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Three Decades on Russia's Path of the Second Demographic Transition: How Patterns of Fertility are Changing Under an Unstable Demographic Policy*

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Abstract: This study aims to highlight the changes in fertility patterns of Russians which occurred after the USSR's dissolution or disintegration, taking a long historical perspective. After that disruption, thirty cohorts were born and raised who never lived under the Soviet system. Fifteen more cohorts (those who were born between 1975 and 1990) remember that system only as a part of childhood, but their adult life started after the iron curtain had fallen and a flood of new ideas and practices spilled into all spheres of life.

At the same time, the increased concern among the Russian elite about the declining population and low birth rates led to the adoption of a pronatalist family policy based on monetarist approaches reinforced by conservative-traditionalist ideology.

Our main research question asks: To what extent did state social and family policies in Russia, which are based on the ideology of traditionalism and conservatism, derail or slow down the modernization of the quantitative and structural parameters of fertility patterns within the Second Demographic Transition context?

Our analysis is based on indicators from period and cohort fertility tables, specific for age and parity. Extrapolations are used for Russia's female cohorts born 1971-1994 to arrive at expected ultimate fertility outcomes.

Our evidence, obtained from the comprehensive analysis of fertility tables, reveals that the transformation of the Russian fertility model continues to be in line with the Second Demographic Transition common to developed countries, and that two decades of active pronatalist policy in the context of strengthening the conservative family ideology did not stop the modernization of fertility patterns.

Keywords: Russia · Period and cohort fertility · Parity progression · Second Demographic Transition · Pronatalist policy

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1 Introduction

In the first three decades following the end of the era of communism in its Soviet socialist form, there were tremendous changes in the political, economic, and social life of people in Russia. The most substantial changes in the patterns of family formation and fertility happened in Russia when a sharp improvement in life satisfaction indices took place in 1995-2008 (*Inglehart* 2018: 164). The so-called value revolution and the revolution of young people's aspirations in their well-being, professional, and social status were confidently revealed in regular sociological surveys conducted from the 1980s to the 2010s (*Magun/Engovatov* 2006).

Young people in that period received previously unknown opportunities for the rapid accumulation of human capital (*Kapeliushnikov* 2011). The level of education in the Russian population was high even in the Soviet period, but since the early 1990s, the expansion of education has assumed an explosive character. Tertiary education, including university-level education, has become the most widespread, as a result of which today Russia's population has one of the highest educational levels in the world. In 2015, in the age group 25-29 years, 40 percent of men and 57 percent of women had higher (university and above) education (*Microcensus* 2015). Based on projections by 2030, these figures will increase by another 5 percentage points. Russian youth practically do not know what unemployment is, which is facilitated by the small size of cohorts starting work, and the premium for higher education was quite stable; in 2000-2015 it did not fall below 50 percent, supporting the demand for vocational education (*Gimpelson/Kapeliushnikov* 2018).

Not surprisingly, such dramatic changes are accompanied by transformations in their sexual, contraceptive, marital and reproductive behaviors, healthy lifestyles, etc., which become more individualized, with a wider choice of strategies (*Golod* 2005; *Zakharov* 2007a; *Blum et al.* 2009; *Troitskaia et al.* 2009; *Denisov et al.* 2012; *Puur et al.* 2012; *Mitrofanova* 2013; 2019, 2020; *Biryukova/Tyndik* 2015; *Vishnevsky et al.* 2017; *Zakharov/Mitrofanova* 2018; *Radaev* 2020; *Andreev et al.* 2022). As a result "Fertility has become 'derivative'. Young people do not have well-defined fertility targets when they begin conjugal life: whether they have children or not, have them early or late, when they are married or before, it all depends on a sequence of decisions made when various options present themselves" (*van de Kaa* 2004: 8).

At the same time, the changes in Russia were not unidirectional or consistent. Moreover, the vector of changes in politics, in institutional reforms of the economic and social sphere, in the living standards of households, has changed several times not only for reasons of internal necessity and as a result of the action of objective forces, but also for subjective reasons, including the changing ideological paradigms and guidelines for the development of society, which were offered by opposing groups of elites who succeeded each other in power. To understand the scale of variability in the situation concerning every citizen in Russia, it is enough to point out that the period of transition to a free market economy, which actively occurred between 1991 and 2004, was immediately followed by a period of transition to autarkic state-monopoly capitalism (*Djankov* 2015; *Åslund* 2019). Social and family policy, moving in the first decade toward liberation from the principles of state

paternalism and acquiring a more liberal attitude towards the family, marriage and partnerships (*Ivanov et al.* 2006), today has firmly taken the ideological positions of Orthodox conservatism with clericalism as a cementing link, proposing pronatalism as the main core of family policy and the entire population policy in general (*Rivkin-Fish* 2010; *Chernova* 2012; *Selezneva* 2017; *Frejka/Gietel-Basten* 2016; *Zakharov* 2018; *Rakhimova-Sommers* 2019; *Kazimov/Zakharov* 2021; *Russkikh* 2021; *Cook et al.* 2022; *Blum/Zakharov* 2023).

Over the last two decades, state intervention in private life has greatly increased in Russia (*Makarychev/Medvedev* 2015; *Rakhimova-Sommers* 2019). Demographic policy became a part of a larger plan for the control of industry, labor, culture, society and family by state institutions and their affiliated agencies. In his presidential address to the Federal Assembly in January 2020 Putin assured the nation that "Russia's destiny and its historic prospects depend on how numerous we will be."[1] Post-Communist Russia under Putin attempts to re-patriarchalize gender and family through a number of pronatalist and pronuptialist state initiatives closely connected to nationalist goals (*Rivkin-Fish* 2010; *Chernova/Shpakovskaya* 2021; *Cook et al.* 2022). For the first time in a long while, Russian political rulers have taken the liberty of setting goals, within a set timetable, for defined quantitative parameters of fertility, mortality, migration and population change in general. The Russian government has never before openly declared a pronatalist policy in such a directive form, and has never taken the full responsibility for the growth of the population; neither in the days of the Empire, in Stalin's time, in Khruschev's time, nor in the late Soviet/Brezhnev era. Previously, pronatalism was presented only in a latent form in Russian social and family-oriented policy (*Zakharov* 2018). The Orthodox Church, moreover, does not remain on the sidelines. The participation of the Church in the development of Russia's demographic policy is very significant, as is its influence in the wider context of family, social, ethnic and cultural policies (*Freese* 2017; *Knorre* 2018).

Putin's predecessor Boris Yeltsin, the first president of the new Russia, rarely touched upon Russia's demographic problems in his speeches, even though one of the charges during his failed impeachment as President in 1999 was "genocide of the Russian people" which referred to pronounced negative natural growth. In his annual presidential addresses to the Federal Assembly in 1994-1999, Yeltsin only minimally noted the problem of high mortality and the aging of the population in Russia, but did not mention the problem of low birth rates. And yet his 1996 address, "Russia for which we are responsible," contains the following statement, reflecting the attitude of the Yeltsin administration to the problem of state control of human behavior: "The experience of Russian history forces us to abandon utopian social engineering, which sets a fictitious, unrealizable goal, and then brings the lives and destinies of people as a sacrifice to its implementation ... any passion for social engineering inevitably leads to the fact that at first they pretend that everything is going according to plan, and then they begin to silence, imprison,

1 http://kremlin.ru/events/president/news/62582

expel and shoot everyone who had the imprudence to doubt this."[2] Also in 1996, Yeltsin signed a presidential decree on the fundamental directions of state policy for the family. The decree stressed the need for the state to provide the conditions necessary for families to realize their quality-of-life goals. State family policy would not regulate familial behavior through economic, legal and ideological measures but rather provide support for the choices of families, which were otherwise to be seen as independent and autonomous in decision-making with respect to their own development. Also emphasized in the decree was the principle of "equality between men and women in achieving a more just division of familial duties, as well as in the potential for self-realization in the working world and in public life."[3]

In our earlier works, in which we relied on demographic data and facts that characterized social changes in the first ten to fifteen years of the post-communist transition period with its liberal approach to family policy, we drew conclusions about the beginning of profound changes in families, marriage and fertility associated with signs of the Second Demographic Transition (SDT), which we were able to see in Russia only after the collapse of the Soviet system, and with a corresponding delay, compared to Western countries (*Zakharov/Ivanova* 1996; *Zakharov* 1999, 2000, 2007a, 2008). Some authors supported our conclusions with the results of their research (*Philipov/Jasilioniene* 2008; *Hoem et al.* 2009; *Eberstadt* 2010; *Potârcă et al.* 2013); others expressed doubts, starting from the idea that the low level of well-being in Russia does not contribute to the growing attitudes in favor of self-expression and choice of life paths (see e.g.: *Billingsley* 2010; *Perelli-Harris/Gerber* 2011).[4] The discussion about Russia's right to move along the path of the SDT is in many ways reminiscent of the discussion that took place at the same time about the validity of the SDT process for the United States (*Lesthaeghe/Neidert* 2006).

Now, a few decades later, in the context of changing milestones in the economy and politics, it is time to look at the shifts that have taken place to assess the extent to which the Russian population retains the most general regularities in the transformation of fertility patterns (*"postponement transition"*, see: *Kohler et al.* 2002, 2006; *Sobotka* 2017) that constitute the Second Demographic Transition. It is time also to continue our critical assessment of the pro-natalist policy that started fifteen years ago and was supported by the state with both constant energy in propaganda and increased financial incentives for the birth of children (see previous works: *Frejka/Zakharov* 2013; *Zakharov* 2016). To what extent did state social and family policies in

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2 http://www.intelros.ru/strategy/gos_rf/psl_prezident_rf_old/73-poslanie_prezidenta_rosii_borisa_elcina_federalnomu_sobraniju_rf_rossija_za_kotoruju_my_v_otvete_1996_god.html

3 http://www.zakonprost.ru/content/base/7042. For more details about historical experience of Russia in family policies issues, see *Ivanov et al.* 2006; *Zakharov* 2018.

4 Economic difficulties have been given a major role in explaining the transformation of fertility patterns in the CEE countries and Russia, especially in their early stages of societal and economic change; see, for example: *Macura* 1997; *Kohler/Kohler* 2002; *Philipov/Dorbritz* 2003; *Barkalov* 2005; *Rieck* 2006. Moreover, at that time, the researchers thought that Russia would remain for a long time among the countries with "lowest low fertility" settings (*Kohler et al.* 2006). For a more general and recent discussion of the explanatory powers of the SDT theory and a "pattern of disadvantage" thesis, with related comments, see *Lesthaeghe* 2020.

Russia, which are based on the ideology of traditionalism and conservatism, derail or slow down the modernization of the quantitative and structural parameters of fertility patterns within the SDT context?

Our analysis is based on the increment-decrement age- and birth-order–specific period and cohort fertility tables. Extrapolations are used for Russia's female cohorts 1971-1994 to arrive at expected ultimate fertility outcomes. The analytical sections of the article are structured as follows: In the first part, we describe the databases used, as well as our main analytical tool. The second part is devoted to a detailed analysis of the transformation of fertility patterns with special emphasis on the age and birth-order profiles, including changes which could be attributed to pronatalist family policy. The final part contains the study's main conclusions. It also discusses the prospects for fertility in the context of Russia's political situation and the limitations of the data and methods used.

2 Data and methods

The annual statistics of women who had a live birth distributed by age and birth order, which are routinely collected and tabulated by the Federal State Statistics Service (Rosstat), are the starting point for our analysis. We used the internationally harmonized and regularly updated Human Fertility Database (HFD),[5] which, on the basis of a special agreement, received initial vital statistics data directly from Rosstat. The HFD also contains estimates of indicators and characteristics of fertility covering Russia during the period 1959-2018 and female cohorts born 1944-1978, including increment-decrement age- and birth-order-specific period and cohort fertility tables. These are life tables which model the process of childbearing in synthetic (period) or real female cohorts, and provide the most reliable basis for comparative studies of differences in fertility over time and space.

The quality of Russia's data, despite the presence of certain but not critical problems, is assessed by HFD experts as quite satisfactory in general, and is recommended for wide use, which is documented in detail in the corresponding protocol (*Andreev et al.* 2020).

In preparing this article, we supplemented the data series with the latest final data for 2019-2021, which are not published by Rosstat, and have not yet been processed in the HFD, but were provided to the Institute of Demography at the Higher School of Economics (Moscow) for analytical purposes by Rosstat officials.[6] Based on these data we computed age- and birth-order-specific period fertility life-tables for 2019-2021, which were easily harmonized with the historical series presented in the HFD.

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5 Human Fertility Database. Max Planck Institute for Demographic Research (Germany) and Vienna Institute of Demography (Austria). Available at www.humanfertility.org; see also: (*Jasilioniene et al.* 2015, 2016).

6 The author performed the calculations with the right to publish the results when he worked for the HSE Institute of Demography.

Previously, we proposed a simple approach to the construction of cohort age- and order-specific fertility tables for cohorts who have not yet exceeded childbearing age (*Zakharov* 2015: 124-128). It is based on modeling the rate of change with age in the probability for women over 25 years old to give birth to another child, using the observed age-specific period progression ratios (PPRs) for synthetic cohorts in recent years. In fact, we propose freezing not age-specific fertility rates, but the tempo of change with age parity progression ratios, which are obtained from period fertility life-tables and then smoothed using spline functions. It should be noted that the curves describing the rate of change with age in parity progression ratios of each birth order for women after 25-30 years – i.e., for women who have reached or exceeded the peak values of fertility rates – demonstrate, at least for Russia, a fairly high stability over time, and can easily be modeled using spline functions of the 3rd-5th order (see "Online Appendix," S-1).

3 Fertility patterns in Russia: quantum, age at childbearing and number of children ever born

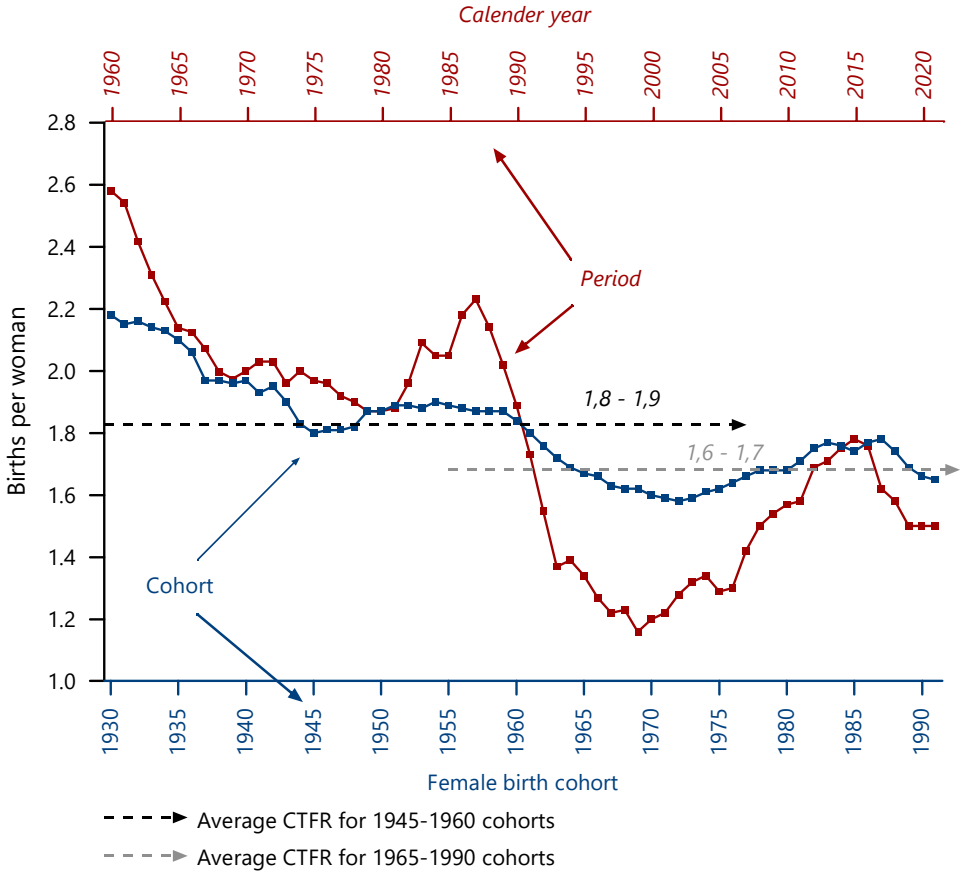
3.1 Fertility quantum in Russia: period versus cohort indicator's trends

The period total fertility rate (PTFR), after a sharp jump in the 1980s caused by family policy measures and a corresponding compensatory decline in the 1990s, has been growing ever since it reached a historically low value in 1999 (Fig. 1).[7] This growth, observed up to and including 2015, is often associated with the positive influence of the pronatalist family policy pursued by the state after 2006. Formally speaking, the data for 2007-2015 fit perfectly into the trend that has emerged since 2000, with a respite in 2005, and it can be hypothesized that the policy to stimulate the birth rate has accelerated the positive dynamics. Further, the PTFR shows a steep drop in 2016-2019 and then the suspension of the decline (in 2019, 2020 and 2021 the PTFR was the same, 1.50 births per woman). The indicator has practically returned to its value observed before the start of Putin's pronatalist policy. The PTFR trajectory in recent years has reproduced, with some partial differences, the situation of the 1980s-1990s in the same interval of 15 years. It can be hypothesized that the demographic mechanisms for changing the PTFR under the influence of policies in the 1980s and 2000s may be similar, despite significant differences in the system of incentive measures. Whereas the campaign in the 1980s prioritized maternity leave and other institutional changes, in the modern context financial instruments and the promotion of traditional values and patriotism play a major role (*Zakharov* 2008, 2018; *Selezneva* 2018; *Rakhimova-Sommers* 2019)**.**

It is known that the PTFR as an indicator of the "expected" fertility quantum is imperfect; it can be misleading when assessing the role of economic turmoil and

7 For the history of fertility change in Russia see (*Zakharov* 2008, 2023).

Fig. 1: Completed cohort (observed and expected CTFR) and period fertility (PTFR)



Birth cohorts 1930-1991 (bottom axis), period 1960-2021 (top axis), Russia, average number of children born to a woman by age 50.

Source: calculations by S.V. Zakharov based on data from the Human Fertility Database (http://www.demogr.mpg.de) and unpublished data from the Federal State Statistics Service of Russia (Rosstat).

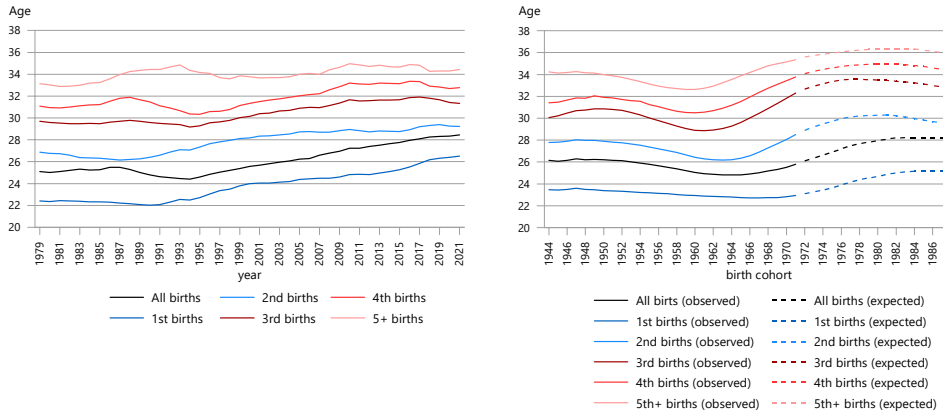
results of policy in the context of long- and short-term shifts in the timing and spacing of childbearing in female birth cohorts (*Rallu/Toulemon* 1994; *Philipov/Kohler* 2001; *Sobotka* 2003a; *Sobotka/Lutz* 2011). Replaced by the rejuvenation of parenting in the 1950s-1970s, the aging of the fertility profile began and continues to this day. Russia, like other Eastern European countries, is experiencing a later onset of the transformation of the age pattern of fertility (*Bosveld* 1996; *Frejka/Sardon* 2006; *Sobotka* 2008; *Frejka/Sobotka* 2008; *Billingsley/Duntava* 2017), but since the mid-1990s, Russia has been moving in the same general direction. This transformation is embodied in the postponement of childbearing and recuperation

process which apparently commenced in the early 1990s with the birth cohorts of the mid-1960s (*Frejka/Zakharov* 2012; *Sobotka* 2017) and are still in progress.

There is one more important point to consider here. In the 1980s, an acceleration in the pace of starting a family at a young age occurred. The family policy of that time further spurred the process of lowering the age profile of parenthood, which had begun in Russia long before the introduction of policy measures, and ultimately led to a kind of – the inflationary growth of period TFRs. It was the outcome of both the continuing decline of the age at childbearing, and shortening the intervals between births, while the latter factor, apparently, played a more significant role.

It is quite reasonable to assume that the current policy of stimulating births established after 2006 demonstrates the same inflationary mechanism, but this time in older age groups of mothers. An unusually high concentration of births occurred as a result of an increase in the age of mothers, followed by a stabilization and even slight decrease in the average age of childbearing (Fig. 2). This was also due to the reduction in the average intervals between births, which accompanied the introduction of pronatalist policy measures in the 2000s (Fig. 3): from the record-breaking intervals in the generations of the second half of the 1960s – the first half of the 1970s (about 6 years between the first and second, and about 4 years between the second and third births) before approaching much shorter intervals in the generations of the late 1980s – early 1990s (less than 4 years between the first and second, less than 3 years between the third and fourth). Of course, for cohorts born after the mid-1970s, we are dealing with expected but reliable estimates of

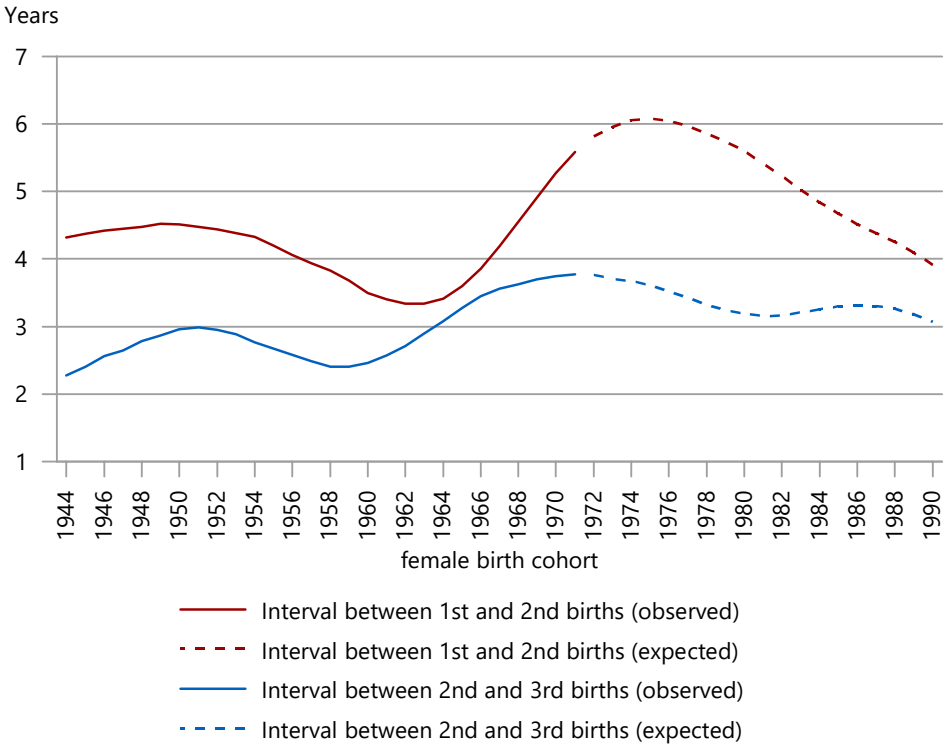
Fig. 2: Mean age of women at birth of all, and the 1st, 2nd, 3rd, 4th, 5th and higher order births, Russia, years



Left panel: period (1979-2021); right panel: female birth cohort (1944-1990), actually observed and expected, with constant rates of change based on the age of period parity progression ratios observed in 2019-2021.

Source: period and cohort age- and order-specific fertility life-tables calculated by S.V. Zakharov, and based on data from the Human Fertility Database (http://www.demogr.mpg.de) and unpublished data from the Federal State Statistics Service of Russia (Rosstat).

Fig. 3: Difference between the average ages of women at the birth of children of the 1st and 2nd order, 2nd and 3rd order, Russia, years



Actually observed and expected with constant rates of change with age of the period parity progression ratios observed in 2019-2021, female birth cohorts 1944-1990.

Source: cohort age- and order-specific fertility life-tables calculated by S.V. Zakharov, and based on data from the Human Fertility Database (http://www.demogr.mpg.de) and unpublished data from the Federal State Statistics Service of Russia (Rosstat).

mean ages of mothers at childbearing, whereas even the youngest cohort under consideration is already past its 30th birthday.

Thus the ongoing significant shifts in the timing of births lead to bias in the interpretation of changes in the fertility quantum based on PTFR, especially when assessing the results of the pro-natalist policies.

What conclusions do we draw from a glance at the fertility trends in Russia over four decades?

First, the timing but not the quantum nature of the surge in PTFR in the 1980s, which did not have long-term consequences (*Zakharov* 2007b, 2008, 2016, 2023; *Andreev* 2016), was once again confirmed. Second, from the beginning of the 1990s to 2015, the true value of total fertility was maintained in a fairly narrow range of 1.6-1.7 births per woman. Third, a slight rise in the 2000s can be observed, which

could be cautiously associated with the intensification of targeted pronatalist family policy.

What can we say about the more distant prospect of fertility quantum in Russia?

In international practice, it is accepted that for cohorts who have reached 30-35 years of age by the time of observation, one can expect that under modern conditions (aging of motherhood), the fertility rates after this age will not be lower than those period age-specific rates for a synthetic cohort that we observe in the reference year. This assumption, in particular, is the basis for the estimates of the expected cohort total fertility rates (CTFR) in Eurostat. So, by 2022 we have ultimate cumulative fertility for all cohorts born before 1971; for the 1972-1982 cohorts, estimates of the expected total fertility will have an error of less than 5 percent; for cohorts born in 1983-1990, the estimates will have an error of less than 10 percent. When regular estimates are made, we get a dynamic picture of sequential changes in estimates of both the "actual" and "expected" components of the cumulative fertility for the same cohort and, consequently, their total value. As long as in Russia, as in other developed countries, there is an increase in fertility rates among women over 25 and even over 35, the values of the expected total fertility have a chance to be revised upward for older cohorts with a growing contribution of late fertility. At the same time, shifts in this direction are countered by declining fertility at a young age, which may outweigh the growing contribution of more mature women. The result of the opposition of the age components is reflected in the expected final value of CTFR (Table 1).

Thus, with fixed age-specific fertility rates of 2021 for cohorts who have reached 30 years of age and older by 2022, the forecast of a stabilizing CTFR in Russia is obvious. But it was not as obvious as it seemed based on the data accumulated

Tab. 1: Observed and expected cohort total fertility rates (CTFR), Russia

Birth cohort	Expected CTFR, estimates based on 1999, 2006 and 2015 data			Expected CTFR, estimates based on 2021 data		
	Estimates based on 1999 data	Estimates based on 2006 data	Estimates based on 2015 data	Observed cumulative TFR by 2022	Expected in addition to observed TFR	CTFR
1960-1964	1.75	1.76	1.76	1.76	0.00	1.76
1965-1969	1.58	1.63	1.64	1.64	0.00	1.64
1970-1974	1.40	1.52	1.60	1.60	0.00	1.60
1975-1979	1.23	1.43	1.65	1.65	0.01	1.66
1980-1984	1.16	1.33	1.73	1.66	0.07	1.73
1985-1989	-	-	1.79	1.46	0.28	1.74
1990-1994	-	-	1.78	0.99	0.65	1.64

Female birth cohorts 1960-1994; average number of births per woman.

Source: calculations by S.V. Zakharov, based on age-specific fertility rates in 1979-2021 and data from the 1979 census regarding the responses of women on the number of children ever born. Initial data taken from the Human Fertility Database (http://www.demogr.mpg.de) and from the Federal State Statistics Service of Russia (Rosstat).

by 2016 (the latest available data referred to 2015 with the highest TFR since the 1980s) – then, if the trends had continued, one would have expected that the level of 1.7 births per woman would be surpassed and the TFR for the cohorts born in the 1980s – first half of the 1990s would come close to 1.8. Five years later, and following the results of negative dynamics, for these cohorts, we can only talk about maintaining the average level of 1.6-1.7, characteristic for the entire period of the 1990-2000s, as an optimistic scenario. The decrease in fertility rates in 2016-2021 had a noticeable effect on both the actual and the expected components of the total cohort fertility. Based on the data available by 2016, the CTFR for the 1985-89 cohorts could be expected at the level of 1.79; and then, based on the data accumulated by 2022, we have for the same cohorts 1.74, and for the 1990-94 cohort (which had reached the age of 28-32), the corresponding values are 1.78 and 1.64 births per woman. The expected values of the CTFR for the 1980-84 cohorts, who are now aged 38-42 years, do not have to be revised, but remain at the level of 1.73. However, they remain significantly higher than could be expected based on the data available by 2000 or by 2007 (Table 1).

Calculations based on the birth-order–specific life-table approach give the following alternative values for expected CTFR: 1.59 for 1970-1974 cohorts; 1.63 for 1975-1979 cohorts; 1.71 for 1980-1984 cohorts; 1.72 for 1985-1989 cohorts; and 1.65 for 1990-1994 cohorts. In comparison with estimates obtained by the more traditional method based on freezing the current age-specific fertility rates presented in Table 1, the alternative projected values of the cohort total fertility do not differ much, but appear slightly more conservative. They are less prone to fluctuations, which is more consistent with the nature of the process under study, with its internal logic of reproducing, and repeating, with some modification, the existing fertility patterns.

Obviously, the TFR for the cohorts that actively contributed to Russian total fertility in the first two decades of the 21st century on average will be 0.1-0.2 live births per woman lower than for their mothers who formed their families in 1970-1980s. The relative stability of the CTFR at the level of 1.8-1.9 live births per woman has been replaced by the new stability at the level of 1.6-1.7.

What conclusions can be drawn from comparing the dynamics of indicators designed to assess the level of total fertility for synthetic and real generations?

1. If the range of fluctuations for the traditional PTFR of 1980-2021 was 1.07 births per woman and 0.62 for the last two decades, 2000-2021, then the range of fluctuations in the CTFR values based on actual and expected cumulative cohort fertility was less than 0.4 births per woman for the entire period from 1979 to 2021, and no more than 0.2 births for the period 1999-2021.
2. The average value of the total fertility of generations in Russia has not fluctuated much, neither from the perspective of the last four decades, nor over the last decade, even though the traditional PTFR showed large fluctuations. The PTFR is an official target indicator in Russian demographic policy. At the same time, due to imperfections and methodological limitations, the PTFR creates distorted ideas about both the actual fertility quantum in Russia and the direction of its changes. The "true" average total fertility rate of childbearing

women in the period from 1980 to 2020 amounted to 1.7 births and 1.6 births per woman over the past decade, with very insignificant fluctuations over the years and the entire period under study.

3.2 Structural changes in Russia's fertility pattern: the number of children born

3.2.1 Annual estimates of women by number of children born

We produced an estimate of the annual distributions of women of reproductive ages (15-49 years old) by number of children ever born for the period 1979-2020, based on the period age- and birth-order–specific fertility tables.

These data attest to the minor changes in the distribution of women by number of children born, confirmed by the dynamics over the past 40 years. For the entire period from 1979 to 2020 the proportion of women who did not have a single birth averaged 28.6 percent (SD = 2.7 percent), the proportion with one birth: 30.8 percent (SD = 1.6 percent), the proportion with two births: 30.4 percent (SD = 2.8 percent), and with three or more births: 10.3 percent (SD = 1.8 percent). For the period from 2003 to 2020 the variability was even lower, despite the ongoing policy to stimulate the birth rate; specifically: without births: 31.2 percent (SD = 0.6 percent), with one birth: 32.3 percent (SD = 1.1 percent), with two births: 27.9 percent (SD = 0.6 percent), with three or more births: 8.7 percent (SD = 0.6 percent). The distribution of women by number of children born, observed today, is very close to what it was in the late 1970s and early 1980s with a slightly larger representation of women with one birth today and a slightly smaller share of women with 3 or more births.

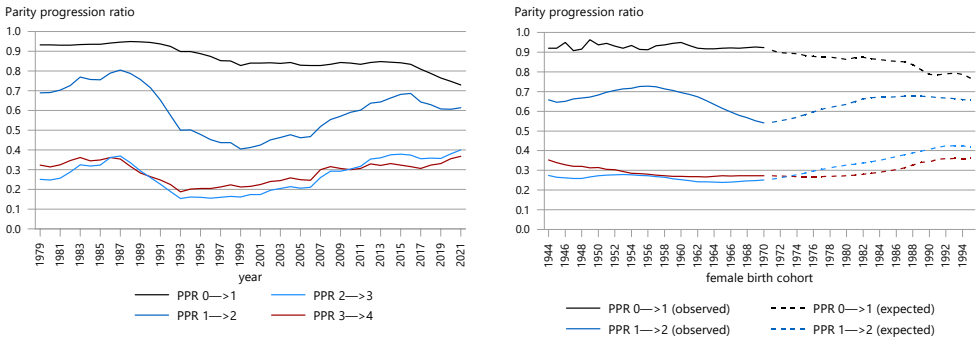
3.2.2 Parity progression ratios

The parity progression ratio (PPR) shows the proportion of women who have given birth to another child among those who have given birth to one child less. Figure 4 presents the values of period and cohort PPRs by the age of 50. The expected values for the cohorts that have not completed reproductive activity were obtained based on modeling age functions of the PPRs using the average rates of change with age of period PPRs observed in 2019-2021 (see "Data and methods" above for details).

Observing trends over the past 40 years leads us to the following conclusions:

- since the 1990s (in the generations born in the early 1970s) there has been a significant decrease in the probability of first birth, and in the most recent years this trend has intensified: if in the generations of the 1940-1960s the percentage of ultimate childlessness was maintained at less than 10 percent (i.e., PPR 0→1 was 0.9 and more), then in the generations of the 1980-1990s the percentage of ultimate childlessness trends towards 20 percent (PPR 0→1 is about 0.8);
- the transition to a second birth (for those who gave birth to one child) experienced significant fluctuations, especially for synthetic cohorts: an increase in the 1980s (i.e. in births by women born in the second half of the

Fig. 4: Parity Progression Ratios for women by age 50, Russia



Period 1979-2021 (left panel), cohort 1944-1994 (observed and expected, right panel).

Source: period and cohort age-order–specific fertility life-tables calculated by S.V. Zakharov, and based on data from the Human Fertility Database (http://www.demogr.mpg.de) and unpublished data from the Federal State Statistics Service of Russia (Rosstat).

1950s); a decline in the 1990s as PPR 1→2 decreased by half (from 0.7-0.8 to 0.4), which served as the basis for the assumption which was widespread among experts in those years, regarding the transition of Russian fertility from a two- to a one-child model (*Antonov* 1999; *Avdeev* 2003; *Barkalov* 2005). In fact, cohort data show that the decrease in the likelihood of a second birth was significantly lower: from 0.6-0.7 in cohorts born in 1940-1950 up to 0.5-0.6 in the 1970s cohorts. The 1980-1990s cohorts restored the values to the level observed in their grandmothers (cohorts born in 1940-1950s);

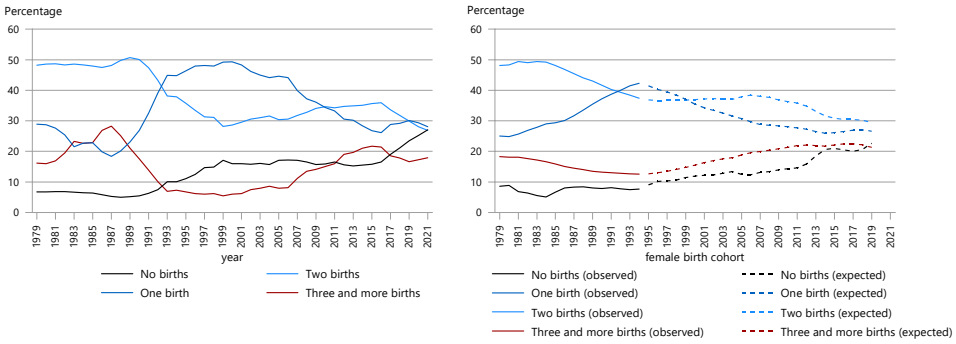
- the probabilities of third, fourth and subsequent births have changed little over 40 years: after some subsiding in the cohorts of the 1950s and 1960s, women born in the early 1970s and later demonstrate a monotonic rise (the accumulated gain was about 0.10 from the minimum value of 0.25-0.3). As a result, at the moment the transitions from the second to the third and from the third to the fourth birth are almost the same, and even slightly higher values can be expected than 40-50 years ago.

3.2.3 Ultimate distributions of women by number of children born

The observed and expected ultimate distributions of women by number of children born, obtained on the basis of period and cohort fertility tables, are presented in Figure 5.

Consideration of shifts in the distribution of women by number of children ever born leads us to the following main conclusion: the presence of one or a higher number of children in Russian families today is more equiprobable than ever before in history (detailed historical changes in the distribution since the end of the 19th century shown in *Vishnevsky* 2006: 176-183; *Zakharov* 2008). In the cohorts born

Fig. 5: Distribution of women by number of children born by age 50, Russia, %



Period 1979-2021 (left panel), cohort 1955-1995 (observed and expected, right panel).

Source: period and cohort age-order–specific fertility life-tables calculated by S.V. Zakharov, and based on data from the Human Fertility Database (http://www.demogr.mpg.de) and unpublished data from the Federal State Statistics Service of Russia (Rosstat).

in the 1980s and up to the first half of the 1990s, we expect that approximately 30 percent of women will eventually have one or two children, and 20 percent each will be those who have not given birth at all and those who have given birth to 3 or more children. Although the ideal two-child family model retained its prevalence, it lost its former overwhelming dominance as a result of an increase in the proportion of women at the edges of the distribution – childless and with "many children" (among women who have given birth to three or more children and are officially recognized as having "many children", the majority are women with three children, and the share of women from particularly large families – with five or more children – is 15-20 percent).

Even if we assume that the entire increase in the relative number of women with the number of births of 3 or more occurred recently as a result of pronatalist measures (or at least in part, as some estimates suggest, see *Validova* 2021), then the question arises as to why this policy turned out to be so ineffective in the transition to motherhood in general (the proportion of ultimately childless women continued to grow); why the probability of transition from first birth to second birth in birth cohorts of women has changed little; and why the proportion with two children among mothers (women who have ever given birth) has hardly changed at all. Let us recall that the policy to stimulate the birth rate was aimed at increasing the prevalence of two-child families, and "maternity capital" as a central financial measure was intended specifically for mothers who gave birth to a second child. In-depth studies should continue to answer these key questions. However, it is clear that the policy did not bring the results that its initiators expected.

4 General conclusions, discussion and limitations

Changes in fertility patterns in Russia over the last three decades can be summarized with at least three points.

First, we observe a continuous increase in the age of parenting. Over the last thirty years, the mean age of mothers at first birth has risen from age 23 by more than 3 years (see Appendix). There are also non-obvious changes in the average age at the birth of the second and subsequent children, and compression of the intervals between births.

Second, we observed strong fluctuations in the period fertility indicators against the background of weak changes in the cohort indicators. The "true" average total fertility rate of childbearing women in the period from 1980 to 2020 was maintained in a fairly narrow range of 1.6-1.7 births per woman. We can observe a slight rise in the 2000s, which could tentatively be associated with the intensification of targeted pronatalist family policy.

Third, there were considerable changes in Russia's order-specific fertility model, including an increase in the proportion of those who have never given birth to children and those who have given birth to three or more children. Since the 1990s there has been a significant decrease in the probability of first birth, and the universality of motherhood ceased to be the characteristic feature of the Russian fertility pattern. The expected share of ultimately childless women is approaching 20 percent, which corresponds to the average level for developed countries nowadays (see Appendix).

Comparison of fertility trends in Russia with Western countries and with the closest neighbors in Eastern Europe shows that the transformation of the fertility model continues towards convergence with those developed countries, that are more advanced on the path of the Second Demographic Transition (see "Online Appendix," S-3).

Therefore the main conclusion from our observations of the development of the situation in Russia is the following. The expanding diversity of life strategies and matrimonial and reproductive practices, which is actively going on in Russia, and which we find in an increasing variety in the birth of children within marriage and out of wedlock; and in the number, timing and spacing of children ever born, fully corresponds to the content of the Second Demographic Transition.

The critical question, the answer to which puzzles most experts, is the extent to which pronatalist policies have had an effect on fertility patterns and trends. In this article, we add what is in our opinion an equally important question: to what extent was the conservative policy of the state able, based on financial and propaganda tools, to reverse the trends of the Second Demographic Transition, and thus brings Russia closer to other developed countries.

Putin's main demographic policy documents, including the "Concept of Demographic Policy" of 2007 and the "Concept of Family Policy" of 2014, are dominated by a natalist concept that is based on traditional values concerning marriage and the family.

The clearly populationist (as much as pronatalist) framework of the contemporary demographic discourse held by the Russian authorities articulates the domination

of conservative thought during the second decade of the 21st century. This is not unrelated to the very marked rapprochement, increasingly visible on the public stage, between the political authorities and the Orthodox Church, which unfailingly supports the war waged by Russia against Ukraine.

The latest embodiment of this conservative stance is, without a doubt, the Decree of the President of the Russian Federation entitled "The foundations of State policy aimed at preserving and strengthening the spiritual and moral traditional values of Russians" (November 9, 2022).

At the same time, the conservative discourse around the so-called "return to traditional values" does not seem to have any significant effect on demographic behavior. Above all, it is in strong contradiction with the profound tendencies that bring Russia closer to other European countries. The age at marriage has indeed increased steadily (*Zakharov/Mitrofanova* 2018; *Mitrofanova* 2020), even if it remains lower than in most European countries. The proportion of children born out of wedlock increased rapidly in the 1990s, reaching 30 percent of all births in 2005. Thereafter, the rate became lower. From 2015, the proportion of births outside marriage oscillates between 21 and 22 percent, which places Russia in the average of developed countries. It should also be noted that half of the children born out of wedlock are registered on the basis of a joint declaration by the parents, which indicates voluntary recognition by the fathers of their children born out of wedlock. All these indicators reveal the high prevalence of cohabitation that, as elsewhere in Europe, has developed (*Stankuniene et al.* 2009; *Mitrofanova/Artamonova* 2016; *Andreev et al.* 2022) which the State, actively supported by the Church,[8] tries to combat. Union breakdown remains very frequent, the rate being one of the highest in the world: between 50 and 60 per 100 of marriages (synthetic indicator calculated according to the duration of marriages). This indicator has not changed since the mid-1990s (*Churilova/Zakharov* 2021). Sociological surveys demonstrate that matrimonial behavior of Russians is diversifying: cohabitation is becoming widespread, normative, and early, while marriages are transforming into selective, choice-dependent, and late unions (*Blum et al.* 2009; *Stankuniene et al.* 2009; *Mitrofanova* 2013, 2019; *Mitrofanova/Artamonova* 2016).

The age at first childbearing is logically increasing following the transformation of the marriage model. Apparently as a result of the 2006 policy measures, the interval between births was considerably reduced, but as we have seen above, this is more of a situational effect than a significant change in the fertility quantum.

Russian fertility began to rise in 2000, admittedly with a short, inexplicable interruption in 2004, but the recovery that followed preceded the adoption of the 2006 decree on the introduction of maternity capital. It is very likely that the policy reinforced the slight rise in cohort total fertility, without being decisive. However, this had mostly only a temporary effect, since period fertility began to fall again in the middle of the 2010s, and most likely the effect has disappeared for the

[8] See Speech of His Holiness Patriarch Alexy II of Moscow and All Rus' at the Council of Bishops of the Russian Orthodox Church, Moscow, June 24, 2008. https://pravoslavie.ru/26960.html

generations born around the 1990s. Moreover, a comparison of the trends observed in Russia with those observed in Europe testifies to a dynamic that is not specific to Russia. Fertility in Russia is now in a zone that corresponds to that observed in many countries (excluding southern Europe, which continues to be marked by low fertility), namely close to 1.5 children per woman.

We cannot support claims about the high demographic effectiveness of pronatalist policy measures adopted in Russia after 2006 because they either rely on direct fixation of the period effects (*Arkhangelsky et al.* 2015) or estimate long-term effects on less or more complex models with various assumptions and limitations (*Slonimczyk/Yurko* 2014; *Yakovlev/Sorvachev* 2020), when it is possible to use the more direct and reliable measurement of final effects (*Andreev* 2016) in the sense of complete cohort fertility, as demonstrated in our article. Skepticism about the results and measures of pro-natalist policies, also shown in this article, is also growing among other experts (*Validova* 2021; *Biryukova/Sinyavskaya* 2021). Awareness of the failure of the pronatalist policy was expressed even at the official level in the fact that at the end of January 2023, having been waging a war in Ukraine for a year, Vladimir Putin instructed the government to develop and submit *in two weeks* a set of additional measures aimed at increasing the birth rate and supporting families with children, providing for an assessment of the effectiveness of these measures, sources and amount of additional funding.[9]

At the same time, there are two important points regarding the changes in Russian fertility patterns that may have not only short-term, but also medium-term consequences. First, it is very likely that the shortened intervals between births will be replaced by, on average, longer intervals, which would negatively contribute to the perspectives of period total fertility indicators. Second, the expansion of the prevalence of the birth of three or more children in the very limited extent in which it occurs does not in any way solve the problem of the reproduction of Russia's population, but will intensify the multidimensional problems of the redistribution of national income in favor of limited and not very numerous ethnic, social and territorial groups of the population which are characterized by above average fertility with less stable economic and political environments, in particular in the North Caucasus and Siberia (*Sievert et al.* 2011; *Kazenin/Kozlov* 2020; *Kazimov/Zakharov* 2021).

In the medium term (within 20-30 years, as a period corresponding to the demographic length of a generation) in Russia, one can hardly expect any fundamental changes in the quantum of fertility. The cohort total fertility rate will be maintained at the level of 1.6-1.7 births per woman, as the strong two-child ideal is still visible in surveys in Russia (*Gudkova* 2019), even in St. Petersburg, the city with the lowest low fertility in Russia (*Rotkirch/Kesseli* 2012). At the same time, more prominent fluctuations for the PTFR can be expected that will remain in the range of 1.4-1.8 births per woman due to multidirectional timing effects under the influence of changing political and economic conditions.

9 https://www.interfax.ru/russia/883641

In this article, we have limited ourselves to analyzing only those official statistics which can be considered complete and reliable in Russia. At the same time, Russian statistics make it possible to analyze long-term changes in fertility patterns only in relation to the distribution of mothers by age at the birth of children of each order. Some of the family and fertility surveys conducted in Russia, including those within the framework of international comparative research projects (GGP, ESS, WVS, EVS, RHS, etc.) provide important information on a wide range of demographic and socio-economic variables; a number of publications based on these studies are mentioned above. However, in the context of Russia's passage along the path of the Second Demographic Transition, they often give a contradictory picture. That is why in this work we have deliberately limited ourselves to an in-depth analysis of only the most reliable and verifiable indicators of fertility modernization, which are provided by routine vital statistics, and increment-decrement age- and birth-order-specific period and cohort fertility tables, which are computed from official statistics.

We also did not include in this work a detailed consideration of such indicators as marriage rates and age at marriage, divorces and remarriages, the spread of premarital cohabitation, out-of-wedlock births, the use of modern contraception, abortion prevalence, etc., which are related to the signs of the Second Demographic Transition (*van de Kaa* 2002; *Lesthaeghe/Neidert* 2006; *Lesthaeghe* 2020). On the one hand, all these issues require special consideration and a variety of additional information, including survey data, which would entail the diversification of the adopted methodology and complicate the structure of the research. On the other hand, we mentioned above a number of important works and conclusions regarding changes in the nature of family formation, marriages, birth control in Russia in recent decades.

Another limitation of our analysis concerns the abstraction from differences in the transformations of fertility patterns that manifest in urban and rural settlements, different provinces, ethnocultural and confessional groups. Russia is a heterogeneous population with significantly different trends for, on the one hand, the highly educated urban strata of the population of Central and North-West Russia and the Urals, and on the other hand, the ethnocultural areas of rural areas of the South, the North Caucasus, the Volga region and Siberia, and some other remote areas in which minorities are characterized by a low level of education, rural organization of life, and having not yet fully completed the First Demographic Transition to low fertility, controlled at the individual level. These differences are of great interest for special studies, as they have an impact on fertility trends at the national level, including when measuring the unequal response of fertility to family policy financial measures (*Kazenin/Kozlov* 2020). At the same time, their importance should not be overestimated, even in the context of increased regionalism in the post-Soviet period (*Streletsky* 2017). More than 80 percent of the Russian population is represented by Russians and ethnic groups close to them (*Streletsky* 2017) with long-standing uniform patterns of demographic behavior in low-fertility settings.

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Appendix

Tab. A1: Key indicators of period fertility in Russia: 1990-2020

	Calendar years					
	1990	2000	2005	2010	2015	2020
Period total fertility rate (PTFR) by the age of 50	1.89	1.20	1.29	1.57	1.78	1.50
Contribution of women under 25 and 25 and over to the total period fertility:						
under 25 years old						
Cumulative fertility rate of age group under 25,						
PTFR (-25)	1.06	0.61	0.57	0.56	0.56	0.44
% to PTFR	56.2	51.0	44.4	35.5	31.5	29.2
25 and over years old						
Cumulative fertility rate of age group 25 and over,						
PTFR (25+)	0.83	0.59	0.72	1.01	1.22	1.06
% to PTFR	43.7	44.0	55.6	64.5	68.5	70.8
Mean age of women at childbearing, years						
All births	25.2	25.8	26.5	27.7	28.2	28.8
First order births	22.7	23.5	24.1	24.9	25.5	25.9
Indicators estimated on the base of age- and order–specific period fertility tables						
Parity progression ratios for women by the age of 50						
First births (PPR 0→1)	0.945	0.847	0.839	0.851	0.851	0.756
Second births (PPR 1→2)	0.725	0.422	0.470	0.597	0.688	0.613
Third births (PPR 2→3)	0.259	0.178	0.208	0.302	0.375	0.384
Fourth births (PPR 3→4)	0.252	0.219	0.248	0.295	0.317	0.356
Distribution of women by number of children born by the age of 50, %						
0 births	5.5	15.3	16.1	14.9	14.9	24.2
1 birth	26.0	49.0	44.5	34.3	26.6	29.2
2 births	50.8	29.4	31.2	35.5	36.6	28.7
3 or more births	17.7	6.3	8.2	15.3	21.9	17.9
All	100.0	100.0	100.0	100.0	100.0	100.0

Notes:

PTFR is the conventional total fertility rate, calculated as the sum of fertility rates of the second kind (frequencies, in the denominator "number of women of a given age") for one-year age groups of women. PTFR (-25) is the sum of fertility rates for women under 25 years of age, TFR (25+) is the sum of fertility rates for women aged over 25 years.

Mean Age of women at childbearing is calculated as an arithmetic weighted average, where the birth rates of the second kind (frequencies, i.e. the denominator of the rates is the number of women of a given age) for one-year age groups are used as weights; the mean age of a woman at the birth of her first child is calculated in the same way, but using fertility rates of the second kind for first births.

Parity Progression Ratio (PPR) is the expected value of the transition to the next birth for a woman over the entire reproductive life, showing the proportion of women who give birth to a next child among women who have given birth to one child fewer.

Distribution of women by number of children born (by the age of 50) is the expected final distribution of women by number of children ever born, provided that the period PPRs remain unchanged at the level of the reference year.

Source: calculations of S.V. Zakharov based on data from the Human Fertility Database (http://www.demogr.mpg.de) and unpublished data from the Federal State Statistics Service of Russia (Rosstat).

Tab. A2: Key indicators of cohort fertility in Russia: female birth cohorts 1960-1970 (observed values) and 1975-1990 (expected values)

	Female birth cohorts						
	1960	1965	1970	1975	1980	1985	1990
Cohort total fertility rate (CTFR) by the age of 50	1.85	1.67	1.60	1.62	1.68	1.74	1.62
Contribution of women under 25 and 25 and over to the total cohort fertility:							
under 25 years old							
Cumulative fertility rate of age group under 25, CTFR (-25)	1.03	1.04	0.92	0.75	0.64	0.58	0.56
% to CTFR	55.8	62.4	57.3	46.5	37.8	33.5	34.8
25 and over years old							
Cumulative fertility rate of age group 25 and over, PTFR (25+)	0.82	0.63	0.68	0.87	1.04	1.16	1.05
% to CTFR	44.2	37.6	42.7	53.5	62.2	66.5	65.2
Mean age of women at childbearing, years							
All births	25.1	24.8	25.5	26.9	27.9	28.2	28.2
First order births	22.9	22.7	22.8	23.6	24.7	25.1	25.4
Indicators estimated on the base of age- and order–specific cohort fertility tables							
Parity progression ratios for women by the age of 50							
First births (PPR 0→1)	0.949	0.920	0.923	0.883	0.863	0.856	0.790
Second births (PPR 1→2)	0.695	0.615	0.541	0.582	0.634	0.668	0.667
Third births (PPR 2→3)	0.253	0.239	0.251	0.286	0.326	0.358	0.396
Fourth births (PPR 3→4)	0.270	0.273	0.272	0.267	0.272	0.297	0.345
Distribution of women by number of children born by the age of 50, %							
0 births	5.1	8.0	7.7	11.6	13.3	14.1	20.8
1 birth	29.0	35.5	42.3	36.9	31.8	28.6	26.4
2 births	49.3	43.0	37.5	36.8	37.1	36.8	31.8
3 or more births	16.6	13.5	12.5	14.7	17.8	20.5	21.0
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Notes:

All estimates obtained on the basis of special cohort fertility tables, taking into account the age of the woman and the order of birth of children. For cohorts of women born in 1960-1970, the observed values are presented; for 1975-1990 cohorts expected values are given, while maintaining the functions of changing the probability of having another child with the age of a woman, observed in 2018-2020. Cohort born in 1975 reached 45 years by 2021

and the cumulative observed fertility is at least 99.8 percent of the expected ultimate value of CTFR; the 1980 cohort reached 40 years of age and the corresponding contribution of observed cumulative fertility to the expected CTFR is 97-98 percent; for the 1985 cohort the corresponding value for the age of 35 years is 86-89 percent; for the 1990 cohort, 65-70 percent.

CTFR is the cohort total fertility, calculated as the sum of fertility rates for one-year age groups. CTFR (-25) is the sum of fertility rates for women under the age of 25; CTFR (25+) is the sum of fertility rates for women over 25.

Mean age of women at childbearing is calculated as an arithmetic weighted average, where the birth rates of the first kind (intensities or occurrence-exposure rates are used as weights, i.e. the denominator of the rates is the number of women at risk of having a next child) for one-year age groups are used as weights; the mean age of a woman at the birth of her first child is calculated in the same way, but using fertility rates of the first kind for first births (for women who had never given birth).

Parity Progression Ratio (PPR): observed (for cohorts aged 50 and over by 2021) and expected (for cohorts aged 30 and over) values of the transition to the next birth for a woman during her entire reproductive life, showing the proportion of women who give birth to another child among women who had given birth to one child fewer.

Distribution of women by number of children born (by the age of 50) is the final distribution of women by number of children ever born, observed for cohorts born in 1960-1970 and expected for cohorts born in 1975-1990, provided that the functions of the change in period PPRs with the woman's age observed in 2018-2020 remain unchanged.

Source: calculations of S.V. Zakharov based on data from the Human Fertility Database (http://www.demogr.mpg.de) and unpublished data from the Federal State Statistics Service of Russia (Rosstat).

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