Ethnic fertility differentials among Yugoslavian-born immigrants in Sweden

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Abstract

Many immigrants to North America and Western Europe originate from countries where fertility patterns differ considerably between ethnic groups. Yet, earlier research on immigrant fertility in Western destination countries typically does not distinguish among immigrants' origin at a finer level than country of birth, an approach that risks hiding variation between sub- and transnational ethnic groups. This study uses Swedish population register data on the so-called information language of newly arrived immigrants to distinguish between BCMS-speaking (Bosnian/Croatian/Montenegrin/Serbian) and Albanian-speaking women immigrating to Sweden from the former Yugoslavia during 1992-2001. The study uses event-history analysis to compare parity-specific transition rates of about 29,000 Yugoslavian-born women and 2.4 million native-born women from 1992 to 2017. Results show that Albanian-speakers have higher first-, second-, and third-birth transition rates than both BCMS-speakers and native women. The transition rates of BCMS-speakers are considerably closer to those of natives. Results point to partial adaptation towards native fertility patterns by duration of stay within the G1 and between the G1 and G1.5 among both BCMS-speakers and Albanian-speakers. The study contributes to the understanding of fertility patterns among Yugoslavian migrants, which is one of the largest immigrant origin groups in several European destination countries. The study also makes a general contribution to research on immigrant fertility in demonstrating that distinguishing among immigrants from the same origin country by subnational ethnicity can uncover considerable within-group heterogeneity.

Keywords: Albanian, language, linguistic, mother tongue, register data, refugees

1. Introduction

Research on immigrant fertility often distinguishes among immigrants by country or international region of birth in order to explore heterogeneity within the immigrant population (Adserà & Ferrer 2016; Andersson 2004; Garssen & Nicolaas 2008; Milewski 2010b, 2011; Mussino & Strozza 2012a, 2012b; Wolf 2016). However, when studying immigrants from ethnically diverse origin countries and regions, sub- or transnational ethnicity may be more relevant than nationality for understanding variation in fertility patterns. Within-country fertility differentials between ethnic groups are common in many migrant-sending regions of the world, including Central Asia (Agadjanian et al. 2008; Agadjanian & Makarova 2003; Kan 2022; Nedoluzhko & Andersson 2007; Spoorenberg 2017), Eastern Europe (Jasilioniene et al. 2014; Koytcheva & Philipov 2008; Puur et al. 2017), Latin America (Grace & Sweeney 2016; McNamee 2009), and the Middle East (Abbasi-Shavazi et al. 2009; Koc et al. 2008; Yavuz 2006). Although such ethnic fertility differentials may be transferred from the origin to the destination country in case of international migration, there is very little research examining ethnic fertility differentials among immigrants from the same origin country (Ren 2009).

Within the former Yugoslavia, Kosovo Albanians stood out from the other major ethnic groups with considerably higher fertility (Courbage 1992; Drezgic 2010). This study explores whether ethnic fertility differentials between Kosovo Albanians and non-Albanians observed in Yugoslavia are also present among Yugoslavian-origin immigrant women in Sweden. The study uses data from Swedish population registers to examine how first-, second-, and third-birth transition rates vary between native women, Yugoslavian-born Albanian-speaking immigrant women, and Yugoslavian-born BCMS-speaking (Bosnian/Croatian/Montenegrin/Serbian) immigrant women. The study population consists of about 2.4 million native women and 29,000 Yugoslavian-born women who immigrated to Sweden in the period 1992-2001. The observation period is 1992-2017.

The extent to which ethnic fertility differentials at origin are reproduced at destination may be influenced by factors such as selection into migration, the degree of adaptation to the fertility regime at destination, and short-term effects of the migration event. First, since immigrants do not necessarily constitute a representative sample of the general population at origin, immigrants' fertility behavior may differ from population averages in the origin country. Second, initial differences between two immigrant groups may disappear if both groups adapt to the fertility patterns in the destination country, due either to cultural integration or adjustment to the opportunity structure relating to childbearing in the destination country. Third, groups may be differently affected by short-term effects of the migration event, such as the separation or reunification of partners in relation to migration. This study examines the impact of short-term effects of the migration event by distinguishing among immigrants by time since immigration. By further distinguishing among immigrants by age at immigration, the study also examines whether intergenerational adaptation towards native fertility patterns is taking place.

This study contributes to research on immigrant fertility in being one of the first to explore how immigrants' subnational ethnic identity in the origin country context may influence fertility patterns in the destination country. Immigrant fertility can serve as an indicator of integration into the destination society (Coleman 1994; Milewski & Mussino 2018). Thus, exploring how immigrant fertility varies by subnational ethnicity can improve the understanding of variation

in the level of integration within country-of-origin groups. In addition to this general contribution to research on immigrant fertility, this study also contributes specifically to the understanding of fertility patterns among migrants of Yugoslavian origin. Yugoslavia constitutes one of the most common immigrant origins in several Western European countries, including Austria, Denmark, Germany, Sweden, and Switzerland (Federal Statistical Office of Germany 2022; Statistics Austria 2022; Statistics Denmark 2022; Statistics Sweden 2022; The Swiss Federal Statistical Office 2022). Earlier research on fertility among Yugoslavian immigrants in Western Europe has not differentiated among Yugoslavian immigrants by ethnicity (Andersson 2004; Milewski 2007).

This study also makes a methodological contribution to Swedish migration research in its innovative use of register data on immigrants' information language to identify ethnic identities that are not captured by country or region of birth. Since Swedish population registers do not contain data on immigrants' sub- or transnational ethnicity per se, register-based analyses of sub- or transnational ethnicity must rely on proxy variables. In demonstrating that immigrants' information language can function as a proxy for ethnicity, this study can inspire Swedish population register research on other topics than fertility where immigrants' ethnicity is a variable of interest.

This paper is structured as follows. Section 2 describes fertility patterns in the former Yugoslavia and among Yugoslavian migrants in European destination countries. Section 3 discusses factors that may affect immigrant fertility patterns and fertility differentials between ethnic groups. Section 4 discusses ethnicity and language in the Yugoslavian context and describes the information language variable. Section 5 describes the research design, whereas results are presented in section 6, followed by a concluding discussion in section 7.

2. Fertility in Yugoslavia and among Yugoslavian migrants

Yugoslavia was created in 1918 to unite various South Slavic ethnic groups in the Western Balkans into one country under a common South Slavic umbrella. Throughout much of Yugoslavia's existence, there were marked differences in fertility patterns between the country's major ethnic groups (Courbage 1992; Drezgic 2010). Especially Kosovo Albanians stood out from the other ethnicities by entering into and progressing through the demographic transition considerably later. Whereas the Croatian and Serbian regions of Yugoslavia reached replacement-level fertility in the 1960s, the total fertility rate (TFR) in Kosovo was still above 6 children per woman at the time (Drezgic 2010). In the late 1980s, all republics and provinces except Kosovo had a TFR at or below replacement level, whereas the TFR in Kosovo was 4 children per woman (Drezgic 2010). The development of Kosovan fertility during the second half of the 20th century more closely resembles patterns in Albania than in the rest of Yugoslavia (Drezgic 2010; Lerch 2013). According to Abdul Ghaffar (2015), Kosovo Albanians' relatively high fertility can be attributed to both socioeconomic and cultural factors, including low educational attainment, a traditional family structure with early marriage and low female labor force participation, a low urbanization rate, son preference, a low contraceptive prevalence rate and low uptake of modern contraceptive methods.

Earlier research on fertility patterns among Yugoslavian immigrants in Sweden has found that women of Yugoslavian origin have higher first-birth transition rates than native Swedish women, whereas second- and third-birth rates are somewhat depressed compared to those of

natives (Andersson 2004). In Germany, first-birth transition rates of Yugoslavian immigrant women are similar to those of native German women (Milewski 2007). Neither Andersson (2004) nor Milewski (2007) distinguish between ethnic groups among Yugoslavian immigrants.

Since fertility patterns in Kosovo resemble those in Albania, it is relevant to briefly review earlier research on fertility among Albanian migrants. In Italy, first- and second-birth transition rates among Albanian immigrant women are between those of low-fertility Romanian immigrants and high-fertility Moroccan immigrants (Mussino & Strozza 2012a, 2012b). Albanian immigrants to Greece have a lower number of children ever born than stayers in Albania but a higher number of children ever born than both native and Bulgarian immigrant women, although differences between the groups have diminished over time (Bagavos et al. 2008).

3. Factors explaining immigrant fertility and ethnic fertility differentials

A possible explanation for ethnic fertility differentials is that they result from cultural differences between the groups. Cultural norms and practices are important determinants of human fertility, for example by influencing gender roles (Myong et al. 2021), the value of children (Nauck 2014), and attitudes to contraception and abortion (Srikanthan & Reid 2008). It has been shown that immigrants may retain fertility-relevant cultural norms and behavior from the origin context in the destination country, for example in terms of gender role norms and practices (Diehl et al. 2009; Kalmijn & Kraaykamp 2018), attitudes to abortion (Milewski & Carol 2018), and sex preferences of children (Lillehagen & Lyngstad 2018; Mussino et al. 2018, 2019). Within research on immigrant fertility, differences in childbearing patterns between natives and immigrants or between groups of immigrants that relate to cultural differences between the groups are referred to as socialization effects. Since cultural norms and practices may differ between subnational ethnic groups, there is reason to expect socialization effects to vary by ethnicity among immigrants from the same origin country.

In addition to cultural explanations for interethnic fertility differentials, fertility differences may be caused by group differences in socioeconomic composition. A common pattern found in research on within-country fertility differentials between ethnic groups in migrant-sending countries is that more urbanized, higher-educated, and historically dominant ethnic groups often have lower fertility than more rural, lower-educated, and underprivileged ethnic groups (Abbasi-Shavazi et al. 2009; Agadjanian et al. 2008; Agadjanian & Makarova 2003; Grace & Sweeney 2016; McNamee 2009; Spoorenberg 2017; Yavuz 2006).

Earlier research on immigrant fertility has shown that immigrants who arrive in the destination country as children often display fertility behavior and preferences that are closer to native patterns compared to immigrants who arrive as adults (Adserà et al. 2012; Carlsson 2018; Wilson 2020, 2021). It is reasonable to expect immigrants who spend part of their childhood and adolescence in the destination country to be more culturally and socioeconomically integrated in the destination society than immigrants whose pre-adult socialization occurs entirely before immigration. Thus, the narrowing of native/immigrant fertility gaps across immigrant generations may be interpreted as intergenerational adaptation towards fertility patterns in the destination country. Research on fertility behavior and preferences among immigrants and children of immigrants in Sweden has shown that the extent of intergenerational change differs between immigrant groups, with more persistent

immigrant/native fertility gaps found among immigrant groups that are culturally more distant to natives (Andersson 2004; Andersson et al. 2017; Carlsson 2018, 2022).

Immigrants' fertility patterns do not only tend to vary by age at arrival but also by time since migration. First, immigrant groups may gradually adapt their fertility behavior towards native fertility patterns as they become more integrated into the destination society by time since immigration. Second, characteristics of the migration event itself may cause fertility to be elevated or depressed directly after immigration, thereby leading to variation by time since immigration as short-term effects wear off. Elevated fertility directly after migration can be expected if migration is related to family formation or family reunification or if childbearing was postponed in anticipation of the migration event. Such positive short-term effects of migration on fertility may be referred to as the interrelation of (demographic) events. Depressed fertility directly after migration can be expected if partners are separated in relation to migration or if the migration event is associated with psychological stress. Such negative short-term effects of migration on fertility may be referred to as disruption effects.

The vast majority of Yugoslavian-origin immigrants arriving to Sweden in the period 1992-2001 were refugees fleeing the Yugoslavian wars (Swedish Migration Agency 2022a, 2022b). Since refugee migration is often less planned than other types of migration, it may also be more disruptive to the refugee's life course trajectory. Refugee migration is also likely to be associated with psychological distress. Thus, there are reasons to expect disruption effects on the fertility of refugee immigrants. However, Andersson (2004) shows that most immigrant origin groups in Sweden, including groups primarily consisting of refugees, have higher transition rates to first birth in the years following shortly after immigration than in later years. This suggests that interrelation-of-events effects dominate over disruption effects. In Norway, refugees tend to have higher completed fertility than family migrants although they do not display elevated fertility directly after immigration to the same extent as family migrants (Tønnessen & Wilson 2023).

There is also reason to expect that socialization effects are stronger among refugees than among other immigrants, at least for refugees from ethnic conflicts, such as refugees from the Yugoslavian wars. Since ethnic discrimination and conflict may strengthen ethnic identities (Grobgeld & Bursell 2021), refugees from ethnic conflicts may give greater meaning than other immigrants to upholding traditional values and practices in order to manifest and nurture the ethnic identity (Randall 2005). If such traditional values and practices are pronatalist, socialization effects may be enhanced among refugees.

4. Ethnicity, mother tongue, and information language

This study uses administrative data on the so-called information language of newly arrived immigrants to identify ethnic groups among immigrants from the former Yugoslavia. This section discusses the possibilities and limitations associated with treating mother tongue as a proxy for ethnicity and with interpreting information language as an indicator of mother tongue, both in general and specifically for the case of the former Yugoslavia.

Ethnicity can be understood as a fluid social construct whose meaning varies over time and by geographical context (Eriksen 2010; Jenkins 2008). Several different dimensions of interpersonal differentiation may contribute to boundary making between ethnic groups, depending on the dividing lines of historical and contemporary political relevance in a specific

temporal and geographical setting. Language is one dimension along which ethnic boundaries may be constructed. Other dimensions include religion, physical appearance, ancestry, traditions, and rituals (Jenkins 2008). Language only constitutes an appropriate indicator of ethnicity in contexts where ethnic and linguistic boundaries between groups coincide.

In the context of the former Yugoslavia, language plays a larger role in ethnic boundaries between some groups than between others. The languages of the Bosniak, Croat, Montenegrin, and Serb ethnic groups, i.e. Bosnian, Croatian, Montenegrin, and Serbian are very closely related and were regarded as one common language, called Serbo-Croatian, before Yugoslavia's break-up. This paper uses the alternative term BCMS when referring to this de facto common language. Together with BCMS, the languages of the Macedonian and Slovenian ethnic groups, i.e. Macedonian and Slovenian, form part of a South Slavic language continuum within which mutual intelligibility between languages is high (Golubović & Gooskens 2015; Gooskens et al. 2018). Albanian, which is the language of Kosovo's ethnically Albanian majority, stands out from the other major languages of the former Yugoslavia in being non-Slavic, and thus only distantly related to BCMS, Macedonian, and Slovenian.

This study uses the registered information language of newly arrived immigrants as a proxy for ethnicity. The Swedish Migration Agency previously registered the so-called information language of newly arrived immigrants with the purpose of determining the language in which the immigrant was to receive interpreter services and information from public authorities (Statistics Sweden 2010). Unfortunately, there is little documentation about how registration of an individual's information language was done. However, it is clear from the data that the information language is not necessarily the immigrant's mother tongue. For example, many immigrants from non-English-speaking countries are registered with English as their information language. It seems that the registered information language can be any language that could be used for effective communication between the immigrant and public authorities. Thus, multilingual immigrants may be registered with an information language other than the language associated with their ethnic group if that would facilitate communication between the parties. Public authorities have an economic incentive to minimize the number of languages in which it is possible to receive information while the individual immigrant has an incentive to report an information language which he or she believes will provide access to the highest-quality and highest-quantity information possible. Many members of linguistic minorities acquire proficiency in a local lingua franca in order to facilitate interaction beyond their own group and should therefore often be able to receive government information in more than one language.

Given that the purposes of registering an information language were purely practical and that authorities had an incentive to minimize the number of possible information languages, the registered information language may reflect de facto linguistic boundaries rather than politically motivated "artificial" boundaries between languages. This means that speakers of closely related but officially distinct languages may be grouped together. Thus, the fact that the South Slavic languages spoken by most of the major ethnic groups of the former Yugoslavia are relatively similar while Albanian stand out from the other languages in being non-Slavic means that the information language data are best suited for distinguishing between Kosovo Albanians on the one hand and other ethnic groups on the other. It seems reasonable to assume that practically everyone who is registered with Albanian as their information language is ethnically

Kosovo Albanian, since there was little incentive for non-Albanian Yugoslavs to learn Albanian at a high level of proficiency. Learning Albanian would have required considerable effort for an individual with a Slavic mother tongue, with few advantages since most Albanian-speakers belonged to a relatively peripheral ethnic minority.

Determining the ethnic composition of immigrants registered as BCMS-speakers cannot be done with similar precision. First, since Bosnian, Croatian, Montenegrin, and Serbian can be considered one de facto language, immigrants registered with a BCMS language may be ethnically Bosniak, Croatian, Montenegrin, or Serb. Second, the considerable mutual intelligibility within the South Slavic language continuum could mean that Macedonian- and Slovenian-speakers are registered with a BCMS language as their information language. Third, the dominant status of Serbo-Croatian in the former Yugoslavia means that many Yugoslavian immigrants from non-BCMS and even non-Slavic ethnic groups would be proficient enough in the BCMS languages to receive Swedish government information in a BCMS language. Thus, BCMS-speakers may potentially be from any Yugoslavian ethnic group, including Kosovo Albanians.

Yet, there is reason to assume that the great majority of registered BCMS-speakers are of non-Albanian ethnicity. First, variation over time in the migration flow to Sweden from Yugoslavia and its successor states during 1992-2001 indicates from which of the Yugoslav wars immigrants to Sweden were fleeing. 80 % of the asylum applications Sweden received from Yugoslavia and its successor states during 1992-2001 were registered in 1992-1994 (Swedish Migration Agency 2022a, 2022b), i.e. during the 1991-1995 war in BCMS-speaking Croatia and the 1992-1995 war in BCMS-speaking Bosnia and Herzegovina but before the 1995 start of the insurgency in Albanian-speaking Kosovo. This corresponds relatively well with the distribution between the main information language groups: Among immigrants to Sweden from Yugoslavia and its successor states during the period in question, 72 % were registered as BCMS-speakers and 21 % as Albanian-speakers.

Second, data available for this study show that 54 % of the immigrants who arrived to Sweden in 1992-2001 from Yugoslavia or any of its successor states are registered as born in Bosnia and Herzegovina. Immigrants to Sweden who were born in a country that has ceased to exist have the right to change their registered country of birth to the new country that was formed in the old country's place, meaning individuals born before Yugoslavia's break-up may choose to be registered as born in Bosnia and Herzegovina. Since Bosnia and Herzegovina is primarily made up of BCMS-speaking ethnic groups, it is likely that the great majority of individuals registered as born in Bosnia and Herzegovina are BCMS-speakers. However, since the possibility to switch country of birth is not used by all immigrants, the actual share of Bosnians among Yugoslavian-origin immigrants arriving to Sweden in 1992-2001 is likely considerably higher than 54 %.

5. Data and methods

5.1. Data and study population

The analyses of this study are based on data from Swedish population registers. All women born in either Sweden, Yugoslavia, or one of Yugoslavia's successor states who were registered as living in Sweden at any time between 1992 and 2017 can be identified in the data

available for this study. After some delimitations that are discussed below, the total study population consists of about 2.4 million native women, 22,600 Yugoslavian-born BCMS-speaking women, and 6,300 Yugoslavian-born Albanian-speaking women. For the transition to first birth, the study population consists of 1,666,720 native women, 15,311 BCMS-speaking women, and 4,953 Albanian-speaking women. For the transition to second birth, the study population consists of 1,039,869 native women, 13,159 BCMS-speaking women, and 3,749 Albanian-speaking women. For the transition to third birth, the study population consists of 1,116,543 native women, 13,065 BCMS-speaking women, and 3,858 Albanian-speaking women. Native women are defined as Swedish-born women with two Swedish-born parents. Swedish-born women with one Swedish-born and one foreign-born parent are not included in the study population.

The immigrant population analyzed in this study is limited to women who immigrated between 1992 and 2001 because the share of Yugoslavian-born immigrants with a registered information language relevant to this study is relatively high during this period. That is, the share of individuals who either have missing information or are registered with English as their information language is relatively low. 6.0 % of the Yugoslavian-born women who otherwise fit the inclusion criteria are excluded from the study population because they either lack a registered information language (1.6 %) or are registered with English (3.6 %) or another language other than BCMS or Albanian, for example Hungarian, Romani, or Turkish (0.7 %).

This study uses piecewise constant exponential models to examine transition rates to the first, second, and third births. Only biological children are considered in the analyses. Time is measured in months. For the transition to first birth, childless native women enter the risk set in the month of their 15th birthday or in January 1992 (whichever happens last). Native women are excluded from the study population if they do not live in Sweden in the month they would have otherwise entered the risk set, i.e. in January 1992 for women whose 15th birthday happens before January 1992 and the month of the 15th birthday for women whose 15th birthday happens in or after January 1992. Childless Yugoslavian-born women enter the risk set in the month of their 15th birthday or at immigration (whichever happens last).

For the transition to second and third births, native women enter the risk set in the month of the previous birth or in January 1992 (whichever happens last), whereas Yugoslavian-born women enter the risk set in the month of the previous birth or at immigration (whichever happens last). Native women who had the previous birth before January 1992 are only included in the study population if they live in Sweden in January 1992. Native women who had the previous birth in or after January 1992 are only included in the study population if they live in Sweden at the time of the previous birth. Women whose first birth was a multiple birth are excluded from the analysis of the transition to second birth. Women whose first or second birth was a multiple birth are excluded from the analysis of the transition to third birth.

For all three transitions, women are censored in the month of their 50th birthday, emigration, death, or in December 2017 (whichever happens first). Women do not re-enter the risk set at re-immigration following an emigration event that occurs after the start of observation. The share of women who are censored due to emigration is 4.6 % for the transition to first birth and 1.0 % for both the transition to second and third birth. The share of women who emigrate and re-immigrate before the next registered childbirth, age 50, death, or December 2017 is 2.5 % for the transition to first birth, 0.4 % for the transition to second birth,

and 0.6 % for the transition to third birth. The share of women who are censored due to death is 0.5 % for the transition to first birth, 1.5 % for the transition to second birth, and 2.7 % for the transition to third birth.

About 1,600 women (almost only natives) with an illogical ordering of immigration and emigration events are excluded from the study population, regardless of when in the life course the illogically ordered events occurred. A small number of women with more than ten registered international migration events are excluded from the study population, regardless of when in the life course the tenth international migration event occurred. For each of the transitions, about 1,000 native women who had spent 10 years or more abroad at the time they would have otherwise entered the risk set are excluded from the study population. For each of the transitions, about 100-200 Yugoslavian-born women who emigrated and re-immigrated before they would have otherwise entered the risk set are excluded from the study population.

Since this study analyzes parity-specific transition rates, it is essential to identify the number of births immigrant women have had prior to immigration. In the population registers, the number of children an immigrant woman has had prior to immigration can only be determined based on the number of children who joins her in the migration to Sweden. A Statistics Sweden survey from 2009 indicates that more than 98 % of 20-40-year-old female immigrants reside with all their children, suggesting that immigrating to Sweden without all children is uncommon for women in this age range (see Mussino et al., 2018). Following Andersson (2004), the study population analyzed in this study is limited to women immigrating at 35 years or younger.

Emigrants from Sweden sometimes fail to report their emigration to relevant government authorities, leading to over-coverage in Swedish population registers (Monti et al., 2020). Immigrants are more likely than natives to emigrate, meaning there is greater over-coverage of the immigrant than the native population. Since over-coverage means that the number of individuals at risk of an event is overestimated, over-coverage of immigrants results in downward biases in register-based estimates of immigrant fertility. However, over-coverage seems to be relatively small among immigrants from the former Yugoslavia and has been estimated at approximately 1-2 % in the period 1990-2012 (Monti et al., 2020).

5.2. Variables and analytical approach

The main independent variable in the analyses of this study is an indicator of ethnicity with three possible categories: native, Yugoslavian-born BCMS-speaker, and Yugoslavian-born Albanian-speaker. Immigrants who are registered as born in either Yugoslavia or any of its successor states, i.e. Bosnia and Herzegovina, Croatia, Kosovo, Macedonia/North Macedonia, Montenegro, Serbia, Serbia and Montenegro, and Slovenia are treated as Yugoslavian-born. About 99.9 % of the individuals who are categorized as BCMS-speakers in this study were registered with Serbo-Croatian as their information language. Individuals who were registered with either Bosnian, Croatian, or Serbian as their information language are also included in the BCMS-speaker category. One individual who was registered as a Macedonian-speaker is also included in the BCMS-speaker category given the relative proximity between the BCMS and Macedonian languages. No individual was registered with Montenegrin or Slovenian as their information language. All individuals in the Albanian-speaker category were registered with "Albanian" as their information language. For a small number of individuals,

the registered information language changes between years. Women whose information language changes between Albanian and any other language are categorized as Albanian-speakers. Women whose information language changes between BCMS and any language other than Albanian are categorized as BCMS-speakers.

To examine intergenerational fertility differences and short-term effects of the migration event on fertility, i.e. interrelation-of-events and disruption effects, the event-history analyses divide BCMS-speakers and Albanian-speakers into three groups: the G1 with less than 5 years since immigration to Sweden, the G1 with 5 or more years since immigration to Sweden, and the G1.5. The G1 is defined as women immigrating at age 15 or older, whereas the G1.5 refers to women who immigrated at age 14 or younger. While there is no standard definition of the G1.5, the threshold at age 14/15 has been used in previous research (e.g. Krapf & Wolf 2015; Wallace 2022).

For all transitions, the base model controls for woman's age (15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49) and calendar period (1992-1995, 1996-2002, 2003-2007, and 2008-2017). Controlling for calendar period is important since period fertility in Sweden has fluctuated over time whereas individuals are observed during different time segments over the full period of observation. The total fertility rate in Sweden was below 1.7 during 1996-2002 and above 1.7 in all other years of observation. In addition to woman's age and calendar period, the base model for the transition to second and third birth also controls for time since the previous birth (0-4 years, 5-9 years, and 10 years or more).

To examine the extent to which ethnic fertility differentials can be attributed to group differences in socioeconomic composition, a second set of models adds educational attainment to the base model. Educational attainment is time varying and measures an individual's highest registered level of education (compulsory, secondary, post-secondary, none/missing information). The month of obtaining a new level of education is set to December for all individuals, since the data available for this study only provides the educational attainment on December 31 in every given year. In Swedish population registers, information on immigrants' education obtained prior to immigration is largely based on self-reports, meaning it is less complete and less reliable than information on education obtained in Sweden (Khaef, 2022). Moreover, the registration of self-reported educational attainment often lags the immigration event with several years. Among refugees and family reunification migrants (categories within which the great majority of Yugoslavian immigrants entering Sweden in 1992-2001 fit) who immigrated in 2000-2006, 90 % had a registered highest level of education within five years of stay in Sweden and almost 100 % had a registered highest level of education within ten years of stay in Sweden (Khaef 2022). Given the high share with missing information among newly arrived immigrants, the G1 with less than 5 years since immigration is excluded from the models that include the socioeconomic status variables. Among natives, the great majority of individuals with missing information on educational attainment are 15- or 16-year-olds who have not yet completed compulsory education or whose completion is not yet registered.

See Appendix tables 1-3 for the distribution of person-months across the categories of the independent variables.

6. Results

As a first step of the analysis, Figure 1 displays the mean number of children to BCMS-speaking and Albanian-speaking immigrant women 16 years after immigration to Sweden, by age at immigration. The dark part of the bars shows the mean number of children born before immigration for each age-at-immigration category, while the light part of the bars show the mean number of children born in Sweden. The numbers are calculated based on women who did not emigrate within 16 years of immigration to Sweden or had not emigrated at age 45 if that happened earlier than 16 years since immigration. 16 years is chosen as the cutoff point since this is the maximum period of observation for individuals who immigrated in 2001, which is the last possible year of immigration for inclusion in the study population.

Figure 1. Mean total number of children born to BCMS-speaking and Albanian-speaking immigrant women from the former Yugoslavia 16 years after immigration, by age at immigration
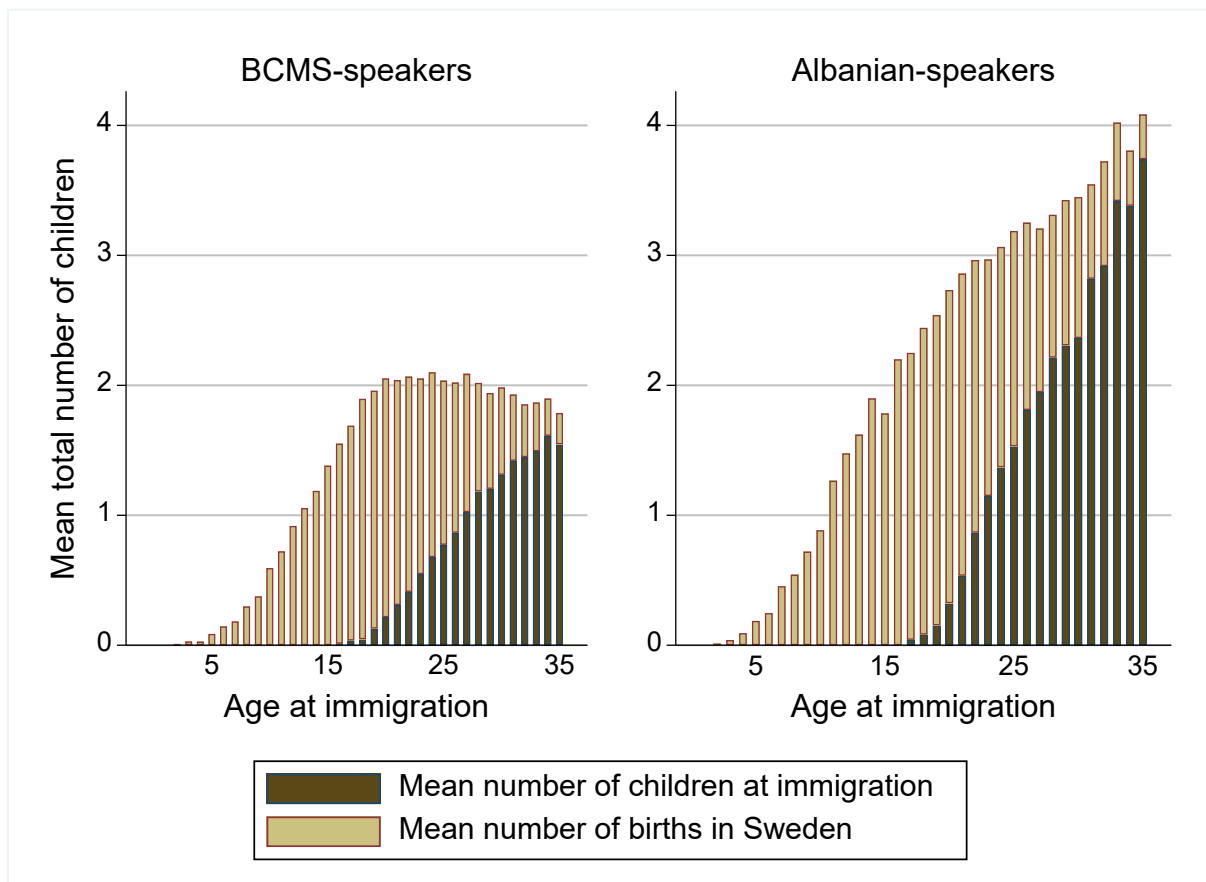
Note: The numbers are calculated based on women who immigrated in the period 1992-2001 and did not emigrate within 16 years of immigration to Sweden or had not emigrated at age 45 if that happened earlier than 16 years after immigration to Sweden. BCMS = Bosnian/Croatian/Montenegrin/Serbian
Source: Swedish population registers

Figure 1 shows that the mean number of children is higher among Albanian-speakers than among BCMS-speakers across ages at immigration. This gap exists both for time spent in Yugoslavia and for time spent in Sweden but is more pronounced before immigration. Women who immigrated at age 19 are 35 years old 16 years after immigration. Their mean number of children at age 35 can be compared to the mean number of children at age 35 among women who immigrated at age 35. Among BCMS-speakers who immigrated at age 19, the mean number of children at age 35 is higher than both the mean number of children at age 35 and completed fertility for women who immigrated at age 35. Thus, BCMS-speakers tend to have somewhat higher fertility in Sweden than in Yugoslavia. Among Albanian-speakers, on the other hand, there is a clear positive relationship between age at immigration and the mean number of children. Albanian-speaking women who immigrated at age 19 have about one child fewer at age 35 than Albanian-speaking women who immigrated at age 35 had at age 35.

The patterns of both BCMS-speaking and Albanian-speaking women can be interpreted as adaptation to Swedish fertility patterns, from below for BCMS-speakers and from above for Albanian-speakers. An alternative interpretation of patterns for Albanian-speakers is that they represent a continuation of a trend towards lower fertility that was already taking place at origin at the time of migration. Since the study only includes women who immigrated during a relatively short time window, individuals who immigrate at younger ages are also from younger birth cohorts. This makes it difficult to disentangle age-at-immigration effects from birth cohort effects.

The next step of the analysis is to examine transition rates to first, second, and third birth, using piecewise constant exponential models (see Figure 2). Figure 2 only displays results for the independent variable of main interest, i.e. the combination of ethnicity, immigrant generation, and time since immigration. For the full results, see Appendix tables 4-6.

For all three transitions, there are clear differences between BCMS-speakers and Albanian-speakers. Among all three generational status/time since immigration categories, i.e. the G1 with less than five years since immigration, the G1 with five or more years since immigration, and the G1.5, Albanian-speakers have higher transition rates to all three births compared to both the corresponding BCMS-speaking group and natives.

The Albanian-speaking G1 with less than five years since immigration has considerably higher transition rates to all three births than all other groups, both Albanian-speaking and others. The transition rates of the Albanian-speaking G1 with five years or more since immigration and the Albanian-speaking G1.5 are much lower but still considerably higher than the transition rates of the corresponding BCMS-speaking groups and natives. Thus, the high-fertility behavior of Albanian-speakers in the period directly after immigration is followed by less than complete adaptation to native patterns. Compared to the Albanian-speaking G1 with five years or more since immigration, the Albanian-speaking G1.5 have a somewhat higher transition rate to first birth, somewhat lower transition rate to second birth, and a clearly lower transition rate to third birth. Since having three children can be considered high-fertility behavior in the Swedish context, a reduction in the transition rate to third birth between the G1 with five years or more since immigration and the G1.5 may indicate intergenerational adaptation in fertility quantum.

Figure 2. Hazard ratios for the transition to first, second, and third birth, piecewise constant exponential models
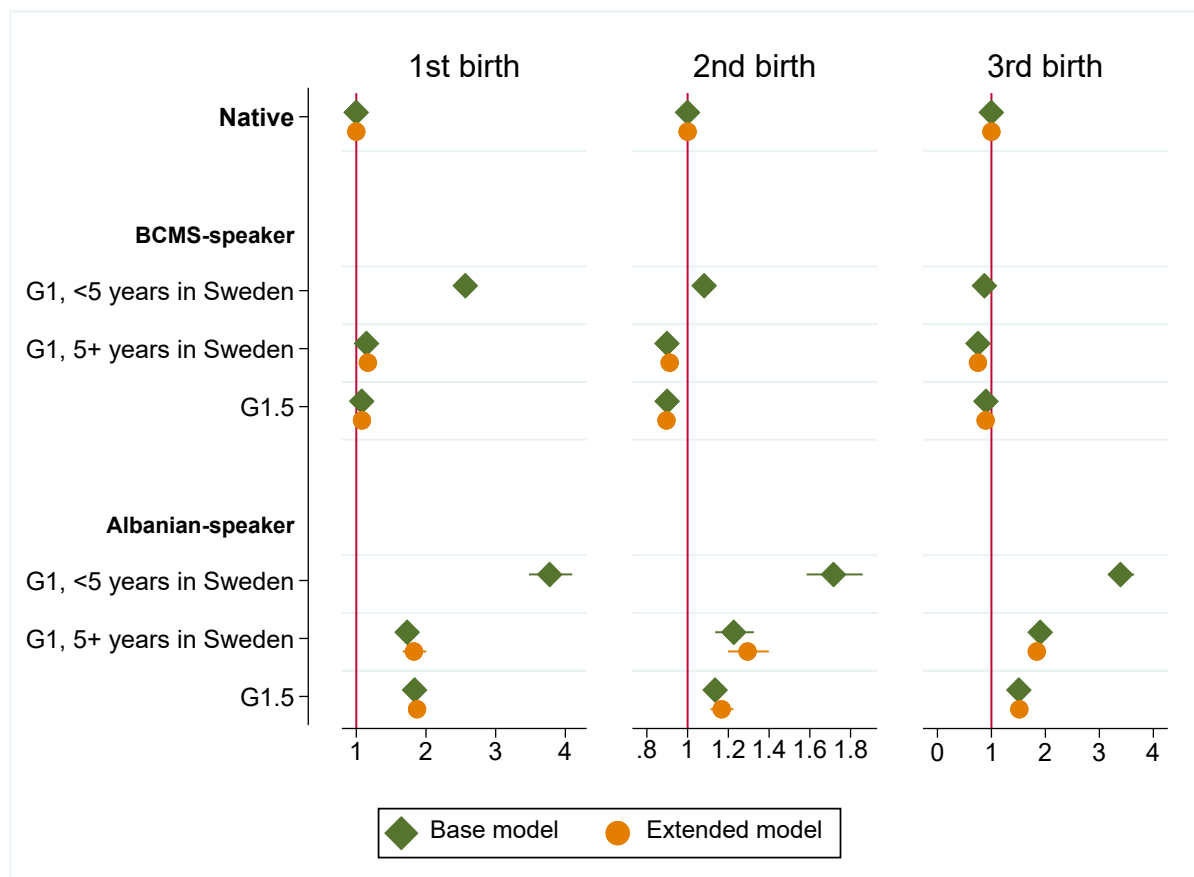
Note: The X-axis range differs for the three transitions. For the transition to first birth, the base model controls for age and calendar period. For the transition to second and third birth, the base model controls for age, calendar period, and time since the preceding birth. The extended model adds educational attainment to the base model. Native women are the reference category. BCMS = Bosnian/Croatian/Montenegrin/Serbian. G1 = individuals who immigrated at 15 years or older, G1.5 = individuals who immigrated at 14 years or younger. 95 % confidence intervals.
Source: Swedish population registers

Among BCMS-speakers, the only instance where the transition rate far exceeds the native rate is for the transition to first birth among the G1 with less than five years since immigration. The BCMS-speaking G1 with five or more years since immigration and the BCMS-speaking G1.5 have transition rates to first birth that are much closer to those of natives, although still somewhat higher. The BCMS-speaking G1 with less than five years since immigration have higher transition rates to second and third birth than the BCMS-speaking G1 with five or more years since immigration, indicating that an interrelation-of-events effect is also present for these transitions, although considerably less pronounced than for the transition to first birth. For the transition to second birth, both the BCMS-speaking G1 with five or more years since immigration and the BCMS-speaking G1.5 have lower transition rates than natives. For the transition to third birth, all BCMS-speaking categories have lower transition rates than natives. For the transitions to first and especially third birth, there is indication of intergenerational

adaptation towards native patterns within the BCMS-speaking group, since the G1.5 is closer than the G1 with five or more years since immigration to the native transition rate. For the transition to second birth, the BCMS-speaking G1 with five or more years since immigration and the BCMS-speaking G1.5 have very similar transition rates, indicating no intergenerational adaptation.

Differences between groups in the transition to second birth are considerably smaller than differences in the transition to first and third birth (note that the X-axis range differs for the three transitions in Figure 1). Group differences cannot be explained by controlling for educational attainment.

7. Discussion

This study examines fertility differentials between BCMS-speaking and Albanian-speaking female immigrants to Sweden from the former Yugoslavia, using population register data. Results show that Albanian-speaking women have considerably higher parity-specific transition rates than both native and BCMS-speaking women, especially for the transition to first and third birth. The transition rates of BCMS-speaking women are considerably closer to those of native women, although there are also important differences between BCMS-speakers and natives. The ethnic fertility differentials among Yugoslavian-origin immigrants in Sweden match ethnic differences observed in Yugoslavia, where fertility was higher among ethnic Albanians than among other ethnic groups (Courbage 1992; Drezgic 2010).

Earlier research on immigrant fertility in Sweden has found that many immigrant groups have elevated fertility in the years directly following immigration, so-called interrelation-of-events effects on immigrant fertility (Andersson 2004). Albanian-speakers clearly follow this pattern, with considerably higher fertility among the G1 with less than five years since immigration than among the G1 with five or more years since immigration. The interrelation of events also seems to affect BCMS-speakers, at least in the transition to first and second birth, although the effect is considerably weaker than for Albanian-speakers.

Results point to adaptation among both BCMS-speakers and Albanian-speakers. The analysis of fertility quantum by age at immigration in Figure 1 shows that Albanian-speakers who immigrated as young adults tend to have fewer children than co-ethnics who immigrated at older ages. Among BCMS-speakers, women who immigrated as young adults tend to have a somewhat higher number of children than women who immigrated at older ages. This suggests adaptation from above among Albanian-speakers and adaptation from below among BCMS-speakers. The analyses of parity-specific transition rates point in a similar direction. In all cases where the G1 with less than five years since immigration has very elevated transition rates compared to natives (i.e. all births for Albanian speakers, first birth for BCMS-speakers), the gap to native levels is clearly reduced among the G1 with five years or more since immigration. This suggests adaptation by time since immigration within the G1. Transition rates to third birth point to intergenerational adaptation from the G1 to the G1.5 among both Albanian-speakers and BCMS-speakers, from above among Albanian-speakers and from below among BCMS-speakers.

Yet, adaptation towards native levels by time since immigration within the Albanian-speaking G1 and between the Albanian-speaking G1 and G1.5 is less than complete, which suggests cultural entrenchment of high-fertility behavior. The finding that group differences in

transition rates largely remain when controlling for educational attainment further indicates that these differences are due to cultural rather than socioeconomic factors. However, fertility in Kosovo has continued to decrease after 2001 and is now below replacement level (Eurostat 2023). Future research should explore the cultural entrenchment hypothesis further by examining whether the G1 who arrived later than 2001 and the G2 of Kosovo-Albanian origin in Sweden follow the fertility patterns of earlier immigrant cohorts and generations or those of contemporary Kosovans.

The contribution of this study to research on immigrant fertility is twofold. First, this is one of the first studies to explore fertility differentials by subnational ethnicity among immigrants from the same country of origin. The study demonstrates that the typical approach of earlier studies on immigrant fertility to only distinguish among immigrants by country or international region of origin may hide considerable heterogeneity among subnational ethnic groups. Aggregating origin groups with distinctly different fertility patterns into wider origin categories may lead to inaccurate understandings of immigrant fertility patterns, for example in terms of trends of adaptation or non-adaptation to fertility patterns in the destination society. Whereas this study focuses on immigrants from Yugoslavia, similar ethnic fertility differentials may exist among immigrants from other origin countries and regions where sub- and transnational ethnic identities may matter more than national identities for the transmission of fertility-relevant norms and practices. Earlier research has shown that considerable within-country fertility differentials between ethnic groups exist in many immigrant-sending regions of the world, including Central Asia (Agadjanian et al. 2008; Agadjanian & Makarova 2003; Kan 2022; Nedoluzhko & Andersson 2007; Spoorenberg 2017), Eastern Europe (Jasilioniene et al. 2014; Koytcheva & Philipov 2008; Puur et al. 2017), Latin America (Grace & Sweeney 2016; McNamee 2009), and the Middle East (Abbasi-Shavazi et al. 2009; Koc et al. 2008; Yavuz 2006).

Second, this study also contributes to research on immigrant fertility in developing the understanding of fertility patterns specifically among immigrants from the former Yugoslavia. Despite the fact that Yugoslavia is one of the most common immigrant origins in several Western Europe countries, relatively few earlier studies have examined the fertility patterns of this migrant group. Previous studies have aggregated all Yugoslavian immigrants into one category and found relatively small differences relative to natives in Sweden and Germany respectively (Andersson 2004; Milewski 2007). Ethnic fertility differentials within the group of Yugoslavian-origin immigrants similar to those found to exist in Sweden may be present in other countries with ethnically diverse Yugoslavian-origin immigrant populations.

This study employs an innovative approach to measuring ethnicity among immigrants to Sweden in treating the registered information language of newly arrived immigrants as a proxy for mother tongue and thereby for ethnicity. The possibilities to use Swedish register data to study how ethnicity relates to demographic, socioeconomic, health, or other factors are limited by the fact that there is no universal registration of ethnicity beyond the country-of-birth level in Sweden. The quality of the data on information language varies considerably between countries of origin and periods of immigration. For some immigrant groups, the share of individuals who either lack a registered information language or are registered with English as their information language is very high. However, this study demonstrates that information

language can be a useful source of data for measuring ethnicity at least for some immigrant groups.

For cases where the information language is not a suitable data source, there are at least two other potential sources of mother tongue information in Swedish register data. First, there is registration of students who take part in mother tongue education at various levels of the Swedish school system. Second, there is registration of the mother tongue of adults who take part in Swedish education for immigrants (SFI in Swedish). For ethnic groups that are geographically separated from other ethnic groups in the origin country, it may be possible to approximate ethnicity by using data on immigrants' place of birth, which are provided in applications to the Swedish Migration Agency (Aradhya et al., 2017).

It should be stressed that an immigrant's registered information language is an imperfect indicator of the immigrant's ethnicity. First, ethnicity is a multifaceted and elusive concept, where language is only one of several components that may contribute to an individual's ethnic identity. It is debatable whether ethnic identity can and should be identified by objective indicators rather than self-reports. Second, whereas mother tongue is a suitable indicator for ethnicity in certain contexts, the registered information language does not necessarily reflect the immigrant's mother tongue. The information language may be any language that can be used for effective communication between the immigrant and various government agencies. An immigrant from a small immigrant group may prefer to be registered with an information language that is used by a larger group if government information in that language is of higher quality and quantity than information in the immigrant's mother tongue. Members of small or marginalized ethnic groups may also be more proficient in the language of the dominant ethnic group at origin than in the language associated with their own ethnic group, meaning they may prefer to be registered with the former language rather than the latter.

A second limitation of the study is that it only includes immigrants who arrived in Sweden between 1992 and 2001. Immigration to Sweden from Yugoslavia and its successor states during this period consisted primarily of refugees from the Yugoslav Wars and their family members (Swedish Migration Agency 2022a, 2022b). Refugee migration differs from other types of migration, for example in more often being involuntary, unplanned, and associated with psychological distress. Thus, the 1992-2001 cohort of Yugoslavian-origin immigrants may not be representative of the full Yugoslavian-origin immigrant population in Sweden, who are also made up to a large extent of labor migrants arriving both before 1992 and after 2001.

To conclude, this study shows that fertility differentials between ethnic groups observed in Yugoslavia are also present among Yugoslavian-origin immigrants in Sweden. Albanian-speaking Yugoslavian-origin immigrant women have significantly higher transition rates to the first, second, and third births than both BCMS-speaking Yugoslavian-origin immigrant women and native women. Whereas Albanian-speakers' transition rates are especially elevated among the G1 with less than five years since immigration to Sweden, both the Albanian-speaking G1 with five years or more since immigration and the Albanian-speaking G1.5 retain transition rates that are higher than those of both natives and the corresponding groups of BCMS-speakers. These findings contribute new knowledge about fertility patterns among Yugoslavian-origin migrants, one of the largest immigrant groups in several Western European countries. This study also makes a more general contribution to research on immigrant fertility in being one of few studies that examine ethnic fertility differentials among immigrants from

the same origin country. The results demonstrate that overlooking the possibility of such ethnic fertility differentials can hide considerable heterogeneity within country-of-origin groups, thereby providing an incomplete picture of immigrant fertility.

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Appendix table 1. Distribution of person months, transition to first birth (%)

	Native	BCMS-speaker			Albanian-speaker		
		G1, <5 years in Sweden	G1, ≥5 years in Sweden	G1.5	G1, <5 years in Sweden	G1, ≥5 years in Sweden	G1.5
Age							
15-19	29.8	24.1	-	40.3	43.0	-	46.5
20-24	27.7	37.1	14.9	35.0	37.8	28.4	35.4
25-29	19.1	21.9	25.1	19.1	10.3	28.9	15.1
30-34	9.4	11.7	21.0	4.9	6.2	17.3	2.8
35-39	5.3	5.0	16.9	0.6	2.7	12.9	0.2
40-44	4.4	0.1	13.3	-	0.0	7.9	-
45-49	4.3	-	8.8	-	-	4.8	-
Calendar period							
1992-1995	15.2	30.7	-	0.8	21.8	-	0.4
1996-2002	26.4	63.4	31.1	18.5	66.8	27.3	17.5
2003-2007	19.4	5.9	34.0	28.8	11.4	34.7	31.3
2008-2017	39.0	-	34.9	51.9	-	38.0	50.8
Educational attainment							
Compulsory	23.5		9.3	27.9		21.3	34.3
Secondary	38.7		44.3	27.4		49.2	30.9
Post-secondary	28.0		43.5	30.5		22.5	16.3
None/missing	9.7		2.9	14.3		7.1	18.5
Total	**206,286,765**	**289,281**	**332,725**	**1,201,287**	**50,588**	**44,057**	**473,993**

Note: BCMS = Bosnian/Croatian/Montenegrin/Serbian. G1 = individuals who immigrated at 15 years or older, G1.5 = individuals who immigrated at 14 years or younger.
Source: Swedish population registers

Appendix table 2. Distribution of person months, transition to second birth (%)

	Native	BCMS-speaker			Albanian-speaker		
		G1, <5 years in Sweden	G1, ≥5 years in Sweden	G1.5	G1, <5 years in Sweden	G1, ≥5 years in Sweden	G1.5
Age							
15-19	0.6	2.0	-	2.0	6.2	-	3.5
20-24	7.7	25.4	3.3	22.9	39.9	14.6	36.4
25-29	19.9	34.0	14.7	46.3	31.3	30.2	46.4
30-34	22.2	25.7	21.2	25.0	16.0	21.8	12.5
35-39	16.0	12.6	22.7	3.8	6.5	15.8	1.2
40-44	14.8	0.3	21.9	-	0.1	11.0	-
45-49	18.8	-	16.2	-	-	6.7	-
Calendar period							
1992-1995	17.8	28.3	-	-	13.8	-	0.0
1996-2002	27.3	61.7	22.0	2.6	69.2	21.2	2.9
2003-2007	18.6	10.0	32.9	15.4	17.1	33.6	18.0
2008-2017	36.2	-	45.1	82.0	-	45.2	79.1
Time since last birth							
0-4 years	51.5	69.2	31.7	85.8	88.0	54.5	89.1
5-9 years	15.7	19.1	22.4	11.7	8.8	20.8	9.2
10 years or more	32.8	11.7	45.9	2.5	3.1	24.8	1.6

(continued)

Appendix table 2, continued

	Native	BCMS-speaker			Albanian-speaker		
		G1, <5 years in Sweden	G1, ≥5 years in Sweden	G1.5	G1, <5 years in Sweden	G1, ≥5 years in Sweden	G1.5
Educational attainment							
Compulsory	13.0		10.4	12.8		26.6	23.2
Secondary	50.3		52.3	43.7		46.5	53.6
Post-secondary	36.4		35.7	42.7		21.5	21.4
None/missing	0.3		1.6	0.8		5.4	1.8
Total	**62,325,741**	**221,726**	**451,610**	**173,152**	**23,622**	**43,274**	**91,040**

Note: BCMS = Bosnian/Croatian/Montenegrin/Serbian. G1 = individuals who immigrated at 15 years or older, G1.5 = individuals who immigrated at 14 years or younger.
Source: Swedish population registers

Appendix table 3. Distribution of person months, transition to third birth (%)

	Native	BCMS-speaker			Albanian-speaker		
		G1, <5 years in Sweden	G1, ≥5 years in Sweden	G1.5	G1, <5 years in Sweden	G1, ≥5 years in Sweden	G1.5
Age							
15-19	0.0	0.2	-	0.4	0.4	-	0.5
20-24	1.1	7.4	0.5	6.5	13.4	2.3	12.7
25-29	7.4	26.2	6.3	34.5	37.8	15.2	48.4
30-34	17.4	39.0	17.1	45.2	33.9	25.0	33.9
35-39	22.7	26.5	27.1	13.5	14.1	25.5	4.6
40-44	23.8	0.6	28.2	0.0	0.4	19.6	-
45-49	27.6	-	20.8	-	-	12.4	-
Calendar period							
1992-1995	17.1	28.3	-	-	20.2	-	-
1996-2002	27.6	67.0	18.2	0.4	67.0	12.4	0.7
2003-2007	18.6	4.7	29.7	5.3	12.9	29.9	7.9
2008-2017	36.7	-	52.1	94.3	-	57.8	91.4
Time since last birth							
0-4 years	29.8	53.9	20.5	76.8	72.8	31.7	80.7
5-9 years	22.8	30.2	25.4	20.6	21.4	28.5	17.4
10 years or more	47.4	15.9	54.1	2.6	5.8	39.8	1.9

Appendix table 3, continued

	Native	BCMS-speaker			Albanian-speaker		
		G1, <5 years in Sweden	G1, ≥5 years in Sweden	G1.5	G1, <5 years in Sweden	G1, ≥5 years in Sweden	G1.5
Educational attainment							
Compulsory	10.6		14.0	13.0		27.9	22.7
Secondary	51.3		58.7	47.7		50.3	58.8
Post-secondary	37.9		26.4	38.7		19.2	17.9
None/missing	0.2		0.9	0.6		2.5	0.6
Total	**125,755,594**	**297,732**	**1,311,458**	**137,998**	**50,922**	**137,755**	**82,391**

Note: BCMS = Bosnian/Croatian/Montenegrin/Serbian. G1 = individuals who immigrated at 15 years or older, G1.5 = individuals who immigrated at 14 years or younger.

Source: Swedish population registers

Appendix table 4. Hazard ratios for the transition to first birth, piecewise constant exponential models

	Model 1	Model 2
Ethnicity / immigrant generation / time since immigration for G1		
Native	*ref.*	*ref.*
BCMS-speaking G1, less than 5 years	2.57***	-
BCMS-speaking G1, 5 years or more	1.15***	1.17***
BCMS-speaking G1.5	1.08***	1.08***
Albanian-speaking G1, less than 5 years	3.78***	-
Albanian-speaking G1, 5 years or more	1.73***	1.83***
Albanian-speaking G1.5	1.84***	1.87***
Woman's age		
15-19	.04***	.06***
20-24	.28***	.28***
25-29	.73***	.72***
30-34	*ref.*	*ref.*
35-39	.53***	.54***
40-44	.11***	.11***
45-49	.01***	.01***
Calendar period		
1992-1995	1.21***	1.21***
1996-2002	*ref.*	*ref.*
2003-2007	1.09***	1.09***
2008-2017	1.04***	1.04***
Educational attainment		
Compulsory		.93***
Secondary		.99***
Post-secondary		*ref.*
None/missing information		.19***

Note: BCMS = Bosnian/Croatian/Montenegrin/Serbian. G1 = individuals who immigrated at 15 years or older, G1.5 = individuals who immigrated at 14 years or younger. *: $p<0.05$, **: $p<0.01$, ***: $p<0.001$.
Source: Swedish population registers

Appendix table 5. Hazard ratios for the transition to second birth, piecewise constant exponential models

	Model 1	Model 2
Ethnicity / immigrant generation / time since immigration for G1		
Native	*ref.*	*ref.*
BCMS-speaking G1, less than 5 years	1.08***	-
BCMS-speaking G1, 5 years or more	.90***	.91***
BCMS-speaking G1.5	.90***	.90***
Albanian-speaking G1, less than 5 years	1.72***	-
Albanian-speaking G1, 5 years or more	1.23***	1.29***
Albanian-speaking G1.5	1.14***	1.17***
Woman's age		
15-19	.21***	.26***
20-24	.60***	.66***
25-29	.86***	.88***
30-34	*ref.*	*ref.*
35-39	.76***	.75***
40-44	.21***	.20***
45-49	.01***	.01***
Calendar period		
1992-1995	1.16***	1.16***
1996-2002	*ref.*	*ref.*
2003-2007	1.09***	1.07***
2008-2017	1.08***	1.06***
Time since last birth		
0-4 years	*ref.*	*ref.*
5-9 years	.53***	.55***
10 or more years	.16***	.17***
Educational attainment		
Compulsory		.76***
Secondary		.88***
Post-secondary		*ref.*
None/missing information		.67***

Note: BCMS = Bosnian/Croatian/Montenegrin/Serbian. G1 = individuals who immigrated at 15 years or older, G1.5 = individuals who immigrated at 14 years or younger. *: $p<0.05$, **: $p<0.01$, ***: $p<0.001$.
Source: Swedish population registers

Appendix table 6. Hazard ratios for the transition to third birth, piecewise constant exponential models

	Model 1	Model 2
Ethnicity / immigrant generation / time since immigration for G1		
Native	*ref.*	*ref.*
BCMS-speaking G1, less than 5 years	.87***	-
BCMS-speaking G1, 5 years or more	.75***	.75***
BCMS-speaking G1.5	.90**	.89**
Albanian-speaking G1, less than 5 years	3.39***	-
Albanian-speaking G1, 5 years or more	1.91***	1.84***
Albanian-speaking G1.5	1.51***	1.52***
Woman's age		
15-19	.77*	.61***
20-24	1.18***	1.18***
25-29	1.20***	1.24***
30-34	*ref.*	*ref.*
35-39	.61***	.60***
40-44	.14***	.14***
45-49	.01***	.01***
Calendar period		
1992-1995	1.33***	1.33***
1996-2002	*ref.*	*ref.*
2003-2007	1.17***	1.17***
2008-2017	1.21***	1.18***
Time since last birth		
0-4 years	*ref.*	*ref.*
5-9 years	.93***	.95***
10 or more years	.42***	.44***
Educational attainment		
Compulsory		1.04***
Secondary		.82***
Post-secondary		*ref.*
None/missing information		1.41***

Note: BCMS = Bosnian/Croatian/Montenegrin/Serbian. G1 = individuals who immigrated at 15 years or older, G1.5 = individuals who immigrated at 14 years or younger. *: $p<0.05$, **: $p<0.01$, ***: $p<0.001$.
Source: Swedish population registers

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