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Abstract

This paper investigates the role of work experience in migrant mothers' current employment in Germany. Unlike previous papers, we focus on actual experience and add the motherhood aspect. To this end, we use data from the German Socio-Economic Panel 2013-2018 including the IAB-SOEP Migration Sample. Having immigrated to Germany and female sex are the two treatments of our sample of 491 migrant mothers, with 7,077 native mothers and 1,383 migrant fathers serving as control groups. Running LPM with individual FE and testing the robustness of the work experience estimators against a range of covariates and unobserved time-varying confounders with Oster bounds, we show that years of domestic part-time experience yield higher returns for migrant mothers compared to migrant fathers and non-migrant mothers. We conclude that current employment is significantly fueled by former employment; thus policies should be designed such that they help women to "get on the right track".

Keywords: migrant employment, maternal employment, LPM with individual FE, Oster test, actual work experience

JEL codes: J61, J16, J24

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Data availability: The data that support the findings of this study are available from the German Socio-Economic Panel (SOEP), but restrictions apply to the availability of these data, which were used under license for the current study and so are not publicly available.

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1 | Introduction

Since the 1990s, Germany has experienced a substantial change in both the scale and composition of immigration flows. In 2019, 26% of the German population had a migrant background (Federal Statistical Office 2020, p. 37). However, the migrants' employment rate still falls short of the respective rate for the non-migrant population. For the working age female (male) migrant population in Germany (20-64) who were foreign-born, it stood at 64.3% (80.5%) in 2019, compared to 79.9% (85.8%) for the native-born population. For non-EU-born migrants, the rate was even lower at 58.4% for women and 76.4% for men (Eurostat 2020). With respect to migrants' untapped labour force potential, mothers form a relevant subgroup. Some 39% of non-employed mothers with a migrant background would like to resume work immediately or within the coming year and another 26% in the next 2 to 5 years (Gensicke et al. 2017, p. 36f.). Beyond macroeconomic benefits, migrant mothers' employment is key to overcoming migrant families' material hardships. For first-generation migrant children under the age of 6, the risk-of-poverty rate stood at 58% in 2017, compared to 15% for same-age children without a migration background (Lochner and Jähnert 2020, p. 42).

Instead of modelling employment outcomes as a function of years since immigration (e.g. Adserà/Ferrer 2016), we are interested in actual employment. Women interrupt their careers more often than men in the course of having a family, so focusing on potential experience would mask the full extent of the gender divide. Thus, we explore the role of actual experience for migrant women's current employment probabilityprobability. If current employment is significantly fueled by former employment, policies should be designed such that they help women to "get on the right track".

The remainder of the paper is as follows: Section 2 reviews the literature, identifies the contribution of this paper and the hypotheses that structure the quantitative analyses. Section 3 delineates the data and Section 4 the empirical strategy. Section 5 presents the results and Section 6 concludes.

2 | Literature

Migrant mothers' employment in a host country lies at the crossroads between the integration of immigrants in the labour market and the specialities of maternal employment. Here, various theoretical strings in the aspects of human capital, institutions and norms, as well as the household context cross each other.

Human capital is crucial for migrants' labour market integration (Kogan 2011). According to human capital theory (Becker 1964), attained formal education reflects general

human capital, while work experience mirrors firm-specific human capital; both enhance individuals' income-generating capacities and work incentives (Mincer 1974). Further, proficiency in the host country's language is a relevant aspect of human capital (Chiswick 2016). Research has long focused on different human capital returns between immigrants and natives (Chiswick 1978, Borjas 1985, LaLonde and Topel 1992), as well as on migrant heterogeneity, e.g. regarding country of origin and cohort (Chiswick 1986, Borjas 1992). In more recent years, the country where the human capital has been obtained gained more attention (Friedberg 2000), pointing at the importance of cultural distance between the source and the host country (Kee 1995). As culture interacts with institutions and legislation (Kremer 2007), the associations of country of ancestry can embody unobserved heterogeneity in terms of economic conditions and institutions (Fernandez and Fogli 2009) as well as norms, attitudes and gender role orientations (Becher and El-Menouar 2014).

Cultural heritage, i.e. norms and attitudes transmitted through socialization, particularly affect maternal employment (Levine 1993; Vella 1994; Fortin 2005; Contreras and Plaza 2010). Many studies have investigated the impact of cultural traits on migrant women's behaviour (Polavieja 2015), e.g. proxied by female labour force participation in the source country (Antecol 2000, van Tubergen et al. 2004; Fernández 2007), or religiosity (Guetto et al. 2015). Women immigrate more often than their male counterparts as family members (Chiswick 2000). In the context of traditional gender roles, women often act as 'tied movers' (Mincer 1978) who are bound to their male partners' job-matching optimization, residing "in labour markets that bear no relation to their skills and employment needs" (Hanson and Pratt 1995: 125). Thus, moving for the sake of the male partner's job may negatively affect women's own post-migration job status (Boyle et al. 2009).

Moreover, culture plays a pertinent role on the demand side of the labour market, for example if recruitment procedures beyond competences and skills are geared towards the 'cultural matching' of applicants with human resource managers and/or firm staff (Rivera 2012). In this context, the length of stay in the host country can be mutually beneficial. It may increase migrants' opportunities to cultivate inter-ethnic social contacts, which have been shown to trigger labour market success in Germany (Kogan 2016). Further, it increases the chances of acquiring country-specific knowledge about culture, the legal and economic system, institutions and language and is therefore decisive for labour market integration (Giesecke et al. 2017, Brücker 2018). If time since immigration leads to increased work experience, it might also decrease employer-sided prejudices and put a process of further integration into motion. However, as a precondition, migrants need a legal work permit.

Germany's immigration laws of the recent past are characterized by several attempts to attract highly skilled workers (the Green Card initiative of 2000, the immigration act

of 2005, the implementation of the EU's Blue Card Directive in 2012, the Skilled Worker Immigration Act of 2020). At the same time, subgroups of immigrants, such as asylum seekers, are usually confronted with waiting times to obtain a work permit. From 1992 to 2004, this held true for family migrants as well, although the waiting period was shortened during this time. From 2005 to 2013, their access to a work permit was conditional upon that granted to the principal migrant as the head of the family.

The literature focusing on migrant mothers has so far mostly addressed formal credentials (Knize-Estrada 2018, Krieger 2020) and has compared foreign and domestic schooling (e.g. Schoeni 1998). Papers emphasizing the role of work experience confirm the relevance of domestic experience (i.e. experience acquired in the host country), but they lack the gender differentiation (Friedberg 2000, Kossoudji 1989, Schaafsma and Sweetman 2001), and they use potential instead of actual experience. Pandey and Townsend (2017) analyze both sexes, but their study is based on Canadian data. Few studies so far have addressed these questions based on German data. Basilio et al. (2014) mark one of the exceptions, but their study focuses on wages and does not exploit the panel structure of the SOEP data. Thus, the returns to women migrants' actual domestic and foreign work experience in terms of actual employment is still an open question in research, even more so in the context of motherhood.

Contribution of this paper

Following Chiswick (1978) and Friedberg (2000), we use country of acquisition and workers' nativity and apply these two distinctions to actual work experience (henceforth: EXP) for migrant mothers' employment probabilityprobability in Germany. Extending previous papers focusing on women (e.g. Beyer 2017; Adsera and Chiswick 2007), we differentiate between genders, i.e. mothers and fathers, adding the parenthood aspect. Having immigrated to Germany (versus belonging to the native-born population) and female sex (versus male sex) are the two treatments of our main sample of migrant mothers, with non-migrant mothers and migrant fathers serving as control groups. Since parents differ much more in actual than in potential experience, we are, to the best of our knowledge, the first to focus on actual work experience. Further, we explore whether EXP intensity matters.

Our findings confirm the importance of country of acquisition, nativity and gender for part-time experience. For migrant mothers, years of part-time experience acquired in the host country's labour market are more valuable for current employment probabilityprobability compared to the years of EXP acquired in the source country. Migrant mothers benefit more than non-migrant mothers and migrant fathers. Thus, our hypotheses H1-H3 are supported by the data for part-time, but not full-time, experience, and H4 referring to experience intensity is rejected. Our experience estimates for migrant

mothers prove robust against omitted variable bias and alternative experience specifications. Plotting marginal effects at representative values shows a substantial narrowing of the employment gap between migrant and non-migrant women within the first ten years of actual (part-time) experience in Germany. We conclude that training-on-the-job seems important to initiating a self-perpetuating process of solid integration.

Hypotheses

The following hypotheses structure our empirical investigations:

H1-COUNTRY OF ACQUISITION: Domestic EXP (both full-time and part-time) is more important for employment than EXP acquired in the home country (**H1**),

H2-NATIVITY: Domestic EXP (both full-time and part-time) is more important to migrant mothers, compared to non-migrant mothers,

H3-GENDER: Domestic EXP is more relevant for migrant mothers compared to migrant fathers concerning FT EXP (**H3a**) and PT EXP (**H3b**) and, irrespective of intensity, foreign EXP in total (**H3c**),

H4-INTENSITY: Full-time EXP entails a higher employment advantage than part-time EXP, irrespective of country of acquisition.

3 | Data

For our analyses, we use the waves 2013-2018 of the German Socio-Economic Panel including the IAB-SOEP Migration Sample (Goebel et al. 2019), relying on samples M1 and M2.[1]

3.1 | Sample construction

Our main sample consists of mothers who immigrated to Germany between 1991 and 2015, who have at least one child below 18 in the household and who were 18 to 47 years

[1] For more information on the data set and variables see Brücker et al. (2014a).

old at the time of immigration to Germany. In line with the underlying population[2], migrants residing in Western Germany are much more prevalent in our sample than those living in Eastern Germany.

We start with a gross sample of 2,065 migrant mothers (see **Table 1**). Excluded are tourists, persons who are currently in education or training (apprentices, trainees and students) and migrants with a refugee background. As for a meaningful interpretation of migrants' employment behaviour in the host country, a residence permit that allows for immediate work after immigration is important, and we exclude migrants who do not meet this restriction. For all samples, we set the restriction that individuals have to deliver full information on the dependent variable and all explanatory variables used in the estimations, with at least two observations per person. We end up with a sample of N=491 migrant mothers with 1,745 observations.

Table 1: Analytical sample with exclusion criteria

Sample restrictions	Number of persons
Mothers (samples M1+M2)	2065
First-generation immigrants	1674
Age at immigration between 18 and 65	1399
No refugee background	1256
No students or tourists	1165
Residence permit allows for immediate employment	912
No missing information	732
At least two observations per person	491
Final sample	491

Sources: SOEP v35; own calculations

The panel is highly unbalanced, as 29.5% of the mothers have only two observations, whereas another 28.3% is observed for three years only (see **Table 2**). Even though the SOEP strives for complete information for all participants in all years, 60% of all respondents drop out of the panel completely due to refusal, death, relocation to a foreign country, or skipping participation for one or more years (Kroh et al. 2018).

[2] In 2019, the migrant population share was 8.2% in the eastern compared to 29.1% in the western part of Germany (Federal Statistical Office 2020, p. 42).

Table 2: Observations per person for the main sample

Number of observations per individual	Frequency	Frequency in percent
2	145	29.5
3	117	28.3
4	106	21.6
5	58	11.8
6	65	13.2

Sources: SOEP v35; own calculations.

To test hypotheses H3 and H2, we use a sample of migrant fathers (N=385 with 1,383 observations) and non-migrant mothers (N=7,077 with 40,904 observations) respectively.

3.2 | Variables

Our dependent variable is the employment probabilityprobability of a mother *i* in the year *t* in Germany, which takes the value 1 in case of employment and 0 otherwise. Employment is measured as the current employment status. Employed persons include dependent employees (workers, employees and civil servants) as well as self-employed persons. In addition to employees subject to social security contributions, those in marginal employment are also included.

Our core independent variable is individual work experience (EXP). We differentiate between foreign and domestic work EXP, distinguishing furthermore between full-time (FT) and part-time (PT) EXP in each category.[3] Foreign (domestic) experience refers to employment before (after) immigration. FT (PT) EXP is measured as the accumulated years of FT (PT) employment until the year (*t-1*) that precedes the survey year (*t*). To allow for non-linear relationships, we include quadratic terms for all four EXP variables.

Highest educational attainment is aggregated into three categories (low/medium/high). To test whether the country of acquisition is decisive for schooling, a dummy for non-zero years of domestic schooling is generated.[4]

[3] Parental leave is coded as employment, different from maternity leave.

[4] In a first step, this requires transforming categories into years of schooling. Following the codification scheme based on ISCED 1997 that has been used for the PISA 2006 study (Prenzel et al. 2007), the following categories are assigned the number of years in brackets: 0(3); 1(4); 2(10); 3 or 4(13); 5(15); 6(18). Secondly, the years of education that were obtained in Germany and in the source country, respectively, are computed from years of education and age at immigration. Non-migrant mothers have zero values on foreign schooling.

As controls we use age and age squared as well as German language proficiency (0= not at all, 4=very good, 5=no migrant background) as further human-capital-related variables. Regarding household contexts, we control for household type (single parent or couple household), marital status, a dummy for the absence of another adult with a direct or indirect migration background in the household[5], the respective number of children aged 0-1, 2-4, 5-7, 8-12 and 13-17[6], and household income other than the respondent's labour income. The presence of another migrant adult in the household could decrease the respondent's effort and motivation to establish inter-ethnic social ties and/or reflect a female tied mover position (Mincer 1978), both being related to a lower maternal employment probabilityprobability. Regarding migration biography, we follow Brücker et al. (2014b) and include dummies for the following country-of-origin groups (with EU-28 as a reference): South-Eastern Europe, former Commonwealth of Independent States (CIS), Arab and other Muslim states and rest of the world. Further, we control for length of stay in Germany using year of immigration. As a country-fixed effect would fail to disentangle institutions and culture, we add the total fertility rate and the female employment rate of the migrant's source country at the time of her immigration to Germany. We argue that these indicators reflect social norms in the source country that potentially shapes the employment behaviour of female immigrants. Further, we include occupational (ISCO-08) and sector affiliation (NACE Rev. 2), which refer to the last job in case of non-employment and the current job in case of employment. Finally, fixed effects with respect to region (16 federal states) and year (survey years 2013-2018) are incorporated in each of the models.

Table A1 in the Appendix depicts descriptive statistics of the dependent variable and explanatory variables. Compared to the main sample of migrant mothers whose employment rate is 55%, migrant fathers and non-migrant mothers are more likely to be employed with rates of 88% and 74% respectively. Most migrant mothers immigrated after the turn of the millennium (45% from between 2000 and 2009, 40% from 2010-15), as only 15% of them came to Germany earlier than that (1991-1999). Most originate from EU-28 countries (58%), followed by former CIS states (24%). The remainder is split between South-Eastern Europe, Arab/Muslim states and the rest of the world (6% each). Migrant mothers' age averages 36.8 years, and their mean foreign experience amounts to 5.1 years (4.6 years FT and 0.5 years PT). They possess 4.3 years of domestic experience (2.2 years FT and 2.1 years PT). Additionally, some 45% (38%) of migrant mothers exhibit medium (tertiary) education. In the group comparison, non-migrant mothers possess more years

[5] The dummy takes the value of 1 for single mothers and for mothers who live together with autochthonous adult persons only.

[6] We refrain from using childcare coverage rates as additional regressors, since we suggest that, with our FE specification, we should cover relevant individual traits that drive usage of institutional childcare that otherwise would be instrumented with county-level coverage rates. Moreover, we control for region (federal states) and time fixed effects.

of domestic work EXP (both FT and PT) than migrants of both sexes, whereas migrant fathers exhibit more years of foreign and domestic FT EXP than migrant mothers. Non-migrant mothers are older, have older children, less frequently have either low or high levels of education, while medium education is much more prevalent among them, compared to the main sample. Migrant mothers and fathers barely differ in migration biography, German language skills, age of children, further income in the household and share of low education. However, migrant fathers are more likely to be married and less likely to have tertiary education or be a single parent.

4 | Empirical strategy

Observing maternal employment indicates that supplied labour matches labour demand. As discussed in the literature review, there are many reasons why individuals differ in their employment preferences and demand-side employment obstacles. This holds particularly true for mothers. Taking account of unobserved individual heterogeneity, we consider individual fixed effects models as superior compared to cross-sectional models.[7]

4.1 | Main analyses: Linear Probability Model with individual fixed effects

We estimate a LPM with individual fixed effects μi where the dependent variable EMP_{it} is a binary indicator for whether individual i is employed or not in wave t:

$$EMP_{it}=\alpha+EXP_{it-1}\beta+Z_{it}\theta+\mu_i+\gamma t+\tilde{\varepsilon}_{it} \quad (1)$$

where α is the intercept, EXP_{it-1} is a measure of accumulated work EXP of individual i in wave $t-1$. The variable uses calendar information up to December of the previous year; Z_{it} is a vector of controls, including (time-varying and time-invariant) other human-capital-related traits, household context, migration biography, cultural distinctions, job-related variables as well as region FE, with associated parameter vector θ; μ_i are individual FE, γ_t are wave FE, and $\tilde{\varepsilon_{it}}$ is the error term. The parameter of interest is β, which measures the change of the probability of being employed in the current year t (i.e. the

[7] We conducted Hausman tests to check whether the RE or the FE estimator is the appropriate specification. The RE estimator relies on the strong assumption that the explanatory factors are uncorrelated with the error term, i.e. the individual FE are not correlated with the time-varying observables. As the Hausman test for our main sample shows, the null hypothesis has to be rejected at the 5-percent significance level, thus the FE estimator is the appropriate specification.

probability change that EMP_{it} takes the value 1, in percentage points), that is caused by one additional year of (full-time or part-time) work EXP in the preceding year *t-1*. Accounting for individual FE and using lagged EXP minimizes reverse causality bias from employment to EXP. In all estimations, standard errors are clustered at the individual level.

(Quasi-)time-invariant variables are omitted in FE models. In our study, e.g. education and foreign work EXP fall in this category of variables. To derive parameter estimates for these variables, an auxiliary regression is used, which relies on the assumption that the requested information is incorporated in the individual FE (Baltagi 1995). The estimated individual FE of individual i can be defined as the per annum average of this individual's estimated idiosyncratic errors during the observation period:

$$\hat{\alpha}_i = \frac{1}{T} * \sum_{t=1}^{T} \hat{\varepsilon}_{it}$$

In a second step, the estimated individual effect can be regressed on these (quasi-)time invariant variables.

Yet, unobserved time-*varying* factors potentially represent a second source of individual heterogeneity. Examples are changes in individuals' informal skills, work preferences and incentives, or macroeconomic conditions. While individual FE models as notified in equation (1) control for time-invariant heterogeneity, this approach does not circumvent the possibility that unobserved heterogeneity in time-varying individual characteristics biases the estimate of β.

4.2 | Oster approach: Accounting for selection into time-varying unobservables

To assess the amount of bias, we apply the Oster (2017) approach.[8] As Bryan et al. (2019) point out, the Oster approach uses information about the correlation between the observables and EXP to compute the correlation between the unobservables and EXP, to estimate the degree of bias in the estimate of EXP arising from omitted variables. Rewriting our equation in Oster form leads to

$$EMP=\alpha+EXP\beta+W_1+W_2+\epsilon \quad (2)$$

where EMP and EXP are the employment and experience measures as before; W_1 is an index that is a linear combination of observed variables that are correlated with both EMP and EXP and their respective coefficients (including Z, μ, and γ); W_2 is a similar index of variables, which are not observed; and ϵ is measurement error in EMP, which

[8] Our explanation of the Oster approach follows Bryan et al. (2019) and Hener et al. (2015).

is uncorrelated with EXP, W_1 and W_2. W_2 contains all residual variation in employment probabilityprobability that cannot be explained by EXP and W_1.

The Oster method differentiates between a controlled regression including all observable factors and an uncontrolled regression including only covariates that are not informative of selection on unobservables. While the controlled regression is equation (1), we specify the uncontrolled regression as

$$EMP_{it}=\alpha+EXP_{it-1}\beta+\mu_i+\gamma_t+\dot{\varepsilon}_{it}. \quad (3)$$

The individual and time FE are included in equation (3), since they capture both the observed and unobserved components of time-invariant individual-level and calendar effects. Thus, the change in the EXP estimator when adding μ_i and γ_t does not indicate what would happen if controls were added which vary over time and across individuals. On the other hand, Z_{it} in equation (1) match this requirement only imperfectly as they refer to the observed part of the cross-person cross-time variation. Thus, the essence of the Oster approach lies with the assessment of the unobserved counterparts to Z_{it} ($W2$).

The seminal work by Altonji et al. (2005) relies on the assumption that selection on observable covariates is the same as selection on unobservable covariates[9], which allows the authors to define a lower bound estimate of β using the coefficient's movement caused by the introduction of observable covariates. The novelty of the Oster approach lies in exploiting both the movements of the coefficient and the R-squared values to compute both the lower and the upper bound of the EXP estimator. As β is not identified in case of omitted variables, Oster (2017) suggests to report an identified set of parameters on the treatment effect. The identified set depends on estimated parameters ($\tilde{\beta}, \dot{\beta}, \tilde{R}, \dot{R}$) and chosen values for δ, the coefficient of proportionality, and R_{max}, the unknown overall R-squared of a model which controls for observables, unobservables and the treatment variable. Both δ and R_{max} are unknown parameters.

The coefficient of proportionality (δ) measures the correlation of unobservables with EXP relative to the correlation of observables with EXP. When δ=1, the observables and the unobservables are equally important and affect β in the same direction; when $0<\delta<1$, the unobserved factors are less important than the observed factors, and the opposite holds when $\delta>1$. The EXP coefficient referring to δ=0 is $\tilde{\beta}$, the estimate from the controlled regression in equation (1). $\dot{\beta}$ is the estimate of β in the uncontrolled regression in equation (3). R_{max}, the second parameter required to form the identified set of parameters on the treatment effect, is the maximum R-squared under the full model in Equation (2), where all (observed and unobserved) variables are included. R_{max} cannot be smaller than the R-squared obtained from the controlled regression. It cannot exceed 1, and it equals 1 only in the unlikely case that the idiosyncratic error ϵ is zero. $\tilde{R}$ and $\dot{R}$ are the R-squared

[9] (proportional selection assumption, cf. Hener et al. 2015: 17 for a more detailed notation)

values from Equations (1) and (3) respectively. β^* is the bias-adjusted coefficient of β, i.e. the corrected effect of EXP on employment for omitted variable bias given the specified values of R_{max} and δ.

Assumptions for δ and R_{max} are required to identify β^*. Oster argues that a plausible upper bound for δ is 1, since deliberately choosing observed controls relies on the assumption that they have a stronger impact on the outcome variable than unobservable covariates. Further, R_{max} is below 1 in the likely case that the idiosyncratic error ϵ is different from zero. Moreover, in a FE model the R-squared retrieved from the controlled regression is the within R-squared, which is lower than the overall R-squared (Bryan et al. 2019). We consider R_{max}=1.3$\tilde{R}$ following Oster, who suggests a heuristic approach setting R_{max}=1.3 $\tilde{R}$ based on a sample of randomized trials (Oster 2017: pp 202f).

We report the identified set for the treatment effect of EXP on employment probabilityprobability [$\tilde{\beta}$, β^* (min{1.3 $\tilde{R}$, 1}, 1)]. If this set excludes zero, the results from the controlled regressions can be considered robust to omitted variable bias. This implies that the bias-adjusted coefficient β^* with the chosen upper bounds on δ and R_{max} does not change sign considerably relative to $\tilde{\beta}$. We also check, following the suggestion by Oster (2017), whether the bounds of the identified set lie within the confidence interval of $\tilde{\beta}$.

4.3 | Robustness checks

As a first robustness check (I), we run cross-sectional Probit models of employment probabilityprobability for the three subgroups. Different from equation (1), the functional form of the Probit model is non-linear, and, since we do not use a Probit panel model, individual fixed effects are not included. The Probit model allows us to measure the parameter of EXP net of (quasi-)time invariant traits such as education, country of origin, or years of schooling in Germany. Second (II), we test the robustness of our EXP estimates with different specifications of EXP and age respectively. The latter seems appropriate, since age is closely associated with experience. Specifically, we run models (a) without the squared term of age, (b) with aggregated experience instead of distinguishing between part-time and full-time EXP and (c) with age categories instead of age as a metric variable. We test the sensitivity of our EXP estimates against different specifications of EXP and age in both models as well as in all three subsamples.

4.4 | Simulated Employment Profiles

After having checked the robustness of our EXP estimators against omitted variable bias, we compute marginal effects at representative values to trace employment profiles

for hypothetical migrant mothers, migrant fathers and non-migrant mothers. In a first step, we calculate marginal effects for specified values of experience (and for subgroup differentiations, specified values of education and country of origin, respectively). We thereby use parameter estimates for experience from equation (1), augmented by their quadratic terms, while holding all other covariates at observed values for each observation. Second, we compute the average effect over all observations. Regarding the first step, we use the EXP estimates from the FE regressions. Referring to the estimates retrieved from the Probit regressions, we graph education- and source-country-specific employment profiles respectively.

5 | Results

5.1 | Main results

For the full results from the FE estimations for migrant mothers, migrant fathers and non-migrant mothers, please see **Table A2** in the Appendix**. Table A3** in the Appendix depict the predicted employment probabilityprobability at different years of work experience. In what follows, we present a sample comparison focusing on the core variables in this investigation, domestic and foreign full-time (FT) and part-time (PT) work EXP. **Table 3** depicts the FE estimation results for the uncontrolled and the fully controlled regressions of employment probabilityprobability. Migrant mothers are compared with non-migrant mothers and migrant fathers.

Table 3: Collapsed results for EXP, based on the Linear Probability Model, uncontrolled model (eq. (3) vs. controlled model (eq. (1), by sample groups.

		Migrant mothers		Migrant fathers		Non-migrant mothers	
		FE/OLS	FE/OLS	FE/OLS	FE/OLS	FE/OLS	FE/OLS
		Uncontrolled	Fully controlled	Uncontrolled	Fully controlled	Uncontrolled	Fully controlled
		(eq. (3))	(eq (1))	(eq. (3))	(eq (1))	(eq. (3))	(eq (1))
domestic	FT linear	-0.0538*	0.0086	0.00481	0.041	-0.00206	0.0161***
	FT squared	0.000894	0.00002	-0.000447	-0.000225	-0.00072***	-0.000165*
	PT linear	0.115***	0.052***	0.0233	0.0406	0.0513***	0.0225***
	PT squared	-0.00557***	-0.0019**	-0.00173	0.0017	-0.00291***	-0.0005***
Foreign	FT linear	0.0106*	-0.0211***	0.00115	0.0266***		
	FT squared	-0.000546	0.000006	-0.00033***	-0.00019		
	PT linear	-0.0266*	-0.0325**	-0.0211*	0.0563***		
	PT squared	0.00208	0.00137	0.000183	-0.00114		
Within R^2		0.0655	0.385	0.0068	0.23	0.0954	0.518
Overall R^2		0.013	0.279	0.0009	0.164	0.0092	0.588
Between R^2		0.0106	0.294	0.0012	0.19	0	0.664
N		1,745	1,745	1,383	1,383	40,904	40,904

Sources: SOEP v35; own calculations; *p < .10; **p < .05; ***p < .01

Starting with migrant mothers, domestic FT EXP does not show sufficiently significant associations (at the 5% level at minimum) with employment probabilityprobability, neither in the uncontrolled nor in the controlled model. Our interpretation would be that unobserved traits, which trigger maternal selection into full-time work are absorbed by individual fixed effects. Furthermore, separate analyses indicate a strong correlation of domestic FT with job-related characteristics (occupation and sector).[10] In contrast, one year of additional domestic PT EXP increases employment probabilityprobability by 5.2 percentage points and due to the negative quadratic term, the marginal returns decrease with increasing experience. Foreign FT and PT EXP show negative signs, which means

[10] This is shown when, starting with the uncontrolled model (eq (3)), covariates are successively added to the model until the fully controlled model (eq. (1) is reached. These results are available upon request.

that mothers who were closely attached to the source country's labour market are less likely to be employed after immigration. As migration comes with a higher career cost for those women compared to their counterparts with loose job market ties, traditional gender roles could have placed the former in the tied mover position. Consequently, they could have used the occasion of migration and the first years after arrival to pursue their family goals, such as family formation or extension.

For migrant fathers, neither domestic FT nor domestic PT EXP are significantly related to employment probabilityprobability in Germany. This holds true for both the uncontrolled and the controlled model. However, in the controlled model, foreign EXP significantly increases domestic employment probability, with an even higher leverage of one additional year of PT EXP (5.6 pp) compared to FT EXP (2.7 pp), referring to the linear term. Here too, returns decrease with increasing EXP. With respect to non-migrant mothers, both domestic FT and PT EXP show significantly positive associations with employment probability. The effect size is higher for PT EXP (+2.3 pp in the fully controlled model) than for FT EXP (+1.6 pp).

Regarding our research hypotheses and referring to the full model, H1-COUNTRY is supported by the data for PT only, due to the insignificance of domestic FT EXP. For the same reason, H2-NATIVITY is supported for domestic PT experience only. Since domestic FT is insignificant for both genders, and since foreign PT and FT EXP is more beneficial for fathers, our data does not support H3c-GENDER and H3a-GENDER. Yet, H3b-GENDER, referring to domestic PT EXP, is confirmed. H4-INTENSITY gains no support from our data. Throughout models and subgroups, PT EXP exhibits higher effect sizes and significance levels than FT EXP. In sum, hypotheses H1-3 gain support for PT experience only and H4 is rejected by our data.[11]

Oster-Test

We present Oster bounds for our main analyses in **Table 4**. The table, which is structured following Hener et al. (2015) and Bryan et al. (2019), depicts the results from the

[11] The controls mostly perform as expected, but some are worth noting. The dummy "some schooling years in Germany" is insignificant for both genders in the Probit regressions and for mothers in the OLS regressions. However, it is highly significant for fathers, boosting their current employment likelihood by 17.6%. In both models, the total fertility rate is not significantly associated with current employment for either gender at the 5% or 1% level. For migrant mothers, the same holds true for the female labor force participation rate in the source country. However, the latter is positively associated to migrant fathers' employment, according to the auxiliary OLS regression. Both variables are insignificant in the Probit models for all three subgroups.

Oster (2017) method and the Altonji et al. (2005) approach.[12] It shows the results for the two treatment effects, domestic FT and PT work EXP, respectively, for the main sample as well as for the control groups of migrant fathers and non-migrant mothers.[13]

Column (1) shows the estimated treatment effects for the baseline model (with standard errors in parentheses and the R-squared in brackets). The baseline effect refers to the uncontrolled regression as denoted in equation (3) in the empirical section. The controlled effect (Column 2) refers to the full model as denoted in equation (1) in the empirical section.

Column (3) reports the identified set [$\tilde{\beta}$, β^* (min{1.3 $\tilde{R}$, 1}, 1)], which excludes zero for the linear terms of both treatments FT and PT and in all considered samples, as column (4) shows. Concerning quadratic terms, exceptions refer to domestic FT EXP for migrant mothers and domestic PT EXP for non-migrant mothers, but in all three cases, the bias-adjusted betas of squared terms are very small, much smaller than the betas of the baseline and the controlled effect. Moreover, as we refrained from interpreting FT EXP for migrant mothers due to lacking significance in the regressions, we can leave the first exception aside. The bias-adjusted coefficients (β^*) are smaller in magnitude than the controlled effect ($\tilde{\beta}$), but the beta change when switching from the controlled to the bias-adjusted effect is far smaller than the change related to a switch from the baseline to the controlled effect. This, together with a notable increase in R-squared in all three samples, indicates that selection in observables is more important than selection into unobservables, a notion that gains further support by the computed identified set, at least for the linear terms. Finally, as can be seen in column (5), the bounds of the identified set are within the confidence intervals of the estimated controlled effect $\tilde{\beta}$ in all cases except domestic PT EXP of non-migrant mothers. For them, this points to a wider "true" confidence interval of a bias-adjusted beta, thus a smaller bias-adjusted beta, compared to the one derived from the controlled regression, indicating a flatter employment curve for non-migrant mothers.

In sum, for the samples of migrant mothers and migrant fathers, there is little concern in these FE models that omitted variable bias could be at play to an extent that undermines the validity of the EXP parameter retrieved from the fully controlled FE model. The indication for non-migrant mothers points to an overstatement of the nativity gradient of actual maternal experience and an understatement of the "true" assimilation effect of actual EXP in the host country.

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[12] The estimates were computed using the Stata module psacalc provided by Oster (2014).

[13] As foreign work EXP refers to the pre-survey period from the perspective of our migrant sample respondents, it cannot be subject to correlation with unobserved time-varying factors during survey years. For non-migrant mothers, foreign EXP does not apply anyway. This is why we do not include foreign EXP into our Oster bounds test procedure.

Table 4: Robustness to omitted variable bias

EXP	Baseline Effect			Controlled Effect			Identified Set	Exclude Zero?	Within Conf. Interval
	beta	(SE)	[R^2]	beta	(SE)	[R^2]			
Migrant mothers									
Domestic FT, linear	-0.0538*	(0.02880)	[0.065497]	0.00862	-0.0309	[0.385129]	[0.00862 , 0.031059]	YES	YES
Domestic FT, squared	0.000894	(0.00120)	[0.065497]	0.0000193	-0.0016	[0.385129]	[-0.000256 , 0.0000193]	NO	YES
Domestic PT, linear	0.115***	(0.02450)	[0.065497]	0.0522***	-0.0188	[0.385129]	[0.029943 , 0.0522]	YES	YES
Domestic PT, squared	-0.00557***	(0.00130)	[0.065497]	-0.00189**	-0.0009	[0.385129]	[-0.00189 , -0.000552]	YES	YES
Migrant fathers									
Domestic FT, linear	0.0048	(0.03340)	[0.006766]	0.041	-0.0309	[0.229892]	[0.041019 , 0.052212]	YES	YES
Domestic FT, squared	-0.0004	(0.00050)	[0.006766]	-0.0002	-0.0005	[0.229892]	[-0.000225 , -0.000156]	YES	YES
Domestic PT, linear	0.0233	(0.05170)	[0.006766]	0.0406	-0.0496	[0.229892]	[0.04064 , 0.045992]	YES	YES
Domestic PT, squared	-0.0017	(0.00950)	[0.006766]	0.0017	-0.0072	[0.229892]	[0.001695 , 0.002754]	YES	YES
Non-migrant mothers									
Domestic FT, linear	-0.00206	(0.00490)	[0.095424]	0.0161***	-0.0035	[0.51828]	[0.01608 , 0.022751]	YES	YES
Domestic FT, squared	-0.000716***	(0.00010)	[0.095424]	-0.000165*	-0.0001	[0.51828]	[-0.000165 , 0.000038]	NO	YES
Domestic PT, linear	0.0513***	(0.00360)	[0.095424]	0.0225***	-0.0024	[0.51828]	[0.011874 , 0.022471]	YES	NO
Domestic PT, squared	-0.00291***	(0.00010)	[0.095424]	-0.000504***	-0.0001	[0.51828]	[-0.000504 , 0.000382]	NO	NO

Sources: SOEP v35; own calculations

5.2 | Robustness checks

We first discuss the EXP parameters of the controlled Probit models estimated for our three subgroups. **Table A4 in the Appendix** depicts the full results of marginal effects. In the Probit models, domestic FT experience is significantly positively linked to employment probability. Apparently, in the between-person perspective, a full-time work history is a significant predictor for current FT employment. Regarding domestic part-time EXP, the parameter is +5.2 pp for migrant mothers, which equals the value in the FE estimation (+5.2pp). For migrant fathers, the parameter is again insignificant, and for non-migrant mothers, it is slightly lower (+1.4 pp instead of +2.3 pp), but again highly significant. Foreign experience is insignificant for migrant mothers and fathers, irrespective of work intensity, in the Probit models. In sum, the Probit models closely replicate the employment returns of domestic part-time work retrieved from the FE models. The deviating results concerning full-time work supposedly hinge on the model assumption that unobserved traits correlating with the outcome variable do not exist.

Regarding the robustness of our EXP estimates against alternative variable specifications of EXP and age, **Table A5 and A6 in the Appendix** show the results. With respect to the key variables of domestic and foreign EXP, and regarding migrant and non-migrant mothers, the results are virtually the same in the specifications without the squared term of age and age groups instead of metric age, respectively. Using aggregate instead of PT and FT EXP yields an EXP parameter that lies in between that of full-time and part-time EXP. This holds for both models with respect to migrant and non-migrant mothers and for the Probit model regarding migrant fathers. However, according to the FE model, migrant fathers exhibit higher returns to domestic aggregate compared to FT and PT EXP respectively. Therefore, the gender hypothesis has to be rejected, as was already the case for FT EXP (H3a) in the main model. Further, although using age groups instead of metric age goes hand in hand with a much smaller effect size of foreign FT EXP for fathers, the returns are still higher for migrant fathers than for migrant mothers, replicating the rejection of the gender hypothesis with respect to foreign EXP (H3c) from the main model. In sum, the robustness checks testing the sensitivity of the EXP variables against alternative specifications support the results derived from the main model.

5.3 | Simulated employment profiles

Simulations for the full sample of migrant mothers based on the FE estimations

Figure A1 in the Appendix charts the employment paths of migrant mothers based on the FE estimation results. Non-migrant mothers serve as the benchmark. The figure

shows how employment probability in year *t* rises with accumulated years of domestic PT EXP in year *t-1*. As this variable was insignificant for migrant fathers, we do not present simulations for migrant fathers, and, for the same reason, we refrain from simulating marginal effects of full-time. It can be seen that migrant mothers continuously approach non-migrant mothers' employment probability over time. Starting with a 15 pp. difference, the two groups end up with a 2 pp. difference after 10 years in the German labour market (82 vs 80%).

Simulations by educational group based on the Probit estimations

Figures **A2 and A3 in the Appendix** rely on the marginal effects retrieved from the Probit estimations and depict the education- and source country-specific employment, respectively. Marginal effects of domestic PT EXP are quite similar for years 0-10 in the FE and the Probit estimation (Tables A4, A5). As Figure A2 shows, employment curves are steeper for migrant mothers compared to their equally educated non-migrant counterparts.[14] Low education migrant mothers, though starting from a lower level, pass their native counterparts and end up with 68.2% after ten years which is 8.7pp higher than the former. Medium education migrants, starting with a 15.5 pp lower employment probability compared to their native counterparts, end up at the same level (78.4%, compared to 79.1% for non-migrant mothers). For migrant mothers with tertiary education, the employment gap decreases from 26.7pp (73.0-46.3) at 0 years of EXP to 9.3 pp (84.9-75.6) after 10 years. Different from graduate native mothers, graduate migrant mothers are less likely to be employed than their medium education counterparts according to the Probit model. Migrant mothers with tertiary education could face employment obstacles such as overeducation (Andersson Joona et al. 2014; Boll et al. 2016), or they could deliberately refrain from employment for the sake of family formation or extension. This interpretation would accord with the FE estimation result that women who have worked many years in the source country before migration are less likely to be employed in Germany. However, note that the auxiliary OLS regression of individual FE does not support a significant education gradient between medium and high education migrant mothers. But even if the latter featured the employment profile of their medium education counterparts, they would continuously approach high education native mothers' employment probability with increasing domestic PT experience.

14 Further, we tested in separate analyses whether the marginal effects derived from the Probit model stay the same when interaction terms of EXP with educational groups are incorporated. For medium and high education mothers with and without migration background, marginal effects were virtually the same. For low education mothers, the EXP range was lower (43-56%) in the interaction model. Thus, the employment growth of low education migrant mothers seems somewhat overrated in the model without interaction effects illustrated in Figure A2. Results of the interaction models are available upon request.

Simulations by country of origin based on the Probit estimations

As can be seen from **Figure A3 in the Appendix**, accumulating domestic PT experience benefits migrant women's employment experience irrespective of the source country, but at different levels. Mothers who immigrated from EU28-countries manage to increase their employment probability by almost 28 pp. after ten years in the German labour market, and PT experience returns are similar for mothers originating from CIS countries. Starting at 49.1% (55.0%), mothers from the EU28 (from former CIS) end up with a 76.7% (84.5%) employment probability after 10 years.[15]

6 | Conclusion

In this paper, we explored the role of actual work experience for migrant women's current employment probability in Germany. To this end, we exploited German panel data including a rich sample of migration data. Our findings show that domestic part-time experience significantly increases migrant mothers' employment probability in Germany. The results from our main model accounting for individual FE can be considered robust against unobserved time-varying FE. Since supply-sided unobserved effects such as preferences, (dis)abilities and skills are addressed by the model, this could hint at demand-side mechanisms. Continuous (part-time) work could help migrant mothers to set productivity signals and thereby decrease information deficits or prejudices on the side of employers. All in all, our findings point to path dependency as a relevant factor in the context of labour market integration. This highlights the importance of information asymmetries and the respective role of productivity signals. The take-away from our study is that, in the case of migrant mothers, training-on-the-job is important to initiating a self-perpetuating process of solid integration. Policies should be designed in such ways that they help women to "get on the right track", i.e. boosting language acquisition and the recognition of qualifications in combination with further training as well as a continued expansion of institutional childcare.

The downside of our data set's rich household and migration biography information lies with rather low observation numbers and short observation periods. Therefore, we were unable to adequately address the fact that the share of migrants in the working

[15] Again, in separate analyses a Probit model with interactions of domestic PT EXP and country of origin has been carried out. The results are available from the authors upon request. The interaction model provides virtually the same values for migrant mothers who have immigrated from EU28- or former CIS-states. For mothers originating from South-Eastern European Countries and the rest of the world, employment profiles are flatter, while the curve is much steeper for those who came from Arab/Muslim states, The latter named three country groups are the ones with the lowest sample shares in the migrant mother sample. Thus, the profiles shown in Figure A3 for ROW, South-Eastern Europe and Arab/Muslim states have to be interpreted with caution.

population notably varies across occupations (Palencia-Esteban and del Río 2020), with migrants being underrepresented in certain jobs such as teaching in general schools and law enforcement agencies, whereas being overrepresented in the cleaning industry and in nursing homes (Federal Statistical Office 2020a). These investigations will have to be left for future research.

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Table A1: Descriptive statistics

	Migrant mothers				Migrant fathers				Non-migrant mothers			
	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
Dummy: employed	0.5512894	0.497505	0	1	0.8806941	0.3242653	0	1	0.7373362	0.4400867	0	1
Work experience in Germany (full-time)	2.153467	3.380508	0	19.3	7.970571	5.837407	0	27	7.840759	6.110954	0	41.7
Work experience in Germany (full-time), squared	16.0587	42.66673	0	372.49	97.58069	120.6057	0	729	98.82035	141.9989	0	1738.89
Work experience in Germany (part-time)	2.11702	3.133187	0	20	0.3983369	1.138431	0	8.799	5.263167	5.151714	0	34.6
Work experience in Germany (part-time), squared	14.29301	39.88737	0	400	1.45376	6.515781	0	77.439	54.24044	92.40533	0	1197.16
Work experience before migration (full-time)	4.56894	5.199255	0	23	7.951265	6.89285	0	37	0	0	0	0
Work experience before migration (full-time), squared	47.89198	84.41625	0	529	110.6997	167.2544	0	1369	0	0	0	0
Work experience before migration (part-time)	0.4982808	1.951093	0	16	0.3239335	1.611818	0	17	0	0	0	0
Work experience before migration (part-time), squared	4.052865	21.98178	0	256	2.701012	19.20074	0	289	0	0	0	0
Dummy: married	0.8240688	0.3808708	0	1	0.9088937	0.2878643	0	1	0.6719147	0.4695218	0	1
Current language proficiency (0=not at all,., 4=very good, 5=no migration backgr	2.870487	0.8735178	0	4	2.728127	0.8855554	0	4	5	0	5	5
Age	36.7639	6.284844	20	56	39.64281	7.101779	22	61	40.5831	6.891906	19	64
Age, squared	1391.061	469.5041	400	3136	1621.951	579.3789	484	3721	1694.485	557.7153	361	4096
Education												
low	0.165616	0.3718422	0	1	0.1778742	0.3825451	0	1	0.0636124	0.2440641	0	1
medium	0.4532951	0.4979566	0	1	0.5234996	0.4996281	0	1	0.6359769	0.481161	0	1
high	0.3810888	0.4857936	0	1	0.2986262	0.4578211	0	1	0.3004107	0.4584422	0	1
Dummy: Some schooling years in Germany	0.086533	0.28123	0	1	0.0310918	0.1736287	0	1				

Table A1: Descriptive statistics (continued)

	Migrant mothers				Migrant fathers				Non-migrant mothers			
	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
Country of origin												
EU28	0.5787966	0.4938936	0	1	0.5806218	0.4936358	0	1				
South East Europe	0.060745	0.2389304	0	1	0.0968908	0.295916	0	1				
Former CIS	0.2372493	0.4255183	0	1	0.2386117	0.4263891	0	1				
Arab/Muslim states	0.0567335	0.231399	0	1	0.0455531	0.2085893	0	1				
Rest of the World	0.0664756	0.2491831	0	1	0.0383225	0.1920431	0	1				
Year of immigration	2006.555	5.337305	1991	2015	2005.18	6.280248	1990	2014				
Total fertility rate in country of origin in year of migration	1.708942	0.7348134	1.085	7.473	1.707574	0.7292557	1.11	7.473				
Female labor force particiation rate in country of origin in year of migration	47.60659	11.06391	8.64	80.13	47.40679	11.18679	9.31	72.81				
Dummy: no further direct migration background in the household	0.2911175	0.4544078	0	1	0.1720897	0.3775949	0	1	0.9694406	0.1721227	0	1
Dummy: no further indirect migration background in the household	0.8452722	0.3617487	0	1	0.8496023	0.3575901	0	1	0.9747946	0.1567503	0	1
Household type (1=single parent)	0.0968481	0.2958356	0	1	0.0036153	0.0600405	0	1	0.2200274	0.4142699	0	1
Other household income	42225.34	46222.3	0	906396	42085.78	31448.71	0	332000	54532.21	47293.1	0	1409654
Number of children aged 0-1 in household	0.1627507	0.3754041	0	2	0.1612437	0.3795064	0	2	0.0916047	0.2954213	0	3
Number of children aged 2-4 in household	0.3810888	0.5394824	0	3	0.3557484	0.5277891	0	3	0.2672355	0.4920672	0	3
Number of children aged 5-7 in household	0.3553009	0.5288215	0	2	0.352133	0.529527	0	3	0.3135635	0.5222065	0	4
Number of children aged 8-12 in household	0.4412607	0.619924	0	3	0.4844541	0.6802016	0	3	0.5672061	0.7005373	0	4
Number of children aged 13-17 in household	0.3340974	0.5876311	0	3	0.4121475	0.6303216	0	3	0.6134363	0.7731728	0	4
Number of observations	1745				1383				40904			
Number of persons	491				385				7077			

Sources: SOEP v35; own calculations

Table A2: Full results from FE estimations

	Migrant mothers		Migrant fathers		Non-migrant mothers	
Work experience in Germany (full-time)	0.00862	(0.0314)	0.041	(0.0309)	0.0161***	(0.0036)
Work experience in Germany (full-time), squared	1.93E-05	(0.0017)	-0.000225	(0.0005)	-0.000165*	(0.0001)
Work experience in Germany (part-time)	0.0522***	(0.0188)	0.0406	(0.0494)	0.0225***	(0.0024)
Work experience in Germany (part-time), squared	-0.00189**	(0.0009)	0.0017	(0.0071)	-0.000504***	(0.0001)
Work experience before migration (full-time)	-0.0211***	(0.0061)	0.0266***	(0.0034)		
Work experience before migration (full-time), squared	6.14E-06	(0.0004)	-0.00019	(0.0001)		
Work experience before migration (part-time)	-0.0325**	(0.0162)	0.0563***	(0.0136)		
Work experience before migration (part-time), squared	0.00137	(0.0014)	-0.00114	(0.0012)		
Dummy: married	-0.0145	(0.0513)	0.0692	(0.0722)	-0.00857	(0.0097)
Current language proficiency (0=not at all,., 4=very good, 5=no migration backgr	0.00792	(0.0215)	7.68E-05	(0.0201)		
Age	-0.0791**	(0.0400)	-0.036	(0.0505)	-0.0533***	(0.0059)
Age, squared	0.00126**	(0.0005)	8.59E-05	(0.0006)	0.000277***	(0.0001)
Education = 1, low	-0.0653**	(0.0322)	-0.0972***	(0.0247)	-0.0732***	(0.0040)
Education = 3, high	0.0224	(0.0250)	0.128***	(0.0207)	0.0890***	(0.0022)
Dummy: Some schooling years in Germany	0.0599	(0.0431)	0.176***	(0.0553)		
Country of origin = 2, South East Europe	-0.0697	(0.0528)	0.0407	(0.0400)		
Country of origin = 3, Former CIS	0.0938***	(0.0335)	-0.0535*	(0.0268)		
Country of origin = 4, Arab/Muslim states	-0.0117	(0.0702)	0.140**	(0.0680)		
Country of origin = 5, Rest of the World	0.0545	(0.0500)	-0.0492	(0.0539)		

Table A2: Full results from FE estimations (continued)

	Migrant mothers		Migrant fathers		Non-migrant mothers	
Year of immigration	0.00903***	(0.0023)	0.00526***	(0.0015)		
Total fertility rate in country of origin in year of migration	-0.0105	(0.0197)	-0.0368*	(0.0183)		
Female labor force particiation rate in country of origin in year of migration	-0.00254*	(0.0015)	0.00329**	(0.0013)		
Dummy: no further direct migration background in the household	0.0855	(0.1200)	0.104	(0.1170)	0.0139	(0.0354)
Dummy: no further indirect migration background in the household	0.179	(0.1170)			0.00798	(0.0561)
Household type (1=single parent)	-0.176	(0.1120)	0.0255	(0.1330)	0.00583	(0.0106)
Other household income	-2.25E-07	(0.0000)	7.54E-07	(0.0000)	1.72e-07***	(0.0000)
Number of children aged 0-1 in household	-0.251***	(0.0460)	-0.0472	(0.0376)	-0.337***	(0.0113)
Number of children aged 2-4 in household	-0.028	(0.0413)	-0.0591	(0.0378)	-0.0911***	(0.0074)
Number of children aged 5-7 in household	-0.03	(0.0391)	-0.0577	(0.0392)	-0.0588***	(0.0065)
Number of children aged 8-12 in household	-0.0191	(0.0463)	-0.0394	(0.0388)	-0.0355***	(0.0055)
Number of children aged 13-17 in household	-0.00516	(0.0477)	-0.000194	(0.0339)	-0.0150***	(0.0047)
Constant	1.678**	(0.7910)	1.697	(1.0740)	2.514***	(0.1470)
Observations	1,745		1,383		40,904	
within R-squared	0.385		0.23		0.518	
overall R-squared	0.279		0.164		0.588	
between R-squared	0.294		0.19		0.664	
Year FE	YES		YES		YES	
Federal State FE	YES		YES		YES	
Sector	YES		YES		YES	
Job	YES		YES		YES	

Sources: SOEP v35; own calculations; robust standard errors in parentheses; *p < .10; **p < .05; ***p < .01

Table A3: Predicted employment probability from FE estimations

	Migrant mothers		Migrant fathers		Non-migrant mothers	
at ... years of work experience	full-time in Germany	part-time in Germany	full-time in Germany	part-time in Germany	full-time in Germany	part-time in Germany
0	0.532	0.468	0.576	0.862	0.628	0.646
1	0.541	0.518	0.616	0.904	0.643	0.668
2	0.55	0.565	0.657	0.95	0.659	0.689
3	0.558	0.607	0.697	0.999	0.674	0.709
4	0.567	0.646	0.736	1.052	0.689	0.728
5	0.576	0.682	0.775	1.108	0.704	0.746
6	0.585	0.713	0.814	1.167	0.718	0.763
7	0.594	0.741	0.852	1.23	0.732	0.779
8	0.603	0.765	0.889	1.296	0.746	0.794
9	0.612	0.785	0.927	1.365	0.759	0.808
10	0.621	0.801	0.963	1.438	0.772	0.821
N	1,745	1,745	1,383	1,383	40,904	40,904

Table A4: Robustness check 1 – Probit estimations

	Migrant mothers		Migrant fathers		Non-migrant mothers	
Work experience in Germany (full-time)	0.0404***	(0.0089)	0.0136***	(0.0052)	0.00893***	(0.0009)
Work experience in Germany (full-time), squared	-0.00118*	(0.0007)	3.60E-06	(0.0002)	-4.93E-05	(0.0000)
Work experience in Germany (part-time)	0.0519***	(0.0086)	0.0285	(0.0182)	0.0142***	(0.0009)
Work experience in Germany (part-time), squared	-0.00235***	(0.0006)	-0.000816	(0.0034)	-0.000299***	(0.0001)
Work experience before migration (full-time)	-0.00527	(0.0059)	0.000727	(0.0044)		
Work experience before migration (full-time), squared	-7.74E-06	(0.0003)	-4.13E-05	(0.0001)		
Work experience before migration (part-time)	-0.0047	(0.0125)	0.00533	(0.0125)		
Work experience before migration (part-time), squared	0.000436	(0.0010)	-0.000254	(0.0008)		
Dummy: married	-0.0229	(0.0359)	0.00941	(0.0261)	-0.0128**	(0.0053)
Current language proficiency (0=not at all,., 4=very good, 5=no migration backgr	0.0309**	(0.0131)	0.0128	(0.0096)		
Age	0.0336**	(0.0151)	0.0211*	(0.0125)	-0.00864***	(0.0024)
Age, squared	-0.000397*	(0.0002)	-0.000281*	(0.0002)	1.83E-05	(0.0000)
Education = 1, low	-0.01	(0.0303)	-0.0324	(0.0293)	-0.0331***	(0.0086)
Education = 3, high	-0.0526**	(0.0266)	-0.00666	(0.0230)	0.0267***	(0.0048)
Dummy: Some schooling years in Germany	0.0624	(0.0383)	0.02	(0.0783)		
Country of origin = 2, South East Europe	-0.0328	(0.0485)	-0.00156	(0.0322)		
Country of origin = 3, Former CIS	0.0182	(0.0316)	-0.0541*	(0.0305)		
Country of origin = 4, Arab/Muslim states	-0.0558	(0.0665)	0.0419	(0.0299)		
Country of origin = 5, Rest of the World	0.0465	(0.0451)	-0.00787	(0.0529)		

Table A4: Robustness check 1 – Probit estimations (continued)

	Migrant mothers		Migrant fathers		Non-migrant mothers	
Year of immigration	0.00635*	(0.0038)	0.00957**	(0.0047)		
Total fertility rate in country of origin in year of migration	0.0108	(0.0208)	0.0148	(0.0112)		
Female labor force particiation rate in country of origin in year of migration	0.0495	(0.0014)	-0.0341	(0.0011)		
Dummy: no further direct migration background in the household	-0.149**	(0.0506)	0.267***	(0.0495)	-0.00345	(0.0091)
Dummy: no further indirect migration background in the household	3.42E-07	(0.0539)	1.09E-06	(0.0522)	-0.0108	(0.0119)
Household type (1=single parent)	-0.299***	(0.0631)	-0.0214	(0.0833)	-0.0251***	(0.0062)
Other household income	-0.0707***	(0.0000)	-0.0607***	(0.0000)	2.17e-07***	(0.0000)
Number of children aged 0-1 in household	-0.0198	(0.0281)	-0.0137	(0.0191)	-0.182***	(0.0055)
Number of children aged 2-4 in household	-0.0154	(0.0203)	-0.0136	(0.0147)	-0.0388***	(0.0035)
Number of children aged 5-7 in household	-0.00705	(0.0177)	-0.0388***	(0.0134)	-0.0225***	(0.0030)
Number of children aged 8-12 in household	-0.024	(0.0178)	-0.0316***	(0.0126)	-0.0115***	(0.0024)
Number of children aged 13-17 in household	-0.000817	(0.0214)	0.00229**	(0.0115)	-0.000598	(0.0027)
Observations	1,745		1,383		40,904	
Year FE	YES		YES		YES	
Federal State FE	YES		YES		YES	
Sector	YES		YES		YES	
Job	YES		YES		YES	

Sources: SOEP v35; own calculations; robust standard errors in parentheses; *p < .10; **p < .05; ***p < .01

Table A5: Further robustness checks – alternative variable specifications (FE estimations)

	Migrant mothers				Migrant fathers				Non-migrant mothers			
Variable specification	main model	without age squared	age groups	total experience	main model	without age squared	age groups	total experience	main model	without age squared	age groups	total experience
Work experience in Germany (full-time)	0.0086	0.00064	-0.0017		0.041	0.0398	0.0484		0.016***	0.012***	0.014***	
Work experience in Germany (full-time), squared	1.93E-05	0.00078	0.00077		-0.0002	-0.00018	-0.0004		-0.00017*	2.44E-06	-8.95E-05	
Work experience in Germany (part-time)	0.0522***	0.053***	0.052***		0.041	0.0403	0.039		0.023***	0.021***	0.022***	
Work experience in Germany (part-time), squared	-0.0019**	-0.0016*	-0.0017**		0.0017	0.0017	0.0026		-0.0005***	-0.0004***	-0.0005***	
Total experience in Germany				0.049***				0.055**				0.0219***
Total experience in Germany, squared				-0.0014**				-0.0007				-0.000271***
Work experience before migration (full-time)	-0.021***	-0.028***	-0.023***		0.027***	0.026***	0.0081**					
Work experience before migration (full-time), squared	6.14E-06	0.0005	0.00057		-0.0002	-0.00018	-0.0003**					
Work experience before migration (part-time)	-0.0325**	-0.0359**	-0.033**		0.056***	0.054***	0.057***					
Work experience before migration (part-time), squared	0.0014	0.0014	0.0017		-0.0011	-0.00096	-0.0029***					
Total experience before migration				-0.021***				0.029***				
Total experience before migration, squared				0.0001				-0.00015				

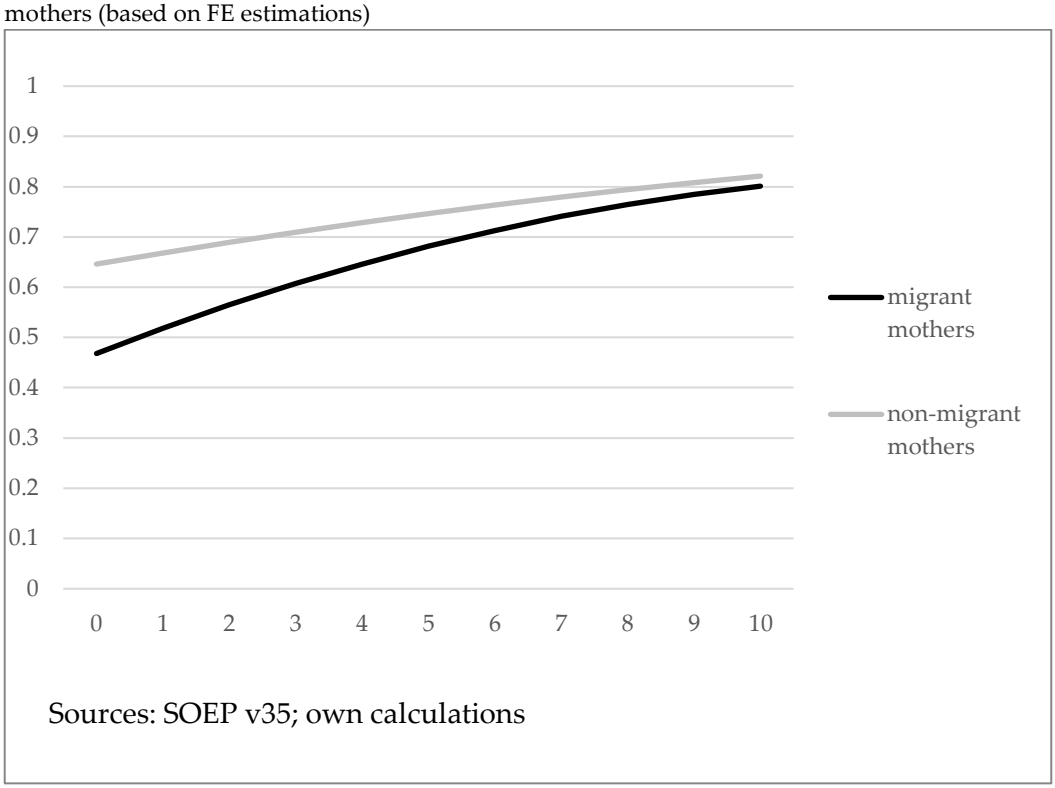
Sources: SOEP v35; own calculations; *p < .10; **p < .05; ***p < .01

Table A6: Further robustness checks – alternative variable specifications (Probit estimations)

	Migrant mothers				Migrant fathers				Non-migrant mothers			
Variable specification	main model	without age squared	age groups	total experience	main model	without age squared	age groups	total experience	main model	without age squared	age groups	total experience
Work experience in Germany (full-time)	0.04***	0.0426***	0.0418***		0.014***	0.0135***	0.015***		0.0089***	0.0085***	0.009***	
Work experience in Germany (full-time), squared	-0.0012*	-0.0013**	-0.0013*		3.60E-06	-2.26E-05	-9.68E-05		-4.93E-05	-4.72E-05	-4.42E-05	
Work experience in Germany (part-time)	0.052***	0.054***	0.053***		0.029	0.026	0.028		0.014***	0.014***	0.014***	
Work experience in Germany (part-time), squared	-0.002***	-0.0025***	-0.0025***		-0.0008	-0.0003	-0.0006		-0.0003***	-0.0003***	-0.0003***	
Total experience in Germany				0.0437***				0.0146***				0.0124***
Total experience in Germany, squared				-0.0013***				-6.17E-05				-0.00014***
Work experience before migration (full-time)	-0.0053	-0.0036	-0.0069		0.0007	0.004	0.003					
Work experience before migration (full-time), squared	-0.001	-0.0001	5.59E-05		-4.13E-05	-0.0001	-0.0002					
Work experience before migration (part-time)	-0.005	-0.004	-0.006		0.005	0.01	0.009					
Work experience before migration (part-time), squared	0.0004	0.0005	0.0005		-0.0003	-0.0007	-0.0007					
Total experience before migration				-0.0057				7.01E-05				
Total experience before migration, squared				3.18E-05				1.12E-05				

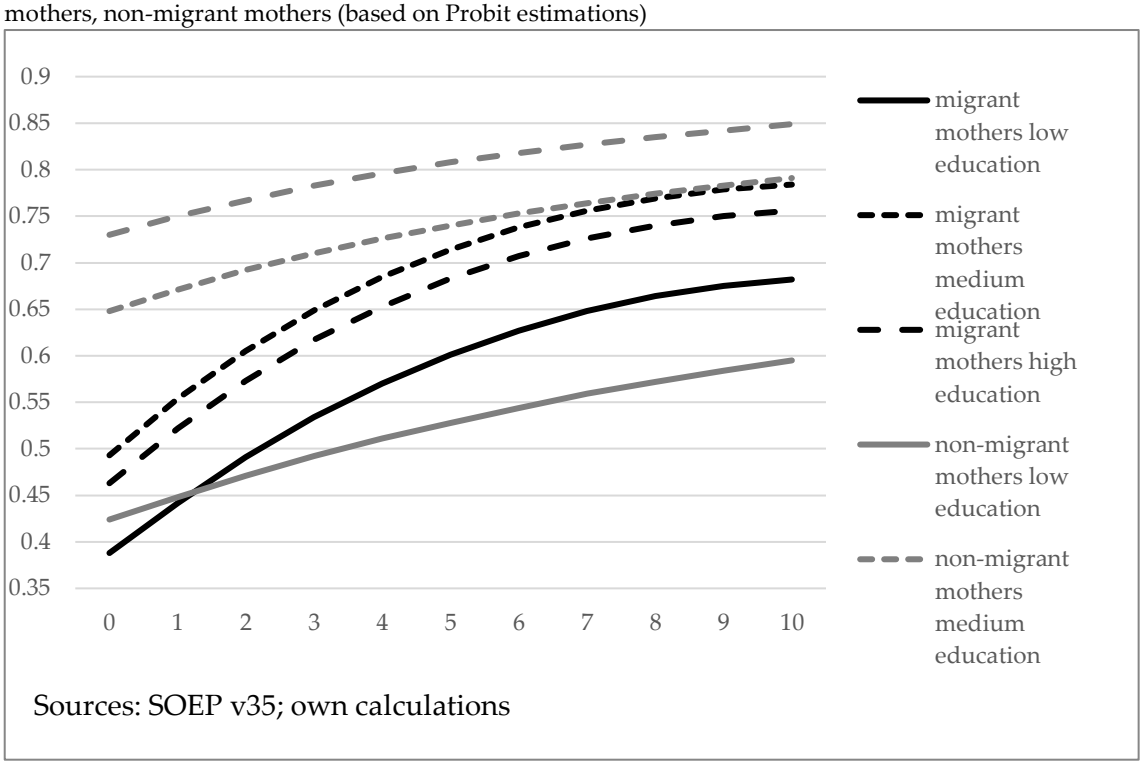
Sources: SOEP v35; own calculations; *p < .10; **p < .05; ***p < .01

Figure 1: Predicted employment probability by years of part-time experience: migrant mothers, non-migrant mothers (based on FE estimations)



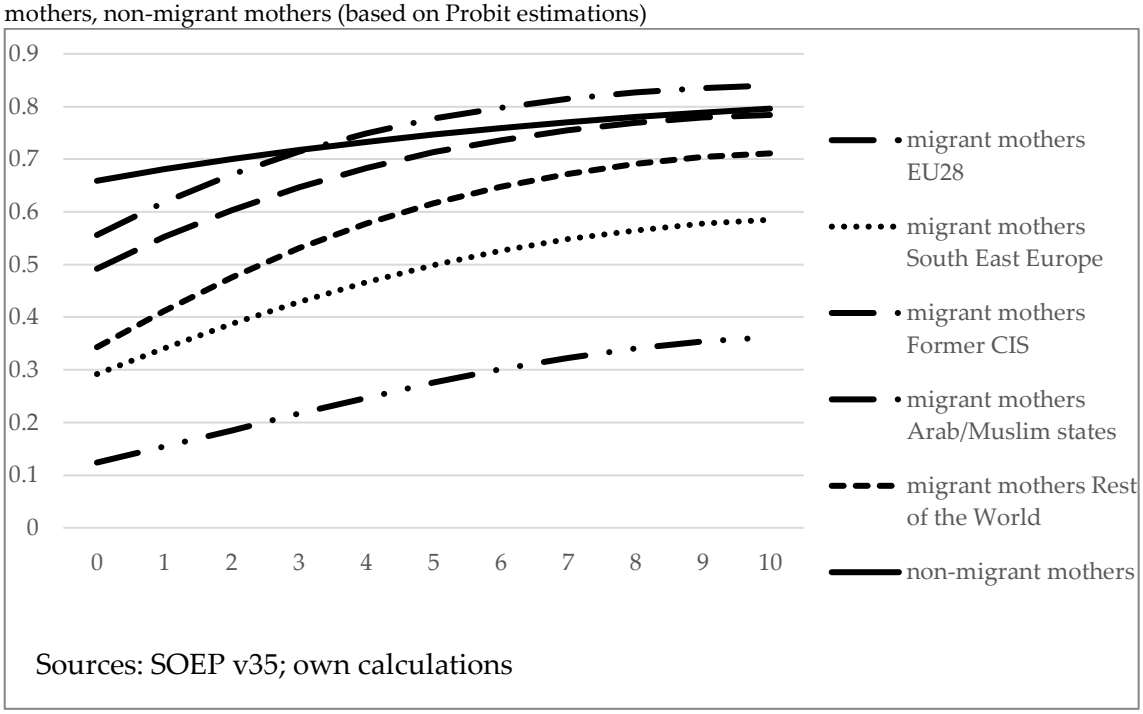
Sources: SOEP v35; own calculations

Figure 2: Predicted employment probability by years of part-time experience and level of education: migrant mothers, non-migrant mothers (based on Probit estimations)



Sources: SOEP v35; own calculations

Figure 3: Predicted employment probability by years of part-time experience and country of origin: migrant mothers, non-migrant mothers (based on Probit estimations)



Sources: SOEP v35; own calculations

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