini (2018) concluded that family policies that support the combination of work and parenthood, including higher earnings-related benefits to parents, were associated with higher fertility. Analysing 26 OECD countries (2002–2019), Fluchtmann et al. (2023) found that parental leave spending, maternity leave lengths and spending on early childhood education and care were all positively, though weakly, related to fertility.

In addition to these cross-national studies examining the overall linkages between policies and fertility, a number of single-country studies have examined the influence of single (or occasionally multiple) policy

changes for fertility. Reviewing the (quasi-)experimental research, Bergsvik and colleagues (2021) concluded that longer maternity leaves increase fertility, paternity leaves do not seem to influence fertility, and increases in transfers have at least transitory effects on fertility but the available evidence does not suggest long-term effects.

Our first research question is thus whether family policies are associated with the transition to first and second births. Although the previous evidence is mixed, we expect a modest overall association between increased (reduced) support for parents and a greater (lower) likelihood of transitions to first and second births across the four types of support that we analyse. The association between policy changes and parity transitions is likely to be more noticeable when analysing changes in maternity and childcare leave rather than other types of policy changes, as well as when analysing the transition to second rather than first births. This last expectation is based on the assumption that parents with a child are more aware of (and thus more influenced by) the costs of childbearing and the possibilities to combine work and family life than couples considering a first child. This is supported by the recent evidence by Fluchtmann et al. (2023).

## 3. Socioeconomically stratified impacts of family policies

Family background is inextricably linked to family formation. Highly educated women in Western countries tend to postpone first childbirth to a greater extent than their lower educated counterparts, mostly due to the longer time that they are students, and to be more likely to remain childless (Berrington et al., 2015; Wood et al., 2014). However, in many countries, their progression to second childbirth tends to be quicker (Klesment et al., 2014; Wood et al., 2014), though among the countries analysed here, not necessarily in the UK or Germany (Berrington et al., 2015; Klesment et al., 2014). Overall, the previous negative association between education level and completed fertility has been weakening across much of Europe (Merz & Liefbroer, 2017). In many countries, the trend has also been towards greater polarisation in the fertility of lower-educated women: they tend to have the highest rates of childlessness but also the highest rates of progression from two- to three-child families (Brzozowska et al., 2022). Socioeconomic differences in childbearing have been linked to factors such as the increasing incidence of single motherhood among the least educated mothers (Härkönen, 2018) and rising union disruptions among less educated parents (Kennedy & Thomson, 2010). Even intergenerational impacts of (grand)parents' resources on family formation behaviour have been demonstrated (Pöyliö & Van Winkle, 2019; Testa et al., 2016).

The perception of barriers and opportunities for childbearing likely differs by socioeconomic position. The opportunities for combining work and family and the level of earnings-related benefits are likely to matter for women with strong labour market attachment – often those who are highly educated – whereas the level of child allowances and other flat-rate benefits are likely to matter more for women with weaker labour market attachment – often those with lower levels of education (see also Bergsvik et al., 2021). Moreover, often only employed mothers can benefit from the increased generosity of maternity and parental leave schemes.

This line of reasoning may, however, be complicated by the fact that information seeking may vary by socioeconomic status (Bergsvik et al., 2021): highly educated women may be more impacted by policy reforms because they are likely to have more knowledge about them than their lower educated counterparts. In addition, changes in the length of parental leave may also influence the opportunity cost of additional children for employed mothers due to time spent away from the workforce (D'Addio & D'Ercole, 2005; Farré & González, 2019). This could lead to an inverted-U-shaped relationship between parental leave length and transitions to childbirth, particularly for highly educated women.

Many single-country studies support the general idea that women in more advantaged socioeconomic positions are more influenced by earnings-related benefits and opportunities for combining work and family, whereas less advantaged women are more influenced by flat-rate benefits. Baby bonuses and flat-rate benefits in the form of home-care allowances or the payment of extended parental leave with flat-rate benefits have been found to increase fertility among women with lower education or lower income in Australia, Austria, Norway, Hungary, and the East German state of Thuringia (Aassve & Lappegård, 2009; Drago et al., 2011; Gathmann & Sass, 2018; Lalive & Zweimüller, 2009; Spéder et al. 2020). German reforms in 2007 changed flat, means-tested transfers to pre-birth earnings-related compensation. This led to increased fertility of higher-income women, who benefited from the reform, whereas lower-income women's first and subsequent birth rates stagnated or even declined (Cygan-Rehm, 2016; Kreyenfeld, 2021;

Raute, 2019). Earlier German reforms in 1996, which increased cash benefits, were found to have a negative effect on first births among the lower educated but positive effects on second births among the higher educated (Riphahn & Wiynck, 2017).

Changes in earnings-related benefits and generous tax relief have been linked with childbearing among high-income groups (Aassve et al., 2006; Spéder et al., 2020). However, the distinction between earnings-related and flat-rate benefits is not always clear when benefits come through the taxation system. For example, in Quebec, Canada, a flat-rate baby bonus implemented through the taxation system was found to increase fertility to a greater extent among high-income groups (Milligan, 2005).

Finally, some studies have examined the differential effects of extensions to parental leave. Swedish evidence suggests, according to the expectations, that this is more influential for highly educated mothers (Liu & Skans, 2010). The introduction of paternity leaves or quotas for fathers within parental leaves has been examined in Norway, Sweden and Spain. No effects were found in Norway and Sweden (Duvander et al., 2020; Hart et al., 2022). In the Spanish case, the introduction of a two-week paid paternity leave reduced the probability of having a subsequent child (Farré & González, 2019). Among those who did have another child, the timing between children was longer.

Our second research question is whether policy changes have differential associations with parity transitions by mother's education level. Our focus on women's education level is primarily due to the relationship between education and labour market outcomes: higher levels of education lead to both greater labour market attachment as well as higher occupational status and income. If women's desire for career fulfilment is a leading cause for falling levels of fertility, then women in different labour market positions may respond differentially to family policies. Education provides a more durable measure of socioeconomic resources and labour market chances than, for example, income or employment in a single year, particularly when considering women's situation after first childbirth.

Following earlier findings, we expect that monetary incentives, including tax allowances and income transfers and specifically flat-rate benefits such as child allowances, are more strongly associated with transitions to first and second births among women with lower levels of education. In contrast, the ability to combine work and family in the form of longer maternity and parental leaves (with earnings-related benefits) is more strongly associated with these transitions among women with higher levels of education. The influence of the level of income replacement paid during parental leaves is harder to predict: it is related to monetary incentives, thus being potentially important for low-educated women, but its absolute value is greater for higher-educated women with higher average earnings. It is also likely to be more readily available for higher educated women.

## 4. Fertility and the family policy environment and changes therein in Finland, the UK and Germany

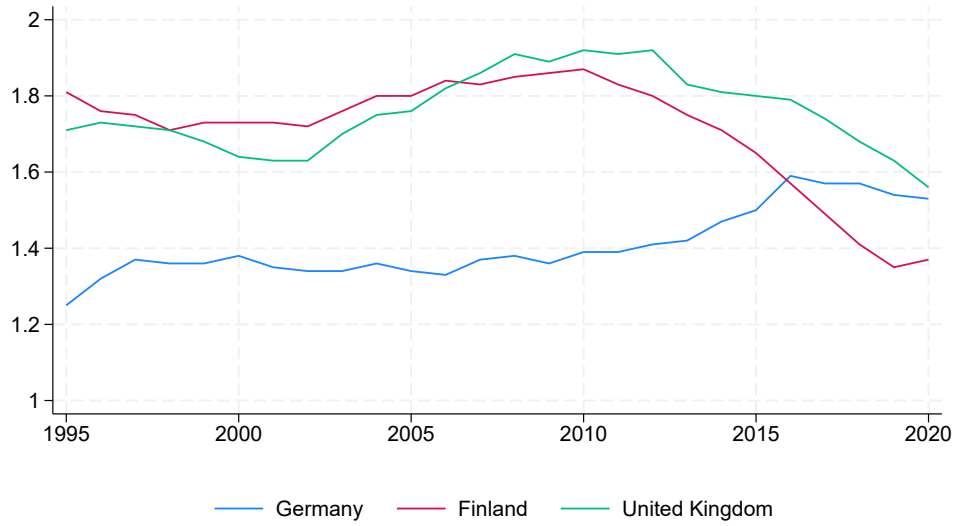
Our countries of interest represent varying family policy schemes, accounting for the diversity of family policy objectives in affecting transitions to first and second births (Castles, 2003; Thévenon, 2011). In this section we review the main changes in policy during 1995–2015, placing them shortly into the broader country context in terms of family policies. In more concrete terms, the policy changes that we analyse are reviewed in the data section.

Both Finland and Germany were recovering from drops in fertility rates in the early 1990s (Billari, 2008; Hiilamo, 2017). Figure 1 presents total fertility rates (TFR) from 1995 to 2020, i.e. during our study period and the five years following it. Fertility in Finland suffered from the effect of the deep recession in the 1990s and later experienced a rapid decrease in TFR in the 2010s. Germany was also recovering from periods of lowest fertility in this era, although with increases in fertility occurring in the 2010s. In the UK, total fertility dipped during the early 2000s, after which it increased until the 2010s but has been decreasing since.

Finland is a country marked by gender equity ideologies, highly developed work–family balancing policies, generous and flexible leave schemes for both parents and easy accessibility to childcare services (Ellingsæter, 2009). A particular feature of the Finnish system in contrast to other Nordic countries is the payment of home care allowances until the child is three years old. During the years analysed, Finland experienced relatively minor changes in its family policies compared to its counterparts. In 1994, the Finnish government introduced a wave of reforms by cutting tax-related benefits but increasing flat-rate

benefits for low-income parents. The government adopted a second wave of this reform in 1996 when it cut flat-rate benefits and reduced entitlement rights to earnings-related benefits but alleviated means testing and expanded entitlement rights to child care services (Haataja, 2005). From 2003, a father was entitled to 12 extra days of bonus paternity leave if he took 12 days of parental leave. Thereafter, in 2010, the "daddy month" was lengthened by two weeks and in 2011, the connection of the daddy month to the father taking the last two weeks of parental leave was dissolved, thereby lengthening the total amount of parental leave time to be shared between parents in households where the father chose to take his individual leave days (DICE Database, 2014).

*Figure 1*: Total fertility rates (TFR) 1995–2020




*Source:* OECD Fertility rates (indicator) (OECD, 2023)

The United Kingdom lies at the other end of the spectrum by providing a typical example of a male breadwinner model that has made recent attempts towards greater family policy interventions (Daly, 2010). Until the mid–late 1990s, the family was left to rely on itself (Daly, 2010). Thereafter, family policies were extended between the years 1997–2010 by expanding access to early childhood education and care, extending financial support beyond low-income families, introducing paternity leave in 2003, and increasing the length of maternity leave in 2003 and 2007 (Daly, 2010; Fleckenstein & Lee, 2014). Subsequently, substantial cuts in social spending on the family were introduced by withdrawing child benefits from high taxpayers and on working tax credits. At the same time, maternity leave was allowed to be transferred to fathers, and a shared parental leave scheme was adopted (Churchill, 2013; Fleckenstein & Lee, 2014). Despite the reorientation towards low-income families, UK family policy now clearly departs from the male breadwinner model, especially in terms of favouring state intervention, balancing gender relations and enhancing child wellbeing (Fleckenstein & Lee, 2014).

Germany represents the convergence of two contrasting family policy schemes: the Socialist East with a dual-earner family policy model and the Conservative West following the male breadwinner model (Leinter et al., 2008). After reunification and until the late 1990s, West Germany continued on a path that did not allow men and women to participate equally in the labour market (Trzcinski & Camp, 2014). Nevertheless, Germany has introduced several family policy reforms over the past two decades that have destabilised the male breadwinner model. An earnings-related parental leave scheme was introduced in 2007 to increase the incentives for fathers to stay at home with their children (Fleckenstein & Lee, 2014; Fleckenstein, 2011). Simultaneously, an agreement to increase childcare facilities was made, and by 2013 the legal right for early childhood education and care was extended from age one onwards (Trzcinski & Camp, 2014). In 2010/2011 child benefits were reformed so that long-term unemployed parents received deductions on child benefits, whereas high-income parents received no child benefits. In 2012, the family care scheme was instituted in the law by allowing parents a reduction in working hours to care for children (Fleckenstein & Lee, 2014).

These changes are seen as attempts to support parents, balance work and family life, and reduce child poverty by improving financial support and maternal employment (Leinter et al., 2008; Fleckenstein, 2011; Fleckenstein & Lee, 2014; Trzcinski & Camp, 2014).

Our third research question asks whether the associations between changes in policies and transitions to first and second births (and educational stratification therein) vary across the analysed countries. It should be noted that we do not conduct a country comparison at the analytical level but rather analyse the three countries separately and compare the patterns of results.

## 5. Data and methods

We used a combination of micro- and macro-level data. We used four micro-level datasets that covered the years 1995–2015: Finnish Register Data (building from a 10% sample of the population in 1987) (Statistics Finland, n.d.), the German Socio-Economic Panel (German Socio-Economic Panel, 2017), the British Household Panel Survey (waves 5–18) and Understanding Society (waves 1–7) (University of Essex, 2018) for the United Kingdom. Because we examined the impact of policies on fertility outcomes, we measured the policy impact to take place at the time of childbearing decisions, not the actual timing of birth. Hence, with both the policy variables as well as all individual-level independent variables, we predicted childbirth in the following year, requiring at least two observation points for every woman aged 18–44. This reduced only around 5% of the sample in both the UK and Germany (Finland having no attrition due to register data). The sources of the macro-level indicators and further details on their contents beyond what is included below can be found in the Appendix.

### *5.1 Micro-level variables*

Our two dependent variables measured the transition to first and second births. For the transition to first birth, we followed childless women from either 1995 or the age of 18 until they had a first birth, dropped out of the sample, or the year 2015. For second births, we followed women from the year of first birth. For Finland and the United Kingdom, our sample for second births consisted of women who had a first birth during our observation window. For Germany, this sample also included women who had their first births before our observation window. Similarly as with first births, we followed women until they had a second birth, dropped out of the sample or until 2015. Our binary dependent variable was therefore 0 if the woman had no first (or second) birth in the following year and 1 if she did.

In order to analyse the socioeconomic differences in policy effects, we used educational attainment as our main variable of interest. As mentioned earlier, education is not only linked to family formation and fertility, it is also strongly associated with labour market attachment. It can also be associated with information effects. Educational attainment was categorised into basic or none (ISCED 2011 version 0–2), secondary (ISCED 3–4), and tertiary (ISCED 5–8) education and was time varying. By using these three categories, we were able to create a well-harmonised measure that still grasps the varying educational attainment withing the different educational systems.

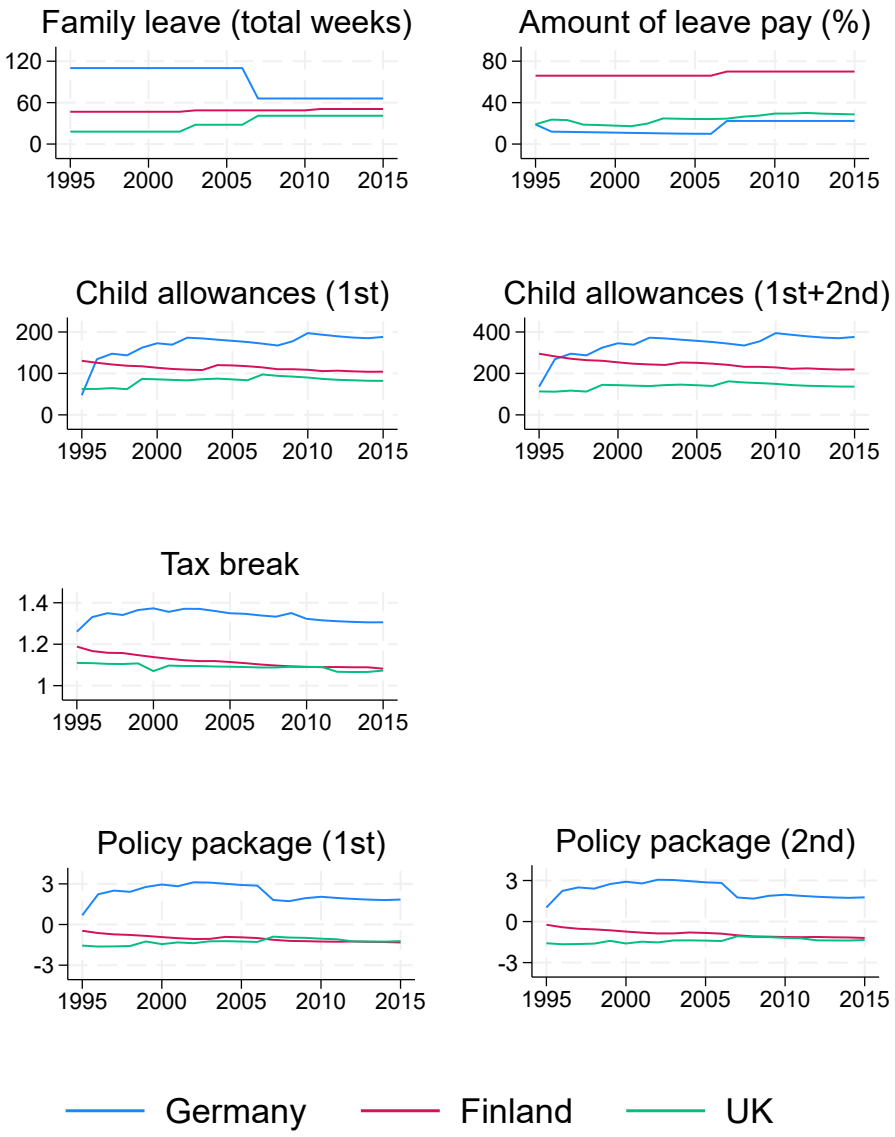
Our micro-level controls included other individual-level factors that have been found to impact fertility decisions, i.e. relationship status (single, cohabiting, married), labour force status (employed full time versus not employed), household equivalised income (log-transformed), age, age squared (for non-linearity of the effect of age on fertility), and year of birth. All these variables, except year of birth, were time varying. The Appendix (Table A1) includes descriptive statistics on all micro-level variables in each country sample.

### *5.2 Macro-level variables*

Our macro-level variables measured four family policies: 1) Cash benefits paid during maternity, paternity and childcare leave (proportion of wages, normalised scale 0 – 1); 2) Length of paid maternity, paternity and childcare leave (one-unit change = 10 weeks); 3) Monthly cash allowance for first child and for first and second child combined (the latter used when analysing transitions to second birth; one-unit change = 100€/£; inflation-adjusted to 2015 values); 4) Tax benefit for families, i.e. the value of tax and benefit

transfers for families with two adults, one of whom is earning, and two children. This value was calculated as the relative difference in disposable income between a single-earner two-parent two-child family and a single-earner who is childless (the scale starts from 1, and the maximum is approximately 1.4). All variables are aggregate annual measures and rescaling and adjustments were done separately for each country. The macro variables vary over time and across countries but not across individuals nested in country-years. Figure 2 displays (the changes in) the macro variables over the observation period and across countries.

*Figure 2:* Changes in the family policies 1995–2015 in Finland, Germany and the UK




*Note:* raw measures presented to demonstrate their comparative volumes and changes over time. In the models these have been rescaled: leave weeks / 10, leave pay from percentage to proportion, child allowances / 100. For sources see Appendix

The main reason why we combined maternity, paternity and childcare leaves into one measure, for both length of the leaves and benefits paid during the leaves, is that during the time period that we study, each of these countries only saw changes in one of these, the changes were concurrent, or the system did not specify the beneficiary between mothers and fathers. In the case of the length of paid family leave, in Finland only paternity leave changed (increases in 2003 and 2011); in the UK in 2003 maternity leave was extended and paternity leave established and in 2007 maternity leave was increased further; in Germany

there was a big family policy reform in 2007 that reduced the length of parental leave but increased the remuneration levels and introduced a separate paternity leave.

In terms of benefits paid during leave, in Germany the amount was constant, though suffering from inflation, until 2007 when it was set to a certain proportion of wages; in Finland, the pay varies between leaves and income levels and thus the variable is an average that increased only slightly in 2007 due to higher pay during the first months of maternity leave; in the UK the amount increased almost annually to meet increases in consumer prices.

To analyse family policies as a whole, we created country-specific family policy packages separately for first and second births (due to child allowances being measured separately for first and second child). For this, we used principal component analysis (PCA) to map family policies onto a single component. This was done before matching individuals with policies as the size of cohorts could alter the PCA. Hence, we only have a few data points and therefore used the correlation matrix to create the principal component that captures as much of the over-time variance as possible but fits the policy measures into one time-varying component. This component was then used as an independent policy variable measuring the family policy package.

In addition to these family policies, we controlled for the annual female unemployment rate (OECD, 2017). This was not only to complement the micro variable on female labour force status (to control for the high correlation between fertility and labour market participation; Gauthier, 2007b) but also to capture the business cycle and, hence, the general health of the economy.

## *5.3 Analytical approach*

The analyses of this study consisted of two parts: associations of separate family policy measures (individual policies and policy packages) and differential associations of policies by education level. The main analyses in all parts were based on logistic regression models with clustered standard errors (SEs), separately by country and for the two outcomes. As the SEs were clustered by individuals, the modelling took into account the hierarchical panel nature of the data, calculating the probabilities of the dependent variable given the independent factors using the variance-covariance matrix based on the individual clusters to derive the results. In other words, the correlation of individual observations across years was acknowledged, and hence we benefitted from the longitudinal nature of time-varying individual-level covariates and examined cross-level interactions between educational attainment and family policies. Further, as the analyses provided information of within-country association, i.e. association between family policies and childbearing over time, the parameter estimates indicate the associations between the changes in the explanatory variables, i.e. family policies, and the probability of the outcome variable (having a first or second child the following year). With this analytical setting, we can analyse how changes in family policies may impact fertility decisions. All results are presented as average marginal effects (AMEs), which enables a clearer interpretation of the logistic regression estimates as percentage point changes, and resolves some issues related to comparing different logistic regression models (see e.g., Breen et al., 2018).

To assess how the impact of family policies varied by education level, we tested interactions between women's level of education and family policies. The interaction results are presented as AME graphs (Figures 3–7) for easier interpretation, the full interaction results can be found in the Appendix (Tables A2–A4). All analyses were conducted with STATA 17.

# 6. Results

## 6.1 Family policy impacts on first and second birth across countries

Table 1 reports the results of the associations between individual family policies and the transition to first and second births for each country separately. We can interpret the AMEs as how a one-unit increase in the family policy is associated with the probability of experiencing a parity transition (with the coefficient multiplied by 100 for the percentage point change). A one-unit increase in all of the policy variables would indicate a higher welfare provision for families. As seen in Figure 2, most policies became more generous over time, the exceptions being family leave length in Germany and child allowances and tax breaks in Finland. Overall, the results showed that all family policies were weakly associated with family transitions; most changes in family policies changed the probability of childbearing by merely a few percentage points, though keeping in mind the different scales and observed variation in the policies. Further, the impact of family policies varied by both country and parity.

*Table 1:* Associations between family policies and transition to first and second births. All estimates are from separate logistic regression models and presented as AMEs

| | **Finland** | | **The United Kingdom** | | **Germany** | |
|---|---|---|---|---|---|---|
| **Family Policy** | **1st birth** | **2nd birth** | **1st birth** | **2nd birth** | **1st birth** | **2nd birth** |
| Family leave weeks | 0.04* | –0.03 | 0.02* | –0.01 | –0.00 | –0.00 |
| | (0.02) | (0.04) | (0.01) | (0.01) | (0.00) | (0.00) |
| Amount of leave pay | 0.02*** | –0.01 | –0.02 | –0.01 | 0.01*** | 0.00 |
| | (0.00) | (0.01) | (0.02) | (0.02) | (0.00) | (0.01) |
| Child allowances | 0.13*** | –0.07* | 0.07 | –0.02 | –0.02*** | 0.03*** |
| | (0.02) | (0.04) | (0.05) | (0.04) | (0.00) | (0.01) |
| Family tax break | 1.44*** | –1.62** | –0.13 | –0.27 | –0.19*** | 0.43*** |
| | (0.20) | (0.52) | (0.32) | (0.35) | (0.04) | (0.11) |
| Family policy package | 0.09*** | –0.10* | 0.04* | –0.03 | –0.01** | –0.00 |
| | (0.01) | (0.04) | (0.02) | (0.03) | (0.00) | (0.00) |
| Sample size | 57,518 | 21,685 | 13,213 | 9,992 | 37,716 | 16,756 |

*Note:* The results represent separate models for each policy, birth parity and country.
Significance: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors are presented in parentheses.
All models control for micro-level maternal and household controls and female unemployment rates.

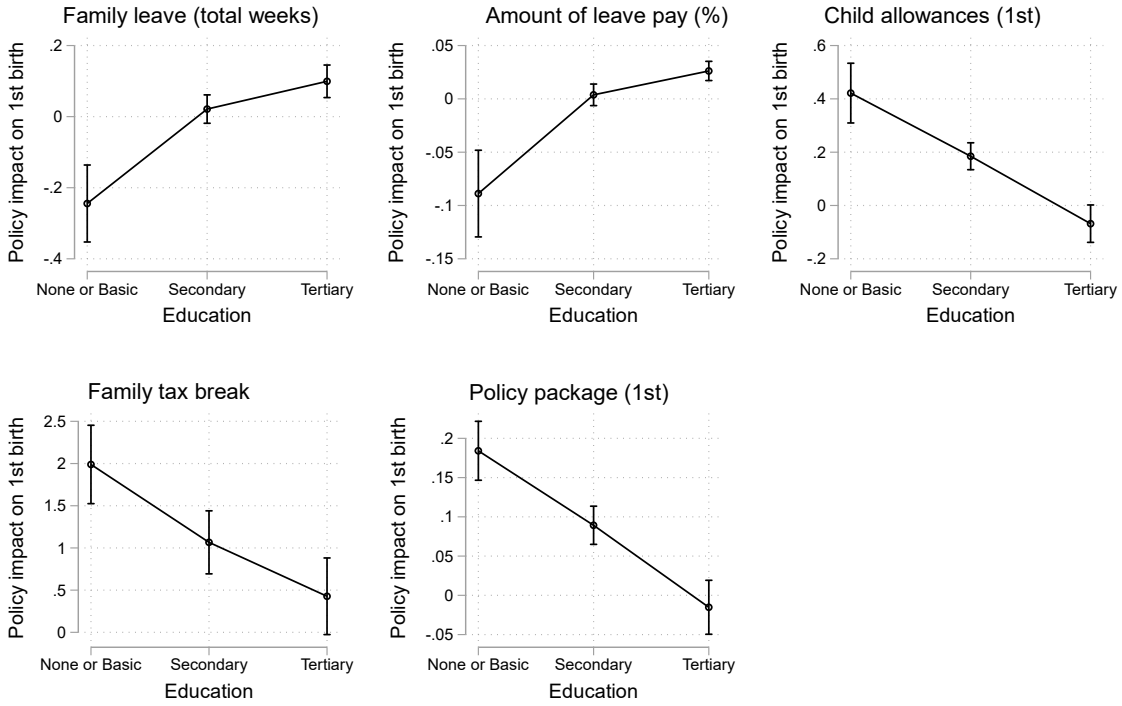
In Finland, all family policies and the policy package had a positive association with the transition to first birth, with higher family support indicating a higher probability of childbearing. Because child allowances and family tax benefits (which in Finland essentially measure the same policy but in different ways) have reduced over time in Finland, the results suggest that these reductions were associated with a lower probability of first birth transitions (and the earlier higher levels with a higher probability). Surprisingly, when it comes to the transition to second birth, the results for all policies were reversed, with child allowances and family tax benefits having statistically significant estimates. This indicates that higher levels of these policies had a negative association with the transition to second birth. Further, the estimate for the policy package is statistically significant, indicating an overall negative association between family policies and the transition to second birth. Overall, the results were very mixed; for example increasing child allowances by 100€ was associated with an estimated 13 percentage point increase in the probability of first birth but a 7 percentage point reduction for second births.

In the United Kingdom, family policies had more varying associations with the transitions, although many coefficients were not statistically significant and hence cannot be assumed to have a generalisable

association with childbearing. The length of family leaves was the only policy with a statistically significant association with the transition to first birth, demonstrating that increasing the length of family leaves was positively associated with childbearing in the UK. Also, the policy package estimate was positive, indicating that the expansion in family policies overall had a positive association with the probability of first birth. In relation to second births, the family policies had a negative association, yet, none of the coefficients for individual policy measures were statistically significant. Hence, this indicates a weaker role of family policies in the transition to second birth in the UK.

In Germany, the results are the most varied, with policy changes having positive and negative associations with both first and second births. For first births, all policy estimates except family leave length were statistically significant: the payment level of family leaves had a positive association and all others a negative one. Considering that child allowances and leave pay increased over time whereas others retrenched, these mixed trends result in the policy package estimate being extremely small, at 1 percentage point difference in probability, indicating that the relationship between family support in general and the probability of transition to first birth was very inconclusive in Germany. In relation to second birth, the story is similar, although most statistically significant policy estimates were reversed in sign: specifically, child allowances and tax benefits had positive coefficients. In other words, these policies were associated with a higher probability of having a second child. However, both indicators on family leave (length and pay) and the family policy package were statistically non-significant, suggesting that the overall relationship between the family policies and second parity transition was generally weak. At this stage it is thus interesting to note that the substantial reduction in the length of family leave in Germany was not found to be associated with parity transitions overall.

*Figure 3:* Interaction effects of family policy measures and mother's educational attainment on transition to first birth in Finland: AME of each policy by education level



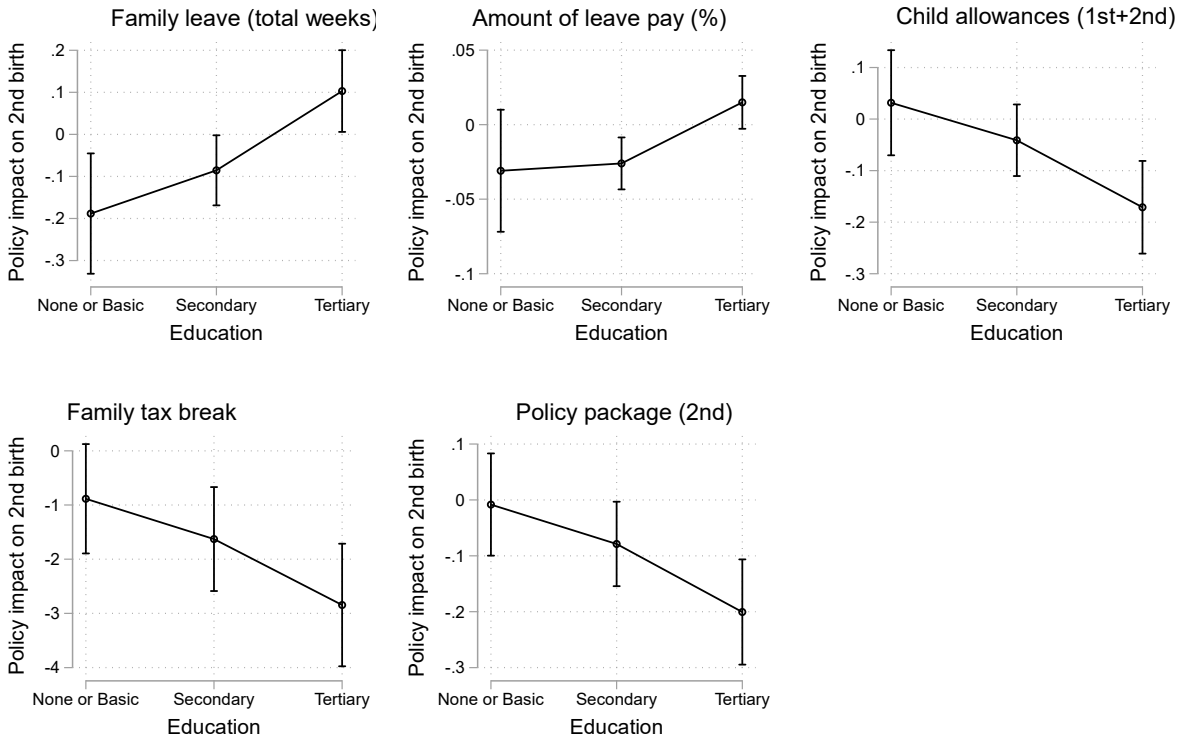

*Source:* Growth Environment Panel (FinGEP), Statistics Finland

## 6.2 *Differential effects by education level*

To deepen our analyses from the mixed general findings presented above, we next analysed whether and how family policies were associated with transitions to childbirth differently according to the mother's

education level by adding education–policy interactions to our models. We present the interaction results with graphs of AMEs of each family policy by education level. Full interaction results are presented in the Appendix (Tables A2–A4), which indicate which contrasts (or second differences between the AMEs of different education levels) are statistically significant. The graphs demonstrate the average change in the probability of having a child when the policy measure increases. For first births, the graphs show all policy measures, including the policy package. For second births, only those results with statistically significant interactions (i.e. at least one significant second difference) are presented: in Finland, all family policy measures, in Germany, the pay level of family leave, child allowances and the policy package, and no policy measures in the UK. The scaling of the graphs varies because the aim is to show the general differences in the associations of policies and births across educational levels, not to compare the strength of these across policies (or across countries).

*Figure 4:* Interaction effects of family policy measures and mother's educational attainment on transition to second birth in Finland: AME of each policy by education level

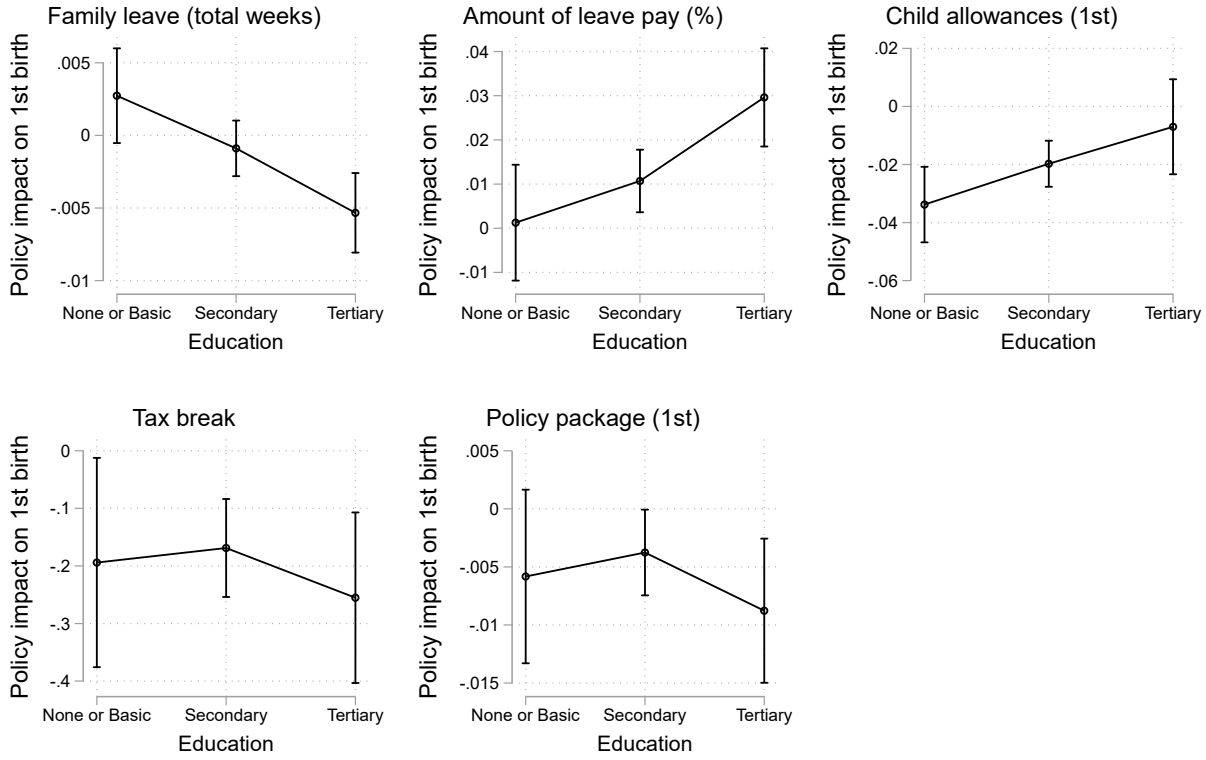



*Source:* Growth Environment Panel (FinGEP), Statistics Finland

In Finland (Figures 3 and 4, Table A2), the interaction models for individual family policies and educational attainment revealed statistically significant results for all policy variables for both parities. The results were very similar between parities, which is particularly noteworthy given that the direction of the association was found to be opposite in the overall results. However, the educational differences in the policy impact varied between the policies. Measures related to family leave (both length and payment level) had a positive association with the transition to first and second births only among highly educated women, a zero association for women with secondary education and a negative association among women with low levels of educational attainment. On the other hand, child allowances, family tax breaks and policies as a package were found to have the opposite association, being positively associated with the first birth most strongly and the second birth least negatively among low-educated mothers. In conclusion, in Finland, family policies had clear differential associations on family formation transitions depending on the woman's education level.

In Germany (Figures 5 and 6, Table A3), the interaction results demonstrated some clear results but also some indifferent interaction results. For first birth, family leaves and child allowances had the clearest differential associations between educational levels. Longer family leaves were weakly positively associated with the transition to first birth among low-educated mothers, having a negative association among medium- and higher-educated mothers. A similar pattern is also detected for second birth but the differences between education levels were not statistically significant (Table A3). In contrast, the payment level had a near-zero association among low-educated and a positive one for highly educated women for both first and second births. Child allowances, on the other hand, had a negative association with first birth across educational levels, but the estimate was almost negligible for women with higher education. For second birth, child allowances had a positive and increasing association across education levels. Although the policy estimates were small, the differences between low and higher education were statistically significant. The estimated coefficient for tax breaks seemed to be similar between educational levels for both first and second birth. The policy package did not have a differential association with first birth, but for second birth, increases in family support had a positive association with childbearing among low-educated, zero among medium-educated and a negative one for higher-educated mothers.

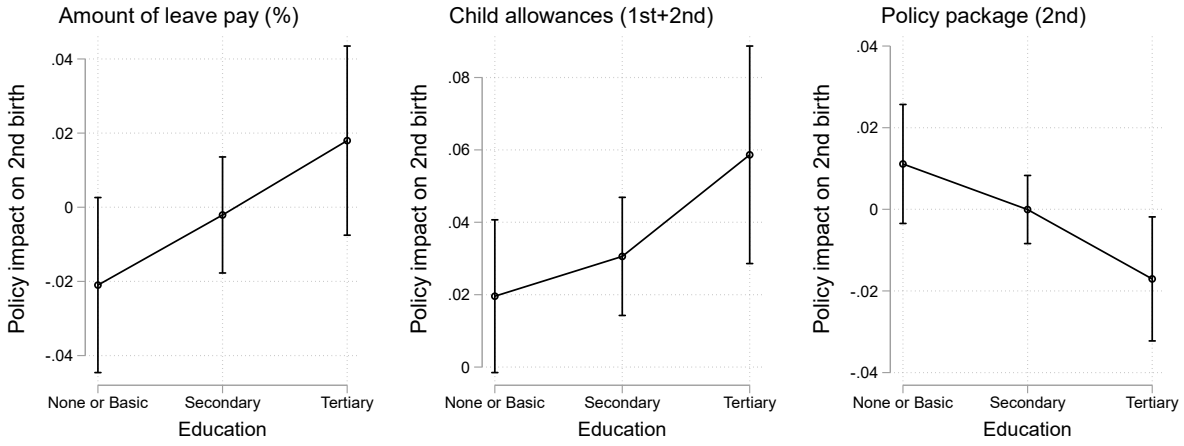
*Figure 5:* Interaction effects of family policy measures and mother's educational attainment on transition to first birth in Germany: AME of each policy by education level




*Source:* German Socio-Economic Panel (SOEP) version 33

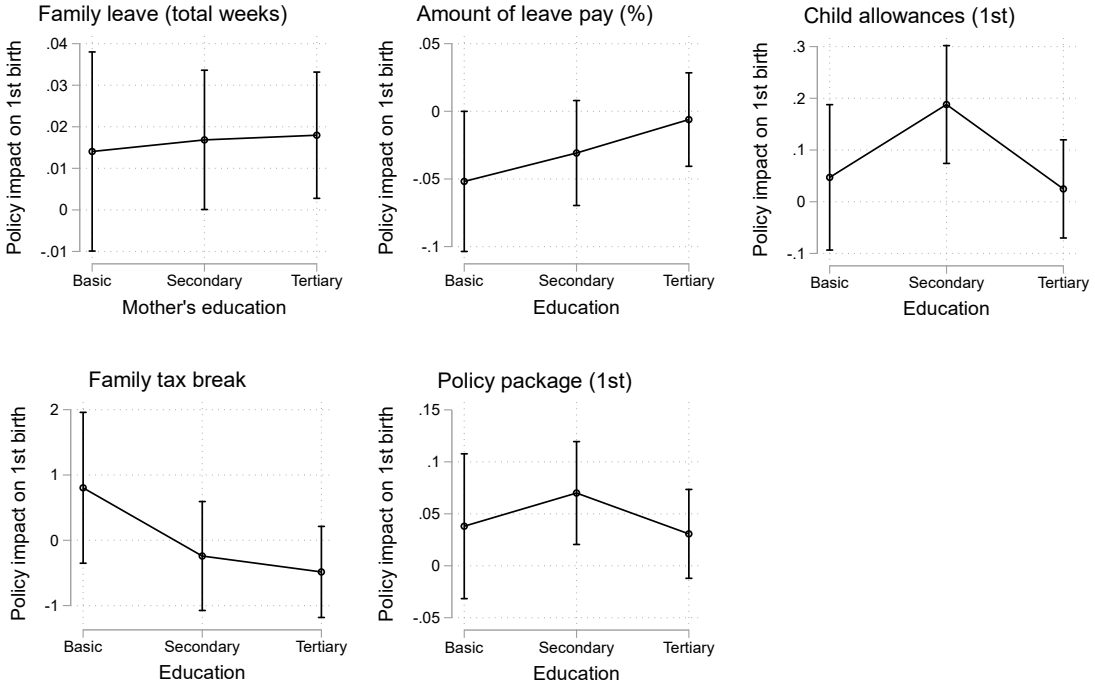
In the UK (Figure 7, Table A4), the interaction results revealed a rather stable association between family policies and first birth across educational levels. The only statistically significant interaction result was in terms of child allowances: higher child allowances were found to be associated with a higher probability of first birth the most among the medium educated. Longer family leaves were found to have a very weak positive association for all educational levels, whereas the amount of leave pay seemed to have a negative association with childbearing probability among low-educated women. Family tax benefits seemed to have a positive association for low-educated women but a slightly negative one for the higher educational attainment levels – but these were not statistically significantly different.

*Figure 6:* Interaction effects of family policy measures and mother's educational attainment on transition to second birth in Germany: AME of each policy by education level




*Source:* German Socio-Economic Panel (SOEP) version 33

*Figure 7:* Interaction effects of family policy measures and mother's educational attainment on transition to first birth in the United Kingdom: AME of each policy by education level




*Source:* German Socio-Economic Panel (SOEP) version 33

## 7. Discussion

We examined how family policies were associated with transitions to first and second births in Finland, Germany and the UK, analysing changes in different policies over two decades. We focused on differences across education levels in order to examine whether different types of women, particularly in terms of their

broader labour market attachment, were influenced by different types of policies. A particular strength of our approach is that we use longitudinal micro-level data with harmonised policy measures. Many of the results differed across the three countries, supporting previous findings that although policies are associated with fertility, policy effects are not uniform across countries. We also found evidence of differential associations by women's education level in Finland and Germany, though not in the UK.

The UK and Finland saw increases in the length of parental leave during the covered period, whereas in Germany, the length of parental leave was reduced. In the UK, the extensions were mainly targeted to women, whereas in Finland, paternity leave was increased in length. Our UK results support the previous research finding that increased maternity leave is associated with increased fertility (Bergsvik et al., 2021). In both Finland and the UK, the change in parental leave length was associated with transition to first birth but not to second, in contrast to our expectations and recent results (Fluchtmann et al., 2023). However, when breaking down the Finnish results by education level, we found changes in paternity leave length to be positively associated with childbearing among highly educated women but negatively among the lower educated for both parities. Overall, the Finnish results add to the relatively scarce research on the influence of paternity leave, suggesting that this may be a policy that improves the work–life balance of highly educated women, thus increasing their fertility. For lower educated women, who may not want to return to employment directly after the end of the maternity leave period but rather stay at home for an extended period with the assistance of the home care allowance, the increased expectation to share leave with their partner may actually be a disincentive for childbearing.

In the case of Germany, we found a negative association of parental leave length with fertility among highly educated women. This means that the reductions in parental leave length were associated with more transitions to first and second births among higher-educated women, which has also been found in previous research analysing the 2007 reforms (Cygan-Rehm, 2016; Kreyenfeld, 2021; Raute, 2019). Indeed, German family policies have been criticised previously for being disadvantageous for childbearing due to long parental leaves (e.g., Neyer & Andersson, 2008). Insufficient childcare services – together with family taxation – mean that combining work and family is challenging for women. Thus to pursue a career, women tended to be more likely to refrain from having children. The German results thus suggest that there is a ceiling to how generous family policies should be, at least if they are not well supported by other policies that improve mothers' labour force participation.

Whereas we expected policies related to family leaves to be more influential for highly educated women, policies related to monetary benefits, in particular flat-rate ones, were expected to be more influential for lower-educated women. These expectations were supported by the Finnish results, particularly for first births, but contradicted by those from Germany. It is possible that the German results in this case were confounded by the larger reforms to family leave. The UK results are too weak to draw conclusions, though this is probably not just a matter of sample size and statistical significance but also related to the actual size of the differences. The country contexts in terms of the broader norms and support for mother's labour force participation seems to influence how the educational differences in policy responses play out, in addition to the previously widely different lengths of parental leave across these countries. While all three countries are moving towards a similar dual-earner model, the way in which this has been supported by early childhood education and care policies (or the home care allowance system in Finland) is quite different. This may be one explanation why our expectations regarding educational differences play out most clearly in Finland.

We also expected that parents might be more aware of the costs of childbearing, and thus having a second child might also be more influenced by flat-rate benefits than having a first child. This expectation was only supported in Germany, specifically for child allowances and family tax breaks. Parental information seeking and knowledge of policies have also been mentioned as a factor complicating the hypothesised heterogeneous associations between policy types and female education (Bergsvik et al., 2021). Although this type of mechanism may be at play, by and large our results do not suggest that highly educated women are systematically more influenced by family policies in comparison with less educated women.

The analysis of policy packages allowed us to explore whether policies have overall joint influences. In the Finnish case, the associations were strongly stratified both according to education level but also parity transitions, and it seems that much of the impact of this package measure was driven by the changes in child allowances. Given that family leaves saw relatively minor changes over these years, this is not necessarily surprising. In the German case, the association was found to be relatively similar and overall

negative for first births, whereas there was some differentiation for second births, with the negative association of family leaves for higher educated women probably driving the negative association of the policy package for them. For the UK, the generosity of the policy environment was associated with increased transitions to first births, independently of the level of education. These results thus suggest that although for some purposes it may be fruitful to examine the overall generosity of policy environments as packages, this can also be somewhat misleading when policies have socially stratified influences. It can also be problematic when policies develop in opposite directions and thus overall there is either no change or the change reflects development in some policies but not others.

Overall, our analyses support previous studies arguing for the context-specific and heterogeneous impacts of family policies on fertility (e.g., Cherlin, 2016; Kreyenfeld, 2021; Neyer & Andersson, 2008). In particular, our work adds to the emerging research on the effects of paternity leave, suggesting relatively strongly stratified influences based on women's education level, with a positive association for highly educated women but a negative one for lower-educated women in the Finnish context. There has also been a scarcity of research on Anglo-Saxon contexts, where family policies tend to be rather weak. Taken together, the findings from the UK and Germany suggest that the generosity of maternity leave in terms of length is associated with transitions to first births but not linearly: when starting from low levels (as in the UK) increases are associated with greater transition propensities whereas when starting from rather long leave lengths (as in Germany) decreases are associated with greater transition propensities.

The strength of our approach has been the use of longitudinal data and harmonised measures at both the micro and macro levels. Our findings thus suggest that the previous mixed results from (longitudinal) single country studies are not merely due to differences in study designs. In terms of context, we have here concentrated on cross-national differences, but we should mention that the influences may also be conditioned by the time period (c.f. Fluchtmann et al., 2023). Well-intentioned policies could become unsuccessful and even counterproductive if unemployment or uncertain employment remain entrenched for long periods of time (Sobotka et al., 2011). The way in which policies are motivated and implemented may also affect how strongly they influence fertility. Bergsvik and colleagues (2021) concluded that family policies have been most influential when they have been explicitly motivated as pronatalist. However, since pronatalism is controversial, promoting family policies with such an agenda may also backfire.

## 8. Limitations

We have been able to analyse the associations of a number of family policies and first and second births across three countries in a relatively systematic way. However, in systematising these variables, some nuances may also be lost (Yu, 2015). For example, the specificities of parental leave are not equal. In the UK, there are firm-specific parental leave policies, and even in Finland, industrial differences exist in terms of the length of time that a mother (or a father) receives full pay at the beginning of the leave. In addition, we were not able to find appropriate information on daycare provision for the time period that we studied, although the provision of daycare has been found to influence fertility (Bergsvik et al., 2021; Kalwij, 2010; Luci-Greulich & Thévenon, 2013). Nevertheless, daycare provision often differs across regions or localities, so national-level measures may not be fully appropriate here in any case.

Analysing the timing of policy effects is also outside the scope of this research, although previous research has indicated that there can be both anticipation effects as well as lags in the influence of policy changes (e.g., Bergsvik et al., 2021; Kreyenfeld, 2021). On the one hand, there can be so-called announcement effects, which means that policies already start to influence behaviour when they are publicly known but not yet implemented. On the other hand, full knowledge may also take time to spread across the population and if applying for benefits is burdensome, then the time it takes to improve processes and knowledge to ease this can slow down the rate at which the policies have an influence. Our approach of taking longitudinal micro-level data over a period of two decades has both strengths and weaknesses in this regard. Since our estimates are essentially averages of pre- and post-reform influences (within the boundaries of our observation window and depending on the type of policy change being analysed), whether policies have an influence from exactly when we date them can be thought of as a form of measurement error. In this sense our estimates also focus on long-term effects, whereas it has been suggested that some policies are likely to have mostly transitory effects (Bergsvik et al., 2021).

It should be noted, however, that our estimates may have provided unrealistically weak evidence for the policy influences. As Bergsvik and colleagues note in the context of the analyses on the increased length of parental leaves in Norway and Sweden: "if policy changes happen in small increments, the effect of each increment may be so slight that even full population data have insufficient power to detect it" (Bergsvik et al., 2021, p. 918). This could apply particularly to Finland, which has seen relatively small changes in its family policies during the analysed period.

## 9. Conclusion

Our analyses concerning family policy changes and fertility in Finland, Germany and the UK provide largely mixed evidence across not only countries but also within countries across policies, parities and women's education levels. Although the countries represent different policy regimes, there are clear similarities in policy changes and the countries have become somewhat more similar over time. In this regard, it seems that policy convergence is taking place. In terms of influencing fertility with family policies, the findings indicate that this may not be a straightforward task. We do not want to argue that these policies cannot matter. Rather, we agree with Neyer and Andersson (2008): even if we can find evidence of the positive associations between policies and fertility, the results would almost always need to be contextualised. If policies are intended to influence fertility, one should then need to take into account current differential fertility patterns and different needs of different groups of women – or families. To our knowledge, this is something that existing policies have not been able to do in any country context.

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## Data availability statement

The German Socio-Economic Panel (G-SOEP) is available for approved users from the German Institute for Economic Research (DIW Berlin). The British Household Panel Study (BHPS) and Understanding Society are available for approved users from the UK Data Archive. Finnish register data is available for approved users from Statistics Finland, subject to fees.

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# Information in German

**Deutscher Titel**

Geburtenverhalten im Rahmen verschiedener familienpolitischer Maßnahmen

**Zusammenfassung**

**Fragestellung:** In dieser Studie wird untersucht, ob und wie Veränderungen in der Familienpolitik mit Erst- und Zweitgeburten in Finnland, Deutschland und dem Vereinigten Königreich zusammenhängen und ob diese Zusammenhänge je nach Bildungsstand der Frauen unterschiedlich sind.

**Hintergrund:** Es wird davon ausgegangen, dass familienpolitische Maßnahmen die direkten und indirekten Kosten der Erst- und Zweitgeburten beeinflussen, indem sie Ressourcen bereitstellen, die sich auf die monetären und nichtmonetären Kosten des Kinderkriegens auswirken. Die hier analysierten Länder haben in den beiden untersuchten Jahrzehnten erhebliche Veränderungen in der Familienpolitik durchlaufen. Dabei hat jedes Land unterschiedliche Aspekte seiner Politik verändert und dies in unterschiedlichen politischen Umfeldern getan.

**Methode:** Wir analysieren Frauen im Alter von 18 bis 44 Jahren und ihre Übergänge zu Erst- und Zweitgeburten anhand von Registerdaten aus Finnland (N = 57.518 / 21.685) sowie Paneldaten aus Deutschland (G-SOEP, N = 37.716 / 16.756) und dem Vereinigten Königreich (BHPS und Understanding Society, N = 13.213 / 9.992), ergänzt durch jährliche Informationen zur Familienpolitik. Die Daten werden anhand von logistischen Regressionsmodellen und Interaktionen analysiert, und die Ergebnisse werden als durchschnittliche marginale Effekte dargestellt.

**Ergebnisse:** Die Ergebnisse deuten darauf hin, dass der Zusammenhang zwischen Veränderungen in der Familienpolitik und den Übergängen zur ersten und zweiten Geburt je nach Geburtsparität, Bildungsniveau der Frauen und zwischen den Ländern variiert. In Finnland beispielsweise waren Verlängerungen des Vaterschaftsurlaubs mit einer höheren Wahrscheinlichkeit des Übergangs zur Geburt des ersten Kindes bei hochgebildeten Frauen verbunden, während Erhöhungen des Kindergeldes einen ähnlichen Zusammenhang bei geringer gebildeten Frauen aufwiesen. In Deutschland waren Verkürzungen des Mutterschaftsurlaubs mit einem Anstieg der Übergänge zur Geburt des ersten Kindes bei höher gebildeten Frauen verbunden. Im Vereinigten Königreich waren Verlängerungen des Mutterschaftsurlaubs mit einer höheren Wahrscheinlichkeit des Übergangs zur Geburt des ersten Kindes bei allen Frauen verbunden.

**Schlussfolgerung:** Die Ergebnisse verdeutlichen, dass familienpolitische Maßnahmen die Fertilität in dem Maße beeinflussen, wie es vom jeweiligen Länderkontext abhängt, und dass es innerhalb der Länder häufig zu Unterschieden auf der Grundlage des Bildungsniveaus der Frauen und der Geburtenparität kommt.

**Schlagwörter:** Fertilität, Familienpolitik, Bildungsunterschiede, Längsschnittanalyse

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