

DISCUSSION PAPER SERIES

IZA DP No. 15571

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Inequality**

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## ABSTRACT

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# Culture, Children and Couple Gender Inequality\*

This paper examines how culture impacts within-couple gender inequality. Exploiting the setting of Germany's division and reunification, I compare child penalties of East Germans who were socialised in a more gender egalitarian culture to West Germans socialised in a gender-traditional culture. Using a household panel, I show that the long-run child penalty on the female income share is 23.9 percentage points for West German couples, compared to 12.9 for East German couples. The arrival of children also leads to a greater increase in the female share of housework and child care for West Germans. I add to the main findings by using time-use diary data from the German Democratic Republic (GDR) and reunified Germany, which provides a rare insight into gender inequality in the GDR and allows me to compare the effect of having children in the GDR to the effects in East and West Germany after reunification. Lastly, I show that attitudes towards maternal employment are more egalitarian among East Germans, but that the arrival of children leads to more traditional attitudes for both East and West Germans. The findings confirm that socialisation has a strong impact on child penalties and that family policies may have an impact on gender inequality through social learning in the long run.

**JEL Classification:** J16, J22, D1

**Keywords:** cultural norms, gender inequality, child penalty

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# 1 Introduction

Women’s labour force participation has increased strongly across high-income countries in past decades and gender inequality has been reduced in many domains. Yet, despite this progress, women tend to work fewer hours than men, gender wage gaps remain substantial, and within couples the norm remains that women earn less than their male partner. Those inequalities are remarkably persistent (Olivetti and Petrongolo, 2016). As more women than men in high-income countries hold college degrees (Kleven and Landais, 2017), classic human capital models fail to account for persisting gender inequalities. The literature has identified children as a main source of the remaining gaps (Córtes and Pan, 2020; Kleven et al., 2019b), but uneven labour market responses to becoming a parent—i.e. employment interruptions with limited recovery that are commonly only observed for mothers—are not deterministic. Some institutional features, such as more generous parental leave allowances for mothers, favour longer leave-taking by mothers and, more generally, main breadwinner models (e.g. joint tax filing for spouses). More recently, the role of culture in determining maternal employment has received increased attention with a particular focus on intergenerational transmission (e.g. Fernández, 2007; Fernández and Fogli, 2009). Giuliano (2021) provides a comprehensive overview of the literature on gender and culture.

Several papers have shown that the gender norms of parents map into those of their children. Therefore, exposure to more egalitarian norms can have a lasting effect. Farré and Vella (2013) and Johnston et al. (2014) examine intergenerational correlations in gender attitudes and find that the mothers’ attitude has a strong effect on the attitudes of their children in adulthood and on their daughters’ labour supply. Kleven et al. (2019b) estimate the intergenerational transmission of child penalties and argue that parents’ gender norms form their daughters’ norms during childhood. In their ground-breaking work, Fernández et al. (2004) document that the wives of men who grew up with a working mothers are more likely to be in the labour force themselves. As a result, different socialisations may have long-lasting impacts on child penalties and gender inequality.

In this paper, I examine how culture impacts within-couple gender inequality by comparing child penalties between couples socialised in a more gender egalitarian culture to those in a more gender-traditional culture but living in the same country.<sup>1</sup> For this, I

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<sup>1</sup>This is comparable to the epidemiological approach (Fernández, 2011) where immigrants coming from different source countries but living in the same country are studied (see, e.g., Blau et al., 2020).

exploit the unique setting of Germany's division and reunification, where couples growing up in the German Democratic Republic (GDR) were exposed to more gender egalitarian policies and norms than those in the Federal Republic of Germany (FRG),<sup>2</sup> especially regarding maternal employment (see section 2).

I first estimate event studies using a long-running household panel (SOEP) and find that labour market inequality due to children is substantially stronger in West German couples with a negative long-run effect on the female earnings share of 23.9 percentage points (pp), 11 pp larger than in East German couples. I then show that inequality in unpaid domestic work, i.e. housework and child care, similarly increases strongly upon the arrival of children, with effects again being more moderate in East German couples (about 8 pp lower for both outcomes). Contrary to labour market outcomes, inequality in housework was already pronounced even before the arrival of children. A summarising specialisation index reveals that a gender-traditional re-orientation is more than twice as strong in West German couples.

I add to this analysis by using time-use diary data from the GDR and reunified Germany to look at gender inequality in time-use by children in more detail. Microdata from the GDR regime is scarce and the newly digitised time-use data thus allow me to examine gender inequality in a regime with one of the world's highest female labour force participation rates. The data show that gender-specific differences in working hours in the GDR were indeed much smaller than in post-reunification West Germany (and to a lesser degree, East Germany) and that the child penalty for women was smaller. However, inequalities in domestic work were also strong in the GDR where women did about two-thirds of the housework. This is similar to East Germany after reunification and only slightly lower than in West Germany. Furthermore, women undertook three-quarters of the child care in the GDR, East and West Germany. As the time-use data is cross-sectional, this analysis contrasts couples with and without children, but of a similar age range and controlling for important observable characteristics.

In a final step, using another household panel (pairfam), I analyse differences in attitudes towards maternal employment and how those attitudes are affected by children. East Germans favour longer working hours for mothers at all child ages, except in the first year when the labour market effect of children is also similar. East Germans are less likely to agree that women should prioritise family over career and that a working

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<sup>2</sup>Throughout this paper, I use GDR and FRG when referring to the two German states before reunification, and to East Germany and West Germany after reunification. Unless explicitly stated otherwise, East and West Germans are defined by their location in 1989 (GDR and FRG, respectively), see section 3.

mother is harmful for children under the age of six. I then show that children lead to more traditional gender attitudes for East and West Germans, with suggestive evidence of a slight convergence of attitudes.

The main contribution of this paper is that it estimates child penalties through the lens of social norms. A growing literature has examined child penalties in recent years in different countries and settings (e.g. [Angelov et al., 2016](#); [Bertrand et al., 2010](#); [Córtes and Pan, 2020](#); [Kleven et al., 2019a,b, 2021a,b](#); [Kuziemko et al., 2020](#)). A consistent finding is that the labour market trajectories of mothers are strongly affected in the short run without full recovery. Effects on fathers tend to be small. In their paper on child penalties in Swedish couples, [Angelov et al. \(2016\)](#) focus the heterogeneity analysis on relative educational attainment and find that the within-couple gap disappears four years after birth only when mothers have a substantial educational advantage.<sup>3</sup> [Kleven et al. \(2019b\)](#) study child penalties in Denmark, documenting underlying mechanisms in detail (e.g. selection into more child-friendly occupations after birth) and showing the transmittance of child penalties across generations; child penalties are closely linked to the labour supply of maternal grandparents. In a cross-country analysis, [Kleven et al. \(2019a\)](#) document that child penalties are much lower in Scandinavian countries compared to the US, UK, Austria and Germany, and that penalties are closely linked to stated gender norms. Building on the two latter papers, this paper estimates child penalties *within* one country, where during the German division individuals were exposed to different policies and gender norms. As a large share of gender inequality is related to children—two-thirds in the US and 80% in Denmark, see [Córtes and Pan \(2020\)](#) and [Kleven et al. \(2019b\)](#) respectively—better understanding the cultural origins of child penalties helps to shed light on a main driver of gender inequality.

A recently emerging literature has compared the impact of children on East and West German mothers. [Collischon et al. \(2020\)](#) contrast child penalties for employment, working hours and hourly wages. Using rich administrative data, [Boelmann et al. \(2021\)](#) address a similar question, but they take several steps to control for confounding factors and explore further mechanisms.<sup>4</sup> I add to those papers in several dimensions by tak-

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<sup>3</sup>In contrast, [Córtes and Pan \(2020\)](#) and [Kleven et al. \(2018\)](#) find no evidence of strong heterogeneities by relative education in the US and Denmark, respectively.

<sup>4</sup>[Boelmann et al. \(2021\)](#) first document persistent differences within cross-border labour markets. They then show, by looking at migrating mothers, that East Germans in West Germany keep their norms whereas West Germans in East Germany adjust to local gender norms. Finally, they document that West German mothers with a high inflow of East Germans in their firm adjust their post-birth return behaviour in the direction of East German mothers. The same local learning mechanism has also been found by [Schmitz and Weinhardt \(2019\)](#) who take a macro-perspective by examining how West

ing a holistic view of children and gender inequality. Besides looking at labour market outcomes, I examine differences in time allocation in the household to non-market work (housework and child care) as well. As an additional contribution, I use time-use data from the GDR which provides a rare insight into gender inequality in time use in a state socialist regime. Combined with time-use data from reunified Germany, I can compare inequalities in the GDR with those in East and West Germany in a consistent framework. I also add an analysis of attitudes, which shows that differential child penalties of labour market outcomes closely follow stated preferences regarding maternal employment and that, overall, the arrival of children leads to more traditional gender attitudes.

This paper takes a household-perspective and uses within-couple shares as main outcomes. As emphasised by [Angelov et al. \(2016\)](#), focusing on couples allows to control for observed *and* unobserved characteristics of the partner. Important unobservable attributes may be gender attitudes or preferences for the timing of births in the life cycle. When differences in child penalties between groups are of key interest, the couple-perspective also automatically controls for potential contextual confounders. In the case of East and West Germans (who mostly live in their regions of origin), the institutional setting is largely identical, but labour market conditions and day care supply are factors with regional discrepancies and aspects that could impact child penalties differently. On the couple-level, these are automatically accounted for.<sup>5</sup>

Several influential papers on gender inequality have also taken a couple-perspective. Most notably, in their seminal work, [Bertrand et al. \(2015\)](#) look at gender identity norms and relative income within married couples in the US, identifying strong aversion to a situation of the wife outearning her husband. Building on this, [Lippmann et al. \(2020\)](#) compare East and West German couples and find that exposure to more gender-equal institutions has indeed impacted gender norms, as East German women can have higher earnings within a couple without an increase in housework or risking their marriage, as is the case among West German couples.<sup>6</sup> However, [Lippmann et al. \(2020\)](#) do not explicitly

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German women's labour force participation changes when their counties experienced a high inflow of East Germans in the years following reunification.

<sup>5</sup>An additional aspect that makes the couple-perspective more relevant is the increasingly active role of fathers in child-rearing. [Gimenez-Nadal and Sevilla \(2012\)](#) show that fathers' child care involvement (and other unpaid work such as housework) has increased substantially over the past decades across high-income countries—albeit to still much lower levels than that of mothers. While studies commonly find that fathers' labour market outcomes are, if anything, only marginally affected by the arrival of children (e.g. [Bertrand et al., 2010](#); [Kleven et al., 2019b](#)), fathers may react with an involvement in child care and in other domains of non-market work such as household chores.

<sup>6</sup>[Sprengholz et al. \(2020\)](#) investigate a similar question with the same data using annual rather than monthly earnings measures, but are unable to confirm this finding.

consider the role of children for gender inequality and only control for the presence of children in their estimation. As children are the main source of differential within-couple gender inequality between East and West Germans, estimating child penalties sheds light on the magnitude of children in explaining this.

This paper also contributes to the sizeable literature examining the long-run *effects*<sup>7</sup> of exposure to the two German regimes on a wide range of outcomes. Papers studying gender-related attitudes have consistently found more gender egalitarian views in East Germany with limited signs of convergence; this holds for the role of mothers in the labour market and in the family (Bauernschuster and Rainer, 2012), gender-specific work preferences (Beblo and Gorges, 2018), importance of career success for women (Campa and Serafinelli, 2019), and attitudes about the detrimental effects of maternal employment on children (Zoch, 2021). In line with those attitudes, a more even distribution in household tasks (Cooke, 2007) and female income share (Lippmann et al., 2020; Sprengholz et al., 2020) has been documented. I add the important dimension of how children impact differences in labour market outcomes, domestic work, and attitudes.

The paper proceeds as follows. The next section discusses the historical context of Germany’s division and reunification, section 3 describes the data sources used and outlines the empirical approach. Results for labour market outcomes and domestic work are presented in section 4, followed by an analysis of attitudes in section 5. I present a battery of robustness checks for the main outcomes in section 6 and conclude in section 7.

## 2 German division and reunification

After World War II, Germany was partitioned into four occupation zones. After increasing tensions in the post-war years, in May 1949 the Federal Republic of Germany (FRG) was formally established, consisting of the three western zones, followed by the German Democratic Republic (GDR) in October 1949, consisting of the Soviet occupation zone. The two German states were to exist separately for 41 years.

The GDR and FRG followed very different paths when it came to policies regarding female employment (Trappe, 1996). The GDR—a socialist, de-facto one-party state—

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<sup>7</sup>Becker et al. (2020) recently highlighted pre-existing differences between East and West Germany before the formal separation in 1949 as well as selective migration in the following years, due to which the German division cannot be treated as a clean *natural experiment* to study the long-run effects of communism/socialism (as many papers explicitly state). However, I do not claim to identify the effect of a political regime, but rather use the setting to compare child-induced gender inequality between regions with differing gender attitudes and histories of maternal employment.

promoted a more gender egalitarian system, and both mothers and fathers in general worked full-time. This was actively encouraged by the state through the provision of universal day care and an obligation for both men and women to be in employment (Beblo and Görge, 2018).<sup>8</sup> In contrast, the FRG was a market-based democracy with conservative gender policies. Day care provision was limited, and the tax and transfer system encouraged a male breadwinner model (or a one-and-a-half male breadwinner model with the woman working part-time). A series of parental leave expansions in the 1970s and 1980s temporarily prolonged maternal leave, but long-run effects on labour market outcomes were small (Schönberg and Ludsteck, 2014). Both before and after those reforms, a large share of mothers did not return to the labour market and, if so, mostly part-time. Differences in attitudes towards maternal employment were also pronounced, as can be seen in derogatory nicknames for *working* mothers in the FRG (“raven mothers”) and *non-working* mothers in the GDR (“parasites”, see Boelmann et al., 2021).

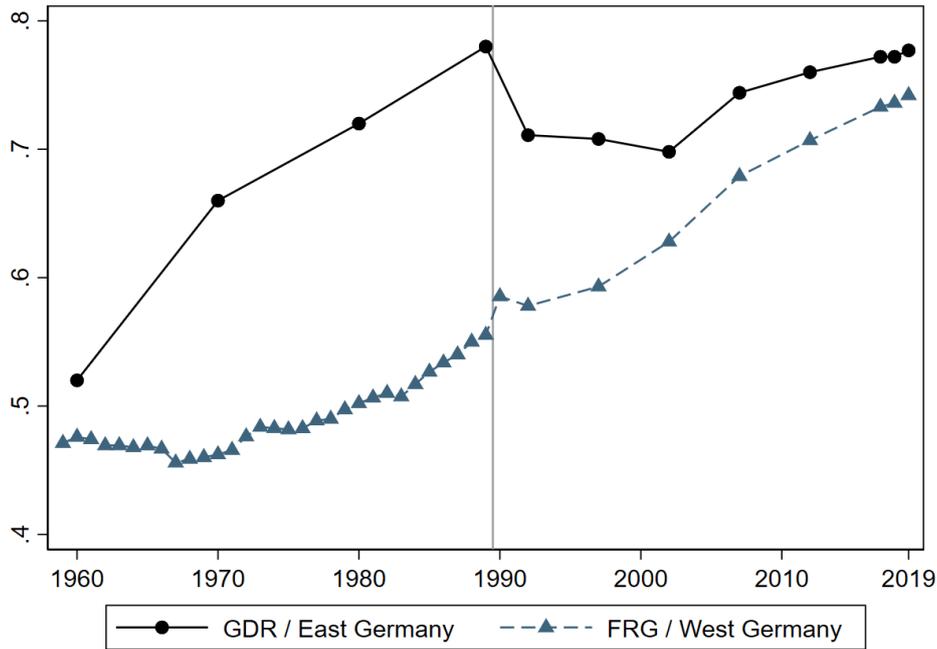
The fall of the Berlin Wall in November 1989 finally led to the reunification of the two German states in October 1990. In the direct aftermath large East-West migration streams began. In 1989 and 1990 alone, more than 800,000 East Germans migrated West, predominantly 18 to 30-year-olds (Fuchs-Schündeln and Schündeln, 2009). In the reunification process the GDR was fully integrated into the FRG, adopting such policies as the tax and transfer system and parental leave legislation. Yet, some differences in the institutional and economic environment remained, such as the larger day care availability in East Germany, a higher share working in the public sector, and an overall weaker labour market (Rosenfeld et al., 2004).

Figure 1 shows female labour force participation rates for GDR/East Germany and FRG/West Germany between 1959 and 2019. Differences were initially relatively small, but the policies in the GDR led to a large increase in the following decades and reached 78% in 1989, which was among the highest rates in the world (Rosenfeld et al., 2004). On the other hand, participation in the FRG only increased slowly from the 1970s onward and before reunification female labour force participation was 22 pp lower than in the GDR. Despite an initial convergence in the years after reunification, differences have persisted over the past two decades (Barth et al., 2020). In line with differences in female labour force participation, research has also shown that attitudes towards maternal employment

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<sup>8</sup>In 1976 a baby year was introduced for higher order births in the GDR and this was extended to all births in 1986 (Heisig and Zierow, 2021). During the baby year mothers received a generous wage replacement, but commonly returned to employment thereafter. In principle, fathers were also eligible but rarely used it.

Figure 1: Female labour force participation



*Notes:* Figure shows female labour force participation for East Germany (GDR before 1990) and FRG/West Germany over time. The vertical line denotes the fall of the Berlin Wall. Sources: GDR statistical office (from [Schmitz and Weinhardt, 2019](#)), Destatis with Microcensus

immediately following reunification were substantially more gender egalitarian in East Germany ([Bauernschuster and Rainer, 2012](#)).

### 3 Data and empirical approach

The main empirical analysis relies on the German Socio-Economic Panel (SOEP), a longitudinal household survey by the German Institute for Economic Research (DIW Berlin, [Goebel et al., 2019](#)). The survey started in 1984 in the FRG and added GDR households in 1990 before reunification was completed. Currently, the SOEP contains about 15,000 households and 35,000 individuals per year. A wide range of topics are covered in the study, including labour market outcomes, attitudes, time use, relationship details and socio-economic characteristics. Being a panel study on the household-level, the data contain information from all household members aged 12 years and over. Importantly for this analysis, the survey asks where respondents had lived before reunification in 1989 (GDR, FRG or abroad). As mobility between the GDR and FRG was strongly restricted, this variable indicates where respondents' parents grew up and where they themselves were socialised. I use the 1989 location of both partners to define East and West German

couples.

### 3.1 Sample criteria and outcomes

This paper takes a couple-perspective on gender inequality and thus relies on the household structure of the survey. I focus on (becoming) parents to examine the impact of children on gender inequality in East and West German couples. In contrast to studies using administrative data (e.g. [Angelov et al., 2016](#); [Kleven et al., 2019b](#)), imposing a balanced sample over a longer pre- and post-birth period would strongly reduce the sample. First, individuals from survey households may not always be covered from three years pre- to six years post-birth (the main sample window, whereby the upper limit is chosen to cover the usual age of school entry). Second, if for a couple full coverage is required, this implies that the couple must have formed a household before the window and not broken up until it ends, which would make the sample more selective, especially in the pre-birth period. The main results simply demand any observation in the event window, requiring couple-level observations at least once before and after the birth of the first child (as in [Córtes and Pan, 2020](#)), yields comparable results, see Appendix Table [B.1](#). Appendix Figure [A.1](#) shows how the observation window by household is distributed.

As this paper investigates gender inequality, same-sex couples are not considered. Due to the large share of non-marital births in East Germany (58% vs. 27% in West Germany in 2009, see [Klüsener and Goldstein, 2016](#)), I include both married and non-married cohabiting couples. A fundamental requirement is that both partners lived in the GDR or FRG in 1989. Due to the low share of mixed East-West couples (6.6%), the analysis focuses on single-origin couples. No further restriction is set on a migrant background. To ensure comparability between households from the East and West, the sample is restricted to 1990 to 2019 where both are covered. Overall, I look at couples of working age (18–65), but the years surrounding the first birth mostly impose a stronger restriction on the age range. I keep observations where either partner has zero earnings, as especially mothers often (temporarily) drop out of the labour force in the years following birth and report zero earnings.

The outcomes considered in the analysis relate to the labour market, unpaid domestic work, and an index taking both domains into account. The main labour market outcome is the share of female income within a couple, where income refers to gross labour income of the previous calendar month. As alternative measures of the income distribution in

couples, results for *gaps* in income and a binary indicator for the couple following a main male breadwinner model (female income share  $< \frac{1}{3}$ ) are presented in the Appendix. To capture not only the income distribution, but also the degree of participation in the labour market, I also show results for the female share of weekly working hours.

For unpaid domestic work I look at contributions to housework<sup>9</sup> and child care. Specifically, the questionnaire asks how many hours respondents normally spend on those tasks on weekdays.<sup>10</sup> In Appendix section D, I compare this time-use information with time-use diary data (see next subsection) to validate the usage of this information in SOEP (Borra et al., 2021, do a similar validation of time-use and survey data for the UK and US). Besides smaller differences, the results are broadly in line with comparable East-West differences. Focusing not only on housework but also on child care is particularly important in this context, as child care obligations are often an obstacle to both parents being (full-time) employed. The couple-perspective is a particular advantage for those outcomes, as due to a strongly differing supply and enrolment rates of day care in East and West Germany,<sup>11</sup> parents in East Germany have fewer hours of potential child care obligations, unless lower day care is fully compensated by informal care arrangements.<sup>12</sup> Shares of child care within a couple take this into account.

Following Siminski and Yetsenga (2022), I also use a proposed household specialisation index ( $SI_2$  in their paper) to summarise the division of market and domestic work within the household in one number.

$$SI = \frac{DW_F}{DW_F + DW_M} - \frac{MW_F}{MW_F + MW_M} \quad (1)$$

$DW$  and  $MW$  denote domestic and market work, respectively, and the subscripts indicate female and male contributions per unit. The index ranges from -1 (non-traditional specialisation) to 1 (traditional specialisation, i.e. the woman is solely responsible for domestic work and the man for market work) with 0 implying equal contributions to

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<sup>9</sup>The questionnaire specifies that housework refers to “washing, cooking, cleaning”. These tasks are commonly defined as *routine housework* as these have to be conducted regularly and are more difficult to postpone than other housework tasks (Borra et al., 2021).

<sup>10</sup>For both housework and child care I set observations to missing if more than 20 hours per day are indicated. These are 0.02% of observations for housework and 4.6% of observations for child care (both refer to post-birth observations). In 97% of cases when more than 20 hours of child care is recorded exactly 24 hours of child care per day is indicated. Perhaps a comprehensible answer, but not suited to this analysis.

<sup>11</sup>As of March 2021, 52.3% of under threes were enrolled in East Germany compared to 30.6% in West Germany. See: <https://tinyurl.com/destatiskita2021>, last accessed 10th January 2022.

<sup>12</sup>Looking at children aged one to six, I find that West German parents spend, on average, 1.4 hours more on child care per weekday.

both domains. The distribution of  $SI$  in East and West German couples is presented in Appendix Figure A.2.

Table 1: Pre-birth characteristics

|                                   | East German couples |            | West German couples |            |
|-----------------------------------|---------------------|------------|---------------------|------------|
|                                   | Women<br>(1)        | Men<br>(2) | Women<br>(3)        | Men<br>(4) |
| <i>Individual characteristics</i> |                     |            |                     |            |
| Age in years                      | 26.56               | 29.28      | 28.97               | 31.79      |
| Higher schooling degree           | 0.35                | 0.28       | 0.40                | 0.41       |
| University degree                 | 0.24                | 0.17       | 0.23                | 0.28       |
| Any employment                    | 0.81                | 0.89       | 0.90                | 0.94       |
| Full-time employment              | 0.70                | 0.85       | 0.76                | 0.88       |
| Weekly working hours              | 33.32               | 39.70      | 34.92               | 40.49      |
| Monthly gross earnings            | 1413.92             | 1877.46    | 2038.29             | 3045.35    |
| Hourly wage                       | 10.75               | 12.42      | 14.57               | 18.24      |
| Daily hours of housework          | 1.73                | 0.83       | 1.70                | 0.84       |
| <i>Couple characteristics</i>     |                     |            |                     |            |
| Current location in East Germany  |                     | 0.83       |                     | 0.01       |
| Married                           |                     | 0.41       |                     | 0.62       |
| Female share of labour income     |                     | 0.41       |                     | 0.41       |
| Female share of working hours     |                     | 0.44       |                     | 0.46       |
| Female share of housework         |                     | 0.68       |                     | 0.68       |
| Specialisation index              |                     | 0.24       |                     | 0.22       |
| Observations                      | 762                 | 762        | 2,389               | 2,389      |

*Notes:* Table shows pre-birth (1 to 3 years before birth) characteristics separately for women and men of East and West German couples (by their 1989 location). Higher schooling degree denotes university entrance qualification (*Abitur*). Earnings and wages reported in 2010 Euros. Specialisation index defined as in equation (1). Source: SOEP v36

Table 1 displays pre-birth characteristics of the sample. West Germans in the sample are about two years older, more likely to be married and have substantially higher pre-birth earnings and hourly wages. In contrast, the pre-birth distribution of income, working hours and housework within households is almost identical.

### 3.2 Additional sources

**Time-use data** I additionally use two time-use surveys from Germany. The first one is a time-use survey from the GDR conducted in 1985 and 1990 (before reunification) by the statistical office of the GDR. Tasks were recorded over 24 hours on a pre-determined day. Participating households were also part of a representative household finance study and the data is representative of worker and employee households (Fiebiger, 1991). Berkes et al. (2021) provide further details on the data. Microdata from the GDR are rare, so

this data offer a unique opportunity to gain insights on time use and gender inequality in a socialist country where participation and working hours were relatively fixed.

Second, I use three waves of the (post-reunification) German Time Use Survey taken in 1991/92, 2001/02 and 2013/13. All adult household members record three-digit classified activities in 10-minute (five in 1991/92) minutes slots over three (two in 1991/92) diary days (Maier, 2014). In the time-use survey I can distinguish between households' current location in East and West Germany, but no information is given on the place of birth or the socialisation of individuals.<sup>13</sup>

In both time-use surveys the analysis focuses on different-sex couples of working age. As both data sets are cross-sectional, no information on future children can be used. Thus, to approximate the impact of children, I use childless couples of a similar age range as a comparison group (see the following subsection).

**pairfam** The analysis of attitudes is conducted with data from the German Family Panel *pairfam*. The longitudinal household survey with a focus on researching partnerships and family dynamics has been conducted annually since 2008 with 12 waves released to date.<sup>14</sup> Similar to SOEP, the same set of respondents are interviewed in every annual survey wave, due to which birth events are often observed in the data. Respondents are asked about a wide range of attitudes in every survey year, thus allowing me to implement event study estimates to analyse whether the arrival of children is associated with a change in the attitudes of individuals.

### 3.3 Empirical approach

To analyse the dynamic effect of having children I employ an event study specification following Kleven et al. (2019b):

$$y_{ist}^r = \sum_{j \neq -1} \alpha_j^r \cdot \mathbb{I}[j = t] + \sum_k \beta_k^r \cdot \mathbb{I}[k = age_{is}] + \sum_y \gamma_y^r \cdot [y = s] + \epsilon_{ist}^r \quad (2)$$

for outcome  $y$  of household  $i$ , of region  $r \in \{East, West\}$ , in year  $s$ , and event time  $t$ . Event time  $t = 0$  denotes the 12 months after a couple's first child is born. The event-time coefficients  $\hat{\alpha}_t^r$  are normalised to the pre-birth year and indicate how the outcome

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<sup>13</sup>Appendix Table C.4 shows that in the SOEP estimates based on 1989 location or current location are statistically indistinguishable.

<sup>14</sup>A detailed description of the study is provided in Huinink et al. (2011). In the analysis I omit the 12th survey wave, as data collection was interrupted by the COVID-19 pandemic.

variable dynamically evolves relative to the counterfactual of not having a (first) child. By including age and survey year dummies, the  $\hat{\beta}$ s and  $\hat{\gamma}$ s non-parametrically net out life cycle trends and time trends, such as concave age-earnings profiles due to return to experience or economic shocks in certain years.<sup>15</sup> Identification stems from variation in age at first birth and across time. Equation (2) is estimated separately for East and West German couples, to allow for differential life cycle or time effects. As the main estimates do not condition on future fertility, coefficients capture the total effect of children on gender inequality and differences between East and West German parents.

In addition to the annual event-time coefficients I also provide summary coefficients for the post-birth effect. To avoid issues of (unspecified) OLS weighting of effects over the time horizon as described in [Borusyak et al. \(2021\)](#), I average the coefficients from one to six years after birth and bootstrap standard errors as in [Kleven et al. \(2021b\)](#).

Event study designs have become standard in the literature estimating the impact of children (e.g. [Angelov et al., 2016](#); [C3rtes and Pan, 2020](#); [Kleven et al., 2019a,b, 2021a,b](#); [Kuziemko et al., 2020](#)), which is due to the elegant transparency of the approach and that coefficients can be visualised neatly in event study graphs. But in some cases, due to data limitations event study designs are not feasible as they crucially rely upon a panel structure to be able to control for pre-birth realisations of the outcome variables.

To be able to assess time use in more detail, I additionally use time-use data from the GDR and the German Time Use Survey, which are both repeated cross-sections. Besides documenting novel insights from time-use data in the GDR, the main aspect of interest is whether children exacerbate gender inequality in time use in the GDR, East and West Germany.

To approximate the impact of children in cross-sectional data, I compare the outcomes of couples with young children to childless couples of a similar age range. Specifically, I use a sample of couples aged in the 5th to 95th percentile of first-time parents. I estimate the equation

$$y_{ist}^r = \kappa \cdot child + \sum_k \omega^r \cdot \mathbb{I}[k = age_{is}] + \sum_y \lambda^r \cdot [y = s] + X_i^r \mu + \nu_{ist}^r \quad (3)$$

where *child* is a binary indicator equal to one for couples with a child aged one to six

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<sup>15</sup>If life cycle and time effects were not taken into account, the event-time coefficients would simply correspond to mean values for the event time relative to the pre-birth year as in [Appendix Figure A.3](#). The figure reveals a small drop in female working hours in the year before birth, which may be due to anticipated fertility or if mothers have entered maternity leave already.

and zero for childless couples.  $X_i$  contains education dummies and an indicator of marital status. In cross-sectional data the validity of this control group cannot be assessed, as only some of these couples will become parents and the problem of selection into parenthood arises. I use SOEP (panel-)data to check how well this approach fares compared to event study estimates. Appendix Table B.2 shows post-birth coefficients and contrasts them with those obtained from equation (3) with the approximated control group. For the outcomes female share of income, working hours and housework, event-study coefficients and approximated coefficients are very close, only for female share of child care is the difference in East German households notable. Despite these encouraging results, due to the imperfect control group, the results should be taken with a pinch of salt; rather than showing the impact of children for couples with children (an average treatment effect on the treated), these are conditional differences between couples with and without children of a similar age.

## 4 Labour market outcomes and domestic work

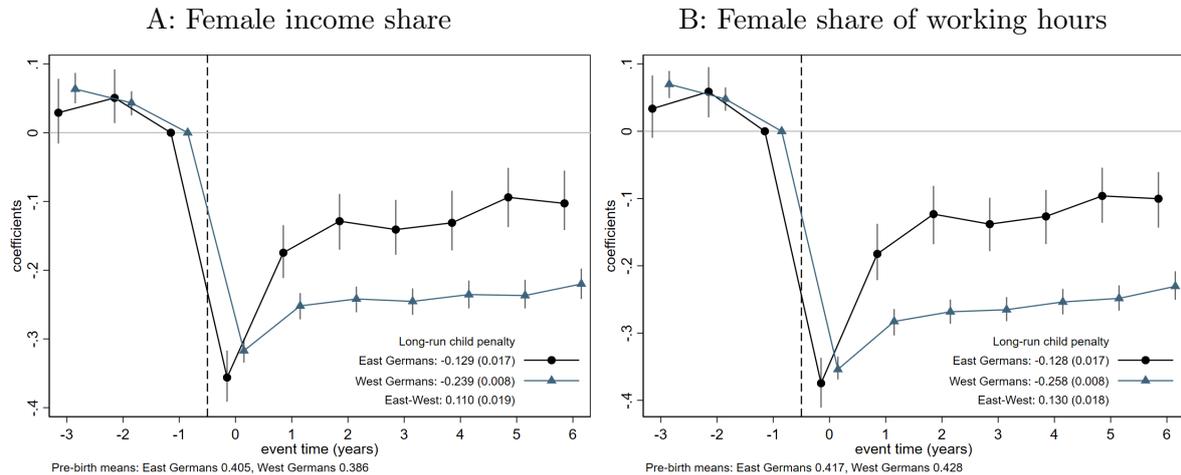
### 4.1 Event studies

**Labour market outcomes** Figure 2 shows the impact of children for the two main labour market outcomes across the event time. Coefficients are normalised to the pre-birth year ( $t = -1$ ), range lines indicate 95% confidence intervals. Panel A shows the impact on female income share. In the year after birth ( $t = 0$ ) the shock to the female income share is similar in East and West German couples. Afterwards, the share in East German couples recovers strongly, but almost stagnates in West German couples at 23.9 pp averaged over the post-birth years. The impact in West German couples is 85% larger relative to East German couples, where the share is reduced by 12.9 pp. As can be seen in the pre-birth averages, this is by no means a convergence to the same post-birth value for East and West Germans (say 25%) but a further divergence in the female income share.

A potential explanation for these differing child penalties could be that bargaining power—through the earnings potential—of women in West German couples is weaker. However, when restricting the analysis to couples with *higher* female pre-birth earnings, where also only 13.5% of women have a lower educational attainment, the East-West Long-run difference still amounts to 7.4 pp. Additionally, differential future fertility could exacerbate differences if West German couples are more likely to have further children.

Yet, looking only at one-child families,<sup>16</sup> East-West differences amount to 11.4 pp, refuting this mechanism. Results by number of children and the local effect of having a second child are shown in Appendix Figure A.4. For one child-families, the female income share in East German couples fully recovers after five years, but remains more than 10 pp lower for West Germans. The local effect of a second child is similar for East and West Germans.

Figure 2: Impact of children on labour market gender inequality



*Notes:* Figure shows event study estimates based on equation (2). Units of observation are couples. Coefficients are normalised to the pre-birth year ( $t = -1$ ), means from this year are displayed in the figure notes. Long-run effects are defined as the average of post-birth ( $t = 1-6$ ) coefficients with bootstrapped standard errors (500 replications). Income share refers to gross monthly labour income. East and West Germans are defined by their 1989 location. Source: SOEP v36

In Panel B of Figure 2 the effect on the share of working hours is displayed. The similarity of the impact on those two outcomes indicates that the effect on hourly wages hardly differs despite the fact that for East German mothers there is less selection into post-birth employment than for West German mothers.

While having a child is a permanent negative shock to gender equality in the labour market, it is so to a much larger degree in West German couples. Additional results are presented in the Appendix. To include couples who both have zero earnings or hours (3–4% of observations) instead of *shares* I also show *gaps* for the outcomes (Appendix Figure A.5) with qualitatively similar results. Panel C in Appendix Figure A.5 further shows the effect of a discrete binary categorisation of the couple having a main male breadwinner (female income share  $< \frac{1}{3}$ ), which increases by 52.3 pp for West Germans compared to 27.7 pp for East Germans.

<sup>16</sup>One-child couples are defined as those for which over the entire period covered in the data, i.e. often beyond six years after birth, only one child is observed.

**Domestic work** Next, I turn my attention to non-labour market outcomes and look at contributions to unpaid domestic work, i.e. housework and child care. Although the weekly working hours of East German mothers, in particular, recover to some degree, it does not follow unambiguously that their relative contribution to domestic work decreases accordingly. If one partner, mostly the mother, temporarily withdraws from the labour market, additional housework and child care is often covered still covered by her alone. Strongly unequal division of such work may lead to lock-in effects if the partner with the longer absence continues to be the main caregiver even after returning to the labour market. This could have negative long-run effects on working hours and flexibility, which negatively affects wages (Goldin, 2014).

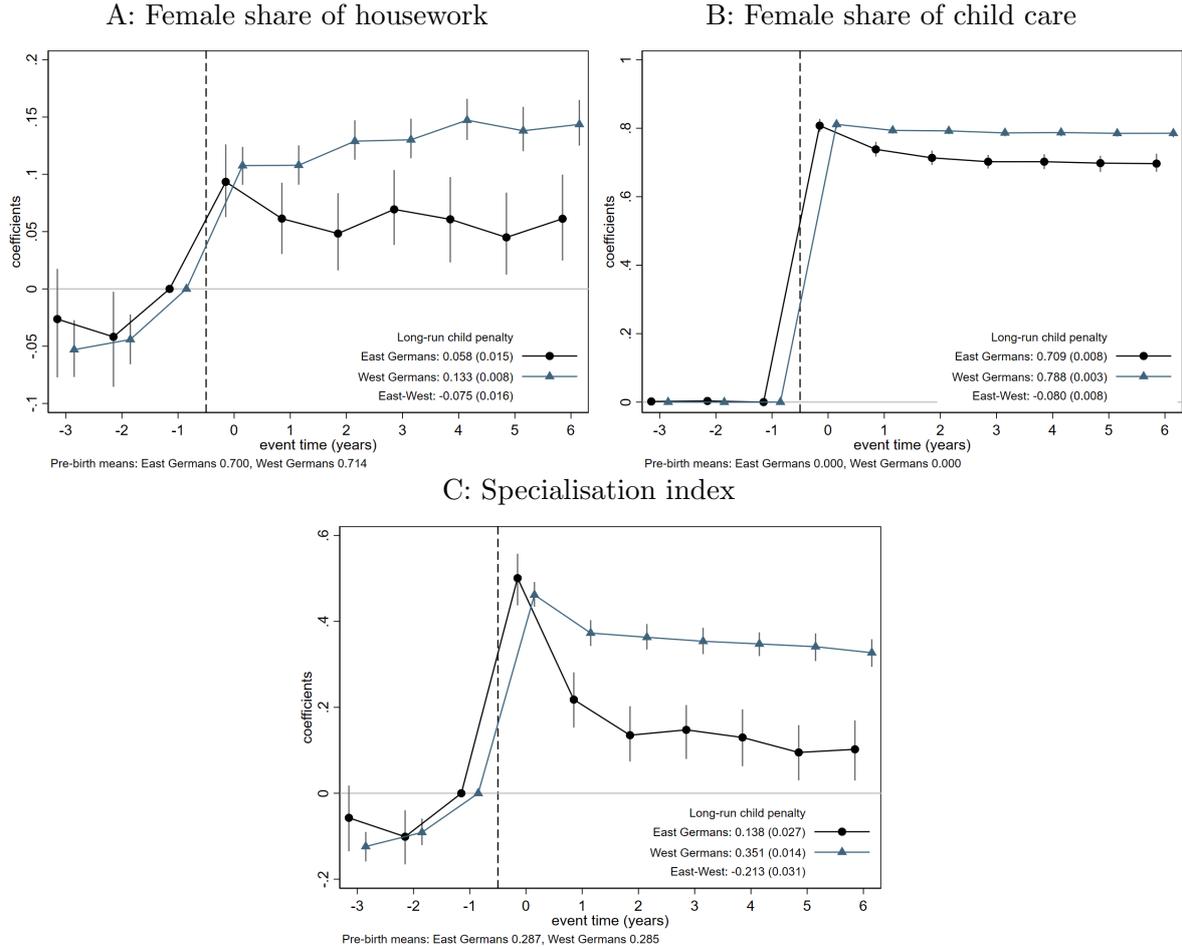
Estimates for domestic work are obtained using the same empirical framework as the previous section, but child care investments only start when the child is born and are zero prior to that.<sup>17</sup> To be consistent the results for child care are still shown in the same way, but the normalisation to  $t = -1$  is irrelevant. To a lesser, non-deterministic degree this also holds for housework as the inputs required post-birth increase strongly and this holds even more when more time is spent at home. For workings hours, in contrast, both pre- and post-birth the choice set is in the same fixed range, say 0—50 hours per week. I also present estimates for the specialisation index by Siminski and Yetsenga (2022) described in subsection 3.1, which indicates to what degree couples divide market and domestic work on a continuous scale from a *non-traditional* ( $SI = -1$ ) to a *gender-traditional* specialisation ( $SI = 1$ ). Because it is calculated with shares, it is less prone to distortions due to level differences between regions (e.g. labour market conditions or day care availability).

Figure 3 presents the results for domestic work. Two aspects stand out. First, the pre-birth means for housework (Panel A) indicate that, in contrast to earnings and working hours where the distribution was more equal prior to children, gender inequality in this domain was already prevalent without children as women were responsible for an average of 70% of the housework. Post-birth, when the total amount of housework is larger, the female share increases and the effect is 8 pp larger in West German couples. Child care (Panel B) is predominantly carried out by mothers with an initial share of 80% in East

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<sup>17</sup> The questionnaire asks for child care in general and not necessarily for the child care of the respondent's children. I observe that pre-birth the average daily time spent on child care is less than 8 minutes for women in the pre-birth year (2% of women report any time spend on child care) compared to 9 hours in the first post-birth year. Due to this I am confident that child care time measures to a large degree time with the own child, and so I set pre-birth child care time to zero.

Figure 3: Impact of children on gender inequality in domestic work



Notes: Housework and child care refer to shares on weekdays. The specialisation index is defined in equation (1). See Figure 2 for other notes. Source: SOEP v36

and West German couples in year after birth and only a slight decrease in East German couples as the child gets older. The long-run effect in West German couples is again 8 pp larger. Appendix Figure A.3 shows descriptively that men are not spending more time on housework when they have children, but the extra work is entirely taken over by mothers.<sup>18</sup> As housework starts with a female share of 70%, when couples have children women take on the child care in addition to a larger share of the housework.

Relative contributions to market and domestic work are summarised in the specialisation index in Panel C. While couples were already somewhat specialised pre-birth (0.29 in East and West German couples), the arrival of the first child leads to a spike in specialisation in couples with relative increases in the index of 48 and 123%. This suggests that having a child leads to a *permanent* traditional orientation in couples. Estimates for *total*

<sup>18</sup>As housework (cooking or cleaning) is to a larger degree also related to children, I also examined repairs around the home, car repairs, and garden work to see whether men take over more of those child-unrelated housework tasks as a compensation, but found no evidence supporting this. Results are available from the author.

*hours of work* per weekday (paid work, housework and child care) in Appendix Figure A.6 show that the female share of overall work increases, and more so for West German households, meaning that the increase in domestic work is not fully offset by a decrease in paid work.

As for the labour market outcomes, event study estimates for gaps are presented in Appendix Figure A.7. Because the overall levels of housework and child care change strongly by event time, an aspect that is less visible when focusing on shares, is that absolute gaps show even stronger divergences after the arrival of a child. Additionally, East-West differences are also stronger with a continuously increasing housework gap in West German couples. For child care, the differences in the impact on the gap six years after having a child is about three hours per day. At this age, in both East and West Germany almost all children attend day care or school.

Long-run estimates, i.e. average estimates for one to six years after birth, for the main labour market and domestic outcomes are summarised in Table 2. Columns (5) and (6) show the difference in long-run estimates between East and West German couples. The table also shows estimates from regressions with additional pre-determined characteristics (see table notes) in even-numbered columns to control for potentially confounding factors. Table 1 revealed that East and West Germans show pronounced differences in some observable pre-birth characteristics. Coefficients in Table 2 are generally stable when control variables are added to the estimation and support strong East-West differences in the long-run effects of children on within-couple gender inequality. As an addition to regressions with control variables, I also reweight West German couples so they match the distribution of the observable characteristics of East German couples, as in Kleven et al. (2021b). Event study graphs and long-run effects for the five main outcomes are shown in Appendix Figure A.8. Reassuringly, the results are very similar to the main estimates.

## 4.2 Evidence from time-use data

Child penalties have been shown to differ strongly between couples socialised in the FRG and GDR. This naturally raises the question of how large child penalties, and gender inequality more generally, were in the GDR. Besides high female labour force participation rates (see section 2) and some evidence on earnings gaps (Krueger and Pischke, 1995), little is known about this due to the lack of microdata from the GDR. Fortunately, time-use surveys were conducted in the GDR, allowing novel insights into time use in the GDR.

Table 2: Long-run effects of children

|                               | East German couples  |                      | West German couples  |                      | East-West difference |                      |
|-------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
|                               | (1)                  | (2)                  | (3)                  | (4)                  | (5)                  | (6)                  |
| <hr/>                         |                      |                      |                      |                      |                      |                      |
| Female income share           |                      |                      |                      |                      |                      |                      |
| Long-run effect               | -0.129***<br>(0.017) | -0.115***<br>(0.018) | -0.239***<br>(0.008) | -0.220***<br>(0.009) | 0.110***<br>(0.019)  | 0.105***<br>(0.020)  |
| <hr/>                         |                      |                      |                      |                      |                      |                      |
| Female share of working hours |                      |                      |                      |                      |                      |                      |
| Long-run effect               | -0.128***<br>(0.017) | -0.118***<br>(0.017) | -0.258***<br>(0.008) | -0.242***<br>(0.008) | 0.130***<br>(0.018)  | 0.124***<br>(0.019)  |
| <hr/>                         |                      |                      |                      |                      |                      |                      |
| Female housework share        |                      |                      |                      |                      |                      |                      |
| Long-run effect               | 0.058***<br>(0.015)  | 0.044***<br>(0.015)  | 0.133***<br>(0.008)  | 0.112***<br>(0.008)  | -0.075***<br>(0.016) | -0.068***<br>(0.017) |
| <hr/>                         |                      |                      |                      |                      |                      |                      |
| Female share of child care    |                      |                      |                      |                      |                      |                      |
| Long-run effect               | 0.709***<br>(0.008)  | 0.704***<br>(0.008)  | 0.788***<br>(0.003)  | 0.784***<br>(0.004)  | -0.080***<br>(0.008) | -0.080***<br>(0.009) |
| <hr/>                         |                      |                      |                      |                      |                      |                      |
| Specialisation index          |                      |                      |                      |                      |                      |                      |
| Long-run effect               | 0.138***<br>(0.027)  | 0.117***<br>(0.027)  | 0.351***<br>(0.014)  | 0.320***<br>(0.014)  | -0.213***<br>(0.031) | -0.203***<br>(0.032) |
| <hr/>                         |                      |                      |                      |                      |                      |                      |
| Age, survey year FEs          | Y                    | Y                    | Y                    | Y                    | Y                    | Y                    |
| Additional controls           |                      | Y                    |                      | Y                    |                      | Y                    |
| Observations                  | 4,088                | 4,026                | 12,552               | 12,163               | 16,640               | 16,290               |

*Notes:* Long-run effects are defined as the average of post-birth ( $t = 1 - 6$ ) coefficients with bootstrapped standard errors (500 replications). Columns (1), (3) and (5) contain the estimates shown in Figures 2 and 3. Additional control variables added in other columns: schooling and university degree, federal state dummies for current location (16), migrant background, municipality size class dummies (7), and an indicator for married couples. Significance levels: \* < 0.1 \*\* < 0.05 \*\*\* < 0.01. Source: SOEP v36

The surveys from the last years of the GDR (1985 and 1990) offer a unique opportunity to study gender inequality in a socialist system, where, generally speaking, individuals were obliged to work, and differences in working hours between men and women were much smaller. As, to date, three time-use surveys (1991/92, 2001/02, 2012/13) have been conducted in reunified Germany in a comparable fashion, this also allows me to compare outcomes from the GDR to those from East and West Germany in a consistent framework, which was not feasible with the SOEP.<sup>19</sup>

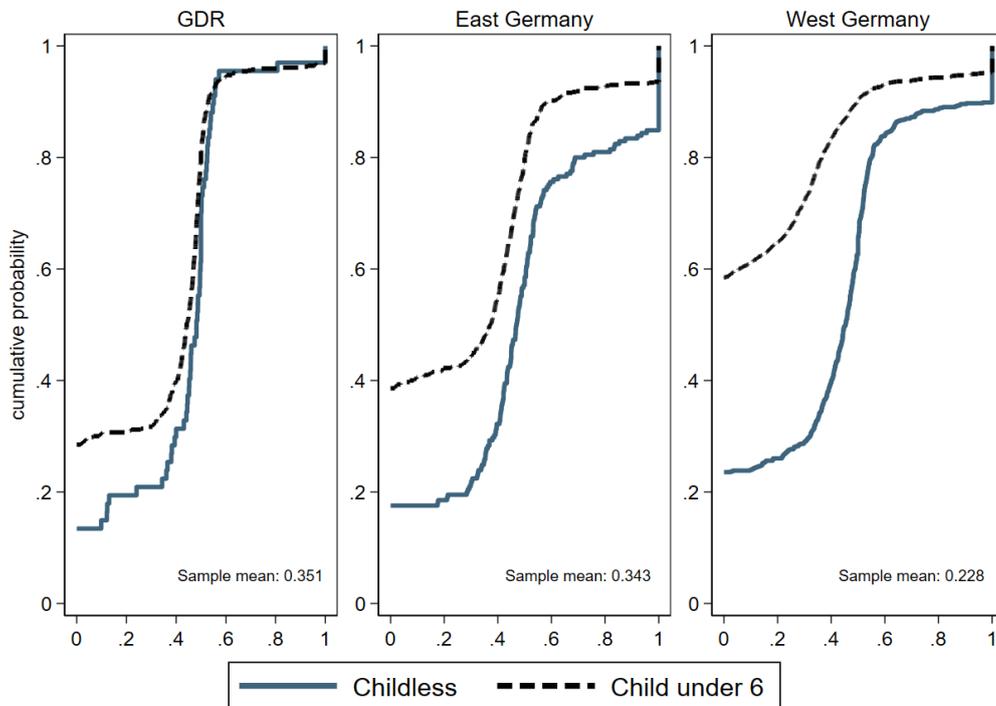
An additional benefit of this time-use data is that it is not prone to the pitfalls of information on time use from regular surveys, namely lack of precision (SOEP only allows for answers in full hours), recall bias, social desirability bias, and measurement error.

<sup>19</sup>Note that estimates in this section are based on the current location of households rather than their location in 1989.

Data from time-use studies, recorded in fine-grained diaries over survey days, resolves those issues and are generally considered to be more accurate, especially for activities other than paid work that are conducted in less regular intervals (Kitterød et al., 2005).

Due to the lack of a panel structure in the German time-use studies, the impact of children cannot be estimated with event studies, but it allows me to compare outcomes from the GDR to those from East and West Germany in a consistent framework, which was not feasible with the SOEP. I estimate conditional differences in the time use of couples with and without children based on equation (3). For this, the sample is restricted to couples with either i) children under six or ii) couples with no children in the household but a female age distribution in the range of the 5th to 95th age percentile of those with children (see subsection 3.3).

Figure 4: Distribution of female share of working hours—time-use data



*Notes:* Figures shows cumulative distribution functions of the female share of working hours within couples. Sample is restricted to weekdays. Region refers to current location of couples. Childless couples have no children and are in the 5th to 95th percentile age range of couples with children in the sample. Sources: Time-Use survey of the GDR (1985, 1990) and German Time-Use Study (1991/92, 2001/02, 2012/13)

In Figure 4 the cumulative distributions of the female share of working hours are plotted separately for the GDR, East and West Germany, and distinguished by childless couples and those with children under 6. The narrow distribution of working hours in the GDR is apparent in the left panel; of couples with both partners working, the female share

lies in the range of 0.4 and 0.6 in 79% of couples.<sup>20</sup> Differences between couples with and without children in the GDR predominantly stem from differences in the participation of women. After reunification, differences in the working hours distribution by children are larger in East Germany across the distribution, but substantially smaller than in West Germany where almost 60% of mothers report zero working hours. Distributions for childless couples are overall much more similar between the samples than those for couples with children.

Figure 5 shows cumulative distribution functions for housework and child care. As already documented by Nickel (1992), strong gender inequalities for those outcomes can also be observed in the GDR where, on average, two-thirds of housework is done by women, but the difference by children is small. The share is, in fact, slightly lower in East Germany, but notably larger in West Germany. In line with the stronger decrease in working hours, children are associated with substantially stronger increases in the female housework share in West Germany compared to East Germany or the GDR.

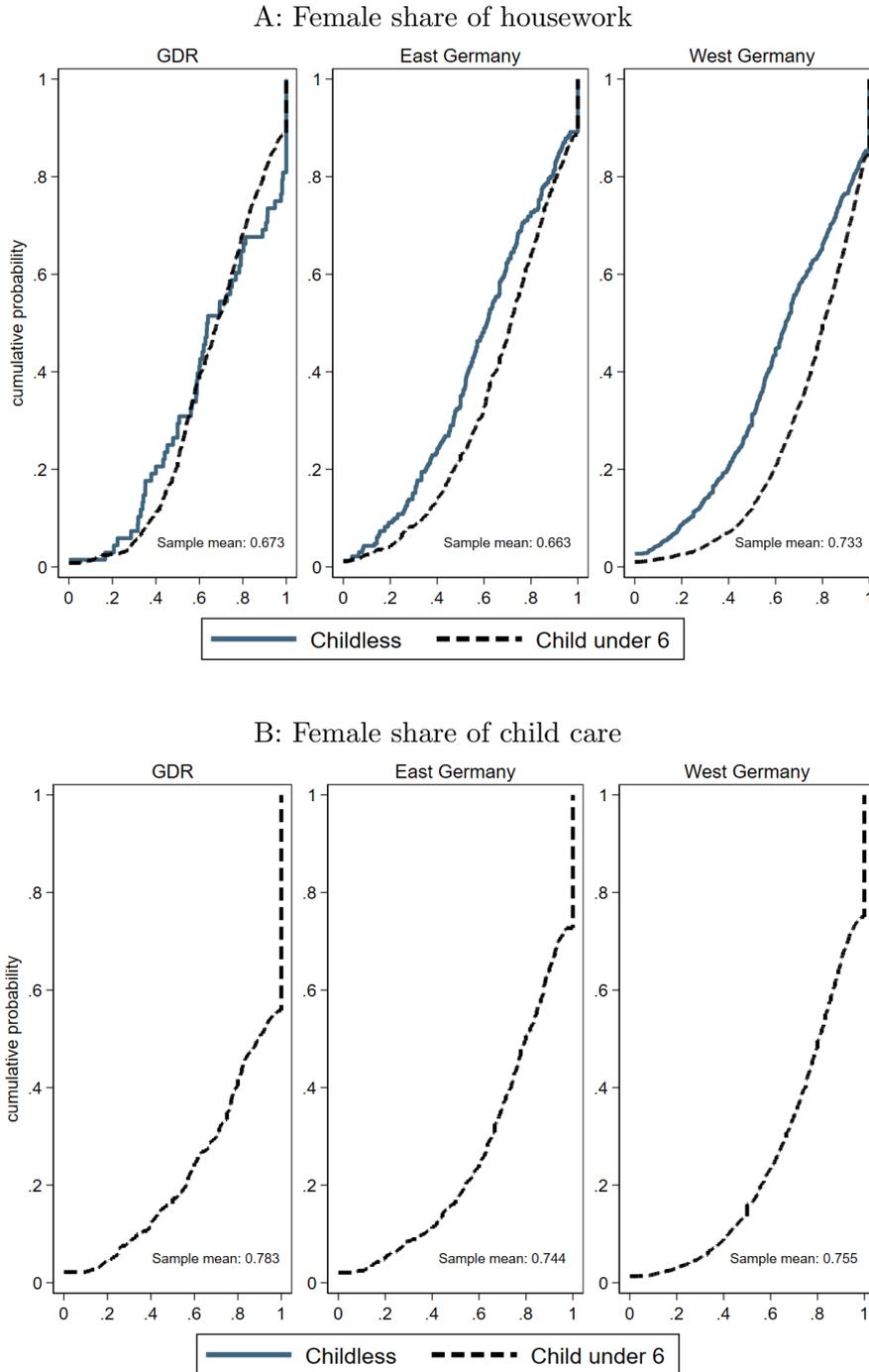
Child care is predominantly the responsibility of mothers across space and time. As for housework, the average division is slightly *more* equal in East Germany compared to the GDR. Gender egalitarian policies in the GDR focused on the labour market (Cooke, 2007), but in terms of domestic work—and especially child care—the data does not suggest that this had any spillovers on an overall more gender egalitarian distribution (Berkes et al., 2021). However, it is worth noting that the share of households with mothers carrying out all child care is substantially larger in the GDR than in either region in reunified Germany (45% compared to 30% and 29% in East and West Germany, respectively).

In Table 3, Panel A, conditional differences controlling for survey wave and life-cycle effects are presented. To make the results more comparable to the survey results using the SOEP, the table additionally includes coefficients for routine housework. The “impact” of children on market work and housework is of similar magnitude when using SOEP data, but East-West differences are smaller, predominantly due to larger effects in East Germany. This could be attributed to different samples, measurement, and the imperfect comparison of households with and without children. A key result of the table is that children had a much smaller impact on gender inequality in the GDR; differences in market work are only one-third to one-half compared to East and West Germany, and inequality in housework is not affected at all.

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<sup>20</sup>By law, a standard working week was 43.75 hours, and 40 hours for mothers with two children under the age of 16 (Rosenfeld et al., 2004).

Figure 5: Distribution of domestic work - time-use data



*Notes:* Figures shows cumulative distribution functions of the female share of housework and childcare. See Figure 4 for other notes. Sources: Time-Use Study of the GDR and German Time Use Survey

An obvious caveat to this analysis is the imperfect control group of households without children, of which there are also relatively few as the combination of young couple-households without children is rare. Due to this, Panel B reports average female shares of paid work, housework, and child care of households with children. Similar to the graphical depiction in Figures 4 and 5 this allows me to descriptively compare GDR, East and

Table 3: Evidence from time-use data

|   | Female share of      |                           |                               |                     | Observations |
|---|----------------------|---------------------------|-------------------------------|---------------------|--------------|
|   | Paid work<br>(1)     | Housework<br>(all)<br>(2) | Housework<br>(routine)<br>(3) | Child care<br>(4)   |              |
| <b>Panel A:</b> Time-use by children in household                         |                      |                           |                               |                     |              |
| GDR   | -0.080***<br>(0.029) | 0.011<br>(0.034)          | -0.041<br>(0.029)             | 0.776***<br>(0.013) | 681          |
| East Germany  | -0.178***<br>(0.027) | 0.085***<br>(0.022)       | 0.097***<br>(0.022)           | 0.742***<br>(0.012) | 1,013        |
| West Germany  | -0.225***<br>(0.013) | 0.123***<br>(0.011)       | 0.117***<br>(0.011)           | 0.751***<br>(0.005) | 3,601        |
| <b>Panel B:</b> Sample means for households with children (time-use data) |                      |                           |                               |                     |              |
| GDR   | 0.344                | 0.674                     | 0.785                         | 0.782               | 617          |
| East Germany  | 0.304                | 0.680                     | 0.728                         | 0.744               | 788          |
| West Germany  | 0.175                | 0.761                     | 0.794                         | 0.756               | 2,789        |

*Notes:* Table displays conditional differences in time use of households with and without children. The sample of households with children have at least one child below the age of 6, and the sample of households without children are in the 5th to 95th female age percentile of those with children. All estimates include survey wave FEs and dummies for 4 age bins, indicator variables for education, marital status and survey wave. Routine housework consists of washing, cooking and cleaning. Sources: Time-Use survey of the GDR (1985, 1990) and German Time-Use Study (1991/92, 2001/02, 2012/13)

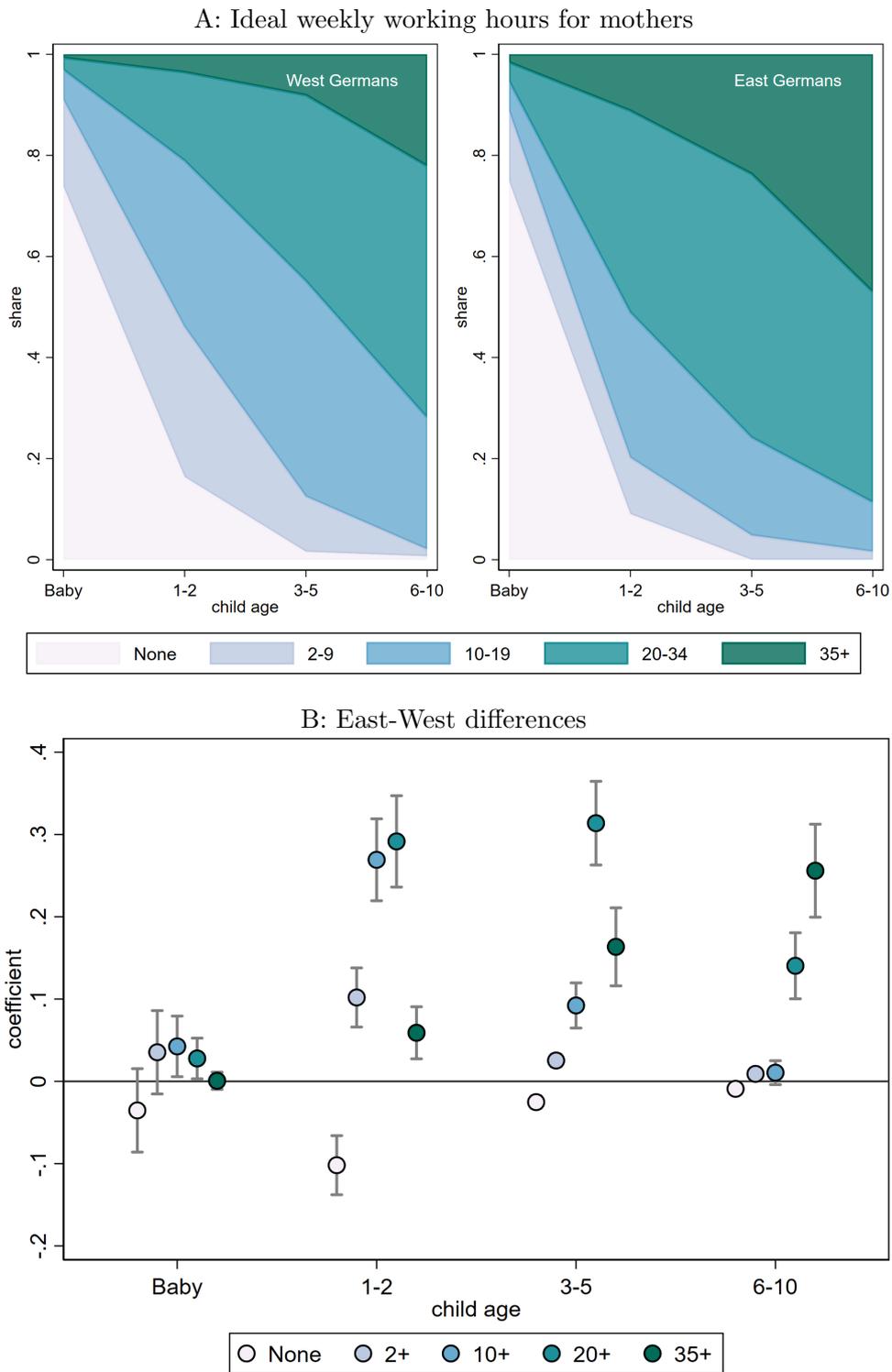
West German households in this regard. The first two rows of this panel indicate that gender division in GDR and East Germany are relatively similar, but the female share of paid work, routine housework *and* child care is somewhat *larger* in the GDR, suggesting a double shift. In West German couples, in contrast, the female share of paid work is substantially lower and the female share of housework is larger.

## 5 Attitudes

To better understand differential responses to having children, I now turn to the examination of gender-related attitudes. Differences in such attitudes between East and West Germans have been well documented in the literature (e.g. [Bauernschuster and Rainer, 2012](#); [Zoch, 2021](#)) with East Germans persistently found to be holding more egalitarian views. Building on this, this section asks how attitudes specifically related to maternal employment differ and whether the arrival of children has an impact on such attitudes. The sociological literature has argued that parenthood can activate gender norms (sleeping effect) and lead to more traditional gender attitudes (e.g. [Corrigall and Konrad, 2007](#);

Cunningham, 2001).

Figure 6: Maternal employment by child age



Notes: Panel A shows the distribution of indicated ideal working hours for mothers of children of different ages. West and East Germans are assigned according to their country of birth (GDR or FRG). Panel B shows coefficients and 95% CIs of East-West differences. Only respondents with children are asked the underlying questions ( $N = 2,016$ ). Source: pairfam waves 1-11

A set of questions in the pairfam survey asks parents how many hours mothers of

children of different age groups should ideally be working. An attractive feature of this is that it allows me to analyse differences in attitudes towards both the extensive and intensive margin of maternal employment by child age. The distribution of ideal working hours by child age is presented in Figure 6, Panel A. In the first year of a child, both East and West Germans indicate that mothers should not be working and, if so, only few hours. This is consistent with very similar effects on labour market outcomes in the first year after birth (Figure 2, Panel B). Then, however, attitudes towards maternal employment begin to diverge; a smaller share of West Germans indicate that mothers should not be working at all, but most respondents are only in favour of part-time work with short hours. In contrast, around 50% of East Germans suggest that mothers of children aged one to two should be working 20 hours or more per week (which only 19% of West Germans are in favour of). With increasing child age, longer maternal working hours are deemed ideal among East and West Germans, but even among more gender egalitarian East Germans less than 50% of respondents prefer full-time maternal working hours. A full catch-up of mothers in terms of labour market outcomes is incompatible with adherence to those attitudes. Panel B of Figure 6 plots corresponding East-West differences in attitudes towards working hours by child age, making it apparent that differences are initially small and, with an increase in the child age, are first stronger at the extensive and later at the intensive margin.

While this evidence is intriguing, as it helps to explain differential recovery for East and West German mothers, it is unclear whether these differences were pre-existent and constant, or either exacerbated or diminished after the arrival of children. [Kuziemko et al. \(2020\)](#) documented that mothers in the US underestimate the effect of having children on their future labour supply, a finding they denote as “the mommy effect”. In line with this, attitudes towards maternal employment may change after the arrival of children. A partial convergence (or further divergence) of East-West attitudes could occur if, upon becoming parents, East Germans find parenthood harder than expected and culturally induced favourable attitudes towards maternal employment are reduced (or vice versa).

To investigate this, I focus on two common questions when studying gender attitudes, which are asked in the survey irrespective of respondents being parents. This lets me investigate whether these attitudes change with the arrival of children. *Women should be more concerned about family than about career* and *A child under age 6 will suffer from having a working mother*. Both variables range from 1 (disagree completely) to 5 (agree completely), for ease of interpretation both variables are coded as binary indicators and

are equal to one if respondents indicate partial (4) or full (5) agreement.

Table 4: East-West differences in attitudes and the impact of children

|  | (1)                  | (2)                  | (3)                  | (4)                  | (5)                  | (6)                  |
|--|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| A: Women should be more concerned about family than career (0/1) |                      |                      |                      |                      |                      |                      |
| East German  | -0.058***<br>(0.010) | -0.059***<br>(0.014) | -0.060***<br>(0.014) | -0.102***<br>(0.028) | -0.090**<br>(0.045)  | -0.112***<br>(0.034) |
| Effect of children   |                      |                      |                      | 0.053***<br>(0.020)  | 0.098***<br>(0.029)  | 0.017<br>(0.029)     |
| East German x children   |                      |                      |                      | 0.043<br>(0.032)     | 0.010<br>(0.051)     | 0.073*<br>(0.041)    |
| Mean of dep. variable  | 0.156                | 0.158                | 0.153                | 0.180                | 0.184                | 0.177                |
| B: A child under 6 will suffer with a working mother (0/1)       |                      |                      |                      |                      |                      |                      |
| East German  | -0.142***<br>(0.011) | -0.106***<br>(0.013) | -0.182***<br>(0.017) | -0.130***<br>(0.029) | -0.107***<br>(0.035) | -0.156***<br>(0.045) |
| Effect of children   |                      |                      |                      | 0.023<br>(0.021)     | 0.055*<br>(0.028)    | -0.008<br>(0.030)    |
| East German x children   |                      |                      |                      | 0.043<br>(0.032)     | 0.024<br>(0.038)     | 0.068<br>(0.049)     |
| Mean of dep. variable  | 0.213                | 0.161                | 0.268                | 0.184                | 0.139                | 0.225                |
| Sample   | Pooled               | Women                | Men                  | Pooled               | Mothers              | Fathers              |
| Survey wave & age FEs  | Y                    | Y                    | Y                    | Y                    | Y                    | Y                    |
| Observations   | 13,621               | 7,084                | 6,536                | 3,689                | 1,764                | 1,924                |

*Notes:* Columns (1) to (3) show the difference in agreement to the attitudes between East and West Germans. The sample in columns (4) to (6) is restricted to respondents with children and relative event time from three years pre- to six years post-birth of the first child. All estimations include survey wave and age fixed effects. Standard errors clustered at the individual-level in parentheses. Significance levels: \* < 0.1 \*\* < 0.05 \*\*\* < 0.01. Source: pairfam waves 1-11

Panel A of Table 4 shows results for whether women should be more concerned about family than career. The first three columns simply show East-West differences. In line with findings in the existing literature, East Germans have more egalitarian attitudes and are 6 pp less likely than West Germans to agree with that statement (37% relative to the sample mean). Effects are similar for male and female respondents. In columns (4) to (6), I only consider respondents who have children or are about to (as in the previous section from three years pre- to six years post-birth) in order to analyse the impact of children on attitudes. In the pooled sample, after having a child, agreement to the statement that women should be putting family over career is 5 pp higher. While the interaction of children and East Germans is positive, which would suggest a convergence of attitudes, it is imprecisely estimated and not conclusive. Differentiating by (becoming) mothers and

fathers, I find that the effect of children comes entirely from mothers (column (5)), but that a slight convergence between East-West attitudes is driven by fathers (column (6)).

Panel B shows results for the statement on whether young children suffer from a working mother. East-West differences are larger (14 pp) for this statement, which is in line with Figure 6 which showed that East Germans were more likely to favour working mothers, but commonly not full-time (meaning that often family should still be their main concern). Absolute East-West differences are almost twice as large for fathers, but they differ little relative to their sample mean (about 66% in either case). In contrast to Panel A, there is only weak evidence (for mothers) that having children leads to a higher agreement with the statement. Similarly, the interaction of East Germans and children is positive, but large standard errors allow no definite conclusion. In Appendix Table B.3 I further differentiate by sex of the child and find that both the East-West difference and the effect of children is slightly larger when the child is a girl.

The examination of attitudes with respect to children and maternal employment for East and West Germans overall supports the notion that attitudes are more egalitarian among East Germans. The arrival of children is associated with more gender conservative attitudes, with suggestive evidence of East-West differences becoming smaller (though attitudes certainly remain more egalitarian for East Germans). Differences in gender attitudes continue to manifest themselves in child penalties that negatively affect the relative labour market outcomes of West German mothers more strongly.

## 6 Robustness

In this section, I run a set of robustness checks to support the hypothesis that the results are primarily driven by the socialisation of couples. For this I will use the SOEP, as the main analyses rely on this data set, and because its panel structure and richness in variables makes it the most suitable to assess robustness. Stability of estimates for the main outcomes examined in subsection 4.1 then also give support to the validity of other estimates.

A main concern may be that current local norms (or institutions) are more relevant than the norms individuals are exposed to during childhood or adolescence, i.e. results are not driven by the couple's origin, but by the current location.<sup>21</sup> This may then

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<sup>21</sup>This would then directly invalidate the analysis based on time-use data as these only rely on the household's current location.

also imply that horizontal cultural transmission through peers is more important than vertical transmission through generations (Bisin and Verdier, 2001). The first two rows of Appendix Table C.4 display estimates by current location in East and West Germany, and results are almost indistinguishable from those presented in Table 2. The two bottom rows show child penalties for East and West Germans (by 1989 location) who live in West Germany. This allows me to contrast East and West German couples having children in the same institutional environment.<sup>22</sup> Child penalties for East Germans in West Germany are larger than for East Germans overall, but they are substantially smaller than for West Germans in the same region (by 7 pp for the outcome female share of income). The results indicate that the current location could play a role, but that socialisation is quantitatively more important. This is also in line with findings from Boelmann et al. (2021) who note at the individual level that East German mothers in West Germany return to work after birth at similar rates to East German stayers, whereas West German mothers moving to East Germany adopt their behaviour to that of local East German mothers.

Another prime candidate to be the driver of East-West differences is the different population share with a migrant background. This may be a relevant factor if individuals born abroad have different gender norms to the native-born population and thus respond differently to the arrival of children. In 15% of West German couples, but only 2% of East German couples, are both partners born abroad. Results with the sample restriction of two German-born partners are displayed in Appendix Table C.5. Coefficients are statistically identical to the main results.

A reason why the child penalty for women is smaller in East Germany could also be that worse economic conditions in East Germany frankly demand that both partners return to employment quicker. In 2019, GDP per capita in East Germany was only 75% of the West German level (43% in 1991, Destatis, 2020). If better economic conditions in some parts allowed young families to have one stay-at-home parent, then parents could voluntarily specialise in market and domestic work. To test this hypothesis, I split West German counties into low- and high-income counties (by GDP per capita). To ensure that couples are always assigned to the same group, I use GDP data from 2008 to split counties. Lower income West German counties have only a 5% larger GDP per capita than the average East German county, GDP differences are thus larger than actual East-West differences. Event study estimates by this split are shown in Appendix Figure C.9

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<sup>22</sup>Too few West German couples live in East Germany to conduct statistical analysis with this sample. Results for East Germans in East Germany are thus almost identical to the results for East Germany.

with no statistically or economically significant differences between the groups.

In a similar spirit, day care availability could be a driver of differences. Day care shortages are prevalent in Germany, especially for the under-threes (Jessen et al., 2020), potentially posing a limiting factor for employment. A difficulty in analysing this aspect is that differences between East and West Germany are so large that West German counties cannot be split to mimic East German counties in this regard. As day care provision for the under-three was very low in West Germany before the mid-2000s, I only use births after 2004 and (median) split West German counties by day care enrolment. Appendix Figure C.10 shows that overall differences are small, but the evidence is suggestive that higher day care availability is associated with slightly lower penalties. As average differences in enrolment between these counties are only 8%, I compare these numbers with East German births *before* 2006 when enrolment was 30–40%. The long-run penalty on the female income share for this group is 13.8 pp.<sup>23</sup> Labour supply elasticities of day care expansion on maternal labour supply are also informative on this matter; research by Müller and Wrohlich (2020) on the effects of day care expansion for toddlers on maternal labour supply in Germany has found elasticities of about 0.2. Under average differences in day care provision for toddlers in the sample period (about 30 pp), this implies that—assuming linearity—between East and West German mothers of toddlers, the average difference in employment could be reduced by about 40% (15 pp).<sup>24</sup> This is in line with the findings that East Germans who had moved to West Germany, i.e. to a region with lower day care provision, had larger labour market child penalties than East German ‘stayers’ though this was still much lower than their West German peers (Appendix Table C.4). In sum, while day care provision may have a moderating effect on child penalties and it cannot be ruled out that part of the East-West differences are due to this factor, the evidence suggests that day care provision is not the main driver of different child penalties.

As another check, I consider the spatial dimension of East-West differences. Recent research has highlighted pre-existing average differences between the East and West German population before the GDR and FRG were formally established in 1949 (Becker et al., 2020). If these are sufficiently large, differences in modern outcomes may be (predomin-

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<sup>23</sup>Looking at the openings of child care facilities in Bern (Switzerland), Krapf et al. (2020) find that child care availability does reduce the child penalty for mothers, but with a dampening effect of the penalty on earnings by 4.5 percentage points (6.3%), the effect is moderate. Kleven et al. (2021a) find no evidence that day care expansions in Austria had any effect on child penalties.

<sup>24</sup>Bauernschuster and Schlotter (2015) identify an elasticity of 0.37 for children aged three to four using the introduction of a legal claim and an expansion for this age group in the 1990s.

antly) attributed to those pre-existing differences. Estimating a spatial RD in proximity to the border allows me to smoothly control for such gradients, assuming those differences did not jump discontinuously at the later border. [Campa and Serafinelli \(2019\)](#) and [Lippmann et al. \(2020\)](#) follow similar strategies in their analysis of East-West differences.

A rigorous implementation of a spatial RD proves difficult due to the large density of observations required in the vicinity of the discontinuity. However, the estimation can follow the intuition of a spatial RD by estimating child penalties in 120km bins around either side of the border.<sup>25</sup> Appendix Figure C.11 shows German counties on either side of the (former) inner border that are included in the estimation. Coefficients of the effect of children for the five main outcomes are plotted in Appendix Figure C.12. They give no indication that estimates converge in proximity to the border.<sup>26</sup>

## 7 Conclusion

Despite important progress in reducing gender inequality over the past decades across high-income countries, differences in earnings persist and women continue to be responsible for larger shares of non-market work. Important contributions have shown that the majority of the remaining gender inequality is child-related ([Córtes and Pan, 2020](#); [Kleven et al., 2019b, 2021a](#)). It is thus of crucial importance to better understand why individuals respond differently to the arrival of children.

For 41 years Germany was divided into two states with vastly different policies regarding maternal employment. In the GDR mothers returned to employment quickly, whereas in the FRG policies favoured a (one and a half) male breadwinner model. Since reunification in 1990, East and West Germans are exposed to the same policy environment, but differences in socialisation could still play a role. This paper examines how child penalties differ between couples who grew up in either the GDR or FRG but have children in reunified Germany.

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<sup>25</sup>The bins are chosen to cover the entirety of East Germany and for each bin to contain at least 1,000 observations (the restriction binds in less densely populated East Germany.) The county furthest away from the border is Spree-Neiße in Brandenburg with a distance of 228km. [Campa and Serafinelli \(2019\)](#) and [Lippmann et al. \(2020\)](#) are able to use finer bins of about 5 and 10km respectively. The reason is that these papers display *average values* based on the entire working age population in their RD plots, whereas the focus here is on data-demanding event study *estimates* for a sample of couples in the years surrounding childbirth.

<sup>26</sup>The main findings are also robust to including mixed-origin couples (with either partner from the GDR and FRG) and to subsequently dropping each federal state in the analysis. I also conducted a placebo exercise where I randomly assigned federal states to either treatment group. None of the differences exceeds the identified East-West difference. Results for these robustness checks are available upon request from the author.

I find that the child penalty on the female income share is 11 pp smaller in East German couples. Looking at contributions to unpaid domestic work, I additionally show that in West German couples children are associated with stronger increases in the female share. These findings are in line with more traditional gender attitudes towards maternal employment among West Germans. The exclusion of numerous potential explanatory factors gives support to the interpretation that differences in norms are a key factor in explaining smaller child penalties on gender inequality in East German couples.

The findings suggest that norms due to different cultural upbringings could play an important role. Children born in the GDR experienced working mothers as the norm and the society held fewer prejudices against them (Boelmann et al., 2021). More gender egalitarian policies in the GDR may not have shifted attitudes in an instant but induced a change in norms over time. A gradual learning process could be an explanation of why using quasi-experimental variation from reform implementations Kleven et al. (2021a) find that Austrian family policies had “virtually no impact” on child penalties. In this paper, on the other hand, I find that for households socialised in the GDR child penalties are much smaller in the long run. The effect could partly run through direct exposure and observing more working mothers (Fogli and Veldkamp, 2011), but also through intergenerational transmission via parents. Johnston et al. (2014) show that the probability of being in full-time employment is substantially larger for daughters after having children whose mothers held non-traditional gender attitudes.

Deeply held gender norms may be difficult to influence in the short run, but family policies such as expansion of day care or parental leave policies, can facilitate maternal employment and also have an impact on norms in the long run. Unterhofer and Wrohlich (2017) show that a parental leave reform in Germany had an effect on the gender role attitudes of grandparents, implying that, through social interactions, policies could also have wider effects in a society. Dahl et al. (2014) and Welteke and Wrohlich (2019) similarly identify spill-over effects of parental leave decisions on coworkers and other family members, and Zoch and Schober (2018) find that day care expansion in West Germany is associated with fewer traditional gender views.<sup>27</sup> These findings underline that most policies do not only have first-order effects, but may potentially also affect the norms of indirectly affected individuals (or firms) or those of the general public as previously frowned upon aspects such as maternal employment become the norm.

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<sup>27</sup>Recognition of same-sex relationships in Europe has been accompanied by more positive attitudes towards sexual minorities (Aksoy et al., 2020).

When designing policies aimed at mitigating the negative effects of children on gender inequality, policymakers should not only consider direct effects but also take long-run effects operating through a gradual change in social norms into account. Short-run effects of, say, day care expansion on maternal labour supply as measured through elasticities may not accurately capture the long-run effects on child penalties and thus on gender inequality as a whole, but instead provide a lower bound.

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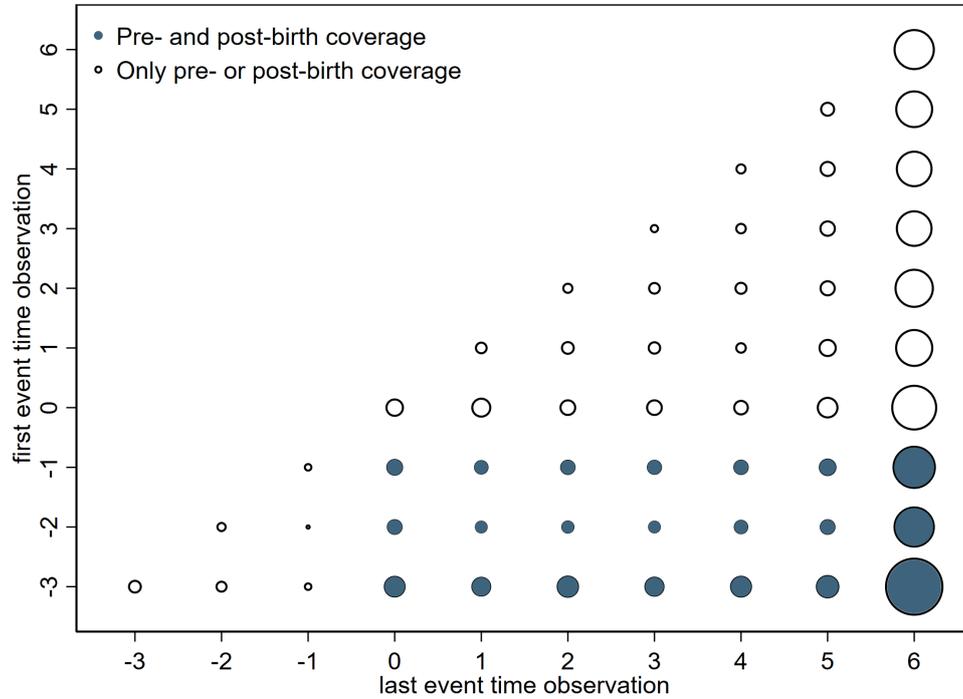
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# Appendix

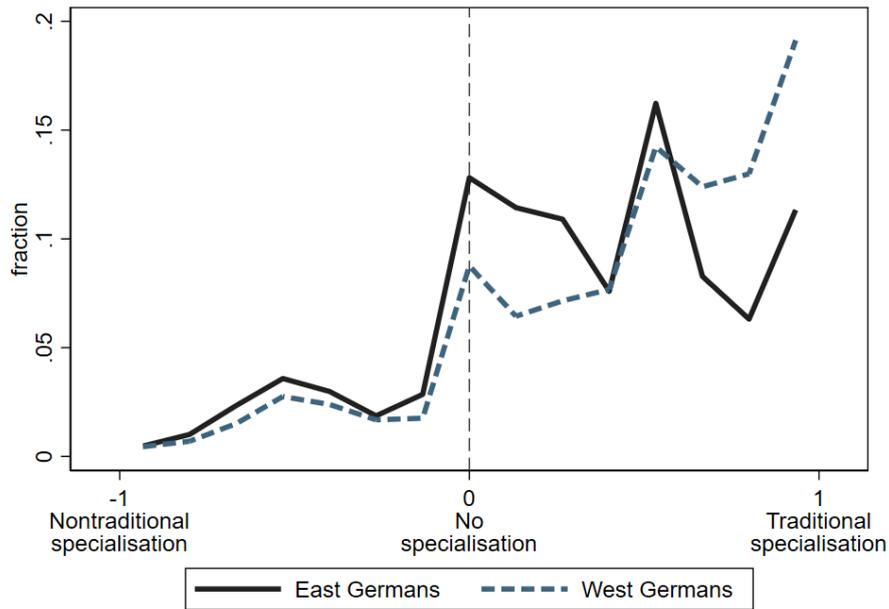
## A Additional Figures

Figure A.1: Observations by event time



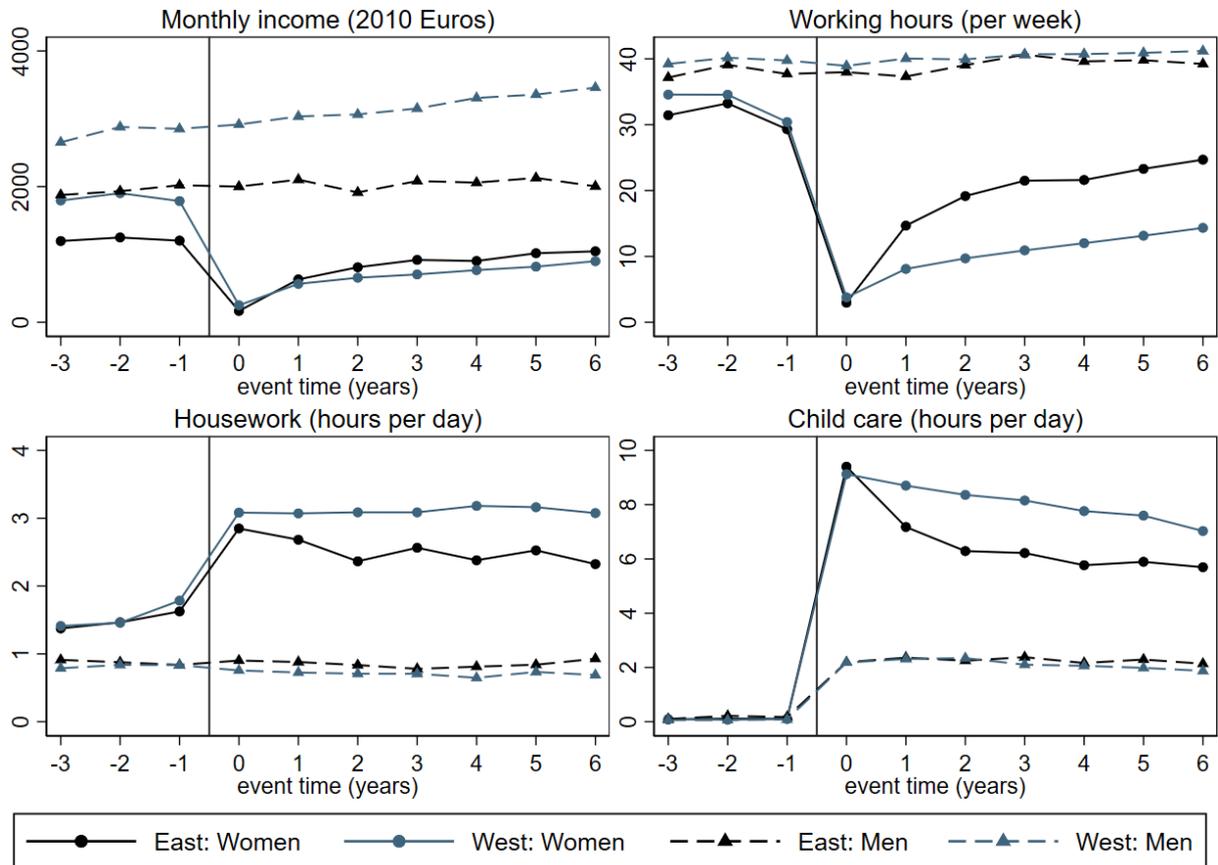
*Notes:* Figure shows how observations in the event study estimates are distributed by their first and last event time (first birth) observation. Circle sizes are weighted by the number of observations in each combination. Blue coloured circles are observations that include both pre- and post-birth event time. Appendix Table B.1 shows estimates for the full sample and for the sample with pre- and post-birth information. Source: SOEP v36

Figure A.2: Specialisation index



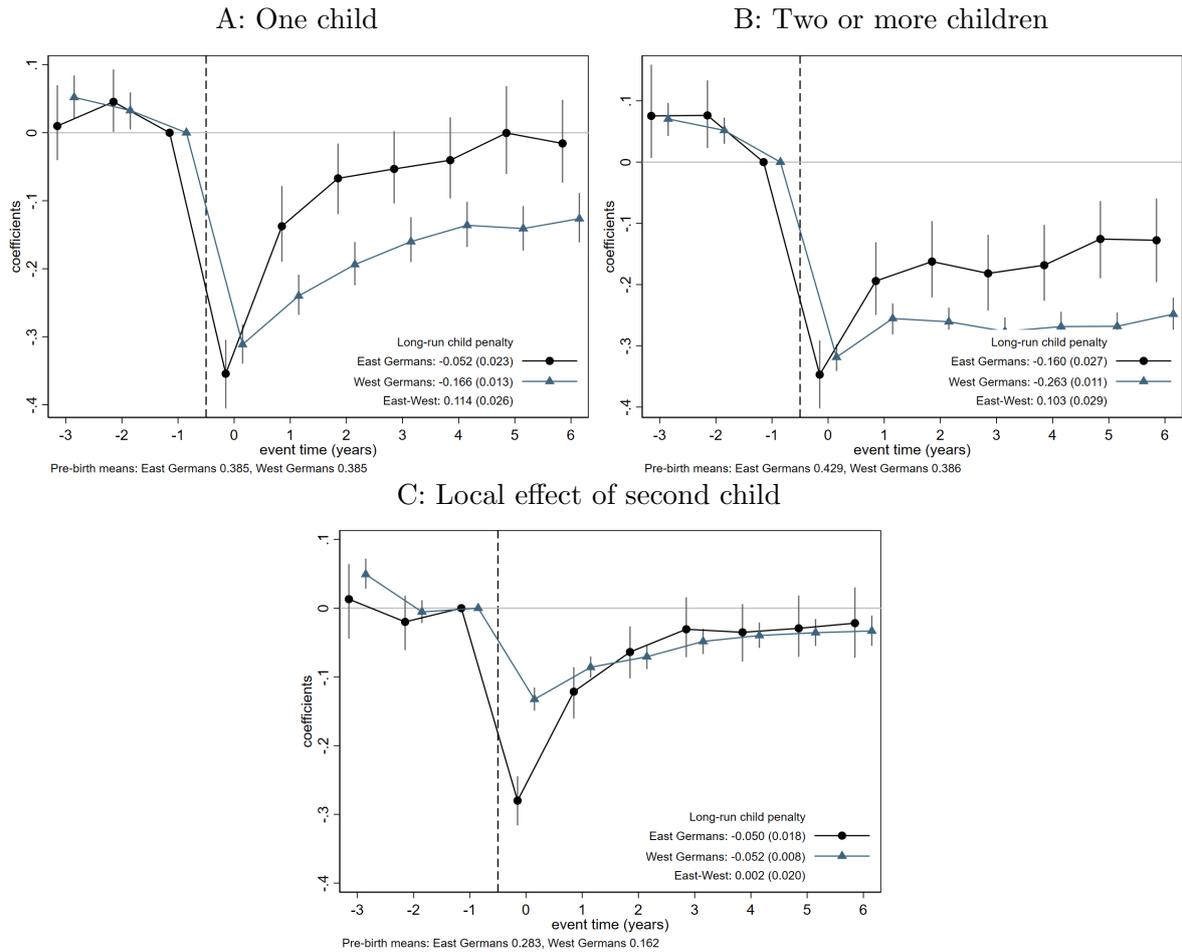
Notes: Figure shows the distribution of a specialisation index proposed by [Siminski and Yetsenga \(2022\)](#). Traditional specialisation implies that the female partner is solely responsible for domestic work and the male partner for market work (vice versa for nontraditional specialisation). Distribution calculated in 15 bins of equal width. Source: SOEP v36

Figure A.3: Average values by event time



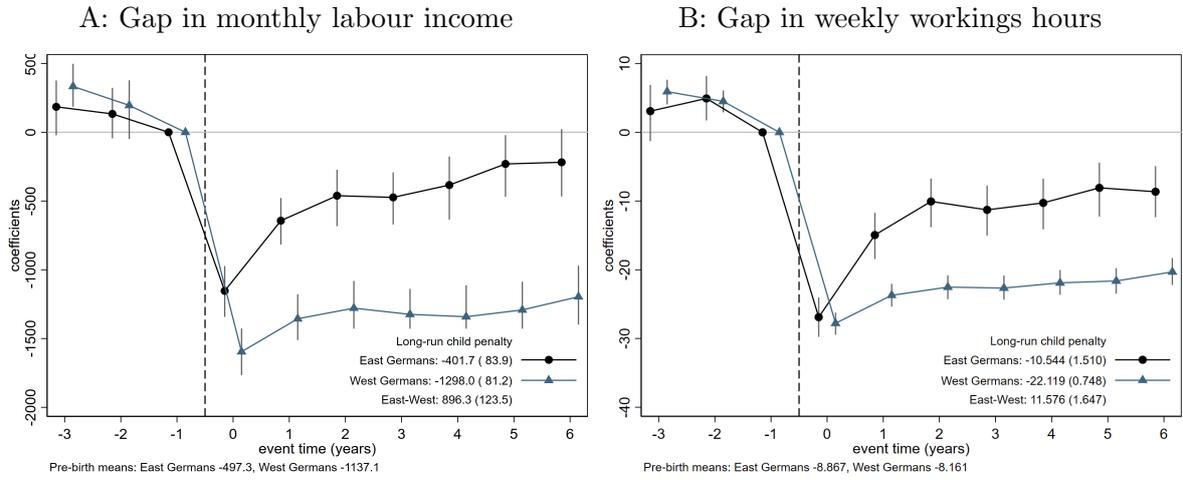
Notes: Figure shows average values of the respective variables by event time relative to the birth of first child. East and West Germans are defined by their 1989 location. Sample covers 1990-2019. Source: SOEP v36

Figure A.4: Impact of children on female income share - by number of children

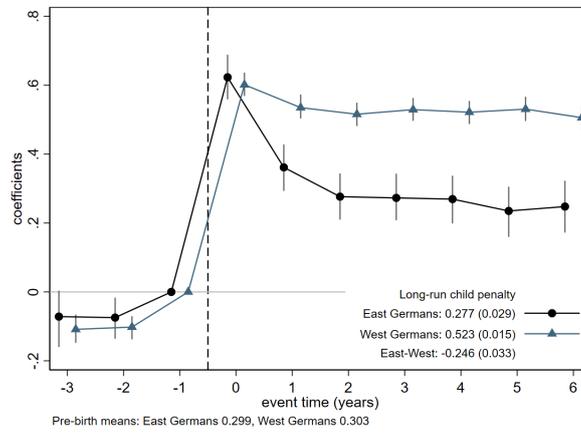


Notes: Panels A and B show event study estimates for the female income share differentiated by couple's total number of children. Panel C shows the local effect of having a second child. See Figure 2 for other notes. Source: SOEP v36

Figure A.5: Impact of children on gender inequality in the labour market - gaps and discrete categorisation

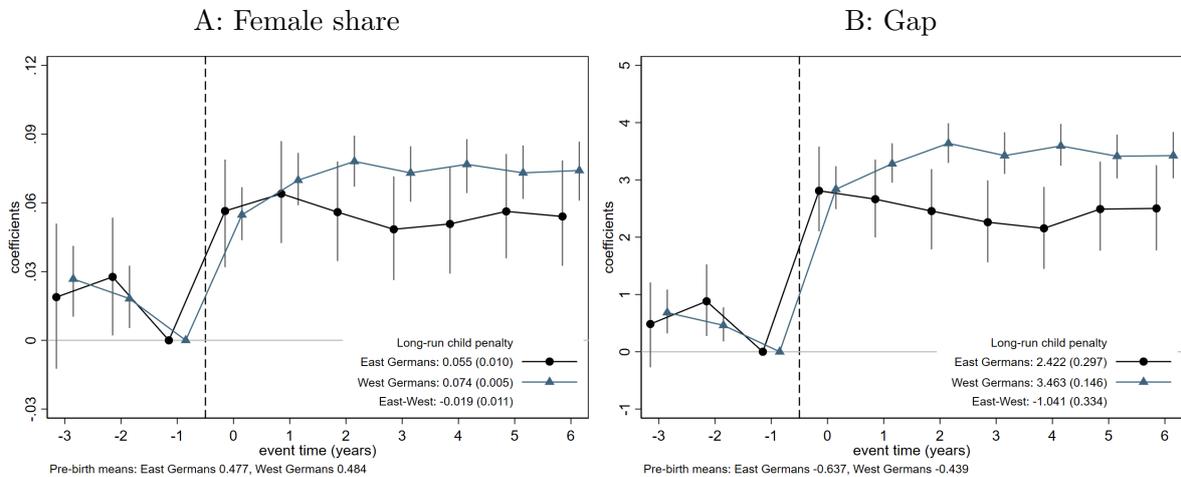


C: Main male breadwinner (0/1)



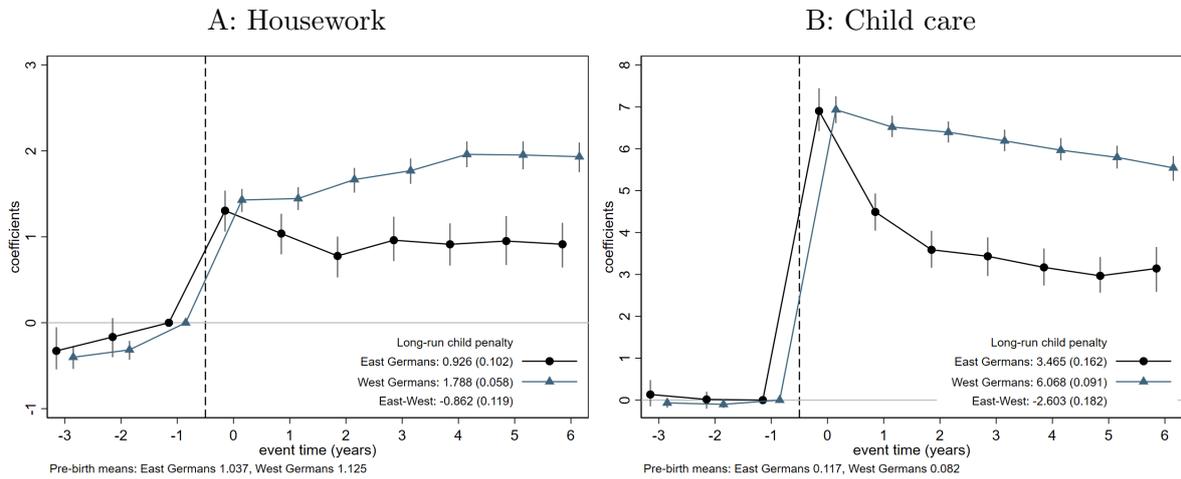
Notes: Panels A and B show gaps corresponding to shares shown in Figure 2. Main male breadwinner households are defined as such if the female income share is  $< \frac{1}{3}$ . See Figure 2 for other notes. Source: SOEP v36

Figure A.6: Impact of children on total hours of work



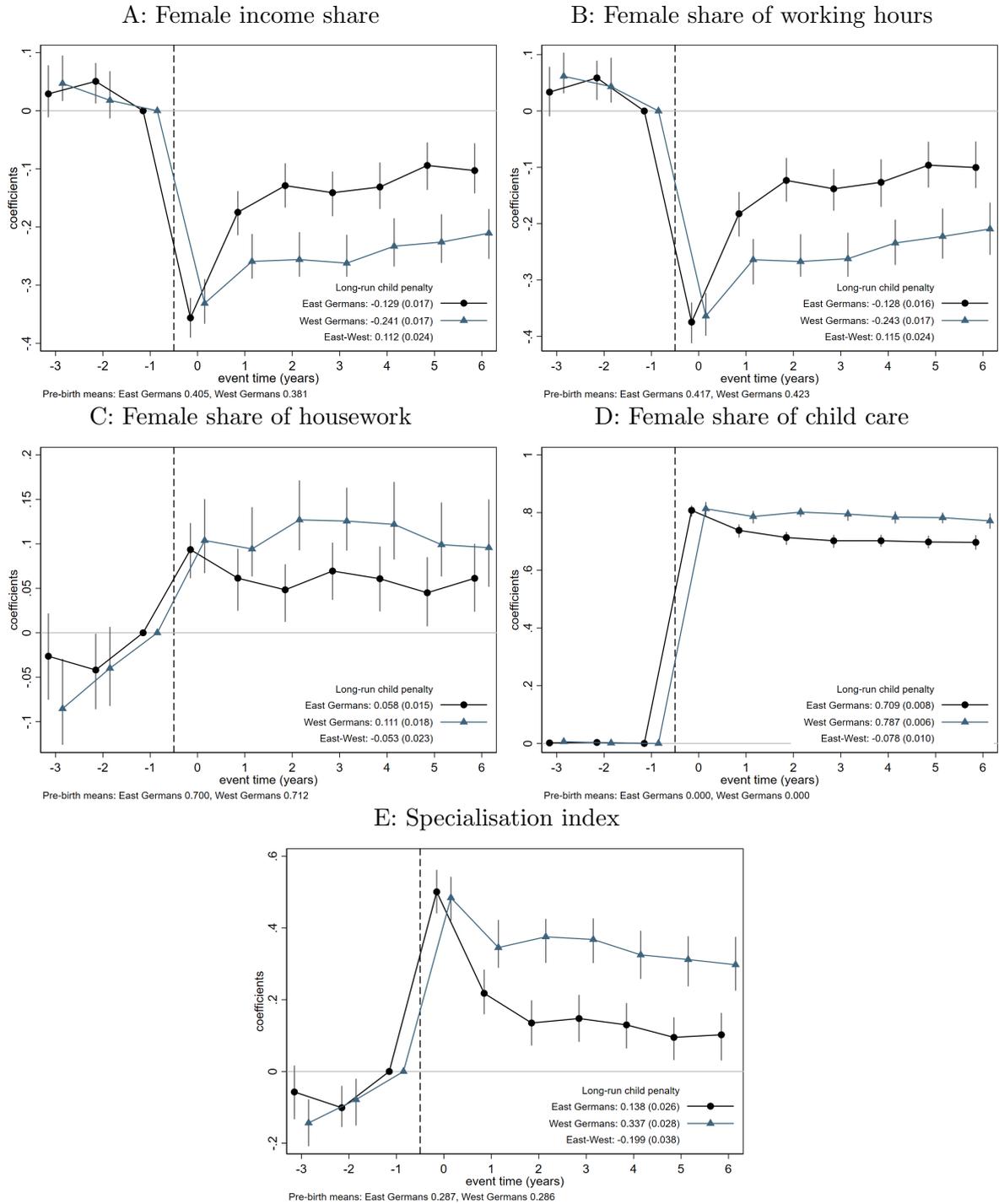
Notes: Figure shows event study estimates for total work, defined as paid work, housework and child care per weekday. See Figure 2 for other notes. Source: SOEP v36

Figure A.7: Impact of children on domestic gender inequality - gaps



Notes: Figure shows gaps corresponding to shares presented in Figure 3. See Figure 2 for other notes. Source: SOEP v36

Figure A.8: Impact of children on gender inequality - weighted estimates



Notes: Figure shows weighted child penalties corresponding to Figures 2 and 3. Weights are constructed following Kleven et al. (2021b) such that West German characteristics match the distribution of East German characteristics. Variables used for weighting; schooling and university degree, migrant background, municipality size class dummies (3), age dummies (3), total number of children, and birth year dummies (3), and an indicator for married couples. All estimations include survey year and age fixed effects. See Figures 2 and 3 for other notes. Source: SOEP v36

## B Additional Tables

Table B.1: Long-run effects of children - full sample and sample with pre- and post-birth observations

|                                  | East German couples  |                      | West German couples  |                      | East-West difference |                      |
|----------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
|                                  | (1)                  | (2)                  | (3)                  | (4)                  | (5)                  | (6)                  |
| <hr/>                            |                      |                      |                      |                      |                      |                      |
| Female income share              | <hr/>                |                      |                      |                      |                      |                      |
| Long-run effect                  | -0.129***<br>(0.017) | -0.143***<br>(0.020) | -0.239***<br>(0.008) | -0.240***<br>(0.009) | 0.110***<br>(0.019)  | 0.097***<br>(0.022)  |
| Female share of working hours    | <hr/>                |                      |                      |                      |                      |                      |
| Long-run effect                  | -0.128***<br>(0.017) | -0.144***<br>(0.019) | -0.258***<br>(0.008) | -0.261***<br>(0.008) | 0.130***<br>(0.018)  | 0.117***<br>(0.020)  |
| Female housework share           | <hr/>                |                      |                      |                      |                      |                      |
| Long-run effect                  | 0.058***<br>(0.015)  | 0.065***<br>(0.017)  | 0.133***<br>(0.008)  | 0.134***<br>(0.008)  | -0.075***<br>(0.017) | -0.069***<br>(0.019) |
| Female share of child care       | <hr/>                |                      |                      |                      |                      |                      |
| Long-run effect                  | 0.709***<br>(0.008)  | 0.712***<br>(0.011)  | 0.788***<br>(0.003)  | 0.788***<br>(0.004)  | -0.080***<br>(0.008) | -0.076***<br>(0.012) |
| Specialisation index             | <hr/>                |                      |                      |                      |                      |                      |
| Long-run effect                  | 0.138***<br>(0.027)  | 0.156***<br>(0.030)  | 0.351***<br>(0.014)  | 0.352***<br>(0.014)  | -0.213***<br>(0.031) | -0.196***<br>(0.034) |
| Age, survey year FEs             | Y                    | Y                    | Y                    | Y                    | Y                    | Y                    |
| Pre- and post-birth observations |                      | Y                    |                      | Y                    |                      | Y                    |
| Observations                     | 4,088                | 2,513                | 12,552               | 8,898                | 16,640               | 11,411               |

*Notes:* Long-run effects are defined as the average of post-birth ( $t = 1 - 6$ ) coefficients with bootstrapped standard errors (500 replications). Columns (1), (3) and (5) are as in Table 2. The even-numbered columns restrict the sample to households with pre- and post-birth observations. Significance levels: \* < 0.1 \*\* < 0.05 \*\*\* < 0.01. Source: SOEP v36

Table B.2: Test of approximated control group

|                      | Female share of      |                      |                      |                      |                      |                      |                      |                      |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
|                      | Monthly income       |                      | Working hours        |                      | Housework            |                      | Child care           |                      |
|                      | Event-study<br>(1)   | Appr.<br>(2)         | Event-study<br>(3)   | Appr.<br>(4)         | Event-study<br>(5)   | Appr.<br>(6)         | Event-study<br>(7)   | Appr.<br>(8)         |
| East Germans:        | -0.129***<br>(0.017) | -0.148***<br>(0.014) | -0.128***<br>(0.017) | -0.153***<br>(0.014) | 0.058***<br>(0.015)  | 0.071***<br>(0.011)  | 0.709***<br>(0.008)  | 0.645***<br>(0.013)  |
| Observations         | 3,890                | 4,240                | 3,724                | 4,050                | 4,088                | 4,426                | 4,618                | 4,156                |
| West Germans:        | -0.239***<br>(0.008) | -0.281***<br>(0.007) | -0.258***<br>(0.008) | -0.301***<br>(0.007) | 0.133***<br>(0.008)  | 0.174***<br>(0.006)  | 0.788***<br>(0.003)  | 0.780***<br>(0.004)  |
| Observations         | 12,332               | 13,779               | 11,792               | 13,165               | 12,552               | 13,989               | 13,947               | 12,380               |
| East-West difference | 0.110***<br>(0.019)  | 0.133***<br>(0.016)  | 0.130***<br>(0.018)  | 0.148***<br>(0.015)  | -0.075***<br>(0.017) | -0.104***<br>(0.013) | -0.080***<br>(0.008) | -0.135***<br>(0.013) |
| Observations         | 16,222               | 18,019               | 15,516               | 17,215               | 16,640               | 18,415               | 15,592               | 16,536               |

*Notes:* Table displays summarised event-study coefficients of having children based on equation (2) which uses pre- and post-birth information. Effects are defined as the average of post-birth ( $t = 1 - 6$ ) coefficients with bootstrapped standard errors (500 replications). Approximated coefficients are based on regressions of couples having children aged one to six with childless couples of a similar age range (5th to 95th percentile of age distribution of couples with children). Source: SOEP v36

Table B.3: Effect of children on attitudes, by sex of child

| Mean of dep. variable  | Women should be more concerned about family than career (0/1) |                      |                     | Child under 6 will suffer with working mother (0/1) |                      |                     |
|------------------------|---|----------------------|---------------------|---|----------------------|---------------------|
|                        | (1)   | (2)                  | (3)                 | (4)   | (5)                  | (6)                 |
| East German            | -0.102***<br>(0.028)  | -0.121***<br>(0.041) | -0.083**<br>(0.039) | -0.130***<br>(0.029)                                | -0.162***<br>(0.040) | -0.102**<br>(0.043) |
| Effect of children     | 0.053***<br>(0.020)   | 0.069**<br>(0.030)   | 0.042<br>(0.028)    | 0.023<br>(0.021)                                    | 0.002<br>(0.031)     | 0.034<br>(0.029)    |
| East German x children | 0.043<br>(0.032)  | 0.040<br>(0.046)     | 0.049<br>(0.046)    | 0.043<br>(0.032)                                    | 0.027<br>(0.042)     | 0.067<br>(0.048)    |
| Child sex              | Pooled  | Female               | Male                | Pooled  | Female               | Male                |
| Wave & age FEs         | Y   | Y                    | Y                   | Y   | Y                    | Y                   |
| Observations           | 3,689   | 1,837                | 1,850               | 3,679   | 1,831                | 1,846               |

*Notes:* Estimates in this table correspond to column (4) of Table 4 and additionally differentiate by sex of the first child. See Table 4 for other notes. Standard errors clustered at the individual-level in parentheses. Significance levels: \* < 0.1 \*\* < 0.05 \*\*\* < 0.01. Source: pairfam waves 1-11

## C Robustness

Table C.4: Estimates based on current location

|                              | Female share of      |                      |                     |                     |                       |
|------------------------------|----------------------|----------------------|---------------------|---------------------|-----------------------|
|                              | Income<br>(1)        | Hours<br>(2)         | Housework<br>(3)    | Child care<br>(4)   | Specialisation<br>(5) |
| East Germany                 | -0.120***<br>(0.019) | -0.120***<br>(0.018) | 0.057***<br>(0.016) | 0.710***<br>(0.008) | 0.133***<br>(0.028)   |
| Observations                 | 4,087                | 3,907                | 4,332               | 4,838               | 3,682                 |
| West Germany                 | -0.237***<br>(0.008) | -0.256***<br>(0.008) | 0.131***<br>(0.008) | 0.786***<br>(0.003) | 0.346***<br>(0.014)   |
| Observations                 | 17,173               | 16,518               | 17,634              | 18,502              | 15,063                |
| East Germans in West Germany | -0.175***<br>(0.051) | -0.178***<br>(0.050) | 0.092**<br>(0.042)  | 0.721***<br>(0.022) | 0.202**<br>(0.082)    |
| Observations                 | 461                  | 446                  | 468                 | 437                 | 408                   |
| West Germans in West Germany | -0.240***<br>(0.009) | -0.259***<br>(0.008) | 0.132***<br>(0.008) | 0.788***<br>(0.003) | 0.351***<br>(0.014)   |
| Observations                 | 12,226               | 11,697               | 12,443              | 11,590              | 10,722                |

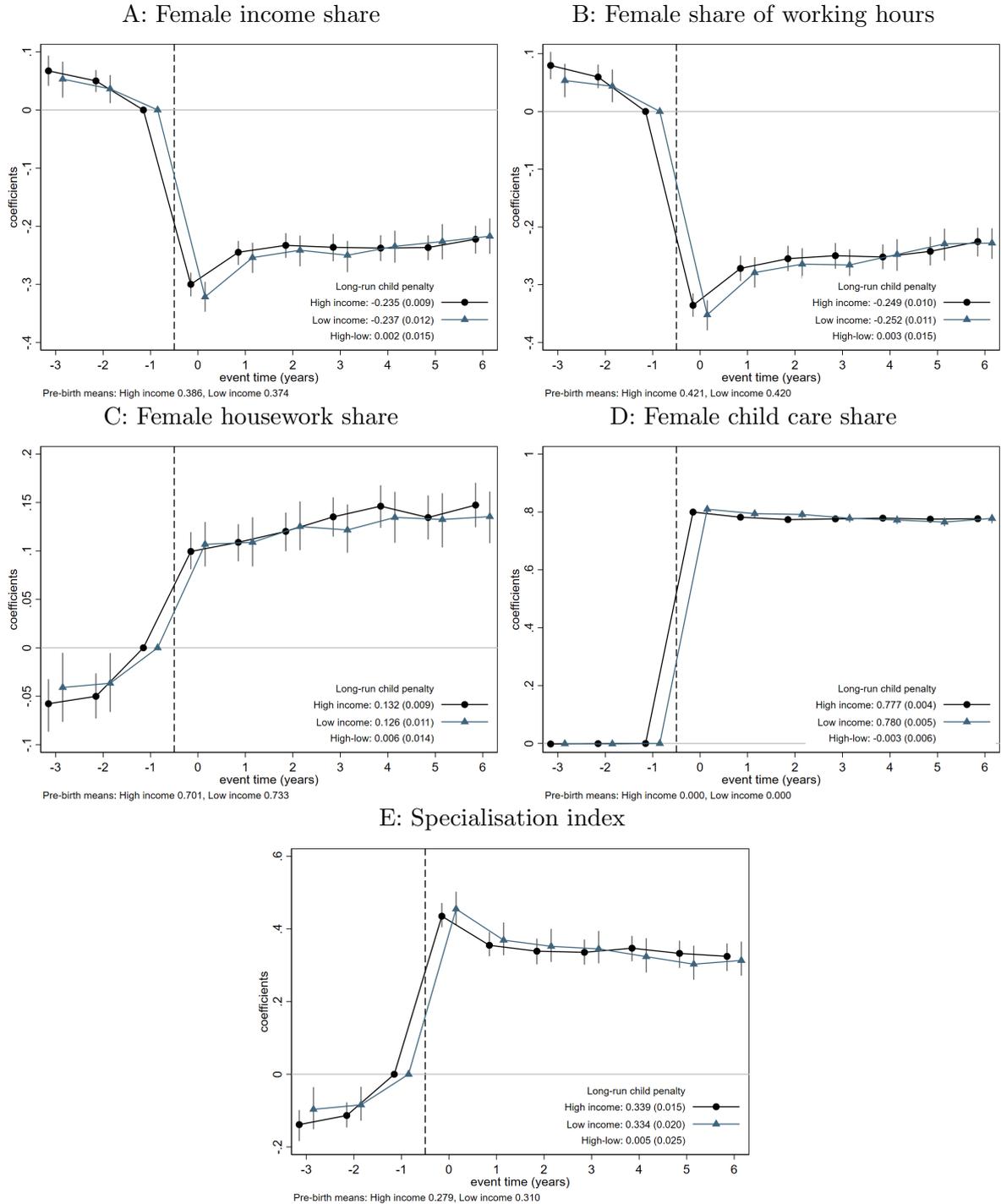
*Notes:* Table shows coefficients for the long-run effect of children as in Table 2. East and West German couples are defined by their 1989 location. East and West Germany relates to the current location. The two upper rows are only based on current location, the two bottom panels are restricted to West Germany and distinguish between East and West German origin of couples. Source: SOEP v36

Table C.5: Estimates with both partners born in Germany

|              | Female share of      |                      |                     |                     |                     |
|--------------|----------------------|----------------------|---------------------|---------------------|---------------------|
|              | Income<br>(1)        | Hours<br>(2)         | Housework<br>(3)    | Child care<br>(4)   | Specialisation      |
| East Germans | -0.131***<br>(0.017) | -0.132***<br>(0.018) | 0.060***<br>(0.015) | 0.709***<br>(0.008) | 0.145***<br>(0.028) |
| Observations | 3,814                | 3,655                | 4,009               | 3,827               | 3,442               |
| West Germans | -0.248***<br>(0.008) | -0.267***<br>(0.009) | 0.137***<br>(0.009) | 0.791***<br>(0.004) | 0.370***<br>(0.015) |
| Observations | 10,460               | 10,050               | 10,607              | 9,851               | 9,197               |

*Notes:* Table shows coefficients for the long-run effect of children as in Table 2 with the estimation sample restricted to couples where both partners were born in Germany. Main estimates in contrast are based on the 1989 location with no further restriction on birth place. Source: SOEP v36

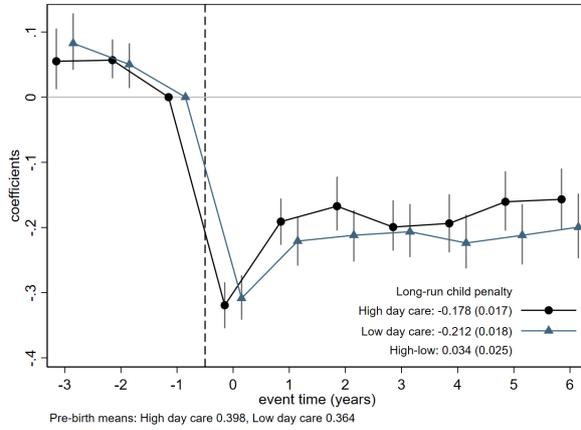
Figure C.9: West German counties split by income per capita



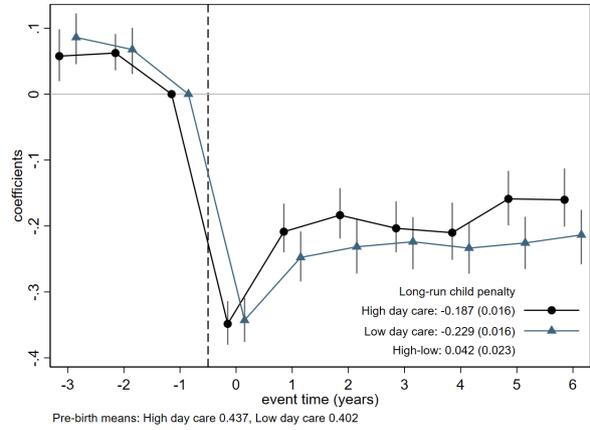
Notes: Figure shows event study estimates corresponding to Figures 2 and 3. The sample is restricted to couples living in West Germany and the sample is split by GDP per capita as of 2008. See Figure 2 for other notes. Source: SOEP v36 and Destatis

Figure C.10: West German counties split by day care availability

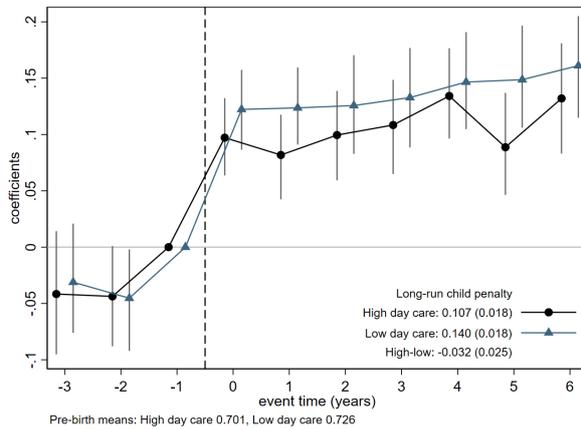
A: Female income share



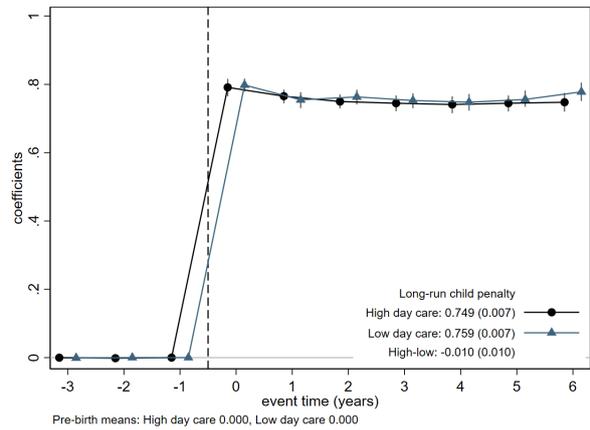
B: Female share of working hours



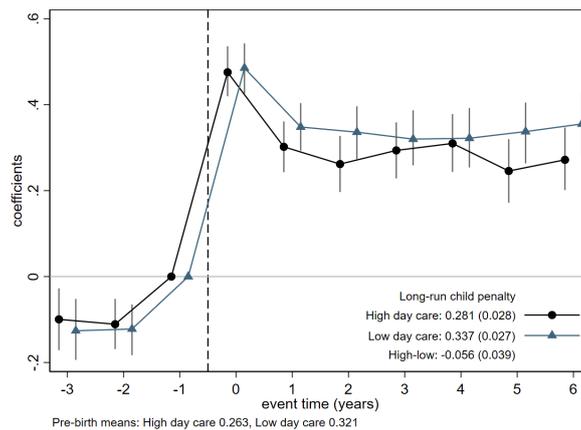
C: Female housework share



D: Female child care share

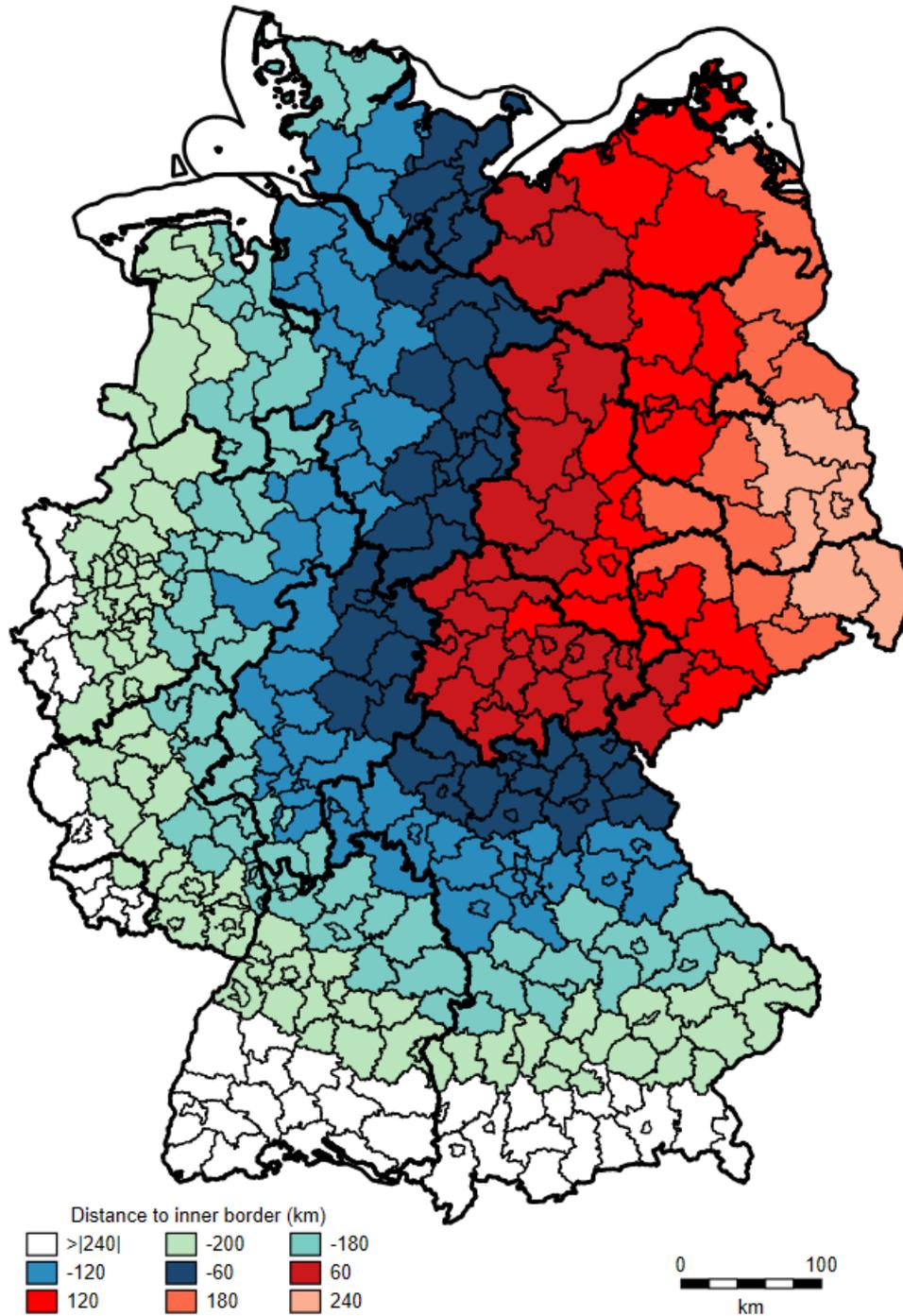


E: Specialisation index



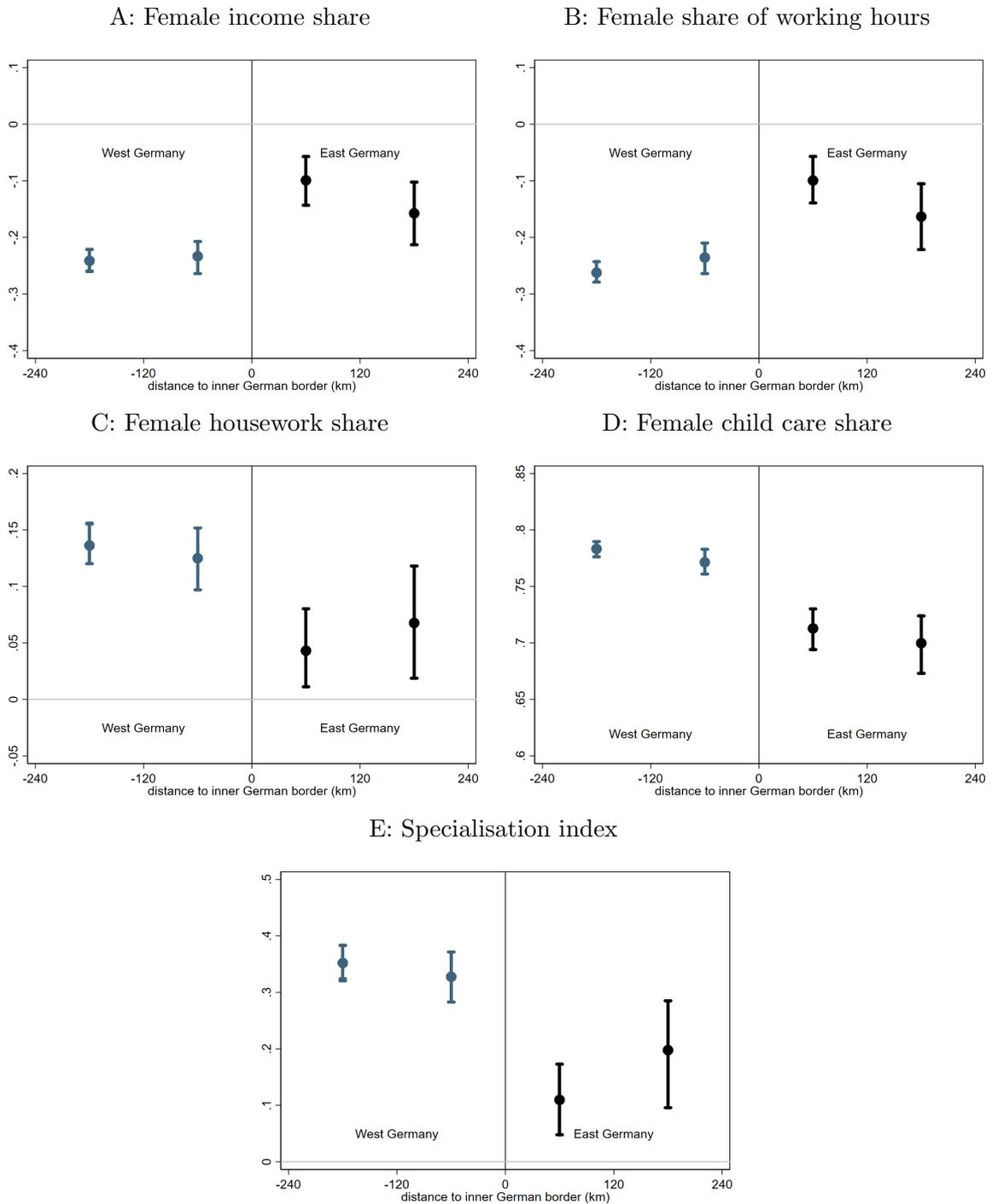
Notes: Figure shows event study estimates corresponding to Figures 2 and 3. The sample is restricted to couples living in West Germany and the sample is split at the county-level the share of children under the age of three enrolled in day care. Estimates based on births occurring between 2004 and 2019. See Figure 2 for other notes. Source: SOEP v36 and Destatis

Figure C.11: German counties and distance to inner border



*Notes:* Map shows contemporaneous German counties and their geodesic closest distance to the former inner German border. Distances are calculated from counties' centroids. Red shades indicate East German states, blue shades West German states. Shapefiles from the Federal Agency for Cartography and Geodesy

Figure C.12: Spatial RD



*Notes:* Figure shows long-run estimates of the arrival of children on within-couple gender inequality by distance to the inner German border. Distances are based on the current county of residence and are calculated from counties' centroids to the closest border point. Estimates are calculated in 120km bins to the border. Source: SOEP v36

## D Comparison of time-use data from diary data and SOEP

Time-use diary data is generally considered to contain less measurement error than survey data based on retrospective questions when it comes to accurately depicting individuals' time spent on various activities [Marini and Shelton \(1993\)](#). Diary data is commonly recorded throughout the day (or after a day) in small time slots. The German Time Use Survey asks participants to record their days in five- to ten-minute slots. In the SOEP questions are asked for a 'typical' weekday or weekend day and respondents may only indicate full hours, automatically leading to some activities being under- or overreported. The literature has found that especially unpaid work, which is usually carried out in irregular intervals, is difficult for respondents to accurately estimate ([Kitterød et al., 2005](#)). The precision of time-diary data comes at the expense of less background information available in such data on individuals, smaller sample sizes and the lack of a panel structure (in Germany, as in most other countries). Longitudinal data is essential for most analyses in this paper, e.g. clean event study estimates, making it desirable to be able to use information from the SOEP for some analyses.

In this Appendix section I compare averages obtained from the SOEP and from the German Time Use Survey, to verify the usage of survey data. In a first step some restrictions have to be imposed to make the samples more comparable. SOEP data is restricted to the same years as the three waves of the time-use survey (1991/92, 2001/02, 2012/13). In both data sets, only information from weekdays is used. Additionally I focus on the main group of interest; couples with exactly one child below the age of six.<sup>28</sup>

The time-use survey contains detailed 3-digit activities, e.g. the 3-digit category 'baking' belongs to the 2-digit category 'preparation of meals' of the 1-digit category 'housework'. In comparison the SOEP questionnaires ask for the time spent on housework (and shopping). Using the 1-digit category housework from the time-use data leads to large differences between the data sets with on average 50% more time spent on housework in the time-use survey. One reason for this is that SOEP also asks for time spent on repairs and gardening, which are two-digit categories belonging to housework in the time-use survey. To ensure better overlap between the housework information, a narrower definition of housework consisting of the 2-digit categories 'preparation of meals', 'maintenance and cleaning of the house or flat', 'fixing textiles' and 'shopping' is defined from the time-use survey.

Similarly, for child care, using the 1-digit category of the time-use survey initially leads to large differences with almost 200% more time spent on this in the SOEP. The retrospective questions in the SOEP generally allow for parallel activities and combining all the different activities elicited often adds up to more than 24 hours per day, whereas primary activities in the time-use survey are by definition mutually exclusive. Child care in the time-use survey consists of specific activities with the child, e.g. playing with or reading to the child. Besides the activities, the time-use survey also contains indicators on whether the child was present at any time ([Jessen et al., 2021](#), use the terms 'parenting activities' and 'time with child' to differentiate between those). As parents of young children will still be interacting with the children and be somewhat constrained by their presence, it is not unreasonable to assume that a general question for 'time spent on child care' will be interpreted this way.

Appendix Table [D.6](#) shows a comparison of time spent on housework and child care using the definitions described above. Panel A shows averages from the SOEP, and

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<sup>28</sup>The reason for this restriction is that the time-use data only contains information on the age of the youngest child in the household. In the event study estimates in this paper, in contrast, the event time relates to the birth of the first child (i.e. the oldest).

Panel B from the time-use survey. Both panels differentiate by survey wave, and displays results separately for women, men, the female share, and by location in East and West Germany. While the values are not perfectly in line, perhaps not too surprising given different sampling, and retrospective questions vs. time diary, it is still apparent that results from the two data sets are generally comparable and differences between different groups (by region or survey year) also tend to point in the same direction. This reassures that time-use information from the SOEP can be used reliably in the analysis.

Table D.6: Time use comparison

|                          | Housework        |                  |                  | Child care       |                  |                  |
|--------------------------|------------------|------------------|------------------|------------------|------------------|------------------|
|                          | 1991/1992<br>(1) | 2001/2002<br>(2) | 2012/2013<br>(3) | 1991/1992<br>(4) | 2001/2002<br>(5) | 2012/2013<br>(6) |
| Panel A: SOEP            |                  |                  |                  |                  |                  |                  |
| East                     |                  |                  |                  |                  |                  |                  |
| Women                    | 2.60<br>(1.43)   | 2.56<br>(1.50)   | 1.68<br>(1.00)   | 4.91<br>(3.64)   | 6.16<br>(4.03)   | 5.08<br>(3.27)   |
| Men                      | 0.53<br>(0.64)   | 0.78<br>(0.71)   | 0.99<br>(0.86)   | 1.98<br>(1.96)   | 2.09<br>(1.30)   | 2.36<br>(1.85)   |
| Female share             | 0.81<br>(0.20)   | 0.75<br>(0.21)   | 0.71<br>(0.24)   | 0.72<br>(0.23)   | 0.71<br>(0.17)   | 0.71<br>(0.20)   |
| Observations             | 236              | 261              | 253              | 234              | 259              | 250              |
| West                     |                  |                  |                  |                  |                  |                  |
| Women                    | 3.42<br>(1.89)   | 3.00<br>(1.98)   | 1.93<br>(1.11)   | 7.24<br>(3.42)   | 7.90<br>(4.05)   | 7.40<br>(4.65)   |
| Men                      | 0.49<br>(0.66)   | 0.69<br>(1.03)   | 0.78<br>(0.75)   | 1.80<br>(1.61)   | 2.16<br>(1.84)   | 2.60<br>(2.65)   |
| Female share             | 0.86<br>(0.20)   | 0.82<br>(0.22)   | 0.73<br>(0.26)   | 0.78<br>(0.18)   | 0.77<br>(0.17)   | 0.71<br>(0.23)   |
| Observations             | 737              | 957              | 693              | 725              | 932              | 682              |
| Panel B: Time-Use Survey |                  |                  |                  |                  |                  |                  |
| East                     |                  |                  |                  |                  |                  |                  |
| Women                    | 3.43<br>(2.07)   | 2.67<br>(2.10)   | 2.50<br>(2.03)   | 5.93<br>(3.60)   | 6.77<br>(4.05)   | 6.02<br>(3.28)   |
| Men                      | 1.70<br>(1.75)   | 1.30<br>(1.65)   | 1.32<br>(1.31)   | 2.95<br>(3.05)   | 3.41<br>(2.92)   | 3.06<br>(2.92)   |
| Female share             | 0.62<br>(0.25)   | 0.55<br>(0.26)   | 0.58<br>(0.29)   | 0.75<br>(0.26)   | 0.75<br>(0.29)   | 0.75<br>(0.27)   |
| Observations             | 872              | 100              | 212              | 872              | 100              | 212              |
| West                     |                  |                  |                  |                  |                  |                  |
| Women                    | 4.80<br>(2.09)   | 3.35<br>(1.95)   | 2.86<br>(1.91)   | 8.88<br>(3.64)   | 7.13<br>(3.05)   | 6.74<br>(3.41)   |
| Men                      | 1.58<br>(1.80)   | 1.24<br>(1.49)   | 1.28<br>(1.61)   | 3.04<br>(2.59)   | 3.25<br>(2.92)   | 2.91<br>(2.47)   |
| Female share             | 0.70<br>(0.23)   | 0.65<br>(0.25)   | 0.65<br>(0.27)   | 0.77<br>(0.24)   | 0.76<br>(0.25)   | 0.73<br>(0.27)   |
| Observations             | 2,362            | 408              | 630              | 2,362            | 408              | 630              |

*Notes:* Table compares average values for time spent on housework and on child care using SOEP survey data and the German Time Use Survey. The SOEP comparison sample is restricted to the same years as the time-use data. Averages refer to weekdays and observations are restricted to couples with a child between the age of one and six years. Source: SOEP v36 and German Time Use Survey