

Immigration and the Evolution of Local Cultural Norms*

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Abstract

We study the local evolution of cultural norms in West Germany in reaction to the sudden presence of East Germans who migrated to the West after reunification. These migrants grew up with very high rates of maternal employment, whereas West German families followed the traditional breadwinner-housewife model. We find that West German women increase their labour supply and that this holds within households. We provide additional evidence on stated gender norms, West-East friendships, inter-marriage, and child care infrastructure. The dynamic evolution of the local effects on labour supply is best explained by local cultural learning and endogenous child care infrastructure.

JEL codes: J16, J21, D1

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1 Introduction

Cultural norms influence individual behaviour and aggregate outcomes, especially when it comes to the labour supply decisions of women (e.g. [Giavazzi et al., 2013](#)). However, important questions on the origins and the evolution of cultural norms remain unanswered. A series of seminal papers established the importance of technology ([Alesina et al., 2013](#)), social movements ([Goldin, 1990](#)), and of the family (e.g. [Fernández et al., 2004](#)) as long-term drivers of change. Focusing on the dynamic evolution of norms, [Fernández \(2013\)](#) and [Fogli and Veldkamp \(2011\)](#) study cultural norms in the presence of learning. [Fernández \(2013\)](#) proposes a model of inter-generational learning where norms and women’s labour supply decisions depend on a noisy public signal generated by women’s decisions in the preceding generation. [Fogli and Veldkamp \(2011\)](#) model local information transmission that generates changes in participation that are geographically heterogeneous, locally correlated, and smooth in the aggregate, and use county-level data to compare the calibrated model to observed participation decisions.

This paper presents causal evidence on the question if large inflows of immigrants speaking the same language, but with different gender identities and cultural norms, can trigger the local evolution of behaviour and norms of natives. Our main finding is that native women adjust their weekly hours worked upwards in the presence of immigrants with more gender-egalitarian views and behaviour. These effects on female labour supply hold within households, i.e. the share of hours worked by the female partner increases. We carefully trace the evolution of these effects over time and examine heterogeneity. Using a combination of administrative, census, and survey data sets, we examine different potential channels. Based on a range of empirical specifications, we provide direct evidence on stated gender norms and beliefs of natives, local friendship-ties and intermarriages, as well as on the evolution of endogenous local supply of publicly funded child care infrastructure.

We exploit the setting of German reunification to investigate the effects of immigration on the evolution of local cultural norms. This setting is uniquely suited for two reasons. First, East and West Germans held very different cultural norms related to the role of women resulting in much higher female labour force participation in the East. As argued in the existing literature, this is the case because

the different political-economic systems imposed on East and West Germany led to different gender norms, identities of women, and beliefs about how maternal employment affects children and the family: individuals who grew up under the GDR regime are less traditional than individuals in West Germany (e.g. [Campa and Serafinelli, 2019](#); [Lippmann et al., 2020](#); [Bauernschuster and Rainer, 2012](#); [Beblo and Gorges, 2018](#)). We describe these differences in detail in section [2.1](#).

Second, the collapse of the wall separating East and West Germany in 1989 resulted in a sudden and unexpected large inflow of several million people who were socialised under the regime of the German Democratic Republic (GDR) into the territory of the former West Germany.¹ These first-wave migrants were previously sealed off from Western influence and had limited information about local differences in economic conditions and cultural norms within the West. We conduct a balancing test in the spirit of an experimental randomisation test and show that a range of receiving region characteristics measured just before reunification fail to predict inflows from the East, while being highly predictive of internal West-West migration patterns. We argue in section [2.2](#) below, that this gives rise to meaningful and quasi-random variation in the presence of East Germans in the West.²

The combination of the large inflows of East Germans with different cultural norms present a unique opportunity to improve the understanding of the evolution of local behaviour and cultural norms in the West. East Germans were not perceived as foreigners in West Germany and are very similar in many regards such as language, education or ethnicity - but very different in their view regarding the role of women. As a result, we think that this unique historical setting gets us as close as is reasonably possible to the idea of an ideal experiment for identifying the evolution of local cultural norms: Exogenously switching cultural

¹We refer to "West Germany" and "East Germany" using capitalised letters to describe the regions of the former two states within Germany, although strictly speaking this is incorrect post-reunification.

²The historical literature has identified two waves of emigration out of East Germany; the first wave occurred immediately following re-unification and the second wave roughly from 1998-2003. We study effects of the first wave of migrants, which was largely untargeted. [Hunt \(2006\)](#) and [Fuchs-Schündeln and Schündeln \(2009\)](#) examine migration patterns after reunification. A similar share of men and women migrated in both waves, in the first wave migrants had average levels of education and were more likely to be young ([Fuchs-Schündeln and Schündeln, 2009](#)). In the second wave (1998-2003) migrants were even more selected by age and had higher educational attainment.

norms through immigration of otherwise observationally similar individuals and then studying changes in norms and behaviour of the local population.

To estimate effects, we use cross-regional variation in the inflow intensity within different empirical models. Our main empirical model is a difference-in-differences-event-study design that compares average changes in working hours of women (relative to their partner in the household) in high vs. low inflow regions in the years before and after German reunification. Our preferred specification estimates bi-annual difference-in-differences (DD) estimates for years after reunification, which allows the direct examination of the evolution of effects over time.³ The assumption underlying this specification is that first-wave East German migrants did not select their destination in West Germany based on existing trends in local cultural norms. To this end, the estimates of our DD event study design for the years before reunification can be interpreted as "placebo analysis" and be used to examine common-trend assumptions.

Our main finding is that the presence of more East Germans with less traditional gender norms changes the behaviour of local women: We find significant increases in the hours worked of employed women, and in the Western women's share of within household working hours. In terms of heterogeneity, we find effects that condition on labour force participation are strongest for women with children above the age of three. In contrast, effects at the extensive margin appear to be strongest for women with young children.⁴ We examine in detail the time-patterns of the dynamic adjustments of the local changes in female behaviour. We find no reaction in the short run, but persistent reactions at the intensive margin in the medium- and long run. These time-patterns are consistent with slow-moving mechanisms of local cultural learning but not with classical labour market channels, which should show up immediately and fade away over time and space.

We present a battery of robustness and placebo checks to support the validity of our findings. In particular, we examine if our estimates reflect changes in local demand for employment or endogenous compositional changes. In addition, we show that the results are robust to specifications including different sets of individual-

³We also provide results for other definitions of the treatment, such as continuous measures of inflows, and simple before/after DD estimates.

⁴We return to and discuss the different impacts at the intensive and extensive margins in the conclusions in the light of child care infrastructure, theories of identity formation and local cultural learning.

level controls, to different region-specific trend specifications, different definitions of how we measure exposure to East Germans, different sample restrictions, and different ways of specifying the baseline pre-period in our DD analysis. Moreover, four of the balancing variables tested in the randomisation test remain significant at the 10% level or higher, so we also present results that include time-interactions of these variables as additional controls.

Using supplementary data sources, we move on to document that the presence of immigrants affects an index of agreement to stated cultural norms and beliefs. Information on stated beliefs is not available at the local level before reunification, so that these effects are not identified based on the DD event-study design. However, we present two alternative estimation strategies to exploit local variation in the presence of East Germans in the West, and examine estimates unconditional and conditional on a set of highly relevant control variables. We measure effects on beliefs about how maternal employment affects children and the marriage. We find that Western women exposed to a large influx of East Germans, adjust their cultural norms and become less gender-traditional, and that these effects are stable across specifications. Overall, this evidence is in line with our interpretation of the labour supply effects.

Are these effects on labour supply and local cultural norms driven by personal interactions or by other channels? Using individual-level information on friendship networks, we use further data to show that East Germans slowly befriend West Germans, which is especially true for stay-home mothers. This is consistent with our finding of no effects in the short run. Moreover, we find that the rate of intermarriage of West Germans with East Germans remains low throughout. This speaks in favor of theories of local cultural learning and against household bargaining.

Finally, the main findings on female labour supply and the heterogeneity with respect to the age of the own child can be best explained if local child care availability matters. To this end, we find that the presence of immigrants with gender-egalitarian local norms has led to local-level increases in the public provision of child care. In Germany, the public provision of child care is governed at the county-level and shortages of public provision are shown to affect female labour supply (e.g. Müller and Wrohlich, 2020). Using the same DD event-study strategy from our main analysis on labour supply, we find that counties with a larger influx

of gender-egalitarian East Germans started expanding child-care provision faster starting several years after reunification. Importantly, this immigration-induced change in public infrastructure occurred only several years after the documented changes in female labour supply at the intensive margin. We therefore conclude that the effects of immigrants on the local infrastructure likely amplified some of the labour supply responses we find in the medium- and long run, but cannot explain the earlier changes in labour supply due to the influx of East Germans with different cultural norms. These are best explained through slow-moving changes in local cultural norms.

This project combines two strands of the existing literature. First, the existing literature that focuses on the impact of immigration on receiving regions such as political outcomes (e.g. [Harmon, 2018](#)), the level of public good provision (e.g. [Alesina et al., 1999](#)), or preferences for redistribution (e.g. [Dahlberg et al., 2012](#); [Nekby and Pettersson-Lidbom, 2017](#)). We add to this literature by exploiting the unique natural experiment of German reunification to study effects of immigration on a different outcome of interest: cultural norms regarding female labour supply.

Second, we provide quasi-experimental evidence on theories of identity formation and cultural change (e.g. [Akerlof and Kranton, 2000](#); [Fogli and Veldkamp, 2011](#); [Fernández, 2013](#)). These theoretical models highlight the importance of local information transmission and behavioural mitigation in the process of identity formation and of cultural learning. This paper contributes to the growing body of empirical evidence showing that changes in the labour supply decisions of women can have large social multiplier effects on current and future generations of women. While there are various studies establishing strong intergenerational correlations between the labour supply decision of one generation and the next, e.g. [Fernández et al. \(2004\)](#), or [Olivetti et al.](#), (forthcoming), the previous literature assessing the question of identity formation and cultural learning in a causal manner is sparse. [Alesina et al. \(2013\)](#) find that descendants of societies where the plow was used as predominant agricultural tool have lower female labour market participation today, as well as less egalitarian gender norms. [Fernández et al. \(2004\)](#) use variation in the mobilisation rates of men in World War II to provide suggestive evidence that female labour supply shocks in one generations have long-run consequences on the following generations due to changes in cultural norms. On the individual level, [Maurin and Moschion \(2009\)](#) and [Mota et al. \(2016\)](#) study short-run

cultural learning effects and find positive effects of the labour supply decision of female neighbours on women’s labour supply at the extensive margin. [Nicoletti et al.](#), (forthcoming) reveal that there are substantial long-run family peer effects (of sisters) on a mother’s labour supply decision. Perhaps most closely related to this paper, [Boelmann et al. \(2021\)](#) show that West German mothers take substantially shorter parental (like their East German peers) when their firms experience a large inflow of East Germans.

Methodologically, this paper is related to the literature examining labour supply effects on natives of unexpected geographically localised inflows of migrants, starting with [Card \(1990\)](#). [Dustmann et al. \(2016a\)](#) provide a framework to reconcile findings in this literature. They summarise that studies that examine sudden changes in the local composition of workers (the spatial approach) only find evidence for displacement or wage effects when focusing on specific skill-, occupation-, or age-groups, or interactions thereof. This also applies to the German context:⁵ Most closely related to our setting [Prantl and Spitz-Oener](#), (forthcoming) study wage-effects of the same within-German first-wave migration post-reunification that we focus on in this study. They find no evidence for effects on West German native’ wages even exploiting variation within age- and occupation-specific cells, unless interacting the labour supply shock with product market regulation. In contrast to this literature, we study female and household-level labour supply decisions without focusing on particular subsets of skill-, occupation- or age-groups in the local labour markets, or product market interactions. We therefore believe our results cannot be rationalised through existing empirical findings on labour supply effects. In line with the existing literature, we document zero effects for males using this (only spatial) approach. Moreover, we document effects for females and at the household level for the medium- and long-run. [Borjas \(2006\)](#) points out that local labour supply effects disperse over time and space. Last but not least,

⁵[Glitz \(2012\)](#) finds skill-specific displacement effects of Eastern and Central European ”ethnic German” immigrants on West Germans working full-time in 1996-2001 by exploiting random geographical variation due to placement policies. [Dustmann et al. \(2016b\)](#) study short-run age- and skill-specific local labour market responses to the sudden inflow of Czech workers along the German-Czech border after reunification. They find evidence for displacement and that these effects are driven by changes in ”inflows” to jobs rather than ”outflows” of existing workers. Earlier papers do not find these negative effects on labour force participation for Germany ([Bonin, 2005](#); [D’Amuri et al., 2010](#)).

we provide direct evidence that shows adjustment in stated local cultural norms.⁶

In sum, we believe this paper makes two important contributions to the literature. First, we document that immigrants with different cultural norms and beliefs can trigger the evolution of cultural norms and behaviour in receiving regions. We discuss the dynamics that we find with respect to theories of identity formation and cultural learning that will eventually result in uniform equilibrium outcomes. Second, we document that immigrants might affect natives even with little direct interaction by changing the local infrastructure. This finding has additional policy relevance as it implies that governments can affect the evolution of local cultural norms by changing public spending.

2 Female labour supply, German reunification and the first wave of migration

The following section places the empirical analysis of this paper in context by providing information on patterns of women's labour supply and family policies in East and West Germany before and after reunification. A more detailed discussion can be found in section B.3 in the Appendix. In addition, we introduce the first wave of East-West migration after the fall of the wall, which we use to examine behavioural changes of women in West Germany.

⁶This paper is also related to a wider literature that uses German reunification to test economic theory: Redding and Sturm (2008) and Ahlfeldt et al. (2015) estimate the importance of market access for economic development at the region- and density at the within-city level. Burchardi and Hassan (2013) show that West Germans with social ties to the East experienced higher wage growth post-reunification. Bursztyn and Cantoni (2016) study consumption behaviour in reunified East Germany and Lichter et al. (2021) trust and economic outcomes.

2.1 Female labour supply in East and West Germany

Throughout the Cold War following World War II,⁷ policies for women and families as well as economic work incentives for women differed greatly between East and West Germany (e.g. Rosenfeld et al., 2004; Trappe, 1996), resulting in very different patterns of female labour supply and formal child care infrastructure.

As shown in Figure 1, women’s labour force participation in the former GDR increased sharply in the 1970’s and 1980’s. By 1989 about 78% of women in the working age population⁸ participated in the labour forces (91% including women still in education), 27% of them in part-time, usually working between 30 and 35 hours. To improve reconciliation of work and family life, the provision of public child care was massively expanded, reaching almost universal coverage in 1989 (Figure A1).⁹

In West Germany, on the other hand, policies and cultural norms set strong incentives to live within traditional role patterns, i.e. the traditional ”breadwinner and non-employed housewife” model (e.g. Wippermann, 2015). Women usually either stayed at home after they had children or entered part-time employment after an extended break. As shown in Figure 1 and discussed in more detail in Appendix B.3 in 1989 about 55% of women participated in the labour force working for on average 35 hours per week (average hours of all women amount to about 18 hours per week). The share of mothers¹⁰ participating in the labour force (47%) and the hours worked (31 hours for employed mothers and 13 hours overall) was

⁷Following WWII, Germany was divided into four occupation zones. The zones occupied by Great Britain, France and the United States, generally located in the Western, Northwestern and Southern parts, became West Germany (Federal Republic of Germany) in May 1949. The zone occupied by the Soviet Union eventually became East Germany (German Democratic Republic, GDR) in October 1949. Berlin, located within Soviet territory, was also divided into East and West zones. Starting in 1961, the border separating West and East Germany became sealed, to prevent further East-to-West migration and formed part of the iron curtain separating Europe into two political spheres. Prior to the construction of the Berlin Wall in 1961 it was possible for civilians to cross the border. After 1961, migration across the inner German border was effectively brought to a halt.

⁸In the former GDR, this was defined as all women between the age of 15 and 60 and 5/12 of women aged 14 (e.g. Statistisches Amt der DDR, 1950–1990).

⁹By 1989 about 80% of children under the age of three and 98% of children above the age of three attended formal child care, mainly in full-time. After-school programs were attended by 85% of primary-school-aged children (POS). In urban regions, the respective shares were almost 100%.

¹⁰Defined as women with children under the age 18 in the household.

even lower and full-time employment was rare (23%). There was hardly any formal child care provision for children under the age of three and school-aged children before reunification, with the exception of West Berlin.¹¹ The consequences of maternal employment and formal child care for children and marriage were subject to a heated public, political and academic debate (e.g. Schütze, 1986; Fthenakis, 1989). As shown in Figure 2 in 1991,¹² about three-quarters of the West German population agreed with the statement that a small child will certainly suffer if his or her mother is employed. Half of West Germans also indicate support for a traditional specialisation, where the husband works and the wife takes care of the household and children. East Germans are shown to have more egalitarian attitudes for five of the six outcomes concerning the role of women, child rearing and employment shown in Figure 2.

Previous studies show that the different politico-economic systems imposed on East and West Germany causally¹³ triggered the evolution of different cultural norms regarding the appropriate role of women. For example, using a spatial discontinuity at the border, Campa and Serafinelli (2019) show that women in East Germany rate their career success to be more important than women in West Germany. The results by Lippmann et al. (2020) suggest that women in East Germany can earn more than their husband without putting their marriage at risk, having to do more housework ("doing gender" hypothesis) or withdrawing from the labour market. Lippmann and Senik (2018) provide evidence on smaller gender gaps in maths and several studies show that East and West Germans exhibit strikingly different attitudes regarding the appropriate role of women, have different beliefs about the potential costs of maternal employment for children and exhibit different gender gaps in preferences for work (e.g. Bauernschuster and Rainer, 2012; Beblo and Görge, 2018). These studies do not find convergence of cultural norms over time. East Germans still have different cultural norms after moving to West Germany.

¹¹In 1990 almost 30% of available child care places in West Germany were provided in West Berlin. In our analysis, we exclude West Berlin.

¹²We are not aware of any data set containing representative information on beliefs and attitudes before reunification.

¹³Note that to examine cultural learning effects after German reunification in West Germany, we do not have to rely on this causality assumption. For our purpose it does not really matter why cultural norms and the labour supply decision of women are different.

2.2 East to West Migration

A series of unforeseen political events and large-scale public demonstrations cumulated in the fall of the Berlin wall on November 9, 1989, and the formal reunification of West and East Germany on October 3, 1990. Decades of East-to-West (net) migration followed.

Extent of Migration We rely on administrative records from all West German registration offices in order to identify migrants from the East. In Germany, by law (Bundesmeldegesetz §17) every person has to register any change in her place of residence with the registration authorities within two weeks after moving. From these records, we can construct exact measures of migration by age group and year. Panel (a) of Figure 3 shows the total migration flows over the years 1950 - 2015. It is evident that immigration from East Germany was almost completely prevented during the period of the wall, i.e. from August 1961 to November 1989. Within three years after the sudden collapse of the wall almost 1.05 million people migrated from East to West Germany. This number corresponds to about 6.5% of the population in the former GDR in 1989 and about 1.7% of the population in West Germany. In our analysis we focus on this sudden initial wave of immigration from East Germany into West Germany in the three years after the fall of the wall.¹⁴

First-Wave Immigration We focus on the first-wave immigrants for three reasons. First, this ensures that immigrants were socialised under the former GDR regime. As already described and discussed in detail in section B.3 in the Appendix, individuals who grew up in reunified East Germany were exposed to different family policies and female labour market patterns, e.g. child care provision was massively reduced after reunification. Second, a large fraction of the early migrants stayed in the region where they first immigrated to in West Germany. We estimate the share of early migrants who stayed in the region they were first observed to be around 75-85%.¹⁵ This is important because cultural learning likely takes time. Third, and most importantly, we show in the following that the first

¹⁴Due to differences in local data availability we base much of our results on inflows in 1991. We do not find significant differences in location decisions within these early years, where data is available.

¹⁵This estimate is based on representative data from the German Socio-economic panel study (Goebel et al., 2019). See section 5 for details.

wave of immigrants from East Germany were primarily driven by distance and not the economic conditions in the receiving counties.

Location Decisions of Migrants Panel (b) of Figure 3 maps the inflows in 1991 relative to the population in each county (broadly equivalent to U.S. counties). It is evident that the distance to the border is a key predictor of location choice. We provide two additional pieces of evidence that the location decision of first-wave migrants was mostly untargeted with regard to local characteristics of the destination county: First, we examine balancing of migration in Table 1. This exercise is in the spirit of experimental randomisation tests and each estimate comes from a separate regression of the treatment on the characteristic of interest. Columns 1 and 2 show if local characteristics predict the treatment indicator, above median inflow post-reunification, without and with state fixed effects as controls. Variables considered are measures of the local industry/firm structure and local values reflected in religiosity or dialectic distance. The latter measure combines historical dialectic distances from Falck et al. (2018), which have large effects on (informed) migration, to compute a measure of average dialectic distance to the East for each of the regions in the West. Moreover, we consider variables on the local availability of and expenditure on child care, population composition measures, housing characteristics, and female labour supply. All of these variables are based on measures taken before German reunification.

The main result from this exercise is that East-West migration is hardly related to these characteristics, although not completely unrelated. This holds in particular when including state fixed effects. Out of 28 local controls only four are significant at the ten percent level or higher for East-West migrants (column 2).¹⁶ In contrast, and to show the relevance of these variables, West-West mobility (columns 3 and 4) during the same years can be explained to a much larger degree by observable county characteristics. In column 4, which includes state fixed effects, 23 variables are significant at the ten percent level of statistical significance for West-West movers. Finally, distance to the border strongly predicts East-West mobility, but is virtually unrelated to West-West mobility.

As a second and related piece of evidence, Figure A2 plots the county-level

¹⁶In section 4.2 we will present results from specifications that allow for time-varying effects of these local measures, for robustness.

inflow share against this distance to the former border: early migration flows are strongly determined by distance. Adjusting for observable characteristics of the receiving counties using the 1986 census data on the county-level barely changes the estimated slope coefficient. In contrast, there is no distance-relation for West-West migration shown by the horizontal slopes in the lower half of the figure. Both of this holds within states (panels b and d). All in all, first-wave migrants thus appear untargeted with respect to local characteristics. Note that in our main DD strategy, it is sufficient if these migration decisions were unrelated to trends in local outcomes.

3 Data and empirical framework

We use a combination of administrative and survey data to study local cultural learning effects in West Germany following German reunification. The various data sets come at different levels of aggregation and we always use the lowest-level possible.¹⁷

3.1 Data, analysis sample and outcomes

Our main analysis is based on data from the German Microcensus, an annual household survey that samples one percent of the German population. The Microcensus is the largest annual household survey in Europe and contains various information on labour market outcomes and socioeconomic characteristics. If selected to participate, households are required to respond by law.

In our analysis, we use information covering the period from 1982 to 2015. More precisely, we rely on information from 1982, 1985, 1987, 1989, 1991, 1993, 1995, 1997, 1999, 2001, 2003, 2005, 2007, 2008, 2010, 2012, 2013 and 2015. Before 1995, this coincides with all waves that are available at a smaller regional level than state-level. Hence, we have information on four pre-reunification years and 14 post-reunification waves to study long-run cultural learning effects.

Our main sample consists of women aged 25 to 55, i.e. women who are out of

¹⁷As a result, our analysis is conducted at the county-level ("Kreis") or the regional level "Raumordnungsregion" (ROR), where a ROR usually consist of two counties and is a commonly used definition of local labour markets based on commuter flows (e.g. [Pischke and Velling, 1997](#)).

education but far from retirement, who have grown up and who are at the time of the survey living in West Germany. Unfortunately, the Microcensus does not ask directly if a respondent grew up in West Germany. To implement this restriction, we identify and drop from the sample East Germans living in the West based on their educational degree using recorded GDR-specific educational qualifications that were universal until reunification.¹⁸ In our main estimation sample, we restrict the analysis to cohorts born between 1945 and 1975. This ensures that we can identify women growing up in the West as the cohorts will have obtained basic educational degrees by reunification. Descriptive statistics for the main analysis sample are reported in Table 2.

We focus on four main outcomes: (i) women’s employment (ii) women’s working hours; (iii) working hours of women in employment; and (iv) relative working hours within households. Employment is coded as a binary indicator and equals one if women report a positive number of working hours. Working hours are measured as contracted working hours per week. Relative working hours are defined as the share of working hours provided by the women in the household (either married or cohabiting).¹⁹ In addition, we include a vector of exogenous controls, including age, age squared, highest educational degree in three categories and nationality. For further robustness checks, we also control for potentially endogenous variables such as separate indicators for the number of children in the household and the marital status, i.e. single, married, widowed and divorced, as well as partner characteristics such as age, highest educational degree in four categories, nationality, working status and working hours.

To examine mechanisms, we use a number of supplementary data sets. Appendix Table A1 provides an overview of the data used. More details about the supplementary data are provided as they are introduced in the respective sections.

¹⁸For a detailed description on how we identify individuals who grew up under the former GDR regime and plausibility checks, see Appendix section B.4. Our results are highly unlikely to be driven by remaining very small numbers of misclassified East Germans living in the West.

¹⁹Identifying non-married cohabiting couples directly becomes possible with the introduction of a new concept of living arrangements in 1996. In earlier waves, identifying non-married couples is possible based on information about the relationship to the household head, information on the household heads’ partner, their marital status, and an age-range plausibility check on the potential couples (Lengerer, 2005).

3.2 Empirical strategy

We use different empirical models to estimate labour supply and cultural learning effects in the aftermath of German reunification. Our baseline model is a simple difference-in-differences (DD) model, which formally reads:

$$Y_{irt} = \beta_0 + \beta_1 \text{HighInflow}_r * \text{Post} + X'_{irt}\beta_2 + \kappa_t + \mu_r + \epsilon_{irt} \quad (1)$$

Post is an indicator variable taking the value of one in post-reunification periods and HighInflow_r is our treatment indicator that is equal to one if a woman i lives in a region r that received above median inflow from the former GDR after the fall of the wall.²⁰ κ_t denote year fixed effects and μ_r a set of region fixed effects. We subsequently include state-year fixed effects to non-parametrically allow for economic shocks at the state level, e.g. changes in government or educational policies. In addition, we include a vector of exogenous individual controls X'_{irt} . β_2 is allowed to vary in pre- and post-reunification periods. We cluster standard errors ϵ_{irt} at the regional level to allow for idiosyncratic within-region correlations.²¹

In this specification, under common trend assumptions, β_1 identifies the average change in outcomes Y_{irt} between pre- and post-reunification periods for high inflow regions compared to low inflow regions conditional on covariates. Under the additional assumption of no compositional changes, this effect over time can be interpreted as the impact of immigration of East Germans on outcomes of West Germans.

To study the local dynamic adjustments directly and to additionally assess pre-trends, we estimate event study versions of equation (1), by interacting the variable that measures the inflow right after the fall of the wall, HighInflow_r, with year-specific dummies. Effectively, this results in the following specification:

$$Y_{irt} = \gamma_0 + \sum_{t \neq 1989} \gamma_1^t \text{HighInflow}_r + X'_{irt}\gamma_2 + \kappa_t + \mu_r + u_{irt} \quad (2)$$

We omit the last pre-treatment indicator (γ_1^{1989}) to standardise the outcomes. Thus, γ_1^t identifies the effect on outcome Y_{irt} relative to the year 1989, i.e. the last

²⁰We conduct several robustness checks using different treatment definitions, all yielding similar results (see section 4.2).

²¹In section 4.2, we conduct several sensitivity checks with respect to how we estimate standard errors.

period before reunification. This is the vector of coefficients of interest. We also report cumulative effects with respect to all pre-periods to mitigate issues related to using only one year as a reference point. The advantage of not combining the years of the pre-period, which is a common approach, is that pre-trends can be readily observed.

4 Results

4.1 Female labour supply

Table 3 reports estimates for equation (1) for the four main outcomes that we study using the Microcensus data for increasingly demanding specifications. The baseline estimates are reported in the odd-numbered columns. All of these specifications included state by year fixed effects. The even-numbered columns include additional individual-level controls, namely age, age squared, highest educational degree in three categories and nationality, which are allowed to differ in pre- and post-periods in columns. If unobserved (economic) shocks at the state level or compositional changes were driving the results, they would likely differ across specifications.

The first three columns show little evidence of consistent effects on working hours for all women. Estimates turn positive but remain insignificant moving from columns 1 to 3. In contrast, the baseline DD coefficients indicate that regions with above median inflow shares after German reunification experience an increase in working hours of employed women of about 0.9 hours per week and an increase in working hours of women relative to their cohabiting partner of about 0.05 percentage points.

To examine the effect evolution, Figure 4 plots coefficients from equation (2) for our main outcomes. The estimated coefficients are close to zero and not statistically significant in pre-reunification years, indicating that before reunification treated and control regions exhibit similar trends in outcomes. After reunification, in panel (b) we find the positive and significant effect on working hours of employed women which seems to level off at about 1 hour per week (3.2% relative to the pre-reunification mean). It takes about 6 years for the coefficients to become statistically significant at the 5% level. Subsequently, they stay roughly constant. Similarly, panel (c) shows a positive effect on the relative working hours of women

within households, which levels of at about 0.1 percentage points. As before, effects at the extensive margin of labour supply are only mildly positive, see panel (a).

Overall, the findings of the different empirical specifications are consistent with our prior assumption on slow moving cultural learning effects, as reflected by the labour supply decisions of women at the intensive margin. One interpretation of the lack of significant effects at the extensive margin is that these also depend on the local child care infrastructure, or identity formation which happens maybe only once in life, issues which we return to in sections 4.3 and 5.

4.2 Robustness

4.2.1 Treatment definition, identifying East Germans and general equilibrium effects, placebos

Table 4 presents a series of robustness checks. Panel A shows results for different functional forms to capture the inflow of East Germans, either using different cut-offs to define "high" inflow or continuous measures. Using a 25% vs. 75% instead of the median split generates larger estimates. Estimates based on continuous measures are also statistically significant. Our results are thus not sensitive to the functional form for measuring the inflow of East Germans

Panel B of Table 4 presents results imposing different sample restrictions. One challenge of our main data set is that respondents are not directly asked if they grew up in East Germany. Thus, one potential threat to the cultural learning interpretation would be to misclassify East German women as West Germans. This would mechanically bias our estimates upwards since East German women exhibit strikingly different labour market outcomes, even after moving to the Western part of Germany. To mitigate this issue, in our main specification we restrict the analysis to cohorts born between 1945 and 1975. This ensures that we can best identify and exclude all East Germans who moved to West Germany by observing their GDR educational degree (see Appendix section B.4 for details). The downside of using this cohort restriction is that our sample grows older with time. As expected from Appendix section B.4, our estimates are very similar without this cohort restriction (estimates with column-title "all cohorts").

The other sample restriction that we use in panel B is the exclusion of border regions. This is potentially important to examine the importance of potentially

unobserved general equilibrium effects of reunification. Notably, these are more problematic for the literature that studies outcomes for East Germans over time, who experienced a period of rapid change post-reunification where changes in individual outcomes would be more difficult to attribute to specific factors. However, even West Germans might have been affected by reunification in various ways. To this end, it is important that our results are not sensitive to including or excluding border regions in the West, which would be most affected by other local effects through reunification.²² Estimates from this "no border" sample are very similar to the baseline. Overall, the results of Panel B confirm that our findings are robust to different sampling choices and unlikely driven by hidden general equilibrium effects on West German regions after reunification.

Finally, in Panel C of Table 4 we estimate placebo regressions with male labour supply as the outcome variable. Here, we fail to detect significant effects, for all outcomes. This finding is maybe not surprising given our approach and the findings of the literature on migration and labour supply.²³ Nevertheless, the fact that there are no effects on males further strengthens our argument that local labour market trends are unlikely driving our results. Furthermore, in Panel C of Table 4 we construct an equivalent treatment measure using West-West migration, i.e. mobility within West Germany and equally do not find a significant treatment effect, suggesting that local demand spillovers that result from an increase in population density are unlikely to drive our results.

4.2.2 Local labour markets

Another concern would be that immigrants start working in services that are close substitutes of household production (e.g. as caregivers or household help), thus lowering the prices of these goods (e.g. Cortes, 2008).²⁴ For example, Cortes

²²Studying differences close to the border is also problematic because in ongoing work (Becker et al., 2020) document that local differences across the inner-German border existed even pre-WWII. Moreover, Redding and Sturm (2008) find regions close to the Iron Curtain experience a decrease in population growth due to the loss of market access after German division, though no statistically significant effects after German reunification. In addition, in 1971 the West German government introduced a subsidy program ("Zohnenrandfördergesetz") for regions within 40 kilometres of the border (e.g. Seidel and von Ehrlich, 2014).

²³See discussion of this literature in section 1.

²⁴We show in section 5 that the presence of East Germans lead to an expansion of the child care infrastructure. Similar to the previous argument, one could argue that the labour supply

and Tessada (2011) show that low skilled immigration increases working hours of highly-skilled women in the US. This alternative interpretation is very unlikely to apply to our setting for several reasons. First, East German immigrants are if anything positively selected and work in similar occupations like West Germans, and rarely work in the child care sector (about 4%). Second, we observe larger effects for lower skilled West German women, who are very unlikely to employ private child minders. Third, informal child care by child minders is generally not very common in Germany (e.g. Büchel and Spieß, 2002). Only very few German households purchase other household services in the market (e.g. Schupp et al., 2006).

4.2.3 Differences in receiving regions' characteristics

Four of the local characteristics tested in Table 1 and discussed in section 2.2 remained significant at the ten percent level of statistical significance even with the inclusion of state fixed effects. On the one hand, this is not surprising given the number of characteristics tested for. On the other hand, we cannot fully exclude the possibility that these differences in levels translate into differences in trends in our outcome measures that are related to the treatment. In Appendix Figures A3-A6 we therefore present estimates for our main results using specification 2 but allowing for additional time-interactions with the underlying variable. For example, in Figure A3 we show the γ_1^t -estimates from a specification that includes additional dummy variables for the interaction $\kappa_t * W_r$, where W_r represents the local share of employers working in manufacturing in this instance. Overall, the main results are robust to these modifications.

4.2.4 Compositional changes

We next assess whether our estimates might simply reflect compositional changes, e.g. due to selective out-migration as a response to the inflow of East Germans. This concern is particularly severe given our long post treatment period, which we chose to capture slow moving cultural learning effects. In Appendix Table A6, responses are driven by West German women now working in child care institutions. However, excluding West German women who work as child minders (about 3% of our sample) does not change our results.

we examine if the regional amount of outflow and the age patterns of outflow in reunified Germany differs by treatment status. Coefficients are small and statistically insignificant. Furthermore, compositional changes might evolve due to selective in-migration. However, coefficients in Panel B of Appendix Table A6 suggest no difference in the amount and age pattern of immigration from other West German regions. Again coefficients are negative and statistically insignificant at conventional levels of statistical significance. To sum up, systematic compositional changes in age groups should either result in positive values in inflow measures and negative values in outflow measures, or vice versa. We find no evidence for this.

In addition, we estimate models with a more extensive set of individual controls such as dummies for the number of children, marital status in four categories (single, married, widowed, divorced) and partner characteristics (age linear and squared, education, nationality, working status, working hours).²⁵ Note that some of these additional controls might be endogenous to local cultural learning effects, in particular in the long run. However, they can better control for any potential compositional changes. Estimated coefficients for our baseline DD model are depicted in Appendix Table A5 and event versions in Appendix Figure A7. They are very similar across different control specifications. We also assess compositional changes more directly by replacing the outcomes with the extensive set of control variables and re-estimate our models. None of these coefficients are statistically significant.²⁶

4.2.5 Further robustness checks: specification changes and inference

In the DD event study analysis we have chosen the last year before reunification, 1989, as baseline year. Alternatively, we can use all years before reunification as baseline, which has little effects on our results due to the flat pre-trends (Appendix Figure A8). In addition, we assess the sensitivity to modelling time trends. Appendix Figure A9 graphically depicts our event-study estimates using different trend specifications, i.e. region specific linear time trends and region specific linear time trends fitted only on pre-unification (1982 - 1989) data. As expected

²⁵Unfortunately, the Microcensus only contains information on net monthly income. Since in Germany, couples are subject to an income splitting taxation model, controlling for the net-income of the partner partly reflect the endogenous earning of the women.

²⁶These additional results can be obtained from the authors upon request.

from observing parallel trends in Figure 4, results are stable using different trend-specifications, with the exception of overall working hours. Note that using unit specific linear time trends changes the identifying assumption from parallel trends to one of parallel growth.

We also assess the sensitivity of inference, i.e. to how we calculate our standard errors. Appendix Table A8 reports standard errors of our main DD estimates when clustering standard errors on the higher level of aggregation, which corresponds to the state-level in our setting. In addition, it reports unclustered standard errors and standard errors that are obtained when aggregating the data on the regional level and re-estimating our main specification. Note that we only conduct this exercise without including additional controls because this would also slightly change our estimated treatment coefficients. Inference remains similar using alternative ways to cluster standard errors. However, when clustering on the state level, standard errors are larger and only the coefficient without any additional controls remain significant. We do not regard clustering at the state level as appropriate due to the small number of states in West Germany (nine) spatial auto-correlation of outcomes and error terms are likely in our context.

4.3 Heterogeneity and further outcomes

This section presents results by different household types. The estimated coefficients in Table 5 are obtained by stratifying our baseline DD estimates by highest educational schooling degree, marital status and age of the youngest child within the household.²⁷

When stratifying the results by education (Panel A), it is evident that the results are primarily driven by women with low and medium levels of education, especially within households. Married women exhibit slightly stronger responses, but these differences are not significant (Panel B).

Panel C of Table 5 splits the sample by the age of the youngest child present in the household. The estimates in columns 1 to 3 show effects that include the extensive margin of not working/working at all, and these are larger for women

²⁷As mentioned above, restricting our sample to cohorts born between 1945 to 1970 has the potential caveat that our sample grows older with time. This is why the stratification by youngest child is done using all cohorts. For all other results, we report results based on the restricted sample. Note, however, that the results are very similar without this cohort restriction.

with small children (0.813 age below three; 0.273 age above six), although these coefficients as well as their differences are not statistically significant from zero or each other at conventional levels of statistical significance.²⁸ In contrast, the effects on female working hours for employed women, both in absolute terms (columns 4 to 6) and relative terms (columns 7 to 9), are clearly driven by women with the youngest child above the age of three in the household. We believe these women are least constrained by the local child care infrastructure. In West Germany, children above the age of three either attended kindergarten or school, enabling women to increase working hours at the intensive margin. We believe that working women with younger children were possibly constrained by the lack of formal child care, which we examine directly in section 5.3 below. Finally, in Appendix Figure A10 we present estimates of equation 2 for other outcomes: full-time employment defined as working above 35 hours per week, and full-time employment of employed women. These findings mirror our results found in our three main outcomes.

5 Mechanisms

There may be different mechanisms at play that could explain the positive labour supply responses of West German women. It could be that West German women simply mimic the behaviour of East Germans (Akerlof and Kranton, 2000), that there is some sort of information and cultural norm transmission (Fogli and Veldkamp, 2011) through social interactions or that East Germans change the local infrastructure for families (e.g. child care provision) either through their direct demand or indirectly through voting outcomes. All of these potential mechanisms are likely to reinforce each other over time.

Empirically, it is not possible to net out one single explanation for the observed effects. However, we can use additional data sets and outcomes to better understand the observed patterns in the data and to provide additional evidence on cultural learning effects. The additional survey and administrative data used to examine effects on local cultural norms, East-West friendship and intermarriage as well as the local child care infrastructure are summarised in Appendix Table A1.

²⁸If taken at face value, the finding that extensive margin effects appear stronger for women with young children might emerge through changes in identity formation, rather than cultural learning, which occurs when children are young.

Descriptive statistics are presented in Appendix Tables [A3](#) and [A4](#).

5.1 Local cultural norms

Studies show that individuals who grew up under the former GDR regime developed different cultural norms regarding the appropriate role of women, beliefs about the potential costs of maternal employment for children, and importance of women’s careers ([Bauernschuster and Rainer, 2012](#); [Beblo and Gorges, 2018](#); [Campa and Serafinelli, 2019](#); [Lippmann et al., 2020](#)).

To empirically examine if cultural norms and beliefs were transmitted to West Germans, we examine the agreement of West Germans to statements regarding the appropriate role of women in the family and beliefs about the potential costs of maternal employment for children and the marriage using data from the General Social Survey (ALLBUS) ([GESIS - Leibniz-Institut für Sozialwissenschaften, 2018](#)). We combine the agreement to the single items shown in [Figure 2](#) to a single index by standardising each variable (measured on 4-point scale ranging from 1 ”completely disagree” to 4 ”completely agree”) and then add up each item such that higher values correspond to more ”progressive” gender attitudes and beliefs about how maternal employment affects children and the family. In the ALLBUS survey, these question were first asked in 1982. However, regional identifiers only become available in 1994. Although we do not have data on norms and beliefs before and after reunification, we can test whether individuals living in high inflow counties exhibit less traditional cultural norms after reunification, controlling for a rich set of covariates including state times year fixed effects.²⁹

Estimated coefficients in [Table 6](#) are positive and significant, suggesting that individuals living in high inflow counties in West Germany in post-reunification periods exhibit more ”progressive” gender attitudes and beliefs about detrimental effect of maternal employment for children and the family. This holds when controlling for state year fixed effects, capturing state specific shocks and a very rich set of individual controls. The magnitude amounts to about 7% of a standard deviation. The estimated relationship increases with time. Examining heterogeneities by gender and individual statements shows that this result is driven by women

²⁹The ALLBUS data has several advantages. First, it directly asks individuals where they were born and spent their youth, which mitigates the problem of misspecification of East Germans. Second, it is rich in socio-economic controls, e.g. we can also control for religion.

who adjust their beliefs about the costs of working for children and families (first, third and fourth statements in Figure 2), while attitudes toward the appropriate role of women (other statements in Figure 2) are less affected.

5.2 Social interactions: friendships and intermarriages

The transmission of cultural norms or information is likely to happen more rapidly if there is a lot of interaction between local West Germans and individuals who grew up under the former GDR regime. Since East Germans are observationally similar to West Germans, i.e. they speak the same language and have similar levels of education, one would not expect to find a "clustering" or enclaves of immigrants as it is common for other immigration groups.

To examine to what extent West Germans interact with people who grew up under the former GDR regime, we rely on data from the Socio-economic panel study (GSOEP).³⁰ The GSOEP is an annual household-panel survey that is representative of the entire population in Germany (Goebel et al., 2019). We construct measures of the prevalence of East Germans in the friendship network of men and women living in West Germany and the share of marriages where one partner is from East Germany. In particular, we construct two indicators: the share of friends who come from East Germany and an indicator whether a person states to have at least one friend from East Germany.³¹

Table 7 shows that in treated regions the share of friends who are originally from East Germany is significantly higher (about 0.5 percentage points) than in control regions. In addition, West Germans in treated regions state to have at least one friend who is originally from East Germany with a 1 percentage point higher probability. These coefficients are large given the overall mean of about 3% and 5%, respectively. Intermarriages rates is also higher in treated regions (by about 0.2 percentage points), though the coefficients are not statistically significant.³²

³⁰As an additional robustness check, we also conduct the main analysis based on GSOEP data. The estimated coefficients are similar; however, due to much smaller sample sizes, they are less precisely estimated (Appendix Table A7).

³¹This information is derived from a question on friendship networks that is available in the years 1996, 2001, 2006, 2011 and 2016. Respondents are asked to think of three friends or relatives (excluding people living in the same household) with whom they go out with or meet regularly.

³²Note that when examining the group of East Germans who live in West Germany directly, we observe an equivalent pattern.

Examining the coefficients over time shows that while treated and control regions exhibit the same friendship outcomes in 1996 (first year available), the coefficient subsequently increases to 1.2 percentage points and 3 percentage points in 2016, respectively. Further analysis shows that the coefficient is significantly larger for working individuals and is increasing with years of education, which might indicate that some of the interaction between East and West Germans happens at the workplace.

To sum up, friendships and intermarriages between East and West Germans remained at a low level in the first decade following German reunification. However, it increased substantially in high inflow regions in the years that followed.

5.3 The local child care infrastructure

As described in section 2, in East Germany almost all children were in formal child care from a rather early age. In West Germany, on the other hand, child care places³³ for young children or after-school care for school-age children were very rare (see section 2 for more details on the institutional setting). Most child care for children under the age of three was provided informally by the mothers, grandparents or other family members and friends. Administrative data on the number of children in publicly funded child care on the county-level is available starting in 1986.³⁴ We construct child care ratios separately for children under the age of three and for children aged three and above (all-day child care). Child care ratios are defined as the fraction of children using subsidised formal child care in the respective age group.³⁵

Figure 5 plots the estimated treatment effect on child care attendance.³⁶ Av-

³³In Germany - in contrast to other industrialised countries - about 98% of all child care places are publicly funded and provided by the municipalities themselves or by non-profit organisations, i.e. churches or welfare organisations (e.g. Jessen et al., 2020). The administration in Germany is up to the states and counties.

³⁴Until 2002 this data set was collected in four-year intervals and contained information on the number of approved child care slots. Starting in 2007 the actual number of children in publicly funded child care is provided annually. Due to severe child care shortages, the change in definition does not cause a discontinuity in the data. The data from 1986 is obtained from the Familien-Atlas of the Deutsches Jugendinstitut (1993).

³⁵It would also be interesting to examine the impact on after school care. However, due to data availability and the expansion of all-day schooling (*Ganztagsschulausbau*), it is not possible to construct a consistent measure of after school care ratios on the county-level over time.

³⁶Since in 1986, there are some missings in the data, we also show estimates when using 1994

erage effects are reported in Table 8. It is evident that in regions with above median inflow formal child care supply for under three year olds expanded at a much faster pace than in other regions. By 2015 the coefficient amounts to about 2.5 percentage points (7% relative to the mean in 2015). The coefficients averaged over all years corresponds to 1.2 percentage points (see Table 8). Interestingly, child care ratios do not increase right away, though in the administrative data set we cannot differentiate between the children of East and West Germans. Thus, one might have expected an immediate increase caused by the direct demand of East Germans themselves. One explanation why it takes so long for the supply to respond to the demand is that the expansion of institutionalised care for children under the age of three was only promoted on the national level in 2005 and 2008, when the government passed two laws (and provided money) to expand child care provision for this age group. Similarly, the estimated coefficient for the fraction of children above the age of three (until school entry) in all-day formal child care amounts to about 3 percentage points (11% relative to the overall mean).

Overall, our empirical exercise suggests that there were substantial spillover effects on the child care infrastructure that potentially amplified or even triggered some of the labour supply responses of women that we see in the data. Importantly, though, the effect of the immigration of more gender-egalitarian East Germans right after reunification on local child care in the West only emerges from 2008/2009 on. In contrast, the effects on female labour supply started emerging about ten years earlier, from 1998/99 onwards. The endogeneity of the local child care infrastructure thus cannot explain the earlier rises in female labour force participation. Based on the evidence on stated norms, friendship ties and inter-marriage these are best explained by slow-moving adjustments in local culture.

6 Concluding remarks

We exploit the unique natural experiment of German reunification to study the local evolution of behaviour of natives. We show that large migration inflows of individuals with different social norms and beliefs about how maternal employment affects children and the family can have substantial spillovers effects on West

as a baseline.

German families, reflected in intensive margin of labour supply and within household division of paid work. We carefully examine the robustness of these findings with respect to the specification, measurement of the treatment, or potential violations of the common trends assumption. Moreover, we rule out traditional labour market channels by providing placebos against males, examining the timing of the effect evolution, and by noting that local gender-specific demand shocks unlikely occurred in the West German setting that we study.

Instead, we find these effects best accommodated by models of cultural learning and endogenous child care infrastructure, which predict gradual change. We support this interpretation by providing evidence on effects on stated beliefs and attitudes and the local social interaction between East and West Germans. These effects are estimated using post-reunification data only, due to data limitations that cannot be changed ex-post, and remarkably robust over various specifications.

Finally, we examine the causal effects of immigrants with different gender norms on the local evolution of formal child care provision, again using difference in differences and event study specifications, among others. We document significant effects on the local provision of child care, which, however, only emerge in the mid-to late 2000s. This is a period when the lack of child care as limiting factor for female labour supply hit the national policy agenda.

Taken together, this study highlights a number of novel findings regarding the impacts of migrants over time. First, our finding on within-household labour supply of working women are best explained by local cultural learning. Effects are then reinforced by endogenous changes in the local child care infrastructure in later years. In contrast to our findings for working women, we find very limited evidence for effects at the extensive margin of labour supply. Here, we find some evidence that mothers of very young children, for whom identities might still be malleable, react at the extensive margin, although the full effect might be muted by limited child care availability.

We argue that the historical setting that we study is uniquely suited to better understand the impact of immigrants on local cultural norms. But what does this imply for external validity? The immigrants that we study have different cultural norms, but speak the same language; they also have accredited educational degrees, and are fairly similar in many other respects. The effects of immigration working through local social interaction are likely to take longer to materialise whenever

immigrants integrate less well with the native population. As a result, different and less integrated immigrants are less likely to immediately affect the cultural norms of natives through the learning channel and might not even do so in the second generation. However, the absence of direct immigrant-native interaction does not mean that such less integrated immigrants have no impact on natives at all. Instead, they might have an effect via changes in the local infrastructure, which does not depend on direct immigrant-native interaction.

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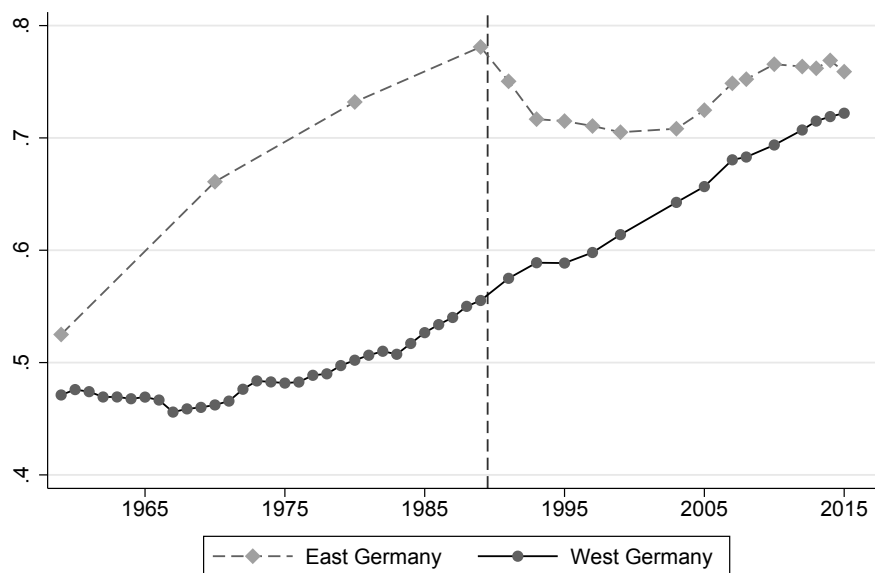
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Figures and Tables

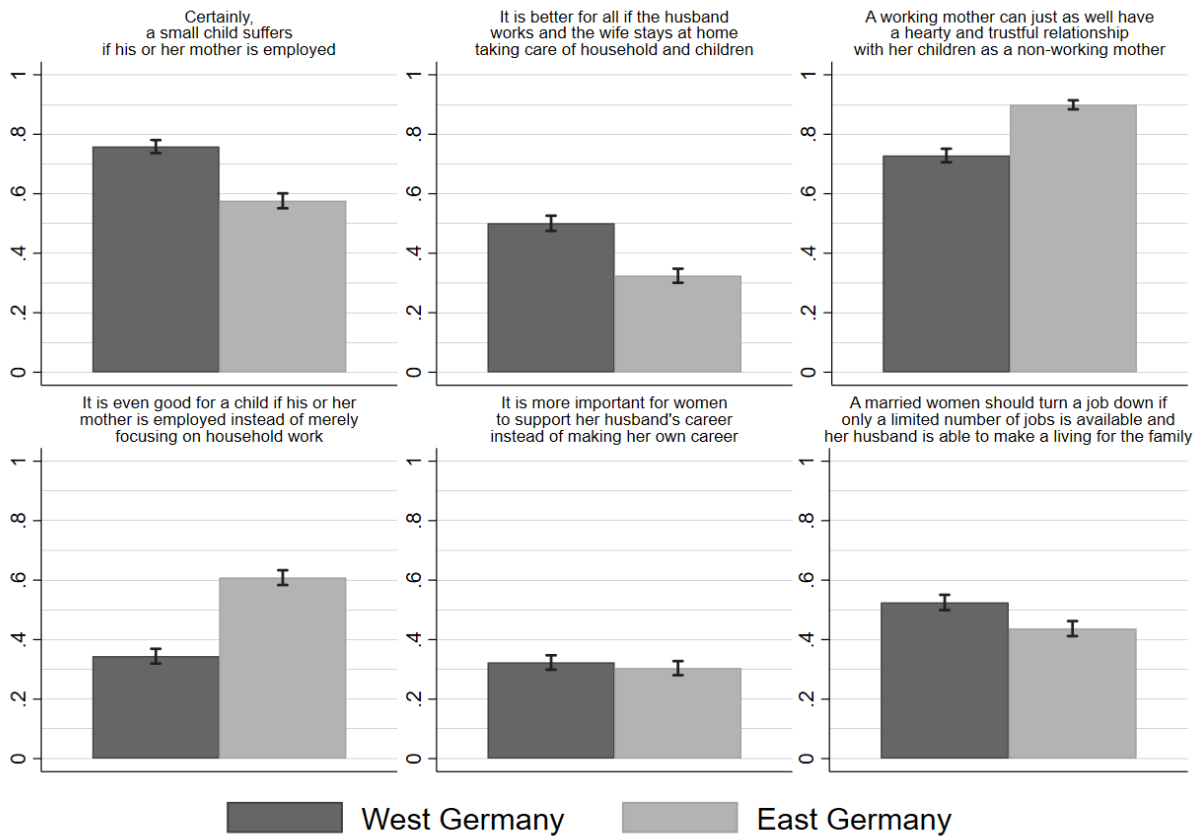
Figure 1: Female labour force participation rates 1959 - 2015



Notes: The figure shows labour force participation rates of women aged 15 - 65 in East and West Germany over time. The vertical line indicates German reunification in 1989.

Sources: Statistisches Amt der DDR (1996-1990), Statistisches Bundesamt (2017), MZ (1991 - 2015), own calculation.

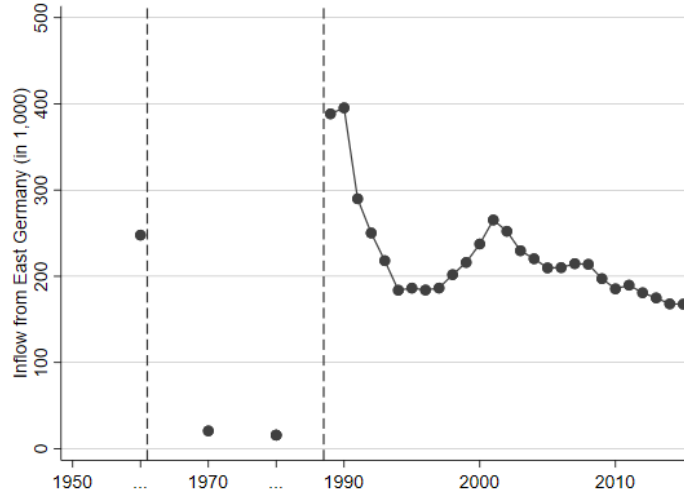
Figure 2: Cultural Norms and beliefs of West and East Germans in 1991



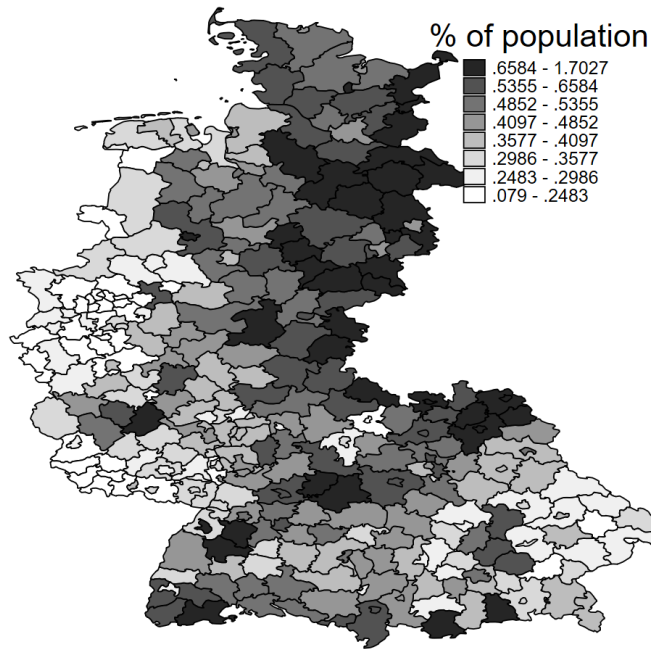
Notes: Figure shows the fraction of individuals agreeing ('rather agree' and 'fully agree') to listed statements by East and West Germans in 1991. Whiskers indicate 95% confidence intervals. Source: ALLBUS 1991, own calculation

Figure 3: Immigration from East to West Germany

(a) Number of immigrants over time



(b) Inflows in 1991



Notes: Panel (a) plots the number of immigrants from East to West Germany over time. The vertical lines indicate the construction of the Berlin Wall in 1961 and the fall of the wall in 1989. Panel (b) show West German counties distinguished by the percent of the local county-level population that migrated from East Germany in 1991 (in eight equally large bins).

Source: BBSR (2017), German Statistical Offices, own calculation.

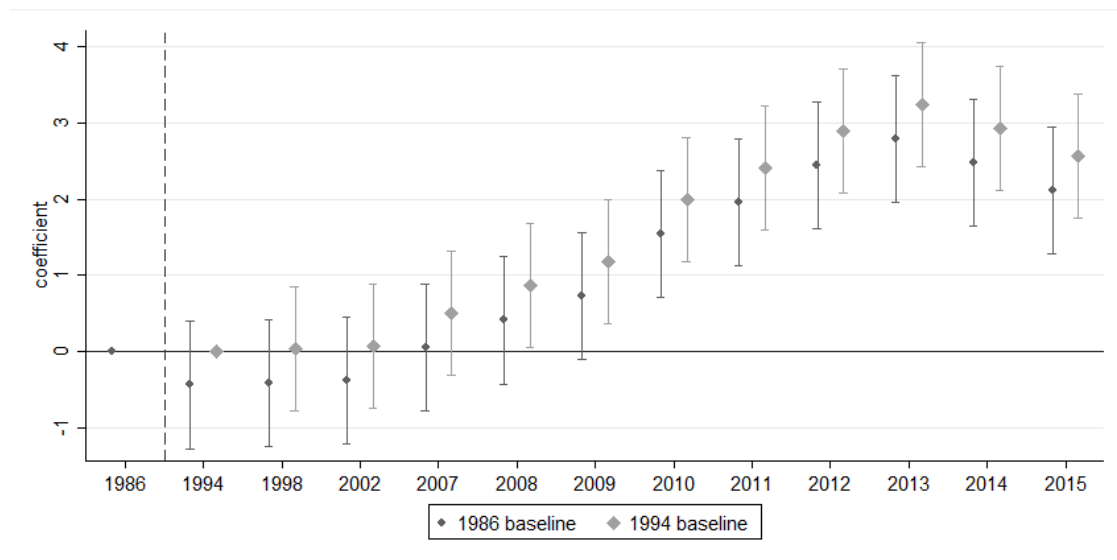
Figure 4: Event analysis



Notes: The figures plots the estimated γ_1 coefficients from equation (2) and corresponding 95% confidence intervals.

Source: MZ 1982-2015, BBSR (2017), own calculation.

Figure 5: Formal child care provision for children below age three



Notes: The figures plots the estimated γ_1 coefficients from equation (2) and corresponding 95% confidence intervals using 1986 and 1994 as baselevels.

Source: Statistisches Bundesamt (2017), BBSR (2017)

Table 1: Randomisation tests using pre-reunification data sets

	High inflow from			
	East Germany		West Germany	
	(1)	(2)	(3)	(4)
Industry/firm structure in 1987: Share of employees working in ...				
Agriculture and forestry	0.717 (0.401)	0.142 (0.387)	-2.343 (0.381)	-2.281 (0.358)
Trade	0.530 (0.768)	-0.100 (0.521)	-2.053 (0.760)	0.457 (0.552)
Manufacturing	2.961 (1.960)	2.702 (1.610)	-11.315 (1.861)	-7.698 (1.527)
Energy, water supply and mining	-0.291 (0.212)	-0.069 (0.201)	-0.755 (0.208)	-0.273 (0.197)
Small firms (2 - 19 employees)	1.471 (0.908)	0.601 (0.991)	-1.497 (0.907)	-3.398 (0.905)
Large firms (\geq 100 employees)	-0.069 (0.060)	-0.033 (0.068)	0.225 (0.058)	0.334 (0.059)
Religion in 1987, dialect distance, voting outcomes 1989:				
Christian religion	-0.175 (0.757)	0.790 (0.676)	-3.371 (0.733)	-4.806 (0.606)
Other / no religion	0.423 (0.747)	-0.910 (0.663)	3.558 (0.719)	4.808 (0.584)
Dialect distance to East	-0.049 (0.350)	0.033 (0.390)	-	-
Vote share Christian Democratic Union	0.398 (0.886)	0.573 (0.988)	-5.168 (0.837)	-6.311 (0.788)
Vote share Social Democratic Party	0.327 (0.885)	0.841 (0.656)	0.051 (0.885)	0.566 (0.610)
Vote share Greens	-0.165 (0.315)	-0.477 (0.343)	1.860 (0.297)	2.480 (0.284)
Vote share Free Democratic Party	-0.077 (0.130)	0.049 (0.093)	0.519 (0.126)	0.632 (0.089)
Formal child care and expenditures in 1986:				
Child care ratio (0–2 year olds)	0.070 (0.147)	-0.002 (0.164)	0.629 (0.142)	0.722 (0.157)
Child care ratio (3–6 year olds)	-2.068 (2.410)	4.216 (1.683)	5.345 (2.394)	3.360 (1.619)

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After-school care ratio (6–9 year olds)	-0.725 (0.500)	-0.844 (0.556)	2.960 (0.473)	3.595 (0.508)
Child and youth welfare expenditures	-0.155 (0.113)	-0.190 (0.131)	0.594 (0.109)	0.703 (0.118)
Population composition in 1987:				
Share singles	1.591 (1.915)	-0.171 (1.279)	-7.764 (1.866)	-2.275 (1.343)
Share married	2.575 (2.414)	1.218 (1.554)	-10.795 (2.340)	-3.744 (1.650)
Share divorcees	0.014 (0.205)	-0.046 (0.161)	0.118 (0.205)	0.803 (0.161)
Share foreigners	-0.477 (0.419)	-0.433 (0.400)	0.091 (0.420)	1.197 (0.403)
Share single households	-0.572 (0.872)	-1.085 (0.979)	5.964 (0.803)	7.365 (0.838)
Share households ≥ 4 person	1.597 (1.279)	0.700 (1.101)	-8.875 (1.181)	-6.622 (1.006)
Housing in 1987:				
Average rent (per m^2 in DM)	-0.509 (0.348)	-0.471 (0.206)	0.476 (0.349)	0.864 (0.176)
Average number of rooms per person	0.034 (0.008)	0.027 (0.008)	0.044 (0.008)	0.024 (0.008)
Female labour supply in 1987:				
Share female employees	1.067 (0.349)	0.388 (0.403)	1.668 (0.341)	1.218 (0.365)
Share of women working part-time	0.705 (0.425)	0.471 (0.359)	0.174 (0.426)	0.478 (0.348)
Share of women working as family worker	0.484 (0.324)	0.297 (0.359)	-1.437 (0.315)	-2.263 (0.314)
Distance to former East border:				
Distance (in km)	-64.034 (8.284)	-55.719 (7.822)	-0.067 (9.035)	8.384 (8.211)

Notes: Each coefficient is obtained from a separate regression for 316 RORs. East/West inflows are normalized for comparisons between inflows from East and West Germany. Column (2) and column (4) include state fixed effects. *Source:* Census 1987 based on DJI Regional Database (1993), BBSR 2017, own calculation, dialect data by [Falck et al. \(2018\)](#).

Table 2: Descriptive statistics

	Mean (1)	Std. Dev. (2)	N (3)
<i>Female labor market outcomes</i>			
Working hours / week	22.74	17.39	1373594
Working hours / week of employed women	30.44	13.05	1026126
Relative working hours within household	0.38	0.13	648386
<i>Individual controls</i>			
Age	39.99	8.20	1438913
Degree from basic school track (<i>Hauptschule</i>)	0.43	0.49	1438913
Degree from middle school track (<i>Realschule</i>)	0.32	0.47	1438913
Degree from high school track (<i>Abitur</i>)	0.25	0.43	1438913
Foreign nationality	0.07	0.25	1438913
<i>Individual potentially endogenous controls</i>			
Married	0.71	0.45	1438913
Divorced	0.09	0.29	1438913
Widowed	0.02	0.13	1438913
Single	0.18	0.39	1438913
No children in household	0.48	0.50	1438913
1 child in household	0.24	0.43	1438913
2 children in household	0.21	0.41	1438913
3 children in household	0.05	0.22	1438913
4 children in household	0.01	0.10	1438913
5 or more children in household	0.00	0.05	1438913
<i>Partner controls</i>			
Age	43.69	9.00	1035538
Degree from basic school track (<i>Hauptschule</i>)	0.50	0.50	1025608
Degree from middle school track (<i>Realschule</i>)	0.21	0.41	1025551
Degree from high school track (<i>Abitur</i>)	0.28	0.45	1025577
Foreign nationality	0.07	0.26	1035516
Working hours / week	39.78	13.47	1002440

Notes: The sample includes all women aged 25 - 55 with non-missing information on individual controls, who are currently living in West Germany and do not have an East German educational degree. Source: MZ 1982-2015, own calculation

Table 3: The labour supply effect of exposure to East Germans

	Dependent variable							
	Labour force participation of women		Working hours of women		Working hours of employed women		Relative working hours within households	
Mean of dep. var. before reunification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
DD coefficient	-0.005 (0.005)	-0.006 (0.005)	0.443 (0.334)	0.343 (0.308)	0.984 (0.357)	0.865 (0.300)	0.006 (0.002)	0.005 (0.002)
State x year FE	✓	✓	✓	✓	✓	✓	✓	✓
Ind. controls		✓		✓		✓		✓
<i>Observations</i>	1,438,913	1,438,913	1,373,594	1,373,594	1,026,126	1,026,126	648,386	648,386
<i>Adj. R-squared</i>	0.030	0.047	0.010	0.037	0.032	0.054	0.026	0.046

Notes: Difference-in-differences coefficients from equation (1). For set of individual controls see Table 2. Source: MZ 1982-2015, BBSR (2017), own calculation.

Table 4: Robustness and sensitivity checks

Panel A: treatment definition	Labour force participation of women		Working hours of women		Working hours of employed women		Relative working hours within households	
	25 vs. 75 (1)	continuous (2)	25 vs. 75 (3)	continuous (4)	25 vs. 75 (5)	continuous (6)	25 vs. 75 (7)	continuous (8)
DiD coefficient	-0.029 (0.013)	-0.018 (0.009)	0.721 (0.672)	0.287 (0.505)	2.589 (0.300)	1.721 (0.445)	0.016 (0.002)	0.015 (0.003)
State x year FE	✓	✓	✓	✓	✓	✓	✓	✓
Ind. controls	✓	✓	✓	✓	✓	✓	✓	✓
<i>Observations</i>	727,150	1,438,913	690,896	1,373,594	507,466	1,026,126	316,424	648,386

Panel B: sample restrictions	Labour force participation of women		Working hours of women		Working hours of employed women		Relative working hours within households	
	all cohorts (1)	no border (2)	all cohorts (3)	no border (4)	all cohorts (5)	no border (6)	all cohorts (7)	no border (8)
DiD coefficient	-0.019 (0.008)	-0.004 (0.005)	-0.044 (0.380)	0.494 (0.329)	1.013 (0.355)	0.996 (0.285)	0.006 (0.002)	0.005 (0.002)
State x year FE	✓	✓	✓	✓	✓	✓	✓	✓
Ind. controls	✓	✓	✓	✓	✓	✓	✓	✓
<i>Observations</i>	1,940,940	1,260,354	1,855,582	1,204,709	1,343,695	896,884	824,547	569,367

Panel C: placebos	Labour force participation of men	of women	Working hours of men	of women	Working hours of employed men	of women	Relative working hours within households
	(1)	west-west (2)	(3)	west-west (4)	(5)	west-west (6)	west-west (7) (8)
DiD coefficient	0.004 (0.004)		0.289 (0.239)	-0.216 (0.198)	0.160 (0.122)	0.114 (0.115)	0.001 (0.001)
State x year FE	✓	✓	✓	✓	✓	✓	✓
Ind. controls	✓	✓	✓	✓	✓	✓	✓
<i>Observations</i>	1,444,844		1,375,725	1,375,725	1,296,065	1,296,065	648,386

Notes: Difference-in-differences coefficients from equation (1) using different treatment definitions in Panel A, different sample restrictions in Panel B and placebo outcomes and treatment indicator in Panel C. In Panel A regions with below 25th and above 75th percentiles of inflows are contrasted as well as a continuous treatment definition. In Panel B the estimation sample includes all cohorts (i.e. without the restriction to birth cohorts 1945 to 1975) in uneven-numbered columns and excludes border regions in even-numbered columns. In Panel C the estimation sample consist of males (columns 1 and 3) or uses internal West-West migration for treatment assignment (remaining columns). For set of individual controls see Table 2. Source: Microcensus 1982-2015, BBSR (2017), own calculation.

Table 5: Heterogenous effects

Stratified by	Labour force participation of women			Working hours of women			Working hours of employed women			Relative working hours within households		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A: Education	low	middle	high	low	middle	high	low	middle	high	low	middle	high
	-0.012 (0.006)	0.007 (0.006)	0.012 (0.008)	0.271 (0.274)	0.749 (0.319)	0.535 (0.491)	1.274 (0.368)	0.704 (0.242)	0.088 (0.344)	0.009 (0.003)	0.004 (0.002)	0.000 (0.003)
Panel B: Married		no	yes		no	yes		no	yes		no	yes
		-0.007 (0.007)	-0.004 (0.006)		0.234 (0.441)	0.431 (0.33)		0.614 (0.302)	0.974 (0.342)		0.006 (0.003)	0.006 (0.002)
Panel C: Age of youngest child	<3	[3,6]	>6	<3	[3,6]	>6	<3	[3,6]	>6	<3	[3,6]	>6
	0.012 (0.013)	-0.004 (0.009)	-0.016 (0.010)	0.813 (0.595)	0.667 (0.505)	0.273 (0.491)	0.991 (0.540)	1.629 (0.579)	1.465 (0.515)	0.002 (0.004)	0.011 (0.004)	0.010 (0.003)

Notes: Difference-in-differences coefficients from equation (1) assessing heterogeneous effects by highest schooling degree, marital status and age of the youngest child. Source: MZ 1982 - 2015, BBSR 2017, own calculation.

Table 6: Cultural norms and beliefs

Dependent variable:	Index of gender attitudes		
Mean of dep. variable:	(1)	(2)	(3)
HighInflow	0.0579 (2.02)	0.0611 (2.13)	0.0626 (2.45)
State x year FE		✓	✓
Individual controls			✓
<i>Observations</i>	6,009	6,009	6,009
<i>Adj. R-squared</i>	0.0521	0.0527	0.1580

Notes: The dependent variable is a composite index of attitudes towards maternal employment and the appropriate role of women (see Figure 2 for the wording of each statement). A higher value indicates less gender traditional attitudes. All estimates include year fixed effects. The individual controls include age, age squared, highest schooling degree in three categories, religion and city size in three categories. Standard errors clustered at regional level. T-statistics in parenthesis. Source: ALLBUS 2000-2016, BBSR (2017), own calculation.

Table 7: Friendships and intermarriages in West Germany

	Share friends from East Germany		At least one friend from East Germany		Partner from East Germany	
	(1)	(2)	(3)	(4)	(5)	(6)
Mean of dep. variable	0.026	0.026	0.052	0.052	0.003	0.003
HighInflow	0.005 (0.002)	0.005 (0.002)	0.010 (0.004)	0.010 (0.004)	0.002 (0.001)	0.001 (0.001)
Ind. controls		✓		✓		✓
<i>Observations</i>	51,720	51,720	51,720	51,720	238,797	238,797
<i>adj. R-squared</i>	0.003	0.008	0.003	0.008	0.003	0.004

Notes: All estimated include year fixed effects. Covariates are depicted in Table A3. Friendship information is available every fifth year starting in 1996. Standard errors clustered at regional level. Source: SOEP 1984-2016, BBSR (2017), own calculation

Table 8: Formal child care provision

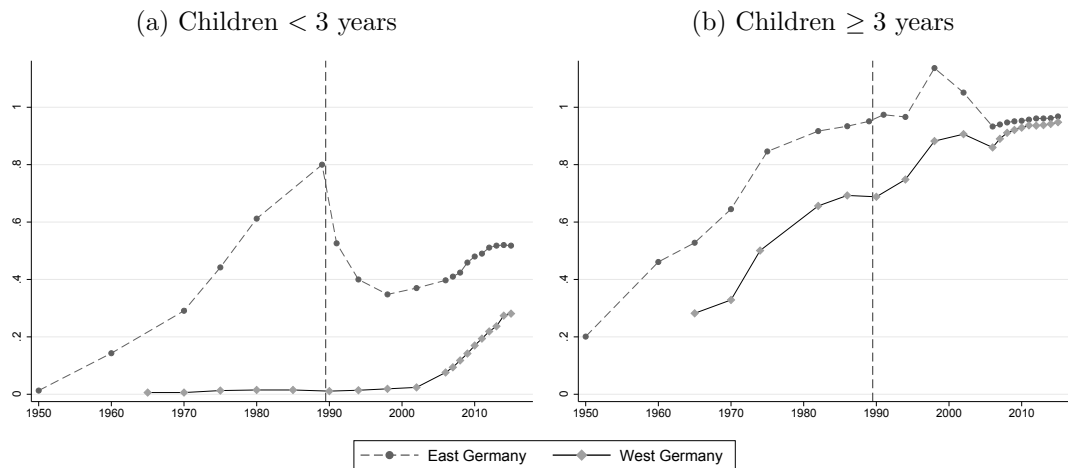
	(1)	(2)	(3)
Panel A: under 3 year olds			
Mean of dep. variable in 1986	1.438	1.438	1.395
HighInflow	1.264 (0.493)	1.266 (0.499)	1.014 (0.344)
State x year FE		✓	✓
Pre-treat county char.			✓
<i>Observations</i>	3,785	3,785	3,713
<i>Adj. R-squared</i>	0.814	0.822	0.874
Panel B: full-day care over 3 year olds			
Mean of dep. variable	27.076	27.076	26.827
HighInflow	3.135 (1.315)	3.135 (1.328)	3.647 (0.912)
State x year FE		✓	✓
Pre-treat county char.			✓
<i>Observations</i>	2,219	2,219	2,177
<i>Adj. R-squared</i>	0.470	0.467	0.785

Notes: All estimates include state and year fixed effects. Column (3) includes the rich set of pre-treatment county characteristics shown in Table 1. Standard errors clustered at regional level. Source: Statistisches Bundesamt (2017), Familien-Atlas I (1993), BBSR (2017)

Appendix A: Figures and table

A.1 Figures

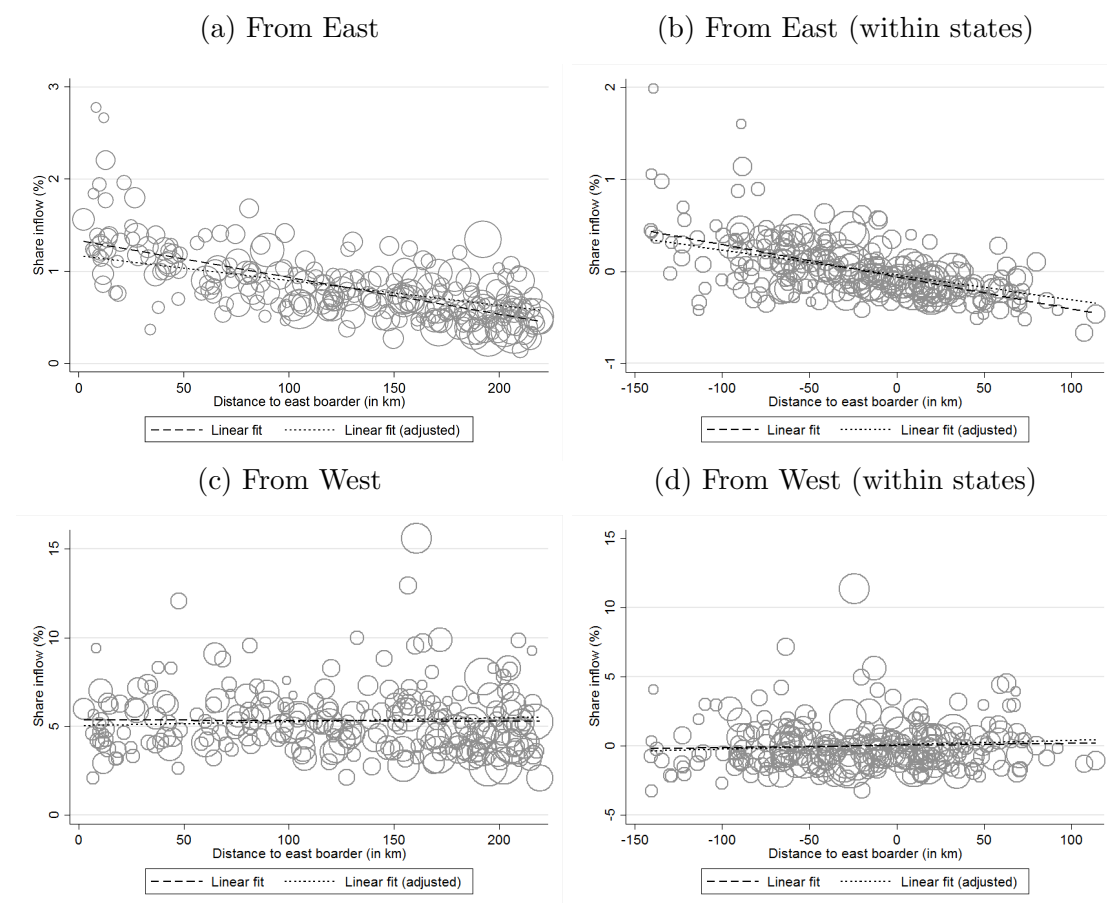
Figure A1: Child care ratios 1950 - 2015



Notes: The figure shows the fraction of children in different age groups being cared for in formal child care in East and West Germany over time. For West Germany there is no data available before 1965. The vertical line indicates German reunification in 1989.

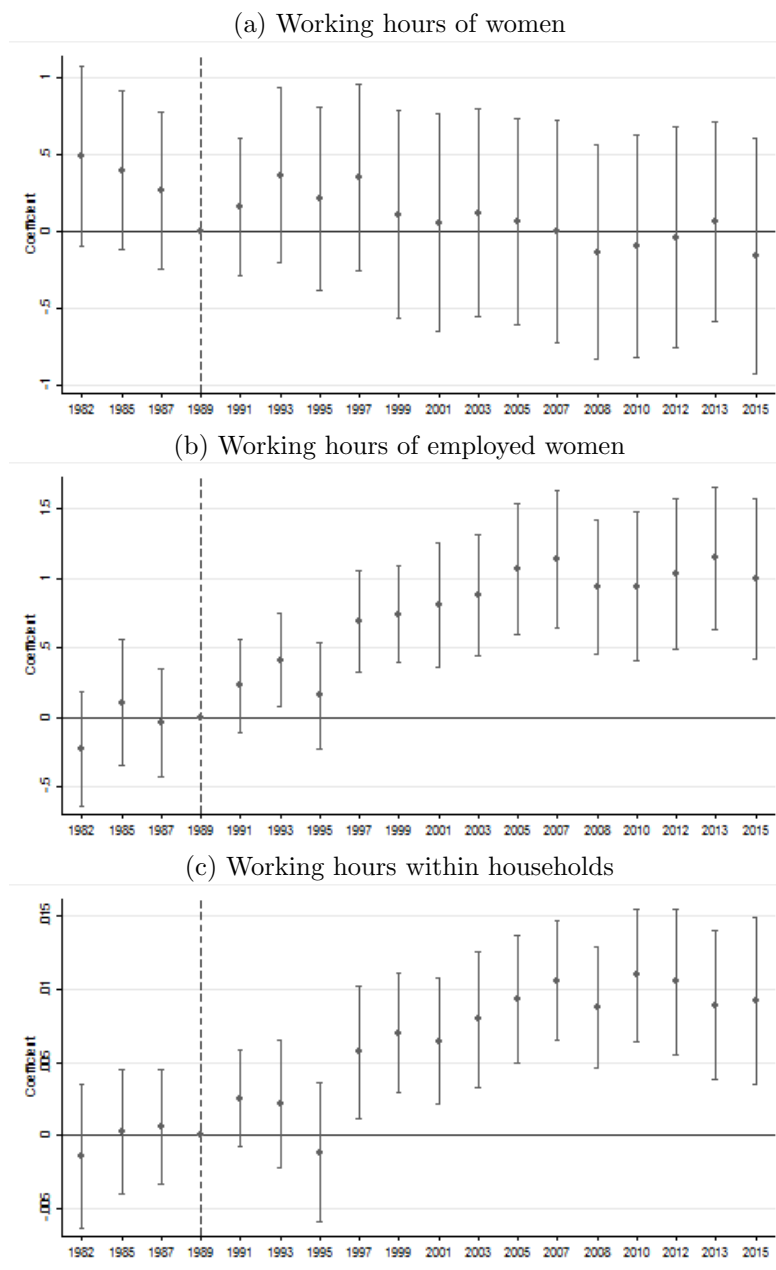
Sources: Statistisches Bundesamt (2018), BMFSFJ (1994), Winkler (1990)

Figure A2: Immigration from East and West Germany by distance to East border



Notes: The size of the bubbles reflect the population size of each destination county. Distance is measured as the distance of the county’s centroid to the nearest border point. Inflows shares are defined as inflows relative to the population in each county. Panels (b) and (d) show inflow shares using only within state variation, i.e. relative to the state mean. Linear regression lines are shown without and with the adjustment by observable county characteristics (see Table 1 for details). Slope coefficients in (a) -0.0039 ($t = -10.57$), in Panel (b) -0.0039 ($t = -12.00$), in Panel (c) $.0022$ ($t = 1.22$), and in Panel (d) $.0010$ ($t = 0.68$). *Source:* BBSR (2017), own calculations

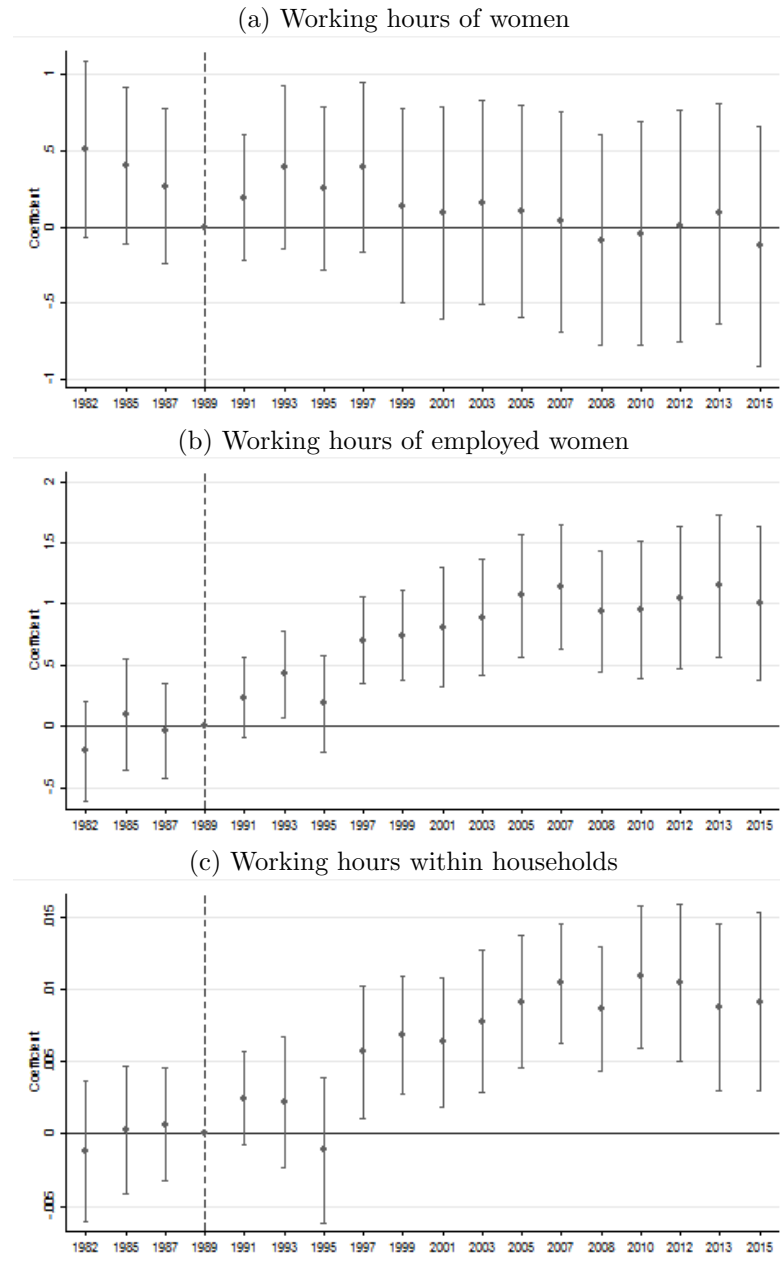
Figure A3: Robustness: Event analysis with year-interaction share manufacturing in 1987



Notes: The figures plots the estimated γ_1 coefficients from equation (2) and corresponding 95% confidence intervals. In the specification estimated here, the local share of employees working in manufacturing in 1987 in interaction with the general time-dummies is included as additional control.

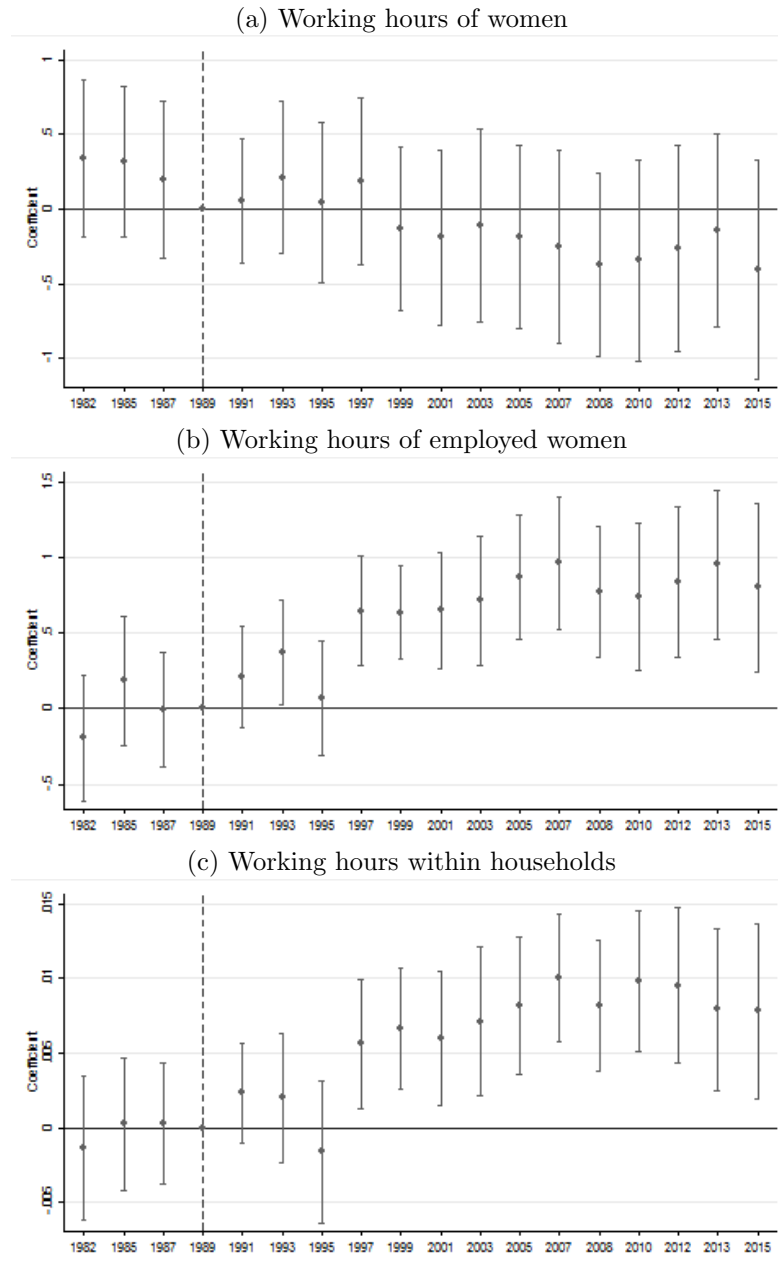
Source: MZ 1982-2015, BBSR (2017), own calculation.

Figure A4: Robustness: Event analysis with year-interaction of child care ratio (3-6 year olds) in 1986



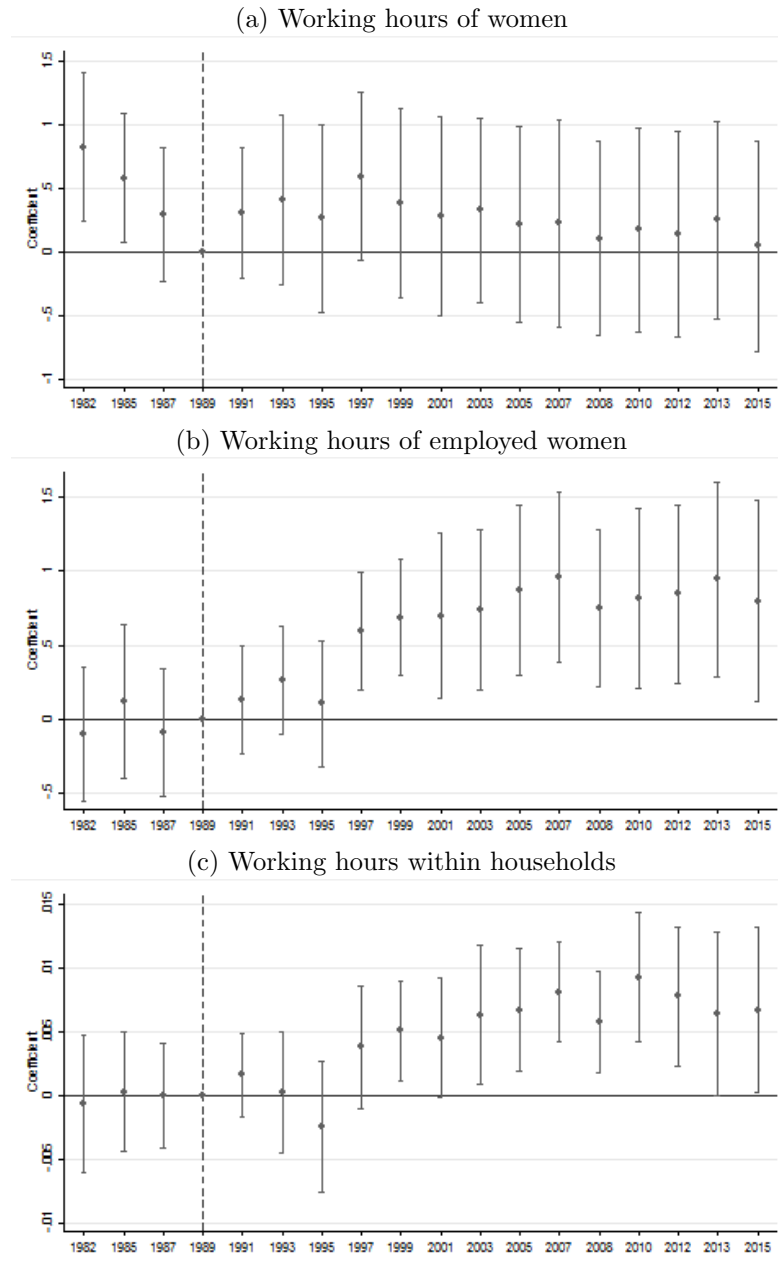
Notes: The figures plots the estimated γ_1 coefficients from equation (2) and corresponding 95% confidence intervals. In the specification estimated here, the local child care ratio (3-6 year olds) in 1986 in interaction with the general time-dummies is included as additional control. Source: MZ 1982-2015, BBSR (2017), own calculation.

Figure A5: Robustness: Event analysis with year-interaction of rent in 1987



Notes: The figures plots the estimated γ_1 coefficients from equation (2) and corresponding 95% confidence intervals. In the specification estimated here, the local average rental price in 1987 in interaction with the general time-dummies is included as additional control.
 Source: MZ 1982-2015, BBSR (2017), own calculation.

Figure A6: Robustness: Event analysis with year-interaction of average number of rooms per person in 1987



Notes: The figures plots the estimated γ_1 coefficients from equation (2) and corresponding 95% confidence intervals. In the specification estimated here, the local average number of rooms per person in 1987 in interaction with the general time-dummies is included as additional control. Source: MZ 1982-2015, BBSR (2017), own calculation.

Figure A7: Event analysis - controls



Notes: The figures plots the estimated γ_1 coefficients from equation (2) and corresponding 95% confidence intervals using different sets of control variables. See Table 2 for details.
Source: MZ 1982-2015, own calculation.

Figure A8: Event analysis - all pre-periods as baseline



Notes: The figures plots the estimated effects when using the average of all pre-periods in equation (2) as a reference point and corresponding 95% confidence intervals.

Source: Microcensus 1982-2015, BBSR (2017), own calculation.

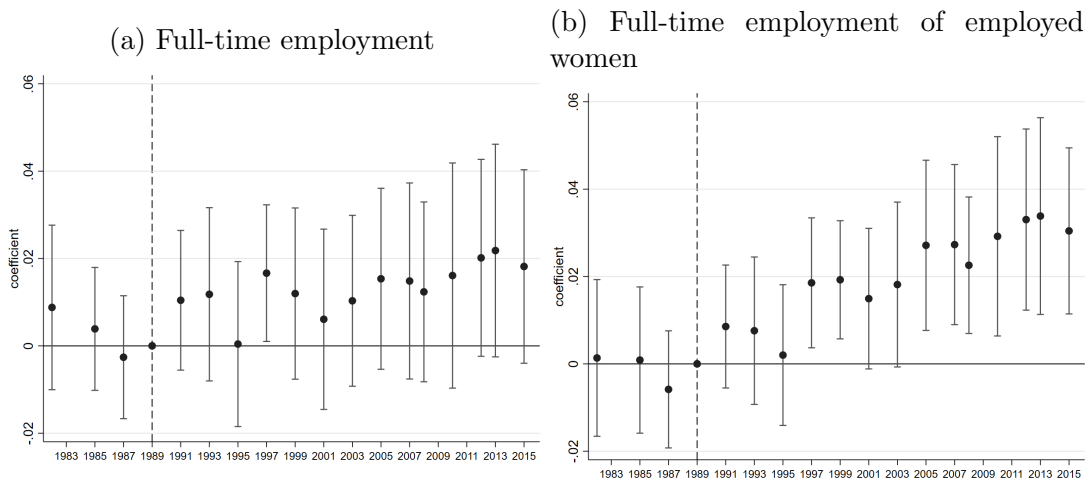
Figure A9: Event analysis - trend specification



Notes: The figures plots the estimated γ_1 coefficients from equation (2) and corresponding 95% confidence intervals using different regional trend specifications. Baseline results (black circles) include no regional trends, the triangular grey estimates use a linear time trend estimated using pre-reunification data only.

Source: Microcensus 1982-2015, BBSR (2017), own calculation.

Figure A10: Event analysis - other outcomes



Notes: The figures plots the estimated γ_1 coefficients from equation (2) and corresponding 95% confidence intervals for alternative outcomes.

Source: Microcensus 1982-2015, BBSR (2017), own calculation.

A.2 Tables

Table A1: Overview of different data sets

Data set	Access	Type	Main variables	Years
Migration statistics	Sonderauswertung	admin	Inflow from East Germany by age groups	1991 - 2015
Microcensus	on-site use	admin	Women's labor supply Socio-economic characteristics	1982, 1985, 1987, 1989, 1991, 1993, 1995, 1997, 1999, 2001, 2003, 2005, 2007, 2008, 2010, 2012, 2013, 2015
Socio-economic Panel Study (SOEP)	(on-site use)	survey	East Germans in friendship network and intermarriage rates	1985 - 2015
German General Social Survey (ALLBUS)	on-site use	survey	Social norm and beliefs	2000, 2004, 2008, 2012, 2016
Population statistics	open access	admin	Population size by age	1990 - 2015
Child care statistics	open access	admin	Child care ratios for different age groups	1986, 1994, 1998, 2002, 2007 - 2015
Regionaldatenbank DJI	open access	admin	Various county charact. mainly based on Population Census and Occupation Census	1986, 1987, 1989

Note: Data on county-level migration statistics was purchased from the Federal Statistical office for use in this project. Microcensus (MZ) data: The MZ data that includes regional identifier is accessible on-site (<https://www.forschungsdatenzentrum.de/en/household/microcensus>) through any of the statistical offices' Secure Data Centers. Researchers are also required to sign a special usage agreement and output is cleared by the statistics office to ensure anonymity. ALLBUS data: The data sets used for our analysis contain detailed regional information and are accessible at the Secure Data Center (www.gesis.org/en/sdc) of the GESIS Data Archive for Social Sciences in Cologne Germany. Researchers are required to sign a special usage agreement and to work within an individually tailored secure virtual work space. SOEP Data: the SOEP data including regional identifiers is available to researchers, after signing a special usage agreement, on-site at the DIW Berlin.

Table A2: Microcensus descriptives statistics - East German women in West Germany

	Mean	Std. Dev.	N
<i>Female labor market outcomes</i>			
Working hours	26.585	15.837	17,859
Working hours of employed women	31.624	11.789	15,013
Relative working hours within household	0.405	0.121	9,948
<i>Individual controls</i>			
Age	41.100	7.874	18,902
Foreign nationality	0.019	0.135	18,902
<i>Individual potentially endogenous controls</i>			
Married	0.701	0.458	18,902
Divorced	0.137	0.344	18,902
Widowed	0.016	0.125	18,902
Single	0.145	0.353	18,902
No children in household	0.524	0.499	18,902
1 child in household	0.263	0.440	18,902
2 children in household	0.172	0.377	18,902
3 children in household	0.034	0.182	18,902
4 children in household	0.006	0.075	18,902
5 or more children in household	0.002	0.040	18,902

Note: The sample includes all women aged 25 - 55 with non-missing information on individual controls, who are currently living in West Germany and have an East German educational degree.

Source: MZ 1982-2015, own calculation

Table A3: SOEP descriptives statistics

	Mean	Std. Dev.	Min	Max	N
<i>Friendship network:</i>					
Share friends from East Germany	0.03	0.13	0.00	1.00	52293
At least one friend East Germany	0.05	0.22	0.00	1.00	52293
Partner from East Germany	0.00	0.05	0.00	1.00	242369
<i>Covariates:</i>					
Female	0.48	0.50	0.00	1.00	242369
Age	42.73	15.09	14.00	92.00	242369
Years of education	11.57	2.52	7.00	18.00	242369
< 20,000 Inhabitants	0.42	0.49	0.00	1.00	242369
20,000–100,000 Inhabitants	0.30	0.46	0.00	1.00	242369
≥ 100,000 Inhabitants	0.28	0.45	0.00	1.00	242369
Protestant	0.40	0.49	0.00	1.00	242369
Catholic	0.40	0.49	0.00	1.00	242369
Other religion	0.02	0.15	0.00	1.00	242369
No religion	0.13	0.33	0.00	1.00	242369
<i>Female labor market outcomes (replication):</i>					
Working hours	15.71	16.45	0.00	80.00	99166
Working hours of employed women	30.62	13.56	0.10	99.90	65542
Relative working hours within household	0.40	0.15	0.00	0.99	48686

Note: The sample includes all individuals with non-missing information on friendship network, who are currently living in West Germany and did not live in East Germany in 1989. The replication sample is restricted to women aged between 25 and 55. Descriptive statistics are weighted using provided survey weights.

Source: SOEP 1984 - 2017, own calculation

Table A4: ALLBUS descriptives statistics

	Mean	Std. Dev.	N
<i>Social norms and beliefs:</i>			
Index	0.00	(0.776)	6,009
Norm 1	1.630	(0.848)	6,009
Norm 2	2.471	(0.898)	6,009
Norm 3	2.292	(1.029)	6,009
<i>Covariates:</i>			
Female	0.513	(0.500)	6,009
Age	48.422	(17.175)	6,009
Primary Education	0.145	(0.353)	6,009
Secondary Education	0.513	(0.500)	6,009
Tertiary Education	0.342	(0.474)	6,009
Protestant	0.418	(0.493)	6,009
Catholic	0.402	(0.490)	6,009
Other Religion	0.030	(0.170)	6,009
No Religion	0.000	(0.000)	6,009
< 20,000 Inhabitants	0.610	(0.488)	6,009
20,000-100,000 Inhabitants	0.101	(0.301)	6,009
> 100,000 Inhabitants	0.289	(0.454)	6,009

Note: The sample includes all individuals with non-missing information, who are currently living in West Germany and did not spend their youth in East Germany.

Source: GESIS (2018), own calculation

Table A5: Difference-in-Differences estimates: Controls

	Dependent variable											
	Labour force participation of women			Working hours of women			Working hours of employed women			Relative working hours within households		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
DiD coefficient	-0.0057 (0.005)	-0.004 (0.005)	0.001 (0.007)	0.343 (0.308)	0.403 (0.355)	0.603 (0.391)	0.865 (0.299)	0.912 (0.357)	1.062 (0.368)	0.005 (0.002)	0.007 (0.002)	0.007 (0.002)
State x year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ind. exog. controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ind. endog. controls		✓	✓		✓	✓		✓	✓		✓	✓
Partner endog. controls			✓			✓			✓			✓
<i>Observations</i>	1,438,913	1,438,913	1,023,692	1,373,594	1,373,594	985,410	1,026,126	1,026,126	693,520	648,386	648,386	643,503

Difference-in-differences coefficients from equation 1 using different vectors of controls. For the different set of individual controls see Table 2. *Source:* MZ 1982 - 2015, BBSR 2017, own calculation

Table A6: Compositional changes - outflows and inflows

	Panel A: Outflow into West German regions						
	overall	stratified by age groups					
	(1)	[0,17]	[18,24]	[25,29]	[30,49]	[50,64]	≥ 65
		(2)	(3)	(4)	(5)	(6)	(7)
Mean of dep. variable	27941	4279	5639	5184	9257	2075	1507
HighInflow	-4865 (4933)	-654 (721)	-713 (802)	-1040 (900)	-1906 (1873)	-353 (423)	-198 (276)
<i>Observations</i>	1728	1728	1728	1728	1728	1728	1728
<i>Adj. R-squared</i>	0.012	0.009	0.009	0.017	0.013	0.008	0.006
	Panel B: Inflow from West German regions						
	overall	stratified by age groups					
	(1)	[0,17]	[18,24]	[25,29]	[30,49]	[50,64]	≥ 65
		(2)	(3)	(4)	(5)	(6)	(7)
Mean of dep. variable	27387	4226	5517	5056	9069	2038	1482
HighInflow	-845 (651)	-947 (946)	-918 (1044)	-1961 (1859)	-356 (343)	-194 (224)	-5220 (4996)
<i>Observations</i>	1728	1728	1728	1728	1728	1728	1728
<i>Adj. R-squared</i>	0.021	0.012	0.010	0.014	0.013	0.009	0.014

Notes: Outflow (number of individuals) in other West German regions (Panel A) and inflow (number of individuals) from other West German regions (Panel B) of treated relative to control regions in post reunification years (1991 - 2015). Regressions control for year fixed effects. Source: BBSR 2017, own calculation

Table A7: SOEP - replication

	Panel A: Outflow into West German regions						
	overall	stratified by age groups					
	(1)	[0,17] (2)	[18,24] (3)	[25,29] (4)	[30,49] (5)	[50,64] (6)	≥65 (7)
Mean of dep. variable	27941	4279	5639	5184	9257	2075	1507
HighInflow	-4865 (4933)	-654 (721)	-713 (802)	-1040 (900)	-1906 (1873)	-353 (423)	-198 (276)
<i>Observations</i>	1728	1728	1728	1728	1728	1728	1728
<i>Adj. R-squared</i>	0.012	0.009	0.009	0.017	0.013	0.008	0.006
	Panel B: Inflow from West German regions						
	overall	stratified by age groups					
	(1)	[0,17] (2)	[18,24] (3)	[25,29] (4)	[30,49] (5)	[50,64] (6)	≥65 (7)
Mean of dep. variable	27387	4226	5517	5056	9069	2038	1482
HighInflow	-845 (651)	-947 (946)	-918 (1044)	-1961 (1859)	-356 (343)	-194 (224)	-5220 (4996)
<i>Observations</i>	1728	1728	1728	1728	1728	1728	1728
<i>Adj. R-squared</i>	0.021	0.012	0.010	0.014	0.013	0.009	0.014

Notes: Difference-in-differences coefficients from equation (1). For set of individual controls see Appendix Table A3. Source: SOEP 1984–2017, BBSR (2017), own calculation

Table A8: Main difference-in-differences - inference

	Dependent variable							
	Labour force participation of women		Working hours of women		Working hours of employed women		Relative working hours within households	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mean of dep. var. before reunification			21.62	21.62	34.78	34.78	0.42	0.42
DiD coefficient	-0.005	-0.006	0.443	0.343	0.984	0.865	0.006	0.005
<i>Clustering of se</i>								
Ror level	(0.005)	(0.005)	(0.334)	(0.308)	(0.357)	(0.300)	(0.002)	(0.002)
State level	(0.005)	(0.005)	(0.512)	(0.457)	(0.618)	(0.544)	(0.004)	(0.003)
No clustering	(0.003)	(0.003)	(0.112)	(0.111)	(0.092)	(0.091)	(0.001)	(0.001)
State x year FE	✓	✓	✓	✓	✓	✓	✓	✓
Ind. controls		✓		✓		✓		✓
<i>Observations</i>	1438913	1438913	1,373,594	1,373,594	1,026,126	1,026,126	648,386	643,503

Notes: Difference-in-differences coefficients from equation (1) using different levels and methods to cluster standard errors. For set of individual controls see Table 2.

Appendix B: Context and measurement error

B.3 Detailed institutional context

B.3.1 East and West Germany before reunification

Women in the labour market The socialistic regime in the former GDR promoted female qualified employment for several reasons (e.g. Behrend, 1990; Trappe, 1996, 2014). First, the government of the GDR was committed to the socialist idea of equality, in particular with respect to gender. The constitution of the former GDR established equal legal and political rights of women and men already in 1949, though women’s emancipation was primarily focused on labour market integration and only later on educational attainment. Thereby, full-time employment was propagandised as the moral duty of women. Second, there was an economic need to integrate women in the labour force due in the aftermath of World War II and the resulting need to reconstruct. The demand for labour was further intensified by the big wave of out-migration between 1949 and the construction of the wall in 1961; about 2.7 million (14% of the 1949 population) left the GDR in that time window. In addition, families faced strong economic incentives to live the full-time-dual-earner model, i.e. they were economically dependent on two full incomes to make a living.

Despite the propagandised equality of sexes in terms of intensive and extensive margin labour force participation, the labour market in the former GDR remained segregated by gender, both with respect to occupation but also within occupations, e.g. leadership positions were still primarily held by men (e.g. Winkler, 1990; Langenhan and Roß, 1999; Trappe, 2014). As a result, a large gender gap of about 25% persisted for full-time workers (Krueger and Pischke, 1995).

Regarding non-paid work, e.g. housework or child rearing, the division between sexes remained fairly ”traditional”. For example, based on data from time use surveys in the former GDR, which were conducted every 5 years starting in 1974, it is evident that, although women between the age of 16 and 65 provided only about 1 hour per day less paid work than men (including weekends), the time devoted to housework was about three times higher than men’s in 1974. However, the ratio decreased substantially up to 1990 (to about double than men). In addition, it was primarily women who devoted time to caring for the children (e.g. Priller, 1993).

In West Germany, on the other hand, policies and social norms set strong incentives for people to live within traditional role patterns, i.e. the traditional "breadwinner and non-employed housewife" model (e.g. Boelmann et al., 2021). Gender equality by law was only established in 1958. Until 1977, a married women was, by law, only allowed to work if she did not neglect her domestic responsibilities and the husband had the sole right to decide on family issues. The labour force participation of women remained rather low until the 1990s. Women usually either stayed at home after they had children or entered part-time employment after an extended break. labour force participation of women and men (overall and with children) is depicted in Appendix Figure B1, working hours in Appendix Figure B2, and full-time employment in Appendix Figure B3.

Publicly funded child care and other family policies In order to improve reconciliation of work and family life, in the former GDR the provision of publicly funded child care was massively expanded starting in the 60's (Appendix Figure A1). Nursery schools (*Krippen*) for children under the age of three, kindergartens for children above age three until school start (*Kindergarten*) and after-school care (*Hort*) for primary school aged children were available almost universally, with no fees. Nursery schools were under the authority of the Ministry of Health (*Ministerium für Gesundheitswesen*) and mainly provided by public providers (only a small fraction was provided by companies and churches). Kindergartens and after-school care was organised by the Ministry of Education (*Ministerium für Volksbildung*). By 1989, about 80% of children under the age of three, more than 95% of children above the age of three (see also Appendix Figure A1) and 85% of primary-school-aged children attended after-school care. In urban regions, the respective shares were almost 100% (e.g. Statistisches Amt der DDR, 1950–1990).

Formal child care was propagandised as more professional and of better quality than informal care provided by friends or grandparents (e.g. Konrad, 2012). The structural quality was evaluated and improved constantly, e.g. the child-teacher ratio for children above the age of three was reduced from about 16:1 in 1955 to 10:1 in 1988 (e.g. Statistisches Amt der DDR, 1950–1990). It was characterised by long opening hours (from 6 am to 7 pm from Monday to Friday), a fixed curriculum (*Bildungs- und Erziehungsplan*) and provided meals. Up to 10% (in 1960) of the

slots for children were provided in so called *Dauerheime* or *Wochenkrippen* - institutions where children remained during the whole week (Monday-Friday) without going home. Other family policies that sought to increase the reconciliation of work and family life and support families in general were gradually expanded, e.g. maternity leave policies became more generous, there were housing subsidies for families with children, and it became prohibited to dismiss pregnant women and women with small children (e.g. [Obertreis, 1986](#)).

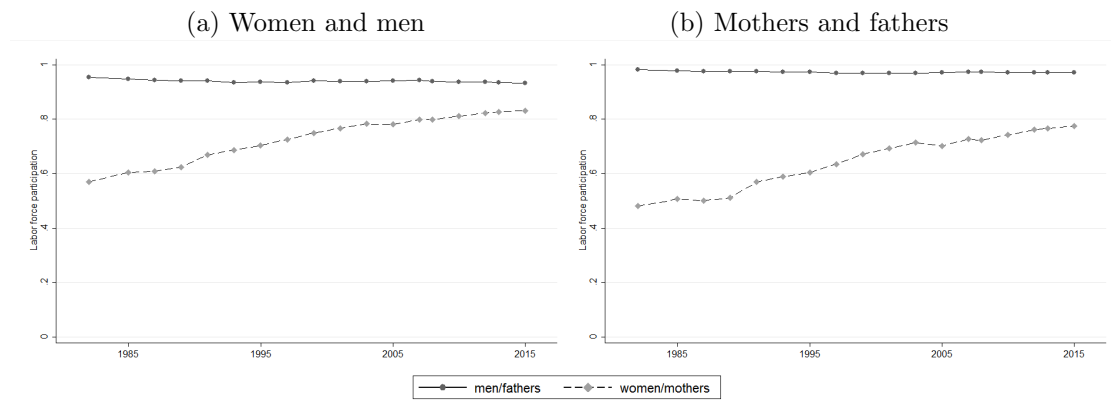
In West Germany on the hand, there was hardly any provision of publicly funded child care for children under the age of three and school-aged children before reunification, with the exception of West Berlin. In 1990, almost 30% of available child care places in West Germany were provided in West Berlin (which comprised less than 4% of the West German population), 20% of children younger than three attended publicly funded child care and 30% were enrolled in after-school programs. In our analysis, we exclude West Berlin. The fraction of children attending publicly funded child care remained below 2% until 1998 and only about 5% of elementary school-aged children in West Germany attended after-school programs before 1989. Most child care was provided informally by the mother, grandparents or friends (e.g. [Büchel and Spieß, 2002](#)). Other family policies, including the tax system and maternal leave regulations, also promoted the traditional division of work within households. There was a heated public, political and academic debate (e.g. [Schütze, 1986](#); [Fthenakis, 1989](#)) about the consequences of maternal employment and formal child care (often called *Fremdbetreuung*—external or alien care—an innately negative term for formal care) for children and marriage.

B.3.2 East and West Germany after reunification

Since reunification, female labour force participation in West Germany increased strongly, though large regional variations persist. By 2015, almost 84% of women in West Germany participated in the labour force, compared to only 63% in 1989 (Appendix Figure [B1](#)). The increase in labour force participation was even stronger for mothers, i.e. from 52% in 1989 to 78% in 2015. However, as shown in Appendix Figure [B2](#), the increase in average weekly hours worked by women (and mothers) was only about 5 hours, for women in employment it decreased from around 33 hours to 30 working hours per week (for mothers from 32 to 27 hours). Similarly,

in Appendix Figure B3, the share of women (mothers) working full-time decreased from around 62% in 1989 to about 47% in 2015 (for mothers from 48% to 29%). This indicates that in Germany (in contrast to other OECD countries) the change in labour supply happened along the extensive margin, i.e. women entering in part-time employment.

Figure B1: Labour force participation in West Germany (1982 - 2015)



Notes: The figures plots labour force participation of (a) women and men and of (b) mothers and fathers over time. The sample is restricted to individuals aged between 25 and 55 living in West Germany.

Source: Microcensus 1982-2015, own calculation.

In addition, in West Germany there was a massive expansion of publicly funded child care along the intensive and extensive margin. The fraction of children below the age of three in publicly funded child care increased from 1.4% in 1994 to 33% in 2016. For children aged three and over, the share increased from 75 to 94%, respectively. However, the increase in child care provision happened heterogeneously across counties. Other family policies, e.g. the parental leave benefit reform coming into effect in 2007, also shifted toward supporting reconciliation of work and family life.

However, family policies in reunified Germany reflect the ongoing conflict between supporting and incentivising traditional family models and increasing the compatibility of work and family duties for dual-earner families. For example, married couples are taxed jointly within a splitting income taxation system that sets strong incentive for an unequal division of paid work within married couples. Another example is a family subsidy for stay-at-home mothers who do not use

Figure B2: Working hours in West Germany (1982 - 2015)



Notes: The figures plots working hours of (a) women and men and of (b) mothers and fathers over time. The sample is restricted to individuals aged between 25 and 55 living in West Germany.

Source: Microcensus 1982-2015, own calculation.

Figure B3: Full-time employment in West Germany (1985 - 2015)



Notes: The figures plots the fraction of (a) women and men and of (b) mothers and fathers in full-time employment (conditional on labour force participation) over time. The sample is restricted to individuals aged between 25 and 55 living in West Germany.

Source: Microcensus 1982-2015, own calculation.

publicly funded child care. It was introduced on the federal level in 2013 and then abolished in 2015, but continued to be in place in some German states.

As a result of institutional factors and cultural norms, child penalties in Germany are relatively large compared to other high-income countries (Kleven et al., 2019). But the legacy of the division and exposure to different policy regimes is

still apparent; in West German couples the effect of having children on gender inequality is much stronger than for East German ones (Jessen, 2021).

In East Germany, there was a substantial decrease in labour force participation of women, partially driven by a significant cut in child care funding, and thus, in the number of available places (see also Appendix Figure A1), the adoption of West German family policies and the general economic crisis that triggered substantial mass layoffs.

B.4 Measurement Issues

B.4.1 Identifying West Germans in the various data sets

Microcensus In the Microcensus, we cannot directly observe whether respondents grew up in East or West Germany. Instead, we rely on information about the highest schooling or vocational degree. We restrict the analysis to individuals born between 1945 and 1975 to ensure we capture all movers and exclude them from our analysis, i.e. individuals who grew up under the former GDR regime and then moved to West Germany.

We define someone as West German if they did not grow up under the former GDR regime and thus have no degree from a POS (*Politechnische Oberschule*), a degree from an EOS (*Erweiterte Oberschule*) or a degree from one of the GDR colleges (*Fachschulen*). In the former GDR, the POS were established in 1959 and replaced the former comprehensive primary schools (*Einheitsschule*). All children from the age of six were obliged to enrol in a POS, which was first designed as an eight year track and later extended to 10 years of schooling (e.g. Anweiler, 2013). A small fraction of children was allowed to continue in an EOS (about 10%), which prepared pupils for entry into higher education (*Fachschulen*). The fraction of children leaving without a schooling degree was relatively low. Handicapped and/or children with learning disabilities were taught in special schools. We can not identify East Germans if they leave without a schooling degree or a degree from a special schools. To address the former, we exclude individuals without a schooling degree or missing information from our estimation sample. Since the rate of marriage between East and West Germans in West Germany is very low (see Table 7 based on SOEP), we use a household definition to best capture and exclude all individuals who grew up in East Germany from the analysis.

SOEP Identifying individuals who grew up in West Germany in the German Socio-Economic Panel (SOEP) is straightforward. All respondents are asked if they lived in East or West Germany in 1989. We define all individuals who lived in West Germany in 1989 as West Germans.

ALLBUS The German General Social Survey (ALLBUS) contains information on the state where the respondent spent their youth and where they were born. Thus, we can infer if someone grew up in West Germany. Individuals growing up in Berlin are excluded from our estimation sample.

Migration data In the migration data, we have yearly, county-level information on the total number of individuals who moved to a West German counties and had their last place of residence in one of the East German counties. Thus, we know the county of origin and the destination county for each individual who moved between 1991 and 2015. In particular, in the early years after the fall of the wall, there was hardly any West to East migration. Thus, we can precisely capture inflows from East Germans as almost all movers from East German counties where from East Germany. In later years, we can not assume with certainty that individuals moving from East to West Germany actually grew up under the GDR regime as we cannot track individuals over time. Thus, we are unable to observe subsequent moves and cannot exclude that some of the East Germans moved from one to another county in West Germany.

B.4.2 Bounding the potential measurement error in the Microcensus

One major threat to our interpretation would be to misclassify East German women as West Germans. This would mechanically bias our estimates upwards since East German women exhibit strikingly different labour market outcomes even after moving to the Western part of Germany.³⁷ In the following, we provide a simple back of the envelope calculation to bound the potential effect bias in the Microcensus caused by this measurement error. To do this, we first estimate the share of women from East Germany who are now living in West Germany (overall

³⁷This holds even for East German mothers living in West Germany (Boelmann et al., 2021) who arguably face constraints by the limited child care infrastructure.

and by treatment status) using different data sets. Second, we validate our Microcensus measure using the East German sample to estimate the fraction that we misclassify. Third, we bound the potential effect bias, using actual labour market outcomes of East German women in West Germany.

Estimating the overall share of women (or men) in West Germany who grew up under the former GDR regime is difficult. This is one major reason why we rely on exact migration statistics and do not take crudely estimated stocks of East Germans as our main independent variable. In the Microcensus, based on educational degrees, we obtain an average share of East German women in West Germany of about 3.77%; 3.86% (6.51% in 2015) in treated (HighInflow) and 2.7% (4.76% in 2015) in control regions (see also Appendix Figure B4).

Using SOEP data and applying the same age and cohort restriction as in our main analysis gives an estimate of about 2.6% (standard deviation of 15.80), 3.1% (4.3% in 2015) in treated regions and 2.1% (2.9% in 2015) in control regions. Remember that in the SOEP every individual is asked about the place of residence in 1989. However, given the small sample size and the panel structure of this data set, this share is not precisely estimated on a fine-grained regional level. We use this share as a lower bound. Estimating the share of East Germans in West Germany using our migration data (BBSR; 2017), and assuming that all individuals stayed in West Germany after migrations, gives an averages share of about 3.7% in post-reunification years (6.5% in 2015); 4.8% (8.3% in 2015) in treated and 2.7% (4.9% in 2015) in control regions. There are several reasons why this share is likely to be overestimated. Some East Germans might move abroad, back to East Germany or pass away. In addition, we might misclassify some West Germans who moved to East Germany and then returned. We use this estimate as an upper bound, for the "true" share of East Germans in our data set.

Next, we validate the Microcensus measure that is based on reported GDR specific educational degrees by estimating the share of East Germans based on the schooling definition in East Germany. Using our sample restrictions described above, we get a share of 95% in 1991 (the first wave available in East Germany). Under the assumption that East German women in West Germany exhibit similar reporting errors, we only miss 5% of East German women in West Germany. This remaining 5% could either be individuals who went to one of the special schools or individuals who misreport their highest schooling degree. Additionally, some

of those 5% may be West Germans who have either moved to the GDR before reunification (which was very rare) or immediately following reunification. I.e., we might miss slightly less than 5% of East German women.

Under the assumption that the measurement error does not differ between East German movers and stayers as well as taking the average share of East German women in West Germany from the Microcensus (3.77%), we can identify 99.8115% ($100 - 0.05 * 3.77$) of West stayer women correctly, i.e. we have about 0.188% East German women in our West German sample. In treatment regions this corresponds to 99.807% correctly identified West German women and 99.864% correctly identified West German women in control regions. Thus, the difference between treatment and control regions in the fraction of correctly identified West German women amounts to about 0.057%.

Using the estimates SOEP numbers, gives us a lower bound of 99.87% ($100 - 0.05 * 2.6$) of correctly identified West German women and using the migration statistic an upper bound of 99.815% ($100 - 0.05 * 3.7$). Differentiating these numbers by treatment and control regions provides us with the following estimates: in treated regions a lower bound based on SOEP data of 99.845% ($100 - 0.05 * 3.1$) and an upper bound based on migration statistics of 99.76% ($100 - 0.05 * 4.8$). The respective shares in control regions are 99.895% ($100 - 0.05 * 2.1$) based on SOEP data and 99.865% ($100 - 0.05 * 2.7$) based on migration statistics. Thus, the difference between treatment and control regions in the fraction of correctly identified West Germans amounts to 0.05% in SOEP data and 0.085% in the migration statistic.

Now assume that East German women exhibit similar labour supply patterns in treatment and control regions: They work on average 3.6 hours more per week than West German women, employed East German women work 1.9 hours more than employed West German women and a 3.1 ppt higher share of total working hours within households. Applying the estimated differences in misclassification between treatment and control regions to these different labour market outcomes, gives the following result: The misclassification might cause a positive bias of 0.0021 hours per week ($0.00057 * 3.6$ hours), 0.0011 hours ($0.00057 * 1.9$ hours) and 0.0018 ppt ($0.00057 * 0.31$ ppt). The lower bound based on SOEP data corresponds to 0.0020 hours ($0.00055 * 3.6$ hours), 0.0011 ($0.00055 * 1.9$ hours) and 0.0002 ppt ($0.00055 * 0.31$ ppt) for the respective outcomes. The upper bound based on migration

statistics correspond to 0.0031 hours ($0.00085 * 3.6$ hours), 0.0016 ($0.00085 * 1.9$ hours) and 0.0003 ppt ($0.00085 * 0.31$ ppt), respectively.

To sum up, the size of measurement error and the resulting effect bias is negligible and cannot be a driver of our results.

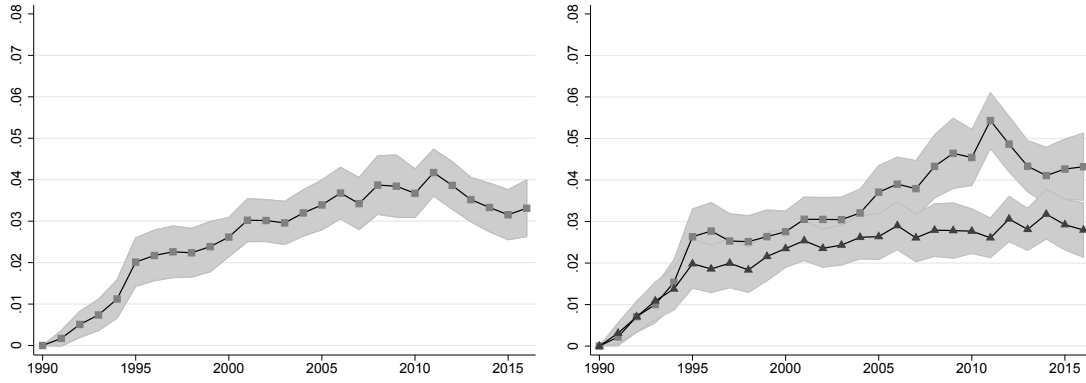
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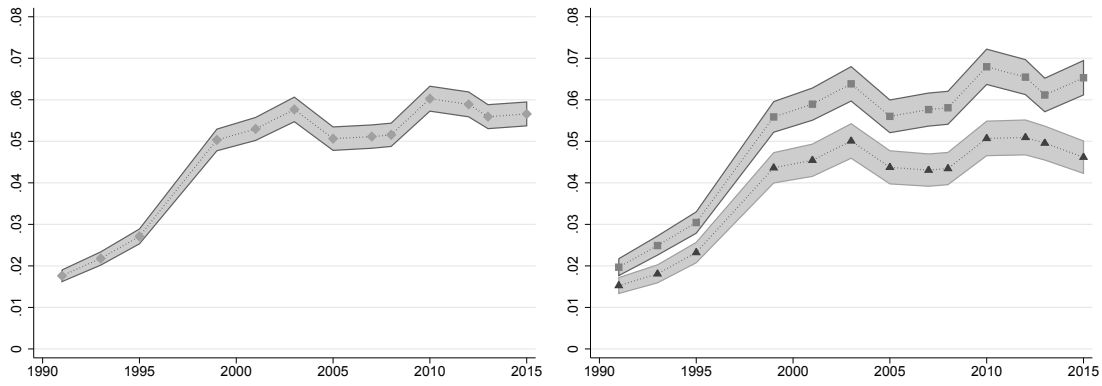
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Figure B4: Share of East Germans in West Germany

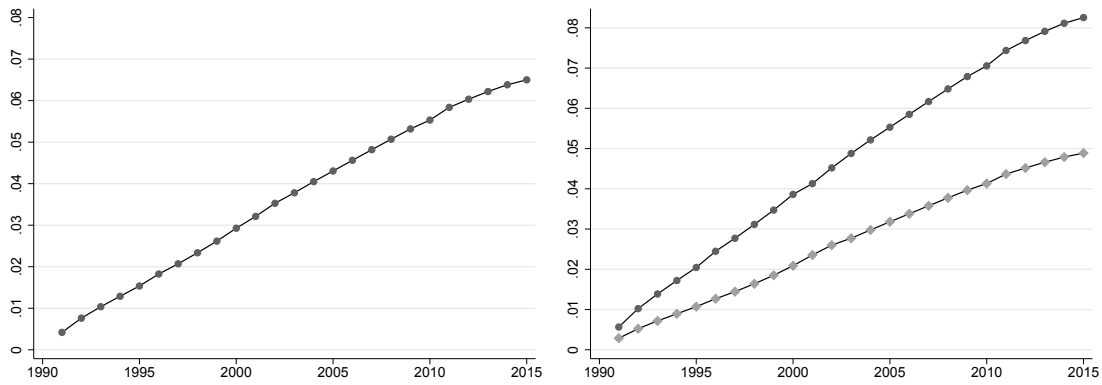
(a) SOEP data



(b) Microcensus data



(c) Migration data



Notes: The figures plot the share of East Germans who live in West Germany relative to the total population in West Germany using different data sets. The left hand figures show the share overall and the right hand figures the share separately for treatment (HighInflow) and control regions.

Source: SOEP 1990-2015, Microcensus 1991 - 2015, BBSR (2017), own calculation.