

THE MODEST DEMOGRAPHIC RESULTS OF PRONATALIST POLICY AGAINST THE BACKGROUND OF THE LONG-TERM EVOLUTION OF FERTILITY IN RUSSIA*

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The idea of an extraordinary growth in fertility in Russia is widespread in the Russian expert community and media space. This increase is believed to be indicative of the positive results of the special financial measures taken by the government after 2006 to stimulate fertility.

The author's viewpoint is more reserved. There are some positive developments, but their significance is quite insufficient to view the future of Russian fertility through rose-colored glasses.

With this paper, we continue our previous long-term research in the field of in-depth demographic analysis of Russian fertility, incorporating the latest official statistical data for 2014. The paper provides an overview of the trends of key fertility indicators over a few decades, as well as developing some approaches to cohort fertility analysis in order to obtain more reliable projections.

In the first part, we examine period fertility indicators (for calendar years), taking into account the latest changes in the structural characteristics of the Russian model of fertility that have occurred over the past several decades.

In the second part of the article, we analyse cohort fertility indicators of generations of women whose actual and expected reproductive activity has been occurring in the second half of the twentieth and the first decades of the twenty-first centuries.

Key words: *fertility, birth order, period fertility, cohort fertility, fertility projections, demographic policy, pronatalist family policy in Russia*

INTRODUCTION

In Russian society, there is a common opinion, supported by a number of experts, that there has been a significant increase in fertility in Russia, which is testimony to the positive results of measures taken to improve it. The starting point of active demographic policy was Putin's message to the Federal Assembly on 10 May 2006, announcing a programme of material stimulation of fertility. In 2007, Russia significantly increased benefits for child-care leave to one and a half years, introduced such benefits for unemployed women, expanded benefits, reduced fees in kindergartens, and introduced an innovative measure, widely known as the "maternity capital", for women giving birth to a second child (or a third or subsequent one, if the second child was born before 2007).

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THE RESULTS OF THE PROJECT "DEMOGRAPHIC DEVELOPMENT IN RUSSIA IN 2005-2015 IN THE CONTEXT OF LONG-TERM TRENDS", CARRIED OUT WITHIN THE FRAMEWORK OF THE BASIC RESEARCH PROGRAMME AT THE NATIONAL RESEARCH UNIVERSITY HIGHER SCHOOL OF ECONOMICS (HSE) IN 2016, ARE PRESENTED IN THIS PAPER.

It is precisely this measure which many experts and politicians consider especially important in stimulating people to have children¹. After its introduction, all financial measures would be indexed annually for inflation, which is unprecedented in Russian history, and the range of benefits and incentives would be expanded and adapted to each region (See: [The Population of Russia... 2010; 2011; 2014; 2015]).

The Minister of Labour and Social Protection of the Russian Federation, M. Topilin, announced in February 2016 that, at the start of the demographic programme in 2006, the total fertility rate was equal to 1.3, while “in 2015 the figure was 1.8, which is higher than most European countries. We are close to ensuring the normal reproduction of the population”². Do demographers have sufficient grounds to support the increased optimism characteristic of today’s politicians and officials?

My previous works systematically set out the results of: 1) a descriptive analysis of sociological data showing changes of intentions and the degree of their implementation in relation to the birth of children according to the results of three waves of the Russian Generations and Gender Survey (RusGGS)³, conducted in 2004, 2007 and 2011 [The population of Russia ... 2013: 309-317]; and 2) an analysis of various statistical indicators designed to assess the level of period total fertility from the perspective of the expected level of ultimate fertility of generations at an active reproductive age, as well as an analysis of the actual changes in the total fertility rates for cohorts of women by year of birth [population of Russia 2013: 318-324; The population of Russia ... 2014: 131-153; Frejka, Zakharov, 2014].

The main conclusion from the above analysis is that neither the intentions nor the behaviours of most Russians have changed significantly under the influence of pronatalist policies. There have been some positive developments in reproductive attitudes, but their significance is quite insufficient for an optimistic view of Russia’s future fertility. The use of better statistical indicators of fertility than the period total fertility rate for calendar years (for synthetic cohorts), which is often groundlessly used to measure the effect of the policy, has also dampened the excitement over the apparent “growth in fertility”.

¹ Message to the Federal Assembly of the Russian Federation // Rossiyskaya Gazeta – Federal Issue №4063. 11.05.2006. URL: <http://rg.ru/2006/05/11/poslanie-dok.html> (reference date 04/04/2016).

² The Ministry of Labour and Social Protection of the Russian Federation. URL: <http://www.rosmintrud.ru/social/290> (reference date 20/02/2016).

³ The Russian title of the survey, translated, is “Parents and children, men and women in family and society”; it is part of the international research project of comparative studies “Generations and Gender Programme”, coordinated by the United Nations Economic Commission for Europe with the support of an international consortium of research centres (See: <http://www.unece.org/ead/pau/ggp/Welcome.html>). Altogether, three waves of the survey were conducted in Russia – in 2004, 2007 and 2011 – each of which interviewed more than 11,000 respondents of both sexes aged 18 years and older (the panel component of those surveyed again in 2007 and 2011 was more than 7,000), representing the urban and rural populations of 32 subjects of the Russian Federation, including Moscow and St. Petersburg. In Russia, the study PCMW / RusGGS was coordinated by the Independent Institute for Social Policy (IISP, Moscow), with O.V. Sinyavskaya as the programme director and S.V. Zakharov as its research leader. The field part of the study was conducted by the independent research group “Demoscope” (led by Polina Kozyreva and Mikhail Kosolapov) with the financial support of the Russian Federation Pension Fund, The Max Planck Society (Germany), Sberbank and others. For more information about the project and publications, see: http://www.socpol.ru/research_projects/proj12.shtml.

Our findings, based on an analysis of “macro-demographic” and “macro-sociological” data, have received support from researchers who analyse current trends in fertility in Russia using econometric methods based on microdata of surveys [Chirkova 2013; Slonimczyk, Yurko 2015; Biryukova, Sinyavskaya, Nurimanova 2016]. These and certain other studies have shown that the effect of the maternity capital programme and other measures enacted in 2007 on the reproductive behaviour of Russians, although positive, is quite weak⁴. And, perhaps more importantly, the effects obtained are difficult to separate, on the one hand, from the so-called timing effects caused by a short-term change in the timing of successive births and not leading to a change in the lifetime fertility rates of cohorts and, on the other hand, from the effects associated with a long-term transformation of the age-fertility pattern, which in turn may or may not be linked to the change in total cohort fertility.

In this work, I continue the demographic analysis of Russian fertility on the basis of official data from Rosstat, including the final data for 2014 – the most recent at the time of writing. The article provides an overview of trends in the main characteristics of fertility over the past few decades, and discusses the effects that can be interpreted as a possible result of pronatalist family policy. In addition, it discusses the development of a methodological apparatus for analysing cohort fertility indicators in order to obtain more reliable projections of fertility.

The article first focuses on changes in the numbers of births in Russia under the influence of changes in the population structure by age, marital status and citizenship status. It then analyses the transformation of period and cohort fertility patterns in Russia in the context of women’s age and birth order. The final part of the study evaluates the prospects of the completed cohort fertility for generations which are now at the peak of their procreative activities, and shows to what extent the observed total fertility rate provides the replacement of generations and the reproduction of the Russian population.

1. CHANGES IN THE NUMBER OF BIRTHS UNDER THE INFLUENCE OF STRUCTURAL CHARACTERISTICS OF THE POPULATION: THE COMPOSITION OF THE POPULATION BY AGE, CITIZENSHIP STATUS AND MARITAL STATUS⁵

In 1999, the number of births in Russia reached an historic low: 1,214,700 (excluding births in the Chechen Republic, in which the demographic events of those years were not registered in the

⁴ Thus, F. Slonimchik and A. Yurko estimate the expected long-term effect from the policy of the maternity capital at a level of 0.15 births per woman of a conditional generation. This result was obtained using various dynamic structural models of fertility applied to the panel data of the Russian Monitoring of the Economic Situation and Public Health (carried out by the Higher School of Economics and ZAO “Demoscope” in Russia with the participation of the Population Center of the University of North Carolina in Chapel Hill, USA) [Slonimchik, Yurko 2015]. Based on the same data, S. Chirkova draws the conclusion that the contribution of the new policy measures to the increased probability of a second child's birth is 2.2 percentage points [Chirkova 2013]. A similar result with respect to the increase in the proportion of women giving birth to a second child was obtained on the basis of data from the RusGGS [Biryukova, Sinyavskaya, Nurimanova 2016: 11-12].

⁵ Hereinafter, unless otherwise specified, official Rosstat statistics for the Russian Federation without Crimea are analysed.

prescribed manner⁶). In 2000-2014, the number of births increased (except for the years 2005 and 2013), and in 2014 the number of live births – 1,880,500 (that is, not including births in the Chechen Republic) – was much larger than in 1999, increasing by 665,800, or 54.8%.

The annual increase in births was highest in 2007 at 8.7%. After that, from 2008 to 2011, growth rates fell rapidly to 6.4%, 2.8%, 1.5%, and 0.4%, respectively. However, 2012 again brought a very significant increase in newborns – 105,500 (5.9%). In 2013, for the first time over a long period, the number of births decreased by 6,300, or 0.3%; in 2014, it once again significantly increased by 17,7000 (0.9%) and reached 1,913,500, which practically meant a return to the 1990 level.

The increase in the number of births over the past two decades has contributed to the favourable age structure of the population: from the beginning of the 2000s, the total number of women in their main childbearing years (20 to 35 years) was in a growth phase, which had a positive influence on the number of marriages and births. True, the sizes of individual reproductive age groups in recent years have been moving in opposite directions: the number of young women under 25 is declining rapidly, thus reducing the potential number of births, while the number of women over 25 years continues to grow, exerting a positive influence. The increase in the number of women in later reproductive ages in modern Russia is more important for the growth of births than that of women under the age of 25 years, as the average age of mothers in the last 15 years has had a tendency to increase after the average age of marriage, exceeding 28 years in 2014. The accompanying increase in the number of potential mothers aged 25 years or older, and the intensity of childbearing at these ages, ensured the increase of births from 2000 to 2014, which was achieved mainly due to later births to women aged 25 years and over. The contribution of younger women in this period was negative.

But now the increase in the number of women with growing fertility has come to an end: the size of the key group of women aged 25-29 peaked in 2012, then began to decline, and by 2017 will have decreased by more than 1 million, i.e. will be less than it was in 2000. For 30-34-year-olds the turning point will come in 2018. In 2012, the total number of women 20-39 years old began to decline, and maintaining the current number of births given the rapid reduction in the number of potential mothers seems unlikely.

A change in the number of births is usually rightly associated with a change in the number of newly married couples and with changes in the marital structure of the population. Moreover, this is based on the fact that persons who are married are traditionally more inclined to have children. In recent decades, due to the mass diffusion of marital unions that are not based on official

⁶ In 1993-2002, registrations of births (as well as of other demographic events) in Chechnya were either absent altogether or were sketchy. For the years 1993-1994, there are also no data on Ingushetia, which are again included in the general set of data for the country starting in 1995. As of 2003, Rosstat has been able to publish data on Russia with the inclusion of births registered in Chechnya. True, in 2003 the total number of births in the Chechen Republic was not distributed by age of the mother, and when calculating more detailed indicators (rates by maternal age, total fertility rate), data on Chechnya were not taken into account (excluded, accordingly, both from the numerator, i.e. the number of births, and from the denominator, i.e. the average annual number of women). Data on fertility in Chechnya have been fully present in official demographic calculations only since 2004. True, the completeness and quality of these data remain in question today. Thus, in calculations of demographic indicators relative to the size of different population age groups (e.g. age-specific fertility, mortality, marriage and divorce rates) Chechnya and Ingushetia are completely excluded in 1993-1994, and Chechnya in 1993-2003.

marriage (i.e. cohabitation), the close connection between fertility and registered marriage can be called into doubt, as shown by the dynamics of the proportion of extramarital births.

The decrease and increase in the total number of births in Russia in the postwar period were accompanied by both an increase and a decrease in the proportion of extramarital births. In some periods, changes in these indicators were synchronous, and in others asynchronous, such as in the second half of the 1990s, when the number of extramarital births increased rapidly, while the total number of births decreased.

In the last decade, alongside an overall growth in the number of births, Russia has seen a decline in the proportion of children born outside of a registered marriage (e.g. 30.0% in 2005 and 22.7% in 2014), with a relative stabilisation of the annual number of births out of wedlock at 430-450 thousand (Figure 1), and a reduction in the share of those births registered at the request of the mother alone (e.g. 56.5% in 2007 and 49.7% in 2014). Accordingly, among the total number of births there is an increasing proportion of marital births and of children with a recognised paternity (Table 1). In 2013-2014, for the first time in the history of Russia, the proportion of extramarital births registered on the basis of a joint declaration by parents not bound by marriage exceeded the proportion of births registered on the basis of a declaration by a single mother. Compared with 1970, when Russia registered approximately the same total annual number of births as in 2012-2014 (1.9 million), the structure of births according to relations between the parents has changed significantly (Table 1). The proportion of extramarital births is 2 times higher, and dominant among extramarital births are those registered on the basis of a declaration of paternity – a joint declaration by both mother and father (this same category, however, includes births for which paternity was established by a court decision).

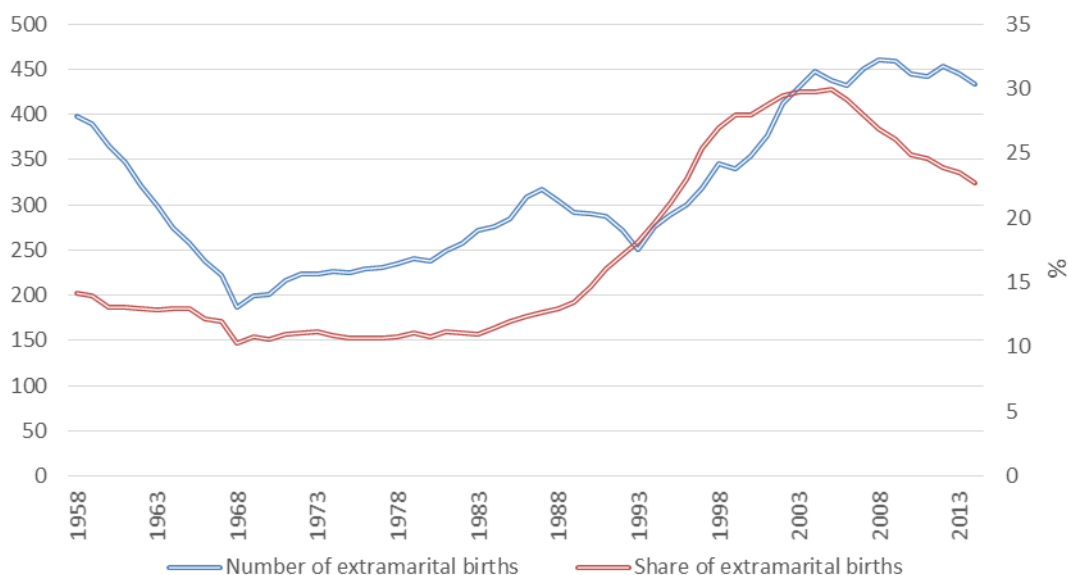


Figure 1. Number of births out of wedlock, thousands (left axis) and their share in the total number of births, % (right axis), Russia, 1958-2014

Sources: [Demographic Yearbook of Russia 2015]; unpublished data from Rosstat, and the author's calculations based on them.

As the sample studies show, the vast majority of children with recognised paternity in fact live in a family with both parents, while the reasons why parents do not register the marriage are quite diverse, being due to the diversity of the nature of relations between parents, their formal and *de facto* marital status (parents may, for example, be officially married to other people), specific living conditions and circumstances of the pregnancy and the birth of the child. Whatever the reason, judging from the above data the proportion of young children who are cared for by both their biological parents is not decreasing, but rather may be increasing, which, correspondingly, has a positive effect on the conditions of their socialisation in terms of gender balance.

Table 1. Marital and extramarital births, including by type of document used as the basis for registration, Russia⁷, 1980, 1990, 1995, 2000, 2005-2014

Year	Total, thous.	Including those born in and outside a registered marriage:		Share of births outside a registered marriage, %	Extramarital births registered on the basis of..., thous.:		Share of births registered by declaration of only the mother in the total number of extramarital births, %
		In a registered marriage	Outside a registered marriage**		Joint declaration of mother and father	Declaration of only the mother**	
1970	1903.7	1702.5	201.2	10.6	82.5	118.8	59.0
1980	2202.8	1965.2	237.6	10.8	90.7	146.9	61.8
1990	1988.9	1698.3	290.6	14.6	124.2	166.4	57.2
1995*	1363.8	1075.5	288.3	21.1	124.2	164.1	56.9
2000*	1266.8	912.5	354.3	28.0	167.3	187.0	52.8
2005	1457.4	1020.3	437.1	30.0	200.4	236.6	54.1
2006	1479.6	1048.1	431.5	29.2	189.9	241.6	56.0
2007	1610.1	1159.3	450.8	28.0	195.9	254.9	56.5
2008	1713.9	1253.5	460.4	26.9	202.8	257.6	55.9
2009	1761.7	1302.3	459.3	26.1	200.6	258.8	56.3
2010	1788.9	1344.1	444.9	24.9	199.2	245.7	55.2
2011	1796.6	1355.1	441.5	24.6	205.8	235.7	53.4
2012	1902.1	1448.6	453.5	23.8	215.5	238.0	52.5
2013***	1895.8	1451.0	444.9	23.5	218.8	226.1	50.8
2014	1913.5	1479.6	433.9	22.7	218.2	215.7	49.7
2014/2013	1.009	1.020	0.975	-	0.997	0.954	-

Source: [Demographic Yearbook of Russia 2015], unpublished data from Rosstat, and the author's calculations based on them.

Notes:

*Without data on Chechnya.

**Including births with unknown legal status of the parents (abandoned children, foundlings and so forth). These newborns are registered by the declaration of government agencies (Ministry of Health, Ministry of Internal Affairs).

***Including those born in Chechnya, not distributed by marital status of the mother. See: [Russia Demographic Yearbook 2015: Note to Table. 4.5]. For detailed annual dynamics for 1958-2011, see: [Zakharov, Churilova 2013: 113-114].

⁷ Hereinafter, all statistical data are given for the territory of Russia without Crimea.

In Russia, a change in the structure of births in favour of marital or extramarital births is still mainly determined by trends in the intensity of marriages, especially first marriages, the number of which has been on the rise since the beginning of the 2000s. At the same time, the ratio of fertility rates for married and unmarried persons – marital and extramarital fertility – has been changing in recent years, apparently also in favour of couples in registered marriages⁸. However, the role of the second factor in the change in the structure of births by marital status of the mother is much less significant compared to the increasing number of married couples. If in the 1990s in Russia there was a rapid decline in marriage rates, mainly due to men and women postponing their first marriages, since the beginning of the 2000s the number of marriages, despite fluctuations in some years, has experienced a compensatory rise (Figure 2); this indicates the mass realisation of postponed marriages at a later age. Younger generations are also seeking to start families later than before, usually after age 25. It is important to note that the absolute number of men and women aged 25-39 years in Russia is, as already mentioned, in a growth phase. As a result, over the past decade and a half the number of marriages has increased significantly (both in absolute and in relative terms), and the marital structure of the population has improved considerably, which is bound to have a positive impact on the number of marital births and on Russian fertility as a whole. However, it is clear that the potential for an increase in births contained in the age and marital structure of the population is almost exhausted (the number of marriages has already begun to decrease), and in the next decade the impact of these factors will be negative.

Judging by the available data for the years 2011-2014 (Rosstat does not have detailed information for earlier years), the contribution of families in which both parents are Russian citizens to the total number of births in Russia remains stable – about 85% (Table 2). However, it is possible that this stability is temporary. Of note is the steady and rapid growth in the number of births (more than 20% annually in 2012-2014) to foreign parents, as well as the increase in births in a fairly large category of families in which the mother of a newborn is a citizen of Russia, and the father a citizen of another country (an increase of 21% in 2012, 12% in 2013, and 13% in 2014). Not far behind is the annual increase in newborns whose father is a Russian citizen and whose mother is a foreigner: the increase in births in this category was 27% in 2012, 11% in 2013 and 9% in 2014 (Table 3). And in rural areas there is a higher proportion than in urban areas of newborns with one or both parents who are not citizens of Russia: in 2014, 14.4% of urban births and 16.2% of rural births were to foreign citizens.

Let us consider in more detail the structural changes in births by citizenship status of the parents for all years for which data are available. The considerable total increase of births in 2012 had a uniform structure and included all categories of citizenship of parents, without exception. In terms of absolute growth, the dominant category was, as might have been expected, families in which both parents have Russian citizenship – 79.6 thousand, or 75.5% of the total annual increase of 105,500 newborns. At the same time, the highest growth rates were shown by parents of mixed nationality (where only the father or only the mother is a citizen of the Russian Federation), as

⁸ See the estimation of the age-specific rates of marital and extramarital fertility, which in Russia can be correctly calculated only on the basis of population censuses and large sample surveys: [Population of Russia ... 2014: 121-130].

well as by parents who are both citizens of other countries (Table 3). The contribution of foreign citizens (up to 25% of the total increase in 2012), should be recognised as very significant.

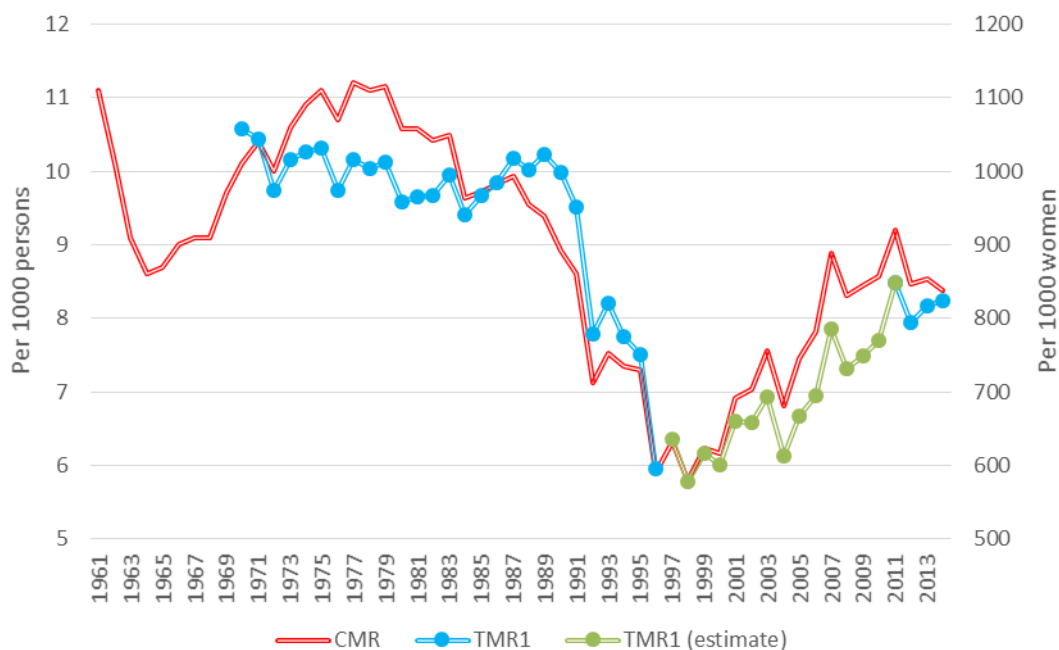


Figure 2. Crude marriage rate (left axis) and the total first marriage rate for women (right axis), Russia, 1961-2014

Source: [Demographic Yearbook of Russia 2000; 2015]; author's calculations based on unpublished data from Rosstat.

Note: CMR – the crude marriage rate per 1,000 population; TMR1 – total first marriage rate per 1,000 women by the age of 50. For the period 1997-2010, TMR1 is the author's interpolated estimate, based on age-specific marriage rates for aggregated age groups taken by Rosstat for the annual processing of data on the number of persons getting married in this period. See: [The population of Russia ... 2006: 207-210; The population of Russia ... 2013: 231-234].

Noteworthy is the fact that the decline in the number of births in 2013 occurred primarily among mothers with Russian citizenship who did not indicate any the nationality of the child's father (the number of births in this group of mothers decreased by 9,400). Also significant was the reduction in births in families where both parents have Russian citizenship (by 3,000). The change in the number of newborns in other categories according to their Russian citizenship status in 2013 showed a mosaic pattern: some categories increased their contribution to the total number of registered births, while others reduced theirs (Table 2). Generally speaking, however, foreign nationals considerably slowed down the decline in the total number of births in the country in 2013, and if not for their growing contribution, the number of births in Russia would have shrunk further.

The contribution of foreign citizens to the increase in the number of births in 2014 was even more significant – 29% of the total growth, with a continued rapid increase in the number of births precisely in families in which either one or both parents are foreign nationals. At the same time, births to parents with undetermined citizenship status diminished.

Table 2. Number of births to parents with varying statuses of Russian citizenship, Russia, 2011-2014

Status	2011		2012		2013		2014	
	Number of births	%	Number of births	%	Number of births	%	Number of births	%
Both parents citizens of RF	1531076	85.22	1610632	84.68	1607665	84.80	162852	85.08
Mother citizen of RF, father citizen of another country	16929	0.94	20425	1.07	22831	1.20	25823	1.35
Mother citizen of RF, father a stateless person	187	0.01	251	0.01	262	0.01	166	0.01
Mother citizen of RF, father's citizenship not indicated	212672	11.84	224547	11.81	215188	11.35	204812	10.7
Father citizen of RF, mother citizen of another country	15689	0.87	19874	1.04	22036	1.16	24080	1.26
Father citizen of RF, mother a stateless person	138	0.01	279	0.01	196	0.01	126	0.01
Father citizen of RF, mother's citizenship not indicated	746	0.04	1770	0.09	1185	0.06	1084	0.06
Both parents citizens of another country	9784	0.54	12609	0.66	15438	0.81	18647	0.97
Others	9408	0.52	11697	0.61	11021	0.58	1084	0.56
Total registered in Russia:	1796629	100.0	1902084	100.0	1895822	100.0	1913472	100.0

Source: unpublished data from Rosstat; author's calculations.

One cannot help but notice a certain strangeness in the dynamics of the number of births based on the citizenship status of parents, which apparently are a consequence of features unknown to us in the registration practice both of children born in families of migrants and of the migration status of their parents. This applies, above all, to the trend of births to parents with an undetermined citizenship status. For example, in 2014 the number of children born in Russia to mothers where the citizenship status of the father was unknown decreased by 10,000 (Table 3). In 2013, this category of parents also showed a decrease of more than 9,000, while in 2012, in contrast, there was a significant increase of almost 12,000 (Table 3). In 2013, this category of newborns essentially caused the large dip in the total number of births in the country, while in 2012 it was responsible for 15% of its growth.

As a rule, a child, for whom registration forms show only the nationality of the mother, is born outside of marriage, in most cases to a “single mother” who, for one reason or another, does not register the child on the basis of a joint declaration of the parents attesting to the father's recognition of his child. In fact, we do not know whether his or her biological father is a Russian citizen or not. Nevertheless, we can say that migrants today are making a significant and growing contribution to total fertility in the country and to the change in the number of illegitimate births in particular. However, changing legislation on the naturalisation of migrants, together with changing registration practices for migrants and their children, mean that any changes detected on the basis of official statistics must be approached with great caution.

An indicator not dependent on the age and sex structure of the population – the period total fertility rate (the total number of births per woman of a synthetic cohort) – indicates that in Russia in 1999-2014 (except for 2005), there was an increase in the intensity of childbirths both in urban

and in rural areas, but up to 2006 the indicator's growth in urban areas outpaced that of rural areas (Table 4).

Table 3. Absolute and relative annual increase in births to parents with varying statuses of Russian citizenship, Russia, 2011-2012, 2012-2013, 2013-2014

	Increase in 2011-2012		Increase in 2012-2013		Increase in 2013-2014	
	Abs.	Relative 2012/2011	Abs.	Relative 2013/2012	Abs.	Relative 2013/2012
Both parents citizens of RF	79556	1.052	-2967	0.998	20387	1.013
Mother citizen of RF, father citizen of another country	3496	1.207	2406	1.118	2992	1.131
Mother citizen of RF, father a stateless person	64	1.342	11	1.044	-96	0.634
Mother citizen of RF, father's citizenship not indicated	11875	1.056	-9359	0.958	-10376	0.952
Father citizen of RF, mother citizen of another country	4185	1.267	2162	1.109	2044	1.093
Father citizen of RF, mother a stateless person	141	2.022	-83	0.703	-70	0.643
Father citizen of RF, mother's citizenship not indicated	1024	2.373	-585	0.669	-101	0.915
Both parents citizens of another country	2825	1.289	2829	1.224	3209	1.208
Others	2289	1.243	-676	0.942	-339	0.969
Total	105455	1,059	-6262	0,997	17650	1,009

Source: unpublished data from Rosstat; author's calculations.

In 2007, the TFR in rural areas (0.2 children per woman) for the first time exceeded fertility growth in the urban population (0.08), by over twice as much. In 2008-2009, the pace of growth of the total fertility rate declined in both urban and rural areas, but it declined in rural areas more intensively. In 2010-2014, the TFR growth in urban areas was barely noticeable (in 2011 there was no increase in fertility in urban areas at all), whereas in rural areas, in contrast, there was a significant growth in the indicator (Table 4). Altogether, for the whole period from 1999 (the lowest point of the TFR) through 2014, the TFR in urban areas increased by 0.55, and in rural areas by 0.81, children per woman.

If, in the early 1990s, period total fertility of rural residents was higher than that of urban residents by approximately 0.9 births per woman, by 2005 the gap between rural and urban areas had dropped to 0.39, that is, by a factor of more than 2. In 2006-2014, differences in the TFR between urban and rural areas increased due to faster growth rates in rural areas, and in 2014 the gap reached 0.75 children per woman, indicating a gradual return to the situation that had remained stable for decades, from the mid-1960s to the first half of the 1990s, when the differences in the values of the index between urban and rural populations were about 0.8-0.9 (the author's assessment after the elimination of inaccuracies in the TFR estimates for urban and rural populations, arising from errors in the calculation of urban and rural population sizes in the intercensal periods [Zakharov, Ivanov, 1996]).

Table 4. Period total fertility rate per woman, Russia, 1980, 1985, 1990, 1995-2014

Year	Whole population	Urban population	Rural population
1980	1.89	1.70	2.51
1985	2.05	1.86	2.67
1990	1.89	1.70	2.60
1995	1.34	1.19	1.81
1996	1.27	1.14	1.70
1997	1.22	1.10	1.62
1998	1.23	1.11	1.64
1999	1.16	1.04	1.53
2000	1.19	1.09	1.55
2001	1.22	1.12	1.56
2002	1.28	1.19	1.63
2003	1.32	1.22	1.66
2004	1.34	1.25	1.65
2005	1.29	1.21	1.58
2006	1.30	1.21	1.60
2007	1.42	1.29	1.80
2008	1.50	1.37	1.91
2009	1.54	1.41	1.94
2010	1.57	1.44	1.98
2011	1.58	1.44	2.06
2012	1.69	1.54	2.21
2013	1.71	1.55	2.27
2014	1.75	1.59	2.34

Source: Author's calculations using unpublished raw data of Rosstat.

Note: Calculation based on one-year age-specific fertility rates, taking into account the recalculation of the population size after the censuses of 1989, 2002 and 2010. In 1995-2003 – without the Chechen Republic.

2. SLOWING DOWN THE PROCESS OF THE AGEING OF MOTHERHOOD IN RUSSIA

Both the growth and the decline in the number of births are not always proportional to the growth and decline in the number of women, as there might be a simultaneous change in the intensity of fertility at different ages. For more than two decades, Russia has seen changes in the age profile of fertility in the direction of “ageing”, which corresponds to the worldwide trend that emerged in the late 1960s and early 1970s in Northern and Western Europe, and which Russia and its neighbours in Eastern and Central Europe joined with a delay of more than two decades [Bosveld 1996; Sobotka 2004; 2011; Frejka et al. 2008]. Throughout its long history, Russia's fertility was highest among women aged 20-24 years. But in the 1990s, when the number of women in this age group increased, their fertility quickly fell. At the same time, fertility rates among mothers younger than 20 years decreased even more significantly (Table 5). Then the decline in the fertility of mothers under 25 years slowed down, but the fertility of women aged 30-34 years began steadily increasing, as did that of women aged 25-29 years in 2000. In 2008, the latter age group of women for the first time exceeded the fertility level of the 20-24-year-old group, and the gap between them began to grow. Fertility in the group aged 30-34 years, having increased more than two-fold from the late 1990s, not only exceeded the previous peak level of 1980, but almost equaled the fertility of 20-24-year-olds. Even more rapid was the increase in fertility in women over 35 years – an increase over one and a half decades of more than 3.5 times (Table 5).

Table 5. Age-specific fertility rates, 1980, 1985, 1990, 1995, 1999-2014, Russia, per 1,000 women of corresponding age

Year	Age group						
	15-19*	20-24	25-29	30-34	35-39	40-44	45-49**
1980	43.8	157.8	100.8	52.1	17.4	4.9	0.4
1985	47.2	165.0	112.9	59.7	23.3	3.6	0.3
1990	55.0	156.5	93.1	48.2	19.4	4.2	0.2
1995	44.8	112.7	66.5	29.5	10.6	2.2	0.1
1999	28.9	91.8	63.7	32.2	11.1	2.2	0.1
2000	27.4	93.6	67.3	35.2	11.8	2.4	0.1
2001	27.3	93.1	70.2	38.0	12.9	2.4	0.1
2002	27.3	95.3	74.8	41.6	14.6	2.6	0.1
2003	27.6	95.1	78.3	44.1	16.0	2.7	0.1
2004	28.2	94.2	80.1	45.8	17.6	2.9	0.1
2005	27.4	88.4	77.8	45.3	17.8	3.0	0.2
2006	28.2	87.8	78.4	46.6	18.6	3.1	0.2
2007	28.3	89.5	86.9	54.1	22.7	3.9	0.2
2008	29.3	91.2	92.4	60.0	25.8	4.6	0.2
2009	28.7	90.5	95.9	63.6	27.6	5.2	0.2
2010	27.0	87.5	99.2	67.3	30.0	5.9	0.3
2011	27.4	88.0	99.5	67.8	31.1	6.2	0.3
2012	27.4	91.2	106.6	74.3	34.9	7.0	0.3
2013	26.7	89.9	107.5	76.2	36.8	7.4	0.4
2014	26.1	89.6	110.1	79.9	39.0	8.1	0.4
2014/1999***	0.905	0.976	1.728	2.480	3.507	3.609	3.606
2014/2013***	0.980	0.997	1.024	1.049	1.060	1.082	1.211

Source: author's calculations based on unpublished data from Rosstat.

Remarks:

**Includes births to mothers younger than 15 years.*

***Includes births to women older than 49 years.*

****In the calculation of growth rates, more accurate baseline values are used than those given in the table, rounded to one decimal place.*

Such a series of changes in age-specific fertility rates indicates that in the 1990s – difficult years for Russian society – there was an intensive postponement of births in cohorts, and that in the 2000s these generations made up for lost time by intensively realising the births they had delayed [Frejka, Zakharov 2014]. A more fundamental and, from an historical point of view, completely new trend for Russia was added to this process: an unforced, intentional formation of families at an increasingly later age among generations of Russians who were born in the second half of the 1960s and later. The trend of women giving birth over age 25 is increasingly becoming a social norm. As a result of strong and sustained changes in the timing of births of the cohorts of mothers born in the 1960s, 1970s and 1980s, we are witnessing not only an increase in fertility among women in older age groups, but a fifteen-year growth in period total fertility rates. At the same time, the cohort completed fertility of Russians is changing quite less significantly, as will be discussed below, which gives a mainly “timing nature” to the increase in the TFR.

If we look at a detailed picture of the changes in fertility rates for one-year age groups of women (Figure 3), it becomes apparent that the well-known public policies to stimulate the birth rate made in 2006-2007, along with their further development, had no effect on fertility in women under 24 years of age: either it continued to decline in the youngest women, or, as among women

of ages 22 and 23, stagnated at the same level⁹. If not for the relative drop in fertility rates in 2005-2006, one would hardly suspect any acceleration in the growth of rates for women over 25 years under the influence of the new population policy measures enacted in 2007. An almost linear trend of a harmonious increase in rates for women of all ages above 24 years was observed in 2000, and for 30-year-old women the growth began even earlier, in the mid-1990s (Figure 3).

The evolutionary component of the transformation of the age pattern of fertility in Russia has clearly prevailed over conjunctural ones, and in the latest trends pronatalist policy plays a secondary role, giving additional signals for the continuation and acceleration of the same processes as in all developed countries without exception: the transformation of an age (timing) model of fertility towards later motherhood.

The transformation of the age profile of mass reproductive behaviour has gone hand in hand with the transformation of the institution of marriage: young people are getting married later than they were two decades ago, and it is natural that they should also begin having children later. The similarity of the trends in different countries suggests that people respond to changes in the economic conditions of running a household, in health care, in how long it takes to get an education, in getting a job, etc., by searching for that portion of the life path which, in the new conditions, is the most suitable for having and raising children. For the modern woman, entry into adult life and self-identification are no longer as clearly associated with marriage and motherhood as before [Zakharov 2010]. The socio-demographic events of her life are arranged in a different sequence and focus on other areas of the life path. Indeed, the life paths themselves are becoming more diverse [Mitrofanova 2015].

At first, the decision to have fewer children naturally led to the rejuvenation of fertility. But then, when having few children became widespread, parents seemed to have become aware that in order to bear and raise one, two or even three children, there is no need to start having children before age 25, often before or during the completion of their education and first job search, as so often happened before. In addition, the structure of education in Russia over the past two or three decades has shifted dramatically in favour of higher degrees: if, among the generations of women born in the 1950s-1960s, the proportion of persons with higher education was 20%, then among the generations of the 1970s it was closer to 40%, and among the generations of the 1980s and later it is expected to exceed one half¹⁰.

In the first stage, when fertility was growing younger, Russia was moving in the same direction as most developed countries. In the early 1980s, probably following other countries, there were signs of a turn in the opposite direction. However, the stepping-up of family policy in those years caused people to have children at a younger age and at shorter intervals. The average age of mothers went up again only in the mid-1990s. At that time, earlier motherhood could be seen only in Bulgaria, Ukraine and Moldova. Today, these same countries, as well as Belarus, still lag

⁹ True, the apologists of the policy of stimulating fertility, seeking to find the positive results of such a policy everywhere, always have one more argument: the policy allegedly “prevented or slowed down further decline in fertility, which would certainly have continued (happened more quickly) in the absence of incentives.” This argument in practice is extremely difficult to prove or disprove.

¹⁰ According to the projections provided by the staff of the Centre for Labour Market Studies of the Higher School of Economics, among the youth cohorts that completed secondary school education in the mid-2000s, the expected share with university diplomas will be more than 60% [The Russian worker ... 2011: 42-43].

slightly behind Russia in the process of restructuring the age-of-fertility profile, and all of them – including Russia – in turn lag behind the Baltic countries and Eastern and Central Europe, where the ageing of motherhood began approximately at the same time [Basten, Frejka et al. 2015]. Apparently, the depth and consistency of political and economic reforms in the former socialist countries play a significant role in terms of the speed and solidity of the changes in the life trajectories of an overwhelming majority of young people.

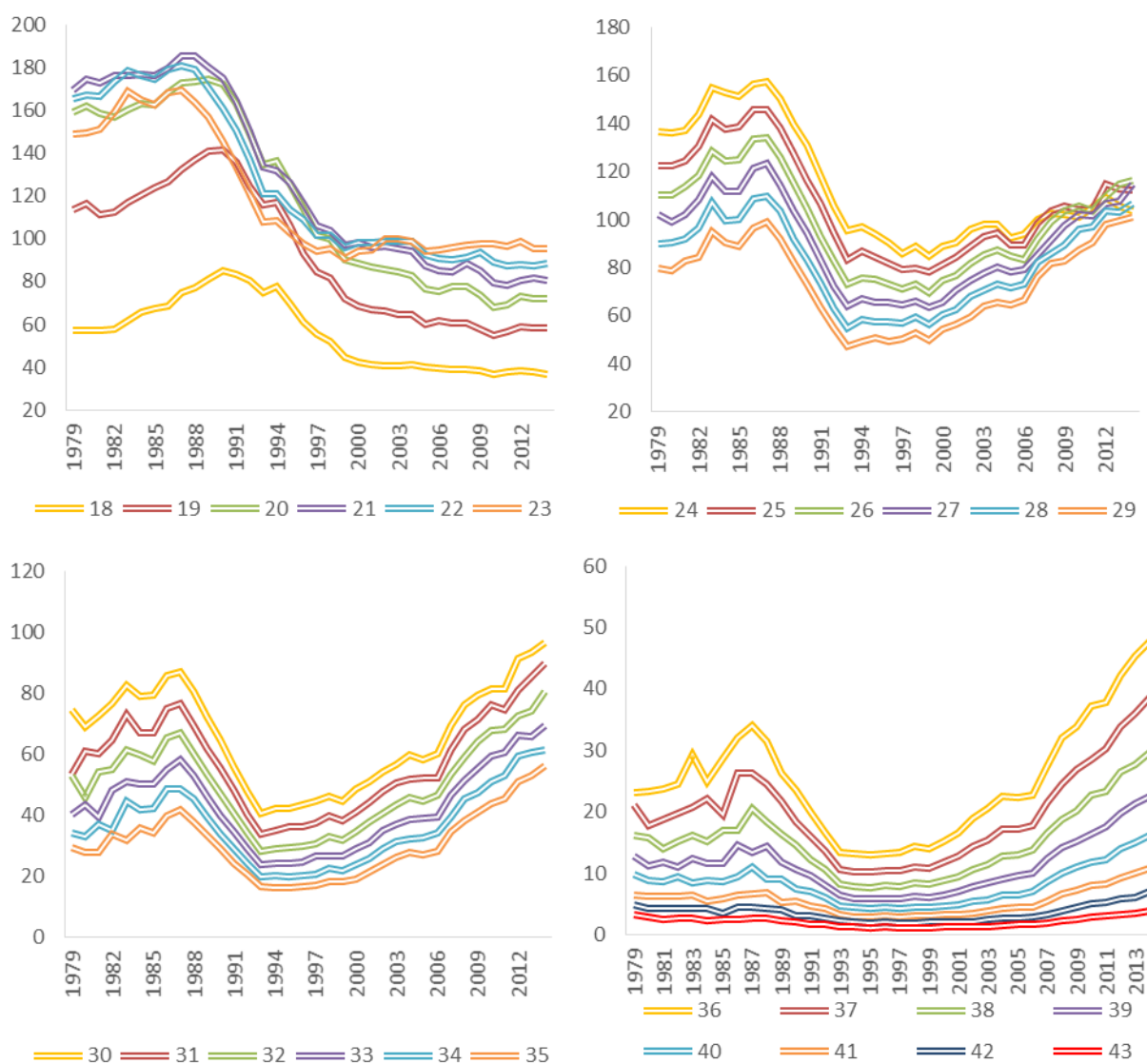


Figure 3. Age-specific fertility for one-year age groups per 1,000 women of the indicated age, Russia, 1979-2014

Source: Author’s calculations based on unpublished data from Rosstat.

The average age of mothers, including at each birth parity, presented in dynamics, gives a general idea of the vector of changes (Table 6). The average age of mothers in 2014 in Russia was 28.12 years, including 25.30 years at the birth of the first child, 29.53 at the birth of the second, and 32.21 at that of the third. These values are much higher than not only those that occurred in the 1990s, when they were minimal for all the post-war period, but also the values for the 1970s

and 1980s. For all birth parities, the average age of motherhood as compared to the first half of 1990 increased by more than 3 years, and at the birth of the first child it increased by 2.6 years.

At the same time, it should be noted that in the last few years the increase in the average age of motherhood has slowed down; in 2014, the first signs of a drop in the mother's age at the births of the second and subsequent children appeared. Women's age at the birth of the first child is still growing, but the near-term prospects for the continuation of this trend are not obvious. It is still too early to say that the transformation of the age profile of motherhood in Russia has turned back towards rejuvenation. However, this fact confirms that there is an acceleration in the formation of the final number of offspring in the family, and the time intervals between the births of children in families, particularly between the first child and second child, are shrinking. It can be assumed that the accelerated pace of childbearing was aided by the approaching completion of government programmes of maternity capital and other benefits to support large families. This widely held explanation seems quite logical, although direct empirical evidence is lacking. According to the same logic, the government's widely publicised decision to extend the maternity capital programme, adopted at the end of 2015¹¹, should weaken the impact on the intensity of higher-parity births in the family.

Table 6. Mean age of mothers at birth of children of each parity, Russia, 1980, 1985, 1990, 1995, 2000-2014, years

Year	All births	By birth parity				
		First	Second	Third	Fourth	Fifth and subsequent
1980	25.67	22.99	27.33	30.07	31.81	35.49
1985	25.78	22.92	27.13	30.03	31.56	34.71
1990	25.24	22.65	26.86	29.95	31.64	34.38
1995	24.79	22.67	26.91	29.85	31.55	34.29
2000*	25.76	23.54	27.88	30.88	32.49	34.57
2001*	25.93	23.66	28.21	31.13	32.60	34.53
2002*	26.12	23.75	28.41	31.26	32.75	34.74
2003*	26.27	23.85	28.61	31.41	32.77	34.78
2004*	26.39	23.96	28.77	31.51	32.99	34.85
2005*	26.53	24.10	28.92	31.60	33.01	34.97
2006*	26.61	24.20	29.04	31.69	33.11	34.99
2007*	26.96	24.33	29.14	31.76	33.18	35.01
2008*	27.18	24.44	29.30	31.94	33.34	35.16
2009*	27.38	24.67	29.44	32.02	33.34	35.07
2010*	27.65	24.90	29.55	32.19	33.41	35.09
2011*	27.69	24.91	29.49	32.16	33.42	35.06
2012	27.85	25.01	29.52	32.21	33.38	34.99
2013	27.98	25.19	29.54	32.22	33.38	34.93
2014	28.12	25.30	29.53	32.21	33.33	34.86

Source: Author's calculations based on unpublished data from Rosstat, using fertility rates for one-year age groups as weights.

*Notes: *Estimates for 2000-2011 are based on the use of incomplete data: only for those territories that kept and provided Rosstat with processed data on births simultaneously by the age of the mother and birth parity. For detailed annual dynamics of the 1980s and 1990s, see: [The population of Russia ... 2004: 47].*

¹¹ On December 30, 2015, President Putin signed a law on the extension of the maternity capital programme for two years (see: Federal Law №433-FZ of 30 December 2015, "On Amending Article 13 of the Federal Law 'On Additional Measures for State Support for Families with Children'", URL: <http://publication.pravo.gov.ru/Document/View/0001201512300055>. Date of circulation 04/04/2016).

The slowing down of the rise in the age of mothers at higher-parity births has not yet shown itself in a breaking of the long-term trend towards an increase in the contribution of older mothers to total fertility. If, several decades ago, more than half of the overall fertility rate in Russia was due to the reproductive activity of the youngest women under 25 years of age, now more socially mature women are making a decisive contribution: all women older than 25 years provide two-thirds of the value of the total fertility rate, with women over 30 accounting for more than a third of its value (Table 7).

Table 7. Contribution of age groups of mothers to period total fertility rate, Russia, 1980, 1985, 1990, 1995, 2000-2014, %

Year	Mother's age. years					Total
	Under 20	20-24	25-29	30-34	35 and older	
1980	11.6	41.9	26.7	13.8	6.0	100.0
1985	11.5	40.0	27.4	14.5	6.6	100.0
1990	14.6	41.6	24.7	12.8	6.3	100.0
1995	16.8	42.3	24.9	11.1	4.9	100.0
2000	11.5	39.3	28.3	14.8	6.1	100.0
2001	11.2	38.2	28.7	15.6	6.3	100.0
2002	10.7	37.2	29.2	16.2	6.7	100.0
2003	10.5	36.0	29.7	16.7	7.1	100.0
2004	10.5	35.0	29.8	17.0	7.7	100.0
2005	10.5	34.0	30.0	17.4	8.1	100.0
2006	10.7	33.4	29.8	17.7	8.4	100.0
2007	9.9	31.3	30.4	19.0	9.4	100.0
2008	9.7	30.0	30.4	19.8	10.1	100.0
2009	9.2	29.0	30.8	20.4	10.6	100.0
2010	8.5	27.6	31.3	21.2	11.4	100.0
2011	8.6	27.5	31.1	21.2	11.7	100.0
2012	8.0	26.7	31.2	21.7	12.4	100.0
2013	7.7	26.1	31.2	22.1	12.9	100.0
2014	7.4	25.4	31.2	22.6	13.4	100.0

Source: author's calculations based on the data presented in Table 4.

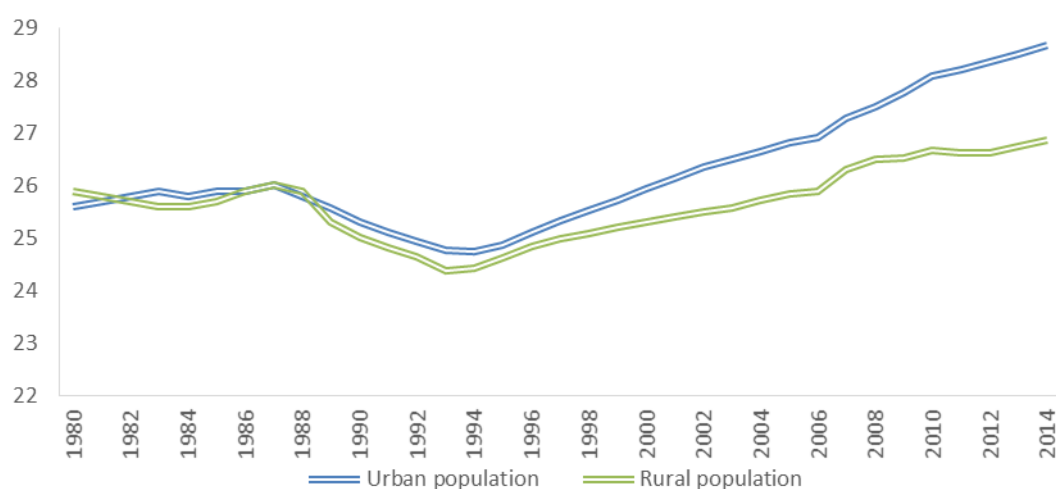


Figure 4. Mean age of mothers in urban and rural areas in Russia, 1980-2014, years

Source: [Demographic Yearbook of Russia 2015] and the author's calculations based on unpublished data from Rosstat.

The age profile of fertility among the urban population over the past two decades has changed faster and more consistently than that of the rural population, as evidenced by a comparison of the average age of first-time mothers. Moreover, in the last few years the increase in the mean age at childbearing for women in rural areas has been barely noticeable (Figure 4). It is precisely rural residents who are mainly responsible for the slowing down of the transformation of the age profile of Russian fertility. If, in the countryside in 2014, the mean age of mothers was 26.9 years, which is not even a year later in comparison with the values which had remained steady 3-4 decades ago, in urban areas the figure reached 28.7 years in 2014, already 3 years above the level observed in the Soviet period.

Since the ageing of fertility has been slower in the rural population than in the urban population, rural-urban differences in this indicator have greatly increased. If, at the end of the Soviet period in the 1980s-1990s, the difference in the average age of mothers in urban and rural areas was negligible (a mere 0.3 years in favour of city-dwellers), then by 2014 it had increased to 1.79 years. One might then ponder the emergence, at least on a temporary basis, of essentially two different age-fertility patterns: a “modernised, post-industrial urban pattern” (with relatively later parenthood, a lower number of children and effective family planning) and a “rural pattern conserving the outward features of the former, more traditional prototype” (with relatively early parenthood, a higher number of children, less efficient family planning).

It is worth remembering that today the rural population of Russian regions in terms of fertility is extremely heterogeneous, and that ethnic and cultural differences and associated features of the demographic transition and social modernisation as a whole continue to play a key role. Moreover, the differences between the rural residents of the regions of the Russian Federation have increased greatly in the last decade [The population of Russia ... 2014: 100-102; 158-173; The population of Russia ... 2015: 90-91]. Further development will show whether and how soon the stage of increasing rural-urban and inter-rural differences will be followed by a stage of convergent dynamics in Russian fertility. Historical experience tells us that, at the stage of rapid changes in socio-demographic models of behaviour – including on a temporary basis – triggered by government policies, a generally continuous increase in regional heterogeneity of statistical indicators is almost inevitable. As the rationality of choosing new behavioural practices gains more widespread approval, a smoothing out of social and territorial disparities becomes the dominant trend.

3. THE PROLONGED STAGNATION OF THE LIKELIHOOD OF A FIRST BIRTH AND THE GROWTH OF LARGE FAMILIES

Russia’s low level of fertility is connected with the mass proliferation of one-child families and, accordingly, with a very high proportion of first-borns in the total number of births. The distribution of births by order is an extremely important initial datum for an in-depth study of fertility schedules and an evaluation of its most important characteristics, such as parity progression ratios. Unfortunately, from 1999 to 2011 researchers were unable to take full advantage of these indicators for characterising fertility in Russia. The Law on Civil Status Acts, adopted in 1997 (Federal Law №143-FZ of 15 November 1997), did not provide for the registration of a newborn’s birth parity in the birth record (the initial document for national

statistics). This absence of information on the sequence of childbearing did not follow international and previous domestic practice. Continuous time-series data of fundamental characteristics of fertility were unexpectedly interrupted.

Nonetheless, many territorial statistical agencies continued on a voluntary basis to gather relevant information and make it available to the Federal State Statistics Service. Both public authorities and experts, realising the absurdity of the situation, ignored the fact that such activities came into conflict with the law. The composition of Russian territories, which continued to monitor the distributions of births by parity, changed from year to year, but because the regions represented all geographic zones of Russia and accounted for up to 70% or more of all births in the country, it was possible for S.V. Zakharov and E.M. Andreev (as well as colleagues maintaining the reputable Human Fertility Database) to extend, albeit with certain reservations, incomplete data to the whole of Russia. Tables 8 and 9 present the final results of our calculations.

Table 8. Period total fertility rates for each birth order* per woman, Russia, 1980, 1985, 1990-1995, 2000-2014

Year	Children by birth order					Overall TFR (children of all birth parities)*
	First	Second	Third	Fourth	Fifth and subsequent	
1980	0.967	0.643	0.147	0.048	0.061	1.866
1985	0.964	0.758	0.214	0.060	0.055	2.051
1990	0.995	0.624	0.178	0.052	0.045	1.893
1995	0.802	0.387	0.098	0.029	0.021	1.337
2000**	0.702	0.358	0.092	0.026	0.018	1.195
2001**	0.720	0.368	0.090	0.027	0.018	1.223
2002**	0.742	0.394	0.099	0.028	0.019	1.281
2003**	0.758	0.412	0.103	0.028	0.018	1.319
2004**	0.772	0.420	0.105	0.029	0.018	1.344
2005**	0.743	0.406	0.100	0.028	0.017	1.294
2006**	0.753	0.409	0.100	0.027	0.016	1.305
2007**	0.761	0.475	0.125	0.033	0.020	1.416
2008**	0.787	0.515	0.143	0.037	0.020	1.502
2009**	0.801	0.535	0.147	0.038	0.021	1.542
2010**	0.786	0.564	0.156	0.040	0.021	1.567
2011**	0.781	0.574	0.164	0.041	0.022	1.583
2012	0.809	0.620	0.189	0.047	0.026	1.691
2013	0.811	0.625	0.198	0.049	0.025	1.708
2014	0.799	0.658	0.212	0.053	0.027	1.750

Source: author's calculations using the fertility rates for one-year age groups. When calculating the indicators for 1995 and 2000-2003, Chechnya was excluded.

Notes:

**The average number of children of each birth parity expected to be born to a woman by the age of 50 years, provided there is no change in the current age-related intensity of childbearing age and the structure of births by birth parity. The sum of values for all birth parities gives a traditional indicator of the total fertility of a conditional generation (the same as in Table 4).*

***Estimates for 1999-2011 are based on the use of incomplete data: only for those territories that kept processed data on births simultaneously by age and birth parity. For detailed annual dynamics of the 1980s and 1990s, see: [The population of Russia ... 2007: 81-82].*

The distribution of births by parity for the year 2012 became available for all Russian territories for the first time after a hiatus of over ten years. Therefore, our estimates of Russian

fertility rates based on birth parity for 2012 and subsequent years are fully comparable with the estimates obtained for the period before 1999.

Already in 2001-2005, that is, before the start of the state policy to stimulate fertility, there was a slow increase in the contribution to the overall dynamics of fertility of second and third births, given the slow reduction in the contribution of first-borns. At the same time, the contribution of fourth and subsequent births decreased.

Table 9. The contribution of each order of birth to the period total fertility rate, %, and the average birth order, Russia, 1980, 1985, 1990-1995, 2000-2014

Year	Children by birth order					Total	Average birth order*
	First	Second	Third	Fourth	Fifth and subsequent		
1980	51.8	34.5	7.9	2.5	3.3	100.0	1.74
1985	47.1	36.9	10.4	2.9	2.7	100.0	1.80
1990	52.5	33.0	9.4	2.7	2.4	100.0	1.72
1995	60.0	28.9	7.3	2.2	1.6	100.0	1.58
2000	58.7	29.9	7.7	2.2	1.5	100.0	1.59
2001	58.9	30.1	7.4	2.2	1.4	100.0	1.59
2002	57.9	30.8	7.7	2.2	1.4	100.0	1.60
2003	57.5	31.2	7.8	2.1	1.4	100.0	1.60
2004	57.5	31.3	7.8	2.1	1.3	100.0	1.60
2005	57.4	31.4	7.8	2.1	1.3	100.0	1.60
2006	57.7	31.3	7.7	2.0	1.2	100.0	1.59
2007	53.8	33.6	8.9	2.4	1.4	100.0	1.65
2008	52.4	34.3	9.5	2.5	1.4	100.0	1.68
2009	52.0	34.7	9.5	2.5	1.4	100.0	1.68
2010	50.1	36.0	10.0	2.5	1.4	100.0	1.70
2011	49.4	36.2	10.4	2.6	1.4	100.0	1.72
2012	47.9	36.7	11.1	2.8	1.5	100.0	1.75
2013	47.5	36.6	11.6	2.8	1.5	100.0	1.76
2014	45.7	37.6	12.1	3.0	1.6	100.0	1.79

Source: author's calculations based on the data presented in Table 8.

*Notes: *The indicator is calculated as the weighted arithmetic mean, where weights are taken for the total fertility rate for each birth parity. For detailed annual dynamics of the 1980s and 1990s, see: [Population of Russia 2007: 82-83].*

In 2007-2014, the structure of fertility by birth *parity* began to change more rapidly. The expected total fertility for first births, compared with 2006, did not change much, but the total fertility of second and subsequent children increased significantly (Table 8). Even the contribution of fourth and fifth births increased, though not significantly. Due to a substantial increase in the contribution of higher birth parities to total fertility, the structure of fertility by birth order practically returned to the level of the mid-1980s (Table 9).

The reduction in the shares of first and, at the same time, of fourth and subsequent births for a long time compensated each other, so that the average birth order (ABO)¹² in 1993-2006 fluctuated around the same level of 1.6 (Table 9). Structural changes in fertility in 2007-2014 caused an increase in the ABO to 1.79, which can be interpreted as evidence of some success in

¹² The average birth parity is calculated as the average arithmetic weighted value of the biological parity of births to a mother, whose weights are the total fertility rates of a synthetic cohort for each birth parity.

the demographic policy carried out in recent years to stimulate fertility. The fact is that the ABO as a statistical indicator of the level of fertility serves as a relatively good predictor of the magnitude of the cohort total fertility¹³. Empirical proof of this claim is shown in Figure 5, where the curve of the cohort total fertility rate is compared with the curves for two period indicators – the period TFR and ABO.

For real generations/birth cohorts of women, there can be no differences between the average birth order and the total fertility rate, as they are essentially the same indicator – the average number of children born per woman by the end of her childbearing years. For synthetic cohorts, in the case of smooth changes in the age patterns of fertility and a stable percentage of women who have never given live birth, discrepancies between the indicators are also minimal, as took place in 1980 and 1990, for example (a difference of fewer than 0.2 births per woman).

However, in the case of sudden changes in the timing of births of many women, or of abrupt changes in the average tempo of formation of the final offspring size in generations, divergences between these integral characteristics of the fertility level for synthetic and real cohorts become inevitable, and are all the greater, the greater the changes in the average tempo of family formation. Recall that the period TFR and ABO are indicators for a synthetic cohort, and therefore should be interpreted as the *expected* values of the ultimate fertility of the generations. In the case of a faster tempo of childbearing (children born to parents at a younger age, shorter intervals between births than before) the conventional period total fertility rate *overestimates* the actual level of fertility and, accordingly, is higher than the ABO, which acts as a more conservative indicator of the expected completed fertility for generations. An example of this is the situation in the mid-1980s when family policy measures that entered into force in 1981 – above all, childcare leave – caused a disruption of the previous calendar of births of the average woman: a significant number of women born in the 1960s were quick to give birth to children, especially to a second child, a few years earlier (the age of mothers went down, the interval between births decreased). The period TFR jumped from 1.89 in 1980 to 2.23 in 1987, or more than 0.3 child per woman. In fact, the demographic effect of these policies was much less significant, since families did not so much change their intentions with regard to the final number of their offspring as change the “schedule” of their birth, as indicated by the poor response of the ABO indicator (1.74 in 1980 and 1.83 in 1987, a difference of only 0.09 children, very close in magnitude to the positive assessment of the impact of policies on completed cohort fertility; for details, see: [Zakharov, 2006]).

¹³ Inclusion in one way or another in the calculation of fertility rates differentiated by birth parity significantly reduces the dependence of the total fertility indicators for synthetic cohorts (calendar years) on short-term or longer-term changes in the timing of births occurring in real generations. Thus, it is considered that the indicator characterising the average birth parity of a mother (Period Average Parity [PAP]), obtained on the basis of the probabilities of the next birth from special fertility tables for synthetic cohorts, is one of the best alternatives to the traditional total fertility rate (see, for example: [Rallu, Toulemon 1994a, b; Suzuki 2007, Buber et al. 2012]). The ABO index discussed here is certainly inferior in its heuristic capabilities to indicators obtained on the basis of special fertility tables taking into account the parity of birth and intervals between births. Nevertheless, while remaining an indicator for synthetic cohorts, it will, firstly, be certainly more resistant to the influence of changes in the age profile (calendar) of childbearing that distort the overall estimate of fertility given by the TFR, and secondly, it is easily accessible for calculations based on current statistical data (does not require the construction of complex multi-status tables), which allows it to be widely used for comparative purposes.

In the 1990s, the opposite was true. The indicator of the average birth order was significantly higher than the period total fertility rate, which points to a significant slowdown in the tempo of childbearing: Women born in the 1970s and 1980s began to have children later than previous generations. As a result, the TFR – estimated for calendar years (for synthetic cohorts) – *underestimated* the expected value of the ultimate fertility of generations undergoing a process of transformation of the age patterns of fertility towards later motherhood.

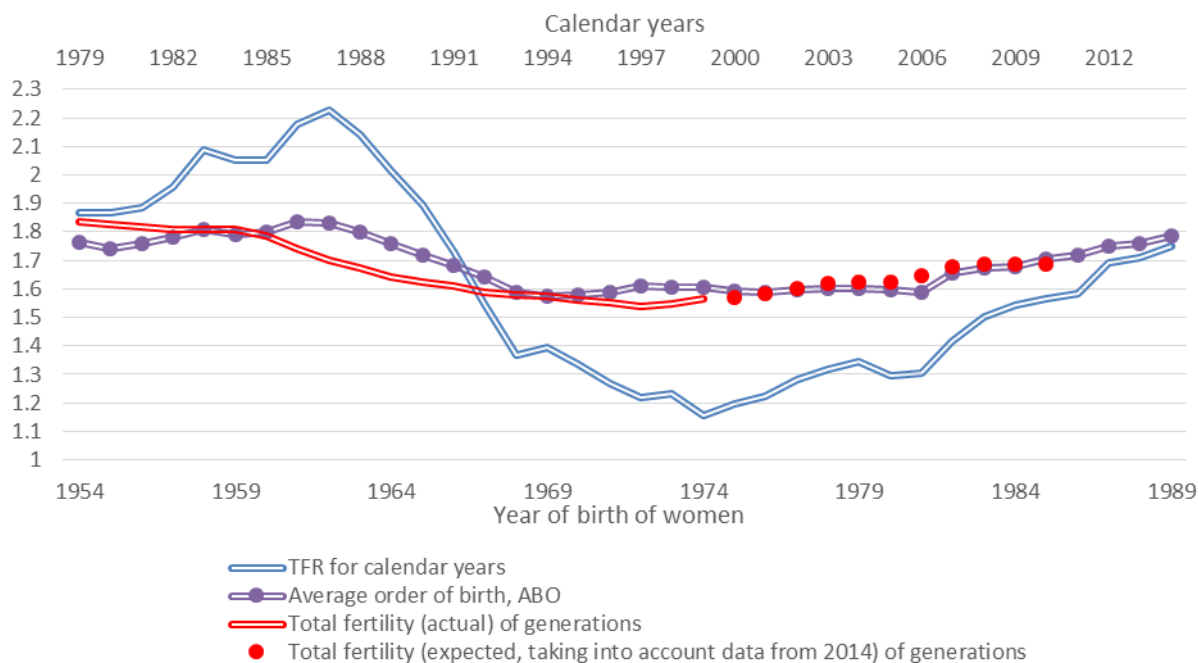


Figure 5. Period and cohort total fertility rates, Russia, births per woman

Source: Author's calculations based on unpublished Rosstat data for one-year age groups.

Notes: TFR is the total fertility rate for calendar years; ABO is the average birth order for calendar years; completed fertility (actual) is for cohorts of women born in 1954-1974; total cohort fertility (expected if age-specific fertility rates observed in 2014 are maintained) is for cohorts of women born in 1974-1989.

Since 2000, the increasing period total fertility rate has been coming close in magnitude to the average birth parity, which has displayed greater stability in recent decades. Does this trend not indicate the completion in Russia of the most dynamic stage of the formation of a new, later model of fertility, where the completed cohort fertility changes little?

Based on the average estimate of the ABO for the past 10 years, we can assume that if there is no further increase in the proportion of permanently childless women (i.e. those never giving live birth), and the structure of mothers by number of births does not change, then the total fertility of female generations, now with an average maternal age of about 27-28 years (i.e. born in the second half of the 1980s), will be around 1.7 children per woman. If the upward trend of the ABO observed after 2006 continues, it would seem we can count on a slightly higher result for these generations (recall that the ABO for 2014 was close to 1.8; see table 9). However, this optimistic scenario is opposed by a steady decline in the probability of first births, as will be discussed below.

The most correct estimate of the probability that, in a given calendar year, the birth of children of one or another parity to mothers of all ages occurred is given by an indicator demographers call the Parity Progression Ratio (PPR): the proportion of women who gave birth to another child in the current year, including those who already gave birth to one fewer child (for example, the probability of the birth of a first child is the proportion of women who gave birth to their first child in the given year among women who had given birth to no children at the beginning of the year, while the probability of a third child is the proportion of mothers with two children who gave birth in a given year to a third child). This indicator is derived based on the construction of special fertility tables by order of birth – a method similar to life tables in mortality analysis, in which the aggregates, in descending order by age, are the number of women with a certain number of children actually born. Annual estimates of the probabilities of having another child are obtained by using a YOY annual cohort transformation of the distribution of women by the number of children ever born based on the annual distributions of live births by the age of the mother and the parity of the birth provided by current statistical records, as well as the annual changes in the size of the female cohorts due to mortality and migration, as estimated by Rosstat.

Our annual estimates of the probabilities of having another child over the last 35 years – with the proviso that the estimates for the period 1999-2011 are based on incomplete data¹⁴ – are presented in Figure 6.

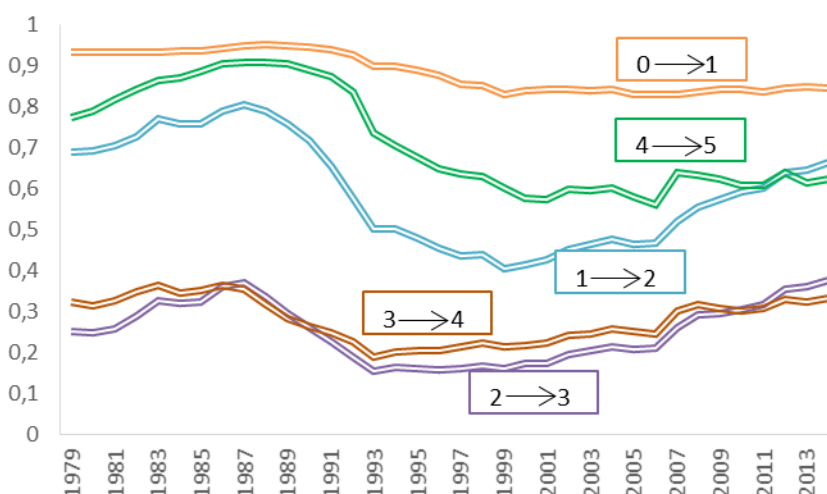


Figure 6. Period parity progression ratios for women by the age of 50, Russia, 1979-2014

Source: Author's calculations based on unpublished data from Rosstat.

Notes: For 1999-2011 the estimate was made based on incomplete data for territories that submitted to Rosstat data on distributions of births by age of mother and birth parity.

In the first half of the 1980s, the probability of a next birth increased for children of all parities, which was an obvious reaction to the innovative measures of family policy (particularly the introduction of childcare leave, partially paid benefits in the provision of housing, etc.), but

¹⁴ In fact, Russian data became incomplete not in 1999, but even earlier: in 1993-1994, no information was collected on Ingushetia, and in 1993-2003 none was collected on Chechnya.

then the movement went in the opposite direction. In the second half of the 1980s, there was a rapid postponement (in some cases, seemingly indefinite) of births not only of second and subsequent children, but even of first-borns. The situation began to improve only in the mid-1990s. In 1994, the probability of the birth of a third and fourth child began edging up, as did the likelihood of a second birth starting in 2000. The probabilities of the birth of a first and fifth child remained at the level of 1999.

As part of the impact of the new pronatalist measures of population policy introduced in 2007, there was a jump in the probability of birth of children of all parities except firstborns. In 2008, the growth in the probabilities of birth of second, third and fourth children continued, and the increase in the likelihood of birth of fifth and subsequent children stopped. In 2009, the probability of second births continued to increase, but more slowly, the growth in the probability of third births stopped, and the probability of fourth and subsequent births went down. In 2010, the only increase was in the likelihood of a second and, to a small degree, third birth. In 2011, the probability of second births continued the trend of slowing growth, and almost imperceptibly the probability of the birth of subsequent children increased. In 2012, there was another jump in the probability of the birth of children of all parities, and in the case of second, third and fourth births, a highly significant one, repeating the jump that occurred in 2007. In 2013, there was a weak and nearly identical increase in the probabilities of having a second or third child. The probability of the birth of a first child also increased, but to an even lesser degree, and the probability of fourth and fifth births declined over the year. Finally, in 2014 we again see a decrease in the probability of the birth of a first child with a relatively low increase in the probability of second and third births (2% and 1.5%, respectively) and even weaker growth in the probability of fourth and subsequent births (less than 1%).

With regard to the probability of a first birth, it is necessary to note a continuation of a long, fifteen-year period of stagnation of this indicator with fluctuations within the range of 0.82-0.85. Thus, the perceptible increase starting in the late 1990s of period total fertility is not related to an increased chance of firstborns appearing in families.

The situation with the probability of birth of a firstborn is alarming, because if it doesn't increase, then the base for further growth for second and subsequent children narrows. If the intensity of birth of first-borns continues to remain at the same level as in 1999-2014, then the expected magnitude of definitively childless women (those who have not had a single live birth by the age of 50) will come to an average of 16% (from 15% to 18%). Assuming this value does not change, then in order to reach an average value of total fertility of 2.1 births per representative of a generation (a threshold that guarantees simple replacement of generations), it is necessary for each woman who has ever given birth to have an average of 2.5 births (and for each woman who has ever been married, even more). Under these conditions, one in two families (a parental family) must have at least three children. Given the current situation, such a situation is difficult to imagine. According to a special birth-order-specific table of fertility for 2014, we expect that for one woman who has ever given birth by the age of 50 years there will be an average of 2.0 births, and among them the proportion of women who have given birth to one child will be 34%, to two children a share of 41% and to three or more children a share of 25%. At the same time, if the proportion of women who have never given birth decreased to 6-7% (as was consistently the case in 1970-1980), then in order to achieve the desired TFR value of 2.1 per woman, it would be enough to have 2.2

births per woman who has ever had children. The share of families with two children in this case would continue to be much larger than that of families with three or more children. Theoretically and practically it is much easier to imagine such a future situation for Russia, given that, according to numerous public opinion polls, the two-child family has always been and remains the most desirable.

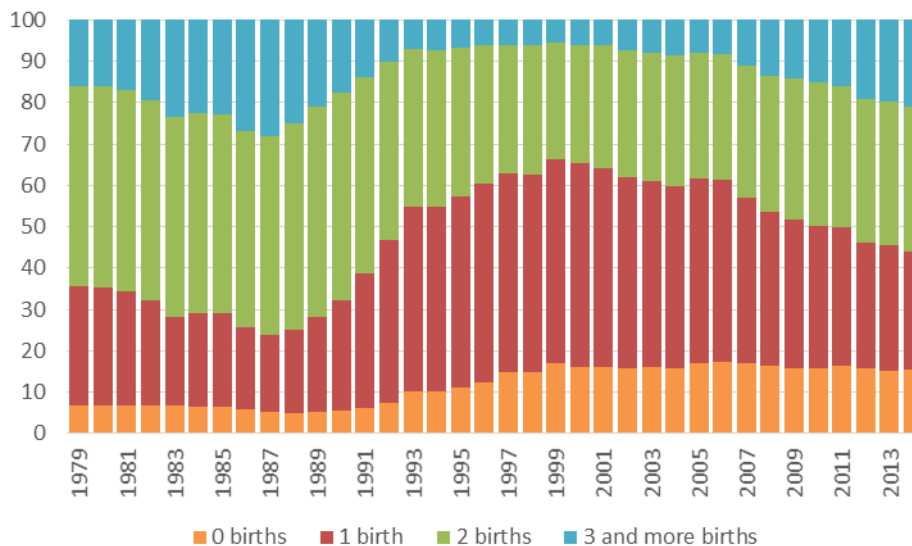


Figure 7. Expected distribution of women by number of children born by the age of 50, assuming no change in the tempo and quantum of fertility of the given year, Russia, 1979-2014, %

Source: Author's calculations based on unpublished data from Rosstat.

The expected distribution of women by the total number of children ever born by the age of 50 years in accordance with special age-specific and birth parity-specific period fertility tables for 1980-2014 is shown in Figure 7. If the parity progression ratios for each birth order stay the same as in 2014, the proportion of women who have given birth to one child in their life among all women (who have and have not given birth) would be 28% versus 44% in 2006 and 49% in 1999-2000 (an historic high). The proportion of women with two births can be expected to reach 35% (31% in 2006 and 28% in 1999-2000). Finally, the proportion of women with three or more births can be expected to be 21% (8% in 2006 and 6% in 1999-2000). Worth noting is the more than three-fold increase in the expected share of large, mostly three-child families which occurred at the end of the 1990s. At the same time, it is not clear to what extent this increase can be attributed to the success of the policy of “stimulating the birth rate” (in any case, the upward trend appeared long before the activation of the demographic policy), and, more importantly, we are not ready to confidently answer the question as to whether these structural changes in Russian fertility are of a short-term or long-term nature.

If we leave aside childless women and focus our attention on changes in the structure of the expected number of children born to mothers, that is, to women who have ever given birth to a live child, then from a thirty-year retrospective view, the increase in the proportion of large families observed in the last 10 years does not look quite so impressive (Figure 8). First of all, during the period of active demographic policy in the 1980s the increase in the share of women

with three or more children was about the same, and the share itself reached 30% in the peak year of 1987; while being a higher value than today's, this level could not be maintained. Secondly, the picture shown in Figure 8 is more evidence in favour of the notion of "recuperation" in dynamics of the structure of Russian fertility by birth order after the disturbances experienced in the 1980s and 1990s, rather than of radical successes caused by measures of demographic policy which took on an openly pronatalist character in the second half of the 2000s.

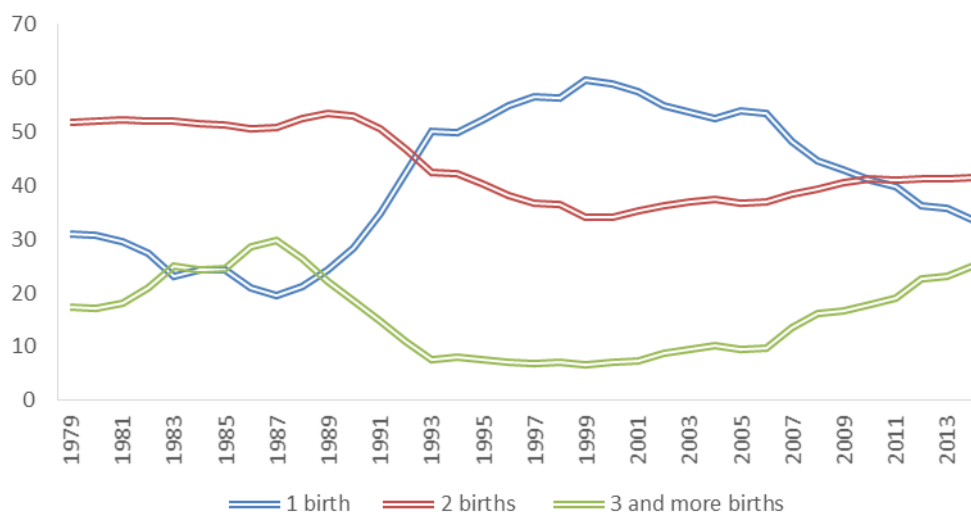


Figure 8. Expected proportion of mothers (women with at least one live birth) with the indicated number of children born by the age of 50 years assuming no change in the tempo and quantum of fertility of the given year, Russia, 1979-2014

Source: Author's calculations based on the data shown in Figure 7.

4. THE FERTILITY OF FEMALE BIRTH COHORTS: IS THERE ANY REASON FOR OPTIMISM?

As mentioned above, in Russian society the notion of the extraordinary growth of fertility in Russia is extremely popular. It allegedly testifies to the positive results of special pronatalist measures taken by the state after 2006. At the same time, many demographers are not inclined to share the increased optimism of politicians, administrators of different levels and widely disseminated media today. There are some positive developments, but their significance is completely insufficient to look at the future of Russian fertility with optimism. Moreover, the one indisputable criterion for a change in fertility – the dynamics of indicators of total fertility of female cohorts by year of birth – does not give cause for great enthusiasm.

Total fertility for the cohorts born in the 1970s and 1980s is likely to be lower than the total fertility of their mothers born in the 1950s and 1960s, which indicates a continuation of the historical decline in the fertility quantum, which so far has proven hard to break (Figure 9). On the other hand, the convergence of fertility rates of mother and daughter generations is a historical fact indicating the completeness of the demographic transition to fertility regulated at the individual and intra-familial level, and the affirmation of the two-child family as the most desirable and common model [Demograficheskaya modernizatsiya ... 2006: 153-175]. If we accept the historical

variation of the length of a generation in the interval from 25 to 30 years¹⁵, then Russian women born in the 1970s and the 1980s and finishing their childbearing today have given birth to an average of 10% fewer children than their “mothers” born in the 1940s-1950s. For comparison, their “grandmothers”, born in the first decades of the twentieth century, produced half as many children as their “great-grandmothers” – women born at the turn of the 19th and 20th centuries (Figure 10).

Let's consider in more detail the prospects for stabilisation and possible growth of total fertility rates for birth cohorts of women in Russia, taking into account the final data for 2014 (the most recent complete data available at the time this article was completed).

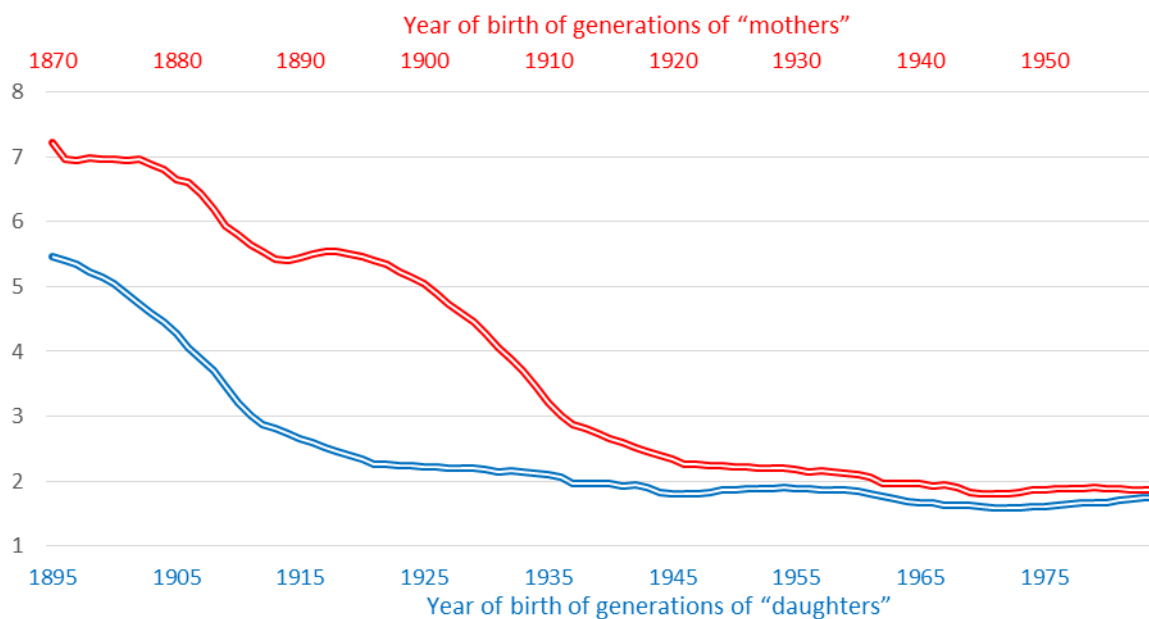


Figure 9. The total number of births per woman in the generations of “mothers” of 1870-1960 and their “daughters” born in 1895-1985

Source: Estimates obtained by the author from the reconstruction of historical dynamic series of period and cohort fertility rates. See: [Demograficheskaya modernizatsiya... 2006: 155-157; 170-171].

Note: For generations of 1965 and younger – the expected value while maintaining the age-specific fertility rates of 2014.

¹⁵ The length of a generation in demography is the interval of time between the appearance of generations of parents and children. If we neglect the effect of the mortality of women in the reproductive age range, it is approximately equal to the average age of the mother at the birth of daughters of all birth parities and is usually in the range of 25 to 30 years.

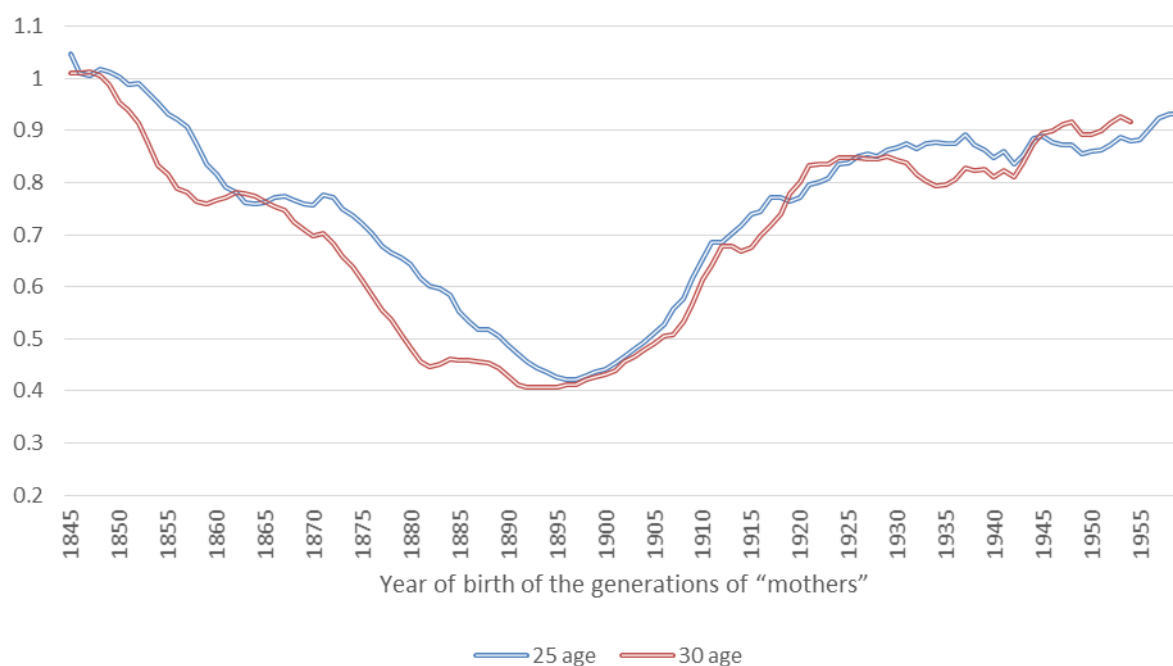


Figure 10. The ratio of total fertility rates of generations of “daughters” to the values of their “mothers”, with the length of the generation taken at 25 and 30 years, Russia

Source: Estimates obtained by the author from the reconstruction of historical dynamic series of indicators of total fertility. See: [Demograficheskaya modernizatsiya... 2006: 155-157; 170-171].

Recall that the methodology for obtaining cohort fertility rates includes the transformation of current birth records by birth order distributed over one-year age groups of mothers into distributions of births for cohorts of women by year of birth, which are then used as the basis for constructing special fertility tables, which are similar to life tables, differentiated by birth order. The technique for constructing such tables is similar to that for period (calendar years) age-specific and birth order-specific fertility tables, as discussed above. As a result of the construction of the cohort fertility tables, we also obtain time-series data on the probabilities of an increase in family for each age, differentiated by birth order and generalising the characteristics of fertility (total fertility for each birth order, mean age at each birth order, distribution of women by the number of children ever born, etc.). Unlike similar indicators calculated for period tables, characteristics from tables for female birth cohorts will be maximally free from the influence of changes in the timing of births that occur from generation to generation. There is, however, a problem with the evaluation of ultimate fertility and the lifetime parity progression ratios for cohorts which, due to their age, have not yet completed their reproductive biographies.

Figure 11 shows cumulative fertility rates for average representatives of female generations born in 1940-1990, at ages 20, 25, 30, 35, 40 and 50 years (the accumulated fertility by the age of 50 can be considered completed fertility of the generation), based on the cohort transformation of the recorded age-specific fertility rates for the period from 1959 to 2014.

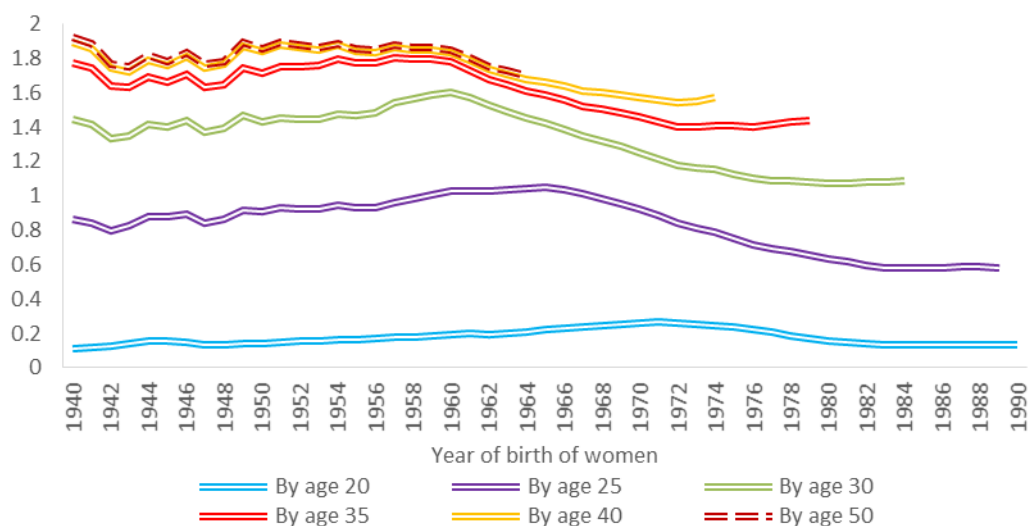


Figure 11. Cumulative fertility rates for the indicated ages (most recent data refer to 2014), Russia, one-year cohorts of women born in 1940-1990, number of births per woman

Source: The author's calculations based on [HFD 2016] and unpublished Rosstat data.

Cumulative fertility by the age of 25 for generations born in the mid-1980s is 40% lower than for generations of the second half of the 1960s (0.6 births on average per woman versus 1.0). No signs of growth in the youngest cohorts are observed at young ages.

Generations born in the late 1970s and early 1980s and reaching ages 30-35 by 2015 demonstrate a barely noticeable recovery of accumulated fertility, indicating a certain stabilisation or even faint signs of growth. At the same time, accumulated fertility by a comparable age in these generations is more than 20-30% lower than for generations of Russian women born in the 1960s: by the age of 30, cumulative fertility in the cohort of 1979 is 1.08 births per woman versus 1.60 in the 1960 cohort; by the age of 35 the figures are, respectively, 1.44 versus 1.78 for the same cohorts.

By the age of 40, cumulative fertility close to the ultimate fertility of a generation, which was continually decreasing in cohorts of women born in the late 1950s and early 1970s, has shown faint signs of growth in the last few years; its value, however, which is equal to 1.57 for the cohort of 1974, still falls short by at least 0.2 births, lower than that of their mothers born in the late 1940s and early 1950s.

Can the generations of the 1980s return to the total fertility level of their mothers – the generations of the 1950s-1960s (1.8-1.9 births per woman)? Probably not. Even the level of 1.7 births per woman will be an overly optimistic forecast for them (see Figure 12, which shows the deviation of the cumulative age-specific fertility rates of the 1965-1985 cohorts from the rates for the 1960 cohort).

The expected result for the generations born in the 1980s is, on average, 1.6 births or slightly more per woman, provided that the trends of the last few years continue over the next decade. This will mean a halt to the long-running historical decline in fertility in Russia and, correspondingly, a decrease in the average number of children in Russian families, but at a level too low to escape the narrowed-down replacement of generations. There are, for now, no grounds

for hope that each new generation of children in numerical terms will at least roughly correspond to their parents' generation. It is still too early to say whether such grounds will be given by the generations of the 1990s – most of them have not yet reached the age of maximum intensity of procreation.

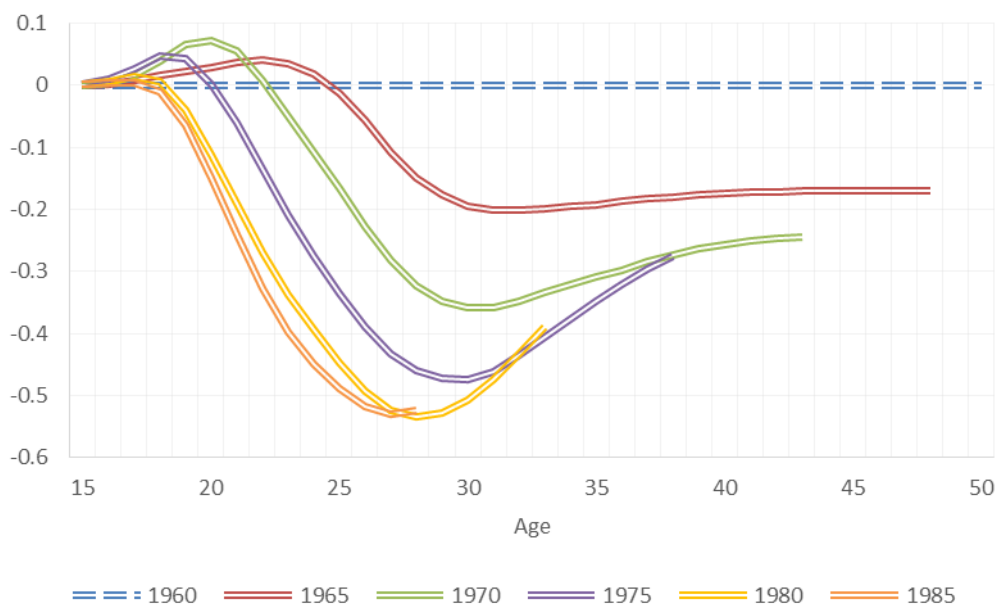


Figure 12. Differences in the values of age-specific cumulative fertility rates for women born in 1965, 1970, 1975, 1980 and 1985 from the values for the 1960 cohort (most recent data refer to 2014). Number of births per woman

Source: The author's calculations based on [HFD 2016] and unpublished Rosstat data.

Cohort birth order-specific fertility tables make it possible to estimate the accumulated values of the probabilities of an increase in the family by a certain age (cumulative parity progression ratios by age). These indicators are similar in nature to those discussed above with regard to period fertility tables, i.e. they also represent the accumulated share of women who gave birth to a next child among those who gave birth by a fixed age to one child less: a first child among those who have never given birth, a second among those who have given birth to a first, etc. But if in the case of the period fertility table we interpreted the probabilities of an increase in the family as the expected indicators if the intensity of childbearing of the current year is maintained, then for the cohort fertility table the probability of an increase in the family size by a given age reflects the proportion of women who actually realised the transition to a status with one more birth. Thus, the probability of an increase in the family size for women who have never given birth (PPR $0 \rightarrow 1$) shows the proportion of women from some cohort who actually gave birth to a first child by a particular age (Figure 13).

The cumulative parity progression ratio for null-parity women by the age of 50 makes it possible to estimate the final share of childless women, for which it is necessary to subtract from the number 1 (a theoretical value indicating the total absence of children). For example, the 1960 generation completed its reproductive biography with a probability of giving birth to a first child of 0.95, which indicates a 5% level of final childlessness (only live births are taken into account and the mortality of children is not taken into account). For women born in 1970 – i.e. over 40

years of age – the expected value is 0.92 (8% will remain permanently childless). Our estimate of the accumulated probability of a first birth by the age of 35, equal to 0.83 for the youngest generation who reached this age by 2015 (women born in 1979), allows us to state that there is still a trend in Russia towards an increase in the proportion of women who have never given birth. The values of the PPR for 35-year-old women differ slightly from the values for 50-year-old women, which gives us grounds for predicting the share of final childlessness for women born in the second half of the 1970s at the level of 12-14%. Similar estimates of the expected share of final childlessness for the same generations were obtained by S. Biryukova and A. Tyndik by constructing a survival function using the Kaplan-Mayer method based on the population census data of 2010 [2015].

During the time equal to the period of reproductive activity of fifteen one-year female birth cohorts, the prevalence of childlessness in Russia increased twofold. As already mentioned, the pronatalist state policy did not affect this trend in any way. It is important to emphasise that with such a significant increase in the proportion of women who have not given birth to at least one child in their lives, efforts aimed at encouraging repeated births may not lead to the desired result – an increase in the average total fertility of cohorts to a level that allows at least a simple replacement of generations, as was shown above. The increase in the likelihood of the birth of children of the second and third order (Figures 14 and 15) is not so significant as to compensate for the cumulative effect of significantly reducing the probability of first births.

Demographic policy after 2007 probably affected the likelihood of second and third births in the country. It is interesting that the policy, conceived as a “second child” policy, brought a comparable result with respect to the increase in the probability of the birth of third children (Figure 15). There are even some signs of an increase in the likelihood of the birth of fourth and subsequent children at an early age (Figure 16).

By the age of 30, among those who gave birth to a first child by this age, 43% of the representatives of the 1984 birth cohort of mothers gave birth to a second child. In comparison with the minimal value demonstrated by the birth cohort of 1976 (36%), the increase was 7 pp. By age 35, this figure was 55% for the youngest cohort that reached that age (the birth cohort of 1979), against the historical minimum of 49% (the birth cohort of 1971), i.e. the increase was 6 pp. The probability of the birth of a third child by the age of 30 for the youngest cohort is at the level of 18%, which is 3 pp. higher than the historical minimum for Russia. By the age of 35, for the youngest generations, the probability of a third birth is at the level of 24%, which means an increase of 5 pp in comparison with the minimum values. The latest estimates for the probability of third births indicate that they are approaching the maximum values achieved by representatives of the 1950s generation, whose reproductive activity also occurred during the period of activation of the demographic policy in the 1980s. At the same time, the probability of second births today is still very far from the values achieved in the 1980s by the generations of the 1950s and 1960s.

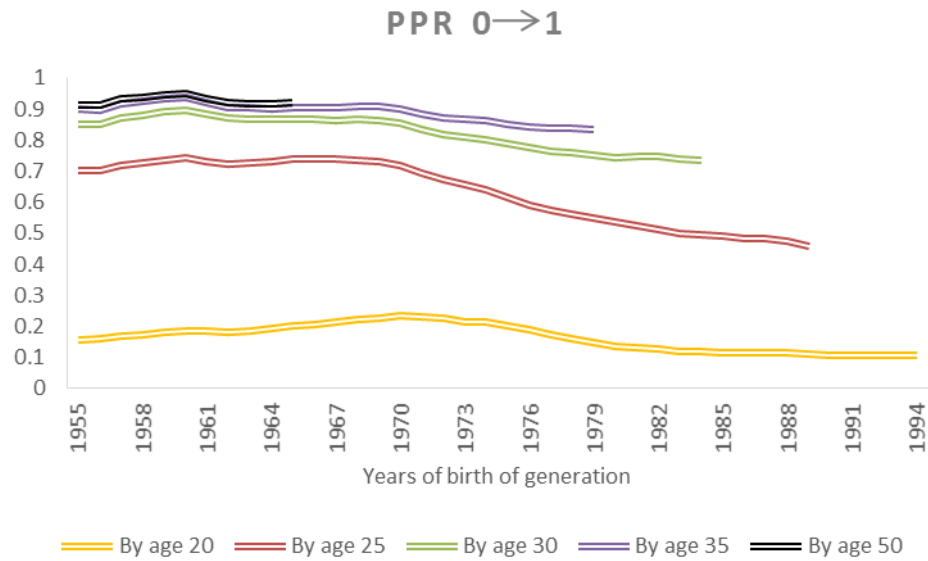


Figure 13. The cumulative probability of the birth of a first child (PPR0) at the indicated ages (most recent data refer to 2014), Russia, female cohorts born in 1955-1994

Source: Author's calculations based on [HFD 2016] and unpublished Rosstat data.

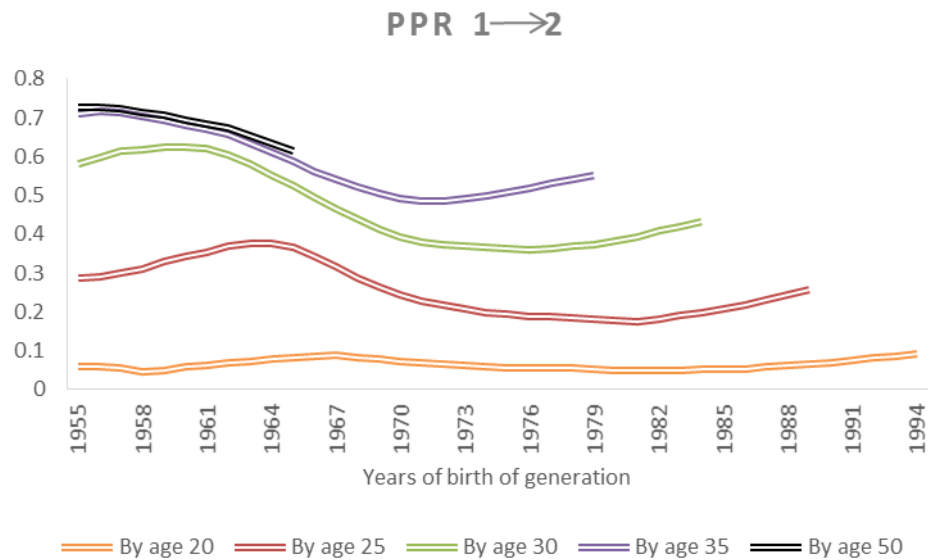


Figure 14. The cumulative probability of the birth of a second child (PPR1) at the indicated ages (most recent data refer to 2014), Russia, female cohorts born in 1955-1994

Source: The author's calculations based on [HFD 2016] and unpublished Rosstat data.

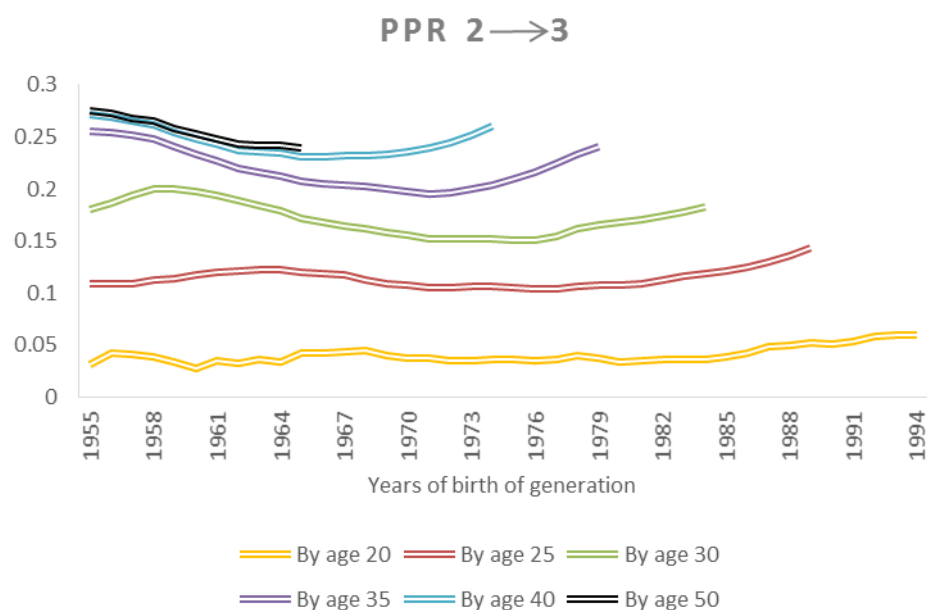


Figure 15. The cumulative probability of the birth of a third child (PPR2) at the indicated ages (most recent data refer to 2014), Russia, female cohorts born in 1955-1994

Source: Author's calculations based on [HFD 2016] and unpublished Rosstat data.

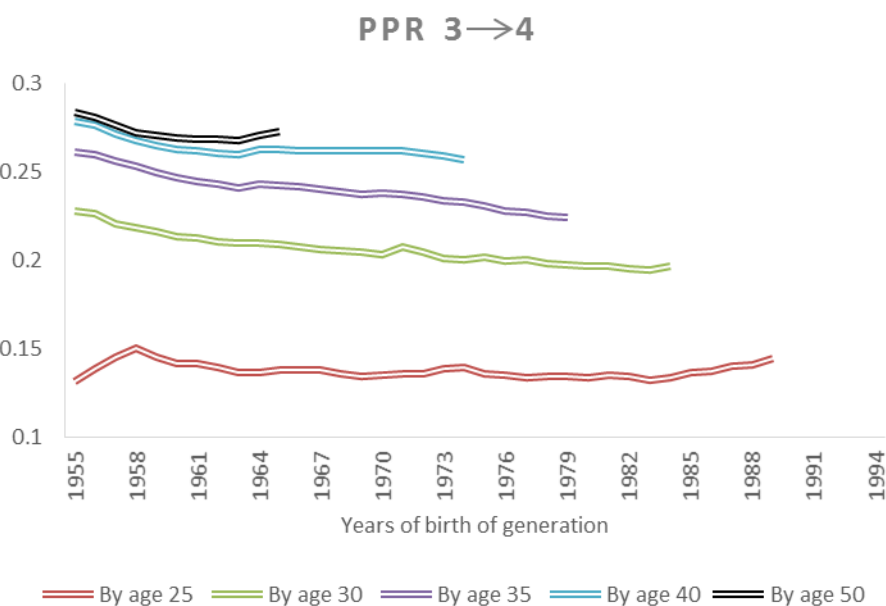


Figure 16. The cumulative probability of the birth of a fourth child (PPR3) at the indicated ages (most recent data refer to 2014), Russia, female cohorts born in 1955-1994

Source: The author's calculations based on [HFD 2016] and unpublished Rosstat data.

It is difficult to explain the significant increase in the probability of third births only by the intensification of financial incentives to which Russian official propaganda pays special

attention¹⁶. This phenomenon deserves closer attention from researchers. As I pointed out before [Population of Russia ... 2014: 144-147; Zakharov 2015], possible explanations go beyond actual demographic analysis and, apparently, are related to the socioeconomic, regional and ethnic heterogeneity of Russian society. It is also possible that the attractiveness of Russia to migrants strengthens the socio-cultural heterogeneity of its population, including in relation to its reproductive strategies. At the same time, one cannot help but notice the fact that the emerging situation with repeated births is in many ways reminiscent of the situation experienced by Russia in the 1980s, when, following the adoption of new family policy measures, there was also an acceleration of second and third births, which, however, did not lead to a significant increase in the total fertility of generations. The future will show whether we will witness a repetition of the experience of the 1980s or can expect a different and more hopeful situation.

The magnitude of total fertility for cohorts that have not yet emerged from reproductive age can be assessed by “extrapolating” the number of children for each female birth cohort actually born by the time of observation with expected numbers of “not-yet-born children”. At the international level, an approach has been adopted that sums up the number of children actually born by the time of observation for each cohort of women and the hypothetical number of children that can be expected if, at subsequent ages, the average woman of this cohort has the same fertility as that shown by women who, in the year of observation, had reached these ages. With this approach, for the cohort of women who were 15 years old in the year of observation, the estimate of total fertility is based entirely on the “expected” component, and numerically coincides with the usual period total fertility rate for the given calendar year, i.e. this is a completely conditional value. The older the generation, the lesser the contribution of the “expected” component, and the greater the role played by the already realised actual fertility in the evaluation of total fertility.

If regular estimates that take into account the age-specific fertility rates that vary from year to year are made, one can obtain a dynamic picture of successive changes in the estimates of both the “actual” and the “expected” components of total fertility for the same cohort and, consequently, their total value. In recent decades, in developed countries and in Russia there has been an increase in fertility among women over 25, even over 35; as long as this increase continues, the expected estimates of cohort total fertility will be revised upwards, not only for the youngest generations, but also for representatives of older cohorts with a growing contribution of late fertility.

Reports of the Institute of Demography of the Higher School of Economics, “Population of Russia”, have for many years presented my annual estimates of the expected total fertility of

¹⁶ For example, one often hears about the positive role of a special monthly allowance in the amount of the subsistence minimum, payable at the birth of the third and subsequent children until they reach the age of 3, in more than 50 regions of the Russian Federation from the list of regions approved annually by the government in which the total fertility rate is lower than the average Russian level or which have a natural or migratory decline in the population (this measure was introduced on the basis of Presidential Decree №606 of May 7, 2012 “On measures to implement the demographic policy of the Russian Federation” and is regulated by regulations approved by Government Decision No. 1112 From October 31, 2012 with subsequent amendments). The size of the allowance is quite large: in 2014, it ranged from 4,800 rubles in the Tambov region to 13,700 in the Kamchatka Territory. It is likely that such a measure is now having some kind of influence on the growing number of large families in Russia. However, this can in no way be connected with the trend of an increased probability of a third birth, which began long before 2013, when this policy measure was introduced.

Russian generations, based on an internationally accepted approach and incorporating data on cohort fertility for the most recent year¹⁷.

Let us see what estimates could be made of total fertility for post-war generations based on historical data limited to 1999 (the year of the historically minimal value of the total fertility rate), and compare them with estimates obtained for the same generations on the basis of the latest available data for 2014 (Table 10). In addition, in order to evaluate the particularly significant contribution of the growth in fertility after 2006 (that is, after the new measures of population policy were introduced), the table reproduces the estimates of the expected total fertility that I made earlier based on data for 2006.

Table 10. Actual and projected average number of births by generations in Russia, women born in 1955-1989

Years of birth of women	Total number of births		Estimate based on 2014 data			Difference between estimates of 1999 and 2013	Difference between estimates of 2006 and 2013
	Estimate based on 1999 data	Estimate based on 2006 data	Actually born by 2015. children per woman	Expected births in addition to those already born	Total number of births		
1955-1959	1.88	1.88	1.88	0.00	1.88	0.00	0.00
1960-1964	1.75	1.76	1.76	0.00	1.76	0.01	0.00
1965-1969	1.58	1.63	1.64	0.00	1.64	0.06	0.01
1970-1974	1.40	1.52	1.58	0.02	1.60	0.20	0.08
1975-1979	1.23	1.43	1.52	0.12	1.64	0.41	0.21
1980-1984	1.16	1.33	1.30	0.42	1.72	0.56	0.39
1985-1989	-	-	0.86	0.90	1.76	-	-

Source: The author's calculations based on unpublished Rosstat data: population censuses of 1979 and 1989 (the distribution of women by the number of children born for one-year age groups) and the age-specific fertility rates for one-year age groups in 1979-2014.

It is clear that the total fertility rate for female cohorts in the second half of the 1950s (1.88 children per woman) did not change. These generations were already close to the end of their reproductive careers in the first half of the 2000s and had already left it by 2010. Indicators for generations born in the first half of the 1960s changed in comparison with the estimate for 1999, slightly increasing from 1.75 to 1.76, and the changes that took place after 2006 go beyond the limits of our significance indicator (in the hundredths). The growth in fertility noted in the last decade did not pass without a trace for generations of women born in the second half of the 1960s: their final fertility exceeded 1.6 children (1.64 compared to 1.58 in 1999). True, the increase in births in 2007-2014 was for them barely significant – just 0.01 per woman.

The expected fertility rates for cohorts born in the 1970s changed more significantly. In comparison with estimates based on the actual accumulated and expected fertility by the year 2000, later estimates show an increase of 0.2-0.4 children per woman. In 2007 alone, these generations “reached” a total fertility rate of 0.03-0.07 children, and for 2007-2014 overall, a rate of 0.1-0.2. It is easy to calculate that, if the trend towards an increase in fertility after age 30 persists, then cohorts of women born in the 1970s will have an average of 1.62 births. Unfortunately, these

¹⁷ Such estimates were first published by us in 2004; see: [Population of Russia: 2004:55].

generations no longer have the chance to cross the indicated threshold, because their representatives are inexorably approaching age 40 or have already reached it. Total fertility of the 1970s cohorts will undoubtedly be lower than that of previous generations.

Cohorts born in the 1980s may complete their reproductive biographies with a slightly higher birth rate than generations of the 1970s. Given the trends observed today, they have a chance to achieve an average of 1.75 births per woman. If such a value is reached, this will mean that the long-term decline in the fertility quantum in Russia will stop, and one can even hope for its growth. With such characteristics, Russia will not differ much from the average period and cohort fertility rates for Europe.

So, given age-specific fertility rates at the 2014 level, for cohorts that reached the age of 25 and above the prospect of a stabilisation of cohort total fertility in Russia by 2015 at the level of 1.7-1.8 looks quite well-founded.

In order to check the result, we resorted to an alternative method of long-term estimation of total fertility for female cohorts over the age of 25. Given the current Russian age pattern of fertility, all women older than 25 years have reached or already passed the peak age of the intensity of childbearing.

The method proposed below is based on the extrapolation of the age-specific probabilities of the birth of the next child in a “real” cohort of women, based on modeling the rate of decrease in the age probabilities of giving birth for a “synthetic” or “hypothetical” cohort (for calendar periods) separately for each birth order beyond the age at which peak values of fertility rates were reached. The probability values for giving birth to another child are taken from the period age-specific and order-specific fertility tables discussed above. It should be noted that, in the period tables, the curve describing the rate of change in the probabilities of childbearing for each parity after age 25 demonstrates a sufficiently high stability over time (Figure 17).

The stability of the change in the probabilities of a next birth is clearly demonstrated when comparing the averaged values for three-year periods with different levels and the age profile of fertility (Figure 17): 1988-1990 (the last years of the Soviet period, with a relatively high level and a “young” fertility profile), 1998-2000 (a period with a historically low fertility level at the very beginning of the transformation of its age profile), and 2012-2014 (recent data with increased intensity of births and an age profile in the stage of active ageing). It can be assumed that, in the next decade, the function of relative changes with age of the probabilities of giving birth to a next child will not change significantly.

The above curves for the 2012-2014 period were smoothed out separately for each birth order using fourth or fifth-order splines (standard smoothing functions offered by MS Excel), which almost perfectly approximate the average annual curves for a given triennium (R^2 is 0.95 for first births, 0.99 for second and subsequent births). After the model curve was obtained, the changes in the period age functions of the probabilities of the next birth were used to extrapolate cohort values within each age interval of childbearing from the age reached in 2014 (25 years and older) to 50 years. The actual values of the probabilities, supplemented by extrapolated values, were used to construct complete, lifetime cohort fertility tables by birth order. The advantage of this approach is that we are able to construct complete special fertility tables and, consequently, to

obtain prospective estimates of such important characteristics as the complete or final set of parity progression ratios, the average age of the mother at the birth of the next child, the intervals between births of children, etc.

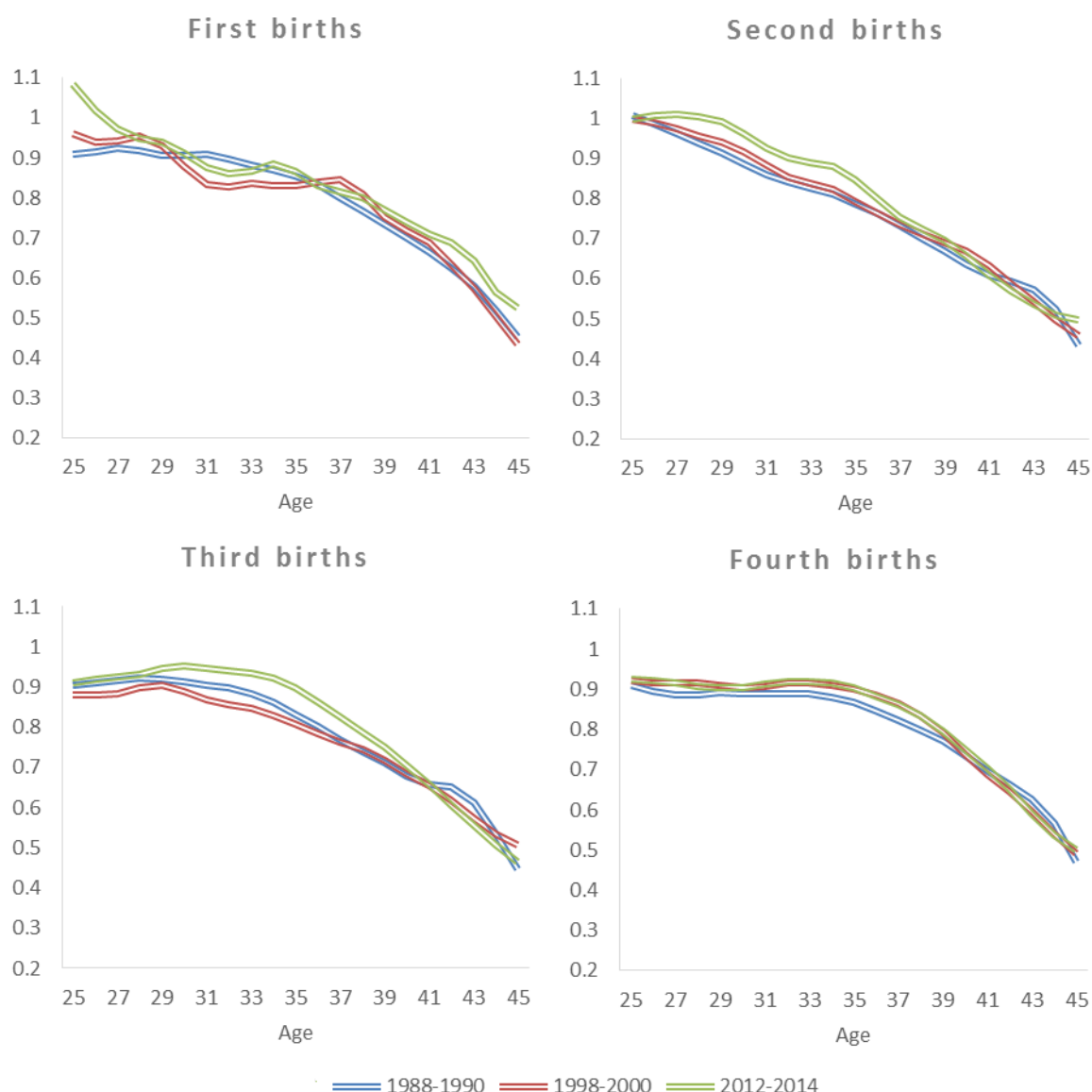


Figure 17. The rate of decrease in the probability of giving birth to a first, second, third and fourth child in the 25-45 age range, Russia, the average annual values for the periods 1988-1990, 1998-2000, 2012-2014

Source: Author's calculations based on unpublished data Rosstat.

The projected change in cohort total fertility for women born in 1968-1988 is presented In Figure 18, where the estimates obtained by modeling the age curve of the probabilities of the birth of the next child are reflected in comparison with estimates obtained in a more traditional way (freezing the age-specific fertility rates at the level fixed in 2014.)

Both methods of obtaining prospective estimates of cohort total fertility are based on the partial use of period characteristics of fertility and give approximately the same results, but the second, more sophisticated method yields slightly more conservative estimates.

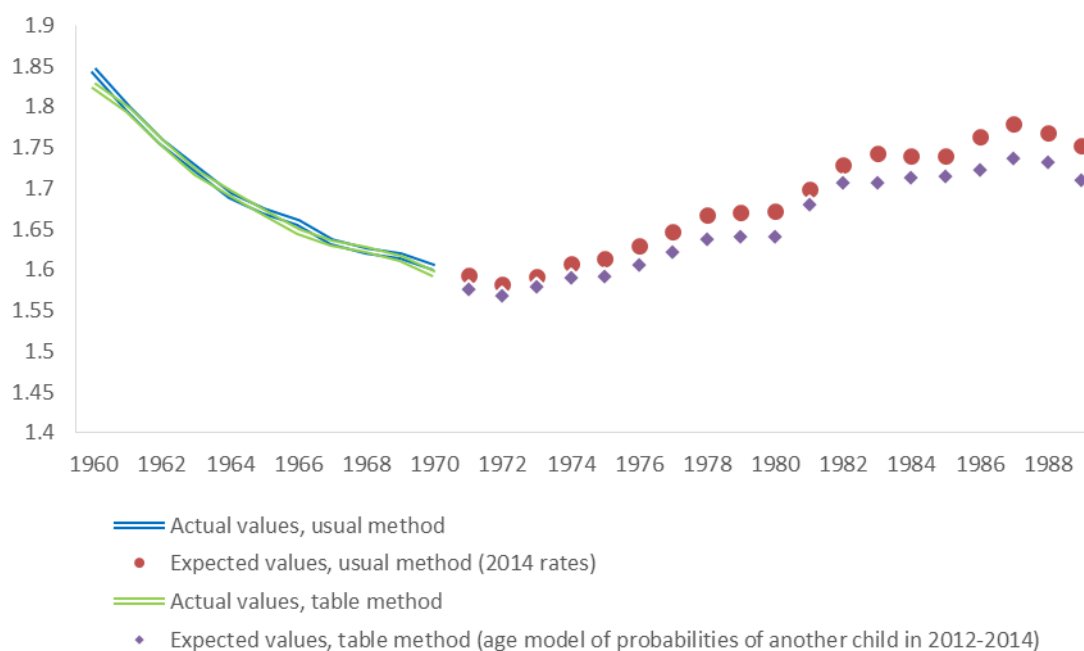


Figure 18. Actual and expected changes in the completed cohort fertility of women born in 1960-1989, obtained by different methods, Russia, per 1000 women

Source: The author's calculations.

Summing up the results of the estimation of a prospective change in the fertility quantum of generations, we come to the conclusion that, most likely, Russia has passed the point of the historical minimum of fertility – the level of fewer than 1.6 births per woman achieved by the cohorts of the 1970s. Given the level and structure of fertility by birth order observed in the most recent years, the total fertility of generations born in the late 1970s will be higher, though not by much, than that of their immediate predecessors. Most likely, slow growth will continue in the generations of the 1980s with a tendency to stabilise at 1.7-1.75 births per woman.

PROSPECTS FOR THE REPLACEMENT OF THE RUSSIAN POPULATION (IN LIEU OF A CONCLUSION)

The positive trend of the last decade inspires some optimism, but it is not worth getting carried away by the relative successes achieved in a decade and a half, especially over the past seven years. It is not impossible that the short-term burst of reproductive activity may be followed by a compensatory decline caused by the exhaustion of the potential for further growth in fertility in generations that, under the influence of favourable conditions, had the desired number of children earlier or at shorter intervals than previously planned. In this case, our rather conservative estimates of the prospective change in fertility, based on the knowledge of today's current situation, may seem extremely optimistic.

Table 11. Components of the period female net reproduction rate, Russia, 1958-2014

Years	Average number of children per woman (Total fertility rate)	Including girls (Gross reproduction rate)	Average age of mother. years	Probability of a girl surviving until her mother's average age of reproduction	Net reproduction rate	Intrinsic rate of natural increase. per 1000*
1958-1959	2.62	1.28	27.8	0.93	1.19	+6.0
1964-1965	2.14	1.05	27.6	0.93	0.97	-1.1
1968-1969	1.97	1.00	27.2	0.96	0.96	-1.5
1974-1975	1.99	0.97	26.4	0.96	0.93	-2.7
1978-1979	1.90	0.92	25.9	0.96	0.88	-4.9
1984-1985	2.06	1.00	25.8	0.97	0.96	-1.4
1988-1989	2.07	1.01	25.7	0.97	0.98	-0.8
1994-1995	1.37	0.66	24.7	0.97	0.64	-17.8
1998-1999	1.20	0.58	25.5	0.97	0.56	-22.4
2004-2005	1.31	0.64	26.6	0.97	0.62	-18.6
2008-2009	1.52	0.74	27.3	0.98	0.72	-12.1
2000	1.19	0.58	25.8	0.97	0.56	-22.2
2001	1.22	0.59	25.9	0.97	0.58	-21.1
2002	1.29	0.62	26.1	0.97	0.61	-19.1
2003	1.32	0.64	26.3	0.97	0.62	-18.1
2004	1.34	0.65	26.4	0.97	0.63	-17.3
2005	1.29	0.63	26.5	0.97	0.61	-18.6
2006	1.30	0.63	26.6	0.97	0.62	-18.2
2007	1.42	0.69	27.0	0.98	0.67	-14.9
2008	1.50	0.73	27.2	0.98	0.71	-12.5
2009	1.54	0.75	27.4	0.98	0.73	-11.4
2010	1.57	0.76	27.7	0.98	0.74	-10.7
2011	1.58	0.77	27.7	0.98	0.75	-10.3
2012	1.69	0.82	27.9	0.98	0.80	-7.9
2013	1.71	0.83	28.0	0.98	0.81	-7.4
2014	1.75	0.85	28.1	0.98	0.83	-6.4

Source: Published and unpublished Rosstat data, as well as the author's calculations based on common period fertility tables constructed to account for the age-specific mortality rates for one-year age groups of women.

Notes: *The intrinsic rate of natural increase is calculated by the formula: $r = \frac{\ln R_0}{T}$,

where R_0 is the net reproduction rate, and T is the length of the generation or the average number of years in the interval between the birth of the hypothetical generations of mothers and their daughters. The length of a generation is usually estimated as the average age of the mother at the time of the birth of a girl who has survived to the age of her mother. With the current age functions of fertility and mortality, the evaluation of the length of the generation only slightly differs from the average age of the mother at the birth of the child without taking into account the survival index presented in the table. So, in 2014 in Russia, according to our estimates, the length of a generation was 28.09 years, and the average age of the mother without taking mortality into account was 28.12 years. For detailed annual dynamics of the indices from 1987 to 2000, see: [Population of Russia ... 2006: 271-272].

When analysing fertility, it is very important to assess its level in terms of how well it provides replacement of generations and affects the reproductive regime of the population as a whole. The latter depends not only on fertility, but also on mortality, so an indicator that takes into account both these processes is necessary. As such an integral indicator, the net reproduction rate – the number of girls born on average to one woman and surviving to the average age at which their mother had them – is used. This indicator does not reflect the overall mortality rate, but only the mortality of women in the ages from birth to the end of the reproductive period (the age limit

of reproduction is usually 50 or 55 for women). In modern conditions, fertility is the leading factor in the replacement of generations, since the mortality rate of women in childhood and young age in Russia has long been quite low, and its further decline is not able to significantly affect the integral indicators of reproduction. This is evidenced by the data in Table 11, which shows the main components of the calculation of the net reproduction rate of the population in Russia.

Russia was one of the first large countries in which, after the Second World War, fertility fell below the replacement level of generations. This happened in the distant 1964, when the net reproduction rate below one was observed only in Hungary, Latvia, Estonia, Romania and Japan. In 1968, only two Soviet republics – Ukraine and Latvia – as well as the Czech Republic, had a net reproduction rate lower than Russia's.

However, the situation in the world soon changed. The process of declining fertility spread to all industrialised countries, and in the 1980s its level almost everywhere dropped below the level of a simple replacement of generations. In 2011-2014, there was not a single developed country in which the value of this indicator would be at the level of simple reproduction of the population¹⁸. Ireland, Iceland, New Zealand and France, with net reproduction rates in the range of 0.95-0.99, come close to replacement level. At the same time, in the countries of Southern, Eastern and Central Europe, in East Asia as well as in Russia, the reproduction regime is far from the threshold of simple replacement of generations.

The net reproduction rate (0.83) observed in Russia in 2014 indicates that, taking into account mortality, the current level of fertility provides only an 83% replacement of generations of current mothers. Therefore, if for the next two or three decades the current (that is, observed today) fertility and mortality regimes do not change, one can expect that each successive generation will be 17% smaller than the previous one. In such a stable (i.e. having an invariable reproductive regime) population, the annual "true" rate of natural increase (the so-called intrinsic rate of natural increase, or Lotka's coefficient, rid of the influence of the age structure) will become negative at a level of -6.4 per 1000 persons. In this case, the population of a country that is closed to migration will decline annually by 0.64% (Table 11).

In 2014, the actual crude rate of natural increase for the entire population of Russia was 0.2 per mille, i.e. negligibly greater than zero (0.4 per 1000 population in urban areas, and 0.0 in rural areas). The cause of the discrepancy between the "true" and the *actual* rates of natural increase is explained by the fact that the actual age structure of the population of Russia differs greatly from the structure of the model stable population corresponding to today's patterns of fertility and mortality. Today, the age composition of the Russian population is favourable for the population not to decrease too quickly. But if the observed regime of replacement of generations persists for a long time, then the actual rate of natural increase will approach the intrinsic one, which will mean a growing negative balance of births and deaths among both the urban and, even more so, the rural populations. The significant increase in period fertility indicators in 2007-2014 and altogether for the entire period since 1999 (after reaching its historical minimum) could not but have a positive

¹⁸We leave aside the specific case of Israel, which, by its level of economic development, is certainly a developed country. At the same time, due to specific historical and sociocultural conditions in this country, a fairly high TFR of 3 or more births per woman has been preserved for more than one decade, which guarantees the maintenance of a net rate significantly exceeding the level of reproduction in a simple scale – 1.4 and higher.

effect on the integral indicators of the reproductive regime, which also concern the hypothetical generation. At the same time, the path that Russia should take to exit this sub-replacement pattern is still long.

Although Russian mortality rates are generally far from those of other developed countries which serve as Russia's standard, the gap is small at childhood and motherhood ages; therefore, the available reserves are also insignificant from the point of view of the indicators of population reproduction. While 98% of Russian girls live to the average age of their mother, the best indicators in the world are 99%. Even assuming that no girl born in 2014 dies, and that she can (and wants to) become a mother, then at the current level of fertility this could only increase the net reproduction rate to the level of the gross rate (i.e. from the observed level of 0.83 to 0.85). Only two things can significantly improve the situation regarding the reproduction of the population: an increase in the fertility of current and subsequent generations of parents and – in part – immigration, if fertility among migrants is higher than that of those living today in Russia.

However, the impact of migration on the number of births is not limited to higher fertility in the families of immigrants¹⁹. The majority of migrants are young, which has a beneficial effect on the age structure of the population; this in turn increases the number of marriages and births and, accordingly, inhibits the transition to the sustainable negative natural increase seen in developed countries. At the same time, the possibility of moving to a long-lasting negative balance of births and deaths – not only in Russia, but also in most developed countries – should be viewed as a plausible threat, as we can see in the net reproduction rate below one and the intrinsic rate of natural increase below zero which have persisted in these countries since the mid-1970s.

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¹⁹ The differences in fertility among migrants and non-migrants in Russia were considered earlier: [Zakharov, Surkov 2009; Population of Russia ... 2010: 111-132; Population of Russia ... 2013: 82-84]. See also: [Biryukova 2012].

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