

## **Online Appendix**

### **Wind of Change? Cultural Determinants of Maternal Labor Supply**

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## Appendix A: Supplementary Figures and Tables

APPENDIX TABLE A1. East and West German Migrants and Stayers: Descriptive Statistics

	West in West	West in East	East in East	East in West
<b>Panel A: Mothers' Characteristics at Childbirth</b>				
Age at birth	28.617	28.063	28.604	29.994
Low education	0.157	0.082	0.108	0.084
Medium education	0.730	0.794	0.802	0.811
High education	0.113	0.124	0.090	0.105
Pre-birth real daily earnings	68.151	51.315	48.599	69.685
Full-time employed	0.802	0.793	0.753	0.812
<b>Panel B: Mothers' Employment Outcomes 4 Years After Childbirth</b>				
Employed (including marginal employment)	0.535	0.635	0.640	0.616
Regularly employed	0.401	0.568	0.562	0.509
Employed full-time	0.199	0.361	0.336	0.261

*Notes:* Panels A and B report sample means of characteristics at birth (Panel A) and employment outcomes four years after birth (Panel B) of first-time mothers who signed up for maternity leave in 2003-2006, by their origin and migration status. We distinguish between women who work in their origin part of Germany when signing up for maternity leave (West in West and East in East) and women who work in the other part of Germany (West in East and East in West).

*Source:* Social Security Records (IEB, 2012), first-time mothers who signed up for maternity leave in 2003-2006.

## **Appendix B: Assessing the Classification Error among East and West Germans Based on the German Socio-Economic Panel**

We use survey data from the German Socio-Economics Panel (SOEP) to examine how accurately our imputed East German origin measure in the social security data reflects an individual's true East or West German origin. The annual household panel survey was started in West Germany in 1984 and covered former East German territories from 1990 onwards. A unique feature of the SOEP is that it includes a question on where respondents lived in 1989, thus allowing to identify where households lived before the fall of the Iron Curtain. We define an individual to be of East German origin if the respondent has lived in East Germany in 1989 before the fall of the Berlin Wall (see also Alesina and Fuchs-Schündeln (2007) and Campa and Serafinelli (2019)). To measure the classification error for our sample of women who give birth in 2003-2006 and are on average born in 1975, we restrict the sample to women born in 1973 to 1977 (i.e., a two-year window around 1975) who are 16 and younger at the time of the fall of the Berlin Wall. Given the small sample size of the GSOEP, restricting the sample further to those who give birth in 2003-2006 is not feasible. For these women, we use survey years from 1990 onwards to identify their labor market entry, defined as the first spell in apprenticeship training, employment, or unemployment after a spell in secondary schools, vocational/technical schools or university. Among women of East German origin (N=114), 95.61% entered the labor market in East Germany, while 4.39% entered the labor market in West Germany. Among women of West German origin (N=225), 98.67% entered the labor market in West Germany, while 1.33% entered the labor market in East Germany.

## Appendix C: Imputation of East and West Germans

We develop an imputation technique for classifying a person as East or West German. We proceed in three steps. In the first step, we use the first place of work to indicate whether a person is East or West German. If the first spell of a person is an unemployment spell, we use the regional information of the job center (*Agenturbezirke*) in which the person is registered as the basis for the imputation (Bundesagentur für Arbeit, 2019). From these regional variables, we compute a binary variable classifying a person as East or West German.

When East German workplaces entered the pool of social security records after the fall of the Iron Curtain, we initially observe an unusually large share of missing places of work as East German workplaces were not yet fully integrated into the reporting system. Therefore, in a second step, we classify as East German all women who we observe as working for the first time during the transition period (1989-1991) and whose place of work is reported as missing.

From 1992 onwards, data for East Germany can be collected reliably (vom Berge, Burghardt, and Trenkle, 2013). By that time, many East Germans had migrated to West Germany for work (Hunt, 2006), such that their first place of work may be recorded as in West Germany. In order not to accidentally misclassify these early migrants as West German, we consider in a third step a worker as East German when she enters the social security data for the first time between 1989 and 1991 and is above a certain age, even if her first place of work is in West Germany. The age thresholds that we apply vary by education at labor market entry: 29 for individuals with a university-level education (*Universität* or *Fachhochschule*), 26 for those with an upper-track high school degree (*Abitur*) and vocational degree, 23 for all other individuals. Prior to 1989, before East Germans had the opportunity to migrate to West Germany, only very few West Germans entered the social security records at older ages, such that the probability of erroneously misclassifying a West German as an East German should be small. It should be noted that the third imputation step has a minimal impact on our estimates in Sections III and IV where we focus on mothers who gave birth between 2003 and 2006, as the majority of these mothers entered the social security records in 1992 or later.

## Appendix D: Additional Robustness Checks

### D1. Selection of Migrants

**East Germans in West Germany.** See main text, p. 21ff.

**West Germans in East Germany.** A potential concern is that the much smaller East-West gaps in the East compared to the West German labor market are driven by the selection of West German migrants relative to East and West stayers, rather than asymmetric adjustment to a new current environment. West German migrants appear to be slightly positively selected compared to East German stayers in terms of education, wages<sup>1</sup> and full-time status (see Panel A of Appendix Table A1), but conditioning on an extensive set of control variables at birth (control set I) and in the three years prior to birth (control set II) barely changes the migrant-native gap (compare columns (1) to (4) in Table 3).

With respect to maternal labor supply, access to family might help women return to work—a potential confounder which we cannot measure directly. However, West German migrants are less likely to have family nearby who may take on childcare responsibilities. Yet, this would predict a lower propensity to work after childbirth for West German migrants compared to their East German colleagues who can access family networks, and hence this cannot explain the adjustment pattern that we find.

Another concern is that West German women who value their career and hence have a high propensity to work after childbirth may strategically migrate to East Germany, expecting that it is easier to combine family and work in a more gender egalitarian environment. While the sample size of West and East German migrants observed prior to moving is small in the German Socio-Economic Panel, the suggestive evidence in Appendix Table D1 casts doubt that this type of selection is of importance: West German migrants do not report, before they moved to East Germany, job success and fulfilling ones' potential (and family) to be more important than West German stayers.

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<sup>1</sup> We compute real wages using the consumer price index provided by the German Federal Statistical Office (Statistisches Bundesamt, 2015).

Evidence based on the SOEP further highlights that spousal income of West German migrant mothers is considerably higher than spousal income of East German mothers in East Germany, also reflected in higher monthly household savings (Panel A of Appendix Table D1). These greater financial resources on the family level would predict a slower return to work of West German migrants and hence cannot explain the pattern of asymmetric cultural persistence.

**APPENDIX TABLE D1. East and West German Migrants and Stayers: Descriptive Statistics using German Socio-Economic Panel (SOEP)**

	West in West	West in East	East in East	East in West
<b>Panel A: Characteristics of spouses (SOEP)</b>				
Has partner	0.913	0.870	0.872	0.838
partner is of same origin (East or West)	0.980	0.834	0.989	0.548
Partner is of East German origin	0.020	0.166	0.989	0.548
Spousal gross labor income	3061.55	4262.79	1900.64	2657.63
Spousal net labor income	2023.77	2691.77	1302.77	1822.38
Monthly household savings	438.37	564.84	351.44	391.53
Household saving rate	0.182	0.199	0.201	0.172
N	8761	208	2959	980
<b>Panel B: Regression coefficients testing for between group differences for work- and family-related attitudes prior to move (SOEP)</b>				
Importance of job success	<i>West German stayers are omitted category</i>	0.033 (0.060)	0.140 (0.006)	0.178 (0.029)
Important to have children		-0.015 (0.061)	0.028 (0.004)	0.015 (0.035)
Important to fulfill one's potential		-0.029 (0.062)	0.067 (0.006)	0.106 (0.033)
N	16037	43	5447	91

*Notes:* In Panel A, we use data from the German Socio-Economic Panel on women with a child aged 0 to 5 to compute sample means of the share of women with a partner (both married and unmarried), the share of partners who originate from East Germany, as well as spousal gross and net monthly labor income. Monthly financial household savings and the household saving rate are measured from four years before childbirth up until age 1 of the child. Household saving rates are calculated as the ratio between monthly household savings and net labor household income (calculated as the sum of net labor income of the woman and her partner). In Panel B, we show estimates from regressing binary attitudes on indicator variables for whether a woman always remained in East Germany and whether a West (East) German woman moved to East (West) Germany within the 5 following years (i.e., before they moved to the other part of Germany). Women who always remained in West Germany form the omitted base category. The sample includes all women between 20 and 45. We further control for women's socio-demographic characteristics (woman's age, education and whether she has children).

*Source:* Panel A: German Socio Economic Panel (SOEP, 2018), women whose first child is age 0-5 in 1990-2010 (N=12,908 overall) for rows 1-4. German Socio Economic Panel (SOEP, 2018), women four years before and up until age 1 of first child in 1992-2010 (N=4,422 overall) for household savings. Panel B: German Socio Economic Panel (SOEP, 2018), women aged 20-45 in 1990-2016 (N= 21,618 overall). Attitude variables are available in 1990, 1992, 1995, 2004, 2008, 2010, 2012, 2016.

## **D2. Additional Robustness Checks on the Persistence of Childhood culture**

**East Germans in West Germany.** To further probe the robustness of our results to potential selectivity of (East) German migrants in our data, we report additional robustness checks in Appendix Table D2. In columns (2) and (3), we first contrast East German migrants with West Germans who migrated at least the average distance as the

aforementioned East German migrants (about 280 km)<sup>2</sup>, but did so internally within West Germany, to account for the possibility that migrant mothers generally work more after childbirth. East-West gaps in Table D2 even increase in magnitude relative to our baseline estimates in column (4) of Table 1 in the main text (presented for convenience also in column (1) of Table D2)—possibly because internal West German migrants do not have, like East Germans, family nearby. Next, we restrict the sample to West German workplaces operating in the five integrated cross-border local labor markets. East Germans in these workplaces are primarily commuters and thus face substantially lower moving costs than cross-border migrants, thus limiting the potential concern of differential selection.<sup>3</sup> Yet, estimates in column (4) of Table D2 are, if anything, slightly larger in size to our baseline estimates reported in column (1).

**West Germans in East Germany.** We also conduct the same checks for West Germans in the East German labor market. The gaps between West German migrants and “natives” are small in magnitude and insignificant when we compare West German migrants to internal East German migrants who moved a similar distance within East Germany and gave birth in the same local labor market in the same year (column (2) of Table D3).<sup>4</sup> Migrant-native gaps are likewise small and statistically insignificant when we compare East and West Germans within the same workplace located in the Eastern part of the integrated cross-border local labor markets (column (3) of Table D3). We conduct a final placebo check in column (4) of Table D3, focusing on “future” migrants who were socialized and give birth in West Germany, stay in West Germany for at least two years after giving birth but move to East Germany at some later point. If West German women who migrate to East Germany are generally more career-oriented than West German women who migrate internally, we would expect “future” West-East migrants to return to work faster after birth than “future” internal migrants who give birth in the same year and same local labor market (the comparison group equivalent to

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<sup>2</sup> Distances were computed as direct distances between district (*Kreis*) centroids based on Shapefiles provided by the Federal Agency for Cartography and Geodesy (GeoBasis-DE/BKG, 2016).

<sup>3</sup> To obtain a sufficiently large sample size, we include East and West Germans who gave birth between 1997 and 2006 (as opposed to between 2003 and 2006, in our baseline specification).

<sup>4</sup> There are only 319 internal East German migrants, making it infeasible to compare West German migrants and East German internal migrants within the same workplace. A within workplace comparison is also infeasible between future cross-border and internal West German migrants due to the small sample size.

that in column (2)). Employment gaps two years after childbirth (when future migrants to East Germany are still in West Germany) between the two groups are, however, close to zero, confirming that West German women who migrate to East Germany are not generally strongly selected, in line with our previous evidence.

**APPENDIX TABLE D2. Differences in Post-Birth Employment Outcomes between East and West German Mothers in West Germany: Robustness Checks**

	Baseline (column (4) from Table 1 in main text) (1)	Relative to West German migrants, same local labor market (2)	Relative to West German migrants, same workplace (3)	Only cross border local labor market (4)
<b>Panel A: 4 years after childbirth</b>				
Regularly employed (excluding marginal employment)	0.0792 (0.00821)	0.121 (0.0104)	0.152 (0.0196)	0.104 (0.0186)
Employed (including marginal employment)	0.0622 (0.00656)	0.112 (0.00841)	0.146 (0.0181)	0.0679 (0.0189)
Full-time employed	0.0509 (0.00645)	0.0546 (0.00812)	0.0558 (0.0168)	0.0949 (0.0456)
<b>Panel B: 1 year after childbirth</b>				
Regularly employed (excluding marginal employment)	0.0366 (0.00706)	0.0544 (0.00876)	0.0877 (0.0286)	0.0469 (0.0295)
Employed (including marginal employment)	0.0241 (0.00843)	0.0609 (0.0106)	0.0769 (0.0332)	0.0371 (0.0306)
Full-time employed	0.0264 (0.00721)	0.0310 (0.00796)	0.0436 (0.0243)	0.0515 (0.0236)
Restriction to cross-border local labor markets	no	no	no	yes
Local labor market*year of birth FE	yes	yes	yes	yes
Firm FE	yes	no	yes	yes
Mothers' characteristics at birth	yes	yes	yes	yes
Pre-birth employment history	yes	yes	yes	yes
N East German	9,565	8,674	2,928	1,806
N West Germans	197,012	10,910	2,986	12,463

*Notes:* The table reports coefficient estimates of the migrant dummy in regression equation (1), estimated on various samples of first-time mothers who give birth in West Germany. Column (1) reports baseline estimates that compare East Germans who migrated to West Germany prior to giving birth with West German “stayers” and control for local labor market by year of birth fixed effects, workplace fixed effects, mothers’ control variables at the time of birth and mothers’ employment history variables in the three years prior to birth (control set II) as in column (4) of Table 1. In columns (2) and (3), we compare East Germans in West Germany to internal West German migrants who have moved at least the mean distance of the East Germans in the sample (ca. 320 km), and control for local labor market by year of birth fixed effects, mothers’ characteristics at the time of birth and employment histories in the three years prior to birth (control set II) in column (2) and additionally workplace fixed effects in column (3). In column (4), we compare East and West Germans in workplaces in the West German part of the integrated cross-border local labor markets, and control for the same variables as in column (3). Standard errors clustered on the local labor market level of the pre-birth place of work are reported in parentheses.

*Source:* Social Security Records (IEB, 2012), first-time mothers who signed up for maternity leave in West Germany in 2003-2006 (columns (1)-(3)), and in the West German parts of cross-border local labor markets in 1997-2006 (column (4)).



**APPENDIX TABLE D3. Differences in Post-Birth Employment Outcomes between West and East German Mothers in East Germany: Robustness Checks**

	Baseline (column (4) from Table 3 in main text)	Relative to East German migrants, same local labor market	Only cross- border local labor market	Placebo: West Germans moving to East after birth vs. West German internal migrants
	(1)	(2)	(3)	(4)
<b>Panel A: 4 years after childbirth (2 years in column (4))</b>				
Regularly employed (excluding marginal employment)	-0.0122 (0.0116)	0.0161 (0.0170)	-0.0229 (0.0198)	0.0169 (0.0253)
Employed (including marginal employment)	-0.0249 (0.0123)	-0.0222 (0.0256)	-0.0130 (0.0181)	0.0159 (0.0253)
Full-time employed	-0.00113 (0.0115)	0.0551 (0.0284)	-0.0182 (0.0213)	-0.000547 (0.0170)
<b>Panel B: 1 year after childbirth</b>				
Regularly employed (excluding marginal employment)	-0.0332 (0.0142)	0.0277 (0.0281)	0.00350 (0.0364)	-0.000446 (0.0148)
Employed (including marginal employment)	-0.0278 (0.0137)	0.0201 (0.0276)	0.00683 (0.0245)	-0.0166 (0.0222)
Full-time employed	-0.00809 (0.0136)	0.0572 (0.0238)	0.00572 (0.0155)	-0.00594 (0.0120)
Restriction to cross-border local labor markets	no	no	yes	no
Local labor market*year of birth FE	yes	yes	yes	yes
Firm FE	yes	no	yes	no
Mothers' characteristics at birth	yes	yes	yes	yes
Pre-birth employment history	yes	yes	yes	yes
N East Germans (future migrants in (4))	40,578	302	6,644	796
N West Germans (stayers in (4))	2,507	4,482	604	1,809

*Notes:* The table reports coefficient estimates of the migrant dummy in regression equation (1), estimated on various samples of first-time mothers who give birth in East Germany (except column (4)). Column (1) reports baseline estimates that compare West Germans who migrated to East Germany prior to giving birth with East German “stayers” and control for local labor market by year of birth fixed effects, workplace fixed effects, mothers’ characteristics at the time of birth and mothers’ employment history variables in the three years prior to birth (control sets I and II) as in column (4) of Table 4. In column (2), we compare West Germans in East Germany to internal East German migrants who have moved at least the mean distance of the West Germans in the sample (ca. 265 km), controlling for local labor market by year of birth fixed effects, mothers’ characteristics at the time of birth and employment histories in the three years prior to birth (control set II). In column (3), we compare East and West Germans in the East German parts of the integrated cross-border local labor markets, controlling for the same variables as in column (2) as well as workplace fixed effects. In column (4), we conduct a placebo test where we compare employment outcomes 1 and 2 years after birth of West Germans who move to East Germany 2 to 10 years after birth and have never worked in East Germany before giving birth (N=796) and West Germans who migrate internally (at least 300 km within West Germany 2 to 10 years after birth (N=1809)). We control for local labor market by year of birth fixed effects, mothers’ characteristics at birth and mothers’ mothers’ employment history variables in the three years prior to birth (control sets I and II). Standard errors clustered on the local labor market level of the pre-birth place of work are reported in parentheses.

*Source:* Social Security Records (IEB, 2012), first-time mothers who signed up for maternity leave in East Germany in 2003-2006 (columns (1)-(2)) and in East German parts of the cross-border local labor markets in 1997-2006 (column (3)). In column (4), we restrict the analysis to first-time mothers who sign up for maternity leave in 2000 in West Germany and migrate across the border to East Germany or internally within West Germany 2-10 years after birth.

### D3. Bounding Analysis

We follow the bounding approach by Oster (2019) (who builds on the ideas discussed in Altonji, Elder, and Taber (2005)) to gauge to what extent unobserved confounding factors could reduce or increase the estimated gaps between (return) migrants and “natives”, assuming extreme differences between (return) migrants and stayers in unobserved characteristics that we cannot account for. The approach is first based on a comparison of those gaps unconditional ( $\hat{\beta}$ )—“short regression”—and conditional ( $\tilde{\beta}$ ) on observed characteristics—“intermediate regression”—e.g., 10.1 and

7.92 percentage points for regular employment four years after childbirth when comparing migrants and stayers in West Germany (columns (1) and (4) in Table 1 in the main text, displayed again for convenience in columns (1) and (2) in Panel A of Table 2).

Oster (2019) suggests a simplified formula to compute approximate bounds  $\beta^*$  around the conditional East-West gap  $\tilde{\beta}$  as follows:

$$\beta^* \approx \tilde{\beta} - d(\hat{\beta} - \tilde{\beta}) \frac{R^{max} - \tilde{R}}{\tilde{R} - \hat{R}},$$

where  $\hat{R}$  and  $\tilde{R}$  denote the  $R^2$  from the unconditional and conditional regression (e.g, 0.009 vs 0.289 for the above example, reported in Panel A of Table 1 in the main text), and  $R^{max}$  is set by the researcher and determines to what extent observed and unobserved factors combined can explain the overall variation in post-birth employment choices of mothers. Oster (2019) recommends setting a value of  $R^{max} = 1.3\tilde{R}$ , arguing that with a higher  $R^{max}$ , bounds would lie outside the 99.5% confidence interval in more than 10% of cases in a set of well-published Randomized Control Studies.

The parameter  $d$  governs the degree of proportionality of selection on observables to selection on unobservables and are typically set to 1 and -1, implying that selection on unobservables is as strong as selection on observables and operates in the same or opposite direction as selection on observables, leading to an over- and underestimation, respectively, of the true effect in this specific context. Note that a choice of  $d = 1$  is a very conservative assumption given our extensive set of control variables and given that some unobserved confounders such as access to nearby family work in the opposite direction as selection on observables.

Table 2 in the main text shows the bounds for the migrant-gaps (Panel A and B) and return migrant-gaps (Panel C and D). Comparing estimates in columns (1) and (2) again demonstrates that the employment gaps are remarkably robust to conditioning on the extensive set of observable characteristics. Columns (3) and (4) show the associated Oster bounds.

We note two key findings: First, comparing Panels A and B, it becomes clear that the asymmetry in the persistence of gender norms is extremely unlikely to be driven by

the exclusion of unobservable characteristics. Even under the very conservative assumption that they are as important as our rich set of control variables, we obtain bounds of 7.2 percentage points for East German migrants in the West, whereas those for West Germans in the East are at most -1.7 percentage points. Second, a comparison of the results on return migrants in Panels C and D confirms that cultural adoption is predominantly a phenomenon of West Germans. The estimated return migrant-stayer gap in West Germany is estimated with remarkable accuracy such that the unbiased gap likely is around 5 percentage points. Under the implausibly strict assumption that East German return migrants are selected on unobservables to the same extent as on our large set of control variables, the gap between East German return migrants and stayers is still bounded between 0.9 and 3.1 percentage, while the original estimates (with and without controls) were not statistically different from 0.

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