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The history of fertility in Russia: from generation to generation

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Abstract: *The article presents the results of the author's demographic research in the reconstruction of the historical evolution of completed fertility in Russia from the beginning of the Demographic Transition to the present. Based on the author's estimates of continuous historic series of period and cohort completed fertility indicators, obtained by direct and indirect methods using several different models, the author determines the periodization of its dynamics and comments on key moments in its history. In the article, for the first time, the author publishes for Russia, annual estimates of the period total fertility rate from 1897 to 2021, and the cohort total fertility rate for women born in 1841-1991.*

Keywords: *history of Russia, demographic transition, fertility, period and cohort total fertility rate.*

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Dedicated to the cherished memory of Anatoly Grigorievich Vishnevsky,
who for more than three decades inspired and supported
my efforts in the study of the history of fertility in Russia.

Introduction

Russia entered the 20th century with a very high total but very low effective fertility. Yet from the point of view of the demographic and, moreover, socio-economic reproduction of society, what matters is precisely effective fertility, which measures not only the number of children born, but also how many of those who are born survive, socialize, participate in economic life, become adults and replace their parents. Children who die in infancy or as they are approaching adulthood are, from a demographic and socio-economic point of view, an unjustified waste of the reproductive potential of the human population. In contrast, children who reach certain socially determined age thresholds become more and more valuable capital for society and the family.

The more that the number of children reaching adulthood, the age of marriage and parenthood differs from the total number of children born, the lower the demographic and social effectiveness of fertility and the economy of the population reproduction regime as a whole. The greater the child mortality, the greater must be fertility's compensatory component and, consequently, fertility as a whole, to maintain a given social norm of family size. The reduction of child mortality is the most important trigger for the modernization of the entire process of population reproduction. The convergence of total and effective fertility is, on the one hand, evidence of the growth of this effectiveness, an indicator of the demographic progress achieved in the course of modernization, while on the other hand it is the objective basis for a significant decrease in fertility, a strengthening of the intra-family birth control that occurred during the first demographic transition, that is, the transition to the modern regime of population reproduction, in which population growth depends barely at all on early mortality.

In France, the transition to low fertility, the threshold of which can be conditionally defined as 2.2 children per woman[1], took about 120 years. But other countries moved along an already beaten path, and in them the transition took half the time. It took two maternal generations (40-60 calendar years) to achieve low fertility in the countries of Northern and Western Europe, in the USA and Canada (Austria even managed in 30 years – a single female generation), and three (70-90 years) in the countries of Southern and Eastern Europe. In Japan, fertility decline began relatively late, in the 1930s, and at first proceeded rather slowly. But in the post-war period, it accelerated greatly, so that overall the Japanese transition lasted about three to four decades (Zakharov 2006a: 158).

Despite the fact that the initial, "pre-modernization" level of fertility in Russia was significantly higher (more than 7 births per woman in her entire life) than in most countries of Europe, North America and Japan (5-6 births), the chronology of the Russian transition to low fertility and its duration do not look at all special against the general background (Zakharov 2006a: 159).

[1] Guaranteed level for ensuring a regime of simple reproduction of the population with an infant mortality rate of 25 and below per 1000 live births

The modernization of the demographic system in Russia took place over five or six decades, and in the first half of the 20th century was accompanied by a well-known series of cataclysms of social etiology which forced people on a massive scale to adapt their reproductive behavior to the changing economic and socio-political reality and, accordingly, to modify the schedule of events in their lives. The rapid spread of abortion in Russia is decisively explained precisely by the need to control fertility amidst constant general uncertainty.

In quantitative terms, the key criteria for the completion of the transition to low fertility are the proximity of the indicators of completed fertility in the "maternal" and "daughter" generations and the achievement of a slightly asymmetric statistical distribution of women in the total number of children born with a mode equal to 2 children per woman by the age of 50 years.

The further evolution of fertility in Russia, as in other developed and rapidly developing countries, is less related to changes in the actual level of fertility and more to structural transformations. The current stage of development, commonly called the second demographic transition, consists in moving away from one standard, unified model of fertility towards a growing diversity of patterns of family formation, childbearing and individualization of a person's choice in making and implementing reproductive plans.

The essence of the second demographic transition is the shift from the practice of limiting the number of offspring to that of optimizing the entire time-space of demographic events and the life cycle as a whole in response to society's entry into the post-industrial phase of development (Lesthaeghe 1991; 2014; 2020; Zakharov, Ivanova 1996; Zakharov 2002; 2005; Zakharov 2008).

The second demographic transition is often understood as a simple transition from the currently dominant model of a two-child family to a model of a family with one child (or even to widespread childlessness). This interpretation of the latest trends not only oversimplifies the situation, but may also turn out to be simply erroneous in the long run.

In terms of demographic indicators, the second demographic transition manifests itself in the form of an increase in the age of marriage and motherhood, an increase in the variability of intervals between births, an increase in the role of births outside of official marriage, and an increase in the proportion of people who have never entered into a registered marriage and have not had a single child. The traditional fusion of three types of behavior - sexual, matrimonial and reproductive - is finally becoming a thing of the past.

The transition to a new phase in the evolution of fertility in Western countries began in the late 1960s and early 1970s, in exact accordance with the beginning of a new stage in social development. Russia, like the countries of the former Eastern Bloc, embarked on the path of the second demographic transition two or three decades later (in the late 1980s and early 1990s) and, of course, is today at less advanced stages of this process, although it is obvious that the "lagging" countries, including Russia, are quickly catching up with "advanced" countries in transforming their fertility model.

In order to study the long-term evolution of fertility, the most methodologically correct demographic approach is the simultaneous consideration of changes based on fertility indicators for real generations (women by their year of birth) and for conditional generations (for calendar years). By focusing on the former, we get a picture of the most fundamental, historical trends in fertility, which fully corresponds to the classical demographic understanding of population reproduction as a process of generational change. As for the trajectories of the latter, we focus

on the study of the influence of the specific conditions of a particular historical period on the rate of reproduction processes. The approach to completed fertility from the standpoint of real generations measures the accumulated result of childbearing for the entire reproductive period of an average person (woman), while the second approach evaluates the potential final result of the expected reproductive activity of an average person (woman) assuming a constant, indefinitely long reproducibility of current conditions. Thus, both approaches (sometimes called "longitudinal" and "transverse"), which complement each other, help demographers to better understand the essence of the ongoing changes, to separate long-term trends influenced by fundamental social changes in society from the effects of more short-term influences and specific conditions[2].

Unfortunately, Russian demography cannot boast of a large number of fertility studies based on the simultaneous use of characteristics for real and conditional generations. Indicators of completed fertility for conditional generations appeared before the Second World War both in international practice and in Russia. The vast majority of academic and journalistic works on fertility trends still operate mainly with the period total fertility rate (PTFR) for conditional generations, the estimate of which is easier to obtain from annual records. This indicator has even been chosen as a target for the modern Russian state's family and demographic policy. At the same time, it is in practice much more difficult to interpret its value and dynamics than those of the completed fertility of a real generation, a fact not well known outside the professional demographic community (Sobotka, Luts 2011).

The first domestic work to give estimates of the completed fertility of real female generations based on Ukrainian birth registration statistics was an article by V.S. Steshenko (Steshenko 1966). The first estimates of the fertility of generations of Soviet women based on a sample study were made by Rosa I. Sifman using data of an All-Union study done by the Central Statistical Administration of the USSR (TsSU) in 1960 (Sifman 1970). She, for the first time in Soviet practice, carried out a detailed analysis of changes in fertility characteristics simultaneously for real and conditional generations, also starting from the survey data of 1960 (Sifman 1974). Later, R.I. Sifman's colleagues at the Department of Demography of the TsSU Research Institute on Statistics, E.M. Andreev, V.S. Belova, A.G. Vishnevsky, L.E. Darsky, G.A. Bondarskaya and others, over a period of more than two decades used data from regular sample surveys of the Central Statistical Administration of the USSR for consistent monitoring and forecasting of changes in the total and marital fertility of female generations. Additional opportunities for studying the fertility of real generations on the basis of large-scale surveys were provided by the All-Union and Russia's population censuses of 1979, 1989, and the microcensuses of 1985 and 1994, which contained questions for women on the number of children born. Here we should mention a particularly valuable cohort study of the history of fertility in Russia by S. Shcherbov and H. Van Vianen, carried out on the basis of special processing of the 1994 Russia's microcensus database (Scherbov, Van Vianen 1999a; 1999b; 2001). For more details on the nature of the data of the largest sample studies and the results obtained, see: (Vishnevsky, Volkov 1983; Belova, Bondarskaya, Darsky 1988; Darsky 1994; Zakharov 2007a). The subsequent All-Russian population censuses of 2002, 2010, and the microcensus of 2015 provided new materials for studying changes in the fertility of real generations, revealing

[2] The heuristic value of both approaches, with indications of the problematic aspects of their practical usage, is well documented for Russian readers in the classic books on the subject (Sifman 1972; 1974).

the effects of the state pronatalist policies (see, for example, (Andreev and Zakharov 2017; Zakharov 2018b)).

The first estimates of the fertility of real generations for the whole territory of the Russian Federation (along with all the republics of the USSR), based on vital statistics data, were carried out by a team led by A.G. Vishnevsky (Vishnevsky et al. 1988). Within the framework of a number of research projects, including international ones, the author of this article continued cohort studies of fertility using all available sources and types of data: population censuses, official birth records, and the largest and most reliable family and fertility sample surveys (Adametz, Blum, Zakharov 1994; Blum , Zakharov 1997; Zakharov 1999; 2008; 2016; Zakharov 2003; 2006a; 2006b; 2007b; 2019; Frejka and Zakharov 2012; 2013; Freika, Zakharov 2014).

Since 2005, the Federal Service for State Statistics (Rosstat) has had an annual statistical form of processing of birth registration data containing the distribution of the number of births in a registered marriage by year of marriage registration. In this case, the order of birth is not taken into account, since it is customary to take into account the mother's biological order of births, and not the birth order in the current marriage. Thus, specialists have received an additional opportunity to study changes in fertility in marriage cohorts based on vital statistics, which they already use to track changes in the timing of marital births (see, for example, (Arkhangelsky 2020)). Previously, fertility in marriage cohorts was studied only on the basis of sample surveys of women, including within the framework of censuses and micro-censuses (Darsky 1972; Sifman 1974; Darsky 1994; Bondarskaya 1999).

In 2009, researchers gained possession of the international "Human Fertility Database" (HFD), a permanent joint project of the Max Planck Institute for Demographic Research (Rostock, Germany) and the Vienna Institute of Demography of the Austrian Academy of Sciences. From the scientific, methodological and organizational side, the project is supervised by the world's leading experts in the field of demography and demographic statistics. At the beginning of 2023, the HFD contained detailed information on fertility by age, year of birth of mothers and birth order in 38 countries around the world. This database is today the most complete methodological source of data for comparative historical and international analysis. Baseline information (absolute numbers of births by one-year age groups/one-year cohorts by year of birth of mothers and birth order) is obtained from national statistical agencies on the basis of direct agreements. Then, the data undergoes an in-depth quality check and is standardized and harmonized so as to calculate indicators according to a unified methodology[3].

Russia is currently represented in the HFD by continuous harmonized series of estimates of age and completed fertility for conditional generations from 1958 to 2018 and for real generations of women born between 1944 and 1978 (Andreev et al. 2020). The indicators of this database are actively used by international and Russian experts and by the author in some of his comparative studies of Russian fertility.

[3] For more information about the project, see the official HFD website. https://www.humanfertility.org/cgi-bin/main.php

Fertility in Russia from a historical perspective: optics of conditional and real generations

It is known that a steady decline in fertility in Russia began at the very end of the 19th and beginning of the 20th century and then proceeded very quickly in response to the radical breakdown of the social, economic and political system that began in the Russian Empire with the reforms of 1861 (Urlanis 1963: 16-23; Kvasha 1971; Vishnevsky 1977; Vishnevsky, Volkov 1983: 132-138; Vishnevsky, Tolts 1988; Zakharov 1991; Zakharov 1992; Bondarskaya 1999). Generations of women born before the 1870s, judging by the available data, did not practice intrafamilial birth control (Vishnevsky 1977; Bondarskaya 1999).

Table 1 and Figure 2 show the general picture of changes in completed fertility for conditional and real generations of women in Russia from the beginning of the demographic transition and throughout the further historical evolution. The complete data on which Figure 1 is based is presented in the Appendix.

Table 1. Total fertility rates of real and conditional generations in Russia: female generations born in 1866-1991, calendar years 1896-2021, births per woman by the age of 50

Birth years of women	Total fertility rate of real generations (CTFR)	Calendar years*	Total fertility rate of conditional generations (PTFR)
1866-1870	7.20	1896-1900	7.30
1871-1875	6.96	1901-1905	7.12
1876-1880	6.85	1906-1910	7.17
1881-1885	6.20	1911-1915	6.30
1886-1890	5.49	1916-1920	5.23
1891-1895	5.50	1921-1925	6.16
1896-1900	5.23	1926-1930	6.38
1901-1905	4.59	1931-1935	4.51
1906-1910	3.66	1936-1940	4.74
1911-1915	2.82	1941-1945	2.60
1916-1920	2.46	1946-1950	2.89
1921-1925	2.25	1951-1955	2.86
1926-1930	2.20	1956-1960	2.67
1931-1935	2.15	1961-1965	2.33
1936-1940	2.01	1966-1970	2.03
1941-1945	1.91	1971-1975	2.01
1946-1950	1.85	1976-1980	1.93
1951-1955	1.89	1981-1985	2.02
1956-1960	1.87	1986-1990	2.09
1961-1965	1.73	1991-1995	1.48
1966-1970	1.63	1996-2000	1.21
1971-1975	1.60	2001-2005	1.29
1976-1980	1.67	2006-2010	1.47
1981-1985	1.75**	2011-2015	1.70
1986-1990	1.73**	2016-2020	1.59

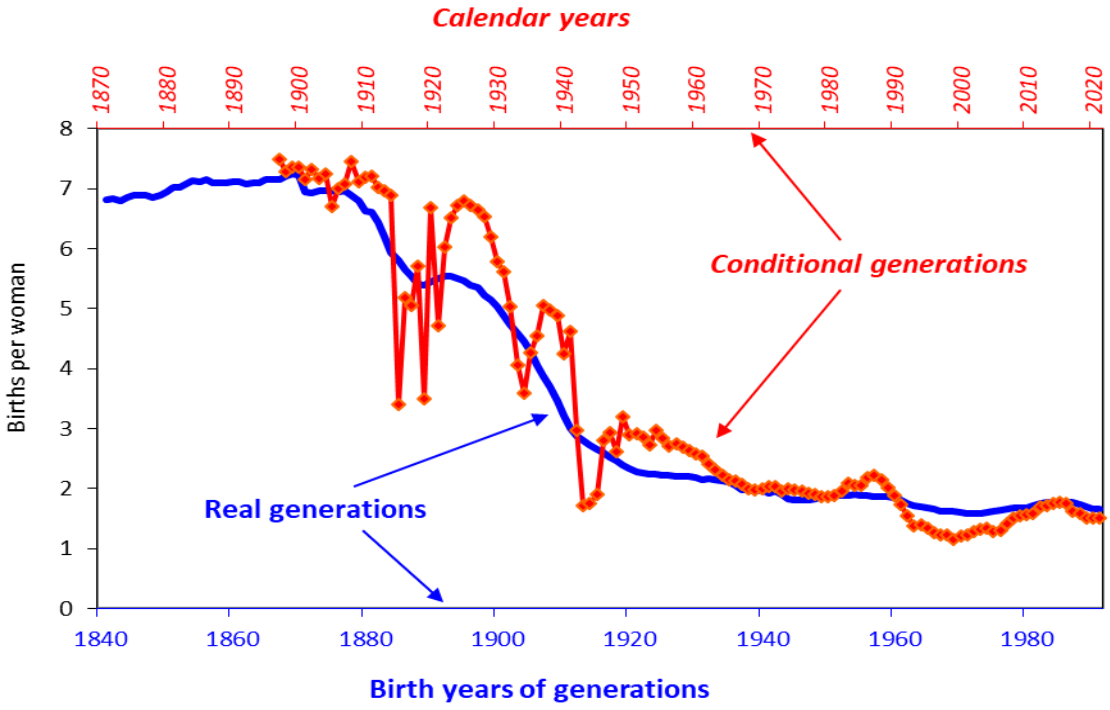
*Note: * - Calendar years correspond to the years at which cohorts indicated on the left side of the table reached the age of 30; ** - preliminary estimate taking into account data up to 2021 inclusive.*

Source: Author's estimates presented in (Zakharov 2006a: 157); author's calculations based on the Human Fertility Database (https://www.humanfertility.org/cgi-bin/main.php) and unpublished data from Rosstat's annual vital statistics reports.

The dual representation of completed fertility in real and conditional generations is a well-known technique that enables researchers to trace both the general trajectory of the decline in fertility and deviations from the main trend caused by incidental, temporary factors. Among the latter, social upheavals such as famine and world and civil wars stand out, as well as attempts by the state to influence Russians' demographic behavior (measures of pro-natalist state policy in the 1980s and after 2006 to the present).

The general periodization of the Russian version of the historical evolution of fertility is defined quite clearly. The beginning of the decline in fertility can be seen in the generations of mothers born in the last quarter of the 19th century, that is, the first generations whose socialization took place in the conditions of post-reform Russia. These generations entered the age of maximum fertility at the very beginning of the 20th century. In Russia, the history of fertility in the 20th century is mainly one of decline, interrupted in certain periods by more or less noticeable fluctuations in indicators, especially pronounced for conditional generations. Given the more monotone nature of the dynamics of fertility in real generations, which should be the primary basis for examining long-term evolution, the periodization of this process comes down to the identification of periods with different rates of its decline.

Figure 1. Total fertility rate of conditional (for calendar years) and real (by year of birth of women) generations: calendar years 1897-2021, generations born 1841-1991, number of births per woman by age 50



Note: a) Estimates are provided for each calendar year and for each one-year cohort; b) Presented here is a preliminary estimate of the completed fertility for generations born after 1971 and who have not yet completed their childbearing years, based on the age-specific birth rates observed in 2021.

Source: Author's estimates, graphically presented in (Zakharov 2006a; Zakharov 2008 and others); author's calculations based on the Human Fertility Database (https://www.humanfertility.org/cgi-bin/main.php) and unpublished Rosstat data for recent years.

The first stage of the accelerated decline in fertility (generations born in 1880-1890): the beginning of the great transformation of the traditional way of life

The rate of decline in fertility in Russia was quite high right from the start. Suffice it to say that already generations of mothers born in the 1890s were having an average of 5.5 children (a drop of 25% from the pre-transitional level, when there were more than 7 births per woman). Additional catalysts for the decline were the Russo-Japanese War, the socio-political and economic crisis of 1905-1907, and then the First World War, which "grew" into the Civil War, accompanied by horrific famines and epidemics. The peaks of this socio-demographic crisis occurred in 1915 and 1919 and are fixed by the values of the period total fertility rate (the total fertility of a conditional generation, or PTFR). The PTFR reached in these years, about 3.5 births per woman, will subsequently be repeated only in 1934 as a result of the great famine and other consequences of collectivization, and then surpassed during the Second World War.

Comparing fertility rates for real and conditional generations at this stage of evolution can be bewildering. The indicators for real generations, firstly, are significantly lower (except for the years with a particularly sharp drop in period fertility), and secondly, their decrease occurs more consistently and smoothly[4]. If we rely on indicators for conditional generations, then we can even conclude that in 1922-1926 the fertility observed before the First World War was practically restored. Is there a contradiction or even an error in the estimates here?

The explanation should be sought in the distinctive properties and different informational values of the two fertility indicators. Indicators for a conditional generation at the stage of a rapid decline in fertility in real generations always overestimate the true level of fertility, since in each of the calculated years the conditional (synthetic) cohort consists largely of mothers belonging to generations that were characterized by a higher fertility (high rates of family formation) and, to a lesser extent, of mothers with a new, lower fertility (with a slowing pace of family formation). In such a situation, the expected total fertility, as demonstrated in the total fertility rate for the synthetic cohort (PTFR), turns out to be overestimated - this indicator, generally having a predictive meaning (showing potential values with unchanged conditions), simply did not keep pace with the actual fertility decline, thereby inflating the estimate of the expected completed fertility of generations.

The next point that must be taken into account when observing the “increased” fertility of conditional generations in the 1920s is again connected with a property of these indicators, namely, their dependence on timing shifts in the distribution of births for real generations of mothers. It is no coincidence that the post-war periods of an increase in the number of births are called a compensatory "increase in fertility." In effect, this means that as the situation in the country normalizes, former marital relations are restored and delayed marriages take place, which ultimately leads to a greater number of delayed births, over and above those births

[4] Estimates of the completed fertility of cohorts born before 1920 were obtained by an indirect technique from an appropriately transformed series of birth numbers, in turn also reconstructed. Because of this, they are of course smoothed out. The original series of births estimates were obtained in the framework of a joint project with colleagues from the French National Institute for Demographic Studies (INED, Paris) under the leadership of Alain Blum, carried out in the mid-1990s (Adametz, Blum, Zakharov 1994; Blum, Zakharov 1997). However, it is known that, due to their initial cumulative nature, the true cohort total fertility indictors cannot have strong short-term fluctuations, in contrast to the period TFR values (for calendar years), which are strongly influenced by the conjunctural situation.

occurring in accordance with the “normal” birth timing and spacing for generations, plans for which had not been changed due to the stressful circumstances. Outwardly, this manifests itself as a rapid increase in the number of births in a certain fixed period of historical time, which, however, does not necessarily mean an increase in the completed fertility for the entire period of reproductive activity of real generations, and, accordingly, an increase in the average ultimate number of children in families. On the contrary, in Russia after the Civil War, while there was an increase in fertility in some cohorts, it was hardly noticeable against the background of a clearly expressed dominant trend of steady decline. Russia would have to face such effects more than once in the 20th century. In passing, we note that in the historical and demographic literature devoted to this historical period, the beneficial effect of the "New Economic Policy" (NEP) on the reproduction of the population and, in particular, on fertility is often exaggerated[5]. The analysis of available statistics does not allow for a strict separation of the influence on the fertility of conditional generations of "socio-economic" factors associated with an increase in the standard of living from purely "demographic" factors, by which we mean the degree of realization of the opportunities provided by age, sex, marriage and family structures. Nevertheless, a comparison of the dynamics of indicators for conditional and real generations gives grounds to assert that the decisive importance in maintaining the total fertility rate of conditional generations at a level of more than 6 children per woman for almost a decade is mainly due to shifts in the timing of births and marriages, or, in other words, their compensatory growth due to the accelerated implementation of deferred demographic events after the exit from the crisis in 1915-1921, and not a real increase in the completed fertility of the generations that survived this crisis, of hose either entering or being of reproductive age at that time.

The second stage of the accelerated decline in fertility (generations born in 1900-1920): a chain of social catastrophes

The rate of decline in fertility in this period is comparable to that observed in the previous period. However, this stage lasted somewhat longer, as a result of which the overall reduction in completed fertility of generations over the period amounted to more than 50% (from 5 children per woman born in 1900 to 2.3 children per woman born in 1921). The childbearing of these generations took place in the second half of the 1920s, the 1930s and the 1940s. These years were marked by various historical events that adversely affected the rhythm of family formation, including such tragedies as “The Great Turnaround” in the city and in the countryside, which led to the displacement of millions of people, the Holodomor in 1932-1933, and the Second World War of 1939-1945, which began for the USSR with the partition of Poland, the annexation of territories along the western borders and a bloody war with Finland. In the second half of the 1930s, a large standing army was rapidly created, and universal military service was introduced. At the same time, mass repressions raged throughout the country, including in the growing army. The marriage market was severely disrupted, many married couples were separated, and marital relations everywhere were put to the test, all of which affected fertility. Social catastrophes caused the collapse of age-specific and total fertility indicators for calendar years. Thus, the PTFR,

[5] Here is how V.A. Isupov characterizes the period: "An era of peace has begun, marked by a release of demographic tension"; “Fertility was quite high during the Civil War years, and after its end continued to increase, which was facilitated not only by family reunification during demobilization of the Red Army and liquidation of the White, but also by the restoration of the peasant community with its regular land redistributions according to the number of eaters. Considering, moreover, that in the countryside labor activity began at an early age, it can be argued that peasant families were economically interested in having many children” (Isupov 2000: 71).

according to our estimates, in 1934 was 3.6, and in 1943-1944, 1.7 births per woman. On the eve of the catastrophes under consideration, the PTFR was 5.6 in 1931 and 5.0 in 1938.

As the country emerged from yet another crisis wave, the same compensation mechanism (having children whose births had been put off) quickly raised fertility indicators for conditional generations. However, there has never been a complete recovery of the pre-crisis values of the total fertility rate. The tendency to strengthen intra-family birth control to adapt to a rapidly changing social reality continued, and, accordingly, each successive generation of mothers produced fewer and fewer children. In times of ongoing uncertainty, the desire to limit childbearing outweighed the impact of improved conditions for having delayed children. In addition, a complete restoration of pre-crisis situations, from the point of view of the structural characteristics of the population, is impossible even theoretically. A catastrophic increase in mortality disrupts age and sex ratios, leads to more frequent widowhood, and disrupts the marriage market. As a result, the chances of realizing life plans regarding the formation of a family and the birth of children are, for the average individual, significantly reduced.

One controversial question remains that of the link between the short-term increase in the indicators of fertility in 1936-1938 with the entry into force of the 1936 law prohibiting abortion at the woman's request[6]. While not denying the impact of this factor, we note that the time of the law's enactment coincided with the compensatory period after the demographic crisis caused by famine in the first half of the 1930s. Experts rightly point out that with this law, which restricts the rights of citizens to control their own fertility, the authorities wanted to "correct" the demographic situation, which had deteriorated sharply during the years of mass collectivization and famine (Urlanis 1963: 28; Sadvokasova 1969: 29; Vishnevsky, Sakevich, Denisov 2016)[7]. This decree of the Communist Party Central Executive Committee and the Council of People's Commissars of the USSR, in addition to the ban on abortion and criminal punishment for evading alimony payments, put into effect a number of measures to support the family, the impact of which on fertility may have been quite positive, but whose real significance is impossible to assess[8]. On the other hand, it is often forgotten that even without this "stimulus" law, the number of births, according to the demographic law of compensation, should have increased sharply a few years after the crisis. Most likely, the Decree of 1936 only strengthened the compensatory post-crisis wave of births, but did not initiate it. Let us substantiate our point of view with the help of concrete data.

Joint consideration of fertility rates in the age groups of 20-24 and 25-29 years for cohorts of women born in 1907-1915 shows that children whose birth did not take place due to the crisis were born several years later, i.e., to the same women at an older age. As a result, the accumulated number of births by the age of 30 in these generations differs slightly, without a clearly defined trend, while the indicators of completed fertility by the age of 50 in these

[6] This issue is emphasized here, since it is seen as relevant in the context of the constant attempts of conservative and clerical circles to greatly restrict or even prohibit abortion at the request of a woman in modern Russia, and the argument used, as in former times, is precisely the need to increase the birth rate.

[7] There are statistical facts, albeit segmented, that testify to a sharp increase in the number of abortions during the famine (Denisenko 2008: 127-128).

[8] Decree of the Communist Party Central Executive Committee and the Council of People's Commissars of the USSR of June 27, 1936 "On the prohibition of abortions, the increase in material assistance to women in childbirth, the establishment of state assistance to large families, the expansion of the network of maternity hospitals, nurseries and kindergartens, increased criminal penalties for non-payment of alimony and some changes to divorce laws." See: Electronic fund of legal and normative-technical documents. https://docs.cntd.ru/document/456020602

generations showed no noticeable reaction to the twenty-year abortion ban and continued to decline steadily (Zakharov 2006a: 161-163).

True, this leaves aside the question of whether the births occurring in 1935-1938, which had been postponed due to famine, would have still occurred without the law of 1936, which severely limited access to abortion. Since such a formulation of the question involves a hypothetical situation, there can be no unambiguous answer. At the same time, it is difficult to imagine that social norms regarding the number of children in a family and individual reproductive attitudes could have changed so rapidly over just a few (basically, 5) years, but only in the case that they had would it be possible to assume that the postponed children, especially the first and second ones, would for the most part have never been born.

The reaction to the Decree of 1936, catching many women by surprise, was a certain increase in the number of births and other period indicators of fertility – the peaks of 1937 on the curves characterizing the dynamics of age-specific fertility rates are clearly visible. However, the decree's influence was not as significant as many authors believed or continue to believe. If these peaks are smoothed out, then we see that the additional increase (the local effect) caused by the abortion law is expressed in terms of a PTFR of no more than 0.4 children per woman (8% of its value of 5 births per woman in 1937), which is equivalent to 353,000 births out of a total 4.4 million births in 1937. Close, but higher estimates - 400-500,000 births - are given by B.Ts. Urlanis, but he based these on a comparison of rougher crude birth rates (Urlanis 1963: 28-29). In subsequent years, the impact of the ban on abortion was even less significant, and we do not see an obvious long-term effect in the magnitude of the completed fertility of the affected generations[9] (see also (Sifman 1974: 42-43; Vishnevsky, Volkov 1983: 174-176)).

So, in the years before the Second World War, not the decision to ban abortion, but the births of postponed children and the restoration of the previous rhythm of family formation after the catastrophic period of the Stalinist "Great Turnaround" for the population played the main role in increasing the fertility indicators of conditional generations[10].

The law of post-crisis compensation is inherent in the demographic system, as we see once again from the impact of the Second World War. The shifting of births from a younger to an older age group occurs for the third time in the Russian history of the 20th century. Due to the war, the cohorts most affected by it, those born in 1920-1923, were unable to carry out their reproductive plans at the age of 20-24, but at the age of 25-29 they to some extent made up for "lost time", having some of these postponed children in the post-war years. The indicators of the completed fertility of real generations, free from the influence of changes in the birth calendar, continued to decline steadily, but with a clear slowdown. Here we must note that the conclusions of M. Nakachi about the ineffectiveness of post-war additional measures to stimulate fertility, initiated at the suggestion of N. Khrushchev in Law 1944[11] (Nakachi 2022), are confirmed.

[9] Apparently, the first researcher to pay attention to this, looking, like us, at the fertility of both conditional and real generations, was R.I. Sifman (1974: 42-43).

[10] In the historiography, the first five-year plan (1928-1932, the five-year plan of "industrialization") and the second five-year plan (1933-1937, the five-year plan of "collectivization") belong to the period of "The Great Turnaround".

[11] Decree of the Presidium of the Supreme Soviet of the USSR of July 8, 1944 "On increasing state assistance to pregnant women, mothers with many children and single mothers, strengthening the protection of motherhood and childhood, on the establishment of the honorary title "Heroine Mother" and the establishment of the Order "Maternal Glory" and a Motherhood Medal". See: Electronic fund of legal and normative-technical documents. https://docs.cntd.ru/document/9033536?marker=7DM0KB

The stage of a slowing decline in fertility and the transition to its stabilization (generations born in the 1920s-1950s): establishing a two-child ideal family model

The formation of families and the reproductive activities of the abovementioned generations took place from the post-war period up until the early 1990s. The completed fertility of real generations was 2.2-2.3 children per woman in cohorts born in the early 1920s and 1.8-1.9 in cohorts born in the 1950s. Fertility reached a minimum in cohorts born in 1946-1947 (1.83 children), then slightly increased and went into a relatively short stagnation before beginning a new downward trend in the generations born in the 1960s-1970s.

The generations born in the first decade after the war had a historic role in completing the demographic transition from high to low fertility. The fertility of conditional and real generations was rapidly converging, indicating the completion of the first demographic transition (the elimination of low fertility due to high child mortality[12], the establishment of total birth control at the individual and intra-family level) and the absence of grounds for drastic changes in timing and spacing of births. Generations of "children" begin to form their families in the image and likeness of the generations of their "mothers": the completed fertility of generations separated by 30 years (the approximate length of the demographic generation[13]) differs little. The two-child family model is established as the most common family model, both as an objectively valid social norm and as a statistical fact, confirmed by the distribution of women according to the total number of children born.

Indeed, while at the stage of rapid decline in fertility a generation of "daughters" had an average of 40-50% fewer births than the generation of their "mothers", generations born in the 1960s are 15-20% smaller and those born in the 1980s, 7-10% (Table 2). At the same time, it is obvious that each new generation of parents continues to have on average fewer children, thus continuing a more than century-long historical trend. This generational under-replacement in modern Russia, which is characteristic of all female cohorts born after 1910 (Zakharov 2003), is far from being overcome, despite the desires and efforts of many generations of politicians, leading inevitably towards an increasing reduction in the total population of the country.

[12] On the concept of ineffective fertility, its quantitative measurement and historical evolution in Russia, see: (Zakharov 2003).

[13] The length of a demographic generation is the average time interval separating generations. It is equal to the average age of the mother at the birth of daughters who survive at least to the age of their mothers at the time of their birth.

Table 2. Ratio of the values of completed fertility in «daughter» and «maternal» generations*, Russia

Birth years		Completed fertility (CTFR), births per woman		Ratio of fertility indicators for "daughter" cohorts to those for "maternal" cohorts
"Maternal" cohorts	"Daughter" cohorts	"Maternal" cohorts	"Daughter" cohorts	
1846-1850	1876-1880	6.90	6.85	0.99
1851-1855	1881-1885	7.08	6.20	0.88
1856-1860	1886-1890	7.11	5.49	0.77
1861-1865	1891-1895	7.12	5.50	0.77
1866-1870	1896-1900	7.20	5.23	0.73
1871-1875	1901-1905	6.96	4.59	0.66
1876-1880	1906-1910	6.85	3.66	0.53
1881-1885	1911-1915	6.20	2.82	0.47
1886-1890	1916-1920	5.49	2.46	0.45
1891-1895	1921-1925	5.50	2.25	0.41
1896-1900	1926-1930	5.23	2.20	0.42
1901-1905	1931-1935	4.59	2.15	0.47
1906-1910	1936-1940	3.66	2.01	0.55
1911-1915	1941-1945	2.82	1.91	0.68
1916-1920	1946-1950	2.46	1.85	0.75
1921-1925	1951-1955	2.25	1.89	0.84
1926-1930	1956-1960	2.20	1.87	0.85
1931-1935	1961-1965	2.15	1.73	0.81
1936-1940	1966-1970	2.01	1.63	0.81
1941-1945	1971-1975	1.91	1.60	0.84
1946-1950	1976-1980	1.85	1.67	0.90
1951-1955	1981-1985	1.89	1.75**	0.93**
1956-1960	1986-1990	1.87	1.73**	0.93**

*Note: * - A 30-year time interval was chosen to identify "maternal" and "children" cohorts, which approximately corresponds to the average length of a demographic generation in a long historical retrospective;*
*** - preliminary estimate based on the forecast of the completed fertility for cohorts not out of reproductive age: the youngest cohort of women born in 1990 by 2022 had reached the age of 32.*

Source: Author's estimates presented in (Zakharov 2006a: 157); author's calculations based on the Human Fertility Database (https://www.humanfertility.org/cgi-bin/main.php) and unpublished data from Rosstat's annual vital statistics

The historical stage of fertility's evolution under consideration is also interesting in that the state again showed concern about the low birth rate, which did not ensure population growth in the long term. Beginning in 1981, gradually over several years, the Soviet government introduced a system of social benefits and allowances for families with children[14]. The key measure, which, in our opinion, had the most noticeable demographic consequences, was the introduction, for the first time in Russian practice, of leave for mothers to care for a small child while maintaining both their workplace and an uninterrupted employment history: partially paid leave for a child up to the age of 1 (1981-1983), extended leave up to 1.5 years (1989-1990), and unpaid leave until the age of three, as well as an increase in maternity (prenatal and postnatal) leave. The opportunity of paid and unpaid parental leave in the USSR was quickly taken advantage of by many women, primarily those with higher education (teachers, doctors),

[14] Decree of the Central Committee of the CPSU and the Council of Ministers of the USSR of January 22, 1981 "On measures to strengthen state assistance to families with children." See: Electronic fund of legal and normative-technical documents. https://docs.cntd.ru/document/9015746

who had previously had a particularly difficult time combining pregnancy with employment in their main profession. The granting of the official status of "large family" to families with three or more children (previously, only families with five or more children were recognized as “large”), also played a certain role, giving them higher priority in obtaining housing, goods and services.

As international experience shows, when fertility is low, such government initiatives cause a significant, albeit short-lived, surge in births, including among working and socially active women, due to shifts in the timing of births of second and, in part, third children. Russia has not been an exception to this rule, confirmed by the experience of many countries. Some part of Russian families in the 1980s not only had children earlier than originally planned, but also shortened the intervals between births (Zakharov 2006b; 2007b; Grishina 2008; 2009), extending parental leave for the birth of the next child. However, a few years later, the short-lived “baby boom” was inevitably followed by a sharp decline in birth rates.

Given the invariability of the ideal family size and the stability of intentions regarding the number of children in one's own family, a child being born "today" means his not being born "tomorrow" (Borisov 1976: 72). The mass postponement of births in response to state family policy is, in terms of its demographic consequences, a mirror reflection of the shifts in the birth calendar due to catastrophic events (wars, famine, etc.). The only difference is the sequence of phases of decline and rise in birth rates for conditional generations.

The demographic policy of the 1980s destabilized the dynamics of total fertility in terms of conditional generations, but had practically no effect on the completed fertility of real generations, who at that moment found themselves in their most active reproductive ages. It is possible that it only supported the trend towards a stabilization of fertility[15].

Let's illustrate what has been said using actual data. Table 3 shows the cumulative fertility by the age of 25, 30, and 35 and the completed fertility of the generations born in the 1950s and 1960s, who were to some extent influenced by the family policy measures taken in the 1980s. The timing of births for women of the generation born in 1960 differs significantly from the timing for women born six years earlier. Yet although the former had more children at a young age, by the age of 35, despite a strong start, the accumulated share of women with two or more children in this generation is the same as in the generation born in 1954, for whom the same 15 years of reproductive life were more measured in the previous historical period.

[15] O.V. Grishina (Krupa), based on data from a large-scale sample study "Parents and children, men and women in the family and society" (GGP/GGS), showed that during the period of additional measures to help families with children in the 1980s, the birth rate increased only among those women who were born and raised in families with two or more children. Women who grew up in one-child families practically did not show an increase in completed fertility. Similar results were obtained for the same generations of men (Grishina 2008; 2009). Thus was empirically confirmed once more the pattern of reproducing similar reproductive attitudes “inherited” from their parents in post-transitional societies (after the transition to low fertility and the establishment of the ideal norm of two children in a family), attitudes reflected even in specific conditions of active family policy. From this it follows, firstly, that the state’s possibilities for changing reproductive practices on a mass level are quite limited, and secondly, that using policy to affect various socio-demographic groups of the population turns out to be difficult: the same measures can stabilize or even increase the likelihood of having several children in groups with above-average birth rates and not have a significant impact on the behavior of population groups with low birth rates (at the same time, the latter, as a rule, are the target group of the pronatalist politicians). What’s more, the first group historically reduces its representation in the population, while the second group increases its, which creates the structural basis for a further decline in overall fertility - “low fertility traps” (Lutz, Skirbekk, Testa 2006).

Table 3. Average number of children born by the indicated ages: Russia, cohorts of women born in 1950-1990s.

Birth year of women	By age 25	By age 30	By age 35	By age 50
1950	0.92	1.45	1.73	1.87
1951	0.93	1.45	1.75	1.88
1952	0.93	1.45	1.76	1.88
1953	0.93	1.45	1.76	1.87
1954	0.94	1.48	1.79	1.88
1955	0.95	1.49	1.80	1.88
1956	0.95	1.51	1.80	1.87
1957	0.96	1.54	1.80	1.87
1958	0.98	1.57	1.80	1.87
1959	1.01	1.60	1.80	1.87
1960	1.03	1.60	1.78	1.85
1961	1.03	1.57	1.73	1.80
1962	1.03	1.53	1.68	1.76
1963	1.04	1.49	1.64	1.72
1964	1.04	1.45	1.60	1.69
1965	1.04	1.42	1.58	1.67
1966	1.03	1.39	1.55	1.66
1967	1.01	1.34	1.52	1.63
1968	0.98	1.31	1.50	1.62
1969	0.95	1.29	1.48	1.62
1970	0.92	1.25	1.46	1.60
1971	0.88	1.21	1.43	1.59
1972	0.84	1.18	1.40	1.58
1973	0.81	1.16	1.40	1.59*
1974	0.79	1.15	1.41	1.61*
1975	0.75	1.13	1.40	1.62*
1976	0.72	1.11	1.41	1.64*
1977	0.69	1.09	1.42	1.66*
1978	0.67	1.09	1.43	1.68*
1979	0.66	1.08	1.43	1.68*
1980	0.64	1.07	1.44	1.68*
1981	0.62	1.08	1.47	1.72*
1982	0.61	1.10	1.50	1.76*
1983	0.60	1.11	1.52	1.77*
1984	0.59	1.11	1.51	1.76*
1985	0.58	1.11	1.50	1.74*
1986	0.59	1.14	1.52	1.77*
1987	0.59	1.16	1.53*	1.78*
1988	0.58	1.13	1.49*	1.74*
1989	0.57	1.09	1.43*	1.67*
1990	0.56	1.05	1.39*	1.63*

*Note: * - Preliminary estimate assuming the same rate of change with age of fertility rates observed in 2021. Actual values will most likely be somewhat higher, given the trend towards higher fertility rates for women over the age of 30. However, for cohorts born in the second half of the 1970s through the first half of the 1980s, it will be barely noticeable, and in the best case (assuming a growth of fertility rates at older ages) will add 0.01 to the value of the completed fertility given in the table.*

Source: Author's calculations and estimates based on published and unpublished data from annual Rosstat Vital statistics.

Based on the values of the completed fertility of the generations born in the 1950s and 1960s, one can hardly speak of any significant demographic impact of the policy of the 1980s – the increase in completed fertility came to no more than 0.1 births per woman in the generations

born in the 1950s. (Zakharov 2006b; 2007b). V.N. Arkhangelsky, relying on data from the 1989 and 2002 population censuses and the 1994 microcensus, came to a similar result (Arkhangelsky 2006: 35, 40). The indisputable effect is yet another destabilization of the birth timing for a number of cohorts, expressed in those years in an increasing tendency to form families at an earlier age with shortened intervals between births, caused not by the natural course of the evolution of the fertility quantum, but by artificial influence from outside - state policy. The surge in the number of births and the rise of the period TFR was then met with great enthusiasm by politicians and a number of commentators as an expected favorable result of family policy. Only a couple of decades later, based on retrospective data from special studies and an in-depth analysis of fertility statistics in the context of real generations, did it become possible to pass a disappointing verdict on the demographic effectiveness of the policy of the 1980s (for details, see: (Arkhangelsky 2006: 33-39; Zakharov 2006b; 2007b; Andreev 2016)).

The latest stage of changes in the level of fertility (generations of mothers born in the 1960-1980s): signs of another stabilization and the weak effectiveness of pro-natalist policy

Starting with the generations of mothers born in the second half of the 1960s, a downward trend in the completed fertility indicators has again become apparent. The historical record low was demonstrated by Russian women born in 1971-1973 – 1.59 births per woman. The completed fertility for the generations of the second half of the 1970s and 1980s is expected to be higher - 1.70-1.77 births, with the prospect of stagnation in the range from 1.6 to 1.7.

A feature of the latest stage in the evolution of fertility is another significant divergence in the trajectories of changes in total fertility rates for conditional and real generations, especially noticeable for generations born in the 1970s, whose reproductive activity occurred in the 1990s (Figure 2). In contrast to previous aggregated historical periods, the decline in the total fertility for conditional generations is greater than for real generations. Such a deviation clearly indicates a serious slowdown in the rate of childbearing: each subsequent generation produces children at a later age than the previous one. Since the mid-1990s, first marriages and first births have been postponed and the intensity of childbearing in the youngest age groups of mothers has sharply decreased, leading to a drop in the period total fertility rate. This shift of the age profile of fertility resulted not in a short-term drop in fertility rates in certain age groups, as observed earlier during the war years or under the influence of family policy measures of the 1980s, but in a long-term process of transformation of the Russian model of fertility towards a gradual aging of motherhood, the same process observed in other industrialized countries since the late 1960s. The instrumental basis for the transition to a new model of family formation and a new age profile of fertility - the second demographic transition (Lesthaeghe 1991; Zakharov 2005; Zakharov 2008; Lesthaeghe 2020) – is, in Russia as in all other countries, the replacement of old birth control methods by modern, highly effective means of family planning - the "contraceptive revolution" (Zakharov, Sakevich 2007; Lesthaeghe 2014; Vishnevsky, Denisov, Sakevich 2017). The main childbearing period for women in all developed and rapidly developing countries is gradually shifting to over the age of 25 and even 30 years, primarily due to the later start of family formation. The Russian model of fertility has not escaped such a fate: by 2022, the period average age of mothers at the birth of the first and second child had increased by 3 years compared to the beginning of the 1990s (Table 4), the birth rate for mothers under 20 years of age had decreased fourfold, and for mothers 30 years and older had doubled over the same period

(Table 5). The greatest changes in the age profile of childbearing took place in the second half of the 1990s and in the first decade of the 2000s.

Table 4. Average age of mother at the birth of children of each order, Russia, 1970-1995, 1999-2021, years

Year	All births	Including by birth order				
		first	second	third	fourth	fifth and subsequent
1970	26.88	23.64	28.25	30.78	32.61	35.92
1975	26.38	23.29	27.77	30.78	32.70	36.00
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
1999*	25.57	23.29	27.70	30.68	32.30	34.53
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
2015**	28.24	25.46	29.52	32.15	33.23	34.70
2016**	28.42	25.63	29.63	32.15	33.25	34.75
2017**	28.51	25.78	29.60	32.08	33.19	34.67
2018**	28.65	25.91	29.63	31.96	32.79	34.27
2019**	28.70	25.93	29.66	31.96	32.94	34.45
2020**	28.76	25.94	29.59	31.97	32.97	34.44
2021**	28.88	26.02	29.63	32.02	33.07	34.43

*Note: * - Estimates for 1999-2011 are based on incomplete data: only for those territories that saved and submitted to Rosstat processed data on births simultaneously by the age of the mother and the order of birth. The proportion of the total number of births distributed by birth order in these years was not less than 66%; differences between groups of regions registering and not registering births by birth order in terms of PTFR were no more than 0.045 births per woman and 0.117 years for the period average mother's age at birth (Andreev et al. 2020); ** - without data for Crimea and Sevastopol. For detailed annual dynamics for the 1980s and 1990s, see: (Vishnevsky 1999: Appendices, Table 2; Vishnevsky 2004: 47).*

Source: Human Fertility Database (http://www.humanfertility.org); the author's calculations of the arithmetic mean age of the mother, using fertility rates for one-year age groups as weights, based on published and unpublished data from annual reports of Rosstat on vital statistics.

Table 5. Period age-specific fertility rates and the total fertility rate, Russia, 1970-2021

Year	Per 1,000 women at indicated age, years							PTFR5*	PTFR1**
	15-19	20-24	25-29	30-34	35-39	40-44	45-49		
1970	28.9	151.7	104.0	68.7	31.9	8.7	1.0	1.97	1.99
1975	34.8	157.3	109.3	56.6	28	7.2	0.6	1.97	1.97
1980	43.8	157.8	100.8	52.1	17.4	4.9	0.4	1.89	1.86
1985	47.2	165	113.0	59.7	23.3	3.6	0.3	2.06	2.05
1990	55.0	156.5	93.1	48.2	19.4	4.2	0.2	1.88	1.89
1995***	44.8	112.7	66.5	29.5	10.6	2.2	0.1	1.33	1.34
1996***	38.9	105.5	65.5	30.1	10.8	2.3	0.1	1.27	1.27
1997***	35.8	98.0	64.8	31.2	10.8	2.2	0.1	1.21	1.22
1998***	33.5	98.1	66.7	33.1	11.5	2.3	0.1	1.23	1.23
1999***	28.9	91.8	63.7	32.2	11.1	2.2	0.1	1.15	1.16
2000***	27.4	93.6	67.3	35.2	11.8	2.4	0.1	1.19	1.20
2001***	27.3	93.1	70.2	38.0	12.9	2.4	0.1	1.22	1.22
2002***	27.3	95.3	74.8	41.6	14.6	2.6	0.1	1.28	1.29
2003***	27.6	95.1	78.3	44.1	16.0	2.7	0.1	1.32	1.33
2004	28.2	94.2	80.1	45.8	17.6	2.9	0.1	1.34	1.35
2005	27.4	88.4	77.8	45.3	17.8	3.0	0.2	1.30	1.29
2006	28.2	87.8	78.4	46.6	18.6	3.1	0.2	1.31	1.31
2007	28.3	89.5	86.9	54.1	22.7	3.9	0.2	1.43	1.42
2008	29.3	91.2	92.4	60.0	25.8	4.6	0.2	1.52	1.50
2009	28.7	90.5	95.9	63.6	27.6	5.2	0.2	1.56	1.54
2010	27.0	87.5	99.2	67.3	30.0	5.9	0.3	1.59	1.57
2011	27.4	88.0	99.5	67.8	31.1	6.2	0.3	1.60	1.58
2012	27.4	91.2	106.6	74.3	34.9	7.0	0.3	1.71	1.69
2013	26.7	89.9	107.5	76.2	36.8	7.4	0.4	1.72	1.71
2014	26.1	89.6	110.1	79.9	39.0	8.1	0.4	1.77	1.75
2015****	24.1	89.9	112.6	83.1	39.8	8.3	0.5	1.79	1.78
2016****	21.6	87.0	111.4	84.5	41.0	8.8	0.5	1.77	1.76
2017****	18.5	81.2	100.0	77.3	39.2	8.7	0.5	1.63	1.62
2018****	16.2	78.4	96.4	76.2	39.7	8.9	0.6	1.58	1.58
2019****	14.7	74.8	91.1	71.6	38.7	8.9	0.6	1.50	1.50
2020****	14.3	73.6	92.4	70.7	39.2	9.2	0.6	1.50	1.50
2021****	13.6	70.6	94.7	71.0	40.1	9.5	0.6	1.50	1.50

*Note: * - PTFR5 - completed fertility rate for the conditional generation (the expected completed fertility rate for the generation that entered childbearing in the reference year), calculated as the sum of the five-year age coefficients presented in the table;*
*** - PTFR1 - completed fertility rate for the conditional generation, calculated as the sum of one-year age coefficients, which gives a more accurate estimate of the expected value of the completed fertility compared to PTFR5;*
**** - without the Chechen Republic, for which records of demographic events in 1995-2003 were absent or far from complete;*
***** – no data for Crimea and Sevastopol.*
For detailed annual dynamics for the 1980s and 1990s, see: (Vishnevsky 2007: 81-90).

Source: Human Fertility Database (http://www.humanfertility.org); based on published and unpublished data from annual reports of Rosstat on vital statistics.

Many commentators in the late 1990s and early 2000s hastened to declare the emerging situation a new crisis in fertility and the family a "demographic catastrophe", drawing an analogy with wartime periods. A number of them spoke of the long-cherished idea of the inevitability of the transition to a one-child and even childless family for the entire population of the country. Alarmism prevailed both in public opinion and at the political level, as reflected in practical

recommendations that boil down to the need for immediate state intervention in the demographic sphere in the form of a special policy to stimulate fertility and even the introduction of emergency measures. Thus, it was proposed to adopt a law on a "demographic emergency", according to which the birth of a first child would be declared mandatory, abortion would again be prohibited, and so on (Khorev 1997: 137-139). Very many, even demographers, believed the latest decline in fertility to be the result of the country's socio-economic crisis, of the drop in living standards and morality, that this was the "demographic price of reforms" leading society in the wrong direction - to depopulation resulting from the "wrong" methods of problem solving, i.e. the creation of a market economy (see, for example, (Khorev 1998; Osipov 2000; Gundarov 2001), a whole series of publications "Population and Crises": (Khorev, Danilova, Ivankova 2001; Khorev 2002) and etc.).

The Russian political elite's search for a national idea ended in the first half of the 2000s with the victory of supporters of the restoration of the well-known Soviet ideology of the state as an "omnipotent" paternalistic state capable of regulating all social relations, including family ones. The ideology of managing demographic processes aimed at achieving quantitative goals with the help of financial instruments and the promotion of ideal behavioral patterns becomes predominant in the state's demographic policy. There is also a sharp increase in the conservative family ideology, which involves the restoration of traditional attitude towards the family as an institution on which the state is based. Pronatalism is declared the basis of a broad social policy (generally speaking, an unprecedented decision for the entire post-imperial history of Russia), which is supported by increasing budgetary investments. For the first time since 1917, the Church and religious fundamentalism play almost the main role in the formation of family ideology, of family and social policy in general (Knorre 2018). This is undoubtedly the most significant feature of the current stage of its evolution, which distinguishes it from the Soviet experience (Vishnevsky 1992; Ivanov, Vishnevsky, Zakharov 2006; Chernova 2012; Selezneva 2018; Zakharov 2018a).

In 2006-2007 in Russia, a policy of active state pronatalism was launched (in official documents referred to as "fertility stimulus policy"). In order to assess the first results of fifteen years of active demographic policy in Russia, let us turn once again to the two-dimensional representation of the dynamics of fertility that we have already used above – as viewed through changes in the total fertility rate for conditional generations (calendar years) and in the completed fertility for real generations.

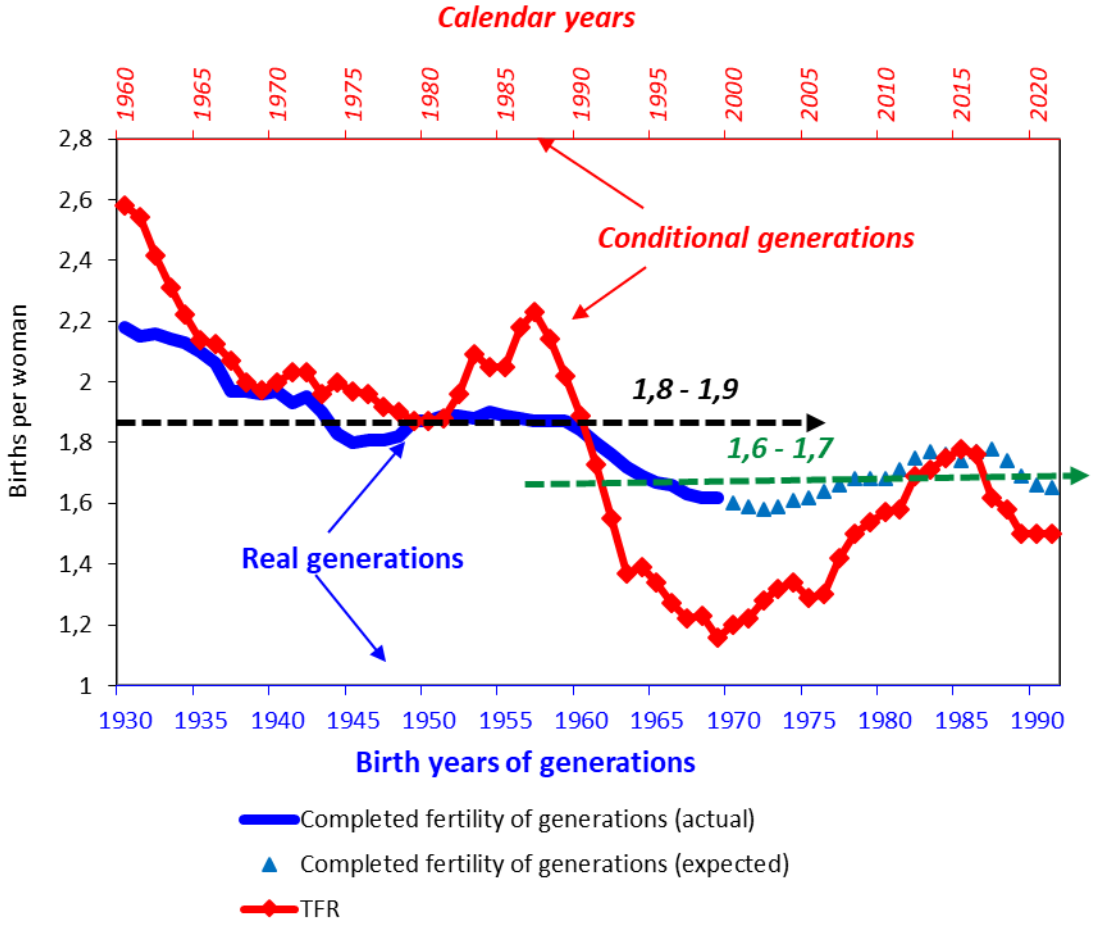
Figure 2 shows the changes in Russian total fertility rates over the period from 1960 to 2021 (60 years is the length of two demographic generations), in the context of which it is possible to assess the significance of shifts in its quantum in recent years, including possible results of the fertility stimulus policy.

First, it should be noted that in the last two or three decades, Russia has reached a new plateau with relatively stable fertility: indicators around 1.8-1.9 births per woman have been replaced by indicators in the region of 1.6-1. 7. Thus, the generations born in the mid-1960s and later produced an average of 0.1-0.2 fewer births per woman than their mothers. On the other hand, there is reason to hope that Russia has passed the historical minimum of fertility (1.58-1.59 births per woman in the cohorts born in the early 1970s). In any case, the generations born in the 1980s showed some increase in completed fertility and overcame the bar of 1.7 births per woman.

Secondly, even if we attribute the entire recorded increase in Russia's completed fertility to the results of a special policy to stimulate fertility, the achievements will still be very modest:

1.73 (average for female cohorts born in 1980-1989) - 1.63 (average for female cohorts born in 1970-1979) = 0.1 births per one woman. The prospect of increasing fertility indicators in the coming years seems to be quite doubtful, since after 2015 we observe a significant decrease in PTFR with a return to the value of 1.5 in 2019-2021 (the level of 2008). Consequently, the recorded increase in the completed fertility of the cohorts may be the final and insignificant estimate of the maximum demographic effect of the pro-natalist policy in modern Russia. In fact, this is a repetition of the demographic result of the policy of the 1980s (see also an analysis involving the probabilities of an increase in family size for each birth order (Zakharov 2016; Zakharov 2019)).

Figure 2. **Total fertility of conditional (for calendar years) and real (by year of birth of women) generations: calendar years 1960-2021, generations born 1930-1991, births per woman by age 50**



Note: Preliminary estimate for cohorts born after 1971 and not yet having completed their childbearing, assuming the age-specific fertility rates observed in 2021.

Source: Author's estimates provided in (Zakharov 2006a: 157) and author's calculations based on Human Fertility Database (https://www.humanfertility.org/cgi-bin/main.php) and Rosstat's unpublished annual vital statistics reports.

Thirdly, in our opinion, the estimated average increase in the completed fertility of real generations cannot be attributed entirely to the pronatalist policies that started after 2006. The rate of childbearing began to gradually rise before the introduction of any stimulus measures and even before society was informed of their possible introduction (Figure 2). Therefore, it is reasonable to assume that the policy only strengthened/accelerated the upward trend in fertility.

A more responsible maximum estimate of the policy effect would be 0.07-0.08 births per woman. But even this value, very likely, overestimates the direct effect of such measures of "demographic policy" taken at the federal and regional levels: the "maternity" capital, all types of cash benefits and other programs, including propaganda. Still, it cannot be denied that both total and disposable income of the population increased for some time in the 2000s, which allowed Russians to be more optimistic about the prospects for forming families. At present, however, the potential inherent in an optimistic attitude towards socio-economic changes seems to be drying up, just as hopes for a rapid growth in the well-being of Russians who survived the 2020-2021 COVID pandemic and now face even more difficult and uncertain years of political and economic crisis are growing increasingly dim.

General conclusions from the analysis of the historical process and a forecast of the total fertility rates for real and conditional generations for the foreseeable future

The decline in fertility of real generations in Russia has been steady for almost the entire duration of the demographic transition. A certain deviation can be found only in the cohorts born in 1890-1895. In contrast, fertility for conditional generations (the period total fertility rate) showed high fluctuations against the background of a general downward trend. Fluctuations in indicators for conditional generations caused by the specific features of certain periods (catastrophic changes in the socio-economic environment and/or state intervention in the demographic sphere) reflect, first of all, strong shifts in the birth calendar. The sharp declines and subsequent, no less dramatic, compensatory booms reflect instantaneous changes in the rate of family formation as a reaction to volatile external circumstances, but mask the general trend of fertility evolution. In Russia throughout the 20th century, there were five cases of a significant deviation of the total fertility rate of conditional generations (for calendar years) from the trend of the completed fertility for real generations: three due to catastrophes and two to state family policy.

The transition to low fertility in Russia was largely accelerated by a continuous chain of social cataclysms that accompanied the accelerated modernization of society. The point is not only that during crises the standard of living of the population fell, but also that during these periods experience of individual birth control became widespread more efficient. The reproductive behavior of Russians constantly adapted to the changing reality, and not always of their own free will - that is, sometimes by force. The need for frequent changes in the timing of births and marriages gave rise to specific measures of state intervention in birth control at the individual and family level. Unfortunately, in Russia this resulted in a mass spread of abortion. The decree of the Communist Party Central Executive Committee and the Council of People's Commissars of the USSR of 1936, which banned abortion at a woman’s request, was in many ways a naive attempt by a totalitarian state to reverse the trend towards declining fertility, to “correct” the demographic situation after the crisis caused by the “Great Turnaround”. We estimate its effect in raising period total fertility rate in 1937 at no more than 8%. In terms of the completed fertility of real generations, the role of this factor is apparently zero, and comes down to shifts in the calendar of births among women caught off guard by the new circumstance.

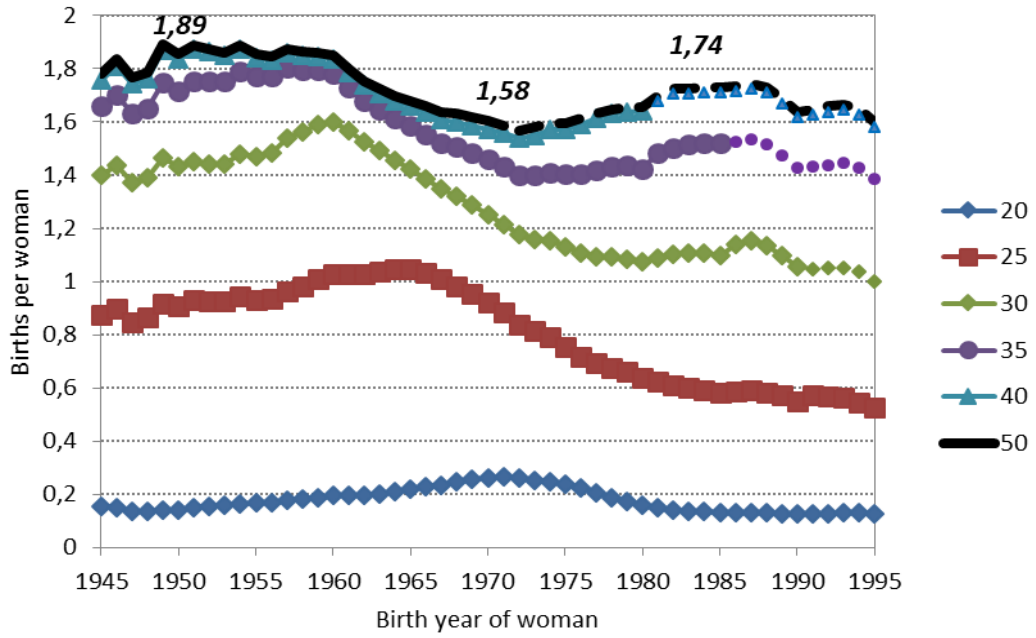
The state’s efforts to improve the demographic situation in the post-transitional 1980s were also ineffective, with not only very weak demographic results, but also negative socio-demographic consequences, including a decrease in the age of motherhood and a decrease in intergenetic intervals. The disruption of the birth timing as a whole appears to be a very serious

problem, since it initiated the subsequent compensatory collapse in the frequency of childbearing in the 1990s.

Since the mid-1990s, the evolution of fertility has entered a new phase. Cohorts born in 1970 and later behave differently in the matrimonial and reproductive sphere than their predecessors. These differences are less evident in relation to the overall level of completed fertility and more evident in structural changes in the Russian pattern of childbearing. Generations born in the 1970-1990s are changing the age profile of fertility and the timing of births, both in response to changes in the economic and political environment, including changes in family and demographic policies, and, more importantly, under the more general influence of long-term, fundamental changes in society in the post-industrial era. Thus, mass shifts in educational strategies inevitably entail a transformation in the age profile of marriage and childbearing.

The impact of the current policy of the Russian Federation to stimulate fertility, which began after 2006, is hardly more than 0.07-0.08 births per woman in terms of the completed fertility of real generations.

Figure 3. Average number of births by age 20, 25, 30, 35, 40 and 50 for cohorts of women born in 1955-1994: actual and expected values assuming the rate of change with age in fertility rates observed in 2019-2021.



Source: Data presented in Table 3 and author's calculations and estimates based on unpublished data of Rosstat's Annual Reports on vital statistics.

For the next one or two decades, it is quite likely that the average level of fertility in Russia will fluctuate within the range of 1.4-1.8 births per woman of the conditional generation, and within the even narrower range of 1.6-1.75 births per woman for generations born in the second half of the 1980s and first half of the 1990s (Figure 3): in 2022, these cohorts were aged 27 to 37 years, i.e. were in the process of active childbearing. Despite possible changes in the economic and socio-political conditions of their life in the coming one or two decades, based on fertility trends over the past few decades the variation in expected reproductive outcomes will remain

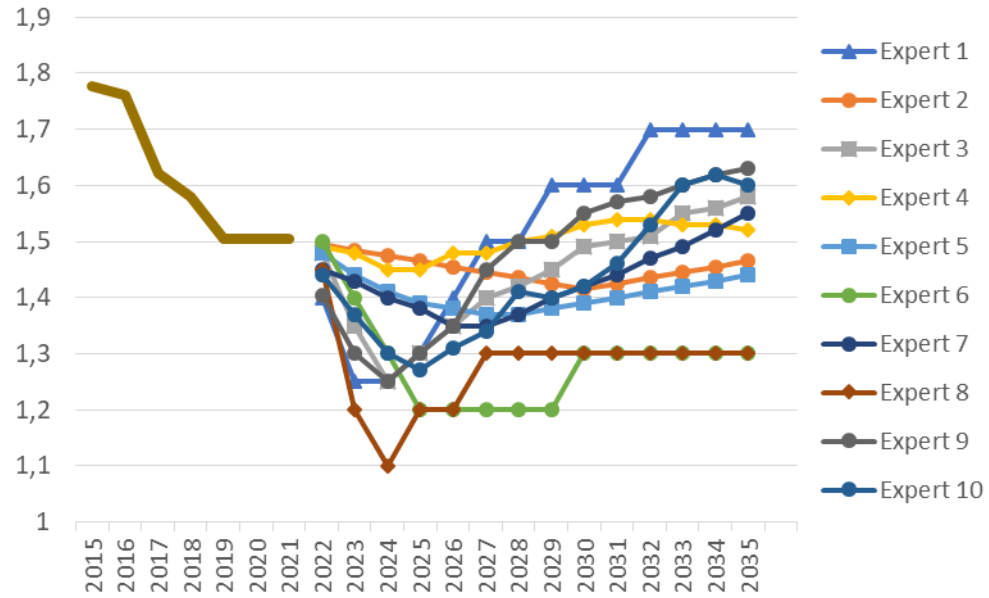
within the above limits. This view of the prospects for Russian fertility is apparently supported by other Russian demographers (Arkhangelsky, Zinkina, Shulgin 2019).

Given the extreme uncertainty of changes in the socio-political and economic conditions of Russians in the coming years, we were forced to resort to heuristic, intuitive procedures for assessing the PTFR trend for the coming decades, primarily to determine the minimax boundaries of the possible variation of the indicator.

We asked 10 experts from among the most professionally trained demographers representing several research centers in Moscow to independently (without a collective discussion of the task and results) present their expected TFR trajectories for the foreseeable future – up to 2035. Results of the expected annual dynamics are shown in Figure 4.

What is striking is the fairly significant spread of expected values, especially for the next few years, which once again emphasizes the high degree of situational uncertainty in the country. At the same time, among the experts there is unanimous denial of the possibility of maintaining the TFR at the 2021 level, and even more so of the possibility of increasing the indicator in the next three to four years. The only question is whether the PTFR will fall to the level of 1.1-1.2 births per woman, or whether the fall will be more moderate - to 1.4.

Figure 4. PTFR changes: actual changes in 2015-2021 and predicted ones in 2022 - 2035 according to 10 Russian experts interviewed by the author in August 2022



Source: Survey data by the author.

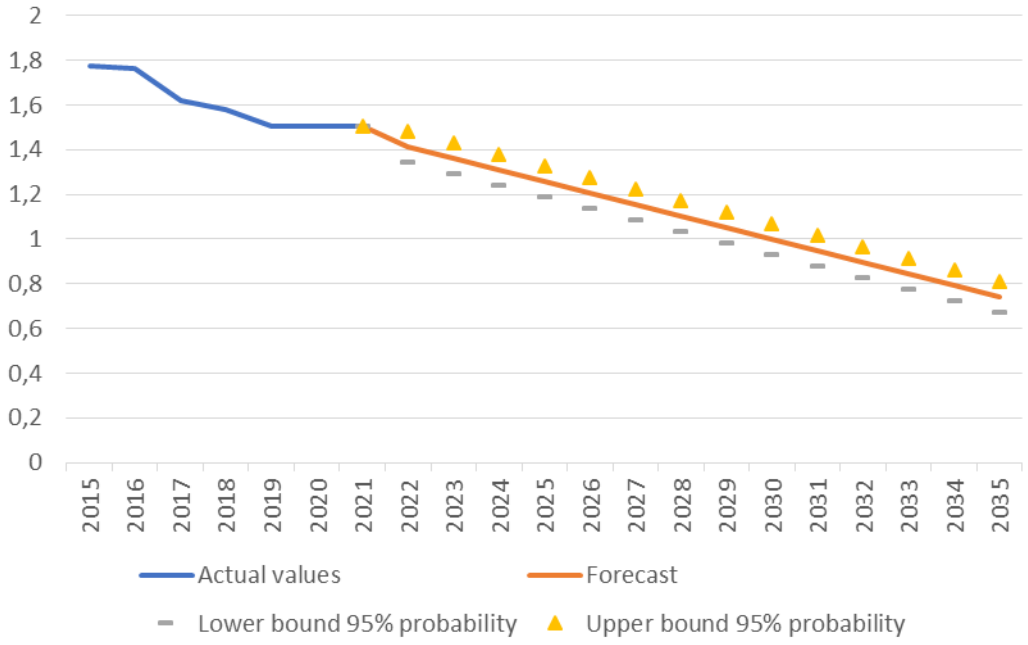
The pessimism of demographers is reinforced by the pessimistic forecasts of many serious economists, which there are more grounds to trust than the cheery optimism of others. Even if it is possible to nominally maintain the existing system of financial and economic support for Russian families, it can hardly be expected to have a stimulating effect on fertility during a comprehensive crisis.

We also present the results of forecasting based on exponential smoothing, a very common method built into the MS Excel program as a standard function. Continuation of the trend that emerged after 2015, even with a three-year stagnation of the PTFR at the level

of 1.5 in 2019-2021 (the method gives higher weights to the most relevant values) leads to a rapid decline in the indicator, and by 2025-2026 the PTFR could reach 1.2 (Figure 5), which corresponds to the intuitive ideas of half of the experts surveyed. A decline to even lower levels, as predicted by the model, seems unlikely, although the world has already experienced a PTFR descending to 0.8 or even lower in some years in eastern Germany, in a number of provinces in Italy, in countries of South-East Asia, and in Russian cities.

At the same time, none of the statistical and mathematical methods can predict a compensatory growth of the PTFR, which would return the normal rate of family formation and whose inevitability is predicted by historical experience. Therefore, when modeling the process of a post-crisis reversal of the PTFR, one must turn to analogues in the past, which are well documented for many countries, not excluding Russia.

Figure 5. PTFR forecast by exponential smoothing based on dynamics of the indicator's values in 2015-2021



Source: Author's calculations.

Thus, a decrease in PTFR in 2022-2025 (according to some experts, until 2027) is the most likely prospect. This decline will be followed by a return to the level of 1.5-1.7 births, bringing this period indicator of total fertility in line with the expected value of the completed fertility of real generations. The duration of the period of compensatory growth (and the rate of this growth) can vary, as reflected in the variety of trajectories proposed by experts.

In truth, we are ill-equipped today to foresee the ideal quantitative model of family and fertility that will prevail among future generations. But what we already know for sure is that in their demographic behavior, people will rely very little on the "traditional values" of past, pre-transition eras. When making decisions about having children, they will be guided by their own ideas about the hierarchy of life values, among which materialistic values, quite possibly, will not play a dominant role. This implies that the state is limited in its ability to influence the quantitative parameters of fertility through targeted monetarist policy. It is also clear that the individual will be much more effective than ever before in history in "tuning" his calendar of demographic events in response to changing specific and diverse life circumstances.

And the basis for this is the rapid development of high technologies of family planning and reproduction, which are becoming widely available and which are not limited to contraceptive protection, but allow the individual to freely spread out reproductive events in time, depending on personal preferences. While sociological study of these personal perceptions by public opinion polls (Churilova, Zakharov 2019; VTsIOM 2021; Vinogradova 2023) or qualitative methods (Yarskaya-Smirnova 2010; Chernova 2011; Borozdina, Zdravomyslova, Temkina 2014) as yet gives no grounds to expect the Russian fertility model to shift significantly towards one-child families or even childlessness, as the alarmists persistently warn of, there is also little reason to expect the kind of general shift to large families which optimistic promoters of state pronatalist policies would like to see.

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Appendices

Appendix 1. *Sources of data and methods for obtaining continuous series of estimates of total fertility rates of real and conditional generations*

The series of total fertility rates for conditional generations (PTFR) is formed on the basis of:

- published and unpublished estimates made by the team from the Department of Demography of the Research Institute of Goskomstat of the USSR/RF in the 1990s as part of a special project on the reconstruction of demographic processes in the USSR and Russia in the 20th century (Andreev, Darsky, Kharkova 1990; 1993; 1998), kindly provided in full by the authors;
- for certain periods (World War I, The Civil War, The Great Patriotic War), we made our own estimates based on the available archival data on the number of births, official and author's estimates of total fertility rates for certain groups of territories with registration of demographic events (also taking into account the well-known estimates made by A.Ya. Boyarsky, R.I. Sifman, and B.Ts. Urlanis);
- we used a set of reference points at the time of population censuses for which the PTFR values could be controlled in different ways: a) based on the age ratios of "Children/Mothers" groups – the methods of J. R. Rele and W. Bras (Rele 1967; UN 1983) implemented in the MORTPAK Software package for demographic measurement (United Nations DESA Population Division); b) using regression equations linking A. Ansley J. Coale's fertility indices with PTFR (Zakharov 1994). Annual assessments of the PTFR between reference points were estimated by us on the basis of the growth rate of the annual number of births/total fertility rates obtained independently (see below);
- in order to obtain consistent relationships, in some cases we had to harmonize the PTFR estimates obtained by the team from the Department of Demography of the Research Institute on Statistics of Goskomstat of the USSR/RF with our own estimates of the PTFR for the war years and our estimates of the completed fertility for real generations, obtained independently;
- From 1970 to the present, the author has used HFD data and made his own calculations based on initial and not processed Rosstat data.

The series of total fertility rates for real generations of women born before 1930 is formed as follows:

- The initial data were our estimates of a continuous series of annual numbers of births, obtained in the 1990s in the framework of joint projects with colleagues from the French National Institute for Demographic research (L'Institut national d'études démographiques, INED) (Blum, Ely, Zakharov 1992; Adametz, Blum, Zakharov 1994; Blum et al. 1995);
- data for the Imperial period of Russia, collected and analyzed by A.G. Vishnevsky (Vichnievski 1992), estimates for the Soviet period of the team from the Department of Demography of the Research Institute on Statistics of Goskomstat of the USSR/RF (Andreev, Darsky, Kharkova 1990; 1993; 1998), our own estimates based on specially harmonized complete population census data for the years 1897, 1926, 1937, 1939, 1959, 1970, 1979, 1989 (models of intercensal survival functions (Adametz, Blum, Zakharov 1994) were used for harmonization);

- based on the ratio of the numbers of births in the "parent generations" and "child generations" divided by the number of years, conditionally taken as the length of a generation (iterative experiments were carried out with different lags in the number of years in the range from 28 to 32), we obtained estimates of the net replacement rate of generations (Blum, Zakharov 1997; Zakharov 2003);
- We independently reconstructed a historical series of infant mortality rates (Zakharov, Revich 1992; Zakharov 1996), which were transformed into a historical series of probabilities of a woman surviving to the average age of motherhood based on a regression model, using the empirical fact of low historical variability of the proportional contribution of infant mortality to the probability of women surviving to the average age of motherhood (Zakharov 1996);
- indicators of the completed fertility of real generations were obtained from estimates of the net replacement rates of generations and estimates of the infant mortality rate for these generations;
- final estimates were obtained as part of the harmonization procedure with estimates of age-specific fertility rates obtained in parallel for real generations and independently obtained estimates for conditional generations (see above); also used in this procedure were estimates of the completed and age-specific fertility of generations based on a sample study of the USSR Central Statistical Administration in 1960 (Sifman 1974) and five comprehensive follow-up surveys on the number of children born within the framework of population censuses in 1979 and 1989 and micro-censuses in 1985 and 1994.

The series of completed fertility rates for real generations of women born from 1930 to 1963 is formed on the basis of:

- results of the 1979 and 1989 population censuses (answers to the question about the number of children born, distributed by one-year age groups of women) and calculations of fertility rates for one-year groups based on the initial birth registration data of Rosstat;
- the transition from age to cohort coefficients (obtaining horizontal parallelograms on the Lexis grid) was carried out according to the simplest scheme of averaging the coefficients for neighboring age groups without making any corrections.

The series of completed fertility rates for real generations of women born since 1964 and later is formed on the basis of:

- calculations of age-specific fertility rates transformed into cohort ones (see above) based on the initial birth registration data of Rosstat;
- for generations censored from the “right” who, due to their age, have not yet completed childbearing by the time of observation (at the time of updated Rosstat data for the latest available year), the expected value of the completed fertility is obtained as the sum of two components: of actual accumulated fertility at the time of observation and of the fertility expected providing that the age-specific fertility rates recorded in the last observed year are unchanged (for 2021 for the indicators presented in the article and below in Appendix 2).

Our estimates of the fertility of real generations, presented in Appendix 2, may differ slightly from the estimates for Russia contained in the international HFD database (primarily for women born in 1944-1963) due to a slightly different techniques for obtaining them. In our approach, data from the 1979 and 1989 censuses are more important, and we also used simplified

procedures for converting period age-specific indicators into cohort ones.

Appendix 2. Total fertility rates of real and conditional generations in Russia: female cohorts born in 1841-1991, calendar years - 1896-2021, births per woman by age 50

Real generations		Conditional generations	
Birth years of women	Cohort Total Fertility Rate	Calendar year	Period Total Fertility Rate
1841	6.81	1871	…
1842	6.84	1872	…
1843	6.79	1873	…
1844	6.85	1874	…
1845	6.90	1875	…
1846	6.89	1876	…
1847	6.89	1877	…
1848	6.86	1878	…
1849	6.88	1879	…
1850	6.96	1880	…
1851	7.03	1881	…
1852	7.03	1882	…
1853	7.08	1883	…
1854	7.13	1884	…
1855	7.12	1885	…
1856	7.16	1886	…
1857	7.09	1887	…
1858	7.09	1888	…
1859	7.10	1889	…
1860	7.11	1890	…
1861	7.13	1891	…
1862	7.09	1892	…
1863	7.10	1893	…
1864	7.10	1894	…
1865	7.15	1895	…
1866	7.15	1896	…
1867	7.16	1897	7.50
1868	7.22	1898	7.28
1869	7.24	1899	7.37
1870	7.22	1900	7.37
1871	6.96	1901	7.15
1872	6.94	1902	7.33
1873	6.98	1903	7.18
1874	6.97	1904	7.25
1875	6.97	1905	6.71
1876	6.95	1906	7.01
1877	6.97	1907	7.07
1878	6.89	1908	7.45
1879	6.80	1909	7.12
1880	6.64	1910	7.20
1881	6.60	1911	7.21
1882	6.44	1912	7.03
1883	6.20	1913	6.97
1884	5.93	1914	6.90
1885	5.81	1915	3.41
1886	5.65	1916	5.19
1887	5.55	1917	5.05
1888	5.42	1918	5.71
1889	5.40	1919	3.49

Real generations		Conditional generations	
Birth years of women	Cohort Total Fertility Rate	Calendar year	Period Total Fertility Rate
1890	5.45	1920	6.69
1891	5.51	1921	4.71
1892	5.53	1922	6.03
1893	5.53	1923	6.51
1894	5.50	1924	6.73
1895	5.46	1925	6.80
1896	5.39	1926	6.73
1897	5.35	1927	6.65
1898	5.23	1928	6.53
1899	5.14	1929	6.20
1900	5.04	1930	5.78
1901	4.89	1931	5.61
1902	4.73	1932	5.04
1903	4.59	1933	4.07
1904	4.45	1934	3.59
1905	4.28	1935	4.26
1906	4.07	1936	4.55
1907	3.88	1937	5.05
1908	3.70	1938	4.99
1909	3.46	1939	4.88
1910	3.21	1940	4.25
1911	3.01	1941	4.63
1912	2.88	1942	2.98
1913	2.81	1943	1.72
1914	2.73	1944	1.75
1915	2.66	1945	1.91
1916	2.59	1946	2.81
1917	2.53	1947	2.94
1918	2.46	1948	2.61
1919	2.40	1949	3.20
1920	2.33	1950	2.89
1921	2.27	1951	2.92
1922	2.26	1952	2.87
1923	2.25	1953	2.74
1924	2.24	1954	2.96
1925	2.23	1955	2.83
1926	2.22	1956	2.71
1927	2.21	1957	2.74
1928	2.21	1958	2.69
1929	2.20	1959	2.63
1930	2.18	1960	2.58
1931	2.15	1961	2.54
1932	2.16	1962	2.42
1933	2.14	1963	2.31
1934	2.13	1964	2.22
1935	2.10	1965	2.14
1936	2.06	1966	2.12
1937	1.97	1967	2.07
1938	1.97	1968	2.00
1939	1.96	1969	1.97
1940	1.97	1970	2.00
1941	1.93	1971	2.03
1942	1.95	1972	2.03
1943	1.90	1973	1.96
1944	1.83	1974	2.00

Real generations		Conditional generations	
Birth years of women	Cohort Total Fertility Rate	Calendar year	Period Total Fertility Rate
1945	1.80	1975	1.97
1946	1.81	1976	1.96
1947	1.81	1977	1.92
1948	1.82	1978	1.90
1949	1.87	1979	1.87
1950	1.87	1980	1.87
1951	1.89	1981	1.88
1952	1.89	1982	1.96
1953	1.88	1983	2.09
1954	1.90	1984	2.05
1955	1.89	1985	2.05
1956	1.88	1986	2.18
1957	1.87	1987	2.23
1958	1.87	1988	2.14
1959	1.87	1989	2.02
1960	1.84	1990	1.89
1961	1.80	1991	1.73
1962	1.76	1992	1.55
1963	1.72	1993	1.37
1964	1.69	1994	1.39
1965	1.67	1995	1.34
1966	1.66	1996	1.27
1967	1.63	1997	1.22
1968	1.62	1998	1.23
1969	1.62	1999	1.16
1970	1.60	2000	1.20
1971	1.59	2001	1.22
1972	1.58	2002	1.28
1973	1.59	2003	1.32
1974	1.61	2004	1.34
1975	1.62	2005	1.29
1976	1.64	2006	1.30
1977	1.66	2007	1.42
1978	1.68	2008	1.50
1979	1.68	2009	1.54
1980	1.68	2010	1.57
1981	1.71*	2011	1.58
1982	1.75*	2012	1.69
1983	1.77*	2013	1.71
1984	1.76*	2014	1.75
1985	1.74*	2015	1.78
1986	1.77*	2016	1.76
1987	1.78*	2017	1.62
1988	1.74*	2018	1.58
1989	1.69*	2019	1.50
1990	1.66*	2020	1.50
1991	1.65*	2021	1.50

*Note: * - Preliminary extrapolation estimate taking into account data on births up to and including 2021. Since the trend of age profile aging and growth fertility rates at older ages is likely to persist in the coming decades, the 1985-1991 cohorts, who by 2022 were in their thirties (i.e., reproductive ages), still have a chance to slightly raise our estimates based on the current situation by their 50s. However, these potential additions are unlikely to exceed 0.05 for these cohorts.*