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Between here and there: Immigrant fertility patterns in Germany

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Abstract

This paper focuses on the role of the home country's birth rates in shaping immigrant fertility. We use the German Socio-Economic Panel (SOEP) to study completed fertility of first generation immigrants who arrived from different countries and at different time. We apply generalized Poisson regression to account for the underdispersion of the dependent variable. The results favor the socialization hypothesis holding that immigrants follow childbearing norms dominant in their home countries. We find that women from countries where the average birth rate is high tend to have significantly more children themselves. In addition, this relationship is the stronger, the later in life migration occurred.

JEL classification: J13, J15, C25, Z10

Keywords: migration, fertility, socialization, underdispersion

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1. Introduction

The list of countries with below-replacement fertility has been getting longer in recent decades. Also, aging of societies became a political key issue because it affects labor markets and social insurance systems. Immigration has been recognized as a possible means to decelerate aging (see e.g. Wu and Li, 2003; Alho, 2008). Since immigrants contribute remarkably to population dynamics in many contemporary societies (World Bank, 2009), immigrant fertility increasingly gains policy makers' attention. Understanding the relationship between migration and childbearing is important in order to draw conclusions about demographic developments in the destination countries.

However, the migration-childbearing relationship is complex: immigrants may share fertility norms of their home country yet act under new socio-economic conditions in the host country. The international literature discusses at least five hypotheses to explain immigrant fertility: selection, socialization, adaptation, disruption, and interrelation. Since each of the hypotheses has received support, and has also been challenged, the exact mechanism of how migration and fertility are related remains unclear.

To shed more light on this issue we explore childbearing behavior of immigrants living in Germany. Germany hosts the largest number of immigrants in Europe. Moreover, over recent decades large migration flows from high-fertility countries coincided with extremely low fertility of German women. As of 2009 foreign women, who make up 8.4% of all women in Germany, contribute substantially to the total number of births with a share of roughly 17% (Federal Statistical Office, 2010).[1]

Despite the increasing relevance of the issue, very few empirical studies investigate immigrant fertility in Germany. Existing research mostly suggests that immigrants exhibit significantly higher fertility than natives even after controlling for differences in socio-demographic characteristics. However, immigrants tend to successively adjust

[1] German Federal Statistical Office's data usually distinguish between German and non-German citizens. We refer to foreigners as to non-German citizens throughout this paper.

their childbearing behavior to what is typical for natives at the new destination (see e.g. Nauck, 1987; Mayer and Riphahn, 2000; Milewski, 2007, 2010). Several studies emphasize significant differences in fertility patterns across immigrants' origins (see e.g. Mayer and Riphahn, 2000; Schmid and Kohls, 2010; Milewski, 2010), but they leave open important questions: why does it matter for fertility to be, for example, of Turkish versus of Italian origin? What drives the observed cross-countries heterogeneities? To what extent may different childbearing norms explain this variation across countries and immigrant excess fertility versus native fertility?

This study contributes to the literature in several dimensions. In particular, it tests the hypothesis that immigrant fertility reflects childbearing norms dominant in the countries of origin before migration (socialization hypothesis). Similar to Fernandez and Fogli (2006, 2009) we use country-specific total fertility rates (TFRs) as a quantitative measure of fertility norms.[2] We use the German Socio-Economic Panel (SOEP) to study completed fertility of first generation immigrants by comparison with natives. Unlike previous studies on German data, we examine the reproductive behavior of all immigrants, not only selected groups[3] and define immigrants according to where they were born, and not based on their citizenship.[4] We account for differences in socio-demographic characteristics related to childbearing choices: education, marriage behavior, number of siblings, and religion. Finally, we investigate whether age at migration affects socialization by home country's birth rates.

We find that women born in countries where the average TFR is high tend to have significantly more children than those born in countries with low TFR. This result favors the socialization hypothesis and is quantitatively important. In particular, one unit increase in home country's TFR is associated with an increase in completed fertility of

[2] Fernandez and Fogli (2006, 2009) study fertility of second generation immigrants in the U.S.

[3] Nauck (1987) looked at the Turks, Mayer and Riphahn (2000), and Milewski (2007, 2010) at the traditional guest workers from Turkey, Italy, Spain, Greece, and former Yugoslavia, Schmid and Kohls (2010) at Turkish, Greek, Italian, Polish, and former Yugoslavian citizens.

[4] Distinguishing immigrants and natives by citizenship is inappropriate for German context. See Liebig (2007) for a debate on difficulties associated with using citizenship to define immigrants in Germany.

8.4%, which is 13% of the total variation in fertility among immigrants, and 20% of the variation across countries of origin. We find that immigrants from countries where the TFR does not exceed the German TFR by more than 0.5 births do not exhibit significant excess fertility compared to native fertility. In addition, age at migration matters, too. Women who migrate prior to age 26 do not exhibit significant excess fertility, but each additional year spent in the home country is related to an increase in the number of children of 1.3%. Finally, the later in life migration occurs, the stronger is the relationship between home country's birth rates and completed fertility.

This paper is organized as follows: the next section sets the stage with information on immigration to Germany. Section 3 briefly reviews previous findings and outlines our hypotheses. Section 4 describes our estimation strategy and section 5 the data. We present the estimation results and robustness tests in section 6. Finally, section 7 discusses the findings and concludes.

2. Immigration and fertility in Germany

As of 2009, foreigners[5] represent roughly 8.7% of the total population in Germany, but almost 19% of the population has a migration background[6] (Federal Statistical Office, 2010). Since East Germany had no significant immigration before re-unification in 1990, the current stock of foreigners in Germany results nearly entirely from the long and intense migration to West Germany. Since World War II most immigrants arrived as ethnic Germans, traditional guest workers, or humanitarian migrants.[7] Ethnic German repatriates arrived in the aftermath of World War II, and the dissolution of socialism after 1989. They emigrated from former German territories in Central and Eastern Europe, mainly from the former Soviet Union, its successor states, as well as from

[5] We refer to foreigners as to non-German citizens throughout this paper.
[6] Those with migration background migrated to Germany after 1949, are foreign citizens born in Germany, or have at least one parent being an immigrant or foreign citizen.
[7] For more information on the phases of immigration to Germany see e.g. Kalter and Granato (2007).

Romania, Poland, and former Czechoslovakia. Since Ethnic Germans obtain German citizenship at entry, they are counted as Germans in most official statistics. Traditional guest workers immigrated during the economic boom since the mid 1950s until the early 1970s. Through that time Germany pushed intensive manpower recruitment and signed bilateral treaties with several countries including Italy, Spain, Greece, Turkey, Portugal, and Yugoslavia. Although, initially, labor migrants' residence permit was restricted to one year, they tended to stay longer or even permanently and increasingly brought their family members. Most refugees and asylum seekers arrived in the 1990s from the territories under the Yugoslav wars: Bosnia and Herzegovina, Croatia, and Slovenia.

The composition of the foreign population currently living in Germany still reflects these major migration streams: the dominant national minorities are Turks, followed by people from former Yugoslavia, Italy, and Poland (Federal Statistical Office, 2010). Despite the various geographic roots, the vast majority of immigrants moved from a high to a low fertility context. Table 1 shows the fertility developments in Germany and selected sending countries over the last five decades.

[Table 1 about here]

The numbers reveal the recent overall fertility decline. Since the late 1980s, total fertility rates (TFRs) in all countries save for Turkey have continuously been below the replacement level of 2.1 and nearly converged. Figure 1 presents fertility developments within Germany since 1991, separately for German and foreign women.

[Figure 1 about here]

While the TFR of German women remained relatively stable at a level of 1.3, the TFR of non-German women fell successively. At the same time, foreign women substantially contributed to the total number of births. In the observed period the share of births to foreign mothers went up from 13.0 to 16.8%.[8]

[8] Since 1991 the share of foreign women on the total female population increased from 6.5 to 8.4%.

3. Previous literature and hypotheses

Existing research suggests that a variety of factors may affect immigrants' reproductive behavior: self-selection into migration, pre-migratory experiences in the home country, socio-economic environment in the destination country, and circumstances accompanying the migration process as such.[9]

The literature focusing on the relationship between migration and completed fertility commonly discusses three hypotheses: selection, socialization, and adaptation.[10] These hypotheses are not necessarily mutually exclusive; they are partly complementary, partly contradictory, they may apply to specific lifetime periods and counteract or reinforce one another. We now consider each of them in turn and briefly present the relevant empirical findings.

The *selection* hypothesis holds that the process that selects people into migration is not random. Immigrants tend to differ from the overall population at their place of origin along many dimensions that are associated with fertility, e.g. age, education, employment, marital status (Hervitz, 1985). Consequently, immigrants' childbearing preferences may, even before the move, more closely resemble the patterns dominant in the destination country than those of the country of origin. Existing research on internal rural-urban migrants provides evidence for this mechanism (see e.g. Macisco et al., 1970; Goldstein and Goldstein, 1981; Lee and Pol, 1993; Chattopadhyay et al., 2006). Studies on international migrants broadly discuss the selection hypothesis, but rarely test it due to lack of bi-national data allowing for comparisons between migrants and their home country counterparts.[11]

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[9] For an overview of previous literature on the relationship between migration and fertility see e.g. Kulu (2005).

[10] In addition, related literature derives two hypotheses - disruption and interrelation - to explain temporary drops or rises in fertility around the migration event (see e.g. Stephen and Bean, 1992; Mulder and Wagner, 1993; Andersson, 2004; Kulu, 2005). They are not of major importance for this study because they refer to different timing of childbearing, and do not explain the level of completed fertility.

[11] See e.g. Bustamante et al. (1998); Blau, F.D. and Kahn, L.M. (2007) for a discussion on selected characteristics of the average Mexican population and Mexican immigrants to the U.S. based on data sources from both countries.

The *socialization* hypothesis emphasizes the critical role of the home country in shaping immigrants' reproductive behavior. According to this hypothesis immigrants acquire norms and behavioral patterns regarding childbearing in their home country, and continue to follow them over the life course. However, it is unclear when (if ever) the socialization of an individual ends. Social scientists define socialization as a life-long process, but divided into two stages: primary and secondary socialization (Mortimer and Simmons, 1978). Primary socialization takes place and is finalized during childhood and adolescence. Bisin and Verdier (2001) distinguish two channels that play a role in the formation of preferences at this early stage: socialization to the parents' trait and socialization to the dominant trait in the population. By contrast, secondary socialization may occur also later in life, each time a person encounters a new environment with changed conditions. The migration literature traditionally discusses the mechanism of secondary socialization in the context of the post-migratory adaptation. Only few studies on immigrant fertility deal with the socialization hypothesis directly (see e.g. Hervitz, 1985; Milewski, 2010). A common approach is to interpret heterogeneities in fertility across immigrants' origins as supportive for socialization, but such evidence does not specify to what extent home country's fertility norms matter. Several papers on the immigrants to U.S. or their descendants invoke the relationship between the source country's birth rates and women's preferences for children (see e.g. Kahn, 1988; Blau, 1992; Fernandez and Fogli, 2006, 2009).

The *adaptation* hypothesis assumes that what matters most in shaping immigrants' fertility is the current socio-economic environment in the receiving country. Numerous contributions use the terms adaptation and assimilation interchangeably, because of the similar outcome: sooner or later, immigrant fertility comes to resemble that of natives. However, the mechanisms behind adaptation and assimilation differ (Hill and Johnson, 2004). The assimilation hypothesis holds that immigrants successively take up the host country's cultural norms regarding family size. Because cultural assimilation takes a long time, it is expected to be more apparent over subsequent generations than within a first generation (Stephen and Bean, 1992; Blau, F.D. and Kahn, L.M., 2007; Parrado and Morgan, 2008). First generation immigrants may instead be subject to adaptation starting shortly after migration. Adaptation occurs if immigrants revise their childbearing preferences as a result of changed conditions regarding wages, prices, employment, and educational opportunities. The convergence to native fertility may be achieved after some years of stay (see e.g. Kahn, 1988; Andersson, 2004) or more precisely with an increasing number of fertile years spent in the host country (Mayer and Riphahn, 2000). Clearly, age at migration determines the duration of exposure to native fertility patterns in the destination country. Consequently, previous research interprets the positive effect of age at migration on fertility as a successive adaptation (see e.g. Mayer and Riphahn, 2000; Bleakley and Chin, 2010). However, age at migration outlines also the duration of the socialization process in the country of origin and may positively correlate with fertility for this reason, instead. Thus, the exact mechanism behind the pure effect of age at migration on fertility is ambiguous.

This study focuses on the question to what extent home country's birth rates explain completed fertility of first generation immigrants. Previous papers on German data show that dissimilar socio-demographic characteristics play a crucial role in explaining fertility differentials between immigrants and natives, but a significant immigrant excess fertility still remains unexplained (Mayer and Riphahn, 2000; Milewski, 2010). We contribute to the literature by examining the role of pre-migratory socialization. Although nearly all papers on fertility of German immigrants emphasize heterogeneous patterns across countries of origin (Mayer and Riphahn, 2000; Milewski, 2010; Schmid and Kohls, 2010), we are not aware of past studies measuring the extent to which home country's fertility matter for immigrants' fertility outcomes. We draw on several U.S. studies using the country-specific total fertility rates (TFRs) to investigate the quantitative importance of home country's childbearing norms (see e.g. Kahn, 1988; Blau, 1992; Fernandez and

Fogli, 2006, 2009). We exploit the variation in TFRs across countries and time to test the following hypotheses:

H1: Immigrants' completed fertility reflects birth rates dominant in their home countries (socialization hypothesis).

H2: The extent of socialization varies with the number of years immigrants spent in the home country (interaction between socialization and age at migration).

4. Estimation strategy

Our empirical approach aims to explore the immigrant excess fertility versus native fertility. Given that the dependent variable - completed fertility - is a non-negative integer we apply a count data approach. The natural starting point for analysis of counts is the Poisson regression which is based on the assumption that the conditional mean and the conditional variance are equal. This equidispersion assumption in our particular case is given by

$$E[y_i|X_i] = V[y_i|X_i] = \exp(X_i\beta), \tag{1}$$

where y_i stands for completed fertility of woman i, and X_i for vector of covariates which varies with the considered specification. To test our research hypotheses we specify two main models.

First, we examine to what extent immigrant excess fertility is related to the childbearing norms which immigrants become acquainted with prior to migration. Central for our analysis is the use of a quantitative variable as a proxy for childbearing norms: we calculate the difference between the country-specific total fertility rates (TFRs) in immigrants' home countries and in Germany as of the migration year. We argue that this variable is a good proxy for the discrepancy in childbearing norms that an immigrant experiences at entry. Note that we refer to differences in fertility norms, not to differences in culture. Fernandez and Fogli (2006, 2009) emphasize that TFR may beyond a cultural component capture also country-specific economic and institutional conditions.[12] At this stage the expected completed fertility of a woman i takes

$$E[y_i|X_i] = \exp(\beta_0 + \beta_1 I_i + \beta_2 DTFR_i + z_i\theta), \tag{2}$$

where I_i indicates an immigrant, the $DTFR_i$ captures the difference in TFRs between immigrants' home and host country, and z_i includes a set of control variables. Positive β_2 would indicate a socialization mechanism.

The individual background variables in z_i control for socio-demographic differences between immigrants and natives. The economic theory of fertility (Becker, 1991) and previous empirical research guide our selection of covariates related to childbearing choices. We proxy women's opportunity costs of an additional child by educational attainment, measured as the highest completed degree.[13] To capture a woman's family orientation, i.e. attitudes towards traditional family structures and desired family size, we include an indicator of whether she was ever married, her age at first marriage, and the number of her siblings. Recent literature on the intergenerational transmission of fertility patterns suggests that individuals raised in larger families tend to establish large families themselves (see e.g. Murphy and Knudsen, 2001; Booth and Kee, 2009). Previous research also strongly emphasizes the role of religion in determining preferences towards birth control and family size. We control for denomination and religiosity approximated by the frequency of attending religious events.

In the second model specification we additionally consider immigrants' age at migration (AM_i) to test whether the coefficient of "difference in TFRs between home and host

[12] Fernandez and Fogli (2006, 2009) argue that they isolate the effect of culture by examining second-generation immigrants because the economic and institutional conditions of the country of ancestry should no longer be relevant for this group.

[13] Following Mayer and Riphahn (2000) we argue that potential endogeneity of education is limited because we observe the completed fertility at age 45 and later while typical educational decisions are taken prior to age 20. In addition, we refer to the results of Monstad et al. (2008) who do not find a causal relationship between education and completed family size.

country" varies with age at migration. The conditional completed fertility of a woman i is now given by

$$E[y_i|X_i] = \exp(\beta_0 + \beta_1 I_i + \beta_2 DTFR_i + \beta_3 AM_i + \beta_4 (DTFR_i \times AM_i) + z_i\theta). \qquad (3)$$

We expect the socialization to be more pronounced, the more years immigrants spent in the home country. However, age at migration simultaneously also determines the duration of exposure to fertility patterns exhibited by natives at the new destination. Since longer socialization shortens adaptation and vice versa, the exact mechanism behind β_4 remains unclear.

Note that the three migrant-specific variables: immigrant dummy (I_i), "difference in TFRs between home and host country" ($DTFR_i$), and age at migration (AM_i) take the value 0 for natives. Thus, the expected fertility of a native woman i in either model specification is $E[y_i|X_i] = \exp(\beta_0 + z_i\theta)$, and relative fertility differentials between immigrants and natives depend in our setting solely on β_1 - β_4. We estimate equation (2) and equation (3) on a pooled immigrant-native sample to facilitate inference.

However, previous empirical studies on fertility emphasize that inference based on a Poisson estimation is invalid if the equidispersion assumption given by equation (1) does not apply (see e.g. Winkelmann and Zimmermann, 1994; Wang and Famoye, 1997; Mayer and Riphahn, 2000). In practice fertility counts often exhibit undersispersion, i.e. the conditional mean exceeds the conditional variance. As a result the standard errors are overestimated.

Since the Poisson estimator is still consistent but inefficient, the most common solution proposed by the literature is to generalize the Poisson model by relaxing the equidispersion condition (see e.g. Consul and Famoye, 1992; Famoye, 1993; Winkelmann and Zimmermann, 1994). The generalized Poisson regression (GPR) assumes the conditional variance to be proportional to the mean by some dispersion factor ϕ, which by definition is positive. The non-linear variance-mean structure in the GPR takes

$$V[y_i|X_i] = \phi E[y_i|X_i], \tag{4}$$

where the additional parameter ϕ may be estimated along with the regression coefficients via maximum likelihood.[14] Clearly, when $\phi = 1$ the GPR reduces to the usual Poisson distribution. When $\phi < 1$ or $\phi > 1$ the GPR accommodates under- or overdispersion respectively and thus provides reliable standard errors.

We estimate the GPR of completed fertility by using the STATA program *gpoisson* by Hardin and Hilbe (2007). This program estimates a dispersion parameter δ, where $0 \leq \delta < 1$. The relationship between δ and ϕ is given by

$$\phi = \frac{1}{(1-\delta)^2}, \tag{5}$$

so that $\delta < 0$ implies underdispersion, and $\delta > 0$ overdispersion. The advantage of using δ (instead of ϕ) is that we may now write the hypothesis of equidispersion as $H_0 : \delta = 0$, and directly test for the significance of the dispersion parameter with a likelihood-ratio test.

5. Data

We use individual-level data from the German Socio-Economic Panel (SOEP) to obtain our sample. The SOEP is a representative longitudinal study of private households, conducted annually since 1984, and the largest dataset providing retrospective information on births, migration, and a number of background characteristics in Germany.[15] Since we focus on completed fertility, we restrict attention to females aged 45 and above, and code their past births as our dependent variable. Data from a single survey year would

[14] For detailed description of the GPR model see e.g. Consul and Famoye (1992).
[15] For description of the content and sampling of the SOEP see e.g. Haisken-DeNew and Frick (2005).

allow us to test our research hypotheses. However, to increase both, sample size and the spread of analyzed age cohorts we pool cross-sectional observations taken from three SOEP waves: 1991, 1999, and 2007. A consequence of this approach is that some of the respondents enter our sample more than once, so we cluster standard errors by individuals.[16] We keep the repeated records because their elimination could lead to a biased sample. Moreover, robustness checks in section 3 show that the estimation results do not change qualitatively when we drop the repeated records.

Based on the respondents' migration background we construct two mutually exclusive sub-samples, natives and first generation immigrants.[17] To obtain a homogeneous native sample we consider German citizens without migration background and include only West German households.[18] The immigrant sample comprises foreign born respondents with direct immigration experience regardless of their current citizenship. In contrast to the common distinction along citizenship lines, this approach includes ethnic Germans and naturalized foreigners. Despite their current citizen status they personally experienced migration and we expect them to follow similar fertility patterns as immigrants with foreign citizenship.[19] We conclude our selection by eliminating immigrants who were 45 and older at arrival, because they completed their reproductive phase before migration.

Finally, we purge records with missing information on explanatory variables (about 4% of the sample). Our final dataset consists of 7,260 native and 1,163 immigrant observations. The immigrants originate from 54 different countries, but most of them are

[16] We observe 48% of women in our final sample once, 27% twice and 25% three times.

[17] We exclude second generation immigrants, i.e. German-born respondents, who ever reported a foreign citizenship, and respondents having at least one parent with migration background. Note that we include the so called "generation 1.5", i.e. women who migrated below age 15. However, because this group accounts for only 4% of the immigrant sample, its inclusion does not affect the results.

[18] Fertility and socio-demographic composition of the East and West German population differ significantly. Moreover, East Germany had no significant immigration prior to 1991 and according to official statistics even today 90% of foreigners live in the western part of the country.

[19] Data limitations do not allow us to further distinguish between ethnic Germans and naturalized foreigners among immigrants with German citizenship. However, 64% of them are from Eastern European countries, 10% from former Yugoslavian territories, and 8% from guest worker countries: Turkey, Italy, Spain, Greece and Portugal.

from countries of traditional guest worker recruitment: women of Turkish origin alone account for 21% of the immigrant sub-sample, women from Italy, Spain, and Greece jointly for 26%. Notable numbers arrived from former Yugoslavian territories, and from different Eastern European countries. Table 2 lists represented countries of origin in our immigrant sub-sample and shows the average completed fertility by country.

[Table 2 about here]

We observe large fertility dispersion across countries of origin, from 3.86 children for Turkish women to 1.65 for women from Austria. Table 3 shows individual summary statistics for our main estimation sample.

[Table 3 about here]

Immigrants and natives differ with respect to fertility and socio-demographic characteristics. On average completed fertility in the immigrant sample is 2.59, in the native sample 1.90. Immigrants are on average younger and less educated than natives.[20] While the differences in marriage behavior are moderate, immigrants have on average more siblings. The religious affiliations of our sub-samples differ substantially: most notably, while jointly almost 87 % of natives are Christians (either Catholics or Protestants), 22% of immigrants are Muslims.[21] Furthermore, immigrants attend religious events more frequently. One third of immigrants have German citizenship. On average immigrants arrive at age 28 and move from a high to a low fertility context, i.e. the TFR in the home country is on average by 1.18 births higher than the German one.[22]

[20] We distinguish four educational thresholds: the lowest comprises inadequately completed school or general elementary degree. The second-lowest threshold corresponds to a basic vocational degree. We assign a secondary degree to women who completed some sort of intermediate or upper secondary schooling, either general or vocational. The highest threshold is tertiary degree from college or university.

[21] Since religious affiliation has been asked neither in 1991, nor in 1999, we use the first religious affiliation a woman ever reported to SOEP. Alternative specifications for this variable including indicators for whether a woman ever belonged to a particular religious community provide nearly identical results.

[22] The variable "difference in TFRs" originally ranged from -0.54 to 5.88 births per woman. We excluded one outlying observation for which the value exceeded 5.15 to enhance the visibility of plots presenting the estimation results. Our results are also robust to more restrictive exclusions performed on this variable.

Our key variable - "difference in TFRs" - is significantly correlated with the number of children immigrants that bear. Table 4 shows the average completed fertility for different thresholds of the variable of interest.

[Table 4 about here]

The positive relationship is apparent: the greater the difference in TFRs between the home and host country at arrival, the higher immigrants' completed fertility. Whereas women arriving from very opposite fertility standards give on average roughly 3.62 births, those who migrate from fertility standards similar to standards in Germany one complete their fertility with 2.11 children.

6. Results

6.1. Main estimation results

Table 5 presents the regression coefficients and standard errors obtained from GPR. The negative and highly significant parameter δ confirms the underdispersion of the dependent variable and indicates that the GPR is more appropriate than the standard Poisson model for our data.

[Table 5 about here]

Since our regression aims to measure the immigrant excess fertility versus native fertility, we focus on the interpretation of the estimation results for migrant-specific variables shown in the upper part of Table 5. We begin with a simple model that estimates gross immigrant excess fertility if adjusted for birth cohort only (column GPR1). As expected, the coefficient of the immigrant indicator is positive and significantly different from zero (at the 1% level). Since the coefficients approximate semi-elasticities, completed fertility of immigrants is roughly higher by 40% ($(\exp(0.334) - 1) \cdot 100\%$) than that of natives in the same birth cohort.

These gross fertility differentials between immigrants and natives diminish after we control for a wide range of observed socio-demographic characteristics (column GPR2). Thus, our estimation results confirm the earlier findings that different characteristics partly explain high immigrant fertility. Still, immigrants give on average significantly more births than natives with identical characteristics. The unexplained excess fertility is 8%. Almost all of the control variables are important predictors of fertility outcomes, and they correlate with fertility in the expected direction. The coefficients of birth cohort dummies reveal the overall declining fertility in younger cohorts, which is commonly explained by a more effective use of birth control. Not surprisingly, the single coefficients of educational thresholds confirm the reverse relationship between woman's human capital and childbearing. The results for the variables describing family orientation and religious affiliation are also consistent with earlier findings. Most notably, being ever married and early marriage are associated with higher fertility outcomes. Muslims exhibit substantially higher fertility than women of any other religion. We observe that the estimated coefficients of the control variables do not change notably in alternative model specifications.

Next, we estimate the specification given by equation (2), i.e. include the proxy for the difference in childbearing norms between the home and host country (column GPR3). We could reject the hypothesis that higher order polynomials for this variable improve the goodness of fit at high levels of significance. As stated in the socialization hypothesis H1, "difference in TFRs" is positively and significantly related to fertility outcomes. Assuming a constant TFR in Germany, an increase in home country's TFR of one birth per woman is related to a ceteris paribus growth in completed fertility of 8.4%, i.e. on average to 0.22 more children (2.59 versus 2.81).[23] To access the quantitative importance of home country's TFR for immigrant fertility, note that the standard deviation in completed fertility among immigrants is 1.71, and across countries

[23] The computation for one unit change in "difference in TFRs" is $(\exp(0.081) - 1) \cdot 100\%$.

1.09. Thus, one unit increase in TFR accounts for 13% of the variation in the number of children among immigrants, and for 20% of the cross country-variation.[24]

The coefficient of the immigrant indicator is no longer significant. However, to evaluate the immigrant excess fertility versus native fertility at different values of our key variable "difference in TFRs" we need to interpret both estimated coefficients of migrant-specific variables jointly. Such interpretation in a non-linear setting is not straightforward, since the sign, magnitude and significance of the joint outcome may change for different values of "difference in TFRs". Consequently, the statistical inference cannot build upon simple t-tests for individual coefficients (Ai and Norton, 2003). Instead of focusing on the results in Table 5, we draw on Greene (2010) and perform a graphical analysis of the estimated relationship. Figure 2 depicts immigrant excess fertility when plotted over the range of the variable "difference in TFRs".

[Figure 2 about here]

The 0%-level on the vertical axis indicates the reference native fertility. For both, natives and immigrants we assume the values of all remaining covariates to be equal. The 95% confidence intervals are obtained by 999 bootstrap iterations. Immigrants from countries where the TFR does not exceed the German one by more than 0.5 births do not exhibit significant excess fertility. Less than 17% of women in our immigrant sample arrived from such low fertility context. Average immigrants are from countries where the "difference in TFRs" is 1.2 and they bear by 13% more children than comparable natives. The greater the difference in country-specific TFRs, the more immigrants' completed fertility diverges from the native level. That Figure 2 shows an insignificant immigrant excess fertility up to the "difference in TFRs" of 0.5 seems to be qualitatively important too: because over recent decades German TFR and TFRs in numerous source countries nearly converged (as shown in Table 1), our results suggest that fertility differentials between natives and recently arrived immigrants will potentially diminish or even vanish.

[24] The proportions are given by $0.22/1.71 \cdot 100\%$ and $0.22/1.09 \cdot 100\%$ respectively.

To test whether the extent of socialization varies with duration of stay in the home country (H2) we interact the variable "difference in TFRs" with age at migration and estimate equation (3) in the final model specification (column GPR4). The estimated coefficient of this interaction term is positive and statistically significant at the 1% level. Estimated coefficients of all migrant-specific variables are jointly significant at the 0.1% level. Again, since interpretation of coefficients of interaction terms in a non-linear setting is not straightforward, we present our results graphically in Figure 3.

[Figure 3 about here]

These plots show immigrant excess fertility if measured at age of migration 22 and 34, which refer to the 1st and 3rd quartile in our immigrant sample, respectively. The overall conclusion does not change: the more childbearing standards in home and host country differ, the larger the divergence of completed fertility of immigrants and natives. However, extent to which the home countries' TFRs affect immigrant fertility plays out differently by age at migration. Women who arrive at age 22 exhibit no significant fertility differences compared to natives, regardless of country-specific TFRs. In contrast, immigrants coming at older ages bear significantly more children even if they arrive from fairly similar fertility contexts. Clearly, the higher age at migration, the stronger the relationship between socialization by home country's TFR and immigrant excess fertility. Overall, we take these findings as evidence in favor of hypothesis H2 suggesting that the way in which home country' birth norms determine immigrants' fertility is associated with the time they spent at home.

However, the exact mechanism behind the relationship between age at migration and immigrant fertility is unclear because age at migration simultaneously determines the duration of stay in home and in host country. In addition, given constant TFRs, immigrant fertility varies considerably across different ages at migration. On average one additional year spent in the home country is related to an increase in the number of children of 1.3%.[25] We plot the relationship between immigrant excess fertility and age at migration in Figure 4.

[Figure 4 about here]

The curve is calculated for an average immigrant arriving from a country where the TFR exceeds the German TFR by nearly 1.2 births. We keep all remaining variables constant. Again, the 0%-level on the vertical axis indicates the reference native fertility. The positive correlation is apparent: the younger women are at migration, the fewer children they bear. Whereas women who migrated prior to age 26 do not exhibit significant excess fertility, those who arrived at age 28 give roughly 12% more births than comparable natives.[26]

Overall, our results suggest that both home country's birth rates and age at migration are significantly related to immigrants' fertility outcomes.

Because we analyze childbearing behavior of first generation immigrants the mechanism of selection into migration may to be of important concern. However, if we believe that immigrants tend to be selected for fertility preferences then we rather expect positive selection towards the destination country, i.e. immigrant move from high to low fertility context because they have on average lower preferences towards childbearing than those women who stay behind. Consequently, selection into migration would bias our results towards not finding any relationship between home country's birth rates and fertility.

[25] Since age at migration is divided by 10, for one year change and "difference in TFRs" of 1.2 the computation is $\exp(0.063 \cdot 0.1 + 0.052 \cdot 1.2 \cdot 0.1) - 1) \cdot 100\%$.

[26] We find that the significant fertility deficit of immigrants arriving prior to age 10 is a result of specification: models with additional interactions with an indicator for childhood migration, or third degree polynomials for age at migration provide an insignificant effect for those who migrated before age 10. Detailed results are available from the author upon request.

6.2. Robustness checks

Our results are robust to alternative estimation methods, to alternative definition of the proxy for difference in childbearing norms between home and host country, and to changes in various sample criteria.

In particular, standard Poisson regressions yield nearly identical results. Also, OLS regressions provide identical signs and significance of the estimated coefficients throughout. We also repeat the analysis using cross-sectional weighting and after drop of the duplicate observations. These estimates generally indicate minor changes in the magnitude of the coefficients, but graphical analyses showed that the findings do not change qualitatively. For detailed results see Table A.1 in the Appendix.

Consider the proxy variable "difference in TFRs" next. One may object that our key variable to identify the relationship between home country's birth rates and immigrants' fertility is potentially endogenous. Since immigrants may have started childbearing before migration, TFR in their countries of origin as of the migration year may to some degree reflect their own fertility.[27] To circumvent the problem, we alternatively calculate the variable "difference in TFRs" by using TFRs as of the year of women's 15th birthday.[28] Note that this is a more restrictive approach because it assumes that socialization is finalized in adolescence. Estimations with this alternative proxy confirm the general patterns, which is not surprising because the correlation between the new proxy variable and the original one is around 0.95.

Furthermore, our results are not driven by certain countries with large numbers of observations. In particular, we find similar results when we omit immigrants of Turkish origin. We also change the estimation sample by excluding 10% of immigrant observations with the highest values on the variable "difference in TFR" and find even stronger

[27] Actually 54% of immigrants in our sample gave their first birth prior to migration year, 2% in the migration year, 36% later, and 8% of immigrants are childless.

[28] We lose 30% of all observations who aged 15 before 1950 because The World Bank does not report country-specific TFRs prior to 1950. We additionally exclude 4% of immigrant observations who migrated below age 15.

evidence for the socialization hypothesis H1. We also consider the childbearing decision itself because the decision to remain childless may be driven by different mechanisms. We repeat the analysis only for women who gave at least one birth and obtained similar results. For detailed results see Table A.2 in the Appendix.

Finally, we estimate the coefficients of migrant-specific covariates separately for immigrants with and without German citizenship to test whether they exhibit different fertility patterns.[29] We find that these two immigrant subgroups follow qualitatively similar patterns. For graphical representation of these results see Figure A.1 in the Appendix.

7. Conclusion

This paper focuses on the question to what extent home country's birth rates play a role in shaping immigrants' childbearing behavior. In particular, it studies completed fertility of first generation immigrants living in Germany. We contribute to the existing literature by examining the socialization hypothesis holding that immigrants follow fertility norms acquired in the country of origin, even if these norms differ from norms in the host country. In contrast to previous studies on German data (Milewski, 2010; Schmid and Kohls, 2010), we do not address the socialization hypothesis by showing significant heterogeneities across countries of origin, but instead use a quantitative measure for countries' fertility norms. In particular, we exploit the variation in total fertility rates (TFRs) across countries and time.

Our empirical results reveal remarkable patterns in favor of the socialization hypothesis: we find that immigrants born in countries where the TFR is high tend to have significantly more children themselves. An increase in home country's TFR by one birth is associated with an increase in completed fertility abroad of 8.4%. Furthermore, we

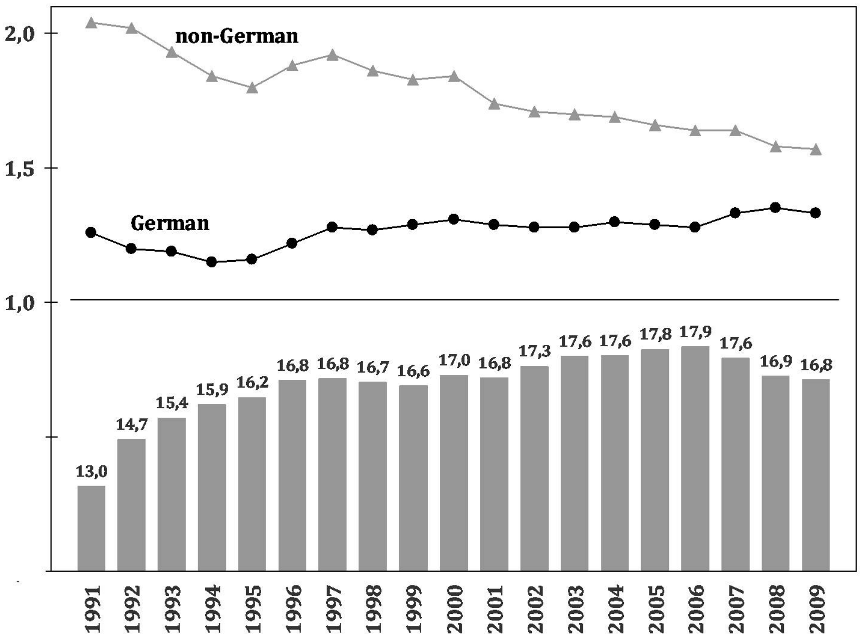
[29] The two groups differ slightly with respect to fertility and socio-demographic composition. Most notably, immigrants having German citizenship have on average fewer children, arrive from lower fertility context, and at older ages than immigrants of foreign citizenship.

show that significant fertility differentials between immigrants and natives reported in earlier studies (Mayer and Riphahn, 2000; Milewski, 2010) disappear once we consider home country's TFR. Immigrants from countries where the TFR does not exceed the German one by more than 0.5 births do not exhibit significant excess fertility. Beyond that, the greater the difference between home and host country's TFRs, the more fertility of immigrants and natives differs.

Finally, our results confirm previous findings that age at migration is significantly related to immigrant fertility (Mayer and Riphahn, 2000). On average, one additional year spent in the home country is associated with an increase in the number of children of 1.3%. In addition, we show that the later in life migration occurs, the stronger is the relationship between home country's birth rates and completed fertility of individuals. However, whether this correlation is attributable to longer socialization or shorter adaptation is an interesting question and should be investigated in future work. We also leave for future research to investigate the role of family members left behind, as well as immigrants' neighborhood and ethnic network in the transmission and preserving of home country's fertility patterns.

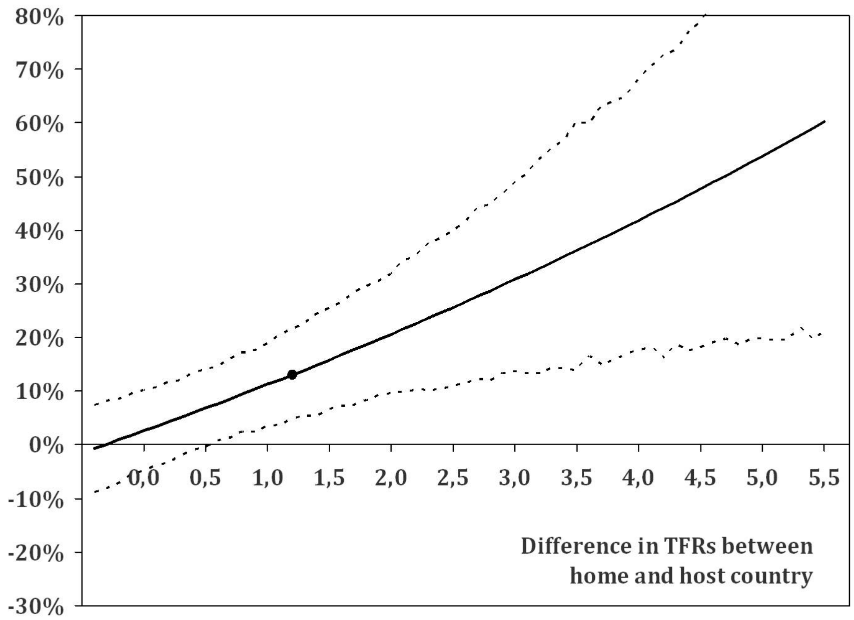
We conclude that childbearing behavior of first generation immigrants is affected by both: birth rates prevailing in the country of origin and age at migration. However, home country's birth rates are quantitatively and qualitatively more important. While, the average age of women migrating to Germany in recent years remains relatively constant between age 27 and 28 (Federal Statistical Office, 2010), the birth rates in the major source countries have been declining continuously for decades (World Bank, 2009). Consequently, we may expect that completed fertility of recent immigrant cohorts will successively approach the low native level.

Figure 1: Fertility in Germany by woman's citizenship



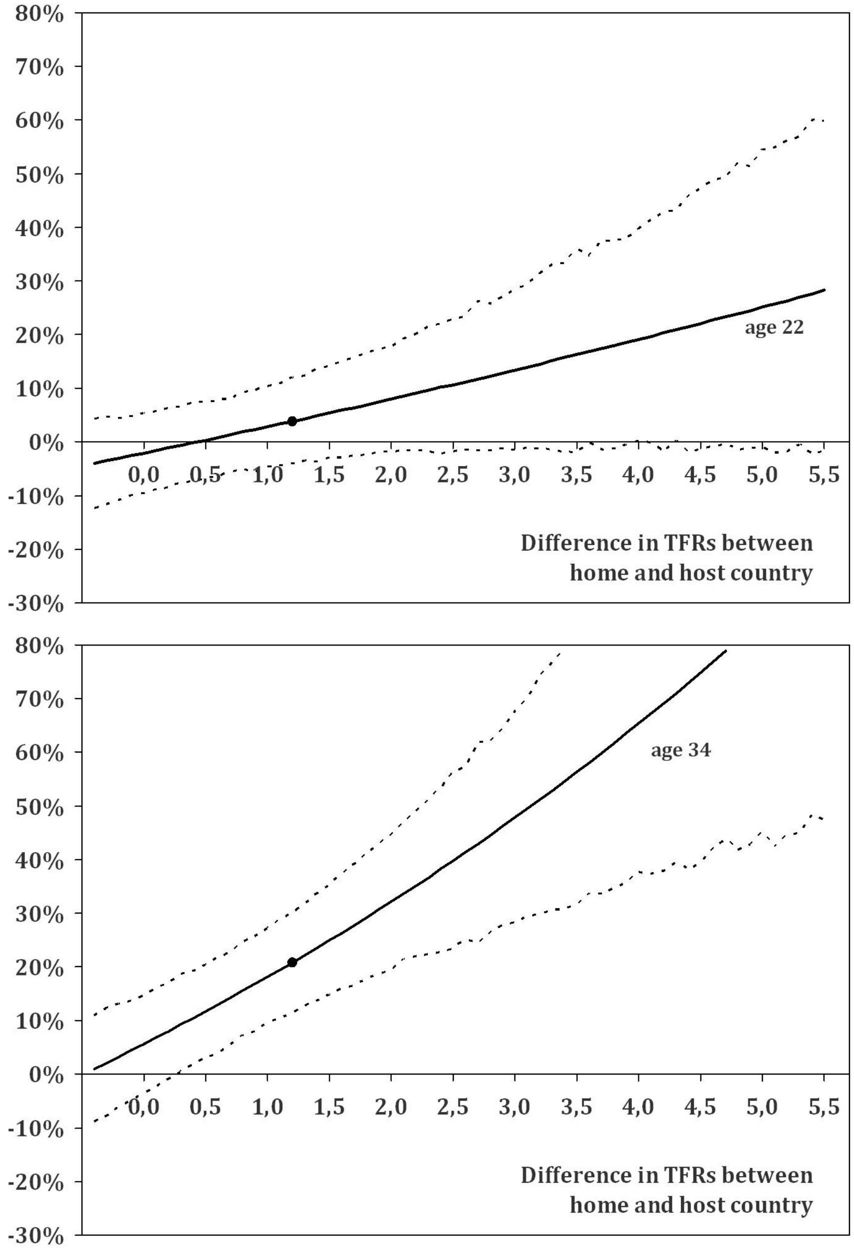
Note: Upper part: TFR by woman's citizenship, TFR of 2.1 is considered to be replacement level. Bottom part: share of births to non-German mothers on the total number of births.
Source: German Federal Statistical Office.

Figure 2: Immigrant excess fertility as a function of difference in TFRs



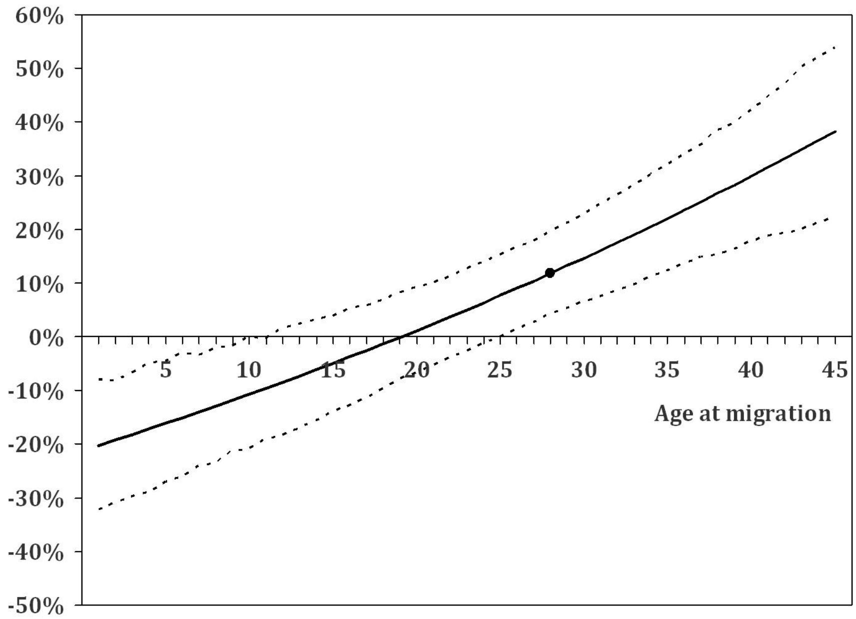
Note: Solid line: Relative difference in predicted completed fertility between immigrants and natives. Remaining covariates are fixed at the means of the pooled native-immigrant sample. The 0%-level on the vertical axis indicates the reference native fertility. The dot refers to the average "difference in TFRs" in the immigrant sample. Dashed lines: 95% pointwise confidence bands based on bootstrap with 999 repetitions.
Source: Own calculations based on SOEP, pooled waves: 1991, 1999, and 2007. Country-specific TFRs from The World Bank (2009).

Figure 3: Immigrant excess fertility as a function of difference in TFRs for immigrants arriving at age 22 and 34



Note: Solid line: Relative difference in predicted completed fertility between immigrants and natives. The curves are calculated at age at migration of 22 (1st quartile) and 34 (3rd quartile) respectively. Remaining covariates are fixed at the means of the pooled native-immigrant sample. The 0%-level on the vertical axis indicates the reference native fertility. The dot refers to the average "difference in TFRs" in the immigrant sample. Dashed lines: 95% pointwise confidence bands based on bootstrap with 999 repetitions.
Source: Own calculations based on SOEP, pooled waves: 1991, 1999, and 2007. Country-specific TFRs from The World Bank (2009).

Figure 4: Immigrant excess fertility as a function of age at migration



Note: Solid line: Relative difference in predicted completed fertility between immigrants and natives. The curve is calculated at the average "difference in TFRs" of 1.2. Remaining covariates are fixed at the means of the pooled native-immigrant sample. The 0%-level on the vertical axis indicates the reference native fertility. The dot refers to the immigrants' average age at migration. Dashed lines: 95% pointwise confidence bands based on bootstrap with 999 repetitions.
Source: Own calculations based on SOEP, pooled waves: 1991, 1999, and 2007. Country-specific TFRs from The World Bank (2009).

Table 1: International total fertility rates

Years	Germany	Turkey	Former Yugoslavia	Italy	Poland
1960-1964	2.49	6.05	2.89	2.47	2.65
1965-1970	2.32	5.67	2.64	2.52	2.27
1970-1974	1.64	5.46	2.39	2.35	2.25
1975-1979	1.52	4.72	2.29	1.94	2.26
1980-1984	1.46	3.98	2.11	1.54	2.33
1985-1989	1.43	3.28	1.96	1.34	2.15
1990-1994	1.31	2.90	1.71	1.28	1.89
1995-1999	1.34	2.57	1.62	1.22	1.48
2000-2004	1.35	2.23	1.49	1.26	1.25
2005-2009	1.32	2.13	1.45	1.38	1.27

Note: Total fertility rates (TFR): basic indicator of the level of fertility, calculated by summing age-specific birth rates over all reproductive ages. Former Yugoslavian TFR refers to averaged TFRs of Bosnia and Herzegovina, Croatia, Montenegro, Serbia, Slovenia, and TFYR Macedonia.
Source: Own calculations based on data from United Nations Population Division (2009).

Table 2: Completed fertility by country of origin

Country of origin	Number of observations	Average completed fertility	Standard deviation
Turkey	242	3.86	1.96
Italy	127	2.72	1.61
Greece	121	2.34	0.88
Former Yugoslavia	115	2.14	1.67
Croatia	63	1.79	1.03
Poland	61	2.05	1.26
Spain	59	2.46	1.81
Eastern Europe	55	1.69	1.45
Russia	41	2.54	1.80
Austria	26	1.65	1.23
Romania	25	2.52	1.12
Kazakhstan	25	2.24	1.20
Bosnia and Herzegovina	25	1.76	0.78
Other	178	2.33	1.56
Cross-country statistics	54	2.44	1.09

Note: Total number of countries is 54. Total number of immigrant observations is 1,163. Other comprises countries with fewer than 20 observations.
Source: Own calculations based on SOEP, pooled waves: 1991, 1999, and 2007.

Table 3: Descriptive statistics

Variable	Natives Mean	Natives St. Dev.	Immigrants Mean	Immigrants St. Dev.
Completed fertility	1.90	1.32	2.59	1.71
Birth cohort				
Born before 1940	0.47	0.50	0.29	0.45
Born 1940-1949	0.26	0.44	0.38	0.49
Born 1950 and later	0.27	0.44	0.33	0.47
Highest completed degree				
No/Elementary degree	0.27	0.44	0.59	0.49
Basic vocational degree	0.34	0.47	0.19	0.39
Secondary degree	0.28	0.45	0.14	0.34
Tertiary degree	0.11	0.32	0.09	0.28
Family background				
Number of siblings	2.16	1.95	3.70	2.56
Ever married	0.95	0.21	0.98	0.14
Age at first marriage	23.36	8.07	22.49	6.58
Religious affiliation				
Catholic	0.39	0.49	0.41	0.49
Protestant	0.48	0.50	0.11	0.31
Muslim	0.00	0.02	0.22	0.41
Other religion	0.01	0.11	0.20	0.40
No religion	0.11	0.31	0.07	0.25
Attend rel. events every week	0.17	0.37	0.20	0.40
Attend rel. events every month	0.14	0.34	0.15	0.36
Attend rel. events less frequently	0.33	0.47	0.28	0.45
Never attend rel. events	0.36	0.48	0.37	0.48
Migrant-specific variables				
German citizenship	-	-	0.31	0.46
Age at migration	-	-	27.92	8.45
Country-specific TFR at the time of migration				
TFR in home country	-	-	3.08	1.34
TFR in Germany	-	-	1.91	0.45
Difference in TFRs	-	-	1.18	1.39
Number of observations	7,260		1,163	

Note: Presented numbers refer to the unweighted sample. All migrant-specific variables are coded 0 for the native sample.
Source: Own calculations based on SOEP, pooled waves: 1991, 1999, and 2007. Country-specific TFRs from The World Bank (2009).

Table 4: Immigrants' completed fertility by difference in TFRs between home and host country

Difference in TFRs between home and host country	Share of immigrant sample	Average completed fertility	Standard deviation
-0.54 - 0.21	0.26	2.11	1.10
0.21 - 0.60	0.24	2.22	1.51
0.60 - 2.19	0.25	2.41	1.63
2.19 - 5.15	0.25	3.62	2.02
Immigrants total	1.00	2.59	1.71

Note: Number of immigrant observations is 1,163.
Source: Own calculations based on SOEP, pooled waves: 1991, 1999, and 2007. Country-specific TFRs from The World Bank (2009).

Table 5: Estimation results

	GPR1	GPR2	GPR3	GPR4
Migrant-specific variables				
Immigrant	0.334***	0.077**	0.026	-0.160
	(0.029)	(0.034)	(0.037)	(0.098)
Difference in TFRs	-	-	0.081***	-0.066
	-	-	(0.025)	(0.051)
Age at migration (10^{-1})	-	-	-	0.063*
	-	-	-	(0.035)
Difference in TFRs × Age	-	-	-	0.052***
at migration (10^{-1})	-	-	-	(0.017)
Control variables				
Born before 1940	Ref.	Ref.	Ref.	Ref.
Born 1940-1949	-0.079***	-0.103***	-0.103***	-0.092***
Born 1950 and later	-0.171***	-0.104***	-0.103***	-0.083***
No/Elementary degree	-	Ref.	Ref.	Ref.
Basic vocational degree	-	-0.178***	-0.179***	-0.181***
Secondary degree	-	-0.138***	-0.140***	-0.146***
Tertiary degree	-	-0.113***	-0.119***	-0.129***
Number of siblings	-	0.024***	0.023***	0.023***
Ever married	-	2.504***	2.496***	2.478***
Age at first marriage	-	-0.035***	-0.035***	-0.035***
Non-religious	-	Ref.	Ref.	Ref.
Catholic	-	0.186***	0.187***	0.183***
Protestant	-	0.222***	0.222***	0.219***
Muslim	-	0.506***	0.294***	0.246***
Other religion	-	0.152***	0.158***	0.160***
Attend religious events				
every week	-	Ref.	Ref.	Ref.
every month	-	-0.113***	-0.111***	-0.114***
less frequently	-	-0.141***	-0.141***	-0.144***
never	-	-0.156***	-0.157***	-0.163***
$\hat{\delta}$	-0.031**	-0.096***	-0.097***	-0.099***
χ^2 for $H_0 : \delta = 0$	17.71	202.28	205.99	215.84
Log-likelihood	-14027.65	-12961.83	-12953.51	-12928.60
Number of observations	8,423	8,423	8,423	8,423
Number of clusters	5,887	5,887	5,887	5,887

Note: Coefficients estimated using generalized Poisson regressions (GPR). Each column is a separate regression. Dependent variable is completed fertility. Robust standard errors in parentheses account for clustering at person level. Standard errors for coefficients of control variables not shown to save space. All specifications include a constant.
***/**/* indicate significant coefficients at the 1%, 5%, 10% levels, respectively.
Source: Own calculations based on SOEP, pooled waves: 1991, 1999, and 2007. Country-specific TFRs from The World Bank (2009).

Appendix

Table A.1: Estimation results using alternative methods

	PR	OLS	GPRweight	GPRdupl
Panel A: Estimations of equation (2)				
Migrant-specific variables				
Immigrant	0.026	0.036	0.013	0.014
	(0.036)	(0.077)	(0.043)	(0.035)
Difference in TFRs	0.078***	0.197***	0.057*	0.076***
	(0.025)	(0.065)	(0.032)	(0.023)
$\hat{\delta}$	-	-	-0.069***	-0.099***
χ^2 for $H_0 : \delta = 0$	-	-	582141.23	151.47
Log-likelihood	-13056.51	-13698.68	-6.58e+07	-8982.79
Number of observations	8,423	8,423	43,372,938	5,887
Number of clusters	5,887	5,887	5,826	5,887
Panel B: Estimations of equation (3)				
Migrant-specific variables				
Immigrant	-0.142	-0.220	-0.104	-0.152*
	(0.095)	(0.200)	(0.113)	(0.092)
Difference in TFRs	-0.071	-0.373***	-0.145***	-0.079*
	(0.050)	(0.130)	(0.053)	(0.047)
Age at migration (10^{-1})	0.057*	0.086	0.036	0.057*
	(0.033)	(0.075)	(0.037)	(0.032)
Difference in TFRs × Age	0.054***	0.210***	0.078***	0.056***
at migration (10^{-1})	(0.017)	(0.049)	(0.019)	(0.015)
$\hat{\delta}$	-	-	-0.070***	-0.102***
χ^2 for $H_0 : \delta = 0$	-	-	606403.32	159.17
Log-likelihood	-13036.52	-13654.94	-6.57e+07	-8965.13
Number of observations	8,423	8,423	43,372,938	5,887
Number of clusters	5,887	5,887	5,826	5,887

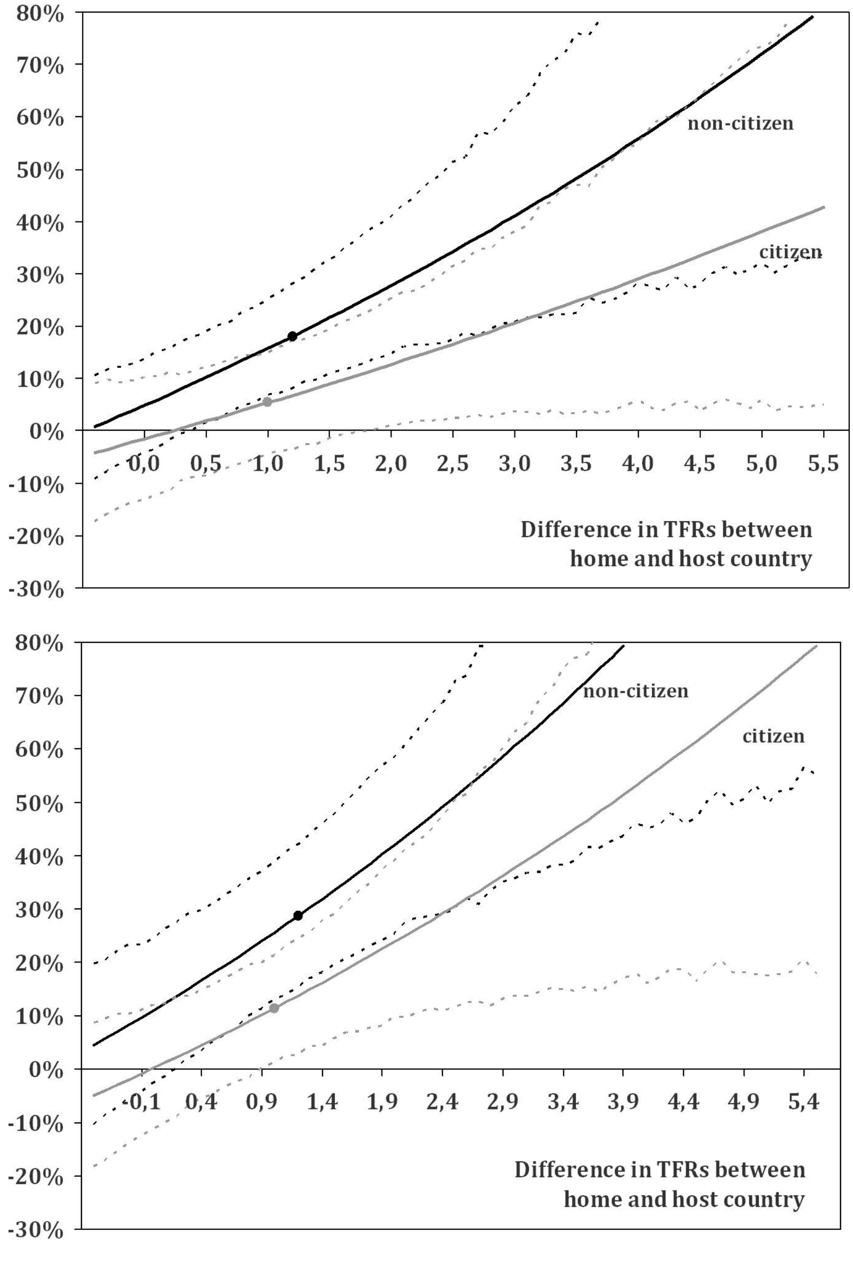
Note: Each column of a panel is a separate regression. Coefficients in columns PR and OLS estimated using standard Poisson regressions, and OLS respectively. Coefficients in columns GPRweight and GPRdupl estimated using generalized Poisson regressions with cross-sectional weighting, and after drop of the duplicate observations respectively. Dependent variable is completed fertility. Robust standard errors in parentheses account for clustering at person level. All specifications include a constant and a full set of control variables.
***/**/* indicate significant coefficients at the 1%, 5%, 10% levels, respectively.
Source: Own calculations based on SOEP, pooled waves: 1991, 1999, and 2007. Country-specific TFRs from The World Bank (2009).

Table A.2: Estimation results using alternative sample restrictions

	TFRage15	nonTurk	TFRoutlier	Child
Panel A: Estimations of equation (2)				
Migrant-specific variables				
Immigrant	0.017	0.026	0.011	0.049
	(0.038)	(0.039)	(0.038)	(0.039)
Difference in TFRs	0.090***	0.084**	0.113***	0.081***
	(0.021)	(0.035)	(0.031)	(0.024)
$\hat{\delta}$	-0.165***	-0.097***	-0.096***	-0.220***
χ^2 for $H_0 : \delta = 0$	361.19	203.47	203.31	808.88
Log-likelihood	-8592.77	-12476.24	-12755.35	-11000.68
Number of observations	5,821	8,181	8,318	7,285
Number of clusters	4,259	5,738	5,820	5,056
Panel B: Estimations of equation (3)				
Migrant-specific variables				
Immigrant	-0.149	-0.126	-0.148	-0.174*
	(0.098)	(0.102)	(0.099)	(0.095)
Difference in TFRs	-0.027	-0.138	-0.066	-0.038
	(0.053)	(0.109)	(0.070)	(0.046)
Age at migration (10^{-1})	0.063*	0.054	0.057	0.076**
	(0.032)	(0.037)	(0.035)	(0.034)
Difference in TFRs × Age at migration (10^{-1})	0.031*	0.074**	0.058**	0.040**
	(0.016)	(0.037)	(0.023)	(0.016)
$\hat{\delta}$	-0.167***	-0.099***	-0.098***	-0.224***
χ^2 for $H_0 : \delta = 0$	368.30	209.51	210.51	832.95
Log-likelihood	-8580.52	-12462.99	-12737.46	-10973.36
Number of observations	5,821	8,181	8,318	7,285
Number of clusters	4,259	5,738	5,820	5,056

Note: Each column of a panel is a separate regression. Coefficients estimated using generalized Poisson regressions (GPR). Column TFRage15: variable "difference in TFRs" based on TFRs as of the year immigrant aged 15 (instead of migration year). Column nonTurk: Turkish immigrants excluded. Column TFRoutlier: 10% of outlying observations with respect to "difference in TFRs" excluded. Column Child: childless natives and immigrants excluded. Dependent variable is completed fertility. Robust standard errors in parentheses account for clustering at person level. All specifications include a constant and a full set of control variables.
***/**/* indicate significant coefficients at the 1%, 5%, 10% levels, respectively.
Source: Own calculations based on SOEP, pooled waves: 1991, 1999, and 2007. Country-specific TFRs from The World Bank (2009).

Figure A.1: Immigrant excess fertility as a function of difference in TFRs by immigrants' citizenship for immigrants arriving at age 28 and 34



Note: Solid lines: Relative difference in predicted completed fertility between immigrants and natives, separately for immigrants of German (grey line) and non-German (black line) citizenship. The curves are calculated at the age at migration of 28 (mean) and 34 (3rd quartile) respectively. Remaining covariates are fixed at the means of the pooled native-immigrant sample. The 0%-level on the vertical axis indicates the reference native fertility. The dots refer to the respective means of "difference in TFRs". Dashed lines: 95% pointwise confidence bands based on bootstrap with 999 repetitions.
Source: Own calculations based on SOEP, pooled waves: 1991, 1999, and 2007. Country-specific TFRs from The World Bank (2009).

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