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# 1957

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# Culture, Children and Couple Gender Inequality

Jonas Jessen

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# Culture, Children and Couple Gender Inequality\*

Jonas Jessen<sup>†</sup>

8th July 2021

## Abstract

This paper examines how culture impacts within-couple gender inequality. Exploiting the setting of Germany's division and reunification, I compare child penalties of couples socialised in a more gender-egalitarian culture (East Germany) to those in a gender-traditional culture (West Germany). Using a household panel, I show that the long-run child penalty on the female income share is 26.9 percentage points in West German couples, compared to 15.5 in East German couples. I additionally show that among women in West Germany the arrival of a child leads to a greater increase in housework and a larger share of child care responsibilities than among women in the East. A battery of robustness checks confirms that differences between East and West socialised couples are not driven by current location, economic factors, day care availability or other smooth regional gradients. I add to the main findings by using time-use diary data from the German Democratic Republic (GDR) and reunified Germany, comparing parents with childless couples of similar age. This provides a rare insight into gender inequality in the GDR and allows to compare the effect of 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 thus on gender inequality as a whole.

*JEL: 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 remaining gaps (Córtes and Pan, 2020; Kleven et al., 2019b),<sup>1</sup> but uneven labour market responses to becoming a parent—i.e. employment interruptions with limited recovery are commonly only observed for mothers—are not per se 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.<sup>2</sup>

In this paper, I examine how culture impacts within-couple gender inequality. Using a long running household panel (SOEP), I compare child penalties using event study estimates between couples socialised in a more gender-egalitarian culture to those in a more gender-traditional culture but living in the same country. For this, I 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<sup>3</sup> and norms than those in the Federal Republic of Germany (FRG),<sup>4</sup> especially regarding maternal employment.

Figure 1 plots the distribution of the female share of household income among East

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<sup>1</sup>As child are associated with longer employment interruptions for women and often followed by part-time work thereafter, human capital serves as an explanation for gaps *after* having children only.

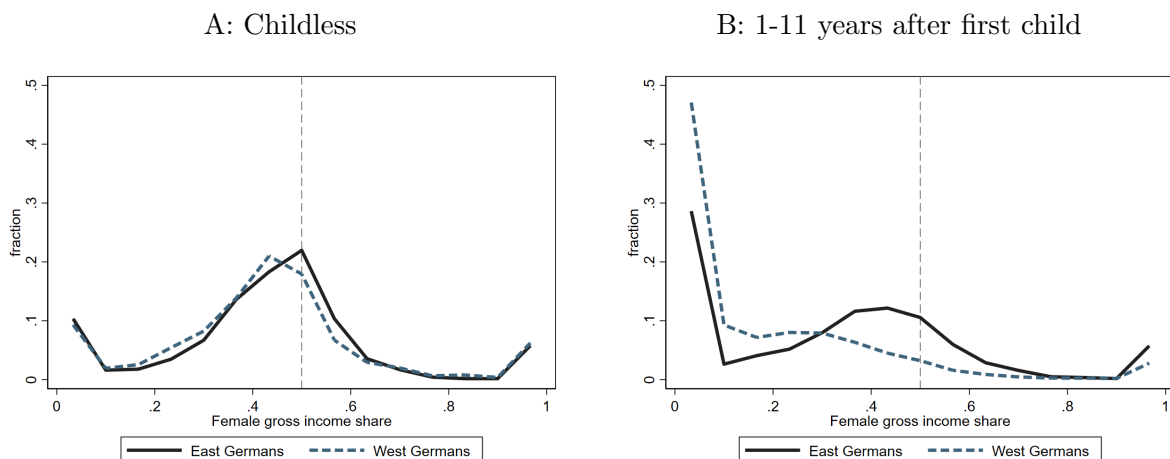
<sup>2</sup>In line with Giuliano (2021), I borrow the definition of culture proposed by Guiso et al. (2006) as a set of beliefs and values held by groups that are transmitted over generations.

<sup>3</sup>E.g. to facilitate maternal employment day care provision was universal in the GDR and Article 18 of the 1949 constitution already stated “equal pay for equal work” (Trappe, 1996). Also since the early 1950s women could freely decide on their employment, in the FRG this was only the case since 1977 (Lippmann et al., 2020).

<sup>4</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.

and West German couples.<sup>5</sup> For childless couples (Panel A) the income distributions are almost identical with a modal share of just below half, i.e. pre-birth gender differences exist but they are quite small. Additionally, with 34% (East) and 29% (West), a non-negligible share of women has higher earnings than their partner. In contrast, East-West differences are striking for parents with young children (Panel B); while the female income share has plummeted for both, the distribution for West German couples is substantially more right-skewed with a large share of mothers having exited the labour force or working few hours.<sup>6</sup> Barth et al. (2020) also show that differences in maternal full-time employment have decreased following reunification but no further convergence has occurred since the early 2000s.

Figure 1: Female income shares in East and West German couples



*Notes:* Income share based on gross monthly labour income of both partners. Distribution calculated in 15 bins of equal width. In Panel A the age range of women is restricted to be between the 5th and 95th percentile of Panel B (25 to 44). Sample covers 1990-2019. Source: SOEP v36

Several papers have shown that gender norms of parents map into those of their children, exposure to more egalitarian role models can have a lasting effect. Farré and Vella (2013) examine intergenerational correlations in gender attitudes and find that mothers' attitudes have a strong effect on those of their children when these are adults. 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 groundbreaking work, Fernández et al. (2004) document that wives of men who grew up with their mothers working are more likely to be in the labour force themselves.<sup>7</sup> As a result,

<sup>5</sup>East and West German couples are defined by their location in 1989, see section 3.

<sup>6</sup>This is also reflected in the shares of couples with young children having a main female earner, which are 23% (East) and 8% (West).

<sup>7</sup>Schmitz and Spiess (2021) identify the same mechanism in West Germany.

different socialisation in the GDR or FRG may have long-lasting impacts on child penalties and gender inequality.

I first estimate event-studies with panel data 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 26.9 percentage points (pp), 11.4 pp larger than in East German couples. I then show that inequality in *unpaid domestic work*, 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 before couples have 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. Micro data from the GDR regime is scarce and the newly digitised time-use data thus allows 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 time in the GDR were much smaller than in post-reunification West Germany (and to a lesser degree, East Germany) and that the child penalty for women was smaller. Inequalities in domestic work on the other hand were also strong in the GDR and women were almost solely responsible for child rearing. 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 mother is harmful for children under 6. Using event study estimates, I then show that children lead to more gender traditional attitudes for East and West Germans, with suggestive evidence for a slight convergence of attitudes.

A main contribution of this paper is that it estimates child penalties through the lens of social norms. A growing literature has estimated child penalties in recent years in different countries and settings (e.g. [Angelov et al., 2016](#); [Bertrand et al., 2010](#); [C  rtes and Pan, 2020](#); [Kleven et al., 2019a,b](#); [Kuziemko et al., 2018](#)). A consistent finding is that

mothers' labour market trajectories 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 their 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>8</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. [Kleven et al. \(2019a\)](#) conduct a cross-country analysis of child penalties and show that these 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.

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 convincingly control for confounding factors and explore further mechanisms.<sup>9</sup> I add to those papers in several dimensions; by taking a holistic view of children and gender inequality, besides looking at labour market outcomes, I additionally examine differences in time allocation in the household to non-market work (housework and child care) and to what extent the arrival of children induces a change in attitudes. As an additional contribution, I use time-use data from the GDR, giving a rare insight into gender inequality 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.

This paper also takes a couple-perspective, which is particularly valuable in this context. When differences in child penalties between groups are of key interest, the couple-

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<sup>8</sup>In contrast, [Córtes and Pan \(2020\)](#) and [Kleven et al. \(2018\)](#) find no evidence for strong heterogeneities by relative education in the US and Denmark, respectively.

<sup>9</sup>[Boelmann et al. \(2021\)](#) first document persistent differences within cross-border labour markets, second they show, by looking at migrating mothers, that East Germans in the West keep their norms whereas West Germans in East Germany adjust to local gender norms, and, 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 German women's labour force participation changes when their counties have experienced a high inflow of East Germans in the years following reunification.

perspective automatically controls for potential contextual confounders. In the case of East vs. West Germany, whereas the institutional framework, e.g. parental leave or the tax system are identical,<sup>10</sup> 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. Finally, because children have been found to be by far the biggest source of residual gender inequality in earnings in the 2010s,<sup>11</sup> by looking at children and their effect on couple gender inequality, the lens is put on by far the most important aspect of overall gender inequality in the labour market and direct inference can be drawn on gender gaps of parents (Angelov et al., 2016).<sup>12</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 *undone gender norms*, as East German women can have higher earnings within a couple without increasing housework (see West and Zimmerman, 1987, for the "doing gender" hypothesis) or risking their marriage, as is the case among West German couples.<sup>13</sup> However, Lippmann et al. (2020) do not explicitly 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 (see Figure 1), estimating child penalties sheds light on the magnitude of children in explaining this.

This paper also contributes to the sizeable literature examining long-run *effects*<sup>14</sup> of

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<sup>10</sup>An exception of the same institutional environment is the different upper earnings limit for statutory pension insurance, which as of 2004 (the median year of the analysis) at 5,150 Euros per month was 18% higher in West Germany.

<sup>11</sup>Two-thirds of gender inequality in the US and 80% in Denmark is child-induced, see C  rtes and Pan (2020) and Kleven et al. (2019b) respectively.

<sup>12</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 in their involvement in child care and in other domains of non-market work such as household chores.

<sup>13</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.

<sup>14</sup>Becker et al. (2020) have 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

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 detrimental effects of maternal employment on children (Zoch, 2021).<sup>15</sup> 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 on how children impact differences labour market outcomes, domestic work, and attitudes.

The paper proceeds as follows. The next section discusses the historical context of the German division and reunification, section 3 describes the data sources used and outlines the empirical approach. Results are presented in section 4 followed by a battery of robustness checks in section 5. I conclude in section 6.

## 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 and gender inequality (Trappe, 1996). The GDR—a socialist, de-facto one-party state—promoted a more gender egalitarian way, and both mothers and fathers in general worked full-time. This was actively encouraged by the GDR through the provision of a universal day care system and an obligation for both men and women to be in employment (Beblo and Gorges, 2018).<sup>16</sup> In contrast, the FRG was a market-based democracy with gender-conservative policies. Day care provision was limited, and regions with differing gender attitudes and histories of maternal employment.

<sup>15</sup>Other papers have, e.g., looked at differences in precautionary savings behaviour (Fuchs-Schündeln and Schündeln, 2005), preferences for redistribution (Alesina and Fuchs-Schündeln, 2007), or attitudes towards financial markets and investment behaviour (Laudenbach et al., 2020).

<sup>16</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, 2019). During the baby year mothers received generous wage replacement, but commonly returned to employment thereafter. Fathers were in principle also eligible but rarely used it.

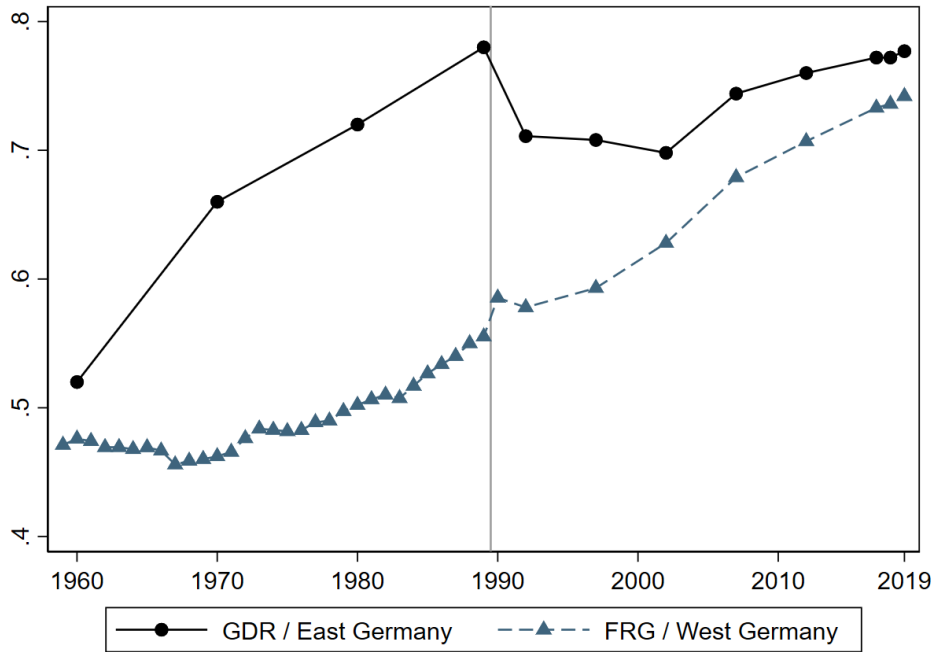
the tax and transfer system encouraged a male breadwinner model (or a one-and-a-half male breadwinner model with the woman working part-time). A series of parental leave expansions in the 1970s and 1980s temporarily prolonged maternal leave, but long-run effects on labour market outcomes were limited ([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 *working* mothers had in the FRG ("raven mothers") and *non-working* mothers in the GDR ("parasites", see [Boelmann et al., 2021](#)).

After increasing discontent in the GDR accompanied by mass demonstrations, the fall of the Berlin Wall in November 1989 finally led to 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 18-30 years olds ([Fuchs-Schündeln and Schündeln, 2009](#)). In the reunification process the GDR was fully integrated into the FRG and adopted their policies, including the tax and transfer system, and parental leave legislation (since 1992 mothers had 36 months of employment protection and means-tested benefits of about 300 Euros for 24 months, [Schönberg and Ludsteck, 2014](#)). Yet some differences in the institutional 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 2 shows female labour force participation rates for East and West Germany starting from 1959 to 2019. Differences were initially relative small, but the policies in the GDR led to a large increase in the following decades and reached 78% in 1989, among the highest rate 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, difference have persisted over the past two decades. In line with differences in female labour force participation, research has also shown that attitudes towards maternal employment immediately following reunification were substantially more gender-egalitarian in East Germany (see e.g. [Bauernschuster and Rainer, 2012](#)).



Figure 2: Female labour force participation



*Notes:* Figure shows female labour force participation for East Germany (GDR before 1990) and 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

### 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, 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 background characteristics. Being a panel study on the household-level, the data contain information from all household members aged 12 years and older. Importantly for my analysis, the survey asks where respondents had lived in 1989 (GDR, FRG or abroad), i.e. before reunification. 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 to define East and West German couples.



### 3.1 Sample criteria and outcome measures

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 role of children impacting gender inequality differentially 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 3 years pre- to 6 years post-birth (this is 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 couple observation in the event window, requiring a couple-level observations at least once before and after birth of the first child, similar to [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 in the sample. 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](#)), both married and non-married cohabiting couples are included (in contrast to the analyses of [Lippmann et al., 2020](#); [Sprengholz et al., 2020](#)). A further requirement is that both partners have 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 often impose a stronger restriction on the age range. While some papers examining earnings distribution of couples restrict their analysis to dual-earners couples (e.g. [Bertrand et al., 2015](#); [Lippmann et al., 2020](#)), 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. Table [1](#) provides an overview of the number of observations by sample restriction.

The outcomes considered in the analysis relate to the labour market, unpaid domestic

Table 1: Overview of analysis sample

<i>Sample</i>	East German couples		West German couples	
	Observations (1)	Individuals (2)	Observations (3)	Individuals (4)
All (post 1990)	77,124	8,044	181,729	20,732
Event time -3 → +6 years to first birth	8,806	1,615	26,743	4,862
Event time & pre- and post-birth observation	5,133	664	18,042	2,508

*Notes:* Table shows number of observations for different samples and number individuals in the samples. East and West Germans are defined by their 1989 location. First sample (All) covers 1984-2019, other samples cover 1990-2019. Source: SOEP v36

work, and an index taking both domains into account. The main labour market outcome is the share of female income of the household income within a couple. The income variable refers to gross labour income of the previous calendar month. As capital income is arguably to a lesser degree affected by gender norms in couples, this income component is not taken into account. 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 ( $< \frac{1}{3}$  of female income share) are presented in the Appendix. To capture not only the income distribution, but also the degree of participation in the labour market—an aspect of women’s empowerment in itself—I also show results for the female share of weekly working hours in couples.

On the domestic level, I look at contributions to unpaid domestic work (child care and housework<sup>17</sup>) in the household. Specifically, the questionnaire asks how many hours respondents spend on those tasks on average weekdays.<sup>18</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 outcomes 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

<sup>17</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 (Borra et al., 2021). Main results are presented using information on weekdays, when the trade-off between market work and domestic work is higher. The survey also asks for contributions on both weekend days biannually, results for weekly estimates are shown in the appendix.

<sup>18</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 child care is recoded, 24 hours of child care per day are indicated. Perhaps a comprehensible answer, but not suited to this analysis.)

particular advantage for those outcomes, as due to a strongly differing supply and enrolment rates of day care in East and West Germany,<sup>19</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>20</sup> Shares of child care within a couple take this into account.

Following Siminski and Yetsenga (2020), 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<sup>21</sup>) with 0 implying equal contributions to both domains by the partners. The distribution of  $SI$  in East and West German couples is presented in Appendix Figure A.2

Table 2 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.

### 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 finances study and the data is representative of worker and employee households (Fiebiger, 1991). participation and working hours are relatively fixed. Berkes et al. (2021) provide further details on the data. Reliable micro data from the GDR is rare, so this data source offers a unique opportunity to gain insights on time use and gender inequality in a state-socialist country

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<sup>19</sup>As of March 2020, 52.7% of under threes were enrolled in East Germany compared to 31% in West Germany. See: <https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Soziales/Kindertagesbetreuung/Tabellen/betreunungsquote-2018.html>, last accessed 4th May 2021.

<sup>20</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.

<sup>21</sup>Hereby I follow Farré and Vella (2013) in using the term *traditional* when referring to a situation when women are responsible for domestic work and men for market work.

Table 2: Pre-birth characteristics

	East German couples		West German couples	
	Women (1)	Men (2)	Women (3)	Men (4)
<i>Individual characteristics</i>				
Age in years	26.56 (4.03)	29.75 (5.03)	28.97 (4.42)	32.00 (4.97)
Current location in East Germany	0.83 (0.38)	0.80 (0.40)	0.01 (0.11)	0.01 (0.11)
Married	0.41 (0.49)	0.35 (0.48)	0.62 (0.49)	0.61 (0.49)
Higher schooling degree	0.35 (0.48)	0.28 (0.45)	0.40 (0.49)	0.44 (0.50)
University degree	0.24 (0.43)	0.18 (0.39)	0.23 (0.42)	0.31 (0.46)
Any employment	0.81 (0.39)	0.89 (0.31)	0.90 (0.30)	0.95 (0.23)
Full-time employment	0.70 (0.46)	0.84 (0.36)	0.76 (0.42)	0.90 (0.30)
Weekly working hours	33.32 (17.85)	39.78 (16.50)	34.92 (14.73)	41.45 (13.03)
Monthly gross earnings	1,413.92 (1026.78)	1,989.96 (1268.72)	2,038.29 (1194.80)	3,101.88 (2204.66)
Hourly wage	10.75 (4.97)	13.15 (5.75)	14.57 (5.98)	18.93 (9.81)
Hours of housework	1.73 (1.41)	0.81 (0.77)	1.70 (1.25)	0.82 (0.71)
<i>Couple characteristics</i>				
Female share of labour income	0.41 (0.26)		0.41 (0.22)	
Female share of working hours	0.44 (0.25)		0.46 (0.21)	
Specialisation index	0.24 (0.42)		0.22 (0.37)	
Observations	762	709	2389	2247

*Notes:* Table shows pre-birth (1 to 3 years) 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

where

Second, I use three waves from 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 ten (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

socialisation of individuals.<sup>22</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 next 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 11 waves released to date.<sup>23</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 to implement event study estimates to analyse whether the arrival of children is associated with a change in 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 individual (couple)  $i$ , of region  $r \in \{East, West\}$ , in year  $s$ , and event time  $t$ . Standard errors are clustered at the individual level. 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 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>24</sup> Identification stems from variation in age at first birth and

<sup>22</sup>Appendix Table C.5 shows that in the SOEP estimates based on socialisation or current location are indistinguishable.

<sup>23</sup>A documentation of the latest release is provided by Brüderl and et al. (2020) and a detailed description of the study is found in Huinink et al. (2011)

<sup>24</sup>If life cycle and time effects were not taken into account, the event-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.

across time. Equation (2) is estimated separately for East and West German couples, to allow for differential life cycle or time effects.<sup>25</sup> An attractive feature of event study designs is that obtained coefficients can be presented neatly in event study graphs. 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.

Besides the event study specification, similar to Kuziemko et al. (2018) I also estimate a simpler difference-in-differences-type equation to obtain a summary coefficient for the average post-birth effect. I specify three discrete points in time; pre-birth, the year of birth and post-birth. The equation is

$$y_{ist}^r = \zeta^r \cdot birth + \delta^r \cdot post + \sum_k \phi^r \cdot \mathbb{I}[k = age_{is}] + \sum_y \theta_y^r \cdot [y = s] + u_{ist}^r \quad (3)$$

The coefficient of interest,  $\delta$ , is reported in all event study graphs as well. While the event study estimates based on equation (2) can tease out the detailed evolution of effects by year, an advantage of this estimation technique is that it provides one summarising coefficient and due to pooling of several years it requires fewer annual (event time) observations, making it more suitable for looking at subgroups. All descriptive analyses in this paper are based on calculations using survey weights.

The impact of children on a wide range of outcomes can most credibly be estimated in an event study framework and this has become the standard in the literature. However, in some cases due to data limitations this is not possible; event study estimates 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. In contrast to simply documenting East-West differences as has been extensively done in the literature, the aspect of interest here is whether the arrival of children exacerbates such differences. The sociological literature has argued that parenthood can activate gender norms (sleeping effect) and lead to more gender-traditional attitudes (e.g. Corrigall and Konrad, 2007; Cunningham, 2001).

To approximate the impact of children in cross-sectional data, I compare outcomes of couples with young children to childless couples of a similar age range. Specifically, I use

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<sup>25</sup>Differences could for example arise if due to different socialisation if it is the norm in one region to have children only after a few years of labour market experience.

a sample of couples aged in the 5th to 95th percentile of first-time parents. I estimate the equation

$$y_{ist}^r = \kappa \cdot child + \sum_k \omega^r \cdot \mathbb{I}[k = age_{is}] + \sum_y \lambda^r \cdot [y = s] + X'\omega + \nu_{ist}^r \quad (4)$$

where *child* is a binary indicator equal to one for couples having a child aged one to six years, and zero for childless couples. *X* contains indicators for higher education and marital status. In cross-sectional data one cannot assess the validity of this control group, as of course 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 based on equation (3) and contrasts them with those obtained from equation (4) with the approximated control group. For the outcomes female share of income, working hours and housework, true and approximated coefficients are very close, only for female share of child care is the difference in East German households notable. Despite those encouraging results, due to the imperfect control group those results ought to 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 similar age.

## 4 Results

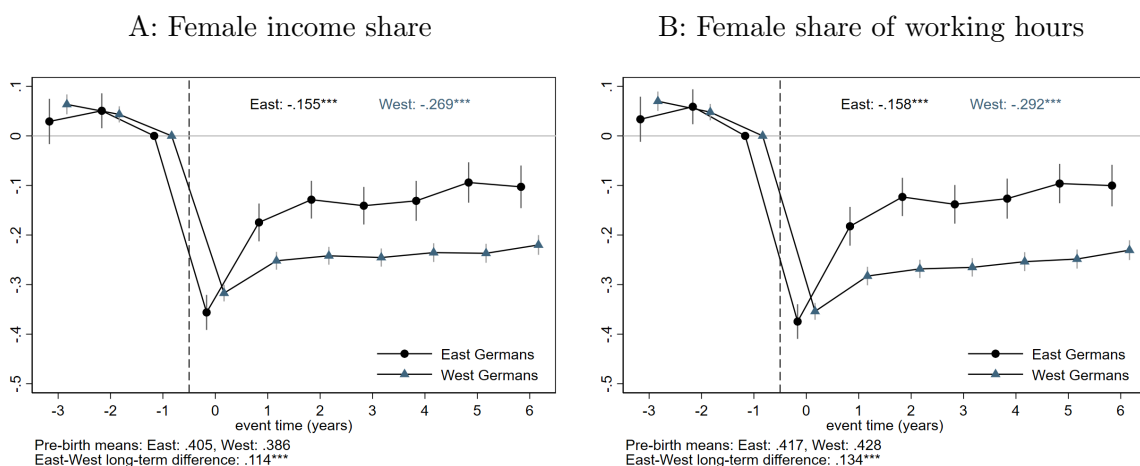
### 4.1 Labour market and domestic outcomes - event study

**Labour market outcomes** Figure 3 shows the impact of children for the two main couple-level labour market outcomes across event time by region. Coefficients are normalised to the pre-birth year ( $t = -1$ ), range lines indicate 95% confidence intervals calculated with standard errors clustered at the individual level. 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 26.9 pp averaged over the post-birth years. The impact in West German couples is 74% larger relative to East German couples, where the share is reduced by 15.5 pp. As can be seen in the pre-birth averages, this is by no means a move to the same post-birth value in East and West Germany (say 25%) but a further divergence in the earnings share between East

and West German couples.

A potential explanation for these differing child penalties could be that bargaining power—through 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 lower educational attainment, the East-West long-term difference still amounts to 9.6 pp. Additionally, differential future fertility could exacerbate differences if more West German couples have additional children. Yet looking only at one-child families,<sup>26</sup> East-West differences amount to 11.9 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 recovers after four years, but remains below 10 pp lower for West Germans. The local effect of a second child is similar for East and West Germans.

Figure 3: Impact of children on labour market gender inequality



*Notes:* Figure shows event study estimates for the respective outcomes. Units of observations are couples. Coefficients are normalised to the pre-birth year ( $t = -1$ ), means from this year are displayed in the figure notes. Long-term coefficients shown in the figure stem from estimates pooled over post-birth years ( $t = 1 - 6$ ). Income share refers to gross monthly labour income. East and West Germans are defined by their 1989 location. Significance levels: \*  $< 0.1$  \*\*  $< 0.05$  \*\*\*  $< 0.01$ . Source: SOEP v36

In Panel B of Figure 3 the share of working hours is displayed. The similarity of the impact on those two outcomes indicates that the effect on hourly wages differs little. In fact, the negative impact on (log) hourly wages is slightly more pronounced for East German mothers where there is less selection into post-birth employment than for West German mothers. Appendix Table B.3 shows overall couple-level sums for the main outcomes, from which the shares are calculated.

<sup>26</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, exactly one child is observed.



While having a child is a permanent negative shock to gender equality in the labour market for couples from both regions, it is so to a much larger degree in West German couples. Additional results are presented in the Appendix. To include couples were both have zero earnings or hours (3-4% of observations) instead of *shares* I also show *gaps* for the outcomes (Appendix Figure A.5). As due to different labour market conditions the earnings level between East and West Germany differs strongly, for ease of interpretation shares are preferred over gaps. However, results are qualitatively the same. Panel C in Appendix Figure A.5 further shows the effect of a discrete binary categorisation of the couple having a main male breadwinner ( $< \frac{1}{3}$  of female income share), which increases in West Germany by 58.3 pp compared to 32.3 pp in East Germany. Individual level event study estimates are presented in Appendix Figure A.6. In line with existing evidence, fathers' labour market trajectories are not strongly affected by children, with small negative coefficients observed for East German fathers.

**Domestic work** Next, I turn my attention to non-labour market outcomes and look at contributions to domestic work, i.e. housework and child care. Although East German mothers' weekly working hours recover to some degree from two years after birth onward, it does not follow unambiguously that their relative contributions to domestic work decrease accordingly. If one partner, mostly mothers, temporarily withdraws from the labour market, additional domestic work and especially child care is often covered by this person. 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, which could have negative long-run effects on working hours and flexibility, which negatively affects wages (Goldin, 2014).

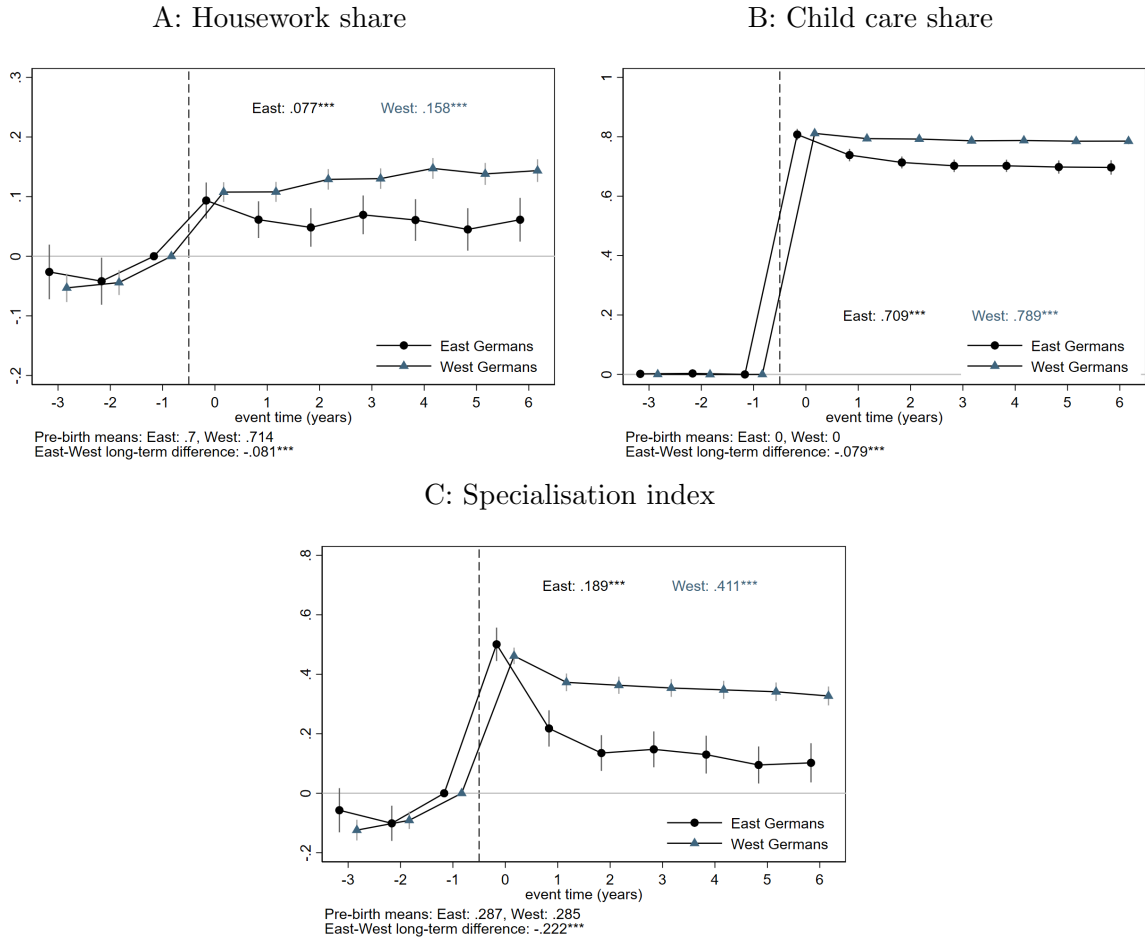
Estimates for domestic work are obtained using the same framework as the previous section, but for child care the estimation cannot follow the identical event study logic as child care investments only start when the child is born.<sup>27</sup> To be consistent the results for child care are still shown in the same way, but the normalisation to  $t = -1$  is irrelevant. To a lesser, non-deterministic degree this also holds for housework because 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

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<sup>27</sup> The questionnaire asks for child care in general and not necessarily for child care of the respondent's children. Yet 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 time spend on child care) compared to 9 hours in first post-birth year. Due to this I am confident that child care time measures to large degree time with the own child and I set pre-birth child care time to zero.

same fixed range, say 0-50 weekly hours. I also present estimates for the specialisation index by [Siminski and Yetsenga \(2020\)](#) 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 ( $SI = 1$ ). The advantage of such an index is that it summarises distinct aspects of household specialisation in one number. Because it is calculated with shares, it is less prone to distortions due to overall level differences between regions (e.g. labour market conditions or day care availability).

Figure 4: Impact of children on domestic gender inequality



*Notes:* Figure shows event study estimates for the respective outcomes normalised to the pre-birth year ( $t = -1$ ). Housework and child care refer to shares on weekdays. The specialisation index is defined in equation (1). See Figure 3 for other notes. Source: SOEP v36

Figure 4 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 work-hours where prior to children the distribution was more equal, gender inequality in this domestic domain was already prevalent without children as women were on average responsible for around 70% of housework. Post-birth, when the total amount of housework increases as well in couples (Appendix Figure A.3 and Appendix Table B.3), the

female share increases by 8-16 pp with—as for labour market outcomes—a stronger effect in West German couples.

Child care (Panel B), starting from a base of zero, is (still) a predominantly a female domain with an initial share of 80% in East and West German couples and only a decrease of just below 10 pp in East German couples as the child gets older. The constant high share in West German couples is even more remarkable as the total amount of daily child care in couples decreases from almost 11 hours ( $t = 1$ ) to less than 9 hours ( $t = 6$ ), meaning that the decreased total time is decreased proportionally by fathers as well who from the onset had much lower involvement. The relative contributions to market and domestic work is summarised in the specialisation index in Panel C. While couples were already specialised pre-birth (0.287 in East and 0.285 in West German couples), the arrival of the first child leads to a spike in specialisation in couples with relative increases in the index of 66 and 144%. Remarkably, even 15 years later the impact of the first child in West German couples on the specialisation index is 0.30 (0.12 in East German couples, not shown but available upon request). This suggests that having a child leads to a *permanent* traditional orientation in couples.<sup>28</sup> Estimates for *total hours of work* per weekday (paid work, housework and child care) in Appendix Figure A.8 show that the female share of overall work increases, and more so for West Germans, 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 in gaps (Appendix Figure A.9) and the individual-level contributions (Appendix Figure A.10) are displayed in the Appendix. 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 within couples after the arrival of a child. Additionally, East-West differences are also stronger with a continuously increasing housework gap in West couples. For child care, the differences in the impact on the gap 6 years after having a child is about three hours per day. At this age, in both West and East Germany almost all children attend day care or school.

Long-run estimates, i.e. average estimates for one to six years after birth, and standard errors of estimates for the main labour market and domestic outcomes are summarised in Table 3. Columns (5) and (6) show the difference in long-run estimates between East

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<sup>28</sup>Estimates using the weekly information rather than from weekdays only are presented in Appendix Figure A.7. Results indicate that child induced inequality in domestic work is lower on weekend days as the coefficients are slightly reduced, but they remain large and East-West differences are very close to the main estimates.

Table 3: Long-run impacts of children

	East German couples		West German couples		East-West difference	
	(1)	(2)	(3)	(4)	(5)	(6)
Female income share						
Long-term effect	-0.155*** (0.016)	-0.140*** (0.016)	-0.269*** (0.007)	-0.241*** (0.008)	0.114*** (0.017)	0.102*** (0.018)
Female share of working hours						
Long-term effect	-0.158*** (0.015)	-0.150*** (0.015)	-0.292*** (0.007)	-0.269*** (0.008)	0.134*** (0.016)	0.119*** (0.017)
Female housework share						
Long-term effect	0.077*** (0.013)	0.060*** (0.013)	0.158*** (0.007)	0.129*** (0.007)	-0.081*** (0.015)	-0.069*** (0.015)
Female share of child care						
Long-term effect	0.709*** (0.008)	0.704*** (0.008)	0.789*** (0.003)	0.783*** (0.004)	-0.079*** (0.009)	-0.079*** (0.009)
Specialisation index						
Long-term effect	0.189*** (0.024)	0.167*** (0.024)	0.411*** (0.012)	0.365*** (0.013)	-0.222*** (0.026)	-0.198*** (0.027)
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:* Table shows long-run coefficients ( $t = 1 - 6$ ) of the arrival of children on within-couple gender inequality. Columns (1), (3) and (5) are estimates shown in Figures 3 and 4. Additional control variables added in other columns: schooling and university degree, federal state dummies (16), migrant background, municipality size class dummies (7) and an indicator for married couples. Standard errors clustered at the couple-level in parentheses. Significance levels: \* < 0.1 \*\* < 0.05 \*\*\* < 0.01. Source: SOEP v36

and West German couples obtained from a fully interacted model. 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. Coefficients are generally stable when control variables are added in the estimation and support strong East-West differences in the long-term effects of children on within-couple gender inequality.

## 4.2 Time-use evidence

A downside to the usage of survey data for analysing time use is the inherent lack of precision (SOEP only allows for answers in full *hours*), recall bias, the issue of social desirability, and measurement error. Data from time-use studies, recorded in fine-grained

diaries over survey days, resolve 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). Time-use researchers have found that despite differences in activities in diary versus survey data, the approaches tend to yield comparable patterns between groups and are therefore insightful (see, e.g., Baxter and Bittman, 1995; Marini and Shelton, 1993). Due to the lack of a panel structure in German time-use studies, the impact of children cannot be estimated with this data, but it allows for a more detailed inspection of gender inequality in time use in couples with and without young children. These analyses are complementary to the event study estimates using SOEP in order to gain a thorough understanding of within-couple gender inequality, particularly for non-market work, and to include evidence from the GDR.

Since reunification, three time-use surveys (1991/92, 2001/02, 2012/13) have been conducted in Germany. Additionally, two time-use 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. Despite some differences in the sampling design, the time-use surveys have been conducted in a comparable fashion in the GDR and in reunified Germany. This allows to compare outcomes from the GDR and to those from East and West Germany in a consistent framework, which was not feasible with the SOEP. To contrast couples with and without children, the sample is restricted to couples with either i) children under 6 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).

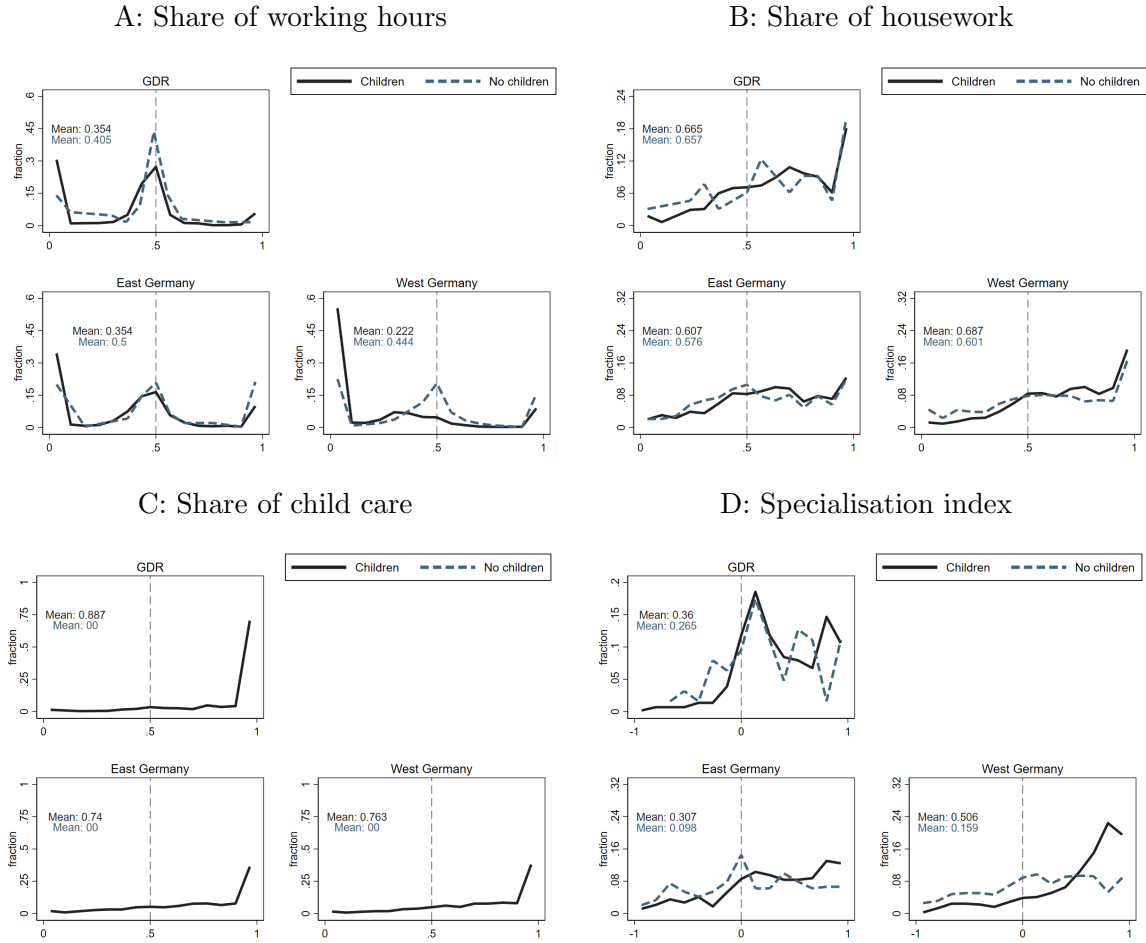
In Figure 5 the couple-level distributions of the female share of (market) working hours, housework and child care, and the specialisation index are plotted separately for the GDR, East and West Germany. In Panel A the narrow distribution of working hours in the GDR is apparent;<sup>29</sup> of couples with both partners working, the female share lies in the range of 0.4 and 0.6 in 74% of couples. Additionally, with 5 pp the difference between couples with and without children is quite low. After reunification, the difference in the working hours distribution by children in East Germany is larger than in the GDR, but much smaller than in West Germany (14 vs. 22 pp). Overall a wider distribution of the working hours share is evident in Germany, which is mostly due to a larger share of

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<sup>29</sup>By law, a standard work week was 43.75 hours, and 40 hours for mothers with two children below the age of 16 (Rosenfeld et al., 2004).

individuals not in employment.

Figure 5: Distribution of activities - time-use data



*Note:* Figures show within couple shares of respective activities per survey day. Sample is restricted to weekdays. Region refers to current location of couples. GDR data from 1985 and 1990, East and West German data from 1991/1992, 2001/02 and 2012/13. Children indicates a child under 6 years in the household, couples with no children are in the 5th-95th percentile age range of couples with children in the sample. Distribution calculated in 15 bins of equal width. Sources: Time-Use Study of the GDR and German Time-Use Survey

With market work being relatively evenly distributed in the GDR (and to a slightly lower degree later in East Germany), strong gender inequalities can be observed in domestic work as documented by [Nickel \(1992\)](#). About two-thirds of housework in the GDR is performed by women, but the average differs little by children. The housework shares for childless couples after reunification are quite similar in both regions of Germany, but in line with the stronger decrease in working hours, children increases the female housework share substantially and more so in West Germany.

Child care is mostly the responsibility of mothers across space and time. Notably, the share in the GDR is more than 10 pp *higher* in the GDR than in East and West Germany. Gender egalitarian policies in the GDR focused on labour market aspects ([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](#)).

The specialisation index summarises the gender-specific specialisation in households and illustrates that the GDR was in fact more gender egalitarian than West Germany, but less so than post-reunification East Germany. However, the difference by children in the GDR is smaller. In Appendix Table [B.4](#) 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 generally smaller using time-use data, which could be attributed to different samples, measurement and the imperfect comparison of households with and without children. Regardless, East-West differences remain strong.

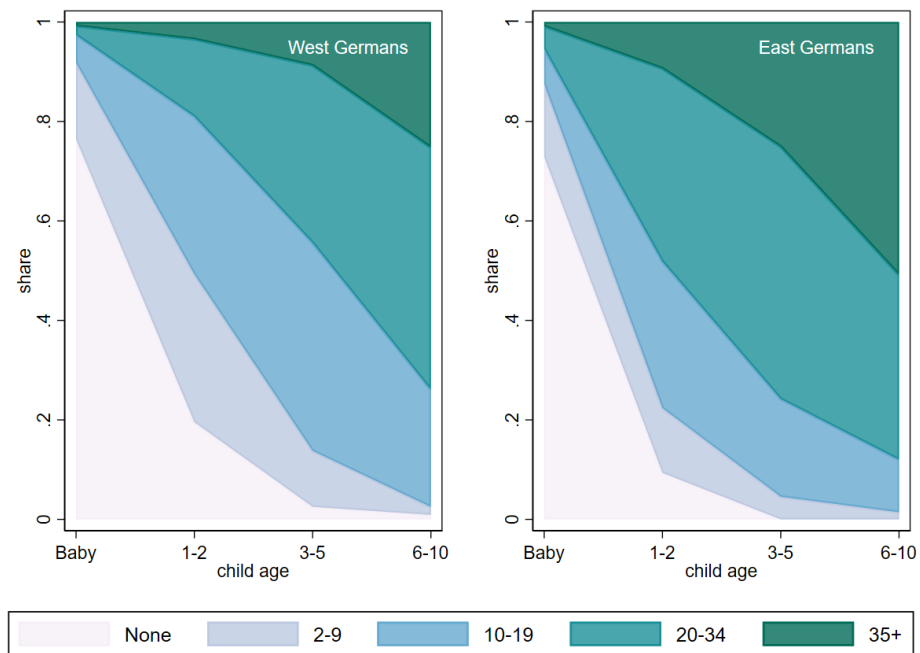
### 4.3 Attitudes

Differences in gender-related 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 holding more egalitarian views. Building on this, this subsection examines how attitudes specifically related to maternal employment differ and whether the arrival of children has an impact on such attitudes. This section uses data from the German family panel *pairfam*. A set of questions ask parents how many hours mothers of children of different age groups should ideally be working. An attractive feature of this is that it allows to analyse differences in attitudes towards both the extensive and intensive margin of maternal employment by child age.

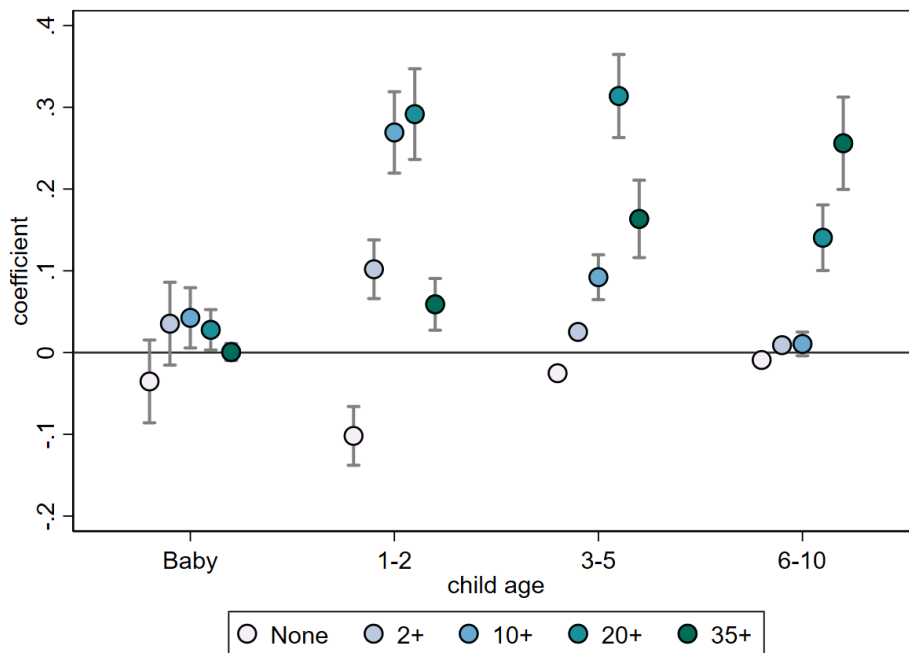
The distribution of ideal working hours by child age is presented in Figure [6](#), Panel A. In the first year of a child, both East and West Germans indicate that mothers should not be in employment or, if so, only be working few hours. This is consistent with very similar effects on labour market outcomes in the first year post-birth (Figure [3](#)). 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 moderate hours. In contrast, about half of East Germans suggest that mothers of children aged 1-2 should be working 20 hours or more per week (which only 19 percent of West Germans are in favour of). With increasing

Figure 6: Maternal employment by child age

A: Ideal weekly working hours for mothers



B: East-West differences



*Note:* 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. The underlying questions are only asked to respondents with children. Source: pairfam waves 1-11

child age longer maternal working hours are deemed ideal in East and West, but it is worth pointing out that even in more gender-egalitarian East Germany less than half of



respondents prefer full-time maternal working hours. If those attitudes are adhered to, a full catch-up of mothers in terms of labour market outcomes is incompatible. Panel B of Figure 6 displays East-West differences in attitudes towards working hours by child age, making apparent that differences are initially small and with increasing child age are first stronger at the extensive and later at the intensive margin.<sup>30</sup>

While this evidence is intriguing as it helps to explain differential recovery for East and West Germans, it is unclear whether these differences were pre-existent and constant, or either exacerbated or diminished after the arrival of children. Kuziemko et al. (2018) have 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 conversion (or further divergence) between 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 questions which are asked in the survey irrespective of respondents having children, allowing to investigate whether these attitudes change. *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 are coded from 1 (disagree completely) to 5 (agree completely), for ease of interpretation both variables are used as binary indicators if respondents indicate partial (4) or full (5) agreement.

In an intermediate step, Panel A of Table 4 displays East-West differences. In line with the extant literature, East Germans are about 6 pp less likely to agree that women should be more concerned about family than career (37% relative to the sample mean) and 14 pp less likely to say that a child suffers under a working mother (67% of the mean). Regarding women putting family over career, gender differences in responses are small (columns 2 and 3). However, men are much more likely to agree with the statement that young children suffer with a working mother (columns 5 and 6), but the larger East dummy for the men-only sample indicates that gender differences in East Germany are generally smaller in this regard (5 vs. 13 pp).

In a second step I take advantage of the panel structure and use an event study design as in the main analysis in subsection 4.1. Similarly, I use data from three years pre- to six years post-birth and report the average pooled post-birth coefficient. Panel B,

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<sup>30</sup>This pattern can also be observed for *desired working hours of respondents* using SOEP data (Appendix Figure A.11).

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

	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)
<i>A: East-West differences</i>						
Mean of dep. variable	0.156	0.158	0.153	0.213	0.161	0.268
East dummy	-0.058*** (0.010)	-0.059*** (0.014)	-0.060*** (0.014)	-0.143*** (0.011)	-0.106*** (0.013)	-0.182*** (0.017)
Sample	Pooled	Women	Men	Pooled	Women	Men
Wave & age FEs	Y	Y	Y	Y	Y	Y
Observations	13,621	7,084	6,536	13,561	7,061	6,499
<i>Panel B: Impact of children on attitudes</i>						
Mean of dep. variable	0.180	0.180		0.184	0.184	
Long-term effect of children	0.062*** (0.019)	0.053*** (0.020)		0.032* (0.019)	0.023 (0.021)	
East dummy	-0.069*** (0.016)	-0.102*** (0.028)		-0.097*** (0.017)	-0.130*** (0.029)	
East x post-birth		0.043 (0.032)			0.043 (0.032)	
Sample	Pooled	Pooled		Pooled	Pooled	
Age & wave FEs	Y	Y		Y	Y	
Observations	3,689	3,689		3,679	3,679	

*Note:* Panel A presents East-West differences in agreement to statements listed at the top of the table, both coded as binary indicators. All regressions include age and survey wave FEs. Panel B shows the impact of children on those attitudes, and differential effects for East German couples. For those estimates the sample is restricted to three years pre- to six years post-birth of the first child. Long-term effect refers to the average post-birth effect. Standard errors clustered at the individual-level in parentheses. Significance levels: \* < 0.1 \*\* < 0.05 \*\*\* < 0.01. Source: pairfam waves 1-11

column 1 shows that children lead to a higher share agreeing that women should be more concerned about their and that in this sub-sample of (becoming) parents East Germans are also less likely to agree with this. In column 2, the East German dummy is interacted with the post-birth period to elicit whether children lead to a differential effect regarding this attitude for East Germans. While the coefficient is positive, it is not statistically significant at conventional levels. For the question on whether children under 6 suffer with a working mother—working mothers were the norm in the GDR—the evidence for children impacting those attitudes is weaker. However, both the coefficient for children as well as the interaction with East Germans are positive, suggestive of an increase for East Germans (jointly the coefficients are significant at the 5% level).

The examination of attitudes with respect to children and maternal employment in East and West Germany overall supports the notion that attitudes are more egalitarian in East Germany. The arrival of children is associated with more gender-conservative

attitudes, with weak evidence for East-West differences becoming smaller (but attitudes certainly remain more egalitarian for East Germans). However, remaining differences in gender- and children related attitudes continue to manifest themselves in child-induced labour market penalties that negatively affect relative labour market outcomes of mothers more strongly in West Germany.

Additionally, I also find that East Germans couples are more likely to dissolve following child birth (Appendix Figure A.12). In the GDR, single mothers were actively supported, e.g. employers were mandated to preferentially hire them and they were eligible for longer paid parental leave. Universal day care provision with long hours also enabled single mothers to work full-time. In contrast in the FGR, the state provided much less support for single mothers. Differential partnership stability of young parents appears to be yet another legacy of the German division.

## 5 Robustness

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

A main concern may be that results are not driven by the couple's origin, but by the current location where households reside.<sup>31</sup> I.e. current local norms (or institutions) are more relevant than norms individuals are exposed to during childhood or adolescence. This may then 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.5 display outcomes by current location in East and West Germany and results are almost indistinguishable to those presented in Table 3. The following rows show DD coefficients for *origin*  $\times$  *location* cross combinations.<sup>32</sup> Results for East and West German couples living in their region of origin are again very similar. For East Germans living in West Germany, i.e. couples who have moved, the effect on labour market outcomes are similar to East German stayers (similar results on the individual

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<sup>31</sup>This would then directly devalidate the analysis based on time-use surveys as these only rely on household's current location.

<sup>32</sup>Too few West German couples live in East Germany to conduct statistical analysis with this sample.

level have been found by [Boelmann et al., 2021](#); [Collischon et al., 2020](#)).

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 13.6% of West German couples, but only 2% of East German couples are both partners born abroad. Results with the sample restriction of both partners born in Germany are displayed in Appendix Table [C.6](#). Coefficients are statistically identical to the main results.

In the current analysis, mixed couples, i.e. those where either partner lived in the GDR and the other in the FRG in 1989, are excluded from the analysis. These are 6.6% of all couple-level observations. Like [Lippmann et al. \(2020\)](#), I find that descriptively these couples are between pure East and West German couples with lower child penalties when the man is from East Germany. If these mixed couples are assigned to either East or West German couples, this has only minor influence on the estimates.

Appendix Figure [C.13](#) subsequently excludes each of the 16 federal states to corroborate that effects are not driven by a specific state. Note that as this exercise is based on the current location of couples, I use these estimates as the reference point. These were shown to be very similar to those based on both partners' socialisation (see above). Coefficients in Appendix Figure [C.13](#) indicate stability to the exclusion of states with estimates being slightly larger when the East German state of Saxony is excluded.

Next, I split the ten West German federal states in all possible combinations to belong to either of the two 'treatment groups'. Then I estimate event study estimates for those two groups and calculate the difference in post-birth coefficients and contrast these to the actual East-West difference observed. This placebo exercise gives an indication how likely these regionally differential responses to the arrival of children could have arisen if Germany had been divided in another way along state borders. Appendix Figure [C.14](#) shows histograms of the coefficients and the observed East-West difference indicated by a vertical dashed line (based on current location). For the five main outcomes, none of the estimates exceeds the observed East-West difference.

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 both partners to 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 allow young families not to have both parents working (full-time), specialisation into

market and domestic work may be easier feasible.<sup>33</sup> 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 for the East-West comparison. Event study estimates by GDP are shown in Appendix Figure C.15. No meaningful differences between the groups are observed.

In a similar spirit, day care availability could be a key driver of differences. Day care shortages are prevalent in Germany, especially for under threes (Jessen et al., 2020a), potentially posing a limiting factor for employment. A drawback with analysing this aspect is that differences between East and West Germany are so large—in 2020, the county with the lowest share enrolled in East Germany still exceeded the highest West German county—that West German counties cannot be split to mimic East German counties in this regard. As day care provision for 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.16 shows that overall differences are quite small with long-run effects on the female income share of 21-25 pp, 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 is 17.1 pp.<sup>34</sup> It is worth noting in this context, that results from East Germans who had moved to West Germany, i.e. to a region with lower day care provision, had labour market child penalties much closer to East Germany ‘stayers’ than to their West German peers (Appendix Table C.5). 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—only about 40% of the average difference in employment (15 pp) between East and West German mothers of toddlers would be closed by this.<sup>35</sup>

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<sup>33</sup>A traditional specialisation would then make (economic) sense if men have notably higher pre-birth earnings.

<sup>34</sup>Looking at opening 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.

<sup>35</sup>Bauernschuster and Schlotter (2015) identify an elasticity of 0.37 for children aged three to four years

Analysing the relationship between the expansion of day care and mothers' return to work separately for East and West Germany, [Zoch and Hondralis \(2017\)](#) only find evidence for a small effect after the birth of a second child in West Germany. While the importance of day care in explaining part of the East-West differences documented cannot be ruled out, the evidence suggests that this is by far not the sole driving factor of different child penalties.

In a final step, 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 (predominantly) attributed to those pre-existing differences. Estimating a spatial RD in proximity to the border allows 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 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>36</sup> Appendix Figure C.17 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.18. They give no indication that estimates converge in proximity to the border.

## 6 Conclusion

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 continue to play a role. This paper examines how child penalties

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using the introduction of a legal claim and an expansion for this age group in the 1990s.

<sup>36</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.

differ between couples who grew up in either in the GDR or FRG but have children in reunified Germany.

The child penalty on the female income share is significantly smaller in East German couples (10 pp). Looking at contributions to unpaid domestic work, I additionally show that in West German couples the arrival of children is associated with stronger increases in the female share. These findings are in line with more gender traditional attitudes towards maternal employment in the West. 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.

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

The case of East and West Germans couples suggests that norms due to different cultural upbringing play an important role. Besides individually held norms on maternal employment and gender roles more generally, the legacy of GDR policies may also have led society to be more family friendly by reducing the stigma on working mothers. While better day care provision in East Germany was not found to be the main explanatory factor for lower child penalties in East German couples, all day schooling and more family friendly employers may also play a role.<sup>37</sup>

Deeply held gender norms may be difficult to influence in the short-run, but family policies such as expansions of day care or parental leave policies, may both facilitate maternal employment and have an impact on norms in the long-run<sup>38</sup> if trade-offs between family and career are reduced, thus providing a fruitful avenue to reduce child-related gender inequality.

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<sup>37</sup>Results for East German couples living in West Germany were found to be similar to East German stayers (albeit estimates with a small sample), so the relative importance of these factors is less clear and an interesting aspect for future research.

<sup>38</sup>E.g., Zoch and Schober (2018) find that day care expansion in West Germany is associated with less gender-traditional views. Dahl et al. (2014); Welteke and Wrohlich (2019) show spill-over effects of parental leaves decisions after policy reforms are implemented. Recognition of same-sex relationships in Europe has been accompanied by more positive attitudes towards sexual minorities (Aksoy et al., 2020).

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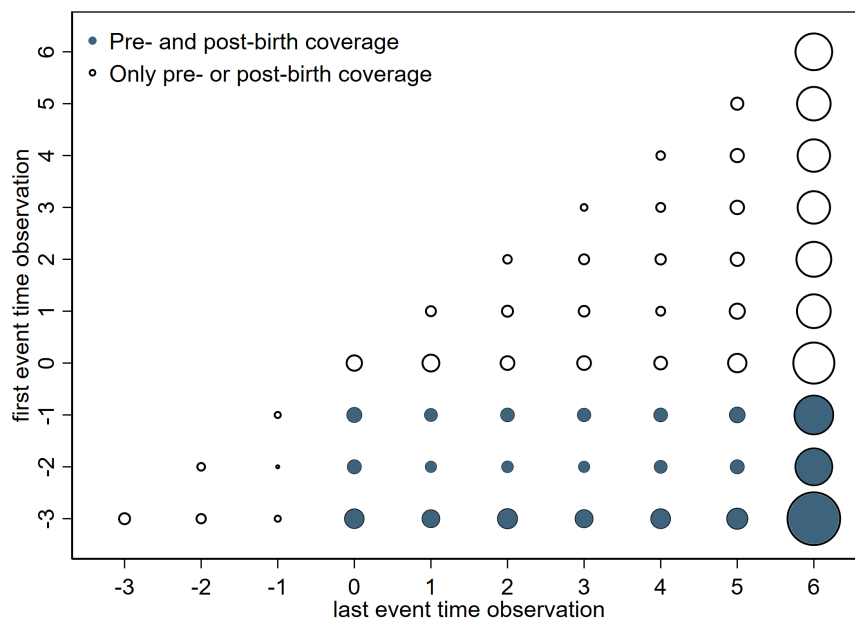
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# Appendix

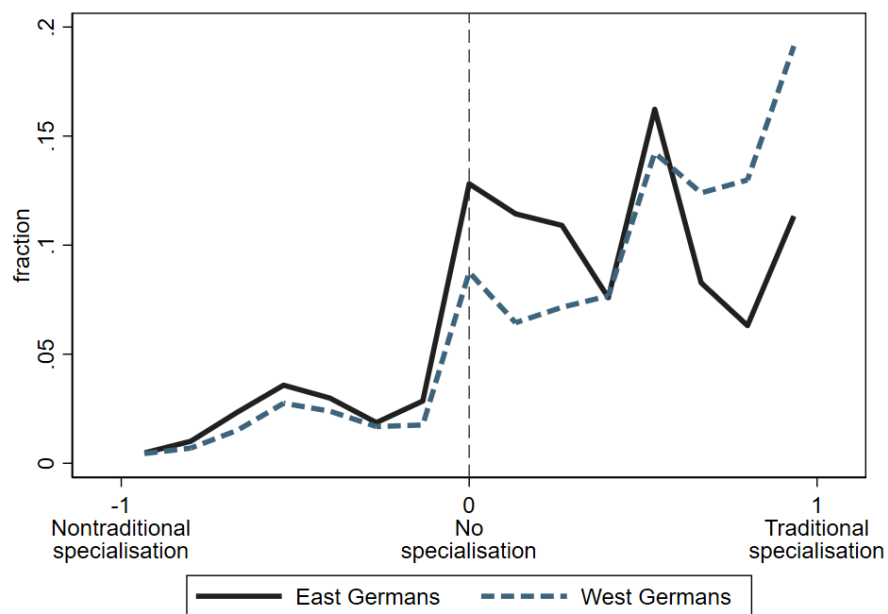
## A Figures

Figure A.1: Observations by event time



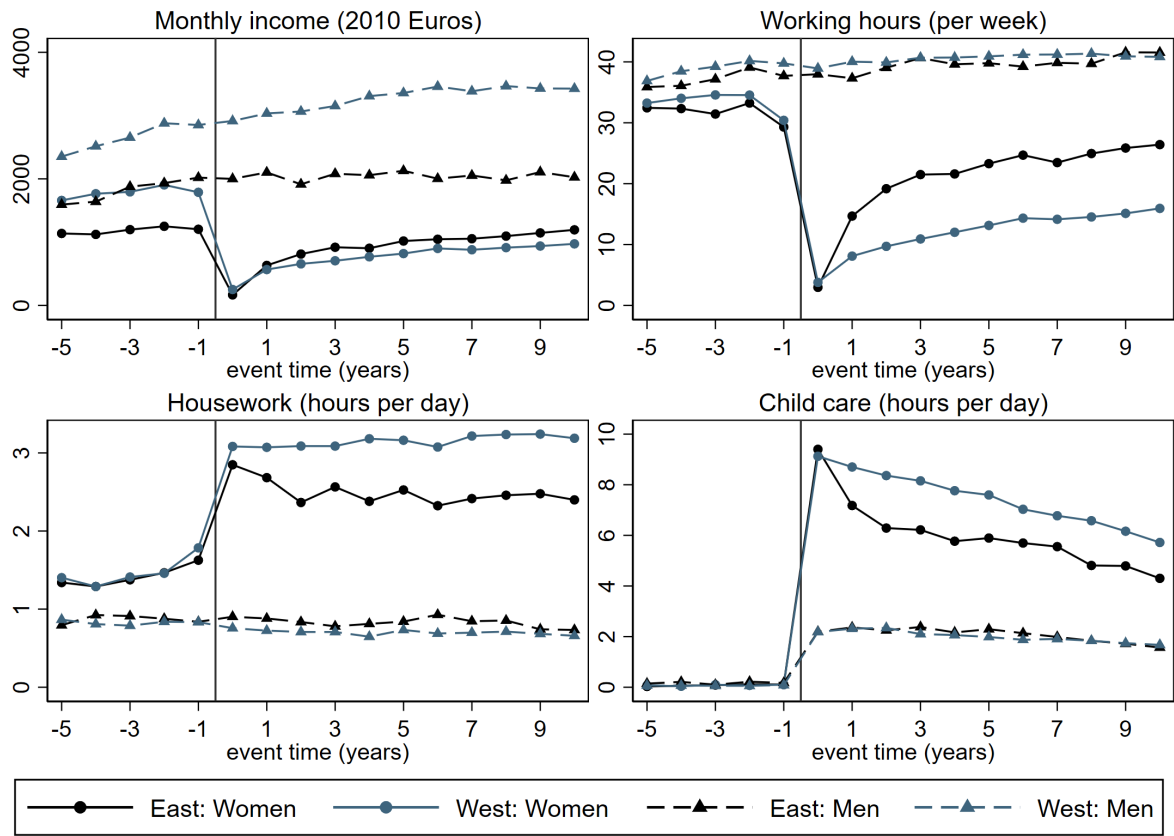
*Note:* Figure shows how observations in the event study estimates are distributed by their first and last event time (first birth) observation. Circle size is weighted by the number of observations in each combination. Blue coloured circles are observations that include both pre- and post-birth event 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



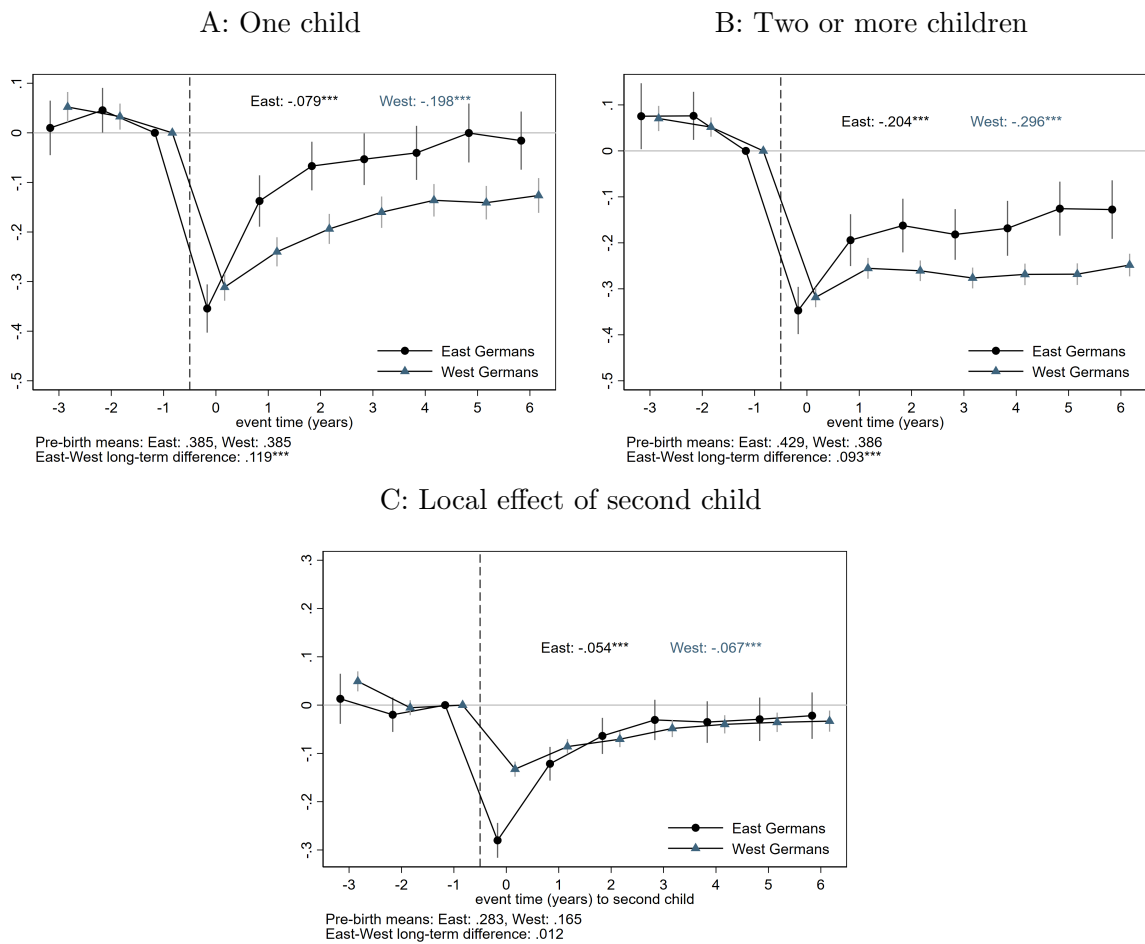
*Note:* Figure shows the distribution of a specialisation index proposed by [Siminski and Yetsenga \(2020\)](#). Traditional specialisation implies that the female partner is solely responsible for domestic work and the male partner for market work (vice versa for nontraditional specialisation). Distribution calculated in 15 bins of equal width. Source: SOEP v36

Figure A.3: Average values by event time



*Note:* Figure shows average values of the respective variables by event time relative to the birth of first child. Sample covers 1990-2019. Source: SOEP v36

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

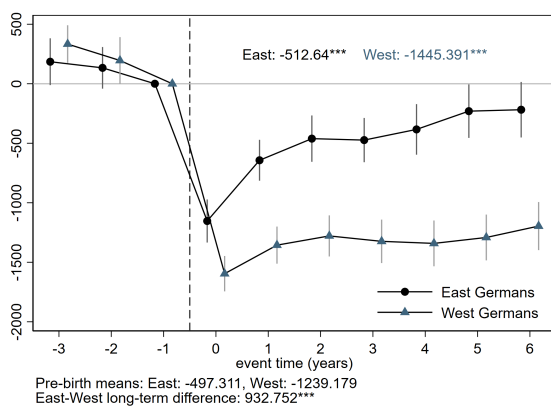


*Notes:* Panels A and B show event study estimates for the female income share differentiated by number of children. Panel C shows the local effect of having a second child. See Figure 3 for other notes. Source: SOEP v36

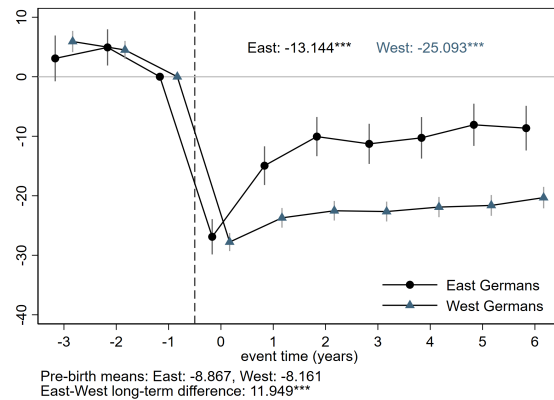


Figure A.5: Impact of children on gender inequality in the labour market - gaps and discrete outcomes

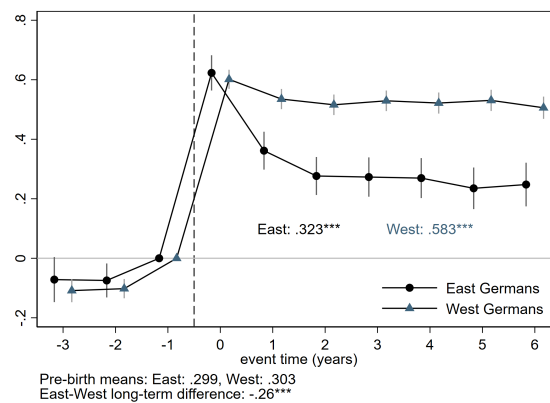
A: Gap in monthly labour income (2010 Euros)



B: Gap in weekly working hours

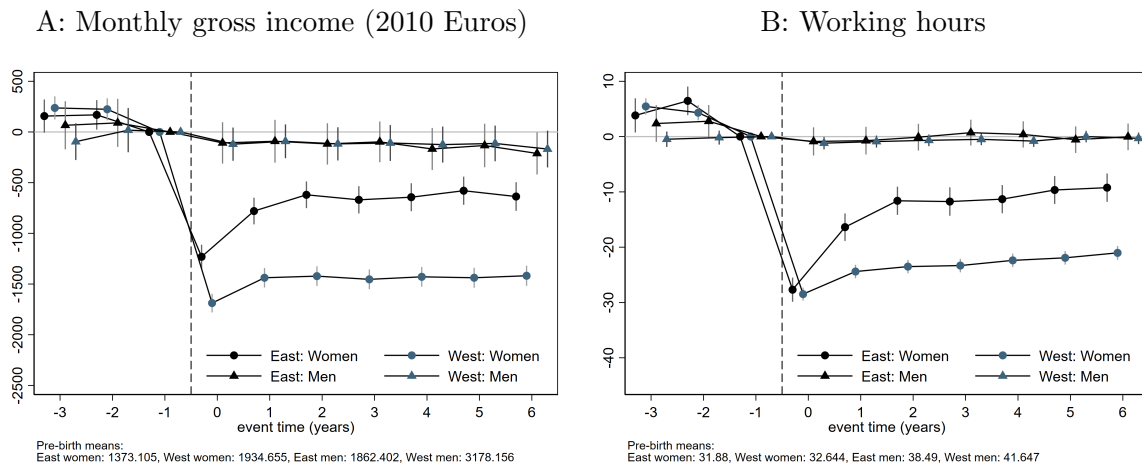


C: Main male breadwinner (0/1)



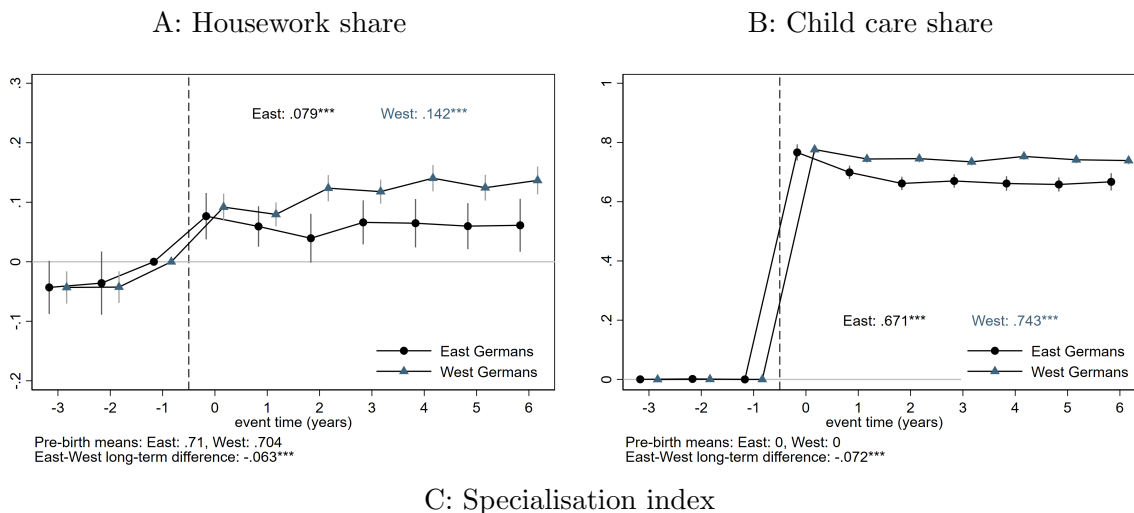
*Notes:* Panels A and B show gaps corresponding to shares shown in Figure 3. Main male breadwinner households are defined as such if the female income share is below  $\frac{1}{3}$ . See Figure 3 for other notes. Source: SOEP v36

Figure A.6: Impact of children on gender inequality in the labour market - individual level



Notes: Panels A and B shows individual-level contributions to the shares depicted in Figure 3. Panel C shows the share that indicate currently being in parental leave. See Figure 3 for other notes. Source: SOEP v36

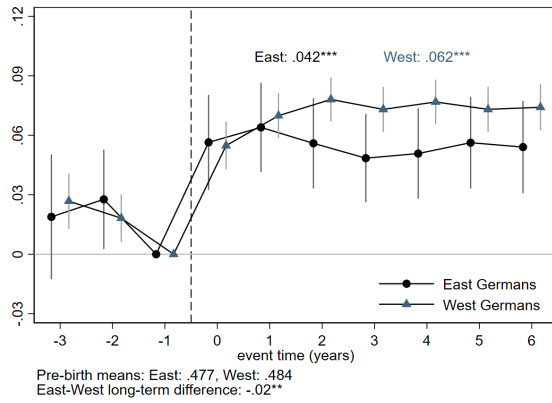
Figure A.7: Impact of children on domestic gender inequality - weekly



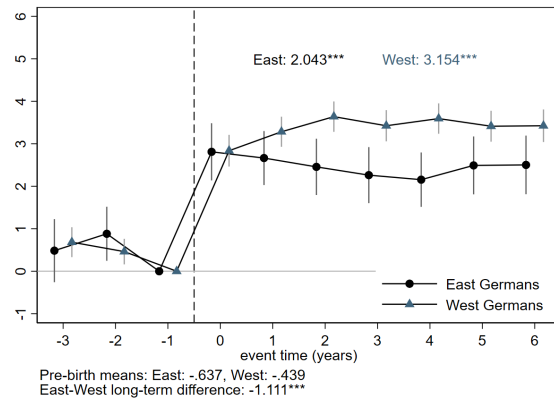
Notes: Figure shows event study estimates for the respective outcomes normalised to the pre-birth year ( $t = -1$ ). In contrast to Figure 4, child care and housework information include weekend days, which reduces the sample size by about half. See Figure 3 for other notes. Source: SOEP v36

Figure A.8: Impact of children on total hours of work

A: Female share



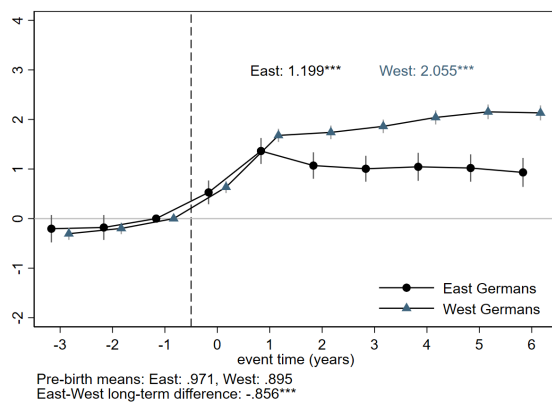
B: Gap



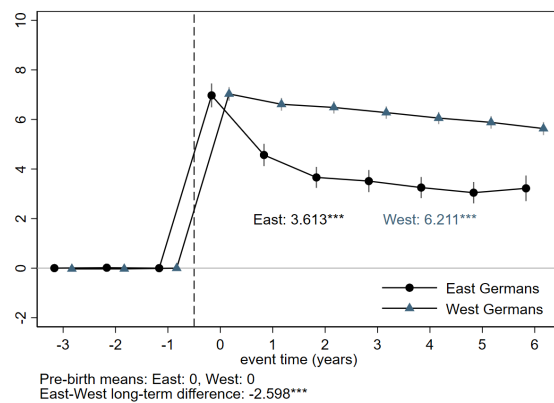
Notes: Figure shows event study estimates for total work, defined as paid work, housework and child care per weekday. See Figure 3 for other notes. Source: SOEP v36

Figure A.9: Impact of children on domestic gender inequality - gaps

A: Housework

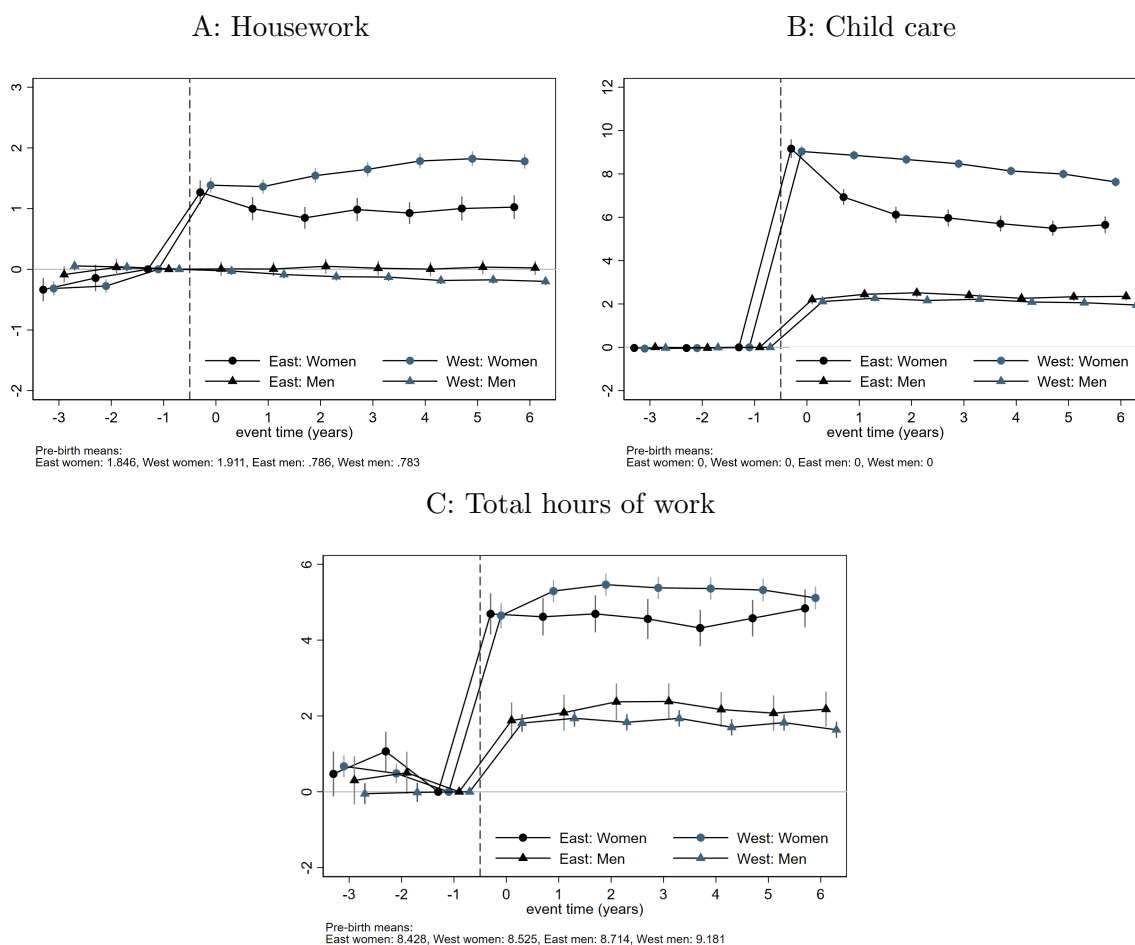


B: Child care



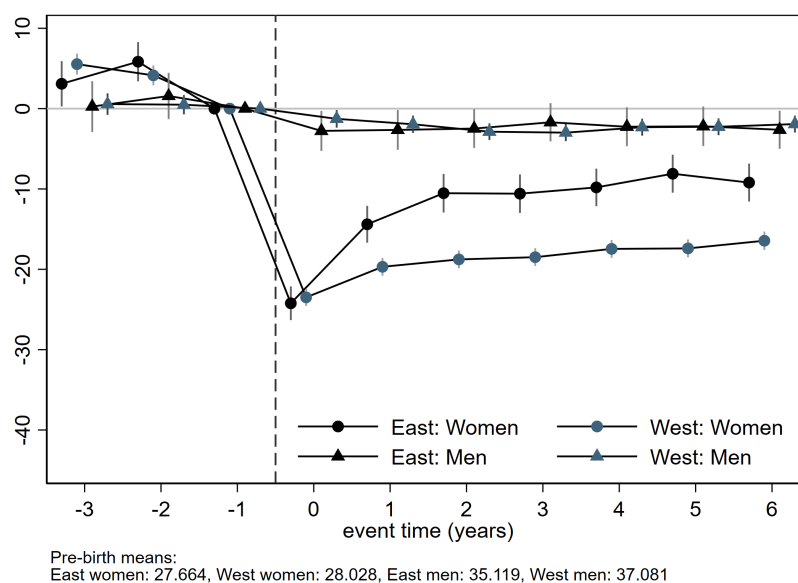
Notes: Figure shows gaps corresponding to shares presented in Figure 4. See Figure 3 for other notes. Source: SOEP v36

Figure A.10: Impact of children on gender inequality in the labour market - individual level



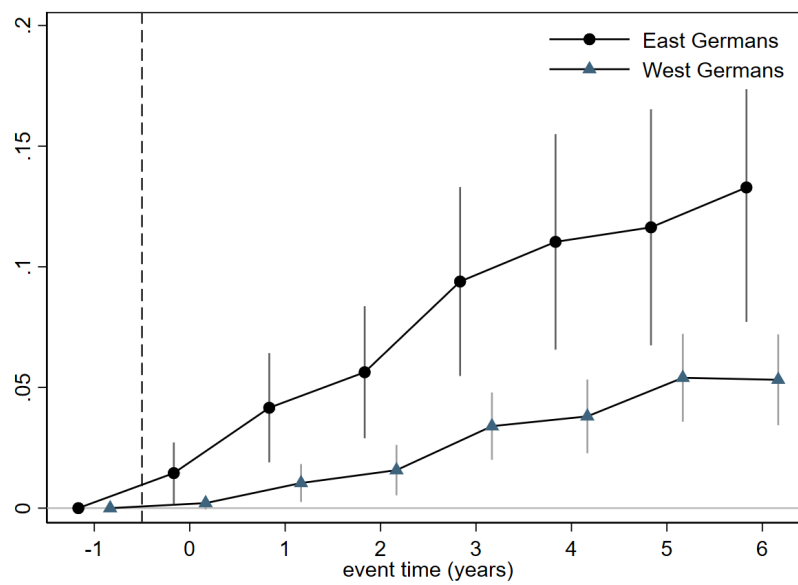
*Notes:* Panels show individual-level contributions to the shares depicted in Figure 4. See Figure 3 for other notes. Source: SOEP v36

Figure A.11: Impact of children on desired working hours - individual level



*Notes:* See Figure 3 for notes. Source: SOEP v36

Figure A.12: Couple dissolution



*Notes:* Figure shows event study estimates for couples to have dissolved. The sample is restricted to couples that existed in the year prior to child birth. Source: SOEP v36

## B Tables

Table B.1: Long-run impacts 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						
Long-term effect	-0.155*** (0.016)	-0.171*** (0.018)	-0.269*** (0.007)	-0.271*** (0.008)	0.114*** (0.017)	0.100*** (0.019)
Female share of working hours						
Long-term effect	-0.158*** (0.015)	-0.177*** (0.017)	-0.292*** (0.007)	-0.296*** (0.008)	0.134*** (0.016)	0.119*** (0.018)
Female housework share						
Long-term effect	0.077*** (0.013)	0.084*** (0.015)	0.158*** (0.007)	0.158*** (0.007)	-0.081*** (0.015)	-0.073*** (0.016)
Female share of child care						
Long-term effect	0.709*** (0.008)	0.714*** (0.011)	0.789*** (0.003)	0.789*** (0.004)	-0.079*** (0.009)	-0.075*** (0.012)
Specialisation index						
Long-term effect	0.189*** (0.024)	0.211*** (0.028)	0.411*** (0.012)	0.411*** (0.012)	-0.222*** (0.026)	-0.200*** (0.030)
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:* Table shows long-run coefficients ( $t = 1 - 6$ ) of the arrival of children on within-couple gender inequality. Columns (1), (3) and (5) are estimates shown in Figures 3 and 4. The odd-numbered columns restrict the sample to households with pre- and post-birth observations. Standard errors clustered at the couple-level in parentheses. 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	
	True (1)	Appr. (2)	True (3)	Appr. (4)	True (5)	Appr. (6)	True (7)	Appr. (8)
East Germans:	-0.155*** (0.016)	-0.148*** (0.014)	-0.158*** (0.015)	-0.153*** (0.014)	0.077*** (0.013)	0.071*** (0.011)	0.711*** (0.007)	0.645*** (0.013)
Observations	3,890	4,240	3,724	4,050	4,088	4,426	4,618	4,156
West Germans:	-0.269*** (0.007)	-0.281*** (0.007)	-0.292*** (0.007)	-0.301*** (0.007)	0.158*** (0.007)	0.174*** (0.006)	0.789*** (0.003)	0.780*** (0.004)
Observations	12,332	13,779	11,792	13,165	12,552	13,989	13,947	12,380
East-West difference	0.114*** (0.017)	0.133*** (0.016)	0.134*** (0.016)	0.148*** (0.015)	-0.081*** (0.015)	-0.104*** (0.013)	-0.079*** (0.009)	-0.135*** (0.013)
Observations	16,222	18,019	15,516	17,215	16,640	18,415	15,592	16,536

*Note:* Table displays coefficients of (true) effects of having children based on equation (3) which uses pre- and post-birth information. 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: Couple-level sums for main outcomes

	Monthly gross income (2010 Euros) (1)	Working hours per week (2)	Housework on weekday (3)	Child care on weekday (4)
<i>Event time</i>				
-3	4,672.08 (2260.68)	76.18 (22.70)	2.41 (1.38)	0.00 (0.00)
-2	4,953.02 (2720.35)	77.55 (19.79)	2.45 (1.51)	0.00 (0.00)
-1	4,755.69 (3201.46)	73.06 (23.39)	2.62 (1.48)	0.00 (0.00)
0	3,141.66 (2002.70)	44.40 (18.03)	3.85 (2.13)	10.80 (5.31)
1	3,535.14 (2294.72)	50.10 (19.31)	3.82 (2.03)	10.64 (4.57)
2	3,598.40 (2037.78)	51.51 (19.99)	3.87 (2.01)	10.34 (4.48)
3	3,811.92 (2465.03)	53.70 (19.05)	3.95 (1.99)	9.99 (4.83)
4	4,030.49 (2864.86)	54.86 (19.68)	3.88 (2.04)	9.56 (4.73)
5	4,166.14 (2786.62)	56.17 (19.93)	3.92 (2.13)	9.34 (4.64)
6	4,260.06 (3219.49)	57.22 (20.66)	3.92 (2.05)	8.78 (4.64)
Observations	34,147	32,812	34,007	35,243

*Note:* Table shows the sum of the main outcomes for couples from which shares are calculated as dependent variables. Standard deviations in parentheses. Source: SOEP v36

Table B.4: Impact of children - time-use data

	Female share of				
	Market work (1)	Housework (all) (2)	Housework (rout.) (3)	Child care (4)	Specialisation (5)
GDR	-0.057* (0.030)	-0.005 (0.036)	-0.010 (0.034)	0.875*** (0.013)	0.100* (0.055)
Observations	661	678	678	649	652
East Germany	-0.143*** (0.036)	0.033 (0.028)	0.047 (0.029)	0.747*** (0.018)	0.255*** (0.053)
Observations	750	875	874	864	755
West Germany	-0.207*** (0.017)	0.104*** (0.014)	0.106*** (0.014)	0.748*** (0.009)	0.329*** (0.027)
Observations	2,227	2,640	2,637	2,627	2,207

*Note:* 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 set to be in the 5th to 95th female age percentile of those with children. All estimates include survey wave and age FEs and additionally control for education and marital status. Sources: Time-Use survey of the GDR (1985, 1990) and German Time-Use Study (1991/92, 2001/02, 2012/13).



## C Robustness

Table C.5: Estimates based on current location

	Female share of				
	Income (1)	Hours (2)	Housework (3)	Child care (4)	Specialisation (5)
East Germany	-0.147*** (0.015)	-0.155*** (0.015)	0.081*** (0.012)	0.708*** (0.007)	0.197*** (0.022)
Observations	4,087	3,907	4,332	4,838	3,682
West Germany	-0.263*** (0.006)	-0.284*** (0.006)	0.153*** (0.006)	0.778*** (0.003)	0.399*** (0.010)
Observations	17,173	16,518	17,634	18,502	15,063
East Germans in East Germany	-0.154*** (0.016)	-0.158*** (0.016)	0.072*** (0.014)	0.708*** (0.009)	0.185*** (0.025)
Observations	3,429	3,278	3,620	3,465	3,100
East Germans in West Germany	-0.162*** (0.053)	-0.157*** (0.047)	0.096** (0.041)	0.720*** (0.022)	0.185** (0.079)
Observations	461	446	468	437	408
West Germans in West Germany	-0.271*** (0.007)	-0.294*** (0.007)	0.157*** (0.007)	0.789*** (0.003)	0.411*** (0.012)
Observations	12,226	11,697	12,443	11,590	10,722

*Note:* Table shows coefficients for the long-term effect of children as in Table 3. East and West German couples are defined by their 1989 location. East and West Germany related to the current location with a distinction made between East and West Berlin. The two upper rows are only based on current location, the bottom three rows distinguish between location and origin of couples. Source: SOEP v36

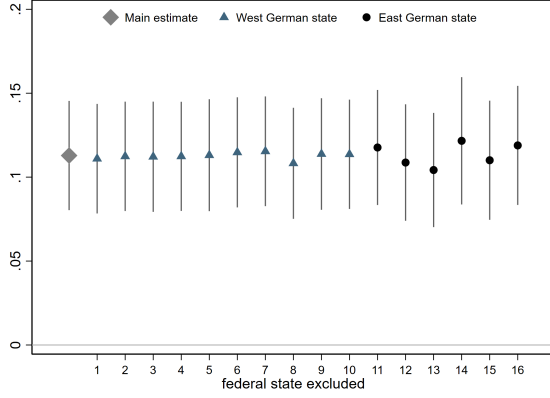
Table C.6: Both partners born in Germany

	Female share of				
	Income (1)	Hours (2)	Housework (3)	Child care (4)	Specialisation
East Germans	-0.156*** (0.016)	-0.160*** (0.015)	0.078*** (0.013)	0.710*** (0.008)	0.192*** (0.024)
Observations	3,814	3,655	4,009	3,827	3,442
West Germans	-0.278*** (0.008)	-0.301*** (0.007)	0.160*** (0.008)	0.791*** (0.004)	0.427*** (0.012)
Observations	10,460	10,050	10,607	9,851	9,197

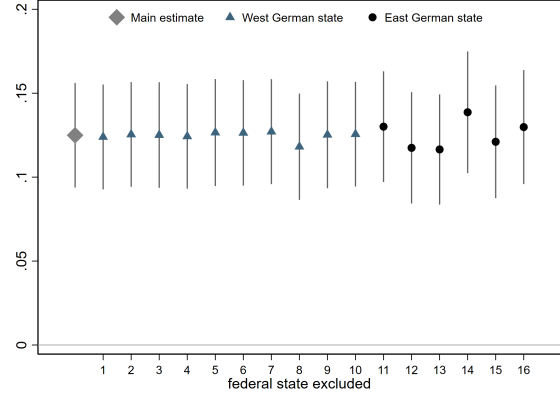
*Note:* Table shows coefficients for the long-term effect of children as in Table 3 with the estimation sample restricted to couples where both partners were born in Germany. Main estimates in contrast are based on the 1989 location with no further restriction on birth place. Source: SOEP v36

Figure C.13: East-West long-run difference with states excluded

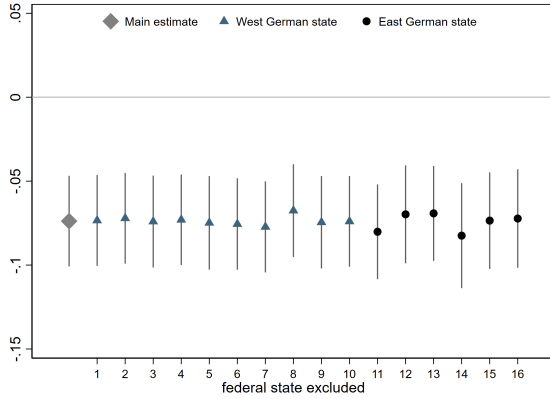
A: Female income share



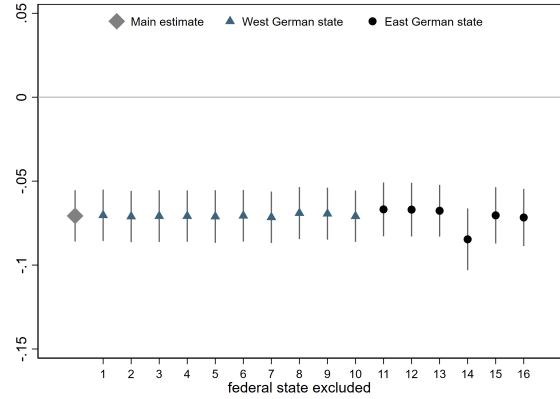
B: Female share of working hours



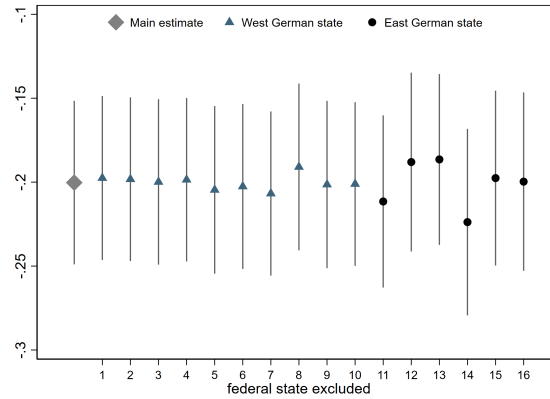
C: Female housework share



D: Female child care share

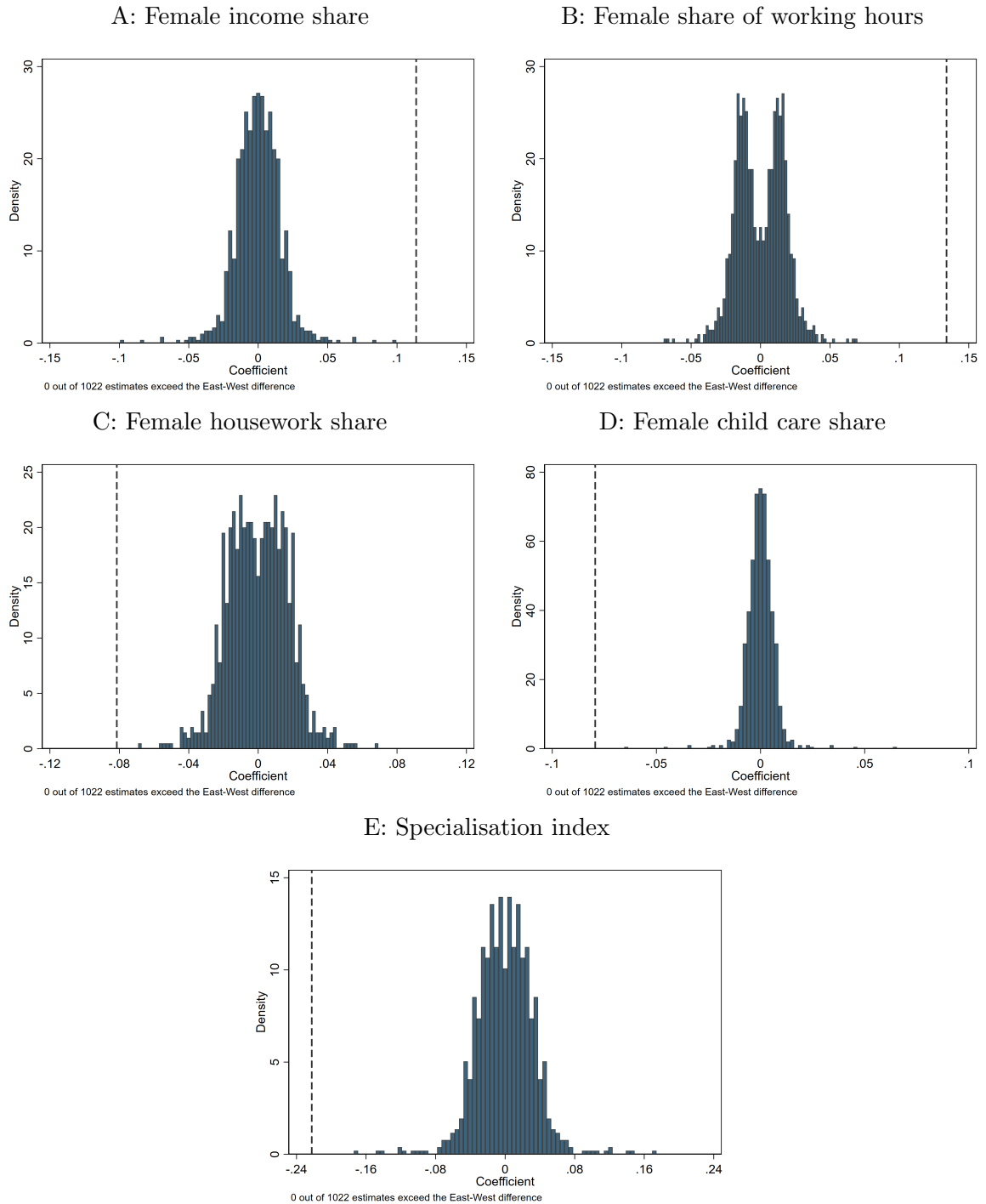


E: Specialisation index



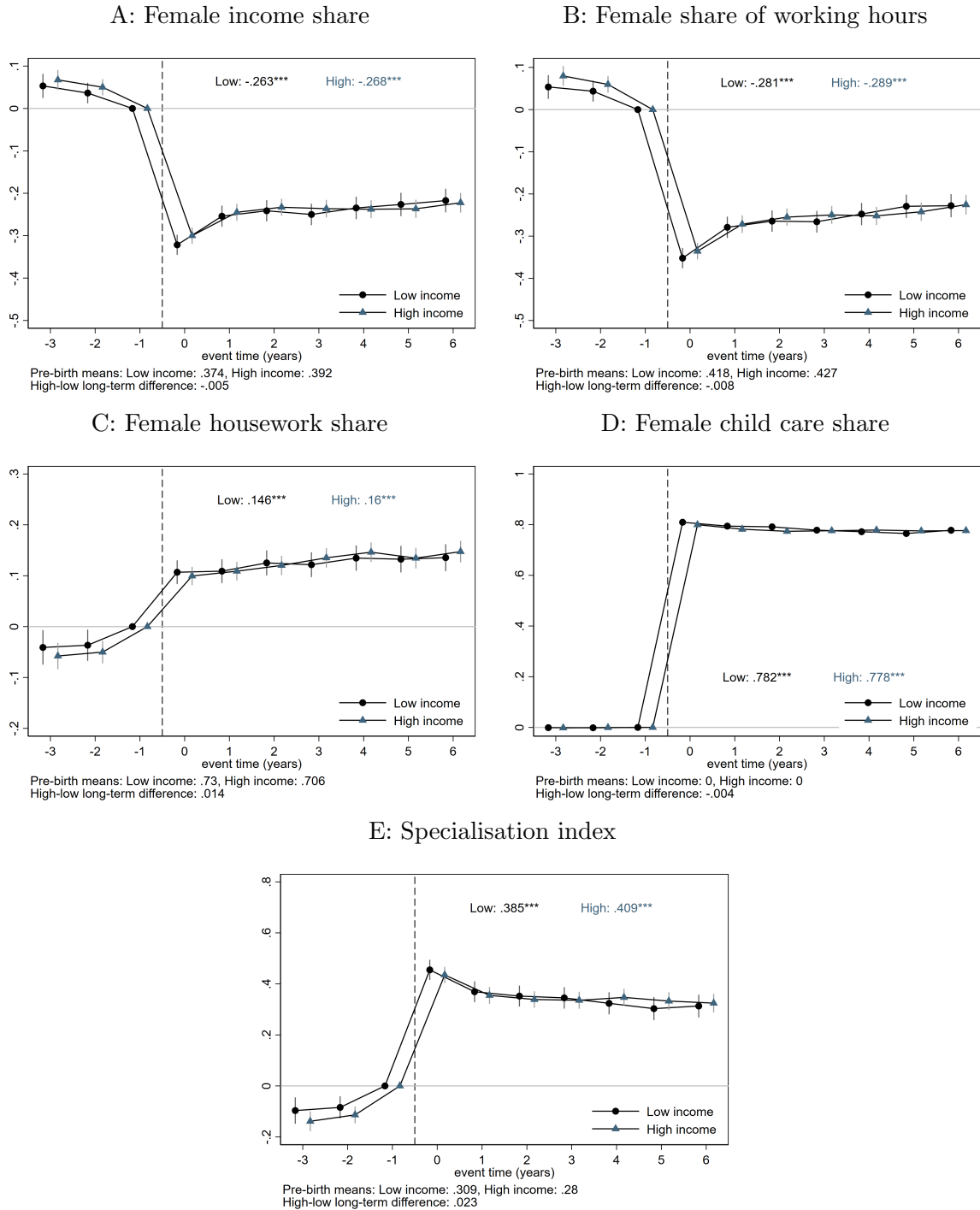
*Notes:* Figure shows East-West long-run differences of the arrival of children on within-couple gender inequality with states subsequently dropped in the estimation. The grey main estimates refer to estimates based on the current location of couples. List of states: 1 Schleswig-Holstein 2 Hamburg 3 Lower Saxony 4 Bremen 5 North Rhine-Westphalia 6 Hesse 7 Rhineland-Palatinate 8 Baden-Württemberg 9 Bavaria 10 Saarland 11 Berlin 12 Brandenburg 13 Mecklenburg-Vorpommern 14 Saxony 15 Saxony-Anhalt 16 Thuringia. Source: SOEP v36

Figure C.14: Placebo treatment assignment



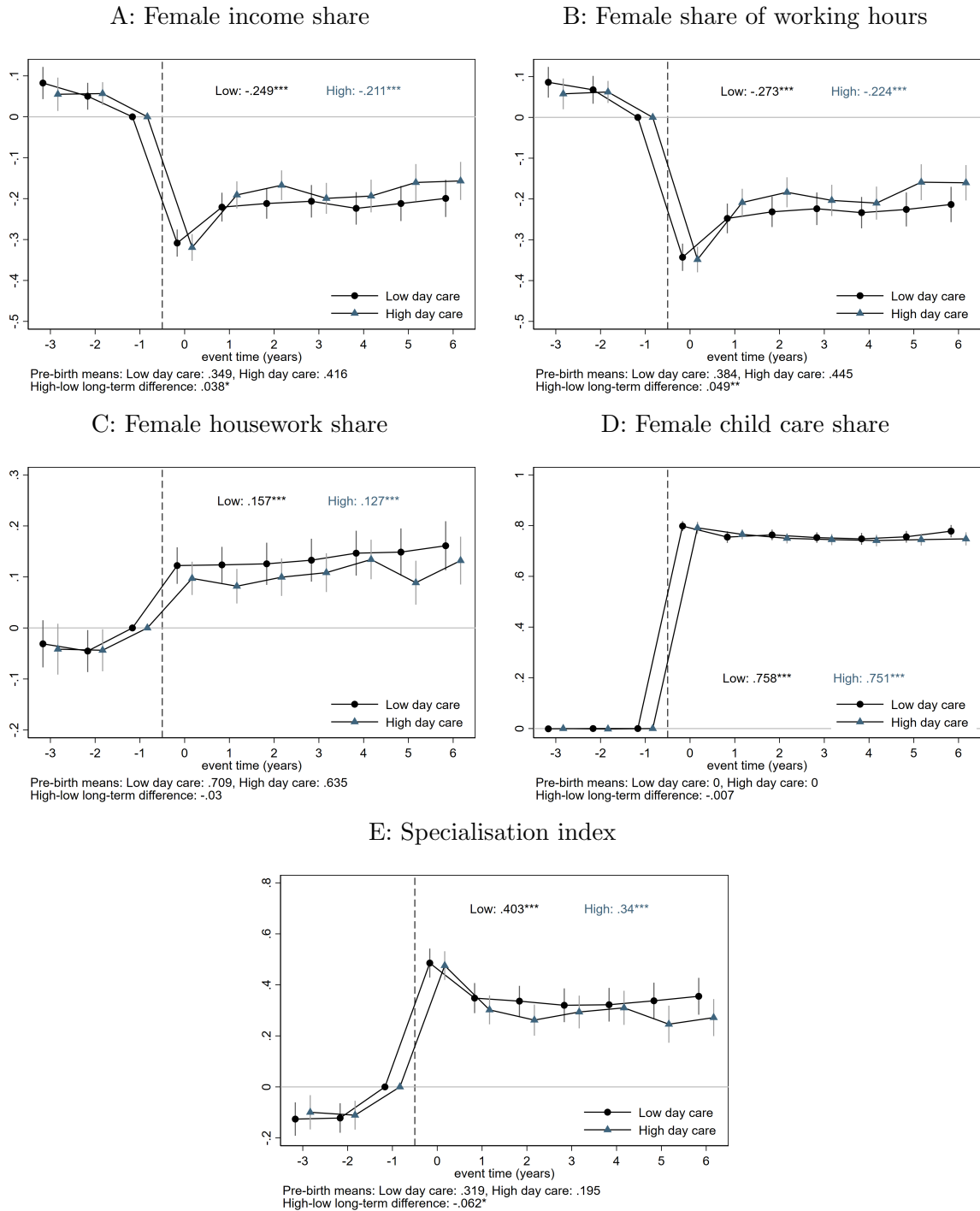
*Note:* Figure shows the distribution of estimates for long-run differences between two groups of federal states. The histogram displays estimates based on all 1022 possible combinations of West German states into two groups. The dashed lines denote the East-West difference based on the federal state of residence. Figure note indicates how many of the placebo estimates exceed the coefficient for the East-West difference. Source: SOEP v36

Figure C.15: West German counties split by income per capita



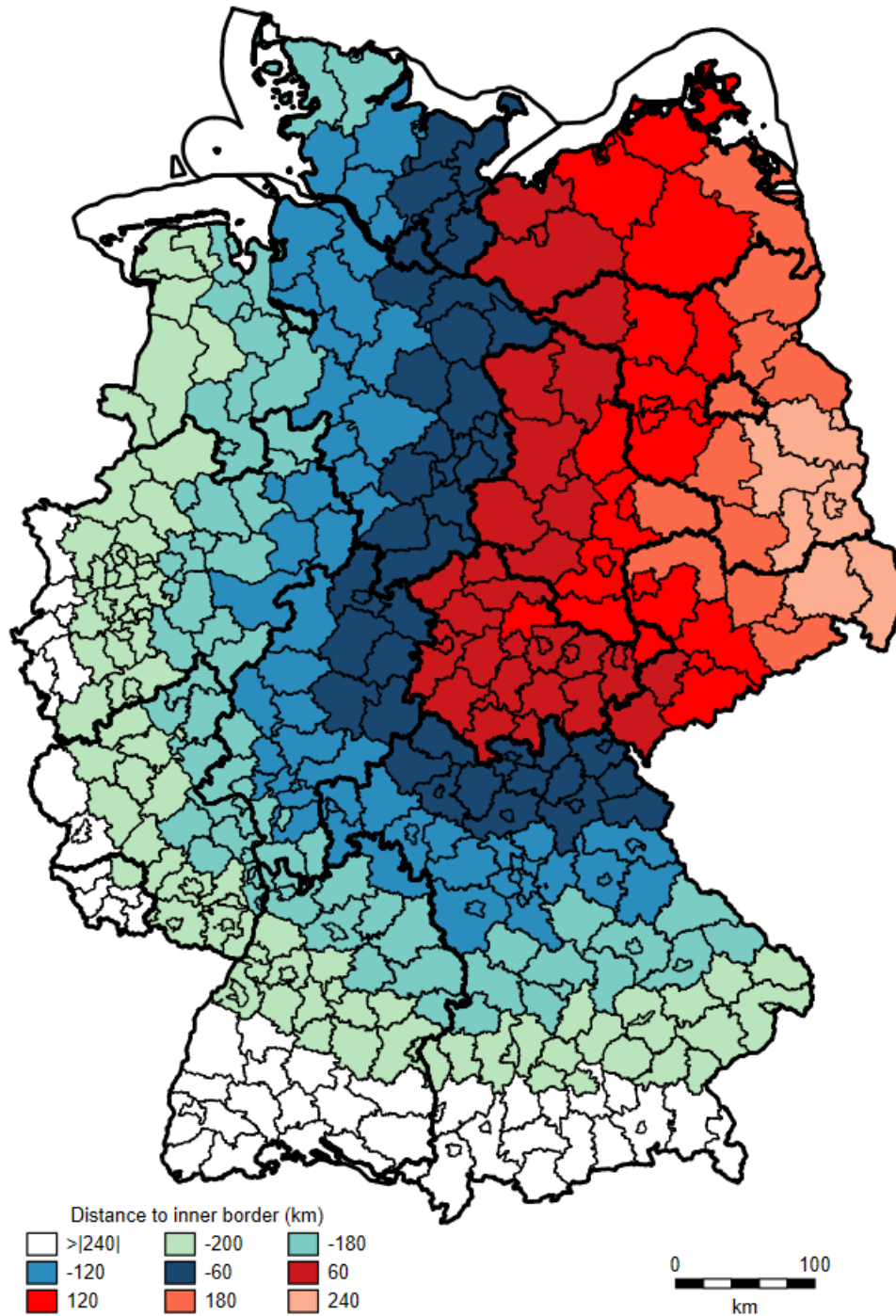
*Note:* Figure shows event study estimates corresponding to Figures 3 and 4. The sample is restricted to couples living in West Germany and the sample is split by GDP per capita as of 2008. See Figure 3 for other notes. Source: SOEP v36 and Destatis

Figure C.16: West German counties split by day care availability



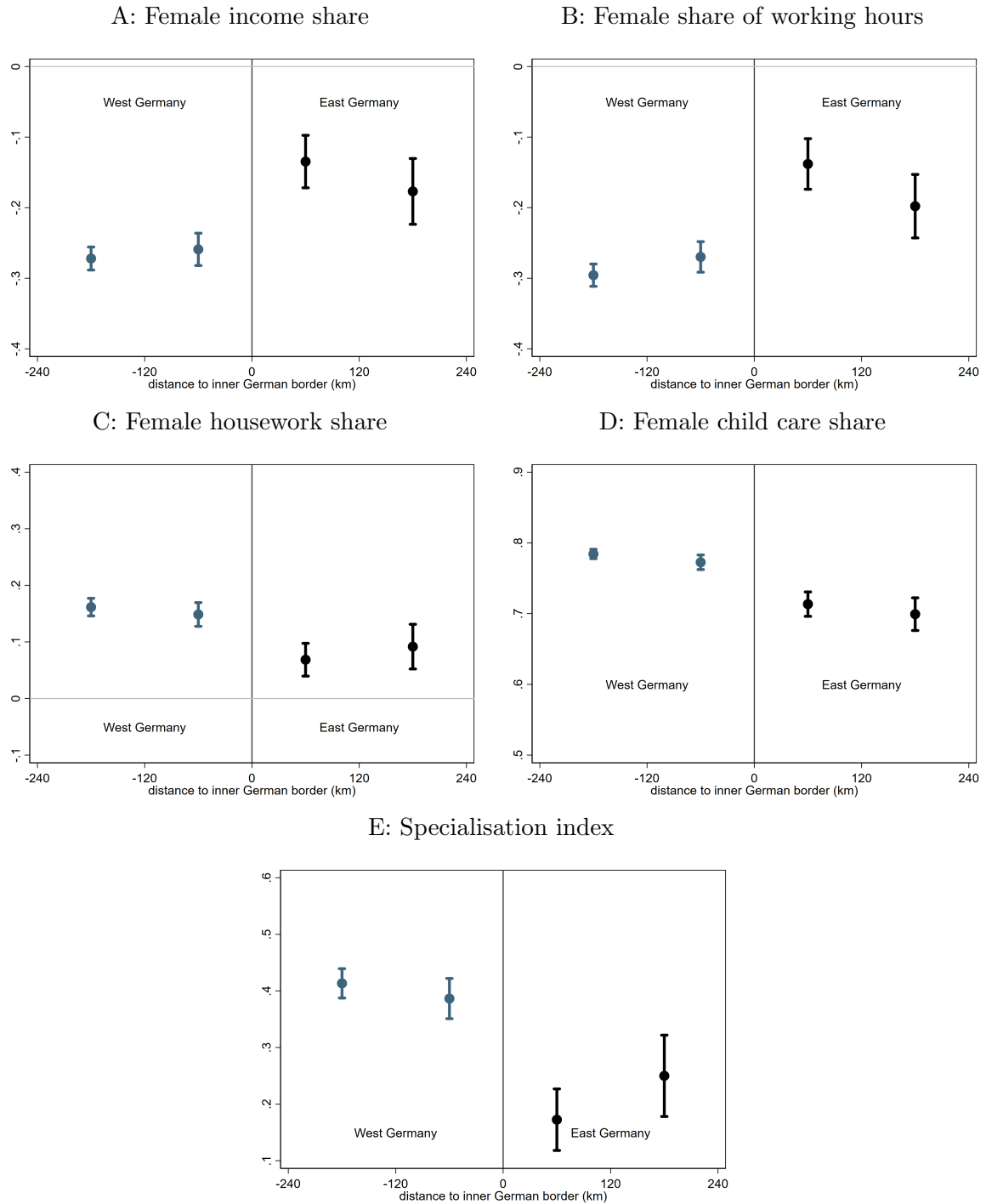
*Note:* Figure shows event study estimates corresponding to Figures 3 and 4. The sample is restricted to couples living in West Germany and the sample is split at the county-level the share of children under the age of three enrolled in day care. Estimates based on births occurring between 2004 and 2019. See Figure 3 for other notes. Source: SOEP v36 and Destatis

Figure C.17: German counties and distance to inner border



*Note:* 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.18: Spatial RD



*Note:* 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>39</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., 2020b](#), 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.

Table [D.7](#) shows a comparison of time spent on housework and child care using the definitions described above. Panel A shows averages from the SOEP, and Panel B from the

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<sup>39</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).



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.7: Time use comparison

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

*Note:* 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