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## Does culture trump money? Employment and childcare use of migrant and non-migrant mothers of pre-school children in Germany

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Hamburg Institute  
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Paper 187

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# Does Culture Trump Money? Employment and Childcare Use of Migrant and Non-Migrant Mothers of Pre-School Children in Germany

Christina Boll\*, Andreas Lagemann#

## Abstract

This study investigates the employment and childcare use behaviour of migrant and non-migrant mothers in Germany. We use the waves 2007-2015 of the German Socio-Economic Panel study (SOEP), including the migrant samples M1 and M2, to identify significant associations between migration background and employment probability, working hours, and childcare usage probability under control of human capital, household, milieu, and macro factors. We correct for self-selection in employment and potential endogeneity of childcare use. We do not find an additional contribution of a migrant background to mothers' use of childcare. However, among self-immigrated mothers with a youngest child aged 3 to 5, roots in Southeastern Europe are associated with lower childcare use. Further, a direct (indirect) migrant background, compared with no migrant background, is associated with a 6.3 % (5.9 %) lower probability of employment for mothers of youngest children under 3 years of age with otherwise identical maternal characteristics. For mothers of youngest children aged 3-5, the figure is 8.0 % (6.7 %). Mothers of youngest children under 3 years (aged 3-5 years) with roots in Arab and other Muslim countries have a 7.1 % (21.1 %) lower probability of employment. In addition, the likelihood of gained employment increases with the length of stay in Germany. There are no significant associations of the migration background with the (conditional) weekly working hours of mothers. In summary, it can be seen that, in addition to economic motives, cultural factors and basic orientations and values also shape mothers' everyday practices, as expressed in their employment behaviour and the use of state-subsidized childcare for their children.<sup>1</sup>

**Keywords:** maternal employment, hours of work, childcare, migration background, milieu, IV techniques, 2SLS, bivariate probit

**JEL Codes:** J220; J130; J610

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<sup>1</sup> A version in German language can be accessed here: [http://www.hwwi.org/fileadmin/hwwi/Publikationen/Publikationen\\_PDFs\\_2018/HWWI\\_ResearchPaper\\_188.pdf](http://www.hwwi.org/fileadmin/hwwi/Publikationen/Publikationen_PDFs_2018/HWWI_ResearchPaper_188.pdf)

# 1 Introduction

The relevance of a stronger integration of parents and in particular of mothers with a migrant background into the labour market exists both from the macroeconomic and the individual perspective. From a macroeconomic point of view, this group has a significant pool of skilled workers: 39 % of non-employed mothers with a migration background would like to resume work immediately or within the coming year, and a further 26 % in 2 to 5 years. A total of 652,000 of non-working mothers expressed the wish to return into employment within the next maximum five years (BMFSFJ 2017a, p. 36f.). As forecasts show, significant immigration may attenuate the decline in the labour force potential (Fuchs et al. 2016), but this will only help mitigating labour bottlenecks if migrants add to the workforce. The individual importance of labour market integration becomes particularly clear against the background of the risk of poverty. Based on a nationwide analysis of the Microcensus 2015, it can be seen that, compared with an at-risk-of-poverty rate of families without a migration background (13 %), migrant families are much more at risk with a rate of 29 % (BMFSFJ 2017a, p. 27).

A mother's decision for or against the use of state-subsidized childcare is, like her labour supply, an individual decision, which in turn has consequences for her family and society. The use of childcare can improve not only maternal employment opportunities (thereby mitigating earnings losses, cf. Boll 2011), but also children's development opportunities. As many studies show, attending institutional childcare is essential, especially for children from educationally deprived families and/or with non-German family language (e.g. Anders 2013, Anders et al. 2012, Ebert et al. 2013, Weinert/Ebert 2013). In addition, early childcare enrolment can positively impact personality traits in adolescence (Bach et al. 2018).

The international empirical literature on maternal employment and childcare use is abundant, and several studies have already been carried out on the basis of German data. However, the database on the migrant population in Germany has only been significantly improved in recent years with the migration and refugee samples of the German Socio-Economic Panel study (SOEP). To our knowledge, the present study is the first to make such comprehensive use of this unique database. The study examines which factors correlate with maternal employment and childcare use and how the relationship between these two behavioural aspects is structured.

The outline of the paper is as follows. Chapter 2 discusses the state of the literature. Chapter 3 presents the data and Chapter 4 the models and hypotheses. Chapter 5 illustrates the results and Chapter 6 concludes.

## 2 Literature

### **Migration background in the context of further confounders of maternal employment**

A key finding of labour market research is that women of foreign nationality have a lower participation rate than women of German nationality (Meister et al. 2017). At the same time,

however, it is known that foreign nationality masks a sizeable cross-country heterogeneity in terms of labour market attachment (e.g. Boll/Lagemann 2017). In addition to nationality, the migration background, as an indicator of a person's cultural background, is another relevant factor in this regard. Of the approximately 8 million families with children under the age of 18 living in Germany in 2015, over 2.5 million families (31 %) had a migration background (BMFSFJ 2017a, p. 9). The on average lower labour market integration of migrants compared to autochthonous people roots in different aspects of labour supply and demand (cf. Knize-Estrada 2018).

A high influx of immigrants within a short period of time can seldom be immediately and completely absorbed by the labour market, even when the economic conditions are favourable. In 2016 foreign women and men from non-European countries that have access to asylum as well as the EU accession states in 2007 (Bulgaria, Romania) recorded sharp increases in unemployment (Federal Employment Agency 2017, p. 17 f.). On the **labour demand side**, a mismatch between applicants' attained qualifications and job requirements is still a relevant factor. For example, the human capital of migrant workers may fit better with the demanded qualifications in the target country than that of persons who lack the economic motive to migrate. This may be particularly true for women, who immigrate more often as family members of (male) migrant workers (Chiswick 1999: 63). Results based on the IAB-SOEP migration sample show that among those that migrated from third countries by 31.12.2012 only about one tenth came to Germany for gainful employment or job search. By contrast, the proportion of persons who moved to Germany as citizens of EU or European Economic Area countries and were able to claim the free movement of workers was 46 % (Brücker et al. 2014b). Being female (Diener et al. 2013, Boll et al. 2016) and having a migration background (Boll et al. 2016) increases the risk of being overeducated. Refugees are particularly prone to educational mismatch: 34% of refugees who immigrated to Germany in the period from 2013 to 2016 are assessed to be overeducated, compared to 15% of the population without a migration background (Bürmann et al. 2018 based on SOEP 2016 data). Analyses of OECD data show that in Europe in 2014 the proportion of overeducated employed women with a university degree who have a refugee background is twice as high (40 %) as among their counterparts without a refugee background (Liebig/Tronstad 2018). Employer discrimination can also play a role, for example if recruitment procedures beyond competences and skills are also geared towards the "cultural matching" of applicants with human resource managers and/or firm staff (cf. Rivera 2012 on the significance of experience, leisure preferences, self-presentation etc.; see also Kaas/Manger 2011, van Tubergen et al. 2004, Granato 2003, Friedberg 2000, Chiswick 1979; 1999).

On the **labour supply side**, *time of immigration* is significant. The time span that the migrant already lives in the host country influences the chances of acquiring country-specific knowledge about culture, the legal and economic system, institutions and language and is therefore also decisive for labour market integration (Giesecke et al. 2017). The relative earnings position of migrants in the host society also improves with the length of stay (Grabka 2018).

In addition, *economic resources*, which are indicated by the person's age, qualifications and household context, also shape the labour market integration of migrants (Kogan 2011). According to human capital theory (Becker 1964, Ben-Porath 1967, Mincer 1974) formal education attained reflects general human capital, while work experience reflects firm-specific human capital. Both positively impact a person's income-generating capacity, which enhances her incentives and intensity to work and, in turn, also her likelihood of using external childcare. The link between the mother's household context and her employment behaviour can also be economically motivated. According to the Theory of Allocation of Time (Becker 1965), household productivity *c. p.* increases with household size as more individuals benefit from the provided services, with correspondingly decreasing incentives for the provider to assume a job instead. In return, employment incentives are increased by a higher age of the youngest child in the household, because in-home childcare can more easily be replaced by external care. Further, refugee women have far less well-developed social networks and suffer from health problems more often than refugee men. In addition, refugee women are more likely to get pregnant the year after arrival as they often postpone the realization of child desires prior to and during the flight due to the associated burdens and insecure future prospects. Together with the lower average education and labour market experience of female refugees, this explains why refugee women integrate more slowly into the labour markets of European destination countries than do their male counterparts: while male employment rates rise in the first 5-9 years after entry and stagnate thereafter, the figure for women is 10-15 years (Liebig/Tronstad 2018).

Previous research has shown that in particular female migrants are less able to exploit their educational and vocational qualifications on the labour market. For example, women's participation in the labour market greatly hinges on their region of origin, even when their family status, age and qualification are controlled for, which suggests *cultural influences* (Kogan 2011). The greater the cultural differences (operationalised in the region of origin), the more difficult it is to integrate the person into the culture of the host country (Kogan 2011). Differences in hours of work could be related to varying working cultures across regions of origin. Polavieja (2015) and van Tubergen et al. (2004) stress the importance of prevalent female employment patterns in the home country for the corresponding individual behaviour in the destination country. In particular, gender roles appear to be culturally determined.

As Guetto et al. (2015) show, the importance of religiosity in the country of origin has a decisive influence as a normative force: Countries of origin with a higher significance of religiosity go hand in hand with more traditional gender roles and more passive behaviour of women in the labour market. Cultural factors are also cited as crucial for the behaviour of women of Turkish origin in Berlin (Brenke 2008). Knize-Estrada (2018), based on the IAB-SOEP migration sample of 2013, also finds evidence for the high significance of traditional attitudes for migrant employment behaviour. In addition to the usual socio-demographic determinants, the author also analyses cultural factors (operationalised by the country of origin) as well as attitudes towards female employment and gender-specific division of household tasks (measured in religious denomination and religiosity). Traditional attitudes impair in particular the

employment chances of women of Middle Eastern or North African descent, Muslim religion and higher religiosity.<sup>2</sup>

However, attitudes, values and role models are not only conveyed through the culture of the home country, but also through the culture prevailing in the destination country, and they also shape the employment behaviour of non-migrant mothers. A study by Rainer et al. (2013) based on the Socio-Economic Panel (SOEP) of the 2004 and 2008 waves concludes that maternal attitudes exert an independent effect on the likelihood of maternal employment, even when a variety of socio-economic factors is controlled for. For Germany, an increasing divergence of work-care arrangements by mothers' qualification can be observed for mothers with under-threes between 1997 and 2013, with a more strongly increasing employment and childcare usage among medium and highly qualified mothers compared to their lowly qualified counterparts (Stahl/Schober 2018). Further, East-West differences in maternal employment remain persistent, in terms of the extensive and the intensive margin; West (East) German mothers of toddlers work on average 24.5 (32.5) weekly hours (BMFSFJ 2017b).

In addition, local milieu affiliation shapes employment behaviour. In reference to Hradil (1987: 165), social milieus are understood as "groups of people who have such external living conditions and/or inner attitudes that common lifestyles emerge". Milieus, relating to Bourdieu's (1983) concept of economic, cultural and social capital, represent "collectives with similar lifestyles" (Georg 1998: 17). Basic orientations in upper-class milieus are shaped by performance and success ethics, the desire for self-determination, intellectuality and responsibility (SINUS Markt- und Sozialforschung GmbH 2015: 16). The implementation of these orientations in practical behavior is made possible by the high economic resources in the form of formal education, professional status and income that characterize the high social situation of the upper class milieus. As with persons without a migration background, membership of a particular milieu also has an influence on values and lifestyles; this applies, for example, to gender role orientations (Becher/El-Menouar 2014: 27). However, empirical evidence shows that neither the culture of origin can be inferred from the milieu nor vice versa (Sinus Sociovision 2007: 21).

The link between a mother's usage of institutional childcare and her employment behaviour is also the subject of empirical analyses. Rainer et al. (2013) find a significantly positive effect of the use of day care even when other confounders like maternal attitudes and education are controlled for. This can be explained by the fact that mothers who use institutional childcare gain a time budget that they can use for labour market entry or for an increase in weekly working hours. However, the use of childcare facilities could also be a consequence of employment instead of its cause. IV techniques are one relevant way to methodologically address the potential endogeneity of individual childcare use. Aggregate coverage rates at the local level often serve as instruments (e.g. Kröll/Borck 2013). In the absence of usage information and in order to circumvent identification problems, evaluation studies on policy reforms usually rely

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<sup>2</sup> However, as the author points out, Muslim religion has an ambivalent interpretation as it could reflect both preferences and discriminatory practices in the host country.



on information on daycare supply, often in combination with time- and region-specific effects (Müller/Wrohlich 2018, Boll/Lagemann 2017).

### **The role of migration background for mothers' use of state-subsidized childcare provision**

In 2015, around 4.3 million underage children with a migrant background were living in Germany, which is about 34 % of all children under the age of 18 (BMFSFJ 2017b, p. 24). The participation of children with a migrant background in early childhood education has increased in recent years, but coverage rates for children with a migrant background are still lower than those for children without a migration background.<sup>3</sup>

Studies on the use of day care centres repeatedly show that children with a migrant background are underrepresented in state-subsidized day care (Peter/Spieß 2015, Statistisches Bundesamt 2014, Schober/Spieß 2012). This applies both to children below 3 and 3 to 5 years of age. The expansion of nursery places in recent years has not significantly altered this situation. The proportion of migrant children in institutional care has risen, but to a lesser extent than of other groups (Schober/Stahl 2014). Admittedly, the relatively low labour force participation of mothers with a migrant background is also related to the use of daycare facilities. However, the study by Peter and Spieß (2015), based on the German Socio-Economic Panel study (SOEP) and including the IAB-SOEP migration sample of 2013, shows that an independent (negative) 'migration effect' remains even when the employment status and other factors are controlled for, provided that both parents of the child have a migration background. However, the latter only applies to the use of after-school care facilities for children aged 6 to 10.

This means that in the case of pre-school children (0-5 years), the low use by parents with a migrant background is fully explained in this study by other observable parental characteristics. For children between 3 years and under 6 years of age, the number of weekly hours in institutional care is even higher if both parents have a migrant background. The effect is maintained even when controlling for other characteristics (but only at a 10 % significance level). As a recent study by Jessen et al. (2018) based on the SOEP shows, however, children under the age of three whose parents *both* have a migrant background are underrepresented in daycare centres. Usage rates here have stagnated in recent years (since 2009/10); accordingly, this group of children could not benefit from the expansion of state-subsidized daycare provision, while the usage rates of parents where only one parent has a migrant background have recently approached those of parents without a migrant background. Further studies come to similar conclusions. According to a study by Alt et al. (2016) based on data from the first supplementary KiföG study by AID:A<sup>4</sup>, parents who were both born abroad are less likely than autochthonous families to make use of a day care place for their children under 3 years of age.

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<sup>3</sup> Based on the child and youth welfare statistics (2017), the 2017 Family Report estimates the 2017 coverage rate in the age group 0 to under 3 years at 21 % for 2016, an increase of 7 percentage points compared to 2011. However, the rate remains well below the 38 % coverage rate for children without a migrant background. For children aged 3 to under 6, the rates were somewhat closer to each other at a much higher level: children with (no) migration background reached a coverage rate of 88 % (96 %) in 2016 (BMFSFJ 2017b).

<sup>4</sup> (AID: A = Survey "Growing up in Germany: Everyday Worlds/ Life")

Schmitz and Spieß (2018) analyse the determinants of the non-use of children aged 3 to 6 years based on the SOEP and the additional sample "Families in Germany" (FiD). Their bivariate analyses show that children who do not attend state-subsidized daycare are significantly more likely to have a migrant background or a not gainfully employed mother than children who do attend childcare. In particular the proportion of children with *both* parents having a migrant background is significantly lower in the group of children attending daycare centres than in the group of children who do not attend childcare. In this study, a child's migrant background significantly increases the likelihood of not attending daycare, even when controlling for other child, parent and household characteristics. The difference in the probability of use is more than four percentage points compared to children without a migrant background. Parental attitudes that can influence usage behaviour are not accounted for in this study.

As shown, the literature on maternal employment and childcare use is vast. However, most studies only consider selected aspects of individual behavioural dimensions, and the link between gainful employment and the use of childcare in the same methodological setting is also rare. This also applies to the investigation of the behaviour of mothers with a migration background.

The present study **contributes to the state of the literature in four ways**. (1) To the best of our knowledge, this study is the first to exploit the information on the migrant population in the SOEP in such a comprehensive way. (2) The evident cultural and economic aspects of the migration background are met by four different specifications of the migration background: In addition to the distinction between indirect and direct migrant background, mothers who have immigrated themselves are also differentiated by region of origin or immigration period. (3) The milieu concept deployed in this study goes far beyond the measurement of individual maternal attitudes. (4) Our methodology considers potential self-selection of mothers into employment in the estimation of working hours as well as potential endogeneity of childcare use in the employment- and hours-estimations.

Our **results** show that, in addition to economic motives, cultural factors and basic attitudes as well as values also shape mothers' everyday actions, as expressed in their employment behaviour and the use of daycare centres. In addition, the immigration period is also relevant among immigrants. With regard to the probability of employment, the migration background shows significant negative associations, also when other socio-demographic characteristics of the mothers, such as educational qualifications, employment experience, milieu affiliation, etc. and macro level factors are controlled for. This points to structural barriers of migrant mothers as an overall group in access to employment, e.g. due to educational mismatches or discrimination. With regard to childcare use behaviour, on the other hand, independent effects of the migrant background can only be observed sporadically for certain subgroups according to region of origin and immigration period.

## 3 Data, Variables, and Samples

### 3.1 Data

For our analyses we use the German Socio-Economic Panel study of the DIW Berlin (SOEP)<sup>5</sup> including the IAB-SOEP Migration Sample (IAB-SOEP-MIG)<sup>6</sup>. The specific contents of the survey include migration biography, intentions to return, professional recognition procedures, language competence and remittances to home countries. For our analysis, we could only use information that was available for all sample persons in all individually observed years.<sup>7</sup> We use the SOEP waves 2007-2015. The SOEP began to record persons with a migration background in the form of separate samples as early as 1984, the year of origin, with the survey of guest workers (sample B) who had immigrated to (western) Germany up to 1983, followed by sample D of immigrants in the period 1984-1994. This was followed by the immigrant sample D with immigrants in the period 1984-1994. The migrant samples M1-M5 were drawn in order to further improve the representativeness of persons with a migration background in the SOEP. The first migrant sample (M1) was drawn in 2013 from the Integrated Employment Biographies (IEB) of the Institute for Employment Research (IAB).<sup>8</sup> Respondents are persons who were recorded in the register data of the Federal Employment Agency for the first time after 1995 (i.e. persons who were either once employed subject to social insurance contributions, seeking or having sought employment or participated in a measure of the Federal Employment Agency) and immigrated themselves or are children of immigrants (anchor persons) as well as their family members over the age of 16.<sup>9</sup> It consisted primarily of immigrants from other EU countries. In 2015, a second sample of migrants was drawn from the IAB's Integrated Employment Biographies (M2). It consists of persons who immigrated in the period 2010-2013. In these two data sets, refugees can be identified by self-disclosure as asylum seekers or refugees entering Germany.<sup>10</sup> The migration samples M+ are integrated as sub-samples into the

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<sup>5</sup> Cf. Wagner et al. (2007).

<sup>6</sup> For more information see: Brücker et al. (2014a) and at [http://fdz.iab.de/de/FDZ\\_Individual\\_Data/iab-soep-mig.aspx](http://fdz.iab.de/de/FDZ_Individual_Data/iab-soep-mig.aspx)

<sup>7</sup> This was not the case for some of the special survey contents, which were collected only once in 2013. Moreover, due to lacking information on the employed macro-level data in this study for the year 2016 at the time of investigation, we were not able to include the refugees who immigrated in the period 1/2013-1/2016 and who were sampled in 2016 (M3 and M4). Yet, migrants, e.g. as family members, may join the migrant household only in later years, e.g. in the context of family reunion.

<sup>8</sup> Due to M1, the number of migrant adults in the SOEP almost doubled (Gerstorff/Schupp 2016, p. 41-42) and also the number of migrant parents has considerably risen.

<sup>9</sup> The sample is drawn on the basis of 250 regional units (sample points) in a multi-stage procedure, so that each person from the migrant population has the same probability of being included in the sample. The structure of the gross sample therefore approximates the distribution of migrants living in Germany. Compared to the distribution of all households in Germany, migrant households are found significantly more frequently in the western federal states and in the centres of larger cities. The largest number of sample points are found in major cities and metropolitan areas. Certain countries of origin have a higher drawing probability in order to guarantee a sufficiently large number of cases for specific groups. These include in particular persons from the new EU member states and persons from Southern Europe (cf. Kroh et al. 2015 and Brücker et al. 2014a, p. 10).

<sup>10</sup> Cf. Giesecke et al. (2017), p. 78.

delivery of regular SOEP data. This makes it possible (a) to additionally evaluate the information provided by persons with a migration background from other SOEP samples in order to distinguish for example immigrants since 1995 from those who immigrated earlier, and (b) to form a comparison group of persons without a migration background. Information is also available for migrants from SOEP's standard personal and household questionnaire, such as employment biography, educational qualification and information on the use of institutional daycare facilities.

The macro variables for the years 2007 to 2015 are taken from the INKAR database ‚Indikatoren und Karten zur Raumentwicklung‘ of the Federal Institute for Research on Building, Urban Affairs and Spatial Development (Bundesinstitut für Bau-, Stadt- und Raumforschung, BBSR).<sup>11</sup> Data on childcare coverage rates for the years 2007 to 2015 are taken from the publications ‚Kindertagesbetreuung regional‘ of the Federal and State Statistical Offices (2008-2016).

## 3.2 Variables

### *Dependent variables*

The three dependent variables of the multivariate analyses are the probability of using a state-subsidized childcare place (in %), the probability of employment (in %) and the (conditional) weekly working hours (in hours). The use of state-subsidized childcare is only used as dichotomous information (yes/no) since information regarding the scope of use is not available for all years and types of care.<sup>12</sup> The information on childcare-use refers to the youngest child in the household.

### *Independent variables*

The socio-demographic characteristics of mothers that are controlled for in the estimations are age, highest educational attainment (low: ISCED level 0-2, medium: 3-4, high: ISCED-97 level 5-6 or ISCED-2011 level 5-8), and migration background. For the analysis of employment behaviour, the mother's use of state-subsidized childcare, her work experience and information on her last job (sector; dummy for public service activity) are also taken into account. A migration background exists when persons have either immigrated themselves (direct migration background) or if at least one parent has immigrated (indirect migration background).<sup>13</sup> Synonymous with 'direct (indirect) migration background' in this study are the

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<sup>11</sup> The BBSR has been regularly offering current information on the situation and the development of the regional living conditions in Germany for many years. The developed INKAR indicators are published in the INKAR online atlas. For more information (available in German only), see: [http://www.bbsr.bund.de/BBSR/DE/Raumbeobachtung/InteraktiveAnwendungen/INKAR/inkar\\_online\\_node.html](http://www.bbsr.bund.de/BBSR/DE/Raumbeobachtung/InteraktiveAnwendungen/INKAR/inkar_online_node.html)

<sup>12</sup> The SOEP records the daily care time only since 2009. Prior to this, it was asked whether the parent uses a full-day or a half-day place for the child. However, information on the hours volume in day care is not available for all years, so that the information on half-day and full-day is not complete either. Especially for toddlers (children below 3 years of age), childminders play an important role for institutional childcare (Federal Statistical Office 2016, Federal and State Statistical Offices 2008-2016).

<sup>13</sup> See Brücker et al. 2014a, p. 5 on the corresponding coding of the variable in the IAB-SOEP-MIG dataset. In the SOEP, the migration background since wave Y (2008) is recorded in the data published by the DIW in the variable MIGBACK, which makes it possible to identify the migration status of respondents (cf. Groh-Samberg et al. 2010).

terms ‘first (second) generation of immigrants’ and, exclusively for the first generation of immigrants, the term ‘self-immigrated’.

In the estimations, a distinction is made between four specifications of the migration background. In a first model specification (a), the influence of a direct or indirect migration background is measured in comparison to the reference category ‘no migration background’. In three further models, the direct migration background is differentiated according to country of origin ((b): EU-28, South Eastern Europe, former Commonwealth of Independent States (CIS) states, Arab and other Muslim states, rest of the world) or with respect to immigration period (1950-1994, 1995-2009, 2010-2015)<sup>14</sup> with different reference categories (c): ‘1950-1994’ or (d): ‘no migration background’. The categories for the region of origin are based on the literature (Brücker et al. 2014b), and those for the immigration period on the observation numbers. In addition, a dummy for an existing refugee experience is included.

As characteristics of the household context which, according to the empirical literature, shape the employment and childcare use behaviour of mothers, we use the household type (single parent or couple household), a dummy for the absence of another adult with a direct or indirect migration background in the household<sup>15</sup>, the number of minor children, the age of the youngest child in the household and the most probable milieu affiliation of the household. The sex of the youngest child is also included in the estimations of childcare usage.

The **milieu** in which parents live plays a special role in this study. Sinus-Milieus® are a typology that have been identified from value priorities, lifestyles and the social status of the persons through qualitative analysis procedures. The milieus are available for the first time for the year 2000. They were determined in market research such that consumer behaviour plays an important role in the characterization. **Table A1 in the appendix** provides brief descriptions of the 10 milieus in the classification since 2010.<sup>16</sup> In 2010, there was a change in the milieu classification. In order to be able to assign each person in the sample for each observation year 2007-2015 a most probable milieu in a consistent manner, we have transformed the 10 Sinus-Milieus® into 9 milieu categories as combinations of 3 basic orientations and 3 social status (see **Table A2 in the appendix**). These 9 status-orientation combinations are used as regressors in the multivariate analyses. It becomes clear that the middle and upper layers of the population with a traditional basic orientation have regressed over the years; instead, groups with a more

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<sup>14</sup> The age distribution of mothers who immigrated in the period 1950-1994 in 2015 ranges from 22 to 58 years. For example, 53.3% of mothers are represented in the age group 25-34 years and 40.0 % in the age group 35-44 years, so that at least nine out of ten mothers who immigrated during this period were of childbearing age in the observation period 2007-2015. 59.8 % of the mothers in this group were under 15 years of age at the time of immigration.

<sup>15</sup> The dummy takes the value of 1 for single mothers and for mothers who live together with autochthonous adult persons only.

<sup>16</sup> To obtain milieu information in the SOEP data set, the MOSAIC Milieus® were matched via the microm data. MOSAIC-Milieus® serve to systematically describe the regional environment of the SOEP respondents (e.g. the type of residential area, socio-structural information as well as information on the probability of occurrence of the various Sinus-Milieus®, cf. Küppers 2018). Due to the small size of the additional information (house block level), an analysis is only possible on specially secured devices at the SOEP group at DIW Berlin for reasons of data security (cf. Goebel et al. 2007, p.1). Each of the ten milieu variables available in the SOEP data set indicates the statistical probability with which a household can be assigned to the respective milieu (cf. Goebel et al. 2007, p. 28; Goebel et al. 2014).

modern basic orientation have become more differentiated. In the middle class, this also applies to people with a distinctly individualistic basic orientation.

In order to also take into account the potential influence of the economic and institutional context, five **macro-level factors** are taken into account at the county level (district type<sup>17</sup>, unemployment rate, labour market participation rate, GDP per capita and total fertility rate). These macro-level factors for the years 2007 to 2015 are derived from the INKAR data. A large number of studies have proven the influence of the type of settlement on employment (Speil et al. 1988, Van Ham/Büchel 2004). In the estimations of childcare use, coverage rates and full-time coverage rates are also taken into account. The coverage rates at county level are available for the two child age groups under 3 years' and '3 to under 6 years' separately, but they are not differentiated according to migration background.<sup>18</sup> The coverage rates are not available before 2006. For the years from 2007 to 2015, they are taken from the Federal and State Statistical Offices (2008-2016). Time trends are recorded on the basis of fixed-year effects.

### 3.3 Samples

A distinction is made between mothers<sup>19</sup> with a youngest child aged under 3 years (sample 1) and those with the youngest child aged 3 to less than 6 years (sample 2). The two samples cover mothers of working age (15 to 74 years) with at least one child in the respective age group living in the household. Six- and seven-year-olds who, according to their parents, are still cared for in a daycare centre, without simultaneously being classified as pupils are included in the group of 3 to under-6-year-olds. Employment is measured according to 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. Excluded are persons who are currently in education or training (apprentices, trainees and students).<sup>20</sup> Sample 1 (2) comprises 2,175 (3,179) mothers with 3,793 (6,253) observations. In the period under review, the share of mothers without a migration background continuously decreased<sup>21</sup>, e.g. from 82 % in 2010 to 62.8 % in 2015.

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<sup>17</sup> Categories of district type are: large cities, urban counties, rural counties showing densification tendencies, and sparsely populated rural counties (reference category).

<sup>18</sup> We are unable to calculate county-specific coverage rates for children with and without migration background separately. The reason is that although the number of migrant children who are enrolled in state-subsidized childcare can be identified for the corresponding age groups 0-2 and 3-5, the county-specific population numbers of migrant and non-migrant children in the respective age groups are not available.

<sup>19</sup> It does not matter whether they are biological mothers; mothers with adopted children and children of a partner living in the household are also included in the sample. Mothers whose children aged below 6 do not live with them in the same household are excluded from the sample.

<sup>20</sup> In addition to registered unemployed persons, unemployed persons also include persons in military or civilian service and parental leave as well as persons in partial retirement with an indication of zero weekly hours. The generated SOEP variable 'PGEMPLST' (cf. DIW Berlin/SOEP (2017), p. 20 and p. 46f.) is decisive for the current employment status.

<sup>21</sup> The sole exception refers to the period 2013-2015 when the FiD data (Familien in Deutschland) has been integrated into the SOEP.

## 4 Models and Hypotheses

### 4.1 Models

In all estimations, we use pooled data sets.<sup>22</sup>

For employment, the extensive (employment propensity) and the intensive margin (weekly hours of work conditional on employment) are investigated. With respect to childcare use we analyse the probability of use of state-subsidized childcare (daycare centres or child minders) for the youngest child in the household. In the context of the employment and hours estimations, the methodological difficulty of the potential endogeneity of individual childcare use arises. The Durbin-Wu-Hausman test (cf. Davidson and MacKinnon 1993) for endogeneity confirms this assumption for both samples.<sup>23, 24</sup>

We address this problem as follows. Since both individual **employment propensity** for the individual  $i$  in year  $t$  ( $EMP_{it}$ ) and individual childcare use ( $CC_{it}$ ) probability are binary variables, a bivariate probit model (Heckman 1978) is used as a first model specification, estimating both probabilities simultaneously (**Model 1**).

$$CC_{it} = 1[\alpha + HC_{it}\gamma_0 + HH_{it}\gamma_1 + MIG_{it}\gamma_2 + MIL_{it}\gamma_3 + MAC_{it}\gamma_4 + Y_t\gamma_5 + CH_{it}\gamma_6 + u_{it} > 0] \quad (1a)$$

$$EMP_{it} = 1[\alpha + HC_{it}\beta_0 + HH_{it}\beta_1 + MIG_{it}\beta_2 + MIL_{it}\beta_3 + MAC_{it}\beta_4 + Y_t\beta_5 + \widehat{CC}_{it}\beta_6 + \varepsilon_{it} > 0] \quad (1b)$$

The likelihood of childcare usage (equation 1a) is supposed to be associated with the mother's human capital ( $HC_{it}$ ), her household context ( $HH_{it}$ ), her milieu affiliation ( $MIL_{it}$ ) and her migration background ( $MIG_{it}$ ). Further confounders are year-specific macro variables on the county level ( $MAC_{it}$ ) as well as year dummies ( $Y_t$ ).

Specifically, the human capital vector encompasses age, work experience, and attained education. The household context comprises of the age of the youngest child, the number of children, the absence of another adult household member with a migration background, and the household type. For the mother's migration background, the four already mentioned alternative specifications (a) to (d) are used. The milieu denotes the mother's most probable milieu

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<sup>22</sup> In principle, a panel model (Random effects probit with Mundlak correction; Mundlak 1978) would also have been possible. However, the samples are too small and the longitudinal scope of the data is not sufficient to formulate the estimation models as panel models.

<sup>23</sup> Firstly, an instrument must be relevant, i.e. it must correlate strongly with the potential endogenous regressor under the control of the exogenous regressors. This is tested using the first stage of an 2SLS estimation. The values of the F statistics are well above the limit value of 10, which indicates a relevant instrument (sample 1: 242.0; sample 2: 84.9). Secondly, the instrument must be valid, i.e. it must not be correlated with the dependent variable in the main estimation, the individual employment probability. The required exogeneity is to be assumed for the aggregate coverage rate at the county level, on which the behaviour of individuals is unlikely to have a resounding success.

<sup>24</sup> Nevertheless, for both samples 1 and 2, additional models without individual childcare use and with actual (instead of estimated) childcare use, respectively, were estimated.

affiliation and the macro variables the county- and year-specific unemployment rate, participation rate, fertility rate, settlement structure and gross domestic product per capita. Further, the vector of year dummies contain the years 2007-2015. In addition, we suggest that individual childcare usage is associated to the aggregate childcare coverage rate.  $CH_{it}$  depicts the county-specific coverage rate for children aged 0-2 and 3-5, respectively which refers to the mother's residence. The county-specific coverage rates for children aged 0-2 and 3-5, respectively are employed as instruments for the mother's individual childcare use. According to findings for the period 2006-2016, the childcare usage rates calculated in the SOEP are quite close to the aggregate coverage rates of official statistics for the below threes and almost completely coincide with those for children aged 3 to 5 (Jessen et al. 2018).

The likelihood of employment (equation 1b) is formulated as a function of the same individual level and macro-level characteristics that are deployed in the childcare use equation (1a), namely  $HC_{it}$ ,  $HH_{it}$ ,  $MIG_{it}$ ,  $MIL_{it}$ ,  $MAC_{it}$  and  $Y_t$ , plus the estimated individual childcare use ( $\widehat{CC}_{it}$ ) obtained as the estimation outcome from equation 1a.

However, since the bivariate probit approach is based on strong parametric assumptions and interpretation is difficult, an alternative estimation of both binary variables is carried out with a two-stage least-squares model (2SLS, Angrist and Pischke 2009) (**Model 2**) using the same set of regressors and instruments as in Model 1, that is, (2)=(1b).<sup>25</sup>

In order to obtain consistent estimators in the estimation of **weekly working hours (Model 3)**<sup>26</sup> despite potential selection bias and endogeneity of childcare use, 2SLS is also chosen here. Again, the individual use of childcare ( $CC_{it}$ ), which is to be included in the estimation of continuous working hours, is regressed in a first step (equation 3a) on  $HC_{it}$ ,  $HH_{it}$ ,  $MIG_{it}$ ,  $MIL_{it}$ ,  $MAC_{it}$  and  $Y_t$  plus the sector affiliation and a public service dummy, both referring to the mother's last job. To this end, we use the same coverage rates ( $CH_{it}$ ) as instruments as in models 1 and 2.<sup>27</sup> In the second step (equation 3b), the working hours ( $HOURS_{it}$ ) are regressed on the estimated individual childcare use ( $\widehat{CC}_{it}$ ) obtained from the first-step estimation and the other explanatory variables employed in equation 3a. The selection correction ( $MR_{it}$ ) is performed using the inverse Mill's ratio (Heckman 1979). The inverse Mill's ratio is obtained by a probit estimation of the employment propensity using the same set of variables as in equation 3b with the education of the partner<sup>28</sup> as a selection variable.

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<sup>25</sup> Unless explicitly mentioned, the results described below refer to the findings that are consistent in both models with regard to the direction and significance level of the association. If concrete values are mentioned that express the influence of an explanatory variable on the employment probability in percent, these refer to Model 2.

<sup>26</sup> The results of the childcare use included in the 2SLS working hours-estimation are not reported by default and are also estimated as a linear model.

<sup>27</sup> As aforementioned, we conduct an OLS estimation of individual childcare usage in Models 2 and 3 although childcare usage it is a binary variable. Angrist and Pischke (2009) and Windmeijer and Santos Silva (1997) propose the following alternative approaches: They first estimate a probit model of individual childcare-usage, but without the aggregate usage; they then use the estimated individual use as a regressor in the OLS estimation of the individual childcare-usage (a) instead of or (b) in addition to the aggregate childcare use. According to Wooldridge (2010), all three approaches are acceptable and produce similar results, with our approach being the standard.

<sup>28</sup> The education of the partner is grouped in three categories according to the ISCED classification (see 3.2 Variables) plus an additional category ("no partner") for single mothers.



$$CC_{it} = \alpha + HC_{it}\gamma_0 + HH_{it}\gamma_1 + MIG_{it}\gamma_2 + MIL_{it}\gamma_3 + MAC_{it}\gamma_4 + Y_t\gamma_5 + CH_{it}\gamma_6 + MR_{it}\gamma_7 + u_{it} \quad (3a)$$

$$HOURS_{it} = \alpha + HC_{it}\beta_0 + HH_{it}\beta_1 + MIG_{it}\beta_2 + MIL_{it}\beta_3 + MAC_{it}\beta_4 + Y_t\beta_5 + \widehat{CC}_{it}\beta_6 + MR_{it}\beta_7 + \varepsilon_{it} \quad (3b)$$

The probability of **childcare use** is estimated as a probit model (**Model 4**). The dependent and independent variables of Model 4 are identical with the ones in equation 1a, except for the county-specific full-time coverage rates and the sex of the child which serve in the childcare use equation as additional covariates.

The multivariate analyses are preceded by principal component analyses, which inform about the correlation structure of the covariates in the two estimation equations. As the rotation method, the orthogonal rotation method "Varimax" is selected. In summary, the principal component analyses show that the data confirms our economic model. As expected, the three factors nationality, country of origin and immigration period are closely related. It is interesting to note that none of the other socio-demographic characteristics of the parents that are relevant to the employment context – age, level of education, household context – correlates significantly with the migration biographical characteristics (country of origin, immigration period, nationality).

## 4.2 Hypotheses

According to the four key factors migration background, milieu, human capital and household context derived from the presented literature on maternal employment and childcare use, we derive the following eight research hypotheses that structure our multivariate analyses:

### *1 Migration background*

As the literature shows, the linkage between an individual's migration background and her employment behaviour can be motivated through various channels, amongst them information gaps, educational mismatch, discrimination and culturally shaped preferences.

Therefore, we postulate that (**H1a**) a migration background of the mother is associated with a lower propensity of employment and childcare use as well as fewer weekly working hours.

As qualificalational mismatch and labour-demand sided discrimination should not affect childcare use and working hours, we expect that (**H1b**) the existence of a migration background relates more strongly to the mother's employment propensity than to her work volume and childcare usage.

### *2 Milieu affiliation*

Following Harney et al. (2003), we suppose that mothers' daily practices and basic values exert an autonomous influence on their employment behaviour and childcare usage beyond the channels of economic resources. Work ethics and independent life styles should trigger upper class-mothers' labour market attachment even further, in addition to their advantageous individual endowments.

In detail, we suggest that (H2) an affiliation to an upper class milieu is associated with a higher likelihood of being employed and using state-subsidized childcare as well as with a higher weekly work volume of the mother.

### *3 Human capital*

With regard to human capital factors we expect that a higher educational level attained (H3a) and a higher employment experience (H3b) relate to a higher employment propensity, more hours of work per week and a higher childcare usage probability.

### *4 Household context*

We establish three hypotheses concerning the household context. We suggest that, first, a lower number of children in the household (H4a) and, second, a higher age of the youngest child in the household (H4b) are associated with a higher maternal employment propensity. Third, we postulate that (H4c) mothers using a state-subsidized childcare place for their youngest child are more likely to be employed and, conditional on employment, work more hours than mothers who abstain from childcare use.

## 5 Results

Unless otherwise indicated, reported results on employment propensity in what follows refer to findings that are consistent in both models with regard to the direction and the significance level of the effect. If concrete values are mentioned that express the influence of an explanatory variable on the employment probability in percent, these refer to model 2 unless stated otherwise.<sup>29</sup>

### 5.1 Childcare use

The detailed estimation results can be found in **Table A3** and **Table A4** in the Annex.

With regard to **migration background**, the results vary according to the specification. For neither of the two age groups can an independent significant effect of the migration background as such on the mother's childcare use be witnessed. Based on our data, a direct or indirect migration background of the partner of the mother similarly neither shows a significant relation with the childcare use probability, deviating from the results of Peter and Spieß (2015) for children aged 6 to 10.<sup>30</sup> Mothers with a migrant background are generally less likely

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<sup>29</sup> This procedure roots in the fact that marginal effects of bivariate probit estimations (Model 1), though reliably indicating direction and significance of effects, are not suitable for interpretation in terms of effect size (Wooldridge 2010). However, deviations between models 1 and 2 in terms of direction and significance of effects are rare.

<sup>30</sup> This may be due to differences in the methodological specification and data. For example, Peter and Spieß (2015) only use the SOEP subsamples of the 2013 wave. In addition, the study of these authors builds on the migration background of the child and not, like the present study, on that of its parents.

to be employed than mothers without a migration background; maternal employment is, however, significantly positively related to the maternal use of state-subsidized childcare, this holds especially true for mothers with a youngest child below three and in particular for mothers with a direct migration background. A recent study by Jessen et al. (2018) based on SOEP data confirms these findings, showing that the smaller utilisation of pre-school institutional care particularly refers to families with a migration background of *both* parents. It is true that the social environment in which the mother lives does not provide a significant independent explanation on the childcare usage in either of the two maternal samples. It has to be noted, however, that the major part of self-immigrated mothers is affiliated to the “escapist” milieu and that mothers’ milieu distribution as such is shaped by childcare-relevant characteristics like educational level and employment status.

Further, the migration context itself is multifaceted; mothers with a migrant background are not a homogenous group. Rather, they differ in their behaviour by immigration period and region of origin. The model specifications, which differentiate the migration background according to these two criteria, therefore draw a slightly different picture of the migration background: mothers with a youngest child aged 0-2 (3-5), who immigrated between 2010 and 2015, have a higher (lower) probability of 6.5 % (5.0 %) to use childcare services, compared to mothers who immigrated between 1950 and 1994 (who have no migration background). However, both associations are only significant at the 10 % level.<sup>31</sup> In the same sample, mothers from South-Eastern Europe stand out with a significant negative marginal effect. The likelihood of childcare use is 4.1 percent lower than in the reference group of mothers without a migration background.<sup>32</sup>

The other **individual variables** behave similarly for both samples. Mothers’ employment experience, the age of their youngest child and a high educational attainment have a highly significantly positive effect on childcare usage. In detail, one year of work experience increases childcare usage by around 0.3 %. If the age of the youngest child increases by one year, the probability for the child to be in state-subsidized care increases in sample 1 (depending on the variable specification) by roughly 23 %, in sample 2 by 12.7 %. The positive age-dependency of institutional childcare enrolment is a robust finding in the empirical literature (e.g. Jessen et al. 2018). Compared to mothers with medium education, low-skilled mothers have a 4 % (sample 1) or 2-3 % (sample 2) lower probability, and highly educated mothers have a 5 % (sample 1) or 3 % (sample 2) higher probability of childcare usage. A higher number of children in the household and, only for sample 2, also the age of the mother, are associated with a significantly less frequent childcare use. Specifically, each child in the household declines the childcare use probability by roughly 2% (sample 1) or 1% (sample 2). For mothers of a youngest child aged 3 to 5, each additional year of her age reduces the probability of childcare use by 0.2 %. In addition, girls are more likely to be enrolled in institutional care than boys, with a 19 % (12-13 %) higher probability for girls in mother sample 1 (2) which is significant at the 10 %-level. The

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<sup>31</sup> In contrast, in the child age group 0-2 years the behaviour of mothers who immigrated between 2010 and 2015 does not differ significantly from that of mothers without a migration background. On the other hand, in the 3-5 year age group the behaviour of mothers who immigrated between 2010 and 2015 does not differ significantly from that of mothers who immigrated between 1950 and 1994.

<sup>32</sup> The parameter for South East Europe is significant at the 5 % level.

household type is not significantly related to childcare use. This is partly due to low observation numbers, in particular for single mothers.<sup>33</sup>

## 5.2 Employment behaviour

### 5.2.1 Sample 1 (Mothers with a youngest child below age 3)

The detailed estimations of employment behavior can be found in **Table A5** to **Table A7** in the Annex.<sup>34</sup>

#### *Employment propensity*

The probability of being gainfully employed is strongly influenced by the **migration background** of the mother. In the model which only categorically includes the migration background in the specifications without/direct/indirect, both a direct and an indirect migration background show negative associations. A direct (indirect) migrant background reduces the probability of employment by about 6.3 % (5.9 %). The model which differentiates the direct migration background by countries of origin shows that mothers from South Eastern Europe (-7.1 %), the former CIS states (-6.6 %) and the Arab and other Muslim states (-14.3 %) are less likely to work than mothers without a migration background. For mothers from the EU-28 states and the rest of the world, however, there are no or only slightly significant differences in this respect.<sup>35</sup>

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<sup>33</sup> Year-specific effects only arise for mothers with the youngest child aged 3 to 5 who use state-subsidized childcare significantly less frequently in 2008; weakly significant negative annual effects also occur for the years 2011 and 2015. At the county level, there are significant positive (negative) associations with childcare use for the below threes (3 to 5 year olds) in the case of urban districts in comparison with the reference category of the sparsely populated district. As expected, the aggregated coverage rates in the respective county are positively related to the individual use of state-subsidized childcare services by mothers. For 3 to 5-year-olds this also applies to the full-time coverage rate: In counties with a higher full-time coverage rate for the age group 3-5, the individual use of day care facilities by mothers with the youngest child in this age group is also higher. In sample 1, however, there are negative effects in this respect. In other words, in counties with high full-time coverage rates for children below the age of three, there is a rather polarized distribution of use, with mothers who use the day intensively on the one hand and a comparatively high proportion of mothers who do not use state-subsidized childcare at all for their child on the other. Since we control for district type, the individual differences in use cannot be attributed to urban-rural differences in usage behaviors. Rather, even counties with the same settlement structure show a significantly positive correlation between individual use and aggregate childcare coverage rate. This confirms our methodological approach of using the county-specific coverage rates as instruments for individual childcare use in the employment estimations.

<sup>34</sup>As mentioned above, the estimations of the probability of employment and working hours were also performed without the childcare use as an explanatory variable and in another model with actual use of childcare instead of estimated use. The results were essentially robust compared to the models with estimated childcare use presented here. Most deviations occurred in the working hours-estimation with respect to household characteristics. Since the Durbin-Wu-Hausman test confirmed the endogeneity of childcare use, we consider the results that we report in what follows to be more valid. The detailed estimation results for the alternative models are available on request from the authors.

<sup>35</sup>In this model, an indirect migrant background is associated with a 6.0 % lower probability of employment, which is congruent with the model without differentiation according to region of origin.

In the model which differentiates the direct migration background by immigration period, a trend can be observed for immigrants since 1995 in comparison with mothers without a migration background: The longer the immigration has been in the past (that is, the longer the length of stay in Germany), the higher the probability of being gainfully employed. Specifically, compared with mothers who immigrated in the period 1950-1994 (mothers without a migration background), mothers who immigrated between 2010-2015 have a 8.7 % (12.8 %) lower probability of being gainfully employed. For mothers with an indirect migration background, the probability of employment is also around 6 % lower than for mothers without a migration background in the specifications that differentiate according to immigration period or region of origin. There is no connection between the presence of a partner with a migrant background and the employment of the mother. Neither is the refugee experience significant. As the factor analyses showed, this is due to the fact that the refugee experience is closely related to the mother's immigration period and region of origin.

The **milieu variables** show only a few weakly significant effects in model 1. Membership of the modern middle class ('new middle class' or 'socio-ecologicals') compared to the modern upper class ("established conservatives" or "liberal intellectuals") is accompanied by an increased probability of mothers of children under three years of age to be employed (significantly at the 10 % level).

Most other factors at the **individual level** are highly significant in both models and all four specifications<sup>36</sup> and show the same association. If the mother's work experience or the age of the youngest child increases by one year, the probability of employment increases by around 2 % or 20 % (depending on the specification). On the other hand, the mother's own age has a negative effect.<sup>37</sup> While a low level of educational attainment is associated with a 6.0 % lower probability of employment (compared with mothers with medium education), it is around 11 % higher if she is highly educated. With regard to household type, it can be noted that single mothers are less likely to be employed than mothers in couple households with otherwise identical maternal characteristics; the difference in employment probability is around 9 %. The fact that the number of children in the household is not significant should be seen against the background of the two-stage estimation procedure.<sup>38</sup> The **estimated use of childcare** in model

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<sup>36</sup> This applies with the exception of the year dummies.

<sup>37</sup> Since due to the necessary parental status very young persons are missing in the sample, the negative influence of age is plausible and was already apparent in the descriptive analyses, despite the different age distribution among the sampled persons depending on the migration background. Moreover, age and work experience are highly correlated, thus the age parameter could be seen as a correction term for the (positive) experience parameter.

<sup>38</sup> The number of children is strongly negatively correlated with the probability of childcare use. Thus it is obvious that this factor has a strong association with the value of the estimated childcare use (first stage of the estimation model), whereby it loses its explanatory power in the estimation of gainful employment (second stage). In addition, the descriptive analyses show an ambivalent relationship between the number of children and the employment rate - depending on whether the change from 1 to 2 or from 2 to 3 or more children was considered.

1 is significantly positively correlated (at the 1 % significance level) with the probability of employment; in model 2, however, the correlation is insignificant.<sup>39</sup>

### *Hours of work*

With regard to weekly working hours, neither the **migration background** as such, nor the differentiations of the direct migration background by country of origin or immigration period prove to be significant. The same applies to the migration background of the partner. In contrast to the probability of employment, however, more statistically significant correlations to milieu affiliation can be observed for the mother's working hours. Compared to the reference category of the modern upper class, mothers from lower social classes (traditional middle class, traditional lower class, modern lower class) work fewer hours. Among the **meta-factors**, only the unemployment rate shows significant positive effects. The district type and the **year** (except for the significant negative effect for the year 2007) are not correlated with working hours.

In addition, **individual factors** are very important. Thus, employment experience is significantly positively correlated to weekly hours of work. Specifically, an additional year of work experience is associated with a good half hour of additional working time per week.<sup>40</sup> On the other hand, the age of the youngest child and (at a low level of significance) one's own age are negatively correlated with working hours. Mothers of two-year-old youngest children have a 4.5-4.7 hours less weekly working time than mothers of one-year-old youngest children. A high level of education increases working hours by more than three and a quarters hours per week compared with mothers with medium education.

**Estimated childcare** use is highly significant, suggesting that mothers using childcare services work significantly more hours than other mothers.<sup>41</sup> The weakly significant positive correction term indicates that mothers with a higher probability of employment tend to have higher weekly working hours, confirming our methodological approach to control for selection of mothers into employment in the estimation of weekly working hours.

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<sup>39</sup> This probably is related to the different ranges of values of the target variables in the two models, which result from different assumptions of the models on the (non-)linearity of the functional relationship, and with the peculiarity of childcare-use as an individually estimated explanatory variable, while all other covariates of the model record the individually observed values. It follows that although the bivariate probit model is the most appropriate model for the data and research question, and the 2SLS model is considered only because of the more easily readable parameter values, the childcare-use parameter is an (only) exception.

<sup>40</sup> Note again that age which is highly correlated with experience exhibits a negative sign in all estimations.

<sup>41</sup> In this interpretation, however, it should be noted that this is not the actual childcare usage, but the estimated childcare usage in the first stage of Model 3. In addition, it is noticeable that the estimated use of childcare and the constant assume very high values, so that the other factors are also partly to be understood as correction factors. It should also be borne in mind that, for example, a low level of education, the type of household and the number of children have a large explanatory power in the first stage (use of childcare) of the 2SLS procedure. Thus, these three factors are implicitly included in the second stage via the estimated use of childcare variable, in which they lose their independent explanatory content for weekly hours of work.

### 5.2.2 Sample 2 (Mothers with a youngest child aged 3 to 5)

The detailed estimation results can be found in **Table A8** to **Table A10** in the Appendix.

#### *Employment propensity*

As in sample 1, in sample 2 the migrant background also plays a role in the probability of being gainfully employed. A direct migrant background reduces the employment probability of mothers with the youngest child aged 3 to 5 years by 8.0 %, an indirect one by 6.7 %. Broken down by country of origin, mothers with a direct migration background those with roots in Arab and other Muslim countries have a 21.1 % lower probability of employment than mothers without a migration background. But mothers from former CIS states and the rest of the world also have a 7.4 % and 14.2 % lower likelihood of employment, respectively.<sup>42</sup> Immigration between 1995 and 2009 (between 2010 and 2015) reduces the probability of employment by 13.2 % (24.8 %) compared with immigrants between 1950 and 1994. In comparison with mothers without a migration background, mothers who immigrated in the period 1995-2009 (2010-2015) have a 12.6 % (24.3 %) lower employment probability.<sup>43</sup> All the values mentioned are significant at least at a 5 % level. For mothers with a youngest child aged 3 to 5, the positive relation between the length of stay in Germany and the probability of employment is thus also evident. A refugee experience as well as the absence of a partner with a direct or indirect migration background in the household do not provide any significant findings in this sample of mothers either.

With regard to **milieu affiliation**, it can be seen that mothers of the new lower class exhibit a 7.1-7.4 % (depending on the model) lower employment probability compared to mothers of the modern upper class. Thus, the multivariate analyses show the independent negative relation of the escapist milieu to the employment probability under otherwise identical maternal characteristics.

Apart from the insignificant result for the number of children and the age of the youngest child (which is, however, highly significantly positive in Model 1), the results for the other **individual factors** are similar to those for sample 1 with respect to their direction and their level of significance. Higher work experience and a high level of education favour the likelihood of employment, whereas an increasing age and a low level of educational attainment of the mother reduce it. For example, one extra year of work experience increases mothers' employment probability by 3.5 % and a low (high) educational attainment is associated with a 11.3 % lower (12.5-13.0 % higher) employment probability. *Ceteris paribus*, single mothers are 8.8 % less likely to be employed than mothers in couple households. As in sample 1, the **estimated use of childcare** in sample 2 is positively related to the employment probability of mothers. In model 2, however, the correlation is only significant at the 10 % level.

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<sup>42</sup> Also in the specification of the direct migration background by country of origin, the indirect migration background is associated with a 6.7 % lower likelihood of employment.

<sup>43</sup> In the specifications by immigration period of the first immigrant generation, the probability of employment for the second immigrant generation is reduced by 7.7 % and 7.1 % respectively; the deviations from the other two specifications of the migration background are therefore minimal.

### *Hours of work*

With regard to the relationship between **migration background** and working hours, the observations from sample 1 are confirmed to the extent that there are no significant relationships to migration background in sample 2 either, not even in the differentiation of the direct migrant background by region of origin or immigration period. The absence of a partner with a direct migration background in the household reduces the weekly working hours in the specification of the migration background as a dummy (by region of origin) by 2.3 (2.8) hours per week, but only to a 10 % significance level in the former case. In the specifications of the direct migration background by immigration period, the partner migration background is always insignificant. The **milieu** also has no significant relationship to mothers' weekly working hours.

By contrast, the other **individual variables** have a high explanatory power that goes beyond that of sample 1 in terms of significance and scope. *Ceteris paribus*, the increase in the mother's age and the age of the youngest child as well as a higher number of children in the household go hand in hand with a reduction in working hours: Analogous to mothers with small children, weekly working hours of mothers with the youngest child aged 3 to 5 also decrease by about 20 minutes (approx. 0.33 hours) per week with each additional year of the mother's age (the significance of the age effect is, however, higher here), while with each additional year of the youngest child's age it even decreases by a good 4 ½ hours per week.<sup>44</sup> In this group of mothers, every additional child in the household is associated with a good 1 hour less weekly work volume. As in the case of mothers with children below the age of 3, the weekly working hours of mothers with the youngest child aged 3 to 5 increases by about half an hour with each additional year of work experience. With a plus of almost 4 hours per week, an academic degree has an even greater effect on working hours here than for mothers in sample 1.

For the **estimated childcare usage**, highly positively significant coefficients can be ascertained which have to be interpreted with caution, though. In contrast to sample 1 there is no significant association between weekly hours of work and employment propensity in sample 2 (the correction term in the hours-estimation is insignificant).

For the employment estimation, no clear time trends can be identified from the **year dummies**. Regarding **macro-level** factors, the district type and the gross domestic product per capita are nowhere significant. The fertility rate and the participation rate show positive associations (mother sample 2) and the unemployment rate negative associations (mother sample 1) to a mother's employment propensity. Except for the unemployment rate which is positively linked to hours of work in both samples, there are no significant correlations between the macro variables and weekly working hours.

### **5.3 Discussion**

In what follows, we link the reported results to the 8 hypotheses motivating our analysis.

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<sup>44</sup>As no panel model has been estimated, the parameters refer to cross-time and cross-sectional variation.



**H1a:** *The hypothesis is partially confirmed.* The strongest references to the migrant background can be seen in the employment probability of mothers. Here, a migrant background both per se and among self-immigrant mothers reduces the likelihood of gainful employment in each of the regions of origin examined and in each of the immigration periods studied compared with mothers without a migrant background. The data confirm the pattern already found in the literature for both age groups of children, namely that a longer length of stay in Germany favours the employment likelihood of mothers (under otherwise identical circumstances). Among the regions of origin, mothers with roots in Arab-Muslim countries drop most strongly compared to mothers without a migrant background; this result could be supported by the traditional gender roles in these countries, which go hand in hand with high religiosity. On the other hand, there are no correlations between the region of origin and weekly working hours in the child age groups considered.

**H1b:** *The hypothesis is essentially confirmed.* In contrast to the probability of employment, there are no significant correlations between the migration background of the mother as such and the childcare use as well as the weekly working hours. The data thus support the assumption that labour market discrimination and qualification mismatches play a lesser role in weekly working hours than in access to employment. The variation in weekly working hours (descriptively, there are lower full-time rates among mothers with a migration background compared to mothers without a migration background) is apparently fully explained by third variables such as region (East vs. West Germany) and number of children. Also differentiated according to region of origin and immigration period, less significant associations with weekly working hours and the use of childcare can be found than with the probability of employment. In addition, it is plausible that access to the use of childcare does not discriminate against migration background.<sup>45</sup>

**H2:** *The hypothesis is partly confirmed.* An affiliation to the modern upper class milieu is associated with a higher weekly work volume (mother sample 1) and a higher employment propensity (mother sample 2), respectively. The hypothesis is not confirmed for the use of childcare; the same applies to weekly working hours of mothers with the youngest child aged 3-5 years and to the probability of employment for mothers with the youngest child under 3 years. Apparently fundamental values typical of the milieu of the modern upper class, such as a liberal basic attitude, the desire to lead a self-determined life and versatile intellectual interests, have a positive influence on (conditional) working hours. On the other hand, a favorable social situation of mothers with small children seems to favour a rather restrained labour market commitment. This suggests a bipolar employment pattern of academically qualified mothers.

**H3a:** *The hypothesis is partially confirmed:* Female academics are significantly more likely to be employed, more likely to use institutional daycare for their youngest child and, when employed, they work more hours per week than mothers with intermediate education, this applies to both groups of mothers. However, mothers with medium education do not differ sig-

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<sup>45</sup> Moreover, with regard to childcare use, self-immigrated mothers with children under 3 years of age show a comparatively low numbers of observations differentiated by country of origin, which could have contributed to the insignificant results.

nificantly from mothers with lower education in terms of hours. This could be due to occupation-specific working conditions since mothers of different educational levels work in different occupations. A higher financial pressure among the low-skilled might also play a role. Note again that the reported educational reference applies under otherwise identical circumstances, i.e. that milieu influences were filtered out. As descriptive analyses show, low-skilled workers tend to be in a lower social status whereas graduate workers are mostly affiliated to an upper class milieu. It is therefore possible that '*milieu trumps education*' in the lower social strata, while in upper class milieus the graduate qualification via the channel of economic resources actually makes an *additional* explanatory contribution for a mothers' labour market attachment.

**H3b:** *The hypothesis is confirmed.* More work experience, which reflects the mother's employment path, is associated with a higher probability of gainful employment and use of childcare in both age groups, as well as higher weekly working hours.

**H4a:** *The hypothesis is partially confirmed.* It is confirmed with regard to the use of childcare and partly with regard to weekly working hours, but it is not confirmed with regard to the probability of employment. Apparently, the theoretical argument that household productivity increases with the number of children only becomes more important from a "critical" threshold, which according to our descriptive analyses, is three children. For mothers with the youngest child aged 3-5 years, a smaller number of children usually goes hand in hand with more working hours per week.

**H4b:** *The hypothesis is partially confirmed.* The older the youngest child in the household, the more likely it is that the mother will use childcare and that she will be employed. Weekly working hours, however, cannot benefit from a higher child age in the two groups of mothers. This result is confirmed by analyses based on the Microcensus 2016: The full-time rate of mothers only equals the part-time rate at the age of the youngest child between 15 and 17 years, while for younger youngest children the full-time rate falls always short of the part-time rate. Moreover, this only applies to mothers with an academic degree; for the maternal population, part-time work dominates over full-time employment even in the last three years before the youngest child reaches full age (Statistisches Bundesamt 2017, p. 126). The positive relation of the use of childcare to the age of the youngest child might also be related to the above-mentioned attitudes towards maternal employment among young children.

**H4c:** *The hypothesis is confirmed.*

## 6 Conclusion

In summary, it can be seen that beyond the economic motives (human capital of mothers and their household context), cultural factors and basic orientations and values (milieu factors, region of origin among self-immigrated mothers) also shape mothers' daily practice, as expressed in their employment behaviour and the use of daycare centres.

Thus, the data does not support the notion of a 'dominance of culture over money'. Rather, cultural factors can be decisive in the event of equal economic endowments, and the opposite

holds also true. However, milieu affiliation tends to strengthen initial inequality in economic endowments even further, increasing the social divide. In addition, the length of stay in Germany is also relevant for employment propensity among immigrant mothers. Especially with regard to the probability of employment, mothers with a migrant background differ per se from mothers without a migrant background, beyond the characteristics of the country of origin, immigration period and other characteristics such as educational qualifications, mothers' employment experience, etc. The milieu affiliation tends to enforce the educational divide of mothers' labour market attachment, with graduate mothers benefitting from both economic resources and upper class-typical basic values such as a liberal basic attitude and the desire to lead a self-determined life on the one hand and lowly skilled mothers more often affiliated to lower classes with a preference for living in the here and now, shunning convention and achievement orientations on the other hand.

Some political implications derived from the results should be mentioned here. The negative association of the migration background with the employment probability of mothers of both age groups could refer to structural barriers in access to employment, e.g. due to qualification mismatches or discrimination. The empirical evidence for a higher overqualification of women with a foreign nationality or refugee background in Germany and Europe points to a relevant facet of inefficient use of resources, which is disadvantageous not only for those affected (e.g. in the form of wage reductions, cf. Boll/Leppin 2016), but also for society as a whole. The higher mismatch among women may also be related to their less well-developed social networks. The fewer social networks of female refugees with German people in the neighbourhood could be addressed by mentoring programmes (Liebig/Tronstad 2018). It has been shown that contact to German friends significantly impacts the employment status of refugee women in Germany (Worbs/Baraulina 2017). Further, German data from the Federal Employment Office shows that at the end of 2017, women accounted for almost one in three unemployed from the key refugee origin countries, but only for one in six participants from these countries who benefited from active labour market policy instruments and even for less than one in seven participants in refugee-specific measures (BAMF 2016). The causes of these discrepancies should be further investigated. Likewise, female refugees do not (yet) access the integration courses to the same degree as male refugees do even when women's proportion amongst refugees is controlled for; this is particularly the case for women with children (Worbs/Baraulina 2017). In order to facilitate the participation of mothers of small children in language courses, institutional childcare could be expanded during the courses. In addition, political communication and information campaigns should aim to raise awareness of the benefits of childcare use, especially for families of certain regions of origin who have hitherto had a disadvantage in use. Moreover, it seems important to avoid the impression of 'gagging from above' when communicating gender equality and family policy measures towards parents in the lower social strata and instead to emphasize more strongly the individual gain in freedom and scope for action (BMFSFJ 2008, p. 63).

Some limitations of this study should be noted. Due to the lack of a longitudinal data in combination with sometimes low observation numbers, it was not possible to derive causal relationships in this study. In addition, some criteria such as German language skills and qualifications acquired abroad could not be controlled for. With the continuous increase in content

and longitudinal scope of migrant and refugee data, the issue of unobserved heterogeneity within the migrant population may be addressed more appropriately in future years, ameliorating the robustness of achieved results.

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## Appendix

Table A1: Brief Profile of Sinus-Milieus® in Germany

<b>Upper classes</b>	
Established Conservative milieu	The classical Establishment: responsibility and success ethic; aspirations of exclusivity and leadership versus tendency towards withdrawal and seclusion
Liberal Intellectual milieu	The fundamentally liberal, enlightened educational elite with post-material roots; desire for self-determination; an array of intellectual interests
High Achiever milieu	Multi-optional, efficiency-oriented top performers with a global economic mindset and a claim to avantgarde style; high level of IT and multi-media expertise
Movers and Shakers milieu	The unconventional creative avant-garde: hyper-individualistic, mentally and geographically mobile, digitally networked, and always on the lookout for new challenges and change
<b>Middle classes</b>	
New Middle Class milieu	The modern mainstream with the will to achieve and adapt: general proponents of the social order; striving to become established at a professional and social level, seeking to lead a secure and harmonious existence
Adaptive Pragmatist milieu	The ambitious young core of society with a markedly pragmatic outlook on life and sense of expedience: success oriented and prepared to compromise, hedonistic and conventional, flexible and security oriented
Socio-ecological milieu	Idealistic, discerning consumers with normative notions of the 'right' way to live: pronounced ecological and social conscience; globalisation sceptics, standard bearers of political correctness and diversity
<b>Lower middle / lower classes</b>	
Traditional milieu	The security and order-loving wartime/post-war generation: rooted in the old world of the petty bourgeoisie or that of the traditional blue-collar culture
Precarious milieu	The lower class in search of orientation and social inclusion, with strong anxieties about the future and a sense of resentment: keeping up with the consumer standards of the broad middle classes in an attempt to compensate for social disadvantages; scant prospects of social advancement, a fundamentally delegative / reactive attitude to life, and withdrawal into own social environment
Escapist milieu	The fun and experience-oriented modern lower class/lower middle class: living in the here and now, shunning convention and the behavioural expectations of an achievement-oriented society

Source: SINUS Markt- und Sozialforschung GmbH (2015), p. 16.

Table A2: Status-orientation combinations (in italics) with their respective milieu names in the respectively valid milieu classification 2000-2009 or from 2010 onwards

<b>Social status</b>	<b>Upper class</b>	Upper Conservatives	Well-Established	Modern Performers
			Post-Materialists	
			Established conservatives Liberal intellectuals	High Achievers
		<i>Traditional upper class</i>	<i>Modern upper class</i>	<i>New upper class</i>
	<b>Middle class</b>	Nostalgics of former GDR	New middle class (2000)	Experimentalists
			New middle class (2010)	Movers and Shakers
			Socio-ecologicals	Adaptive-Pragmatists
		<i>Traditional middle class</i>	<i>Modern middle class</i>	<i>New middle class</i>
	<b>Lower class</b>	Traditionals	Consumer-Materialists	Escapists (2000)
		Traditionals	Precarious	Escapists (2010)
		<i>Traditional lower class</i>	<i>Modern lower class</i>	<i>New lower class</i>
		<b>Tradition</b>	<b>Modernisation</b>	<b>Re-orientation</b>
	<b>Basic values</b>			

Sources: Sinus Markt- und Sozialforschung GmbH (2015), p. 14-19; own illustration.

Remarks: The top row in each cell indicates the milieus according to the concept 2000-2009, the middle row of each cell the milieu valid from 2010 (if still available; blank lines indicate milieu mergers). The milieus in italics are the situation-orientation combinations used in the multivariate analyses.

Table A3: Estimation of childcare use (Model 4), sample 1

Specification of migration background	(a) direct/indirect (reference: no migration background)		(b) Country of origin (reference: no migration background)		(c) Year of immigration (reference: 1950-1994)		(d) Year of immigration (reference: no migration background)	
<b>Human capital</b>								
Age	-0.002	(0.0018)	-0.002	(0.0018)	-0.002	(0.0018)	-0.002	(0.0018)
Work experience	0.00356**	(0.0017)	0.00347**	(0.0017)	0.00376**	(0.0017)	0.00376**	(0.0017)
Education (reference: medium education)								
Low	-0.0387**	(0.0160)	-0.0410**	(0.0161)	-0.0391**	(0.0160)	-0.0391**	(0.0160)
Medium	reference		reference		reference		reference	
High	0.0519***	(0.0142)	0.0509***	(0.0143)	0.0506***	(0.0143)	0.0506***	(0.0143)
<b>Migration background</b>								
Refugee experience	-0.055	(0.0444)	-0.054	(0.0448)	-0.046	(0.0444)	-0.046	(0.0444)
Migration background (reference: no migration background)								
no migration background	reference							
direct migration background	-0.001	(0.0190)						
indirect migration background	-0.021	(0.0217)						
Country of origin (reference: no migration background)								
EU-28			0.015	(0.0249)				
South East Europe			0.020	(0.0342)				
Former CIS			-0.037	(0.0251)				
Arab/Muslim states			-0.020	(0.0425)				
Rest of the world			0.003	(0.0359)				
no migration background			reference					
indirect migration background			-0.021	(0.0218)				

Year of immigration (reference: 1950-1994/no migration background)

no migration background					0.030	(0.0245)	reference	
indirect migration background					0.011	(0.0275)	-0.019	(0.0218)
1950-1994					reference		-0.030	(0.0245)
1995-2009					0.036	(0.0262)	0.006	(0.0226)
2010-2015					0.0645*	(0.0348)	0.035	(0.0331)

**Milieu affiliation**

upper class#traditional	-0.081	(0.0511)	-0.081	(0.0507)	-0.081	(0.0510)	-0.081	(0.0510)
upper class#modern	-0.017	(0.0189)	-0.015	(0.0188)	-0.017	(0.0190)	-0.017	(0.0190)
upper class#new	0.016	(0.0234)	0.017	(0.0233)	0.016	(0.0233)	0.016	(0.0233)
middle class#traditional	-0.023	(0.0426)	-0.020	(0.0428)	-0.023	(0.0425)	-0.023	(0.0425)
middle class#modern	-0.025	(0.0208)	-0.024	(0.0207)	-0.026	(0.0207)	-0.026	(0.0207)
middle class#new	0.000	(0.0203)	0.001	(0.0202)	0.001	(0.0203)	0.001	(0.0203)
lower class#traditional	0.004	(0.0233)	0.005	(0.0233)	0.004	(0.0233)	0.004	(0.0233)
lower class#modern	-0.005	(0.0190)	-0.004	(0.0189)	-0.005	(0.0190)	-0.005	(0.0190)
lower class#new	reference		reference		reference		reference	

**Household context**

Dummy: no further direct migration background in the household	0.017	(0.0198)	0.014	(0.0201)	0.020	(0.0200)	0.020	(0.0200)
Dummy: no further indirect migration background in the household	0.031	(0.0234)	0.033	(0.0233)	0.032	(0.0233)	0.032	(0.0233)
Household type (1=single parent)	0.002	(0.0214)	0.003	(0.0215)	0.002	(0.0213)	0.002	(0.0213)
Number of children in the household	-0.0198***	(0.0072)	-0.0194***	(0.0073)	-0.0186**	(0.0073)	-0.0186**	(0.0073)
Age of youngest child	0.226***	(0.0090)	0.226***	(0.0090)	0.227***	(0.0090)	0.227***	(0.0090)
Dummy: Sex of child (1=female)	0.0187*	(0.0111)	0.0189*	(0.0111)	0.0187*	(0.0110)	0.0187*	(0.0110)

### Macro-level variables

Settlement structure (reference: Sparsely populated rural counties)

Large cities	0.0473*	(0.0244)	0.0454*	(0.0244)	0.0488**	(0.0244)	0.0488**	(0.0244)
Urban counties	0.020	(0.0179)	0.020	(0.0180)	0.020	(0.0178)	0.020	(0.0178)
Rural counties showing densification	0.028	(0.0188)	0.027	(0.0188)	0.029	(0.0187)	0.029	(0.0187)
Sparsely populated rural counties	reference		reference		reference		reference	
Unemployment rate	0.004	(0.0027)	0.003	(0.0027)	0.003	(0.0027)	0.003	(0.0027)
Labour force participation rate	0.000	(0.0025)	0.000	(0.0025)	0.000	(0.0025)	0.000	(0.0025)
GDP per capita	0.001	(0.0004)	0.001	(0.0004)	0.001	(0.0004)	0.001	(0.0004)
Total fertility rate	0.018	(0.0722)	0.023	(0.0719)	0.019	(0.0720)	0.019	(0.0720)
Childcare coverage of the respective age group	0.00824***	(0.0011)	0.00830***	(0.0011)	0.00824***	(0.0011)	0.00824***	(0.0011)
Full-time childcare coverage of the respective age group	-0.00292***	(0.0011)	-0.00296***	(0.0011)	-0.00295***	(0.0011)	-0.00295***	(0.0011)

### Year

2007	-0.030	(0.0287)	-0.028	(0.0286)	-0.024	(0.0288)	-0.024	(0.0288)
2008	-0.045	(0.0279)	-0.044	(0.0278)	-0.039	(0.0280)	-0.039	(0.0280)
2009	-0.043	(0.0281)	-0.042	(0.0279)	-0.036	(0.0282)	-0.036	(0.0282)
2010	-0.023	(0.0262)	-0.022	(0.0261)	-0.019	(0.0262)	-0.019	(0.0262)
2011	0.001	(0.0237)	0.003	(0.0237)	0.006	(0.0237)	0.006	(0.0237)
2012	-0.035	(0.0234)	-0.032	(0.0235)	-0.029	(0.0235)	-0.029	(0.0235)
2013	-0.001	(0.0198)	0.000	(0.0197)	0.002	(0.0198)	0.002	(0.0198)
2014	-0.025	(0.0161)	-0.023	(0.0160)	-0.021	(0.0160)	-0.021	(0.0160)
2015	reference		reference		reference		reference	

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Standard errors in parentheses

\* p<0.1, \*\* p<0.05, \*\*\* p<0.01

Sources: SOEP v33, BBSR 2018; Federal and State Statistical Offices 2008-2016; HWWI.

Table A4: Estimation of childcare use (Model 4), sample 2

Specification of migration background	(a) direct/indirect (reference: no migration background)		(b) Country of origin (reference: no migration background)		(c) Year of immigration (reference: 1950-1994)		(d) Year of immigration (reference: no migration background)	
<b>Human capital</b>								
Age	-0.00209**	(0.0010)	-0.00192*	(0.0010)	-0.00212**	(0.0010)	-0.00212**	(0.0010)
Work experience	0.00305***	(0.0009)	0.00294***	(0.0009)	0.00302***	(0.0009)	0.00302***	(0.0009)
Education (reference: medium education)								
Low	-0.0270**	(0.0117)	-0.0242**	(0.0119)	-0.0275**	(0.0117)	-0.0275**	(0.0117)
Medium	reference		reference		reference		reference	
High	0.0268***	(0.0080)	0.0257***	(0.0080)	0.0278***	(0.0080)	0.0278***	(0.0080)
<b>Migration background</b>								
Refugee experience	0.005	(0.0221)	0.006	(0.0231)	0.005	(0.0221)	0.005	(0.0221)
Migration background (reference: no migration background)								
no migration background	reference							
direct migration background	-0.017	(0.0114)						
indirect migration background	-0.014	(0.0132)						
Country of origin (reference: no migration background)								
EU-28			-0.014	(0.0157)				
South East Europe			-0.0408**	(0.0205)				
Former CIS			-0.013	(0.0153)				
Arab/Muslim states			-0.011	(0.0260)				
Rest of the world			-0.007	(0.0205)				
no migration background			reference					
indirect migration background			-0.015	(0.0132)				



Year of immigration (reference: 1950-1994/no migration background)

no migration background					0.005	(0.0133)	reference	
indirect migration background					-0.009	(0.0162)	-0.015	(0.0132)
1950-1994					reference		-0.005	(0.0133)
1995-2009					-0.015	(0.0144)	-0.021	(0.0137)
2010-2015					-0.045	(0.0292)	-0.0501*	(0.0291)

**Milieu affiliation**

upper class#traditional	0.024	(0.0263)	0.024	(0.0264)	0.025	(0.0261)	0.025	(0.0261)
upper class#modern	reference		reference		reference		reference	
upper class#new	0.011	(0.0124)	0.012	(0.0124)	0.011	(0.0124)	0.011	(0.0124)
middle class#traditional	0.013	(0.0286)	0.014	(0.0285)	0.014	(0.0284)	0.014	(0.0284)
middle class#modern	-0.002	(0.0118)	-0.002	(0.0118)	-0.002	(0.0118)	-0.002	(0.0118)
middle class#new	0.004	(0.0117)	0.005	(0.0117)	0.004	(0.0117)	0.004	(0.0117)
lower class#traditional	-0.014	(0.0122)	-0.013	(0.0122)	-0.014	(0.0121)	-0.014	(0.0121)
lower class#modern	-0.014	(0.0122)	-0.013	(0.0123)	-0.013	(0.0122)	-0.013	(0.0122)
lower class#new	-0.011	(0.0117)	-0.009	(0.0117)	-0.010	(0.0117)	-0.010	(0.0117)

**Household context**

Dummy: no further direct migration background in the household	-0.002	(0.0114)	-0.004	(0.0116)	-0.003	(0.0115)	-0.003	(0.0115)
Dummy: no further indirect migration background in the household	0.003	(0.0124)	0.001	(0.0125)	0.004	(0.0124)	0.004	(0.0124)
Household type (1=single parent)	0.002	(0.0122)	0.001	(0.0121)	0.003	(0.0122)	0.003	(0.0122)
Number of children in the household	-0.00942**	(0.0042)	-0.00934**	(0.0043)	-0.0102**	(0.0043)	-0.0102**	(0.0043)
Age of youngest child	0.127***	(0.0048)	0.127***	(0.0048)	0.127***	(0.0048)	0.127***	(0.0048)
Dummy: Sex of child (1=female)	0.0124*	(0.0068)	0.0121*	(0.0068)	0.0125*	(0.0068)	0.0125*	(0.0068)

### Macro-level variables

Settlement structure (reference: Sparsely populated rural counties)

Large cities	0.010	(0.0145)	0.011	(0.0144)	0.009	(0.0143)	0.009	(0.0143)
Urban counties	-0.0230**	(0.0115)	-0.0227**	(0.0115)	-0.0248**	(0.0114)	-0.0248**	(0.0114)
Rural counties showing densification	-0.003	(0.0120)	-0.002	(0.0120)	-0.004	(0.0119)	-0.004	(0.0119)
Sparsely populated rural counties	reference		reference		reference		reference	
Unemployment rate	-0.001	(0.0016)	-0.001	(0.0016)	-0.001	(0.0016)	-0.001	(0.0016)
Labour force participation rate	0.00278*	(0.0015)	0.00286*	(0.0015)	0.00281*	(0.0015)	0.00281*	(0.0015)
GDP per capita	0.000	(0.0003)	0.000	(0.0003)	0.000	(0.0003)	0.000	(0.0003)
Total fertility rate	0.006	(0.0435)	0.003	(0.0435)	0.006	(0.0432)	0.006	(0.0432)
Childcare coverage of the respective age group	0.00398***	(0.0010)	0.00403***	(0.0010)	0.00402***	(0.0010)	0.00402***	(0.0010)
Full-time childcare coverage of the respective age group	0.00105***	(0.0002)	0.00105***	(0.0002)	0.00104***	(0.0002)	0.00104***	(0.0002)

### Year

2007	-0.013	(0.0155)	-0.012	(0.0155)	-0.014	(0.0156)	-0.014	(0.0156)
2008	-0.0355**	(0.0151)	-0.0346**	(0.0151)	-0.0373**	(0.0153)	-0.0373**	(0.0153)
2009	-0.014	(0.0157)	-0.014	(0.0157)	-0.015	(0.0158)	-0.015	(0.0158)
2010	-0.012	(0.0163)	-0.012	(0.0163)	-0.014	(0.0164)	-0.014	(0.0164)
2011	-0.0233*	(0.0139)	-0.0233*	(0.0139)	-0.0244*	(0.0139)	-0.0244*	(0.0139)
2012	0.000	(0.0130)	0.000	(0.0130)	-0.001	(0.0130)	-0.001	(0.0130)
2013	0.002	(0.0115)	0.002	(0.0115)	0.002	(0.0115)	0.002	(0.0115)
2014	reference		reference		reference		reference	
2015	-0.0207*	(0.0108)	-0.0212**	(0.0108)	-0.0181*	(0.0108)	-0.0181*	(0.0108)

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N	6253		6253		6253		6253	
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Standard errors in parentheses

\* p<0.1, \*\* p<0.05, \*\*\* p<0.01

Sources: SOEP v33, BBSR 2018; Federal and State Statistical Offices 2008-2016; HWWI.

Table A5: Estimation of the employment propensity (Model 1), sample 1

Specification of migration background	(a) direct/indirect (reference: no migration background)		(b) Country of origin (reference: no migration background)		(c) Year of immigration (reference: 1950-1994)		(d) Year of immigration (reference: no migration background)	
<b>Human capital</b>								
Age	-0.0573***	(0.0097)	-0.0571***	(0.0097)	-0.0581***	(0.0096)	-0.0581***	(0.0096)
Work experience	0.0798***	(0.0095)	0.0792***	(0.0094)	0.0798***	(0.0095)	0.0798***	(0.0095)
Education (reference: medium education)								
Low	-0.244**	(0.1030)	-0.240**	(0.1050)	-0.249**	(0.1040)	-0.249**	(0.1040)
Medium	reference		reference		reference		reference	
High	0.329***	(0.0728)	0.331***	(0.0735)	0.346***	(0.0736)	0.346***	(0.0736)
<b>Migration background</b>								
Refugee experience	-0.053	(0.2720)	0.107	(0.2890)	-0.117	(0.2800)	-0.117	(0.2800)
Migration background (reference: no migration background)								
no migration background	reference							
direct migration background	-0.273***	(0.0895)						
indirect migration background	-0.237**	(0.1110)						
Country of origin (reference: no migration background)								
EU-28			-0.189	(0.1160)				
South East Europe			-0.449***	(0.1620)				
Former CIS			-0.237*	(0.1250)				
Arab/Muslim states			-0.940***	(0.3320)				
Rest of the world			-0.268	(0.1870)				
no migration background			reference					
indirect migration background			-0.245**	(0.1120)				

Year of immigration (reference: 1950-1994/no migration background)

no migration background					0.146	(0.1170)	reference	
indirect migration background					-0.105	(0.1400)	-0.251**	(0.1120)
1950-1994					reference		-0.146	(0.1170)
1995-2009					-0.127	(0.1270)	-0.273***	(0.1050)
2010-2015					-0.516***	(0.1900)	-0.662***	(0.1760)

**Milieu affiliation**

upper class#traditional	-0.220	(0.3000)	-0.226	(0.3010)	-0.211	(0.3000)	-0.211	(0.3000)
upper class#modern	reference		reference		reference		reference	
upper class#new	-0.044	(0.1070)	-0.033	(0.1080)	-0.040	(0.1070)	-0.040	(0.1070)
middle class#traditional	-0.142	(0.1960)	-0.138	(0.1970)	-0.140	(0.1970)	-0.140	(0.1970)
middle class#modern	0.179*	(0.0960)	0.183*	(0.0964)	0.185*	(0.0963)	0.185*	(0.0963)
middle class#new	0.091	(0.0918)	0.089	(0.0922)	0.085	(0.0917)	0.085	(0.0917)
lower class#traditional	0.020	(0.1040)	0.022	(0.1040)	0.027	(0.1040)	0.027	(0.1040)
lower class#modern	0.015	(0.0923)	0.021	(0.0928)	0.019	(0.0926)	0.019	(0.0926)
lower class#new	-0.112	(0.0933)	-0.100	(0.0945)	-0.108	(0.0934)	-0.108	(0.0934)

**Household context**

Dummy: no further direct migration background in the household	0.022	(0.0977)	0.023	(0.0986)	-0.002	(0.0987)	-0.002	(0.0987)
Dummy: no further indirect migration background in the household	-0.012	(0.1050)	-0.015	(0.1060)	-0.009	(0.1050)	-0.009	(0.1050)
Household type (1=single parent)	-0.444***	(0.1260)	-0.437***	(0.1270)	-0.441***	(0.1270)	-0.441***	(0.1270)
Number of children in the household	0.002	(0.0364)	0.007	(0.0367)	-0.008	(0.0364)	-0.008	(0.0364)
Age of youngest child	0.579***	(0.1050)	0.604***	(0.1110)	0.587***	(0.1120)	0.587***	(0.1120)
estimated childcare use	1.043**	(0.4130)	1.100**	(0.4430)	1.100**	(0.4480)	1.100**	(0.4480)

### Macro-level variables

Settlement structure (reference: Sparsely populated rural counties)

Large cities	-0.053	(0.1290)	-0.055	(0.1300)	-0.062	(0.1300)	-0.062	(0.1300)
Urban counties	0.032	(0.0943)	0.027	(0.0949)	0.027	(0.0948)	0.027	(0.0948)
Rural counties showing densification	-0.013	(0.1070)	-0.017	(0.1070)	-0.018	(0.1080)	-0.018	(0.1080)
Sparsely populated rural counties	reference		reference		reference		reference	
Unemployment rate	-0.0343**	(0.0135)	-0.0320**	(0.0140)	-0.0327**	(0.0140)	-0.0327**	(0.0140)
Labour force participation rate	-0.005	(0.0125)	-0.006	(0.0126)	-0.004	(0.0126)	-0.004	(0.0126)
GDP per capita	0.001	(0.0024)	0.001	(0.0024)	0.001	(0.0025)	0.001	(0.0025)
Total fertility rate	-0.108	(0.3390)	-0.083	(0.3390)	-0.113	(0.3400)	-0.113	(0.3400)

### Year

2007	0.004	(0.1430)	-0.012	(0.1470)	-0.061	(0.1450)	-0.061	(0.1450)
2008	-0.058	(0.1410)	-0.073	(0.1430)	-0.122	(0.1420)	-0.122	(0.1420)
2009	0.194	(0.1290)	0.184	(0.1320)	0.131	(0.1310)	0.131	(0.1310)
2010	-0.328**	(0.1350)	-0.334**	(0.1350)	-0.385***	(0.1350)	-0.385***	(0.1350)
2011	0.099	(0.1140)	0.100	(0.1150)	0.045	(0.1140)	0.045	(0.1140)
2012	-0.062	(0.1110)	-0.072	(0.1120)	-0.122	(0.1110)	-0.122	(0.1110)
2013	0.059	(0.0938)	0.059	(0.0941)	0.014	(0.0945)	0.014	(0.0945)
2014	-0.070	(0.0838)	-0.075	(0.0844)	-0.120	(0.0839)	-0.120	(0.0839)
2015	reference		reference		reference		reference	

Constant	0.413	(1.0450)	0.368	(1.0600)	0.303	(1.0650)	0.449	(1.0580)
N	3792		3792		3792		3792	

Standard errors in parentheses

\* p<0.1, \*\* p<0.05, \*\*\* p<0.01

Sources: SOEP v33, BBSR 2018; Federal and State Statistical Offices 2008-2016; HWWI.

Table A6: Estimation of the employment propensity (Model 2), sample 1

Specification of migration background	(a) direct/indirect (reference: no migration background)		(b) Country of origin (reference: no migration background)		(c) Year of immigration (reference: 1950-1994)		(d) Year of immigration (reference: no migration background)	
<b>Human capital</b>								
Age	-0.0134***	(0.0021)	-0.0133***	(0.0021)	-0.0134***	(0.0021)	-0.0134***	(0.0021)
Work experience	0.0207***	(0.0023)	0.0204***	(0.0023)	0.0205***	(0.0023)	0.0205***	(0.0023)
Education (reference: medium education)								
Low	-0.0595***	(0.0205)	-0.0595***	(0.0210)	-0.0592***	(0.0205)	-0.0592***	(0.0205)
Medium	reference		reference		reference		reference	
High	0.106***	(0.0197)	0.105***	(0.0198)	0.108***	(0.0196)	0.108***	(0.0196)
<b>Migration background</b>								
Refugee experience	-0.022	(0.0498)	0.001	(0.0526)	-0.032	(0.0507)	-0.032	(0.0507)
Migration background (reference: no migration background)								
no migration background	reference							
direct migration background	-0.0634***	(0.0223)						
indirect migration background	-0.0587**	(0.0263)						
Country of origin (reference: no migration background)								
EU-28			-0.043	(0.0308)				
South East Europe			-0.0713**	(0.0324)				
Former CIS			-0.0661**	(0.0305)				
Arab/Muslim states			-0.143***	(0.0411)				
Rest of the world			-0.0718*	(0.0412)				
no migration background			reference					
indirect migration background			-0.0599**	(0.0264)				

Year of immigration (reference: 1950-1994/no migration background)

no migration background					0.041	(0.0295)	reference	
indirect migration background					-0.020	(0.0327)	-0.0611**	(0.0262)
1950-1994					reference		-0.041	(0.0295)
1995-2009					-0.021	(0.0297)	-0.0617**	(0.0253)
2010-2015					-0.0874**	(0.0382)	-0.128***	(0.0348)

**Milieu affiliation**

upper class#traditional	-0.074	(0.0768)	-0.076	(0.0767)	-0.072	(0.0765)	-0.072	(0.0765)
upper class#modern	reference		reference		reference		reference	
upper class#new	0.008	(0.0295)	0.008	(0.0295)	0.008	(0.0294)	0.008	(0.0294)
middle class#traditional	-0.024	(0.0519)	-0.023	(0.0520)	-0.023	(0.0520)	-0.023	(0.0520)
middle class#modern	0.042	(0.0279)	0.042	(0.0279)	0.042	(0.0279)	0.042	(0.0279)
middle class#new	0.029	(0.0252)	0.028	(0.0252)	0.028	(0.0252)	0.028	(0.0252)
lower class#traditional	0.008	(0.0287)	0.008	(0.0286)	0.009	(0.0287)	0.009	(0.0287)
lower class#modern	0.012	(0.0244)	0.012	(0.0244)	0.012	(0.0244)	0.012	(0.0244)
lower class#new	-0.017	(0.0236)	-0.016	(0.0238)	-0.017	(0.0236)	-0.017	(0.0236)

**Household context**

Dummy: no further direct migration background in the household	0.024	(0.0241)	0.023	(0.0246)	0.020	(0.0243)	0.020	(0.0243)
Dummy: no further indirect migration background in the household	0.014	(0.0269)	0.013	(0.0272)	0.014	(0.0270)	0.014	(0.0270)
Household type (1=single parent)	-0.0908***	(0.0266)	-0.0901***	(0.0268)	-0.0895***	(0.0266)	-0.0895***	(0.0266)
Number of children in the household	-0.001	(0.0084)	0.000	(0.0084)	-0.003	(0.0084)	-0.003	(0.0084)
Age of youngest child	0.200***	(0.0238)	0.201***	(0.0238)	0.199***	(0.0238)	0.199***	(0.0238)
estimated childcare use	0.032	(0.1170)	0.029	(0.1170)	0.031	(0.1170)	0.031	(0.1170)

### Macro-level variables

Settlement structure (reference: Sparsely populated rural counties)

Large cities	-0.001	(0.0332)	-0.002	(0.0332)	-0.004	(0.0331)	-0.004	(0.0331)
Urban counties	0.004	(0.0253)	0.003	(0.0254)	0.002	(0.0254)	0.002	(0.0254)
Rural counties showing densification	0.013	(0.0285)	0.012	(0.0285)	0.012	(0.0285)	0.012	(0.0285)
Sparsely populated rural counties	reference		reference		reference		reference	
Unemployment rate	-0.002	(0.0035)	-0.002	(0.0035)	-0.002	(0.0035)	-0.002	(0.0035)
Labour force participation rate	0.002	(0.0033)	0.001	(0.0033)	0.002	(0.0033)	0.002	(0.0033)
GDP per capita	0.000	(0.0006)	0.000	(0.0006)	0.000	(0.0006)	0.000	(0.0006)
Total fertility rate	-0.036	(0.0886)	-0.034	(0.0886)	-0.035	(0.0885)	-0.035	(0.0885)

### Year

2007	-0.052	(0.0361)	-0.052	(0.0362)	-0.0637*	(0.0362)	-0.0637*	(0.0362)
2008	-0.0602*	(0.0349)	-0.0606*	(0.0350)	-0.0723**	(0.0349)	-0.0723**	(0.0349)
2009	0.012	(0.0344)	0.012	(0.0344)	0.000	(0.0344)	0.000	(0.0344)
2010	-0.111***	(0.0320)	-0.110***	(0.0321)	-0.122***	(0.0321)	-0.122***	(0.0321)
2011	0.015	(0.0305)	0.016	(0.0305)	0.004	(0.0307)	0.004	(0.0307)
2012	-0.043	(0.0298)	-0.042	(0.0299)	-0.0544*	(0.0299)	-0.0544*	(0.0299)
2013	0.016	(0.0235)	0.017	(0.0236)	0.006	(0.0241)	0.006	(0.0241)
2014	-0.027	(0.0206)	-0.025	(0.0207)	-0.0366*	(0.0210)	-0.0366*	(0.0210)
2015	reference		reference		reference		reference	

Constant	0.202	(0.2750)	0.217	(0.2750)	0.176	(0.2750)	0.217	(0.2750)
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N	3792		3792		3792		3792	
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Standard errors in parentheses

\* p<0.1, \*\* p<0.05, \*\*\* p<0.01

Sources: SOEP v33, BBSR 2018; Federal and State Statistical Offices 2008-2016; HWWI.



Table A7: Estimation of hours of work (Model 3), sample 1

Specification of migration background	(a) direct/indirect (reference: no migration background)		(b) Country of origin (reference: no migration background)		(c) Year of immigration (reference: 1950-1994)		(d) Year of immigration (reference: no migration background)	
<b>Human capital</b>								
Age	-0.331*	(0.1720)	-0.329*	(0.1730)	-0.338*	(0.1760)	-0.338*	(0.1760)
Work experience	0.521***	(0.1520)	0.511***	(0.1530)	0.533***	(0.1550)	0.533***	(0.1552)
Education (reference: medium education)								
Low	-0.250	(2.1760)	-0.218	(2.1960)	-0.316	(2.1840)	-0.316	(2.1842)
Medium	reference		reference		reference		reference	
High	3.245***	(1.1510)	3.241***	(1.1470)	3.237***	(1.1650)	3.237***	(1.1650)
Last sector (reference: not applicable)								
not applicable	reference		reference		reference		reference	
Agriculture	12.89*	(7.1960)	12.86*	(7.2240)	12.90*	(7.2000)	12.90*	(7.2003)
Manufacturing	5.918*	(3.3070)	5.831*	(3.3250)	6.052*	(3.3370)	6.052*	(3.3373)
Construction	5.647*	(3.0950)	5.558*	(3.0680)	5.719*	(3.1540)	5.719*	(3.1545)
Trade	5.454**	(2.5940)	5.503**	(2.6170)	5.526**	(2.5930)	5.526**	(2.5927)
Transport	9.392	(7.4910)	9.413	(7.4190)	9.256	(7.4140)	9.256	(7.4136)
Bank, Insurance	8.878	(5.4470)	9.134*	(5.4960)	8.764	(5.4270)	8.764	(5.4274)
Services	0.453	(1.2060)	0.545	(1.2010)	0.446	(1.2070)	0.446	(1.2073)
Dummy: last sector (public services)	1.744*	(1.0250)	1.765*	(1.0270)	1.766*	(1.0250)	1.766*	(1.0255)
<b>Migration background</b>								
Refugee experience	2.541	(4.6820)	2.969	(5.2360)	2.470	(4.7980)	2.470	(4.7976)
Migration background (reference: no migration background)								
no migration background	reference							
direct migration background	-0.560	(1.4080)						
indirect migration background	-2.727	(2.0060)						

Country of origin (reference: no migration background)								
EU-28			0.051	(1.7680)				
South East Europe			-2.680	(4.2920)				
Former CIS			-1.557	(1.9840)				
Arab/Muslim states			6.057	(8.6070)				
Rest of the world			-0.210	(3.1060)				
no migration background			reference					
indirect migration background			-2.816	(2.0070)				
Year of immigration (reference: 1950-1994/no migration background)								
no migration background					1.585	(1.8700)	reference	
indirect migration background					-1.056	(2.5620)	-2.640	(2.0126)
1950-1994					reference		-1.585	(1.8696)
1995-2009					1.763	(2.4530)	0.178	(1.9058)
2010-2015					1.644	(3.7780)	0.060	(3.4927)
<b>Milieu affiliation</b>								
upper class#traditional	6.514	(6.1750)	6.365	(6.1740)	6.548	(6.2030)	6.548	(6.2031)
upper class#modern	reference		reference		reference		reference	
upper class#new	-2.269	(1.5350)	-2.250	(1.5500)	-2.283	(1.5380)	-2.283	(1.5383)
middle class#traditional	-5.882**	(2.4440)	-5.889**	(2.4440)	-5.944**	(2.4540)	-5.944**	(2.4537)
middle class#modern	-2.209	(1.5460)	-2.213	(1.5330)	-2.291	(1.5520)	-2.291	(1.5520)
middle class#new	-0.862	(1.4200)	-0.763	(1.4190)	-0.814	(1.4210)	-0.814	(1.4212)
lower class#traditional	-2.838*	(1.5890)	-2.853*	(1.5880)	-2.899*	(1.5910)	-2.899*	(1.5914)
lower class#modern	-3.109**	(1.5110)	-2.990**	(1.5060)	-3.156**	(1.5180)	-3.156**	(1.5182)
lower class#new	1.803	(1.6890)	1.746	(1.6950)	1.750	(1.6950)	1.750	(1.6946)
<b>Household context</b>								
Dummy: no further direct migration background in the household	-1.249	(1.4650)	-1.362	(1.4830)	-1.207	(1.4650)	-1.207	(1.4646)
Dummy: no further indirect migration background in the household	-0.520	(1.6930)	-0.556	(1.6900)	-0.548	(1.7060)	-0.548	(1.7058)
Household type (1=single parent)	-0.678	(2.1830)	-0.769	(2.1920)	-0.643	(2.1980)	-0.643	(2.1984)
Number of children in the household	-0.874	(0.6730)	-0.869	(0.6800)	-0.825	(0.6770)	-0.825	(0.6768)

Age of youngest child	-4.694***	(1.3300)	-4.468***	(1.3340)	-4.675***	(1.3380)	-4.675***	(1.3384)
estimated childcare use	16.12***	(3.7600)	15.87***	(3.7270)	16.09***	(3.7850)	16.09***	(3.7851)
<b>Macro-level variables</b>								
Settlement structure (reference: Sparsely populated rural counties)								
Large cities	-2.330	(2.0830)	-2.461	(2.0780)	-2.291	(2.0830)	-2.291	(2.0831)
Urban counties	-0.764	(1.5950)	-0.856	(1.5930)	-0.772	(1.5920)	-0.772	(1.5924)
Rural counties showing densification	-0.323	(1.5510)	-0.450	(1.5510)	-0.260	(1.5540)	-0.260	(1.5544)
Sparsely populated rural counties	reference		reference		reference		reference	
Unemployment rate	0.685***	(0.2190)	0.698***	(0.2190)	0.680***	(0.2190)	0.680***	(0.2193)
Labour force participation rate	0.044	(0.2010)	0.040	(0.2020)	0.043	(0.2030)	0.043	(0.2029)
GDP per capita	-0.051	(0.0378)	-0.050	(0.0378)	-0.051	(0.0380)	-0.051	(0.0380)
Total fertility rate	-8.882	(5.8060)	-8.592	(5.8040)	-8.628	(5.7770)	-8.628	(5.7775)
<b>Year</b>								
2007	-4.676**	(2.0860)	-4.591**	(2.0860)	-4.444**	(2.0720)	-4.444**	(2.0723)
2008	-3.205	(2.1860)	-3.056	(2.1520)	-2.979	(2.2030)	-2.979	(2.2025)
2009	-1.453	(2.1220)	-1.287	(2.1030)	-1.215	(2.1020)	-1.215	(2.1018)
2010	-2.406	(2.2610)	-2.234	(2.2370)	-2.200	(2.2620)	-2.200	(2.2623)
2011	-1.419	(1.8280)	-1.295	(1.8070)	-1.237	(1.8290)	-1.237	(1.8292)
2012	1.084	(2.0670)	1.244	(2.0690)	1.282	(2.0810)	1.282	(2.0807)
2013	-0.276	(1.6470)	-0.117	(1.6250)	-0.205	(1.6330)	-0.205	(1.6328)
2014	0.146	(1.4450)	0.291	(1.4320)	0.256	(1.4460)	0.256	(1.4462)
2015	reference		reference		reference		reference	
inverse Mill's ratio	0.0894*	(0.0528)	0.104*	(0.0596)	0.0861*	(0.0517)	0.0861*	(0.0517)
Constant	42.66**	(18.8300)	42.16**	(18.8900)	40.72**	(19.0200)	42.30**	(18.9412)

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N	993	993	993	993
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Standard errors in parentheses  
 \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

Sources: SOEP v33, BBSR 2018; Federal and State Statistical Offices 2008-2016; HWWI.

Table A8: Estimation of the employment propensity (Model 1), sample 2

Specification of migration background	(a) direct/indirect (reference: no migration background)		(b) Country of origin (reference: no migration background)		(c) Year of immigration (reference: 1950-1994)		(d) Year of immigration (reference: no migration background)	
<b>Human capital</b>								
Age	-0.0869***	(0.0070)	-0.0873***	(0.0070)	-0.0886***	(0.0070)	-0.0886***	(0.0070)
Work experience	0.135***	(0.0069)	0.135***	(0.0069)	0.136***	(0.0069)	0.136***	(0.0069)
Education (reference: medium education)								
Low	-0.362***	(0.0727)	-0.367***	(0.0728)	-0.368***	(0.0719)	-0.368***	(0.0719)
Medium	reference		reference		reference		reference	
High	0.505***	(0.0609)	0.511***	(0.0614)	0.532***	(0.0617)	0.532***	(0.0617)
<b>Migration background</b>								
Refugee experience	-0.163	(0.1800)	-0.048	(0.1960)	-0.195	(0.1830)	-0.195	(0.1830)
Migration background (reference: no migration background)								
no migration background	reference							
direct migration background	-0.274***	(0.0752)						
indirect migration background	-0.258**	(0.1030)						
Country of origin (reference: no migration background)								
EU-28			-0.220**	(0.1030)				
South East Europe			-0.195	(0.1320)				
Former CIS			-0.234**	(0.0980)				
Arab/Muslim states			-0.759***	(0.1990)				
Rest of the world			-0.433***	(0.1540)				
no migration background			reference					
indirect migration background			-0.253**	(0.1030)				

Year of immigration (reference: 1950-1994/no migration background)

no migration background					-0.064	(0.0958)	reference	
indirect migration background					-0.331***	(0.1220)	-0.268***	(0.1030)
1950-1994					reference		0.064	(0.0958)
1995-2009					-0.486***	(0.1020)	-0.422***	(0.0876)
2010-2015					-0.944***	(0.1750)	-0.880***	(0.1700)

**Milieu affiliation**

upper class#traditional	-0.125	(0.2070)	-0.125	(0.2060)	-0.118	(0.2000)	-0.118	(0.2000)
upper class#modern	reference		reference		reference		reference	
upper class#new	0.050	(0.0942)	0.053	(0.0941)	0.038	(0.0942)	0.038	(0.0942)
middle class#traditional	-0.135	(0.1580)	-0.135	(0.1580)	-0.115	(0.1590)	-0.115	(0.1590)
middle class#modern	-0.091	(0.0802)	-0.090	(0.0804)	-0.091	(0.0802)	-0.091	(0.0802)
middle class#new	-0.016	(0.0813)	-0.015	(0.0819)	-0.020	(0.0811)	-0.020	(0.0811)
lower class#traditional	-0.131	(0.0887)	-0.122	(0.0887)	-0.123	(0.0890)	-0.123	(0.0890)
lower class#modern	-0.003	(0.0803)	-0.006	(0.0804)	-0.005	(0.0806)	-0.005	(0.0806)
lower class#new	-0.247***	(0.0792)	-0.246***	(0.0792)	-0.234***	(0.0791)	-0.234***	(0.0791)

**Household context**

Dummy: no further direct migration background in the household	0.071	(0.0813)	0.090	(0.0823)	0.061	(0.0821)	0.061	(0.0821)
Dummy: no further indirect migration background in the household	0.097	(0.1040)	0.102	(0.1040)	0.101	(0.1030)	0.101	(0.1030)
Household type (1=single parent)	-0.283***	(0.0685)	-0.281***	(0.0685)	-0.275***	(0.0688)	-0.275***	(0.0688)
Number of children in the household	-0.023	(0.0318)	-0.020	(0.0319)	-0.039	(0.0321)	-0.039	(0.0321)
Age of youngest child	0.108***	(0.0230)	0.108***	(0.0232)	0.102***	(0.0230)	0.102***	(0.0230)
estimated childcare use	0.816***	(0.1500)	0.811***	(0.1520)	0.850***	(0.1500)	0.850***	(0.1500)

**Macro-level variables**

Settlement structure (reference: Sparsely populated rural counties)

Large cities	0.112	(0.0974)	0.105	(0.0977)	0.102	(0.0978)	0.102	(0.0978)
Urban counties	-0.013	(0.0744)	-0.015	(0.0743)	-0.039	(0.0746)	-0.039	(0.0746)
Rural counties showing densification	0.007	(0.0797)	0.007	(0.0794)	0.003	(0.0800)	0.003	(0.0800)
Sparsely populated rural counties	reference		reference		reference		reference	
Unemployment rate	0.000	(0.0090)	0.000	(0.0091)	-0.001	(0.0091)	-0.001	(0.0091)
Labour force participation rate	0.0181*	(0.0095)	0.0168*	(0.0096)	0.0190**	(0.0096)	0.0190**	(0.0096)
GDP per capita	0.002	(0.0020)	0.002	(0.0021)	0.002	(0.0021)	0.002	(0.0021)
Total fertility rate	0.783***	(0.2680)	0.776***	(0.2670)	0.747***	(0.2680)	0.747***	(0.2680)
<b>Year</b>								
2007	-0.009	(0.0898)	-0.018	(0.0897)	-0.051	(0.0899)	-0.051	(0.0899)
2008	0.027	(0.0900)	0.020	(0.0898)	-0.010	(0.0900)	-0.010	(0.0900)
2009	0.118	(0.0896)	0.115	(0.0893)	0.082	(0.0898)	0.082	(0.0898)
2010	-0.021	(0.0916)	-0.024	(0.0915)	-0.049	(0.0918)	-0.049	(0.0918)
2011	-0.071	(0.0815)	-0.070	(0.0818)	-0.097	(0.0823)	-0.097	(0.0823)
2012	-0.006	(0.0826)	0.000	(0.0830)	-0.033	(0.0830)	-0.033	(0.0830)
2013	0.010	(0.0660)	0.012	(0.0663)	0.031	(0.0669)	0.031	(0.0669)
2014	reference		reference		reference		reference	
2015	0.020	(0.0498)	0.028	(0.0498)	0.063	(0.0507)	0.063	(0.0507)
Constant	-1.442*	(0.8310)	-1.353	(0.8310)	-1.305	(0.8330)	-1.369	(0.8340)
N	6227		6227		6227		6227	

Standard errors in parentheses

\* p<0.1, \*\* p<0.05, \*\*\* p<0.01

Sources: SOEP v33, BBSR 2018; Federal and State Statistical Offices 2008-2016; HWWI.

Table A9: Estimation of the employment propensity (Model 2), sample 2

Specification of migration background	(a) direct/indirect (reference: no migration background)		(b) Country of origin (reference: no migration background)		(c) Year of immigration (reference: 1950-1994)		(d) Year of immigration (reference: no migration background)	
<b>Human capital</b>								
Age	-0.0231***	(0.0020)	-0.0231***	(0.0020)	-0.0234***	(0.0020)	-0.0234***	(0.0020)
Work experience	0.0353***	(0.0018)	0.0352***	(0.0017)	0.0351***	(0.0018)	0.0351***	(0.0018)
Education (reference: medium education)								
Low	-0.113***	(0.0271)	-0.113***	(0.0265)	-0.113***	(0.0268)	-0.113***	(0.0268)
Medium	reference		reference		reference		reference	
High	0.125***	(0.0190)	0.126***	(0.0185)	0.130***	(0.0191)	0.130***	(0.0191)
<b>Migration background</b>								
Refugee experience	-0.031	(0.0500)	0.016	(0.0538)	-0.028	(0.0502)	-0.028	(0.0502)
Migration background (reference: no migration background)								
no migration background	reference							
direct migration background	-0.0801***	(0.0232)						
indirect migration background	-0.0670**	(0.0319)						
Country of origin (reference: no migration background)								
EU-28			-0.0535*	(0.0303)				
South East Europe			-0.068	(0.0442)				
Former CIS			-0.0739**	(0.0315)				
Arab/Muslim states			-0.211***	(0.0540)				
Rest of the world			-0.142***	(0.0498)				
no migration background			reference					
indirect migration background			-0.0668**	(0.0320)				

Year of immigration (reference: 1950-1994/no migration background)

no migration background					-0.006	(0.0274)	reference	
indirect migration background					-0.0765**	(0.0373)	-0.0706**	(0.0320)
1950-1994					reference		0.006	(0.0274)
1995-2009					-0.132***	(0.0310)	-0.126***	(0.0277)
2010-2015					-0.248***	(0.0589)	-0.243***	(0.0580)

**Milieu affiliation**

upper class#traditional	-0.047	(0.0607)	-0.046	(0.0606)	-0.044	(0.0596)	-0.044	(0.0596)
upper class#modern	reference		reference		reference		reference	
upper class#new	0.001	(0.0250)	0.003	(0.0250)	-0.001	(0.0249)	-0.001	(0.0249)
middle class#traditional	-0.050	(0.0441)	-0.049	(0.0442)	-0.045	(0.0446)	-0.045	(0.0446)
middle class#modern	-0.028	(0.0210)	-0.027	(0.0210)	-0.028	(0.0209)	-0.028	(0.0209)
middle class#new	-0.011	(0.0217)	-0.010	(0.0218)	-0.011	(0.0214)	-0.011	(0.0214)
lower class#traditional	-0.034	(0.0237)	-0.031	(0.0235)	-0.031	(0.0235)	-0.031	(0.0235)
lower class#modern	-0.001	(0.0214)	-0.001	(0.0213)	-0.002	(0.0213)	-0.002	(0.0213)
lower class#new	-0.0744***	(0.0223)	-0.0726***	(0.0222)	-0.0706***	(0.0221)	-0.0706***	(0.0221)

**Household context**

Dummy: no further direct migration background in the household	0.022	(0.0246)	0.027	(0.0246)	0.019	(0.0244)	0.019	(0.0244)
Dummy: no further indirect migration background in the household	0.017	(0.0301)	0.018	(0.0299)	0.017	(0.0297)	0.017	(0.0297)
Household type (1=single parent)	-0.0889***	(0.0194)	-0.0880***	(0.0194)	-0.0867***	(0.0194)	-0.0867***	(0.0194)
Number of children in the household	-0.008	(0.0094)	-0.007	(0.0093)	-0.012	(0.0094)	-0.012	(0.0094)
Age of youngest child	-0.012	(0.0355)	-0.011	(0.0351)	-0.012	(0.0353)	-0.012	(0.0353)
estimated childcare use	0.651*	(0.3760)	0.640*	(0.3720)	0.649*	(0.3750)	0.649*	(0.3750)



### Macro-level variables

Settlement structure (reference: Sparsely populated rural counties)

Large cities	0.020	(0.0297)	0.017	(0.0297)	0.018	(0.0296)	0.018	(0.0296)
Urban counties	-0.005	(0.0208)	-0.006	(0.0207)	-0.011	(0.0207)	-0.011	(0.0207)
Rural counties showing densification	-0.003	(0.0213)	-0.002	(0.0213)	-0.003	(0.0212)	-0.003	(0.0212)
Sparsely populated rural counties	reference		reference		reference		reference	
Unemployment rate	-0.002	(0.0027)	-0.002	(0.0027)	-0.003	(0.0027)	-0.003	(0.0027)
Labour force participation rate	0.003	(0.0033)	0.003	(0.0033)	0.003	(0.0033)	0.003	(0.0033)
GDP per capita	0.001	(0.0006)	0.001	(0.0006)	0.001	(0.0006)	0.001	(0.0006)
Total fertility rate	0.216***	(0.0765)	0.213***	(0.0763)	0.206***	(0.0762)	0.206***	(0.0762)

### Year

2007	0.026	(0.0319)	0.023	(0.0316)	0.015	(0.0320)	0.015	(0.0320)
2008	0.043	(0.0367)	0.040	(0.0363)	0.033	(0.0368)	0.033	(0.0368)
2009	0.0485*	(0.0277)	0.0467*	(0.0275)	0.039	(0.0277)	0.039	(0.0277)
2010	0.009	(0.0278)	0.008	(0.0277)	0.001	(0.0279)	0.001	(0.0279)
2011	0.003	(0.0297)	0.002	(0.0295)	-0.005	(0.0298)	-0.005	(0.0298)
2012	0.003	(0.0232)	0.004	(0.0231)	-0.003	(0.0231)	-0.003	(0.0231)
2013	0.010	(0.0191)	0.010	(0.0191)	0.015	(0.0191)	0.015	(0.0191)
2014	reference		reference		reference		reference	
2015	0.017	(0.0156)	0.018	(0.0156)	0.0257*	(0.0152)	0.0257*	(0.0152)
Constant	0.105	(0.2470)	0.134	(0.2460)	0.141	(0.2460)	0.135	(0.2450)
N	6227		6227		6227		6227	

Standard errors in parentheses

\* p<0.1, \*\* p<0.05, \*\*\* p<0.01

Sources: SOEP v33, BBSR 2018; Federal and State Statistical Offices 2008-2016; HWWI.

Table A10: Estimation of hours of work (Model 3), sample 2

Specification of migration background	(a) direct/indirect (reference: no migration background)		(b) Country of origin (reference: no migration background)		(c) Year of immigration (reference: 1950-1994)		(d) Year of immigration (reference: no migration background)	
<b>Human capital</b>								
Age	-0.357***	(0.0994)	-0.363***	(0.0999)	-0.354***	(0.0982)	-0.354***	(0.0982)
Work experience	0.493***	(0.0925)	0.487***	(0.0917)	0.494***	(0.0910)	0.494***	(0.0910)
Education (reference: medium education)								
Low	2.563	(2.1630)	2.527	(2.0890)	2.546	(2.1150)	2.546	(2.1150)
Medium	reference		reference		reference		reference	
High	3.882***	(0.7630)	3.817***	(0.7590)	3.825***	(0.7590)	3.825***	(0.7590)
Last sector (reference: not applicable)								
not applicable	-1.576	(1.0640)	-1.536	(1.0770)	-1.725	(1.0450)	-1.725*	(1.0450)
Agriculture	6.214	(5.2430)	6.097	(5.2380)	6.177	(5.2140)	6.177	(5.2140)
Manufacturing	1.575	(1.2480)	1.463	(1.2580)	1.590	(1.2380)	1.590	(1.2380)
Construction	-3.247**	(1.4740)	-3.194**	(1.4720)	-3.230**	(1.4540)	-3.230**	(1.4540)
Trade	-2.247**	(1.0120)	-2.306**	(1.0200)	-2.247**	(1.0040)	-2.247**	(1.0040)
Transport	0.766	(2.1500)	0.712	(2.1320)	0.797	(2.1430)	0.797	(2.1430)
Bank, Insurance	-1.116	(1.5060)	-1.097	(1.5090)	-1.141	(1.4920)	-1.141	(1.4920)
Services	reference		reference		reference		reference	
Dummy: last sector (public services)	0.965	(0.8360)	0.951	(0.8360)	0.995	(0.8230)	0.995	(0.8230)
<b>Migration background</b>								
Refugee experience	0.431	(4.1830)	0.691	(4.7210)	0.461	(4.1540)	0.461	(4.1540)
Migration background (reference: no migration background)								
no migration background	reference							
direct migration background	0.423	(1.2390)						
indirect migration background	0.296	(1.4970)						

Country of origin (reference: no migration background)								
EU-28			1.268	(1.4630)				
South East Europe			0.527	(3.6690)				
Former CIS			-1.925	(1.7720)				
Arab/Muslim states			-2.465	(4.4780)				
Rest of the world			2.828	(3.2380)				
no migration background			reference	(0.0000)				
indirect migration background			0.189	(1.4950)				
Year of immigration (reference: 1950-1994/no migration background)								
no migration background					0.202	(1.5760)	reference	(0.0000)
indirect migration background					0.536	(1.9590)	0.334	(1.4870)
1950-1994					reference	(0.0000)	-0.202	(1.5760)
1995-2009					1.070	(1.8690)	0.868	(1.5250)
2010-2015					3.150	(5.0020)	2.948	(4.9340)
<b>Milieu affiliation</b>								
upper class#traditional	-0.343	(2.9690)	-0.239	(2.9690)	-0.346	(2.9490)	-0.346	(2.9490)
upper class#modern	reference		reference		reference		reference	
upper class#new	-0.040	(1.2920)	-0.068	(1.2920)	-0.036	(1.2870)	-0.036	(1.2870)
middle class#traditional	-3.619	(2.8460)	-3.651	(2.8520)	-3.679	(2.8190)	-3.679	(2.8190)
middle class#modern	-1.669	(1.0750)	-1.712	(1.0820)	-1.671	(1.0670)	-1.671	(1.0670)
middle class#new	-1.487	(1.1220)	-1.477	(1.1290)	-1.492	(1.1160)	-1.492	(1.1160)
lower class#traditional	0.968	(1.4580)	0.956	(1.4600)	0.964	(1.4470)	0.964	(1.4470)
lower class#modern	0.663	(1.1850)	0.683	(1.1860)	0.659	(1.1750)	0.659	(1.1750)
lower class#new	0.991	(1.3800)	0.928	(1.3700)	0.939	(1.3610)	0.939	(1.3610)
<b>Household context</b>								
Dummy: no further direct migration background in the household	-2.327*	(1.4030)	-2.802**	(1.4340)	-2.259	(1.3830)	-2.259	(1.3830)
Dummy: no further indirect migration background in the household	-0.574	(1.5540)	-0.575	(1.5550)	-0.607	(1.5370)	-0.607	(1.5370)
Household type (1=single parent)	1.179	(1.1130)	1.201	(1.1030)	1.175	(1.0940)	1.175	(1.0940)
Number of children in the household	-1.092**	(0.5050)	-1.082**	(0.5000)	-1.066*	(0.5030)	-1.066**	(0.5030)

Age of youngest child	-4.515***	(1.7020)	-4.524***	(1.6710)	-4.531**	(1.6430)	-4.531***	(1.6430)
estimated childcare use	82.85***	(30.0500)	83.50***	(29.5900)	82.88**	(28.9100)	82.88***	(28.9100)

### Macro-level variables

Settlement structure (reference: Sparsely populated rural counties)

Large cities	-2.881	(1.9320)	-3.062	(1.9510)	-2.834	(1.8710)	-2.834	(1.8710)
Urban counties	-1.090	(1.0740)	-1.066	(1.0820)	-1.042	(1.0650)	-1.042	(1.0650)
Rural counties showing densification	-0.985	(1.0530)	-1.017	(1.0640)	-0.986	(1.0450)	-0.986	(1.0450)
Sparsely populated rural counties	reference		reference		reference		reference	

Unemployment rate	0.851***	(0.1450)	0.854***	(0.1450)	0.852***	(0.1420)	0.852***	(0.1420)
Labour force participation rate	-0.054	(0.2270)	-0.059	(0.2260)	-0.050	(0.2190)	-0.050	(0.2190)
GDP per capita	0.026	(0.0304)	0.026	(0.0306)	0.025	(0.0300)	0.025	(0.0300)
Total fertility rate	4.490	(4.2990)	4.546	(4.3190)	4.469	(4.2810)	4.469	(4.2810)

### Year

2007	1.262	(1.6690)	1.220	(1.6620)	1.381	(1.6740)	1.381	(1.6740)
2008	2.045	(1.9830)	2.055	(1.9740)	2.123	(1.9550)	2.123	(1.9550)
2009	1.078	(1.7340)	1.049	(1.7260)	1.167	(1.7280)	1.167	(1.7280)
2010	0.319	(1.6060)	0.255	(1.6010)	0.383	(1.6040)	0.383	(1.6040)
2011	4.377**	(1.7030)	4.408***	(1.6920)	4.483**	(1.7070)	4.483**	(1.7070)
2012	1.491	(1.3540)	1.482	(1.3570)	1.568	(1.3590)	1.568	(1.3590)
2013	0.865	(1.3350)	0.846	(1.3440)	0.867	(1.3280)	0.867	(1.3280)
2014	reference		reference		reference		reference	
2015	2.187**	(1.0800)	2.181*	(1.0840)	2.118*	(1.0360)	2.118*	(1.0360)
inverse Mill's ratio	-0.385	(0.3530)	-0.434	(0.3570)	-0.360	(0.3350)	-0.360	(0.3350)
Constant	-28.78*	(14.7100)	-28.24**	(14.7400)	-29.44*	(14.8800)	-29.24**	(14.7400)

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N	4193		4193		4193		4193	
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Standard errors in parentheses

\* p<0.1, \*\* p<0.05, \*\*\* p<0.01

Sources: SOEP v33, BBSR 2018; Federal and State Statistical Offices 2008-2016; HWWI.

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