



LIVES WORKING PAPER 2018 / 73

WHO HAS MORE CHILDREN IN SWITZERLAND: SWISS OR FOREIGN WOMEN?

WHY THE TFR IS A MISLEADING MEASURE

MARION BURKIMSHER; CLÉMENTINE ROSSIER; PHILIPPE WANNER

RESEARCH PAPER

http://dx.doi.org/10.12682/lives.2296-1658.2018.73

ISSN 2296-1658





The National Centres of Competence in Research (NCCR) are a research instrument of the Swiss National Science Foundation





Authors Burkimsher, M. (1) Rossier, C. (2)

Wanner, P. (2)

Abstract

The Swiss Federal Statistical Office publishes data showing that the TFR of foreign women is much higher than for Swiss women. However, statistics from household registration (STATPOP) and from the Family and Generations Survey (FGS) indicate that foreigners have slightly smaller families than Swiss women. How can we reconcile this apparent contradiction? To do this we follow the fertility of cohorts of Swiss and foreign women through their reproductive life. In addition to birth registrations and population totals by age (the input data for calculating the TFR) we also include data on how many children women have at the time of their immigration, emigration and naturalisation.

Using these input data, we compiled the fertility profiles of Swiss and foreign women aged 15-49 (cohorts 1965-2001); these correspond well with the FGS and household register data. Most immigrants arrive childless and start childbearing in the years following arrival; hence, younger foreign women in Switzerland have higher fertility than Swiss women. However, the ongoing inflow of low fertility women 'dilutes' the average fertility of older foreign women. Naturalisation–which is more frequent for women with children–significantly impacts the fertility profile of 'Swiss' and 'foreign' women. We confirmed that the TFR gives an inflated impression of the ultimate fertility of foreign women, and under-estimates that of Swiss women, because foreign women are only in the receiving country (Switzerland) for the most fertile portion of their reproductive career. Our comprehensive fertility model covering the entire reproductive life course better describes fertility differentials by age and nationality.

K e y w o r d s

Comprehensive Fertility Profile | immigrant fertility | foreigner fertility | TFR | cohort fertility | naturalisation

Authors' affiliations

(1) Independent researcher affiliated to the University of Lausanne

(2) Institute of Demography and Socioeconomy, University of Geneva

Correspondence to

drmarionb@gmail.com

* LIVES Working Papers is a work-in-progress online series. Each paper receives only limited review. Authors are responsible for the presentation of facts and for the opinions expressed therein, which do not necessarily reflect those of the Swiss National Competence Center in Research LIVES.

1. Introduction

The aim of this paper is to reconcile two superficially contradictory observations: firstly, that the TFR of foreigners in Switzerland is significantly higher than the TFR of Swiss women; and secondly (using the data from household registers (2011-2014) and the Family and Generations Survey (FGS) of 2013) that Swiss women have slightly larger families, on average, than foreign women.

This is a complex story. After introducing definitions, giving an overview of the literature on how other researchers have tackled the question and the specifics of the Swiss situation, we then look in detail at the different measures of fertility. These point to a conflict of conclusions one could draw about the fertility of the native population versus foreign women. Then, by incorporating estimations for fertility at immigration, emigration and naturalisation, we develop a model describing the fertility by age of the Swiss and foreign subgroups and compare it with the data sources, finding excellent agreement. This reconstruction elucidates the processes which occur through the life course and which produce the differences by nationality of these two measures. This work demonstrates why the TFR is such a misleading measure for predicting cohort fertility of foreign women in particular.

2. Nomenclature

This study looks at residents of Switzerland both by their nationality and their migration status. To clarify, these are the meanings of the terms we use in this paper:

Swiss national or simply 'Swiss': individuals holding Swiss nationality. They may also hold additional nationalities. They may have had Swiss nationality from birth or gained it during their lifetime through naturalisation.

Foreigner: someone with any nationality(ies) but not including Swiss nationality. They may or may not have been born in Switzerland.

Immigrant: someone who has moved into Switzerland during their life, whatever their nationality. This includes those who spent some or most of their earlier life already in Switzerland but moved away for a period of time (e.g. to study or work) before coming back.

Emigrant: someone who leaves Switzerland to live elsewhere, either temporarily or permanently.

•2•

Period fertility: The TFR is an indicator of the intensity of births in a particular year.

Cohort fertility: The completed cohort fertility (CCF) measure is the actual number of children cohorts of women have had, on average, through their reproductive life.

Both the TFR and CCF are single numbers relating to either a year or a cohort (birth year). This study rejects the concept that fertility can be described by a single number, but instead develops a vector of numbers which describes the fertility of the whole set of women of different cohorts and in two population sub-groups (Swiss and foreign) who co-exist at a single point in time. We name it the Comprehensive Fertility Profile: it is a set of values for the fertility rate of women at each age (15-49) in a single year. This set of measures avoids the distortions caused by migration and postponement.

3. Literature review

The standard measure of fertility, the Total Fertility Rate, is incorrectly assumed by non-demographers to reflect the average number of children a woman will ultimate have, whereas it is actually a measure of the intensity of childbearing in a specific year (of the group of women in question). Sobotka and Lutz (2011) heavily criticised its use because, although it is a simple measure, it does not accurately reflect cohort fertility and is easily misinterpreted by policy-makers. The distortions to the TFR caused by postponement have been addressed extensively (the classic paper on this is Bongaarts and Feeney 1998); the distortions inherent in calculating the TFR of immigrants or the foreign population have received less attention.

The reason the TFR is so unhelpful in characterising immigrant fertility is because there is, commonly, a high intensity of childbearing in the years immediately after arrival in the new country following subdued fertility in the years preceding migration (Ng and Nault 1997; Robards and Berrington 2016; Toulemon and Mazuy 2004). The TFR for foreigners (as opposed to immigrants) is even more susceptible to distortion because women who stay longer in a country more often naturalise and are then no longer foreign nationals: therefore the TFR of foreigners tends to relate only to women who have been in the country for a relatively short duration – after they arrive but before they naturalise, which is also a period of peak likelihood for partnering and starting a family (Sobotka and Lutz 2011).

Few attempts have been made to date to attempt to correct the distortion inherent in the TFR for the immigrant population. Toulemon and Mazuy (2004) have carried out one of the

most comprehensive studies to date. They compared the fertility rates calculated using three methods, all using the large data set of the 1999 survey "Étude de l'Histoire Familiale" (EHF; Study of Family History in English): (1) A TFR measure, using estimated age-specific fertility rates which have been adjusted to account for the period of high childbearing soon after an immigrant arrives (2) The "own children method" (Cho, Retherford and Choe 1986, Chapter VIII) which reconstructs, for years prior to the survey, the age-specific period fertility rates by linking the mothers (by age) and the known ages of her children; and (3) A novel methodology they developed combining data on the fertility of immigrants at the time they arrived in France (by age of arrival) plus their fertility in subsequent years. They found that the third method indicated a much smaller excess in fertility of immigrants compared to native French residentsof the order of 0.5-compared to the TFR method which suggested an excess of 0.7 children/woman. Women who arrived between 14 and 21 years of age had the highest excess fertility compared to native French women. The authors acknowledge that one limitation of their analysis is that emigration and the (low) fertility of emigrants is not taken into account, and the fact that the younger that women arrive in the country, the longer they are likely to stay (and so be included in any survey).

Robards and Berrington (2016) also included the fertility of women prior to migration in their calculations of the fertility of immigrants to the UK and they also highlighted the high rates of fertility in the years soon after their immigration, these varying by age of arrival in the country and country of origin.

Several other studies have used the "own children method" to compare native and immigrant fertility, including studying immigrants from specific countries (Krapf and Kreyenfeld 2015; Wanner 2002; Abbasi-Shavazi and McDonald 2002; Dubuc 2009). In the latter three papers, the TFRs of prior years are calculated, which commonly indicate that (high fertility) immigrant populations approach the (low-fertility) regime of the host country after a period of time.

Yet another novel approach to compare the fertility of different ethnicities in the UK is that described by Dubuc (2009); the child-woman ratio (CWR). This is calculated as the number of children aged 0-4 to women aged 15-49. The TFR of a chosen ethnicity (e) is the TFR(full population) x (CWRe/CWRall). Dubuc found comparable results from her (refined) own-child method and the CWR.

Wanner (2002) and Wanner and Fei (2005) used the census data of 2000 (which included a question on ever-born children and their years of birth) to derive the TFR of Swiss

and foreign women using the own children method. The first paper includes the TFR of 68 nationalities, showing a wide range, from 4.2 (Somalians) to 0.94 (Romanians). In the second paper a 'standardised TFR of foreigners' was calculated, by assuming that the distribution of foreign women by nationality had remained constant and identical to the 1981 distribution and calculating the ASFRs for different nationalities. As this 'standardised' measure was significantly lower than the non-standardised one (1.52 for 1997 compared to 1.85) the deduction was made that the new arrivals of the 1990s (many from ex-Yugoslavia) had higher fertility than the traditional immigrants from Italy and Spain.

Rojas, Bernardi and Schmid (2018) used the Family and Generations Survey in Switzerland to compare, for Swiss and foreign women of various origins, the transition to first and second birth. Both first- and second-generation women were studied and both the speed and likelihood of having a first or second child were compared using survival analysis. They found that, compared to Swiss natives, immigrants become parents younger and more often; they are less likely to remain childless. However, having a second child is less frequent and comes after a longer birth interval for migrants compared to native Swiss. Rephrasing in TFR terms, this would indicate that the TFR1 (the fertility rate for first births only) is higher for foreigners, but the parity progression ratio 1st-2nd is lower, compared to that for Swiss women.

4. Data sources

The following are the primary data sources used in this paper.

- Decennial census. The last one was in December 2000; since 2010 population registers have supplied equivalent data. As well as supplying basic population numbers by age and sex, the 2000 census also provided a wealth of other information which has been exploited for this paper: number of biological children and their year of birth (up to the 5th or last); country of birth; nationality and year of naturalisation. However, it does not include the year an immigrant moved into Switzerland. The census data is 'almost' comprehensive; however, of women aged 20-39, 4.5% of Swiss women and 8.9% of foreign women did not respond, and although we suspect that many non-respondents are childless, we cannot confirm this.
- 2. Household register data (STATPOP), from 2010 onwards. This collates data from all households in Switzerland with information on the age, sex, nationality and country of birth of all co-residents in each household plus any change which has happened in the

previous year (birth, civil status, naturalisation) (SFSO, 2016a). The latest data available was from 2014. However, the relational links between members of a household are not recorded.

- 3. Birth registration by age and nationality of the woman, whether Swiss or foreign (the BEVNAT database). Since 2011 births by country of birth of mother (Switzerland or abroad) have also been recorded. From 1971 onwards the SFSO has published the TFR of Swiss and foreign women and, from 2011, by nationality and country of birth of mother. For the years 2000-2014 the SFSO have supplied us with births by biological birth order to Swiss and foreign women.
- 4. The PETRA database collated information about foreign residents up to 2009 (SFSO 2016b), since when the STATPOP database has been the source of equivalent information. These are the sources of estimates of the annual number of naturalisations by age and sex.
- 5. Family and Generations Survey 2013 (SFSO 2018). This was a representative survey of 17,000 respondents, covering women (and men) aged 16-79. It includes their nationality(ies), country of birth, their number of children and years of birth. Where applicable it also includes the age when they immigrated and naturalised. It is similar in focus to the Generations and Gender Survey, carried out in 19 other European countries.
- 6. Data from the Migration-Mobility Survey, a sample survey of immigrants who have lived in Switzerland for less than 10 years. This provides estimates of the proportion of mothers who arrive in Switzerland without their biological children.

5. Population structure and trends

We now look at the structure of the female population of reproductive age by country of birth and nationality (Figure 1), how the foreign population has changed in recent years (Figure 2) and the balance of immigration and emigration by age (Figure 3).



Figure 1: Nationality and country of birth by age: STATPOP 2016

Switzerland is unique in Europe for having a very high proportion of foreigners in its population, around a quarter (only Luxembourg has more; Eurostat 2018). Part of the reason for this is that being born in Switzerland gives no automatic right to Swiss nationality and naturalisation can be a slow and expensive process; hence a significant number of children born in Switzerland do not adopt Swiss nationality, even as adults; this is the light orange band on Figure 1. However, the "Swiss born in Switzerland" category in Figure 1 does include people who were born in Switzerland as foreigners but had naturalised before 2016. The purple band "Swiss born abroad" is primarily women who have naturalised during their life. The widening turquoise band shows the major influx of foreigners coming into the country in their 20s before they naturalise or re-emigrate.

Of particular note is that at age 19, three-quarters of the female population are "Swiss born in Switzerland" whereas by age 34 only half of women fall into this category.



Figure 2: Foreign female population aged 20-39 inc., PETRA and STATPOP

Other EU and EFTA: Belgium, Bulgaria, Denmark, Finland, Greece, UK, Ireland, Luxembourg, Netherlands, Norway, Austria, Poland, Portugal, Romania, Sweden, Spain, Hungary, Slovakia, Czech Rep, Croatia, Slovenia, Estonia, Latvia, Lithuania (and smaller countries) Other European: Albania, Turkey, Serbia, Bosnia, Montenegro, Macedonia, Kosovo, Moldova, Russia, Ukraine, Belarus Non-European OECD: Chile, Canada, Mexico, USA, Japan, South Korea, Australia, New Zealand Note: the kink from 2009-2010 reflects the change from the PETRA database to the household register system of collecting population data (STATPOP).

We can see from Figure 2 that more than half of the foreign population originates from low-fertility countries. Since 2000 the origin of the largest foreign group has changed from Italy to Germany, with the German population of young women more than doubling, but the Italian population shrinking. There has also been significant growth in the number of women from Eastern Europe (Hungary, Slovakia, Poland, Romania and Bulgaria) associated with Switzerland joining the Schengen area in 2008 and the EU-Switzerland bilateral agreement for free movement of 2009. Additionally, the growth in immigrants from non-European non-OECD countries is also significant.



Figure 3: Immigration, emigration, net change; mean 2011-2014 STATPOP

We also need to bear in mind the ongoing flows into and out of the country. As can be seen in Figure 3, there is a net loss of Swiss women in their 20s (dark red line). However, immigration and emigration flows of foreign nationals dwarf the flows of Swiss women. Peak immigration (for 2011-2014) is at age 27 (dark blue bars), whilst peak emigration for foreign women is at age 29 (light blue bars). After age 33 there is a net neutral flow of Swiss women, whereas for foreign women it is still positive until at least the late 40s (blue line).

6. TFR of Swiss and foreign women

The SFSO has published the TFR for foreign women and Swiss women for each year since 1971 (Figure 4). The usual conclusion that is drawn from these statistics (shown in parallel with the increase in mean age at first birth) is that foreign women in Switzerland have more children than Swiss women.

The early years shown in Figure 4 show the sharp fall in the TFR at the end of the Baby Boom, partly caused by ongoing postponement in childbearing. From 1971 onwards, the mean age at first birth has risen almost linearly from 25 to almost 31 (considering all women). The mean age of first birth amongst foreign women, whilst also increasing, is significantly lower than for Swiss women, although the gap has narrowed since 2000.



Figure 4: TFR of foreign and Swiss women and mean age at first birth, as published by SFSO: derived from BEVNAT and population statistics

Note: the sharp downward kink in the TFR of foreign women between 2000 and 2001 is because after 2000 births to asylum seekers and other temporary residents were no longer included in the statistics.

The impact of the fertility rates of foreign women on overall TFR has been significant and positive since at least 1971. It can be calculated as the TFR of the full population minus the TFR of just Swiss women. In the early 1970s, and again around the turn of the millennium, foreigner fertility boosted the TFR by over 0.2 child. During the 1980s the impact was only marginally positive. Between 2000 and 2009 it dropped from 0.2 to 0.1 and since then has been stable at that level. It should be noted that Switzerland has experienced the highest positive impact of foreigner fertility compared to other European countries (Sobotka 2008).

The description above applies to the standard way of calculating the TFR, i.e. from birth registrations linked to the female population by age. However, we can also calculate the TFR of years prior to 2000 years using the fertility data recorded in the 2000 census using the own-children method. We do not know, however, where the children were born (some will have been born outside Switzerland). We found that the "own-children TFR" for Swiss nationals (which includes women who have naturalised) and for all women born in Switzerland (which includes some women who remain foreign nationals) closely tracked that of the standard TFR of Swiss women as shown in Figure 4. However, the "own-children" TFRs derived from the two different methods relating to foreign/born abroad women are significantly different from the standard TFR for foreign women (Figure 5).

Except during the 1980s the standard TFR exceeds that derived from the own-children method. One possible reason for the difference is that the standard TFR includes all women living in the country by age in a given year, whereas the census data only includes women who were still living in Switzerland in 2000; women who have emigrated in the intervening period are not included. However, we consider it unlikely that foreign women with larger families were more likely to emigrate (see section 9 to support this assertion). We believe the problem lies not in the own-children method but in the standard TFR calculation, which we discuss in section 13.



Figure 5: Standard TFR of foreign women (derived from vital statistics); TFR derived by own-children method from census 2000: of foreign women and of women born outside Switzerland

Note: only children up to birth order 5 were included in the own-children calculations, so they will be slight under-estimates. No adjustments were made for female mortality (none were necessary for child mortality as the census asked about ever-born children). The designation "foreign women" relates to their non-Swiss nationality in 2000.

7. Number of children from register data, FGS and census

We now look at the number of children women have, by age, from three sources. Firstly, using register data (STATPOP) we looked at households in which there was a woman aged 20-39 and counted any co-habiting children (or young adults) who were 15 years or more younger than her. As we only have information on co-habiting children, it is only an approximation of the number of children the woman has borne. In discussing these problems, Dubuc (2009) found evidence of over- and under-counting to be just a few percent, as did Krapf and Kreyenfeld (2015). A small number of children will have died (a rough estimate is 0.5% by the age of 15). Some children will be living apart from their mother (e.g. with their father, adoptive family, or in the country of origin) or there may be additional children in the household that are not those of the 'mother' (e.g. siblings who are much younger, step-children of a male partner, foster children or children of other relatives/friends). We make the cut-off at women older than 40 for this comparison, as after that age some children will have started to leave home. As for children yet to be born to women over 40, the fertility of women aged 40-49 from TFR data was 0.05 (for Swiss women in 2001) and 0.06 (for foreign women in 2001), rising to 0.09 (Swiss women in 2014) and 0.10 (foreign women in 2014).

The four graphs in Figure 6 show the parity distribution and average number of children by age of women from 20-39 by country of birth (Switzerland/abroad) and nationality (Swiss/foreign). We consider that the majority of women classified as 'Swiss born abroad' are immigrant women who have naturalised (in the census it was 81% and in the FGS it was 83%).

These graphs show that the FGS and STATPOP data are in reasonable agreement. The FGS gives a lower number of children for women in their 20s. The significantly lower fertility of foreign women in their 20s (6b and 6d) enumerated in the FGS compared to STATPOP gives some concern about its representivity for these ages. It is surprising that low fertility young women seem to be over-sampled in the FGS; this would contradict the findings of Kreyenfeld et al (2012).

The FGS shows higher fertility of women in their 30s compared to STATPOP. The biggest mismatch is for naturalising women in their early 30s (Figure 6c); this is possibly explained by the small sample size of the FGS. The 'under-estimate' of number of children in the STATPOP data for women in their late 30s reflects the fact that older children of young mothers are starting to leave the household at this stage. Comparing Swiss mothers (born in Switzerland) with mothers who immigrated into Switzerland after the age of 15 and who were

aged in their 40s, 31% of the former had at least one child aged over 18, whilst 42% of the immigrants did (FGS data).



Figure 6: Mean number of children – STATPOP household registers (mean 2011-2014), FGS (2013, moving average of 5 year age bands) and census (2000), plus parity distribution by age of woman (STATPOP)

Looking at the changes that have happened since 2000 by comparing the census data with the other sources we see there has been a significant fall in the fertility of 'Foreign born abroad' women, from 1.8 to around 1.4 at age 39. There have also been fertility declines, though of a lower magnitude, of women born in Switzerland (both Swiss and foreign nationalities). However, the fertility pattern of naturalising women ('Swiss born abroad') has remained quite constant.

LIVES Working Papers - Burkimsher et al.

Comparing childlessness, we see that naturalised women (6c) have the lowest proportion, whilst amongst the other three groups around 30% are still childless at age 39. Foreign women (6b and 6d) have a higher proportion of one-child families than Swiss women (6a and 6c), whereas the latter have a higher proportion of 2-child families.

To summarise, data on actual family sizes (FGS and STATPOP) indicate that foreign women, by the age of 39, have lower fertility than Swiss women.

8. Inconsistency between the TFR and actual number of children

We now look at summary statistics of the TFR and the data of actual children from the sources described in the previous section (Table 1).

Table 1: Fertility indicators from different sources (census data in grey as it is older data but *is included for comparative purposes)*

	т	R	Avera	nge no. children all w	vomen
	av. 2001-2009	2014	Census 2000 -	STATPOP 2011-14	FGS 2013 -
			age 39	age 39	average 37-41
Swiss born in Switzerland	1 20	1.42	1.67	1.42	1.58
Swiss born abroad (~naturalised)	1.25	1.58	1.68	1.55	1.79
Foreign born in Switzerland	1.07	1.47	1.55	1.27	1.32
Foreign born abroad (immigrants)	1.87	1.94	1.80	1.31	1.42
	Children/mothe TI	r estimated from R	Averag	ge no. children just n	nothers
	TFR/ TFR1 av.	TED / TED4 2044	Census 2000 -	STATPOP 2011-14	FGS 2013 -
	2001-2009	IFR/ IFRI 2014	age 39	age 39	average 37-41
Swiss born in Switzerland	2.07	2.12	2.21	2.05	2.07
Swiss born abroad (~naturalised)	2.07	2.13	2.07	1.95	2.01
Foreign born in Switzerland	1.01	1.07	2.08	1.83	1.93
Foreign born abroad (immigrants)	1.01	1.67	2.18	1.85	1.86
			Childlessness %		
	(1-TFR1) av. 2001-	(1 TED1) 2014	Census 2000 -	STATPOP 2011-14	FGS 2013 -
	2009	(1-1FK1) 2014	age 39	age 39	average 37-41
Swiss born in Switzerland	200/	220/	25%	31%	23%
Swiss born abroad (~naturalised)	56%	53%	19%	20%	11%
Foreign born in Switzerland	20/	00/	25%	31%	31%
Foreign born abroad (immigrants)	-3%	U%	17%	29%	23%

Note: in FGS the 'Swiss born abroad' include those with Swiss or double nationality (including Swiss)

In FGS the 'Foreign born in Switzerland' include those who only have foreign nationality plus those have double nationality (including Swiss)

The 'Foreign born abroad' are non-naturalised immigrants

The 'Swiss born in Switzerland' include those who were born in Switzerland with foreign nationality but who have since naturalised For all measures, it is the nationality of the woman/mother that is being analysed, not those of her child/children

Looking at the first section of Table 1 (as already shown in Figure 4), the TFR indicates that foreign women have significantly higher fertility than Swiss women. However, the STATPOP, like the FGS we already mentioned, show that Swiss women have more children than foreign women. The difference is particularly marked for the measure for "Foreign born abroad" women, i.e. immigrants.

The second section shows the number of children <u>per mother</u>. This can be estimated from the TFR data when births by (biological) birth order are known, by the simple calculation TFR/TFR1. From this information it is clear that Swiss mothers have larger families than foreign mothers. There has been a fall in the family size of all women since 2000, but this has been especially marked for "Foreign born abroad" women (immigrants).

Looking at childlessness (3rd section of Table 1) gives us an indication of how part of the discrepancy arises. When we calculate childlessness from the TFR1 it gives 'impossible' values for foreign women because the TFR1 of foreigners is close to or even exceeds 1. A TFR1 value greater than 1 has been seen in population-wide contexts, such as during the Baby Boom years in the United States (Bongaarts and Feeney 1998) and the Czech Rep, the Netherlands and Italy (Sobotka 2003). The cause is a high intensity of first births, which can happen when women across a wide span of ages are entering motherhood for the first time, and/or when the mean age at first birth is getting younger – or, in this case when immigrant women, who are childless in their 20s, arrive in the country.

The estimate of childlessness derived from the TFR of Swiss women is also problematic: it is too high. There is a simple explanation for this: ongoing postponement of mean age at first birth (Figure 4). This well-known distortion can be easily compensated for using the Bongaarts-Feeney correction (1998).

A final point to note is the low fertility of foreign women born in Switzerland (both from the TFR and actual number of children). This echoes the work of Rojas et al (2018) who found subdued fertility of second-generation immigrants in Switzerland. It could also be a reflection of differential rates of naturalisation, which we discuss in a later section.

Having described the apparent discrepancies between the TFR and measures of cohort fertility in detail, we now develop a model to describe more accurately the fertility differentials between the two groups. For that we need data, in addition to births to Swiss and foreign women, on the number of children they have at immigration, emigration and naturalisation.

9. Fertility of women at immigration and emigration

STATPOP data can give us estimates of the number of children that arrive with an immigrating woman and who leave with an emigrating woman. As children do not necessarily arrive at exactly the same time as their mother then these are measures of the change in the

household over the year. It is likely to be an under-estimate of the number of children that immigrating women actually have for two reasons. Firstly, we know from the Migration-Mobility Survey that women arrive in Switzerland with somewhat fewer children than they have borne; occasionally these are young children left with relatives, more often they are older children continuing their education or early work life elsewhere. For women under 35, more than 90% of mothers arrive with their children; however, this drops to 85% for women 35-39, 70% for women 40-44, and just over half for women 45-49. The second reason the STATPOP data is likely to be an under-estimate is that it relates to the end of each year and some women will arrive towards the end of a calendar year to be joined by their children early the following year.





Figure 7: Number of children in households of immigrants and emigrants in year of arrival/departure: mean of STATPOP data 2011-2014

Although there are slight differences, the fertility profiles (by age) of women who move country (immigrate/emigrate, Swiss/foreign) are really quite similar. The people who move country (both immigrants and emigrants) are predominantly childless. However, during their 30s, women are increasingly likely to migrate with a (small) family in tow. Foreign immigrants arriving with three or more children are exceptionally rare.

Interesting to note is that Swiss national <u>immigrants</u> (7a) have slightly higher fertility than Swiss national <u>emigrants</u> (7c) i.e. they return to Switzerland after having had a child/children elsewhere. In contrast, foreign <u>emigrants</u> (7d) have slightly higher fertility than foreign <u>immigrants</u> (7b) i.e. they leave (often to return to their home country) after having had a child/children in Switzerland. It is also worth noting that foreigners moving into and out of Switzerland (7b and 7d) have lower fertility than Swiss women immigrating/emigrating (7a and 7c).

The base data we use for number of children at immigration and emigration are the STATPOP values shown in Figure 7 (a-d) up to the maximum value (around when women turned 40). After this age then, rather than a sudden fall, the values were chosen manually to decline slightly after that age (Table 2). We consider that the apparent high proportion of childless women in their 40s shown in the STATPOP data is an over-estimate of actual childlessness. The likely reason is that they leave their older and young adult children in their home country; they arrive in Switzerland without accompanying children, which would imply they are 'childless', even though they are not. The FGS gives some support for this (see Figure 8).



Figure 8: Number of children at immigration and % childless

Note: for the FGS, women of both Swiss and foreign nationalities were included. The FGS is smoothed data for 5 year rolling age groups and covers all sampled women (aged up to 80). The STATPOP data is the mean for foreign women immigrating for years 2011-2014.

Table 2: Fertility	rates by age	at immigratio	n and emigration	n as used in th	e Comprehensive
Fertility Profile co	alculations				

	Swiss immigs	Swiss emigs	Foreign immigs	Foreign emigs
15	0	0	0	0
16	0	0	0.01	0.01
17	0	0	0.01	0.01
18	0	0	0.02	0.02
19	0	0.02	0.02	0.03
20	0.01	0.03	0.02	0.04
21	0.03	0.03	0.03	0.04
22	0.05	0.05	0.04	0.07
23	0.05	0.05	0.04	0.08
24	0.06	0.07	0.06	0.10
25	0.07	0.07	0.09	0.11
26	0.12	0.09	0.11	0.14
27	0.12	0.12	0.16	0.19
28	0.19	0.16	0.21	0.21
29	0.20	0.19	0.27	0.28
30	0.31	0.26	0.35	0.33
31	0.38	0.31	0.43	0.40
32	0.49	0.39	0.54	0.47
33	0.54	0.45	0.62	0.56
34	0.68	0.50	0.61	0.64
35	0.82	0.58	0.78	0.74
36	0.85	0.67	0.85	0.80
37	0.92	0.71	0.90	0.84
38	1.05	0.73	1.00	0.86
39	1.01	0.72	0.99	0.88
40	0.99	0.76	0.98	0.91
41	0.99	0.76	0.97	0.90
42	0.98	0.75	0.96	0.89
43	0.97	0.74	0.95	0.88
44	0.96	0.73	0.94	0.87
45	0.95	0.72	0.93	0.86
46	0.94	0.71	0.92	0.85
47	0.93	0.70	0.91	0.84
48	0.92	0.69	0.90	0.83
49	0.91	0.68	0.89	0.82

One further comment on Figure 8: there are two likely reasons why the fertility at immigration is higher in the FGS sample than for the STATPOP data. The first is that the FGS sample covers women aged 15-79 and fertility has fallen for women across those cohorts. Secondly, the FGS samples only those women who have immigrated and subsequently stayed in the country. It cannot reflect very mobile childless women who arrive, stay only a short time and then leave again. A strong assumption was made for the base data in Table 2: that there has been no trend over time in the fertility of women at migration.

10. Fertility of women at naturalisation

Data on the number of children that women have at naturalisation is the most difficult statistic to obtain (we have had to deduce it from various sources) and there have been several trends over the past decades: in the number of naturalisations (rising), the age at which people naturalise (also rising), and (hence) the number of children they have at naturalisation.

Several important changes in the naturalisation rules over the past decades have occurred. In the 1970s women who had lost their Swiss citizenship (because of marrying a non-

Swiss man, for instance) could regain their Swiss nationality by request. Up until the end of 1991 a foreign woman who married a Swiss man automatically gained Swiss nationality (and may thereby have lost her existing nationality); this statute was then dropped with the introduction of the new law on citizenship. Foreign women marrying a Swiss man (and vice versa) are eligible to apply for fast-track citizenship, although this still takes several years (SwissInfo 2018). One of the countries which until recently allowed only single citizenship was Germany; however, since 2007 German women can have dual citizenship of Switzerland and Germany (and many older German women living in Switzerland have been doing so; SwissInfo 2007).

There has been a rise in naturalisations since the mid-1990s, especially amongst older women since 2012 (many of these being German) (Figure 9).



Figure 9: Number of foreign women becoming naturalised Swiss 1981-2016, at ages 18, 28, 38 and 48

Naturalisation has traditionally been part of the transition to adulthood and this remains the case for many children who grew up in Switzerland. There are several links between naturalisation and fertility, as described in Pecoraro (2012). Firstly, childless women tend, if possible, to become naturalised before starting a family. This is confirmed from the FGS data on women of reproductive age: 62% of mothers had naturalised before (or in the same year as) the birth of their first child. Secondly, women who have children choose to naturalise when the duration of stay is long enough; childless women have a slightly lower propensity to naturalise. The outcome is that naturalised women have a fertility around 0.2 higher than foreign women as they reach their 40s, as seen in Figure 6c and Table 1.

To estimate the number of children that women have (on average, by age) at the time of their naturalisation we analysed several data sources. The census data of 2000 gives the year of naturalisation, as well as the years of birth of children. From this we can deduce the number of children a woman had in the year she naturalised (black continuous line 1 in Figure 10). We also know, from the census data, the number of children of all women who are 'Swiss born abroad' (81% of these women are naturalised) (black dashed line 2 in Figure 10). The fertility profile by age turns out to be very similar for these two sets. STATPOP (averages from 2011-2014) can provide two similar data sets: data set 3 (red continuous line) for number of children at naturalisation and data set 4 (red dashed line) for all women 'Swiss born abroad'. Unlike for the census data, these latter two differ significantly and line 3 is markedly lower. We wonder whether the reason for the particularly low fertility for the years 2011-2014 was a surge in the naturalisation of low-fertility German women after the possibility of them gaining dual nationality after 2008. Our fifth data set (green continuous line 5) is that from the FGS for children at naturalisation (for all women under age 50) – a smoothed line of 5 year rolling averages. Although the FGS fertility curve is higher than that from the other sources for ages up to the late 30s, it agrees that fertility at naturalisation of women aged about 40 is around 1.7.



Figure 10: Data sources to estimate number of women at naturalisation

LIVES Working Papers - Burkimsher et al.

Data sets 1, 2 and 4 show good agreement and so a combination of these were used for the fertility of women at naturalisation and a table of values for years 1981-2016 was compiled as follows:

- 1. For the years 1981-2000, the direct values of children at naturalisation as calculated from the census 2000
- 2. For 2001-2016, ages 15-19, an extrapolation (constant values) of the census data on children at naturalisation (fertility at these ages is very low indeed)
- For 2001-2011, ages 20-37, an interpolation of children at naturalisation in the year 2000 from the census and the STATPOP data on number of children for 'Swiss born abroad' women (mean of years 2011-14).
- For 2011-2016, ages 20-37, the mean fertility of 'Swiss born abroad' women from STATPOP for the years 2011-2014 (the mean for those four years was used across the six years).
- 5. From 2001-2016, ages 38-49, an extrapolation (constant values) of the values in the census of the fertility of Swiss born abroad women.

The compiled data set for the average number of children at naturalisation for years 1981-2016, ages 15-49, is shown in Appendix table 4.

11. Methodology for calculating the Comprehensive Fertility Profile (CompFerProf)

The aim of the model described here is to give an estimate, for Swiss and foreign nationals, the average number of children borne by women of each age (15-49). In this respect it is a <u>period</u> snapshot of the estimated average family size (cohort fertility so far) of each cohort of women by nationality that year. As we have fertility and population data from 1981-2016 then we know the full fertility history for women born in 1966 and 1967 (i.e. from when those cohorts reached 15 through to when they reached 49) but not for women older than that (they were already over 15 when the records begin). For younger cohorts we only know their fertility history for part of their reproductive life.

The calculation process considers "incoming" and "outgoing" children for each cohort of women as they pass through each age. "Incoming" children are from births and immigration and, for Swiss women, naturalisation. "Outgoing" children are from emigration and, for foreign women, naturalisation. Note that we look at the number of children by the nationality (Swiss or foreign) of the <u>mother</u>, not the child, and this is her nationality in a particular year.

The formulae for net increase in number of children for each group of women is as follows:

Foreign women: Births_f + $[Imm_f x r_f (imm)] - [Emig_f x r_f (emig)] - [Nat x r(nat)]$

where:

Birthss are births to Swiss women at each age.

Imms are the number of immigrants of that age of Swiss nationality.

 r_{S} (imm) is the mean number of children (fertility rate) that Swiss immigrants bring with them into the country.

Emigs are the number of emigrants of that age of Swiss nationality.

 $r_{\rm S}$ (emig) is the mean number of children that Swiss emigrants have at the time they emigrate.

Nat is the number of women of each age who naturalise.

r (nat) is the mean number of children women have at the age when they naturalise.

Births_f are births to foreign women at each age.

Imm_f are the number of foreign immigrants of each age.

 $r_{\rm f}$ (imm) is the mean number of children (fertility rate) that foreign immigrants bring with them into the country.

Emig_f are the number of emigrants of that age of foreign nationality.

 $r_{\rm f}$ (emig) is the mean number of children that foreign emigrants have at the time they emigrate.

LIVES Working Papers - Burkimsher et al.

After calculating the cumulative net 'incoming' children for each cohort these are divided by the population of women of each age (for years 2013-2016). See Appendix for a summary of the data tables. Table 3 below shows a summary of the results for 2016.

		Cumulative		Number of	Cumulative		Number
		net	Swiss	shidron	net	Foreign	shildron
Age	Cohort	children of	women	Chidren	children of	women	foreign
		Swiss	2016	SWISS	foreign	2016	Ioreign
		women		women	women		women
15	2001	2	30764	0.00	0	9118	0.00
16	2000	13	33033	0.00	21	8731	0.00
17	1999	33	33314	0.00	38	8770	0.00
18	1998	94	34374	0.00	102	8518	0.01
19	1997	206	35206	0.01	258	8681	0.03
20	1996	376	36447	0.01	530	9106	0.06
21	1995	718	36371	0.02	942	9526	0.10
22	1994	1229	36962	0.03	1607	10064	0.16
23	1993	1919	37621	0.05	2433	10458	0.23
24	1992	3165	39229	0.08	3636	11611	0.31
25	1991	4818	39073	0.12	5311	13160	0.40
26	1990	6856	39212	0.17	6870	14630	0.47
27	1989	9454	38454	0.25	8592	16248	0.53
28	1988	12453	38335	0.32	11391	17696	0.64
29	1987	15922	36750	0.43	13371	19483	0.69
30	1986	20403	37043	0.55	16145	20357	0.79
31	1985	24759	36488	0.68	18928	21403	0.88
32	1984	29459	36232	0.81	21492	22265	0.97
33	1983	33800	35766	0.95	23983	22908	1.05
34	1982	39872	36710	1.09	25946	22779	1.14
35	1981	43401	36153	1.20	28120	23216	1.21
36	1980	47743	36754	1.30	28997	23389	1.24
37	1979	49965	36281	1.38	29809	22824	1.31
38	1978	51722	35669	1.45	30436	21970	1.39
39	1977	53911	36175	1.49	30533	21773	1.40
40	1976	56265	36691	1.53	30469	21209	1.44
41	1975	58292	37023	1.57	29636	20598	1.44
42	1974	60811	38655	1.57	28905	19829	1.46
43	1973	63343	39869	1.59	27356	19201	1.42
44	1972	66040	41561	1.59	27252	18512	1.47
45	1971	70282	44305	1.59	25786	18055	1.43
46	1970	72735	45423	1.60	24959	17594	1.42
47	1969	76695	47613	1.61	24221	17154	1.41
48	1968	79491	49083	1.62	22962	16727	1.37
49	1967	81439	50015	1.63	22292	16492	1.35

Table 3: CompFerProf of Swiss and foreign women 2016

This total is the sum of all the boxes shaded pink for Swiss/foreign (Appendix tables) Ditto orange

Ditto yellow

Purple box is age when Swiss/foreign fertility swaps

Figure 11a shows the source of 'incoming' and 'outgoing' children for Swiss women in 2016 and Figure 11b the same for foreign women. The impact of naturalisation in increasing the flow of incoming children for Swiss and their loss on the 'balance sheet' for foreign women is particularly noticeable; it has a significantly bigger impact than migration. For both sets of women the gains and losses from immigration and emigration almost balance.



Figure 11a: Incoming and outgoing children of Swiss women 2016



Figure 11b: Incoming and outgoing children of foreign women 2016

12. Comparing the CompFerProf with STATPOP data and FGS

We now compare the values obtained from the Comprehensive Fertility Profile calculations with the fertility data we have in the STATPOP data for 2013 and the FGS sample data from 2013. For clarity we have divided the graphs into those for ages 15-32 (Figure 12a) and ages 32-49 (Figure 12b).



Figure 12a: Completed fertility of women up to age 15-32: FGS data is the moving average across 5-year age brackets

The story for women in the first half of their reproductive life is relatively straightforward: foreign women have higher fertility at young ages than Swiss women. The fertility rates from the three data sources for Swiss women match very well. The STATPOP and CompFerProf for foreign women also match closely. The FGS gives a lower estimate of number of children of foreign women of this age group but not Swiss women; this discrepancy was mentioned in section 7. For both Swiss and foreign women, the slight excess number of children seen in the STATPOP values for number of children (of Swiss and foreign women) probably indicates that a small number of children in addition to the woman's biological children are co-habiting in the household.



Figure 12b: Completed fertility of women up to age 32-49

The story of women in their mid-30s and 40s is more complex but is central to the explanation of the paradox between the TFR and how many children women actually have, as shown in Table 1. What we see in all three data sets is a reversal of which group has higher fertility – from foreign women at younger ages to Swiss women as they reach higher ages. For the CompFerProf and for STATPOP it occurs between the ages of 34 and 35, and for the FGS at age 37. From the calculation process of the CompFerProf we can observe several motors of this switch over, viz:

- 1. Swiss women are more likely to remain childless than foreign women and tend to start childbearing at older ages.
- 2. Swiss mothers, after starting childbearing later, have a higher propensity to have a second child after their first and after a shorter duration.
- 3. Women who naturalise have (slightly) higher fertility than foreign women who do not; and, concomitantly, women who have a family are more likely to naturalise. It is the effect of naturalisation that causes the CompFerProf for foreign women to drop after age 42.
- 4. Foreign emigrants have (slightly) higher fertility than foreign immigrants (Figure 7d and 7b).

LIVES Working Papers - Burkimsher et al.

 The ongoing influx of low fertility foreign women through the 30s and into their 40s 'dilutes' the average fertility of foreign women at these ages.

There is one further issue which causes the TFR to not reflect the number of children of immigrants, which we now discuss.

13. Migration and childbearing: how their association affects the TFR

As discussed in the literature review, immigrants commonly arrive in their new country childless: before their move they tend to have depressed fertility rates but it is common for childbearing to start soon after their arrival, especially if they arrive in their 20s (e.g. Toulemon and Mazuy 2004 p.8; Robards and Berrington 2016 p.1043). We confirm that this is also the case for new arrivals to Switzerland (Figure 13).



Figure 13: Spacing between immigration and first birth: FGS data for women who arrived in Switzerland aged $\geq =15$ and aged $\leq =49$ at time of survey (2013)

Let us now reflect on how this behaviour impacts the TFR. The TFR is a measure of the intensity of output of babies (Andersson 2006). We can see from Figure 13 that this intensity is strong in the years shortly following immigration.

The TFR would accurately reflect the "average number of children per woman" in a closed population with no immigration, emigration, mortality or change in the timing of

childbearing. In fact, even if there were significant migrant flows but the fertility of immigrants and emigrants were similar to those of natives at age of arrival/departure, then there would be no distortion. However, this is not the case for Switzerland.

The problem with the TFR calculation is that an immigrant is included in the denominator of the age-specific fertility rate (ASFR) calculation only after she has arrived in the country. The period of her reproductive life when she is in the new country is the time when she is most likely to be childbearing. In her country of origin, when she was childless, she was included in the denominator: this would deflate the TFR of that country. However, for the country in which she has children, but in which she spends only part of her reproductive life, the TFR is inflated.

We can see that this problem of post-arrival childbearing also applies to the ownchildren method of calculating the TFR, but to a lesser extent. For the years just prior to the census, then new arrivals will be over-represented. For years further back, however, then the TFR of immigrants will more accurately reflect their 'true' fertility (as seen in Figure 5, 'women born abroad'). By contrast, the child-woman ratio (CWR) method described by Dubuc (2009) would be particularly susceptible to the distortion imposed by the high initial fertility of immigrants.

The TFR of immigrants reflects the duration of time they have spent in their new country (Toulemon and Mazuy 2004). A downward trend may reflect an increasing average duration of stay, although it could also reflect a change in actual behaviour or changes in the source countries. Trends in the TFR of <u>foreign</u> women could reflect changes in the average duration before naturalisation. Any interpretation of trends in immigrant or foreigner fertility should be treated with caution.

14. Conclusion

Switzerland is a country with a high foreign population and high levels of in- and outmigration: it also has population registers (STATPOP) together with rich fertility data from the census of 2000 and the Family and Generations Survey of 2013. Therefore, it provides an opportunity for exploring the differences in Swiss and foreign fertility in depth and investigating the disparity between the TFR and cohort fertility measures. This study has included data not only on births by nationality (Swiss/foreign) but also fertility at immigration, emigration and naturalisation. These latter factors have not been included in previous studies of fertility differentials by origin or nationality. We built a model, which we term the Comprehensive Fertility Profile (CompFerProf), of each of the sub-populations. We believe that fertility is better described by a vector of values covering the ages 15-49, rather than a single indicator, the TFR, which is subject to several distortions. We feel that it is misleading of the SFSO to publish the TFR statistics for Swiss/foreign and 'born in Switzerland'/'born abroad'. The current published statistics are open to misinterpretation biased against immigrants, yet these are also published by other national statistical offices, such as the UK (Tromans, Jefferies and Natamba 2009). The TFR of foreign women is also commonly discussed in the demographic literature, as if it reflected 'real' (cohort) fertility, e.g. Sobotka (2008), Bagavos, Verropoulou and Tsimbos (2018).

From our detailed analysis, we found that, in Switzerland, although the difference in TFR between 'Swiss' and 'foreign' women is large (1.3 for Swiss women versus 1.9 for foreign women for the years 2001-2009), by age 40 'Swiss' women have had slightly more children than 'foreign' women.

15. Acknowledgements

The Families and Generations Survey (FGS) was carried out by the Swiss Federal Statistical Office (SFSO). Funding for the supply of the Swiss Census data of 2000 and the FGS data from the SFSO was provided by the Institut de sciences sociales des religions, University of Lausanne.

This publication benefited from the support of the Swiss National Centre of Competence in Research LIVES – Overcoming vulnerability: Life course perspectives (NCCR LIVES), which is financed by the Swiss National Science Foundation (grant number: 51NF40-160590). The authors are grateful to the Swiss National Science Foundation for its financial assistance.

The computation of the fertility of immigrants, emigrants and naturalised persons was done using tables produced by the NCCR On the Move in Neuchâtel.

16. References

- Abbasi-Shavazi, M.J. and McDonald, P., 2002. A comparison of fertility patterns of European immigrants in Australia with those in the countries of origin. *Genus 2002*, pp.53-76.
- Andersson, G., 2004. Childbearing after Migration: Fertility patterns of foreign-born women in Sweden. *International Migration Review*, *38*(2), pp.747-774.
- Bagavos, C. & Verropoulou, G. & Tsimbos, C., 2018. Assessing the Contribution of Foreign Women to Period Fertility in Greece, 2004-2012. *Population, English edition* 73(1), 115-128. Institut national d'études démographiques.
- Bongaarts, J. and Feeney, G., 1998. On the quantum and tempo of fertility. *Population and development review*, pp.271-291.
- Cho Lee-Jay, Retherford Robert D., Choe Minja Kim, 1986. *The own-children method of fertility estimation*. University of Hawaii Press, Honolulu, Hawaii.
- Dubuc, Sylvie, 2009. Application of the Own-Children Method for estimating fertility by ethnic and religious groups in the UK. *Journal of Population Research*, *26*(3), p.207-225.
- Eurostat, 2018. Share of non-nationals in the resident population. <u>http://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Share_of_non-nationals_in_the_resident_population, 1_January_2017_(%25).png</u> Website accessed 25 May 2018.
- Krapf, S. and Kreyenfeld, M., 2015. Fertility Assessment with the Own-Children-Method: A Validation with Data from the German Mikrozensus. *MPIDR Technical Report TR-*2015-003. Rostock, Max Planck Institute for Demographic Research.
- Kreyenfeld, M., Zeman, K., Burkimsher, M. and Jaschinski, I. 2012. Fertility data for German speaking countries: What is the potential? Where are the pitfalls? *Comparative Population Studies Zeitschrift für Bevölkerungswissenschaft 36*(2-3).
- Myrskylä, M., Goldstein, J.R. and Cheng, Y.H.A., 2013. New cohort fertility forecasts for the developed world: rises, falls, and reversals. *Population and Development Review*, *39*(1), pp.31-56.

- Ng, Edward and Nault, François, 1997. Fertility among recent immigrant women to Canada, 1991: An examination of the disruption hypothesis. *International Migration*, *35*(4), pp.559-580.
- Pecoraro, Marco, 2012. Devenir Suisse: les facteurs intervenant dans le choix de se naturaliser. Chapter 10 in Wanner P, Topgul C, Steiner I, Lerch M, Pecoraro M. "La démographie des étrangers en Suisse". Seismo; 2012, Zürich and Geneva.
- Robards, J. and Berrington, A., 2016. The fertility of recent migrants to England and Wales. *Demographic Research*, 34(36), pp.1037-1052.
- Rojas, E.A.G., Bernardi, L. and Schmid, F., 2018. First and second births among immigrants and their descendants in Switzerland. *Demographic Research, 38*, pp.247-286.
- SFSO (Swiss Federal Statistical Office), 2016a. Population and Households Statistics (STATPOP) factsheet. https://www.bfs.admin.ch/bfsstatic/dam/assets/8541/master
- SFSO (Swiss Federal Statistical Office), 2016b. *Statistique de la population résidante de nationalité étrangère (1991-2009)* https://www.bfs.admin.ch/bfsstatic/dam/assets/6809/master
- SFSO (Swiss Federal Statistical Office), 2018. Family and Generations Survey factsheet. https://www.bfs.admin.ch/bfsstatic/dam/assets/4082634/master
- Sobotka, T., 2003. Tempo-quantum and period-cohort interplay in fertility changes in Europe: Evidence from the Czech Republic, Italy, the Netherlands and Sweden. *Demographic Research, 8*, p184.
- Sobotka, T., 2008. Overview Chapter 7: The rising importance of migrants for childbearing in Europe. *Demographic Research, 19*(9), pp.225-248.
- Sobotka, T. and Lutz, W., 2011. Misleading policy messages derived from the period TFR: Should we stop using it? *Comparative Population Studies*, *35*(3).
- SwissInfo, 2007. German citizenship law to boost Swiss expats. https://www.swissinfo.ch/eng/german-citizenship-law-to-boost-swiss-expats/6084376 Accessed 18 June 2018.

- SwissInfo, 2018. *Becoming a citizen*. <u>https://www.swissinfo.ch/eng/becoming-a-citizen/29288376</u> Accessed 18 June 2018.
- Toulemon, L. and Mazuy, M., 2004. Comment prendre en compte l'âge à l'arrivée et la durée du séjour en France dans la mesure de la fécondité des immigrants). Working paper 120, INED.
- Tromans, N., Jefferies, J. and Natamba, E., 2009. Have women born outside the UK driven the rise in UK births since 2001? *Population trends*, *136*(1), pp.28-42.
- Wanner, P.W. 2002. The demographic characteristics of immigrant populations in Switzerland, in Haug, W., Compton, P. and Courbage, Y. eds., 2002. *The demographic characteristics of immigrant populations (Vol. 38)*. Council of Europe (pp 419-476).
- Wanner, Philippe and Fei, Peng., 2005. *Facteurs influençant le comportement reproductifs des Suissesses et des Suisses*. Office fédéral de la statistique, Neuchâtel, novembre 2005.

Appendix: Tables of 'incoming' and 'outgoing' children

1. Births to women of Swiss nationality: Birthss Cohort 1967 highlighted yellow, 1977 highlighted orange, 1987 highlighted pink

49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	
~		~		18	26	6	99	188	289	46,	65	860	1213	1680	2054	2659	3192	3928	4202	4934	5176	5214	5190	482	4248	348.	2688	1913	1219	67.	32	99	18	•	198:
0		+- 	7 16	3 20	ы 30	378	11	3 17:	319	1 459	5 64	,68	3 1243) 1658	1 2219	9 2712	2 3307	3 3830	2 4579	1 4938	527.	1 5510	5233	1 4882	3 4236	7 3400	3 2568	3 1866	9 1163	7 67(L 289	8	3 26	0,	1 1982
0	0	~	с, (л	25	41	89	113	2 211	9 292	9 430	1 632	568 1	3 1183	3 1723) 2181	2 2705	3248	3970	9 4564	3 4913	5334) 5543	\$ 5254	2 4814	3 425C	3415	3 2501	5 1689	3 1045	543	9 218	82	14	с,	1983
1		4	14	22	. 45	80	3 120	230	1 315	517	1 681	3 960	1355	1648	. 2209	2740	3418	4085	4767	5106	5490	5640	5312	4895	4136	3267	. 2442	1616	992	483	3 213	9 5	12	~	1984
0	2	2	13	22	34	67	143	210	352	486	720	1021	1382	1815	2283	2924	3529	4198	4875	5383	5653	5676	5387	4840	3970	3032	2112	1498	704	446	155	51	19	4	1985
0	4	з	8	15	44	73	141	225	347	502	726	1031	1410	1883	2434	3028	3797	4357	5159	5612	5743	5793	5440	4755	3768	3077	2050	1280	769	357	151	69	10	б	1986
1	л	з	9	25	40	74	136	236	357	541	766	1102	1453	2056	2601	3193	3818	4621	5250	5749	5821	5699	5452	4536	3725	2703	1779	1145	683	328	144	36	∞	2	1987
1	ω	ω	∞	31	35	75	143	265	374	599	906	1135	1617	2082	2701	3475	4219	4902	5403	5977	6201	6001	5535	4756	3727	2582	1793	1145	617	333	121	46	12	2	1988
1	0	∞	10	27	45	86	159	261	393	627	820	1289	1662	2221	2807	3680	4369	5054	5853	5987	6270	5834	5411	4413	3271	2490	1641	1008	556	274	122	36	9	1	1989
1	1	ω	9	17	42	68	162	270	442	645	945	1319	1770	2352	3001	3783	4468	5281	5720	6197	6279	6068	5358	4304	3308	2251	1525	991	489	268	91	38	л	0	1990
2	1	л	9	28	66	102	170	301	484	665	952	1325	1905	2457	3111	3770	4631	5417	6146	6115	6344	5968	5045	4039	2991	2063	1490	608	489	221	105	47	∞	1	1991
2	ω	∞	9	15	53	68	192	306	529	677	1042	1350	1900	2619	3202	3999	4730	5556	6139	6427	6246	5573	4742	3655	2805	1860	1106	707	383	178	77	29	7	0	1992
0	2	ω	14	27	43	106	174	290	449	679	979	1459	1966	2544	3185	3920	4717	5503	5997	6093	5673	5007	4134	3247	2360	1483	995	565	314	137	64	17	10	1	1993
1	1	4	7	23	56	103	179	331	466	741	866	1509	1987	2675	3294	3992	4810	5461	5751	5805	5392	4760	3779	2937	1946	1319	833	429	249	115	67	19	4	1	1994
1	1	л	7	21	52	94	173	303	472	786	1093	1451	2010	2657	3472	4054	4933 .	5455	5512	5451	5020	4244 .	3394	2413	1859	1165	757	414	255	131	54	26	∞	1	1995
0	2	л	16	31	56	99	195	347	518	780	1124 :	1539	2212	2892	3503	4368 4	4982 /	5286 4	5445	5163 /	4789 4	4030	3147 :	2320	1562	1003	634	423	248	142	ប្ដ	26	11	1	1996
2	2	ω	10	29	63	122	201	410	565	859	1108	1646	2144 2	2865	3601 3	4266 4	4756 4	4978 4	5134 5	4893 4	4401 3	3423	2810 2	1951 :	1349	981	606	369	250	155	60	28	9	ω	1997
0	∞	თ	15	22	69	121	209	391	598	897	1244	1700	2328	2983	3506	1144	4584	1891	5017	1479	3985	3306	2509	1787	1261	815	605	366	263	172	66	34	17	2	1998
1	2	6	16	34	70	131	215	403	642	920	1298	1746	2464	2963	3470	4064	4564	4753	4597	4145	3703	2912	2235	1780	1154	860	594	434	290	190	86	31	10	2	1999
ω	ω	л	16	45	84	154	227	408	697	968	1436	1841	2530	3088	3639	3971	4554	4590	4520	4052	3417	2831	2164	1530	1142	841	572	471	318	177	100	36	4	ω	2000
1	0	л	20	33	86	144	248	481	745	983	1441	1935	2416	2955	3515	3953	4127	4225	4017	3580	3075	2539	1932	1388	1076	790	586	444	286	201	103	41	18	ω	2001
4	6	∞	23	35	96	145	291	455	764	1063	1530	1977	2628	3044	3424	3805	4097	4187	3839	3417	2899	2254	1805	1393	1047	757	567	442	317	190	97	46	16	2	2002
4	4	9	20	52	82	149	301	555	834	1190	1495	2056	2600	3119	3580	3831	3931	3903	3553	3241	2750	2148	1833	1364	1006	775	538	429	279	178	111	39	18	ω	2003
0	თ	ω	17	43	110	175	319	534	882	1266	1714	2143	2697	3082	3591	3886	3958	3994	3650	3200	2673	2207	1699	1394	1046	784	574	405	285	214	103	45	24	2	2004
1	ω	6	20	48	121	210	360	615	972	1361	1741	2194	2795	3265	3639	3716	3838	3746	3501	3127	2619	2168	1775	1360	1030	786	554	401	268	187	108	63	26	10	2005
1	7	10	15	62	114	222	408	687	1004	1351	1803	2319	2888	3217	3569	3786	3792	3766	3457	3054	2601	2203	1865	1356	1058	785	580	437	296	188	97	52	23	6	2006
ы	7	20	41	66	129	268	446	746	1026	1430	1869	2346	2968	3325	3542	3673	3808	3810	3464	3102	2659	2232	1816	1409	1014	753	590	431	290	201	112	60	14	4	2007
თ	10	20	30	69	152	243	456	756	1083	1548	2020	2489	2959	3408	3638	3801	3884	3746	3551	3186	2904	2281	1814	1386	1034	776	601	409	304	209	106	42	14	6	2008
4	11	14	41	96	163	291	476	769	1192	1583	2105	2513	2960	3453	3762	3928	3983	3854	3631	3288	2802	2323	1765	1343	979	804	605	438	315	190	97	39	11	∞	2009
თ	7	25	35	80	134	291	502	779	1217	1592	1994	2560	2957	3457	3783	4002	4212	3998	3750	3340	2762	2214	1879	1388	1141	794	606	459	286	171	96	47	17	თ	2010
4	14	31	46	96	140	307	514	789	1250	1603	2018	2559	3011	3560	3659	3943	4129	4147	3760	3385	2701	2254	1804	1366	961	772	589	405	265	156	73	38	14	ы	2011
8	17	22	55	86	154	320	536	823	1101	1586	2030	2481	3013	3444	3859	4194	4393	4195	3794	3259	2794	2280	1831	1283	1033	743	521	398	279	125	90	43	7	4	2012
4	21	26	61	105	166	270	512	824	1167	1590	1966	2523	2962	3486	3811	4167	4278	4228	3741	3425	2830	2290	1768	1355	1051	747	558	325	221	121	67	22	6	6	2013
18	20	18	50	105	193	324	538	813	1139	1526	2002	2581	3138	3688	4134	4377	4535	4095	3838	3329	2837	2252	1800	1370	666	705	461	314	178	122	70	27	10	2	2014
15	11	31	54	107	187	355	527	777	1120	1579	2043	2550	3279	3744	4104	4482	4440	4141	3976	3478	2947	2249	1799	1408	1043	720	402	277	162	96	51	25	10	ω	2015
15	23	44	55	75	158	314	531	862	1157	1557	2035	2672	3401	3779	4282	4354	4470	4277	3948	3485	2944	2309	1764	1286	902	601	425	255	151	112	48	21	10	2	2016

2. Swiss immigrants x mean fertility of immigrants with Swiss nationality: $Imm_S \ x \ r_S \ (imm)$

49	48	47	46	45	44	43	42	41	40	39	38	37	36	ω 5	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	
59	67	70	81	81	97	104	123	136	156	178	219	224	242	261	236	204	203	179	160	113	116	08	68	53	46	37	35	19	∞	0	0	0	0	0	1981
60	63	73	80	96	104	120	122	142	148	180	211	215	223	242	223	197	198	173	155	107	112	76	89	51	44	36	32	17	7	0	0	0	0	0	1982
69	75	80	91	103	119	136	156	175	201	229	264	247	238	248	226	201	201	174	151	106	110	77	83	51	44	36	32	17	7	0	0	0	0	0	1983
73	76	86	84	86	102	133	145	181	192	235	261	262	259	271	242	208	200	172	148	105	106	74	80	49	42	34	31	16	7	0	0	0	0	0	1984 :
67	70	79	84	86	107	121	132	153	172	208	250	247	249	259	240	213	218	195	166	117	114	81	86	53	44	35 5	30	15	7	0	0	0	0	0	1985 :
66	69	76	86	101	123	140	139	142	174	217	254	256	262	263	240	217	218	194	175	120	123	89	86	56	46	38	34	17	7	0	0	0	0	0	1986
75	69	71	82	104	119	128	147	162	185	229	269	269	280	296	272	235	227	192	173	126	132	92	100	58	48	38	33	18	∞	0	0	0	0	0	1987 1
73	78	94	107	118	131	138	146	158	181	233	278	264	271	287	261	228	230	201	181	132	136	92	100	59	50	38	33	18	7	0	0	0	0	0	1 8861
85	68	97	108	120	132	149	162	180	207	238	283	284	285	309	291	259	261	225	205	148	149	101	111	67	54	40	34	18	∞	0	0	0	0	0	1 686
75	76	89	107	118	125	140	164	187	212	248	288	286	294	320	311	279	274	239	217	153	152	103	113	66	54	41	34	17	7	0	0	0	0	0	L 0661
82	86	97	108	106	137	152	173	180	193	232	262	258	298	306	277	251	250	222	200	146	148	101	110	63	54	41	35	17	7	0	0	0	0	0	.991 1
82	59	75	85	76	99	99	133	149	148	176	201	189	198	208	202	181	168	156	142	86	96	67	74	41	32	27	22	11	თ	0	0	0	0	0	.992 1
73	53	59	72	72	84	102	100	121	118	136	163	158	161	208	178	147	152	134	118	81	84	55	57	34	27	22	19	10	4	0	0	0	0	0	993 1
ല	61	61	71	83	87	87	86	123	132	140	170	177	178	212	176	166	159	137	116	83	83	50	អ	33	28	21	18	9	4	0	0	0	0	0	994 1
69	61	63	89	93	87	112	106	130	136	145	162	179	201	208	172	157	155	136	118	83	78	55	57	35	28	22	19	10	4	0	0	0	0	0	995 1
63	89	77	82	85	94	108	110	119	132	161	184	164	195	215	187	164	150	131	116	84	76	53	59	33	27	21	18	9	4	0	0	0	0	0	996 1
62	64	71	65	73	86	101	116	123	125	157	174	166	168	199	180	160	148	124	109	74	76	49	53	30	26	20	16	9	4	0	0	0	0	0	997 1
59	70	59	74	78	92	110	103	132	129	167	179	178	190	208	209	162	155	135	116	76	78	53	55	32	27	21	18	9	4	0	0	0	0	0	998 1
74	75	67	87	81	105	119	131	129	152	173	188	205	181	213	204	166	170	134	117	80	87	53	56	32	27	20	17	9	4	0	0	0	0	0	999 2
80 50	80	68	95	92	101	119	135	142	173	165	206	208	214	225	206	175	159	132	124	85	85	61	64	35	30	22	20	10	თ	0	0	0	0	0	000 2
71	75	100	83	105	114	103	129	137	139	179	198	207	194	206	196	161	145	132	111	79	76	53	56	32	24	20	17	9	4	0	0	0	0	0	001 2
74	79	64	64	86	96	102	128	131	134	170	203	162	180	180	174	145	133	116 :	86	69	89	45	49	29	24	18	16	∞	4	0	0	0	0	0	002 20
66	72	72	80	80	94	95	104	131	116	164	176	157	174	176	162	124	123	113	68	63	59	40	43	27	21	17	14	∞	ω	0	0	0	0	0	203 20
59	63	61	69	82	85	94	101	122	134	145	152	155	146	145	144	125	119	97	83	57	54	37	40	24	20	15	14	7	ω	0	0	0	0	0	004 20
ដ	59	60	79	84	79	90	102	120	130	144	161	144	140	161	127	110	0	95	82	56	55	40	41	22	20	15	13	7	ω	0	0	0	0	0	005 20
59	69	82	83	84	87	. 86	801	124	130	125	148	153	152	162	141	113	120	. 96	94	64	60	44	44	26	21	16	15	7	4	0	0	0	0	0	006 20
63	78	85	08	77 1	103 1	128 1	110	119 1	121	156 1	168 1	165 1	149 1	162 1	153 1	129 1	128 1	101 1	88	60	64	43	47	27	21	18	17	∞	4	0	0	0	0	0	007 20
80	83	82	90	102	126 1	112 1	125	136	139	136 1	179 1	173 1	162	187	157 1	128	126	10	95	62	64	47	46	27	23	18	16	∞	4	0	0	0	0	0	008 20
79	84	.01	81	.06	00	.16	.31 1	16 1	.22 1	.45 1	.61 1	.68 1	.55	.62 1	.56 1	.36 1	125	.03 1	88	62	89	42	50	28	23	19	15	9	4	0	0	0	0	0	09 20
74 1	75 1	79 1	91 1	1 08	.01	1 <mark>76</mark>	.19 1	.14 1	.42 1	.40 1	.78 1	.40 1	.50 1	.75 1	.41 1	.20 1	.31 1	.07	94	66	66	44	49	28	23	18	16	∞	4	0	0	0	0	0	10 20
.37 1	.27 1	.29 1	.38 1	.51 1	.36 1	.46 1	.54 1	.84 1	.60 1	.59 1	.71 1	.62 1	.66 1	.58 1	.62 1	.27 1	.15 1	68	78	50	45	29	31	17	15	13	11	6	4	0	0	0	0	0	11 20
.21 1	.47 1	.52 1	.40 1	.43 1	.49 1	.60 1	55 1	.58 1	.63 1	.63 1	.77 1	.75 1	35	.44 1	.45	.18 1	.15 1	95 1	76	48	47	31	32	19	16	14	13	6	4	0	0	0	0	0	12 20
53 1	55 1	34 1	33 1	67 1	44 1	36 1	49 1	71 1	74 1	63 1	79 1	70 1	70 1	58 1	60 1	25 1	18 1	04 1	08	46	52	33	30	22	20	13	13	6	ω	0	0	0	0	0	13 20
67 1	67 1	34 1	52 1	56 1	48 1	72 1	72 1	62 1	63 1	95 1	76 1	76 1	53 1	58 1	57 1	19 1	13 1	01 1	77	54	46	33	36	23	15	14	12	6	ω	0	0	0	0	0	14 20
57 1	<mark>56</mark> 1	50 1	62 1	62 1	51 1	49 1	53 1	76 1	61 1	79 1	96 1	55 1	48 1	71 1	53 1	26 1	08 1	01	77	48	48	37	36	21	16	13	12	7	4	0	0	0	0	0	15 20
17	30	31	34	44	45	46	23	22	46	89	60	55	ß	ß	43	12	07	82	8	52	50	30	36	22	17	12	11	ы	ω	0	0	0	0	0	16

3. Swiss emigrants x mean fertility of emigrants with Swiss nationality: $Emig_S \ge r_S$ (emig)

49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	
38	42	41	43	42	48	53	66	76	99	102	127	138	147	140	127	130	124	114	109	94	68	75	64	54	52	39	37	21	19	10	0	0	0	0	1981
44	4b	50	53	57	64	65	75	82	100	105	125	131	139	136	136	142	140	122	111	90	83	69	58	49	48	35	33	18	15	7	0	0	0	0	1982
46	υ υ	54	62	60	71	73	86	86	107	117	131	143	148	139	134	130	125	106	102	88	85	72	60	50	46	34	31	18	16	9	0	0	0	0	1983
52	5/	6	62	66	72	84	68	107	107	117	121	135	144	141	135	131	126	112	107	88	81	65	56	46	45	33	32	18	16	9	0	0	0	0	1984
49	54	5	60	61	89	73	84	99	113	125	148	153	164	143	139	131	129	112	105	90	83	72	60	52	49	35	32	18	15	7	0	0	0	0	1985
48	4/	ដ	64	71	82	91	95	86	113	135	153	157	152	141	143	150	142	124	121	97	85	73	64	54	51	36	32	18	15	6	0	0	0	0	1986
53	59	66	74	82	85	88	101	109	122	147	168	169	164	160	157	152	147	135	125	102	97	80	65	53	52	38	34	20	16	7	0	0	0	0	1987
61	89	81	80	74	88	95	96	110	131	153	175	182	182	166	156	155	150	133	124	103	86	81	89	59	56	37	33	19	16	6	0	0	0	0	1988
69	"	74	70	83	101	108	119	128	127	138	167	181	176	166	165	168	161	140	129	108	103	85	72	59	54	37	33	19	15	6	0	0	0	0	1989
63	50	78	83	81	91	108	128	141	142	138	152	171	182	173	164	172	177	154	140	119	112	89	72	59	55	39	34	19	16	6	0	0	0	0	1990
57	6/	76	77	71	72	83	105	116	128	138	145	166	168	158	139	152	152	128	129	112	107	91	71	58	49	33	32	18	14	7	0	0	0	0	1991
61	99	78	72	77	103	94	111	112	133	128	145	169	196	168	164	168	166	145	137	117	108	87	72	57	48	34	31	17	14	6	0	0	0	0	1992
70	62	69	72	81	84	93	86	115	128	125	144	154	163	156	148	153	148	134	135	107	100	77	58	47	40	29	26	15	11	ო	0	0	0	0	1993
73	64	78	74	87	78	90	102	140	135	135	175	174	184	170	165	169	150	135	146	109	100	81	60	49	41	30	26	15	12	6	0	0	0	0	1994 :
77	83	87	92	92	91	109	116	144	133	152	173	180	200	178	175	172	165	144	133	107	103	79	59	48	43	28	26	14	11	თ	0	0	0	0	1995 :
86	TG	90	86	81	104	124	123	148	156	151	174	196	209	194	176	184	169	144	143	110	96	78	59	49	40	28	26	14	13	6	0	0	0	0	1996 :
84	96	79	75	85	100	99	117	126	152	161	177	201	190	192	178	188	160	145	130	105	95	71	59	43	38	27	24	14	12	6	0	0	0	0	1997 :
86	67	83	84	96	88	121	122	137	162	165	187	203	206	187	183	166	167	149	131	104	68	75	5 5	43	37	25	24	14	12	6	0	0	0	0	1998
78	T S	69	90	86	95	102	125	126	156	168	184	206	198	187	174	170	156	123	114	96	85	66	52	40	34	26	22	13	11	6	0	0	0	0	1999 :
80	68	8 83	104	88	103	104	125	146	163	169	202	215	216	201	184	169	169	133	117	97	68	89	57	40	34	25	23	15	12	6	0	0	0	0	2000
71	6	81	79	82	87	104	113	133	147	154	177	187	184	158	140	145	129	105	97	76	89	53	42	33	29	21	21	12	10	ო	0	0	0	0	2001
81	72	58	74	68	93	90	105	128	134	138	164	169	184	135	138	123	118	100	100	71	66	49	41	34	29	21	19	11	10	თ	0	0	0	0	2002
75	89	71	85	94	99	100	114	132	150	153	151	166	165	157	134	135	123	100	88	72	63	50	42	32	29	21	21	12	10	ო	0	0	0	0	2003
78	8/	83	85	91	93	106	120	128	150	156	180	164	183	156	144	133	108	96	91	69	64	53	42	34	31	23	21	12	11	6	0	0	0	0	2004
91	06	87	83	86	101	97	125	152	160	165	178	170	166	164	142	125	114	97	99	74	70	ង	44	36	32	24	22	13	12	б	0	0	0	0	2005
74	76	84	107	112	121	117	145	138	169	158	177	176	176	163	151	133	125	114	94	80	72	62	51	39	36	25	24	13	13	7	0	0	0	0	2006
82	/6	92	97	112	123	113	135	143	153	171	164	169	186	159	137	139	112	106	86	81	76	57	49	38	32	24	22	13	12	6	0	0	0	0	2007
74	89	75	93	92	117	116	130	130	133	153	165	163	170	138	120	115	115	102	95	76	73	59	46	36	34	25	23	13	11	6	0	0	0	0	2008
78	84	101	85	91	88	110	120	120	119	136	134	148	148	123	119	114	108	92	85	72	65	56	46	37	32	25	22	14	11	6	0	0	0	0	2009
80	6	86	68	97	66	101	113	115	110	127	152	142	124	124	115	113	108	68	87	71	64	ភូ	45	34	31	24	22	13	11	თ	0	0	0	0	2010
124	711	120	131	132	125	135	159	135	166	164	156	150	166	135	132	124	122	108	90	75	64	48	39	28	26	18	16	9	8	ო	0	0	0	0	2011
125	ЧUТ	128	120	118	142	132	133	134	148	154	156	159	135	138	122	118	133	105	94	71	66	52	41	33	28	18	17	9	∞	თ	0	0	0	0	2012 :
123	104	119	104	106	119	131	134	151	120	147	121	148	133	114	119	129	110	86	80	67	59	46	40	30	26	18	15	∞	8	ы	0	0	0	0	2013
121	104	114	119	116	117	99	132	130	138	121	117	142	147	148	125	125	121	96	83	64	59	44	41	31	24	17	16	∞	8	л	0	0	0	0	2014 ;
122	57T	109	133	131	124	124	125	138	137	144	135	160	148	133	129	127	120	96	79	69	63	53	39	32	27	17	14	∞	7	л	0	0	0	0	2015
105	0TT	117	111	130	112	110	121	128	126	137	132	134	150	160	127	128	108	103	87	75	66	55	44	38	29	18	15	∞	8	ы	0	0	0	0	2016

4. Average number of children of women who naturalise

49	48	47	46	45	#	43	42	41	40	39	38	37	36	ω 5	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	
1.33	1.93	1.69	1.41	1.31	1.91	1.30	1.89	1.43	1.57	1.30	1.30	1.31	1.14	0.99	0.80	0.80	0.74	0.51	0.44	0.50	0.37	0.39	0.29	0.29	0.18	0.16	0.17	0.19	0.15	0.09	0.06	0.02	0.00	0.00	1981
1.38	1.44	1.46	1.70	1.72	1.69	1.67	1.36	1.43	1.51	1.31	1.35	1.36	1.15	0.96	0.96	0.88	0.63	0.61	0.57	0.44	0.37	0.28	0.23	0.20	0.24	0.17	0.19	0.17	0.13	0.11	0.04	0.01	0.00	0.00	1982
1.70	1.65	1.80	1.73	1.58	1.53	1.65	1.41	1.61	1.41	1.22	1.15	1.11	1.15	0.90	0.96	0.89	0.52	0.69	0.55	0.40	0.46	0.29	0.26	0.30	0.21	0.26	0.22	0.18	0.13	0.10	0.03	0.02	0.00	0.00	1983
1.57	1.65	1.63	1.68	1.35	1.50	1.68	1.51	1.33	1.21	1.28	1.14	1.24	1.12	1.11	0.87	0.69	0.52	0.58	0.42	0.40	0.32	0.28	0.26	0.22	0.24	0.21	0.22	0.15	0.16	0.08	0.03	0.00	0.02	0.00	1984
1.52	1.90	1.38	1.57	1.43	1.37	1.66	1.54	1.45	1.18	1.12	1.36	1.15	0.96	1.11	0.83	0.72	0.56	0.55	0.46	0.45	0.36	0.29	0.29	0.23	0.20	0.21	0.13	0.18	0.11	0.05	0.03	0.00	0.00	0.00	1985
1.35	1.71	1.45	1.88	1.24	1.48	1.45	1.30	1.41	1.04	1.15	1.18	0.96	0.91	0.91	0.76	0.75	0.74	0.52	0.48	0.48	0.41	0.32	0.26	0.21	0.23	0.24	0.19	0.11	0.09	0.06	0.01	0.01	0.00	0.00	1986
1.81	1.52	1.82	1.10	1.36	1.23	1.33	1.30	1.33	1.15	1.27	1.21	1.14	0.95	0.91	0.68	0.73	0.54	0.58	0.50	0.44	0.35	0.35	0.30	0.26	0.18	0.17	0.15	0.10	0.10	0.10	0.02	0.00	0.00	0.00	1987
1.69	1.19	1.55	1.51	1.44	1.34	1.40	1.41	1.17	1.27	1.22	0.91	1.06	0.85	0.80	0.74	0.68	0.55	0.61	0.46	0.45	0.36	0.33	0.30	0.23	0.19	0.24	0.14	0.18	0.08	0.12	0.03	0.01	0.00	0.00	1988
1.61	1.29	1.22	1.48	1.30	1.33	1.16	1.33	1.39	1.24	0.99	1.04	0.85	0.89	0.78	0.95	0.74	0.60	0.51	0.47	0.51	0.30	0.26	0.30	0.27	0.21	0.18	0.16	0.14	0.09	0.09	0.04	0.00	0.00	0.00	1989
1.53	1.23	1.42	1.50	1.57	1.41	1.49	1.23	1.24	1.37	1.18	1.09	0.97	0.88	0.88	0.79	0.64	0.63	0.55	0.53	0.36	0.39	0.34	0.30	0.25	0.23	0.20	0.16	0.20	0.14	0.09	0.03	0.02	0.01	0.00	1990
1.43	1.59	1.33	1.36	1.31	1.20	1.54	1.24	1.27	1.01	1.10	0.96	1.04	1.02	0.83	0.65	0.58	0.59	0.59	0.47	0.37	0.42	0.31	0.29	0.22	0.19	0.18	0.18	0.16	0.10	0.14	0.05	0.01	0.00	0.00	1991
1.36	1.52	1.36	1.47	1.53	1.50	1.72	1.47	1.49	1.46	1.63	1.65	1.61	1.59	1.28	1.30	1.18	1.13	1.00	0.83	0.50	0.47	0.49	0.39	0.30	0.32	0.22	0.05	0.03	0.01	0.01	0.00	0.01	0.00	0.00	1992
1.90	1.67	1.47	1.68	1.37	1.89	1.49	1.88	1.72	1.80	2.36	1.75	1.79	1.58	2.15	1.40	1.52	0.88	1.27	1.22	0.72	0.84	0.45	0.27	0.14	0.13	0.11	0.09	0.01	0.03	0.00	0.01	0.00	0.00	0.00	1993
1.53	1.68	1.66	1.72	1.79	1.52	1.52	1.98	1.41	1.86	1.63	2.12	1.70	1.72	1.52	1.61	1.29	1.60	1.08	0.77	0.65	0.82	0.45	0.29	0.12	0.17	0.09	0.01	0.02	0.03	0.00	0.02	0.00	0.00	0.00	1994
1.77	1.68	1.79	1.84	1.70	1.72	1.72	1.72	1.76	1.82	2.01	1.75	1.57	1.58	1.92	1.65	1.37	1.33	1.26	1.15	0.80	0.59	0.35	0.31	0.23	0.19	0.03	0.04	0.03	0.01	0.00	0.00	0.01	0.00	0.00	1995
1.47	1.61	1.80	1.74	1.50	1.72	1.78	1.93	1.80	1.67	1.84	1.69	1.43	1.69	1.78	1.44	1.16	1.34	1.05	1.08	0.80	0.63	0.51	0.42	0.21	0.16	0.07	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00	1996
1.74	1.73	1.77	1.46	1.88	1.86	1.73	1.77	1.89	1.70	1.69	1.83	1.75	1.52	1.45	1.60	1.24	1.28	1.27	0.98	0.76	0.74	0.64	0.50	0.28	0.16	0.12	0.04	0.03	0.00	0.00	0.00	0.00	0.00	0.00	1997
1.61	1.52	1.54	1.76	1.57	1.60	1.63	1.64	1.55	1.69	1.76	1.58	1.60	1.61	1.50	1.42	1.27	1.18	1.19	1.08	0.92	0.76	0.61	0.56	0.38	0.17	0.10	0.02	0.02	0.02	0.01	0.01	0.00	0.00	0.00	1998
1.79	1.77	1.83	1.76	1.77	1.58	1.69	1.92	1.59	1.76	1.72	1.76	1.66	1.54	1.42	1.45	1.37	1.30	1.11	1.14	0.93	0.83	0.74	0.60	0.30	0.18	0.17	0.07	0.04	0.01	0.02	0.01	0.00	0.00	0.00	1999
1.57	1.79	1.60	1.67	1.64	1.75	1.72	1.68	1.69	1.67	1.73	1.64	1.54	1.55	1.50	1.43	1.33	1.27	1.24	1.07	0.96	0.88	0.71	0.48	0.40	0.18	0.11	0.05	0.05	0.01	0.01	0.01	0.00	0.00	0.00	2000
1.66	1.67	1.66	1.68	1.68	1.71	1.71	1.69	1.71	1.70	1.68	1.65	1.55	1.55	1.50	1.43	1.33	1.27	1.23	1.06	0.95	0.86	0.70	0.48	0.39	0.19	0.12	0.06	0.05	0.01	0.01	0.01	0.00	0.00	0.00	2001
1.66	1.67	1.66	1.68	1.68	1.71	1.71	1.69	1.71	1.70	1.68	1.65	1.55	1.55	1.50	1.43	1.33	1.26	1.22	1.06	0.94	0.85	0.69	0.48	0.39	0.19	0.12	0.06	0.06	0.02	0.01	0.01	0.00	0.00	0.00	2002
1.66	1.67	1.66	1.68	1.68	1.71	1.71	1.69	1.71	1.70	1.68	1.65	1.56	1.56	1.50	1.43	1.33	1.26	1.21	1.05	0.93	0.83	0.67	0.47	0.38	0.20	0.13	0.07	0.06	0.02	0.01	0.01	0.00	0.00	0.00	2003
1.66	1.67	1.66	1.68	1.68	1.71	1.71	1.69	1.71	1.70	1.68	1.65	1.56	1.56	1.50	1.43	1.34	1.26	1.20	1.04	0.92	0.82	0.66	0.47	0.38	0.21	0.14	0.08	0.06	0.03	0.01	0.01	0.00	0.00	0.00	2004
1.66	1.67	1.66	1.68	1.68	1.71	1.71	1.69	1.71	1.70	1.68	1.65	1.57	1.56	1.50	1.43	1.34	1.26	1.18	1.03	0.91	0.80	0.65	0.47	0.37	0.21	0.14	0.08	0.06	0.03	0.01	0.01	0.00	0.00	0.00	2005
1.66	1.67	1.66	1.68	1.68	1.71	1.71	1.69	1.71	1.70	1.68	1.65	1.57	1.56	1.51	1.43	1.34	1.25	1.17	1.03	0.91	0.79	0.64	0.47	0.37	0.22	0.15	0.09	0.07	0.04	0.01	0.01	0.00	0.00	0.00	2006
1.66	1.67	1.66	1.68	1.68	1.71	1.71	1.69	1.71	1.70	1.68	1.65	1.58	1.56	1.51	1.43	1.34	1.25	1.16	1.02	0.90	0.77	0.62	0.47	0.36	0.23	0.15	0.10	0.07	0.04	0.01	0.01	0.00	0.00	0.00	2007
1.66	1.67	1.66	1.68	1.68	1.71	1.71	1.69	1.71	1.70	1.68	1.65	1.58	1.56	1.51	1.43	1.34	1.25	1.15	1.01	0.89	0.76	0.61	0.47	0.36	0.23	0.16	0.10	0.07	0.04	0.01	0.01	0.00	0.00	0.00	2008
1.66	1.67	1.66	1.68	1.68	1.71	1.71	1.69	1.71	1.70	1.68	1.65	1.59	1.57	1.51	1.43	1.34	1.25	1.14	1.00	0.88	0.74	0.60	0.46	0.35	0.24	0.17	0.11	0.08	0.05	0.01	0.01	0.00	0.00	0.00	2009
1.66	1.67	1.66	1.68	1.68	1.71	1.71	1.69	1.71	1.70	1.68	1.65	1.59	1.57	1.51	1.43	1.34	1.24	1.13	1.00	0.87	0.73	0.59	0.46	0.35	0.25	0.17	0.12	0.08	0.05	0.01	0.01	0.00	0.00	0.00	2010
1.66	1.67	1.66	1.68	1.68	1.71	1.71	1.69	1.71	1.70	1.68	1.65	1.60	1.57	1.51	1.43	1.35	1.24	1.12	0.99	0.86	0.71	0.58	0.46	0.34	0.25	0.18	0.12	0.08	0.06	0.01	0.01	0.00	0.00	0.00	2011
1.66	1.67	1.66	1.68	1.68	1.71	1.71	1.69	1.71	1.70	1.68	1.65	1.60	1.57	1.51	1.43	1.35	1.24	1.12	0.99	0.86	0.71	0.58	0.46	0.34	0.25	0.18	0.12	0.08	0.06	0.01	0.01	0.00	0.00	0.00	2012
1.66	1.67	1.66	1.68	1.68	1.71	1.71	1.69	1.71	1.70	1.68	1.65	1.60	1.57	1.51	1.43	1.35	1.24	1.12	0.99	0.86	0.71	0.58	0.46	0.34	0.25	0.18	0.12	0.08	0.06	0.01	0.01	0.00	0.00	0.00	2013
1.66	1.67	1.66	1.68	1.68	1.71	1.71	1.69	1.71	1.70	1.68	1.65	1.60	1.57	1.51	1.43	1.35	1.24	1.12	0.99	0.86	0.71	0.58	0.46	0.34	0.25	0.18	0.12	0.08	0.06	0.01	0.01	0.00	0.00	0.00	2014
1.66	1.67	1.66	1.68	1.68	1.71	1.71	1.69	1.71	1.70	1.68	1.65	1.60	1.57	1.51	1.43	1.35	1.24	1.12	0.99	0.86	0.71	0.58	0.46	0.34	0.25	0.18	0.12	0.08	0.06	0.01	0.01	0.00	0.00	0.00	2015
1.66	1.67	1.66	1.68	1.68	1.71	1.71	1.69	1.71	1.70	1.68	1.65	1.60	1.57	1.51	1.43	1.35	1.24	1.12	0.99	0.86	0.71	0.58	0.46	0.34	0.25	0.18	0.12	0.08	0.06	0.01	0.01	0.00	0.00	0.00	2016

See section 10 in text body for the derivation of these values

5. Women who naturalise x mean fertility of women at naturalisation: Nat x r(nat)

49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	
60	79	64	86	73	113	74	181	133	132	99	99	93	63	52	27	28	24	14	10	12	8	6	12	8	9	∞	14	22	19	15	11	ω	0	0	1981
66	92	74	131	132	144	169	112	129	127	152	122	110	68	71	64	36	14	17	14	11	∞	ы	7	ы	∞	9	14	21	19	18	8	2	0	0	1982
78	91	122	126	117	132	117	100	161	140	93	79	83	86	51	40	35	11	21	9	ы	8	6	8	10	6	18	17	23	20	17	л	ω	0	0	1983
72	92	80	119	100	132	158	113	114	76	95	70	68	67	49	43	22	9	9	8	9	л	8	8	7	11	11	24	24	32	18	6	0	2	0	1984
68	116	90	111	134	118	123	122	110	71	71	91	59	48	51	25	19	11	17	11	14	8	8	10	11	12	17	20	31	21	13	7	0	0	0	1985
46	84	80	135	53	93	107	100	80	62	69	89	45	28	30	19	22	21	11	∞	∞	11	10	10	7	11	22	24	17	17	14	2	ц	0	0	1986
54	58	104	56	64	74	81	72	73	58	74	56	43	34	31	16	20	12	12	13	7	9	11	14	15	12	13	17	17	19	19	4	0	0	0	1987
56	27	79	56	68	72	43	66	53	85	65	39	50	26	18	21	18	13	16	6	9	7	9	14	13	15	25	18	31	16	20	6	1	0	0	1988
37	37	40	53	64	47	38	45	57	57	29	36	28	31	18	16	16	13	10	11	18	6	14	17	13	14	14	19	25	16	20	10	0	0	0	1989
29	32	43	50	38	55	57	41	38	67	38	32	25	22	20	13	10	13	10	∞	9	10	14	15	12	10	13	15	25	22	15	7	4	1	0	1990
29	56	37	37	43	47	51	35	46	28	28	16	21	22	16	10	11	15	16	13	11	16	14	14	15	13	∞	17	17	15	23	10	-1	0	0	1991 :
37	46	29	44	49	53	57	47	45	58	51	53	47	41	17	29	19	37	29	22	14	16	25	25	23	20	20	6	4	2	2	0	2	0	0	1992
72	52	62	68	49	96	69	96	69	104	92	63	89	66	54	60	58	26	47	43	42	34	35	21	11	11	10	10	ч	6	0	2	0	0	0	1993 1
70	79	118	129	149	123	122	123	109	113	104	151	77	83	76	97	74	96	58	43	38	ទួ	38	39	15	22	15	2	4	7	0	ഗ	0	0	0	1994
122	116	138	197	168	182	169	184	176	204	147	142	108	126	154	157	130	88	117	79	86	47	44	43	39	36	6	∞	∞	ω	0	0	2	0	0	1995
132	132	184	184	180	184	196	226	223	179	230	162	187	194	228	170	126	180	140	140	106	106	77	86	40	30	14	7	2	ω	0	0	0	0	0	.996 1
136	135	172	137	218	193	215	248	215	255	203	236	275	211	232	251	223	211	215	180	174	139	119	102	59	29	22	9	∞	0	0	0	0	0	0	.997 1
134	196	165	224	214	210	205	221	265	289	322	354	317	420	350	378	362	389	362	284	265	192	156	146	92	40	24	თ	თ	6	4	ы	0	0	0	.998 1
152	182	190	208	212	224	228	301	253	334	339	306	370	405	405	378	418	389	309	294	244	190	154	132	67	35	З	16	10	ω	7	4	0	0	0	.999 2
188	251	243	266	346	350	353	407	443	483	503	558	521	609	603	595	555	580	523	446	335	324	220	146	94	42	29	13	17	4	თ	ы	0	0	0	2000 2
232	237	249	279	274	321	366	421	515	486	509	650	539	636	584	637	531	521	494	425	323	259	191	127	79	38	24	12	15	ы	4	4	0	0	0	2001 2
314	321	257	333	396	457	585	613	638	712	764	822	780	780	728	735	709	706	621	429	398	319	250	147	114	51	35	22	22	9	6	6	0	0	0	2002 2
271	287	354	358	415	455	523	537	602	704	732	749	717	706	779	695	676	601	578	452	335	272	195	134	99	46	37	19	20	9	თ	თ	0	0	0	2003 2
262	316	284	363	432	492	482	615	660	745	732	082	707	752	608	633	612	573	554	437	327	282	177	133	68	46	36	23	19	11	თ	б	0	0	0	2004 2
299	299	340	430	516	525	636	610	716	770 1	791	736	768 1	778 1	754	684	619	566	503	440	305	252	177	131	85	50	38	24	23	13	თ	ഗ	0	0	0	005 2
304	382	445	494	581	701	720	891	944	.056	937	960 1	.022	.027	926	875	756	714	655	509	394	279	225	153	107	60	43	34	28	16	6	7	0	0	0	006 2
369	438	515	526	642	740	718	777	850	903 1	971	.028	935	897	942	878	729	653	639	443	368	275	195	138	110	89	44	33	27	19	6	6	0	0	0	2007 2
412	481	488	559	618	763	823	872	868	.005	981	921	942	862	814	774	715	582	494	424	343	268	197	150	105	64	43	37	27	23	6	7	0	0	0	2008 2
427	518	543	679	768	831	901	904	997	976	939	898	894	857	804	762	666	631	513	427	327	239	184	138	82	64	44	36	28	22	6	6	0	0	0	2009 2
432	479	530	665	702	711	751	789	845	794	858	815	822	803	661	684	556	498	437	383	282	225	148	123	89	63	42	36	28	21	თ	6	0	0	0	2010 2
415	509	544	581	652	687	708	777	730	784	853	782	726	749	666	624	596	544	395	338	276	223	136	116	72	52	40	31	27	22	თ	л	0	0	0	2011 2
461	453	523	548	645	652	730	737	663	687	680	695	678	637	630	609	460	474	357	274	234	164	118	105	87	54	39	33	25	19	თ	л	0	0	0	2012 2
530	503	594	543	662	667	749	744	776	758	825	764	758	753	619	602	502	397	391	276	231	148	111	105	71	54	46	31	24	21	ы	4	0	0	0	2013 2
448	503	<u>598</u>	622	655	718	706	730	759	753	813	705	735	658	660	571	475	429	348	251	181	141	106	88	67	50	38	29	25	20	4	ы	0	0	0	2014 2
609	616	704	769	795	817	841	688	668	921	911	988	785	802	713	622	580	457	394	312	235	173	132	104	85	64	47	35 5	29	25	ы	ы	0	0	0	2015
671	710	669	862	904	869	843	901	939	972	961	968	861	761	707	662	492	483	395	286	224	167	131	115	86	71	48	32	29	25	6	ы	0	0	0	2016

6. Births to women of foreign nationality: Birthsf Cohort 1967 highlighted yellow, 1977 highlighted orange, 1987 highlighted pink

49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	
0	0	ы	4	10	13	26	41	58	75	127	170	200	269	342	423	538	573	665	674	716	799	805	852	839	748	742	869	675	476	334	141	74	20	4	1981
0	1	1	ω	4	24	20	27	43	77	133	159	199	267	349	403	509	569	666	695	816	820	839	847	803	755	814	782	692	566	308	173	73	19	ω	1982
0	0	0	ω	4	9	25	37	52	84	132	143	227	266	343	375	453	484	635	675	695	788	800	803	802	787	782	691	636	484	309	148	49	15	თ	1983
0	0	2	2	ω	11	21	30	54	81	111	158	211	284	322	399	441	522	587	899	730	728	776	832	925	885	775	680	603	466	306	131	43	14	4	1984
0	1	2	4	4	9	23	23	50	76	107	152	231	278	268	364	437	509	593	711	695	729	826	901	914	806	608	675	593	436	264	125	47	13	0	1985
0	0	2	ω	თ	11	15	39	57	82	130	149	203	269	344	432	465	522	603	729	765	808	966	966	887	888	762	692	609	434	230	110	54	19	0	1986
1	2	0	4	თ	15	23	37	62	81	121	139	219	263	309	378	478	583	643	703	788	. 688	947	940 :	981 :	883	836	663	586	405	230	117	57	11	ы	1987
2	2	2	0	10	13	20	29	56	90	112	170	201	291	334	401	506	627	697	608	924 1	1065 1	1 696	1123 1	1019 1	1011 1	835	749	494	437	290	141	64	20	2	1988 1
0	0	2	ц	ω	16	15	49	60	104	154	188	238	314	383	442	533	667	722	068	1011	1062	8601	1118	1161	1037	862	730	588	451	319	162	67	18	2	: 6861
0	0	2	ц	9	20	12	33	51	125	141	183	272	344	422	516	610	746	921 1	1087 1	1073 1	1191 1	1257 1	1286 1	1248 1	1181 1	1 <mark>086</mark>	885	669	574	351	168	60	22	4	0661
1	ч	0	0	ω	16	34	54	62	103	146	220	296	389	475	574	726	915 1	1034 1	1157 1	1303 1	1398 1	1482	1543	1402	1 <mark>261</mark>	1150 1	960 1	810	635	421	233	84	26	2	1991
0	0	1	6	11	13	28	56	91	119	185	242	354	417	517	676	808	1040	1181 1	1332 1	1490 1	1574 1	1548	1580	L474 1	1399 1	1262 1	1052 1	068	678	414	183	55	14	щ	1992
1	ц	р	4	6	7	8	48	105	121	204	241	344	452	585	812	696	1050 1	1298 1	1464 1	1640 1	1660 1	1669	1516 1	L469 1	1399 1	1262 1	1038	927	610	414	159	68	18	ω	1993
1	1	2	ω	თ	17	38	52	100	150	214	309	405	540	714	874	950 1	1198 1	1483 1	1600 1	1685	1724	L764 1	1715 1	1617 1	1397 1	1224 1	1078	871	627	349	163	50	11	2	1994 1
1	0	4	ω	თ	15	43	71	104	168	240	313	420	609	805	905 1	.139 1	.349 1	.613 1	.757 1	.915 1	.922 1	.800 1	.770 1	.612 1	.477 1	.340 1	.067 1	861	809	313	146	51	7	2	.995 1
0	2	ω	∞	9	27	36	70	114	189	288	339	536	668	829	.121 1	.327 1	.619 1	.784 1	.988	.951 1	.936 1	.889 1	.752 1	.680 1	.469 1	.319 1	.079 1	688	594	326	146	45	14	ω	.996 1
0	0	ω	6	11	21	44	66	120	168	301	414	591	735	989 1	.208 1	470 1	.696 1	.918 1	.938 1	.981 1	.991 1	.846 1	.629 1	.652 1	.455 1	.350 1	044 1	850	522	328	122	46	13	1	.997 1
2	2	2	∞	7	24	44	96	138	223	301	467	584	804	038 1	282 1	485 1	692 1	846 1	858 1	987 1	868 1	801 1	733 1	506 1	476 1	347 1	097 1	811	534	302	119	43	13	ω	998 1
1	1	2	ω	15	22	49	92	134	283	330	489	664	960 1	.149 1	.375 1	.560 1	.809 1	.806 1	.947 1	.991 1	.831 1	.864 1	.722 1	.592 1	.458 1	.376 1	.142 1	871	564	323	120	53	13	2	.999 2
1	2	1	7	14	22	60	103	181	269	374	574	751	.005	.231 1	.474 1	.694 1	.811 1	.931 1	.946 1	.919 1	.882 1	.755 1	.750 1	.561 1	.527 1	.271 1	.049	608	529	331	126	42	10	თ	2000
2	ц	2	7	14	83	50	118	197	256	405	561	746	984 1	.167 1	301 1	518 1	.603 1	.693 1	.666 1	.644 1	568 1	.608 1	.425 1	.358 1	270 1	120 1	976	745	452	238	110	щ	14		001 2
1	1	4	9	23	42	62	118	223	293	459	596	801	007 1	156 1	377 1	499 1	637 1	647 1	720 1	670 1	618 1	639 1	599 1	462 1	285 1	120 1	958	725	517	255	109	46	13	4	002 2
ω	ω	თ	6	21	38	62	143	195	318	517	625	857	054 1	219 1	357 1	527 1	630 1	718 1	687 1	711 1	601 1	614 1	505 1	386 1	296 1	198 1	886	683	506	266	88	28	თ	0	003 2
2	4	7	10	9	40	88	151	227	400	550	709	944	097 1	348 1	438 1	542 1	698 1	642 1	717 1	727 1	597 1	560 1	536 1	421 1	268 1	095 1	951	703	479	245	100	34	9	1	004 2
0	ω	თ	9	23	43	105	164	283	397	548	745	949 1	149 1	268 1	427 1	576 1	603 1	723 1	764 1	704 1	667 1	565 1	502 1	349 1	192 1	152 1	905	646	449	216	95	23	11	2	005 2
1	0	∞	18	28	56	93	177	295	411	566	760	002	174 1	329 1	484 1	571 1	624 1	761 1	756 1	665 1	667 1	566 1	457 1	348 1	235 1	690	839	601	413	210	75	20	ω	2	006 2
1	6	∞	15	33	48	130	185	319	454	622	879	957 1	202 1	447 1	516 1	635 1	771 1	767 1	820 1	766 1	647 1	541 1	456 1	338 1	211 1	951	832	607	355	179	74	24	7	2	007 2
2	6	9	22	32	79	140	206	354	501	672	892	053 1	306 1	539 1	677 1	781 1	812 1	810 1	846 1	770 1	695 1	585 1	462 1	309 1	174 1	953	792	609	374	165	66	31	11	2	008 2
ω	4	11	24	35 5	81	122	253	376	530	755	957 1	174 1	370 1	574 1	771 1	776 1	936 2	924 2	880 1	810 1	688 1	598 1	450 1	326 1	117 1	984	722	540	342	189	84	19	∞		009 2
ω	10	10	18	40	74	169	264	420	542	804	000 1	225 1	456 1	662 1	852 1	954 1	039 2	074 2	988 2	888 1	780 1	688 1	506 1	328 1	140 1	904	767	497	344	145	89	20	10	2	010 2
ω	თ	13	26	43	<u>0</u>	155	254	413	652	849	024 1	309 1	509 1	754 1	997 1	975 2	130 2	067 2	096 2	917 1	808 1	590 1	541 1	355 1	139 1	965	681	512	327	134	55	25	7	2	011 2
ω	9	17	26	62	108	184	293	448	709	903	126 1	373 1	644 1	874 1	979 2	181 2	220 2	219 2	066 2	969 1	816 1	638 1	466 1	275 1	121 1	876	671	487	313	165	50	25	9	ω	012 2
7	12	16	19	61	117	188	331	468	708	967 1	230 1	453 1	743 1	915 2	105 2	180 2	235 2	274 2	081 2	974 2	876 1	678 1	409 1	372 1	008 1	088	749	442	278	125	63	22	12	1	013 2
13	16	14	46	64	120	192	324	552	745	041 1	402 1	583 1	830 1	038 2	268 2	390 2	433 2	360 2	302 2	096 2	851 1	683 1	498 1	255 1	108 1	668	612	404	291	132	43	22	∞	0	014 2
2	17	17	37	87	126	205	380	626	844	106 1	374 1	650 1	988 2	156 2	404 2	361 2	485 2	379 2	249 2	093 2	860 1	746 1	495 1	245 1	072 1	859	613	407	245	143	37	15	7	4	015 2
∞	9	23	32	86	145	244	418	595	903	860	1471	1709	2032	2351	2469	2460	2550	2501	202	2118	1986	1680	1542	1345	080	836	662	441	284	150	59	24	13	0	2016

7. Foreign immigrants x mean fertility of immigrants with foreign nationality: $Imm_f x r_f$ (imm)

ť	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	<u> </u>
FUU	187	202	212	223	261	253	288	321	319	351	428	380	370	430	355	426	348	343	310	268	227	204	151	133	102	82	82	59	41	37	31	12	∞	0	.981
FU C	158 158	192	178	222	254	236	308	310	302	342	380	368	388	415	338	394	384	338	298	278	241	205	152	133	109	86	82	56	41	37	28	9	7	0	1982
101	101	138	136	159	156	184	218	207	275	284	288	323	322	314	298	323	309	286	256	230	212	173	133	113	95	69	64	45	32	27	19	7	6	0	1983
F C C	131	136	153	196	187	173	184	250	255	244	351	309	350	339	284	330	331	300	293	226	196	181	139	118	95	67	62	46	31	29	20	7	თ	0	1984
ç	118 89	141	176	217	208	197	206	268	251	287	332	319	370	359	258	369	362	307	305	253	231	191	148	126	86	66	64	48	31	28	18	б	თ	0	1985
TO O	174	174	182	179	237	215	259	280	320	395	417	395	401	406	357	395	410	355	339	279	266	223	165	148	109	78	73	50	34	30	21	∞	6	0	1986
161	170	161	179	194	244	257	262	340	332	411	442	424	442	446	381	411	443	385	366	327	305	242	179	157	123	68	8	54	34	28	22	8	7	0	1987
101	209	230	242	273	290	326	356	431	472	513	571	564	582	567	466	533	501	438	418	369	326	250	196	171	133	92	8	57	34	29	23	9	7	0	1988
101	176	176	217	244	241	305	324	388	427	502	492	544	576	627	490	532	573	476	461	381	335	290	220	181	138	94	84	57	35 5	28	21	9	7	0	1989
101	221 184	202	239	281	350	384	415	410	495	554	658	666	739	693	570	639	649	621	590	489	419	360	268	224	165	110	97	60	39	31	26	10	∞	0	1990
5	244 219	278	327	341	399	444	490	613	594	621	747	746	793	807	636	757	716	687	614	526	450	379	282	217	157	115	93	65	41	36	28	12	10	0	1991
1	275	252	340	360	398	414	465	583	633	720	808	794	892	819	726	845	828	717	697	590	513	413	298	240	173	119	99	65	41	36	28	12	11	0	1992
	202	268	336	344	399	422	444	635	638	686	764	814	857	821	764	844	782	774	697	589	490	390	291	226	168	108	91	62	37	33	24	10	9	0	1993
E C	173	207	316	299	331	352	395	524	550	594	682	660	749	782	652	730	729	730	631	526	456	373	265	217	145	101	83	56	34	32	23	9	∞	0	1994
FUC	191 191	220	252	278	257	351	378	485	484	551	597	601	653	713	582	710	652	610	573	461	380	311	233	174	124	86	69	49	30	27	20	7	7	0	1995
110	168	193	189	220	252	303	312	357	404	459	571	552	600	561	519	541	583	510	469	371	323	254	172	137	101	70	60	38	24	23	17	6	თ	0	1996
1.1	181	190	212	239	299	310	294	372	392	442	489	500	563	588	510	560	580	491	470	363	305	237	161	129	93	65	52	ω 5	24	22	16	ы	თ	0	1997
FUO	194 158	180	227	229	280	292	364	391	444	487	545	522	623	647	547	562	588	500	451	378	310	239	160	135	92	64	52	36	23	20	16	6	თ	0	1998
100	206	226	237	283	316	366	374	452	520	586	687	869	694	738	624	723	693	563	530	421	358	275	188	153	107	74	62	38	25	22	18	6	6	0	1999
1. 1	203	223	264	309	319	371	400	452	543	634	707	734	781	790	691	716	889	584	550	435	375	276	198	159	111	75	63	37	24	23	17	თ	6	0	2000
	241 217	277	298	356	406	459	523	589	650	762	852	868	916	855	756	875	871	681	639	502	442	332	226	169	127	84	67	45	28	24	18	6	6	0	2001
5 T T	315	321	362	422	447	515	544	660	748	823	881	887	973	951	804	879	883	751	684	523	436	343	242	190	138	91	75	48	30	25	19	6	6	0	2002
	290 092	321	366	393	419	506	548	653	718	794	831	803	088	904	748	848	814	693	612	495	414	325	232	181	129	86	70	46	28	23	18	6	6	0	2003
1	284 278	341	335	439	441	502	575	623	730	817	698	<mark>923</mark>	911	932	764	851	818	667	625	513	425	324	224	179	127	86	69	44	27	23	17	6	თ	0	2004
	295	322	397	403	469	495	588	641	069	713	068	688	891	846	737	861	756	655	564	476	402	305	222	171	119	80	63	42	24	24	18	6	6	0	2005
010	316	341	406	441	493	538	643	676	759	848	988	928	925	944	799	850	823	735	640	529	448	325	234	182	122	82	66	43	26	23	18	ы	ы	0	2006
111	482	550	578	585	728	892	883	957	1032	1157	1243	1164	1213	1189	1029	1131	1126	915	862	681	578	449	304	238	160	105	79	49	31	28	19	б	6	0	2007
	587 587	667	674	780	897	968	066	1132	1177	1250	1441	1327	1409	1333	1103	1240	1253	1071	924	762	660	525	354	261	188	114	89	55	35	30	22	б	6	0	2008
	450 450	559	659	746	741	811	878	935	1026	1101	1161	1131	1119	1193	993	1105	1094	906	831	680	588	453	316	243	164	108	82	51	32	29	21	6	6	0	2009
100	520 158	615	621	681	743	814	849	895	1035	1033	1229	1120	1195	1124	1022	1126	1109	953	822	675	584	434	314	242	162	110	85	52	31	30	20	6	6	0	2010
HU H	512 491	582	581	692	693	775	834	951	1064	1103	1184	1213	1199	1220	1063	1169	1121	968	872	704	596	466	325	245	170	111	85	51	31	27	20	თ	თ	0	2011
	505	671	640	738	779	847	880	1001	1044	1168	1251	1275	1304	1293	1127	1156	1100	1038	887	700	600	460	336	251	182	112	86	51	29	29	22	თ	6	0	2012
	573	725	785	816	830	1024	1053	1096	1201	1333	1428	1436	1464	1444	1131	1333	1274	1045	932	769	658	513	361	285	197	126	91	55	34	31	26	б	6	0	2013
001	587	641	722	816	870	934	1043	1113	1139	1262	1355	1404	1397	1382	1194	1350	1273	1090	955	784	660	515	364	266	187	119	91	53	31	31	23	л	6	0	2014
500	538	663	744	817	848	929	1008	1156	1169	1275	1341	1381	1343	1414	1196	1328	1263	1072	940	768	663	508	359	277	185	120	91	52	33	33	26	6	6	0	2015
500	502	701	717	789	815	946	994	1099	1166	1282	1321	1362	1433	1371	1126	1299	1263	1055	940	730	656	496	357	258	186	111	91	53	32	33	26	6	6	0	2016

8. Foreign emigrants x mean fertility of emigrants with foreign nationality: $Emig_f x r_f$ (emig)

49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	
176	170	189	205	202	259	266	276	343	295	333	380	340	338	403	338	372	353	325	244	188	180	132	86	83	71	52	52	42	29	26	19	7	ы	0	1981
177	175	166	196	206	222	249	263	294	241	303	369	315	424	381	317	371	338	264	242	195	180	138	100	88	73	55	53	42	30	27	19	6	4	0	1982
193	194	193	194	204	236	266	227	261	300	314	311	374	367	408	329	350	322	273	238	195	163	125	86	87	73	54	50	41	29	24	16	თ	4	0	1983 1
168	179	197	200	229	238	216	231	268	287	273	351	349	360	364	300	313	311	261	216	174	146	123	95	83	67	49	46	3 5	23	18	13	4	4	0	1984
168	175	206	227	260	194	240	245	279	249	364	394	332	366	340	254	315	284	237	230	173	153	119	95	83	65	45	47	33	25	17	12	4	ω	0	1985
156	185	184	199	159	214	204	234	255	287	310	334	322	305	308	262	308	284	237	219	178	159	125	100	85	67	52	50	35	25	18	11	4	ω	0	19861
166	187	158	182	193	176	223	188	275	272	310	298	308	311	328	289	292	271	239	210	184	162	136	108	85	75	53	49	38	25	17	12	4	ω	0	1 2861
209	182	161	180	188	205	206	236	245	279	276	317	332	345	340	273	312	276	250	236	220	175	139	112	101	84	58	52	39	25	17	12	4	ω	0	1 8861
193	176	185	173	217	169	256	281	275	274	359	325	302	369	381	305	323	311	309	288	222	188	175	134	119	92	64	58	42	25	19	11	4	ω	0	1 6861
158	177	185	205	203	212	237	281	261	299	332	350	360	396	363	310	318	350	327	297	228	197	163	133	115	86	60	53	37	24	17	11	4	ω	0	00661
247	222	227	306	252	310	329	338	382	364	405	450	424	506	402	365	395	397	377	309	262	225	180	140	117	92	62	52	39	24	18	12	4	ω	0	1991
268	275	294	359	315	370	372	360	444	420	489	568	494	808	523	462	524	499	435	386	303	259	200	149	119	93	61	58	40	24	17	13	თ	4	0	1992 1
249	239	264	322	317	300	350	331	416	374	491	487	508	537	488	422	468	467	403	351	306	255	190	148	116	92	60	50	40	22	17	12	4	4	0	1 5661
224	229	223	325	248	302	298	341	406	351	436	484	483	524	519	416	433	450	407	341	262	220	177	128	100	72	52	46	<u>ж</u>	20	13	10	4	4	0	.994 1
240	253	229	259	286	289	320	313	412	387	422	446	472	529	488	423	479	448	383	353	254	211	156	119	90	71	53	42	29	19	14	11	4	4	0	.995 1
248	305	268	305	291	306	309	363	382	433	454	504	514	549	557	443	486	464	393	338	255	225	168	114	85	72	49	43	29	17	14	10	4	4	0	.996 1
283	270	269	277	293	358	324	374	404	436	474	576	536	519	555	460	481	483	378	321	248	186	137	104	78	63	43	39	24	15	13	10	ω	ω	0	.997 1
247	250	256	290	262	284	305	321	395	404	505	542	515	566	536	435	473	446	394	315	234	190	137	96	72	57	36	ы	25	14	11	∞	ω	ω	0	.998 1
235	248	233	247	253	325	324	367	387	425	465	517	526	565	513	468	473	431	344	324	232	187	138	92	75	54	37	32	21	13	11	9	ω	ω	0	999 2
236	234	244	247	262	290	280	334	378	391	413	494	533	521	495	420	423	403	351	278	215	169	124	68	71	52	38	32	19	13	11	∞	ω	ω	0	2000 2
182	188	207	218	240	285	295	323	376	387	466	482	444	526	501	419	401	400	315	292	201	174	130	86	74	57	38	30	20	12	10	8	2	ω	0	001 2
190	199	221	225	246	258	263	319	363	406	426	471	470	512	463	369	397	378	289	264	209	162	119	85	74	55	35	29	20	11	10	∞	ω	2	0	002 2
224	203	228	246	254	226	288	323	343	363	419	491	420	442	440	359	381	348	304	225	193	143	106	85	ങ	49	33	28	17	∞	∞	7	ω	2	0	003 2
217	207	236	248	256	294	310	326	410	424	458	485	461	465	449	397	429	385	297	266	193	157	118	86	66	50	33	27	14	8	9	7	2	2	0	004 2
223	233	238	236	258	295	349	312	381	396	469	518	462	449	502	391	450	411	317	275	200	166	120	80	71	49	34	27	16	7	∞	7	ω	2	0	005 2
247	238	268	259	291	306	354	399	411	441	529	551	534	538	491	444	434	421	310	266	210	156	124	86	70	54	34	28	15	7	∞	7	ω	2	0	006 2
264	278	303	313	295	343	393	410	406	467	475	508	503	497	559	426 .	444	407	332	295	224	168	129	94	80	54	37	28	16	∞	9	7	2	2	0	207 20
224	203	240	230	276	338	336	364	376	423	499 .	505	458	512	488	408	415	412	351	305	234	199	138	99	86	63	36	30	18	∞	9	∞	2	2	0	208 21
220	220	238	270	299	310	340	365	395	428	425	490	533	482	471	396	436	418	327	286	221	184	137	86	84	62	39	33	19	9	9	∞	ω	2	0	009 21
268	265	312	311	351	370	428	415	468 .	514	553	581	551	591	555	487	547	. 961	409	370	292	245	172	124	103	76	47	42	24	10	10	∞	ω	ω	0	010 20
255	244	285	282	327	328	365	398	441	473	487	499	478	525	488	464	515	478 .	401	348	276	218	161	117	101	73	51	41	24	10	∞	6	2	2	0	011 20
263	313	333	321	352	357	371 .	428	508	528	549	584	595	601	865	521	541	493	442	379	287	227	164	113	108	77	51	41	23	11	10	∞	ω	2	0	012 20
288	315	328	383	392 .	391 .	443 .	434 .	475	527	568	641	597	633	673	539	588	567	421 .	396	291	239	184	130	114	82	58	44	24	12	10	7	2	2	0	013 20
323	319	348	370	408 4	406 4	484 4	474 !	529	617 !	596 (699	591 (577 :	707 :	573 !	619 (563 (473 4	421 4	300	247	193	143 :	118 :	90	56	43	26	12	12	9	2	2	0	014 20
323	348	357	381 4	412 4	427 4	466 !	526	556	561 (886	725	578 (715	783 :	595 (573 (517 (472 !	414 .	321	249	200	146 :	124 :	98	58	43	26	13	12	9	2	2	0	015 20
333	348	383	418	419	483	504	570	590	669	683	730	594	785	761	629	665	624	536	442	309	272	191	134	117	98	57	49	28	13	12	9	ω	ω	0	016