

Family Policies and Child-Related Earnings Gaps in Germany

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June 7, 2019

Abstract

Recent evidence documents (a) that parenthood lowers women’s earnings in the long run and (b) that this substantial loss in income due to children explains a large part of the gender inequality in earnings. Findings as these put family policies at the center stage of the public debate. Combining German administrative data ranging from 1949 to 2015 with quasi-experimental variation, we study the dynamic impacts of parental leave policies on women’s earnings trajectories. In a first descriptive part of the paper, we confirm the substantial and persistent effects of parenthood on mother’s careers: Due to children, mothers earn roughly 55% less compared to fathers or women without children, even ten years after birth. Furthermore, the child-related earnings gap in West Germany is not only much higher than in East Germany but also increased substantially from the 1950s to the early 2000s. In the second part of the paper, we exploit a dynamic regression discontinuity design to demonstrate that a sequence of parental leave reforms can explain a large share of this increase in the earning gaps, both in the short and medium run. This finding suggests that, despite creating job security, parental leave policies can harm women’s careers.

Extended Abstract

Gender inequality in earnings has sharply decreased in the second half of the 20th century, and, in recent decades, most of the remaining gender gap in earnings is explained by the birth of children ([Angelov et al., 2016](#); [Kleven and Landais, 2017](#); [Kleven et al., 2018, 2019](#)). After the birth of a child, mothers tend to stay at home with young children more often and many of them do either return to work only few hours or do not return to the labor market at all for a long time. As a result, the arrival of a child has large and persistent effects on mothers’ incomes. In contrast, there are no or only negligible effects on fathers’ incomes. Qualitatively, the effects of having children on gender inequality is strikingly similar across countries. Quantitatively, however, there are large cross-country differences ([Kleven et al.,](#)

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2019): Child-related inequality is relatively small in Denmark and Sweden (around 20%), larger in the US and the UK (around 30-40%), and particularly large in Germany and Austria (50-60%). While the size and importance of child-related earnings gaps in current years is well documented, there is no evidence about how these gaps have evolved over the last 60 years. Also, little is known about the driving forces behind child-related inequality and about which measures are effective in reducing this remaining aspect of economic gender inequality.

Purpose. The goal of this paper is, first, to document how child-induced earnings gaps developed in Germany since the 1950s and, second, to comprehensively evaluate the effects of family policy reforms on child-related earnings gaps. Several aspects make Germany an ideal case for our study. First, we are able to analyze rich and large administrative micro-data from two sources: tax authorities and pension registers. This data allows us to track mothers that gave birth from the 1950s to the 2000s over their entire working career. In contrast to the previous literature, we have precise information on individual earnings and employment on a monthly level. Second, German governments in both parts of the country implemented a large number of family policies with potential effects on child-induced earnings gaps (e.g., parental leave, child care expansion, parental leave benefits). Third, our data sets cover mothers from West Germany and East Germany, both for times before and after the German reunification. Thus, we can compare the earnings gaps for mothers who share the same historical and cultural background, but experienced very different sets of current policies and contemporaneous cultures.

Basic Empirical Approach. Our paper (a) estimates the impact of having children on mothers' labor market trajectories in Germany, (b) documents how the resulting child-related earnings gaps between mothers and fathers (or mothers and women without children) changed between the 1950s and the 2000s, and (c) analyzes how family policies shape these earning gaps. For this purpose, we exploit and extend the event study methodology suggested by [Angelov et al. \(2016\)](#) and [Kleven et al. \(2018\)](#), which we briefly describe subsequently. The approach defines the first child's birth as the event of interest and estimates the impact of this event on mother's labor market choices.

In particular, the estimation approach consists of four steps. First, for each mother, we define event time t relative to the month of the first child's birth. Denoting by Y_{ist} mother i 's outcome (e.g., earnings) in month s at event time t , we then estimate the following regression focusing on the samples of mothers:

$$Y_{ist} = \sum_{j \neq -12} \alpha_j^m \cdot \mathbb{1}[j = t] + \sum_y \gamma_y^m \cdot \mathbb{1}[y = s] + \sum_k \beta_k^m \cdot \mathbb{1}[k = \text{age}_{is}] + u_{ist}^m \quad (1)$$

The first term reflects event time dummies (i.e., it identifies the effects of having children), the second term includes calendar year dummies (i.e., it controls for business cycle effects), and the third term includes age dummies (i.e., it controls for life-cycle effects). Given that we omit the event time dummy at $t = -12$, all the event time coefficients identify the impact of the first child relative to mother's income twelve months before childbirth. Second,

we convert the estimated level effects into percentages by calculating $P_t = \hat{\alpha}_t^m / E[\tilde{Y}_{ist}^m | t]$. In this equation, \tilde{Y}_{ist}^m is the predicted outcome when omitting the contribution of the event dummies. Third, we re-estimate equation (1) for our control groups: that is either fathers or childless females to whom we assign placebo births (based on the observed age distribution of mothers at the first childbirth). Again, we convert the estimated level effects into percentages. Fourth, we define the child-related earnings gap (sometimes also called the child penalty) at event time t as $P_t = \frac{\hat{\alpha}_t^m - \hat{\alpha}_t^c}{E[\tilde{Y}_{ist}^m | t]}$, where $\hat{\alpha}_t^c$ refers to the estimated coefficient for the considered control group (i.e., fathers or women without children).

Part 1: Development of child-related earning gaps since the 1950s. Having outlined the basic empirical approach, our first step is to estimate the current levels and time patterns of child-induced earnings gaps in both parts of Germany. For simplicity, in the following, we focus on one of our two types of gap measures: the gaps between mothers and women without children. Figure 1 shows the income paths of West German mothers (Figure 1a) and East German mothers (Figure 1b), who gave birth to their first child since 1993 (i.e., after the German reunification). Hence, the figure is for mothers from both parts of Germany who face the same legal framework. Nevertheless, a substantial difference between the earning paths in both parts of the country is readily apparent: The average income of West German mothers sharply drops after childbirth and rises only gradually over the course of the next ten years (see Figure 1a). Three years post-birth, the average income is still 80% lower than 12 months before birth. And ten years after birth, mothers still have more than 60% lower income than women without children. By sharp contrast, East German mothers behave very differently from their Western counterparts (see Figure 1b). After the first year, their earnings increase much faster and stronger. After 36 months, their earnings are about 40% below the incomes of childless women. There is no further earnings convergence in the years 4 to 10 after childbirth.

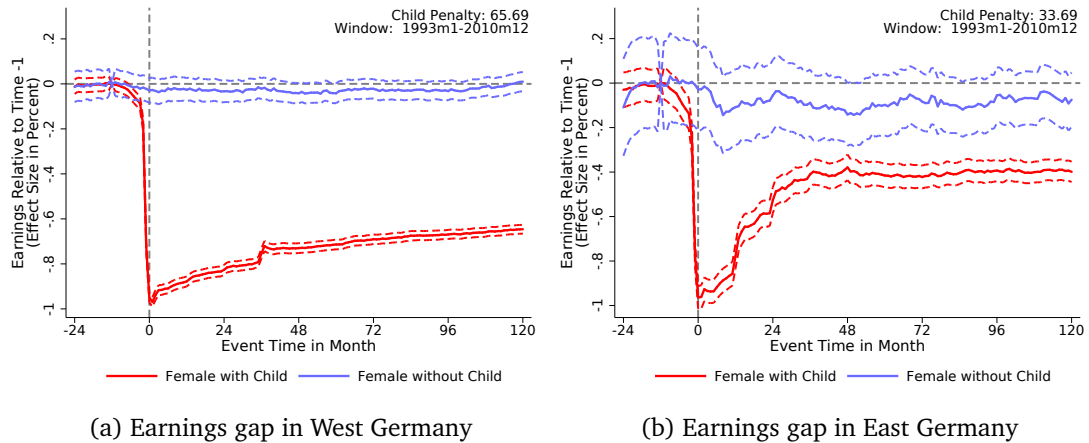


Figure 1: Current earnings gaps in Germany, births 1993-2010

The previously discussed differences give rise to the question whether West German mothers and East German mothers have always behaved differently (e.g., due to cultural differences). Our second step of the descriptive analysis is, therefore, to document the evolution of child-related inequality in both parts of Germany over time. For this purpose,

we distinguish mothers based on the birth decades of their first children, starting in the 1950s and ending in 1980s, just before the German reunification.¹

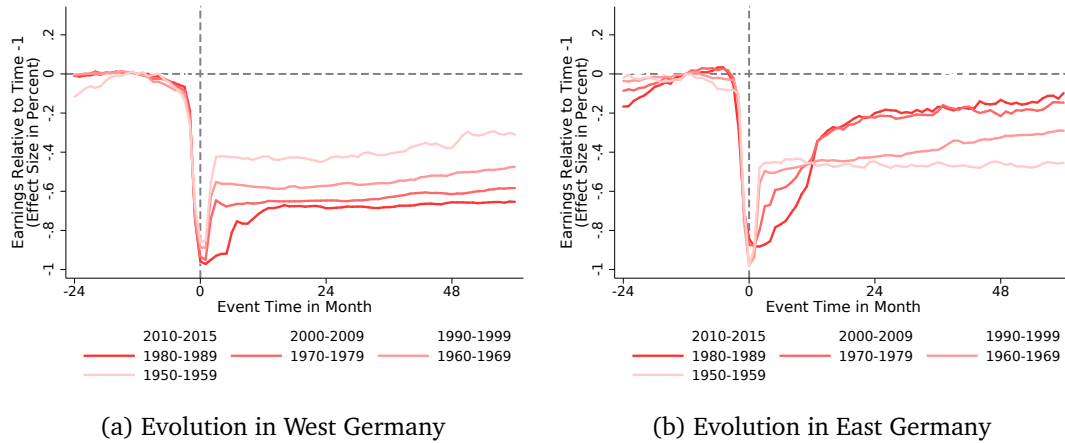


Figure 2: The evolution of earnings gaps in Germany, 1950s to 1980s

Figure 2a shows the income paths of mothers in West Germany who gave birth to their first child in the 50s, 60s, 70s, and 80s of the last century. Figure 2b depicts the income paths of East German mothers who gave birth in the same decades. In both figures, the lighter red lines represent the income paths of early birth cohorts, while darker red lines represent the paths of later birth cohorts. Perhaps surprisingly, we find that child-related earnings gaps in both parts of Germany were almost identical in the 1950s. Over the following decades, gaps started to diverge and continued to do so just until the reunification. In the West, child-related inequality strongly increased from the 1950s to the 1980s (see Figure 2a). This evolution is monotonic and has the same sign for all post-birth months. Note that this increase in children-related earnings gaps took place at a time when gender inequality, in general, shrank massively in most of the Western world. In the East, child-related inequality only increased with respect to the first 12 months after birth. For all the other months, child-related earnings gaps massively decreased to reach levels around 10% in the 1980s (see Figure 2b). Notably, the East German long-run child-related gaps were even smaller than the current gaps in Scandinavian countries such as Denmark and Sweden. We also find that, after the reunification, East German gaps partly converged towards West German levels (compare Figures 1 and 2).

Part 2: Impacts of Parental Leave Reforms. This paragraph investigates the role of parental leave reforms as driving factors behind the variations in the child-related earnings gaps over time documented above. We present preliminary evidence of ongoing work. We evaluate the impacts of a number of parental leave reforms that extended the leave duration and the implied job guarantee for West German mothers in six reforms (from two months before 1979 to 36 months after 1992).

¹Our pension register data contain employment and earnings information on East German women as well. This data was imported from the East German social security registers and is used to compute current and future pensions after reunification.

Figures 3a, 3c, and 3d motivate the subsequent analysis by highlighting that parental leave reforms could be an important driver of earnings gaps. Figure 3a shows child-related earnings gaps in West Germany, now focusing on births in 1979 (before first reform) and 1992 (after last reform). Again, the previously described increase in the earnings gaps over time becomes apparent. We isolate the role of the extensive margin in Figures 3c and 3d below. These two figures clearly demonstrate that many mothers tend to exploit the maximal parental leave duration (which was 2 month before 1979 and 36 month after 1992).

In a nutshell, we find that, in 1992, mothers tend to delay their labor market re-entry (compared to 1979) and at the same time, face higher earnings gaps (again compared to 1979). This observation is in line with the notion that extensions of parental leave periods caused the delay in labor market re-entry, which could harm mothers' careers, for example, through human capital losses. Our next step is to explore this idea in detail.

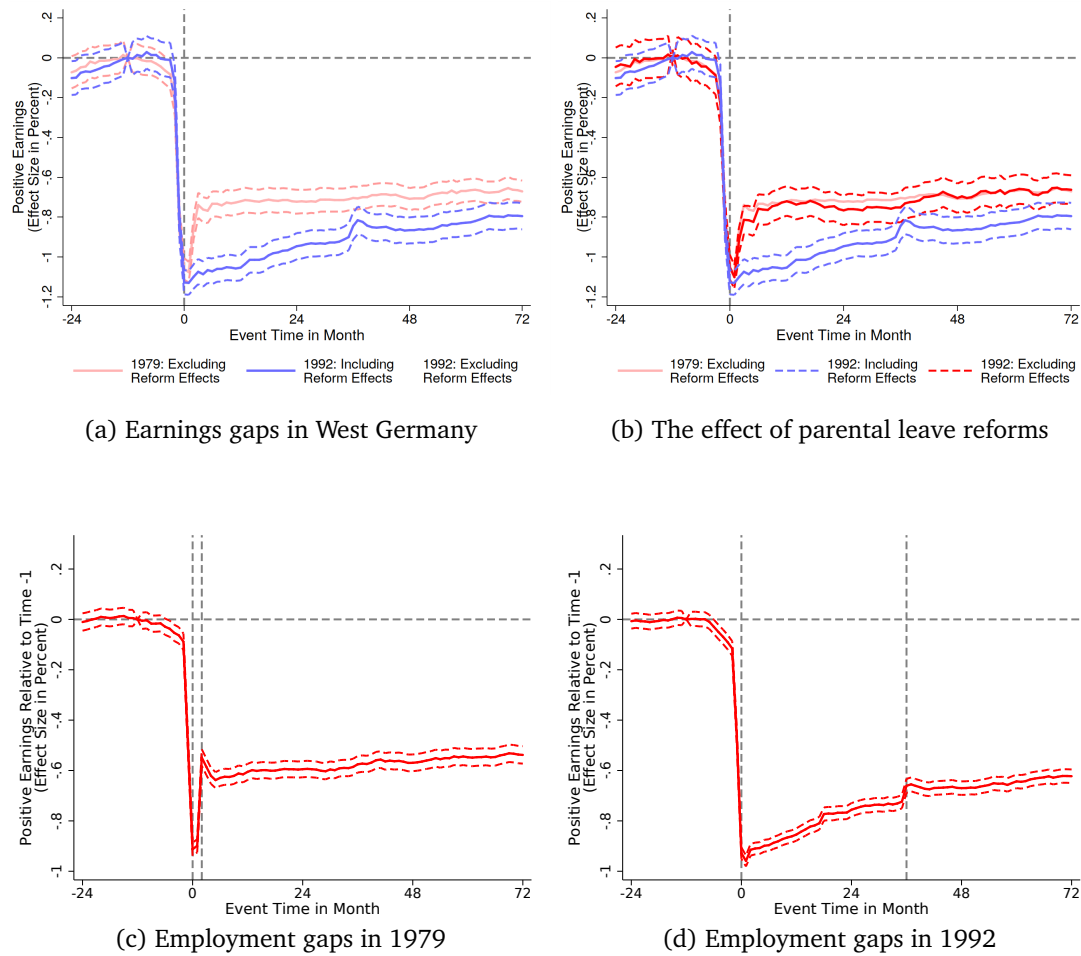


Figure 3: The role of parental leave reforms for changes in earnings gaps, 1979 to 1992

For that purpose, we estimate the causal effects of the parental leave reforms on mothers' labor market trajectories. Our estimation approach combines the event study methodology suggested by Kleven et al. (2018) with a dynamic regression discontinuity design. In particular, it exploits the fact that the regime eligibility depends on the child's date of birth. For example, while mothers who give birth before July 1979 are eligible for two months of parental leave, mothers who give birth after this cutoff can take six month of parental

leave. Intuitively, this type of institutional design allows us to estimate the effects of each reform on the earnings of mothers in months $t = 1$ to T after birth, based on the behavior of mother giving birth shortly before and shortly after the eligibility threshold.

We find that, in the short run, each reform had strong effects on the employment and income choices of mothers, which were sharply concentrated on the post-birth months that were directly affected by the reform. These short-run results are in line with the previous work by Schönberg and Ludsteck (2014) who studies the effects of each parental leave reform in isolation.²

In contrast to Schönberg and Ludsteck (2014), however, we also assess the joint effect of all six parental leave reforms on long-run behavior, based on the local estimates from our RD design. Our motivation for this type of exercise lies in our ultimate goal to explore which part of the increase in the earnings gap between 1979 and 1992 can be explained by parental leave reforms. This question cannot be answered by only analyzing each reform separately. Figure 3b presents the results. It, again, shows the income paths of mothers giving birth in 1979 versus 1992 and, additionally, the joint effect of extending parental leave from 2 to 36 months. More specifically, the dark red line depicts the predicted income path of 1992 mothers when subtracting the estimated effects from all six parental leave reforms (i.e., the income path for the counterfactual case in which the parental leave duration would have been maintained at 2 months instead of 36 months). We find that the parental leave reforms jointly increased the child-related earnings gaps significantly and substantially from an economic perspective. Most importantly, they even increased earnings gaps beyond the 36 months, which shows that – despite the implied job guarantee – parental leave policies have harmful effects on women’s long-term earnings. For example, the reforms jointly reduced the employment rate of mothers 72 months after birth by 13 percentage points.

Perhaps surprisingly, almost the entire increase in the West German earnings gaps from 1978 to 1992 is due to the causal effects of parental leave reforms (see Figure 3b). This finding suggests that family policies play a larger role for explaining child-related inequality than argued by much of the previous literature (see, e.g., Kleven et al., 2019).

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²See also Lalive and Zweimüller (2009) for the effects of similar reforms in Austria.

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