DOI: 10.15838/esc.2024.6.96.4
UDC 314.387, LBC 60.7

Two Approaches to Assessing the Effectiveness of Demographic Policy (Using the Example of Federal Maternity Capital)

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For citation: Arkhangelskiy V.N., Zolotareva O.A., Kuchmaeva O.V. (2024). Two approaches to assessing the effectiveness of demographic policy (using the example of federal maternity capital). *Economic and Social Changes: Facts, Trends, Forecast,* 17(6), 77–97. DOI: 10.15838/esc.2024.6.96.4

Abstract. Recently, attention to assessing the effectiveness of measures aimed at promoting birth rate has been increasing. Among these measures, federal maternal (family) capital is, doubtless, the most significant one; thus, it is necessary to develop methodological approaches so as to assess the impact of specific demographic policy measures, in particular maternity capital, on birth rate dynamics. The aim of the study is to design a methodology for evaluating and measuring the effectiveness of federal maternity capital based on official statistics. The article presents two approaches to the methodology for evaluating the effectiveness of federal maternal (family) capital: the first is based on current accounting data, the second is based on census and micro-census data. Within the framework of the first approach, we consider it necessary to apply age-related birth rates for second births in real generations of women, that is, attributed to generations rather than calendar years. The second approach is based on the information about reproductive intentions. In accordance with this information, data on the average expected number of children, according to the 2015 micro-census, and the average number of children born according to the results of the 2020 census are compared. The proposed methodology helps to obtain estimates of the effectiveness of demographic policy measures, taking into account their target orientation (for example, an increase in the birth rate of a certain order or in women of certain age groups). The approbation of the proposed approaches on the example of assessing the effectiveness of maternity capital indicates the expediency of their application. Scientific novelty of our research consists in the convergence of the two approaches in order to measure the effectiveness of federal maternity capital, and in the methodology for using more detailed birth rate indicators in assessing demographic policy measures. The approbation of the approaches has not only analytical capabilities, allowing us to study birth rate in real generations of women according to the order of births and characterize reproductive attitudes; it also substantiates the conclusions about the effectiveness of federal maternity capital.

Key words: federal maternity capital, birth rate, second births, "timing" shifts, effectiveness of measures.

Introduction

In modern Russia the demographic crisis is intensifying due to the second wave of depopulation that began in 2016–2017 (Ryazantsev, Rybakovsky, 2021), characterized by population decline against the background of a critically low birth rate. Currently, despite the implementation of demographic policy, total fertility rate is not only far from the level of simple population reproduction (2.12–2.14), but shows unfavorable dynamics (*Fig. 1*).

The forecast values of total fertility rate presented by Rosstat for the foreseeable time lag look very disappointing, suggesting that the set national development goals for both 2030 and 2036[1] will not be achieved (by 2030, the target value is 1.6 with Rosstat's most optimistic upper bound forecast of 1.516[2]; by 2036, respectively, 1.8 versus 1.675). In this regard, it is of high practical importance to assess the effectiveness of government decisions in the field of fertility[3]. Back in the late 1990s, a leading Russian demographer V.A. Borisov proved that it fertility that plays the main role in population reproduction[4].

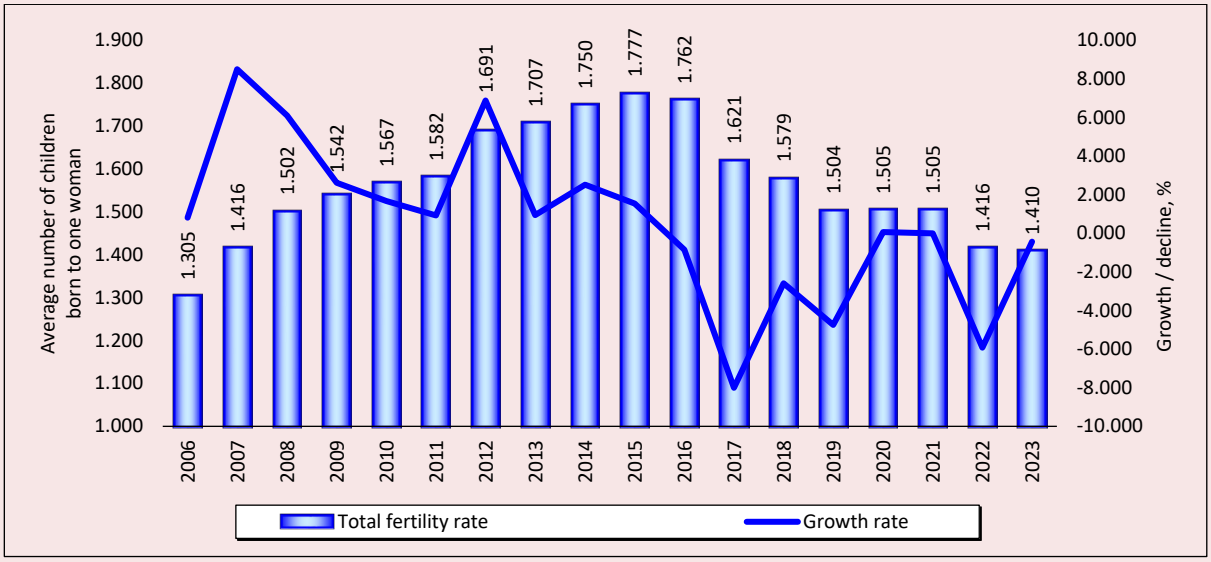
[1] Decree on the national development goals of the Russian Federation for the period up to 2030 and for the future up to 2036. Available at: http://www.kremlin.ru/events/president/news/73986 (accessed: October 9, 2024).

[2] Rosstat. Demographic forecast. Available at: https://rosstat.gov.ru/folder/12781 (accessed: October 9, 2024).

[3] Increasing birth rate is the main goal of Russia's demographic policy. Available at: https://vcot.info/blog/povysenie-rozdaemosti-osnovnaa-cel-demograficeskoj-politiki-rossii (accessed: October 9, 2024).

[4] Borisov V.A. (1999). Demography: A Textbook for Universities. Moscow: NOTABENE publishing house.

Figure 1. Total fertility rate dynamics in Russia in 2006–2023



Source: Rosstat.

Literature review

Currently, researchers and practitioners pay great attention to measuring the effectiveness of demographic policy, in particular those measures aimed at increasing fertility (Arkhangelskiy et al., 2016; Rybakovsky, 2016; Slonimchik, Yurko, 2016; Bulanova, 2022; Rostovskaya et al., 2022; Ageev, Zolotareva, 2023; Bagirova et al., 2024, etc.). However, there is no unity in approaches, which gives us reason to propose our own vision of this issue.

Most studies present a comprehensive approach to assessing the effectiveness of demographic policy, and only some cases focus on individual measures. We should note that an integrated approach is typical for foreign practice in general, which is reflected, for example, in the article by C. Adelle and S. Weiland, which systematizes theoretical foundations of a methodology for assessing social policy, of which demographic policy is a part (Adelle, Weiland, 2012).

A work of A.I. Ageev and O.A. Zolotareva presents a comprehensive approach to assessing the effectiveness of demographic policy, which does not single out the effectiveness of the impact of concrete decisions adopted (Ageev, Zolotareva, 2023).

An article by M.A. Bulanova evaluates the effectiveness of demographic policy to promote fertility (using the example of the Far Eastern Federal District) and also does not measure the impact of individual implemented measures on fertility (Bulanova, 2022).

In the work "Demographic Well-Being of Russia's Regions. National Demographic Report 2022" by the team of authors (Rostovskaya et al., 2022) uses an approach based on an integrated assessment according to a system of indicators for monitoring family demographic policy. A comprehensive approach to the analysis of demographic behavior, reflecting the results of the project "Demographic behavior of the population in the context of Russia's national security", carried out by a creative team of Russian scientists from academic institutions and leading universities, supported by the Russian Science Foundation, is presented in a number of works by a team of researchers (Shabunova, Rostovskaya, 2020; Ilyin et al., 2021).

One of the ways to assess the effectiveness of demographic policy measures is to analyze the results of surveys of target groups (Maleva et al., 2017). Thus, the work of A.P. Bagirova, N.D. Blednova and A.V. Neshataev is based on the results of a survey that assesses the impact of parental leave on fertility, according to parents' opinions (Bagirova et al., 2024). In this case, it is proposed to assess the impact of a specific measure, but rather narrowly focused. It is important to note that in modern conditions, the development of the parental leave system is undoubtedly significant, primarily in the context of the need to ensure a balanced combination of professional and household responsibilities, which helps to alleviate the burden of work–family balance, which is considered a factor in fertility reduction (Ekberg et al., 2013; Gandevani et al., 2014; Nomaguchi, Fettro, 2019).

Among the studies devoted to assessing the effectiveness of maternity capital, there are also works whose authors use data from sample surveys and econometric modeling techniques (Shelkova, 2020). The following works deserve special attention: 1) F. Slonimchik and A.V. Yurko, which assesses the impact of the maternity capital program on fertility dynamics based on the "before-after" and "difference-differences" models; however, it does not take into account the dependence of second births on the average number of first births among real generations of women at a given age, which makes it possible to more correctly assess the impact of demographic policy on second births (Slonimchik, Yurko, 2016; 2) V.N. Arkhangelskiy, A.E. Ivanova, L.L. Rybakovsky, which, in particular, provides an approach to assessing individual measures aimed at increasing fertility, including federal maternity (family) capital (Arkhangelskiy et al., 2016). The latter source served as the basis for a deeper study of the issue of assessing the effectiveness of the introduction and use of federal maternity (family) capital in order to increase fertility.

A comparative analysis of the studies shows that their authors use various data sources and methods of their processing, and indicators reflecting fertility. However, the debatable question remains, to what extent are the measures, in particular federal maternity capital, achieving their goals? Can we reasonably say that the introduction of this measure has helped raise the number of second and subsequent births? Answering these questions requires using more detailed demographic indicators, including calculations for the real generation, and an integrated approach to using demographic statistics based on current accounting of demographic events and population censuses.

Research methodology

The aim of the study is to develop a methodology for assessing and measuring the effectiveness of federal maternity capital based on official statistical information: according to both current accounting and population census data.

Assessing the possible impact of demographic policy measures on fertility dynamics using statistical information, it is necessary to identify the influence of this factor as precisely as possible, eliminating the influence of other determinants. To some extent, this is possible if the measures implemented are not focused on all births, but are differentiated according to order of birth and/or age of the mother. In this case, with a certain degree of conditionality, it will be possible to judge the impact of measures on fertility dynamics related to the order of birth or the age of the mother that they are aimed at.

In addition, when assessing the impact of demographic policy measures on fertility dynamics, it is possible to focus on the timing, the time interval between the launch of measures and an increase in fertility. Almost all measures to increase fertility are aimed at creating more favorable conditions for realizing the need for children, rather than changing the need itself. Experience shows that in this case people's reaction in their reproductive

behavior to the implementation of measures occurs immediately and is not being delayed (meaning that the beginning of the reaction is not delayed, but it can, to one degree or another, persist throughout the period of implementation of the demographic policy measure). At the same time, it is advisable to use fertility indicators not only in the whole year, but also by quarter and month.

When assessing the impact of demographic policy measures on fertility dynamics, it is important to determine to what extent this influence affects only "timing" shifts, i.e. earlier birth of children (at a younger age, with a shorter interval after marriage (first child) or the birth of a previous child), and to what extent – on increasing the total number of children born in real generations of women.

The methodology we propose for measuring the effectiveness of federal maternal (family) capital for the second or subsequent child is based on the consideration of two types of data (according to which two approaches to such performance measurement are defined): current accounting and data from censuses and micro-censuses.

The advantage of the assessment based on current accounting data (the first approach) is that it allows for annual monitoring of the situation, which made it possible, using statistical and demographic analysis methods, in particular, the analysis of age-specific fertility rates for second births in real generations of women, to identify the above-mentioned "timing" shifts and substantiate them. Data from censuses and micro-censuses (the second approach) provide information about reproductive intentions and their determinants. In fact, this is a value-based approach, which is no less important for measuring the effectiveness of federal maternal (family) capital for the second or subsequent child, as it provides an opportunity to get the opinion of the population directly on the importance of certain measures. Thus, the complexity of the approaches allows us to more fully characterize the consequences of the introduction of such a demographic policy measure as federal maternity capital.

We should note that we calculated all fertility rates (the first approach) taking into account the data from the 2020 census.

Measuring the effectiveness of federal maternal (family) capital for the second or subsequent child according to current statistics (the first approach)

Among the demographic policy measures implemented in Russia, federal maternal (family) capital is not just a significant, but a critically important one (Elizarov, Dzhanaeva, 2020). It was introduced on January 1, 2007 in accordance with Federal Law 256-FZ, dated December 29, 2006 "On additional measures of state support for families with children".

A steady significant increase in the number of births in 2007 compared to 2006 began in July and was greatest in October – December (in January the increase was 5.5%; in February – 3.6%; in March – 3.8%; in April – 4.4%; in May – 9.2%; in June – 3.1%; in July – 10.6%; in August – 9.6%; in September – 10.0%; in October – 14.3%; in November – 15.7%; in December – 16.4%).

It would seem that there is no reason to associate a significant increase in the number of births in July – September 2007 with the launch of measures to support families with children on January 1. However, we should point out that Russian President Vladimir Putin announced the introduction of these measures as of January 1, 2007 in his Address to the Federal Assembly of the Russian Federation on May 10, 2006. That is, families who expected the birth of a child knew about these measures in advance. It is possible that some women, after waiting for confirmation of the implementation of new measures to support families with children in early January 2007, did not terminate their pregnancy (it was too late for those who gave birth before June 2007 to decide whether or not to continue their pregnancy in early 2007).

Table 1. Total fertility rate by birth order in Russia in 1999–2023 (based on 2020 census data)

Year	First	Second	Third	Fourth	Fifth and subsequent
1999	0.679	0.344	0.087	0.026	0.018
2000	0.706	0.357	0.089	0.024	0.017
2001	0.718	0.369	0.090	0.026	0.017
2002	0.744	0.396	0.099	0.027	0.018
2003	0.758	0.412	0.102	0.028	0.018
2004	0.757	0.413	0.102	0.028	0.017
2005	0.728	0.398	0.098	0.027	0.016
2006	0.738	0.401	0.098	0.026	0.015
2007	0.742	0.469	0.123	0.033	0.019
2008	0.767	0.506	0.140	0.036	0.020
2009	0.800	0.535	0.147	0.038	0.021
2010	0.784	0.565	0.156	0.040	0.021
2011	0.779	0.573	0.164	0.041	0.022
2012	0.807	0.618	0.188	0.047	0.025
2013	0.807	0.621	0.197	0.048	0.025
2014	0.783	0.644	0.207	0.052	0.027
2015	0.781	0.682	0.217	0.055	0.028
2016	0.756	0.679	0.222	0.057	0.029
2017	0.696	0.597	0.219	0.058	0.030
2018	0.654	0.574	0.227	0.065	0.035
2019	0.626	0.523	0.225	0.068	0.036
2020	0.611	0.514	0.237	0.073	0.040
2021	0.593	0.513	0.245	0.077	0.042
2022	0.595	0.462	0.237	0.079	0.043
2023	0.597	0.441	0.240	0.087	0.045

Source: own calculation using Rosstat data.

Federal maternity (family) capital was initially provided at the birth of a second or subsequent (if not previously received) child. In 2020 it began to be provided at the birth of the first child. Therefore, to assess its impact on fertility dynamics, it is possible and advisable to use indicators differentiated by birth order, primarily total fertility rate (*Tab. 1*).

Total fertility rate for second births in 2007 increased by 0.068 compared to 2006. This is significantly more than in previous years (before 2007, the largest increase was in 2002 – by 0.027). The increase in this indicator was only slightly higher in 2000–2004 (by 0.069).

Total fertility rate for third and subsequent births increased by 0.036 in 2007 (for comparison, the overall increase in 2000–2003 was only 0.017; the indicator decreased in 2004–2006).

Thus, first, there is a coincidence in the timing of the start of the provision of federal maternal (family) capital and a significant increase in the total fertility rate for a second, third and subsequent births. Second, if the increase in fertility had been due to some other factors other than the beginning of the implementation of this measure, it would probably have manifested itself in relation to the first births. However, the increase in the total fertility rate for first births in 2007 was quite small (by 0.004). A significant increase in this indicator in 2008 (by 0.025) and 2009 (by 0.033) was probably due to a significant increase in marriage rates in 2007: total marriage rate increased by 12.8% (the largest increase since the early 1960s); the number of first marriages in women increased by 12.4%; marriage rate in women in the 18–24 age group increased by 9.2%, in the 25–34 age group – by 18.4%.

Continuous increase in the total fertility rate for second births in the period up to 2015 suggests that there was at least no priority effect of "timing" shifts on a significant increase in this indicator at the beginning of the implementation of the federal maternal (family) capital program. If they were present, then a "timing" gap would be inevitable after them, i.e. a significant decrease in the indicator due to the fact that children who could have been born in subsequent years were already born earlier.

Apparently, there were "timing" shifts in second births in 2015 and, probably, in 2016 due to the approaching the deadline originally set for the implementation of the federal maternity (family) capital program (until the end of 2016). In this case, there was a "timing" gap after them.

The use of fertility rates for real generations of women allows for a more accurate assessment of the presence or absence of "timing" shifts. However, this assessment is not given due attention, and the researchers' conclusions are mainly based on analyzing total fertility rate by birth order (Bulanova, 2022).

First of all, it is possible to analyze age-specific fertility rates (in this case, by second births) in real generations of women and assess in which generations and at which ages an increase was recorded compared to the coefficients at the same ages in previous generations. If there was an increase, but at older ages, then in the same generations the coefficients were lower than in previous generations, then there is reason to talk about "timing" shifts.

Starting from the generation of women born in 1975, we can probably talk about a significant increase (compared with the previous generation) in fertility rate for second births at the age at which women were in 2007, with the beginning of the provision of federal maternity (family) capital (*Tab. 2*).

Table 2. Dynamics (compared with the previous generation) of age coefficients for second births in 2007, before and after 2007 in Russia in generations of women born in 1972–1983, percentage points

Year of birth of women	Age in 2007	Increase in fertility rate for second births at the age at which women were in 2007, compared with the previous generation	The largest increase (compared to the previous generation) in fertility rate for second births at younger ages (i.e. before 2007)	Decline (compared with the previous generation) in fertility rate for second births at older ages (i.e. after 2007)
1972	35	2.7	2.4 (30 years)	yes
1973	34	2.9	2.2 (29 years)	no
1974	33	4.0	3.3 (28 years)	no
1975	32	3.9	1.9 (27 years)	-0.1 (36 years)
1976	31	5.5	1.4 (26 years)	-0.1 (35 years)
1977	30	4.6	0.8 (25 years)	no
1978	29	5.4	0.9 (24 years)	-0.5 (39 years)
1979	28	5.3	1.1 (23 years)	-0.1 (34 years); -1.1 (38 years); -0.3 (39 years)
1980	27	4.5	no	-1.2 (31 years); -0.9 (33 years); -0.2 (34 years); -0.5 (36 years); -2.0 (37 years); -0.8 (38 years); -0.8 (39 years)
1981	26	4.6	0.2 (21 years)	-0.7 (30 years); -0.1 (32 years); -2.0 (36 years); -0.5 (37 years); -0.5 (38 years)
1982	25	3.9	0.1 (20 years)	-2.2 (35 years); -0.4 (37 years)
1983	24	3.3	no	-3.6 (34 years); -0.6 (35 years); -0.9 (36 years); -0.4 (37 years); -0.3 (39 years)

Source: own calculation using Rosstat data.

In the generations of women born in 1972–1974 the increase in fertility rate for second births was relatively close to the one in 2007 and five years earlier (in 2002), while starting from the generation born in 1975 there was no increase in younger ages that was close in magnitude to the one in 2007. Here, with a high degree of confidence, we can talk about the impact of the beginning of the provision of federal maternity (family) capital in 2007. Probably, there were no "timing" shifts in these generations, because at older ages, first, there was either no decrease in fertility rate for second births (compared with older generations), or it was very small; second, it was recorded only in certain ages (in generations born in 1975, 1976, and 1978 – in one age group; in the generation born in 1979 – in three age groups); third, it was relatively far from the age of a significant increase in the indicator (in the generations born in 1975 and 1976 – after four years; in the generation born in 1979 – after six years; in the generation born in 1978 – after ten years; see Tab. 2).

Perhaps, in the generation of women born in 1980 there could be small "timing" shifts in second births. The first (after a significant increase) decrease in fertility rate for second births was recorded at the age of 31 in 2011 (i.e., four years after the increase in 2007) and then at almost all ages, starting at 33. Small "timing" shifts in second births could also occur in the generation of women born in 1981.

However, with regard to the generations born in 1982 and 1983, there is less reason to talk about "timing" shifts in the increase in fertility rate for second births in 2007, since the first decrease, although relatively significant, took place only 10 years later.

Table 3. Increase (compared with the previous generation) in the age coefficients for second births in 2015 in Russia in the generations of women born in 1984–1995, percentage points

Year of birth of women	Age in 2015	The increase in fertility rate for second births at the age at which women were in 2015	Decline (compared with the previous generation) in fertility rate for second births at older ages
1984	31	2.8	-5.5 (33 years); -1.3 (34 years); -2.0 (35 years); -0.9 (36 years); -0.7 (38 years); -0.1 (39 years)
1985	30	2.3	-0.8 (31 years); -7.3 (32 years); -2.1 (33 years); -2.9 (34 years); -1.4 (35 years); -0.3 (36 years); -1.4 (37 years); -0.4 (38 years)
1986	29	3.0	-0.7 (30 years); -8.1 (31 years); -2.5 (32 years); -3.2 (33 years); -1.5 (34 years); -0.4 (35 years); -1.7 (36 years); -0.5 (37 years)
1987	28	5.6	-5.8 (30 years); -2.0 (32 years); -0.6 (35 years)
1988	27	2.9	-0.6 (28 years); -8.7 (29 years); -1.7 (30 years); -4.3 (31 years); -0.9 (32 years)); -0.1 (33 years); -2.5 (34 years); -0.7 (35 years)
1989	26	1.3	-1.5 (27 years); -9.0 (28 years); -2.9 (29 years); -5.9 (30 years); -2.1 (31 years); -1.3 (32 years); -3.6 (33 years); -1.3 (34 years)
1990	25	1.6	-2.1 (26 years); -8.5 (27 years); -3.0 (28 years); -6.0 (29 years); -2.3 (30 years); -1.4 (31 years); -4.1 (32 years); -1.8 (33 years)
1991	24	2.4	-0.8 (25 years); -4.9 (26 years); -0.4 (27 years); -3.8 (28 years); -0.4 (29 years); -2.7 (31 years); -0.7 (32 years)
1992	23	2.5	-3.3 (25 years); -0.2 (26 years); -3.2 (27 years); -2.8 (30 years); -0.4 (31 years)
1993	22	1.1	-1.1 (23 years); -3.3 (24 years); -0.9 (25 years); -3.5 (26 years); -0.3 (27 years); -0.4 (28 years); -4.7 (29 years); -1.7 (30 years)
1994	21	1.0	-0.8 (22 years); -1.6 (23 years); -2.2 (25 years); -2.6 (28 years); -0.6 (29 years)
1995	20	0.6	-0.8 (21 years); -1.4 (22 years); -1.6 (23 years); -3.1 (24 years); -0.1 (26 years); -5.0 (27 years); -2.3 (28 years)

Source: own calculation using Rosstat data.

In older generations, there was a significant increase in fertility rate for second births in 2015, due to the approaching completion of the originally established term of the federal (maternal) family capital program (until the end of 2016) (*Tab. 3*).

Beginning from the generation of women born in 1984, the increase (compared to the previous generation at the same age) in fertility rate for second births in 2015 was higher than in 2007. And if, after the increase in 2007, there was no significant decrease in older ages in the same generation (i.e., if there were "timing" shifts, they were relatively insignificant), then after its increase in 2015 there was a significant decrease in older ages. This suggests a significant impact of "timing" shifts on the increase in fertility rate for second births in 2015 and the inevitable "timing" failure after that (which is largely due to the decrease in fertility rates for second births at older ages in this generation compared to the previous generation). Moreover, this decrease was most significant not at the next age (respectively, in 2016), but at the age at which women of this generation were in 2017. It is likely that the continued "timing" shifts still had a positive impact in some months of 2016 (see Tab. 3).

To assess the impact of federal maternal (family) capital on fertility rates in real generations of women, it is also advisable to use the average number of second births in certain age periods (*Tab. 4*), as well as by one age or another. To calculate this indicator, age-specific fertility rates are summed up within a generation (followed by division by 1000), and not within a calendar year, as when calculating total fertility rate.

A relatively significant increase in the average number of second births during the period when the federal maternal (family) capital program was launched (2007) can probably be noticed in relation to the generations of women born in 1973–1974 and especially in 1975. In the age range of 32–34 years the average number of second births (1973–1974 years of birth – 0.07; 1975 year of birth – 0.08) is higher than in older generations (1970–1972 years of birth – 0.06; 1968–1969 years of birth – 0.05). At the same time, in the next age range of 35–37 years the average number of second births is higher than in older generations. That is, it is likely that the increase in the indicator in 2007 was not related to "timing" shifts.

To an even greater extent, the impact of the beginning of implementation of federal maternal (family) capital probably manifested itself in the generations of women born in 1976–1978. In the age range of 29–31 years the average number of second births in each one-year generation increased and was higher than in the generations born in 1972–1975 (0.09): in those born in 1976 – 0.10; 1977 – 0.11; 1978 – 0.12. Compared to previous generations, it was also higher at older ages.

To a lesser extent there was an increase in the average number of second births among women born in 1979–1981 in the age range of 26–28 years.

In anticipation of the approach of the originally set deadline for the completion of the federal maternal (family) capital program (by the end of 2016), there was also a significant increase in fertility rate for second births in 2015. The estimates given above indicate that, unlike in 2007, "timing" shifts could have been more pronounced here.

The generation of women born in 1985 has the highest average number of second births in the age range of 29–31 years (0.15). However, at older ages in this generation the rate is lower than in the generations born in 1978–1984.

Women born in 1987–1989 have the highest average number of second births (compared to previous and subsequent generations) in the age range of 26–28 years. However, in older ages, on the contrary, it is less: 29–31 years old – 0.15 in the generation born in 1985, 0.14 in the generations born in 1986–1987, 0.12 in the generation born in 1988, 0.11 in the generation born in 1989; at the age of 32–34 – 0.11 in the generations born in 1982 and 1983, 0.10 in the generation born in 1984, 0.09 in the generation born in 1985, 0.08 in the generations born in 1986–1988, 0.07 in the generation born in 1989.

Table 4. Average number of second births by age range in Russia in generations of women born in 1965–1995 (per woman)

Year of birth of women	Age (years)											
	15-17	18-19	20-22	23-25	26-28	29-31	32-34	35-37	38-40	41-43	44-46	47-49
1965	0.00	0.01	0.13	0.19	0.11	0.06	0.04	0.02	0.01	**0.00**	0.00	0.00
1966	0.00	0.02	0.13	0.17	0.10	0.07	0.04	0.02	0.01	**0.00**	0.00	*0.00*
1967	0.00	0.02	0.13	0.15	0.10	0.07	0.04	0.03	**0.01**	0.00	0.00	*0.00*
1968	0.00	0.02	0.12	0.13	0.10	0.07	0.05	0.03	**0.01**	0.00	0.00	*0.00*
1969	0.00	0.02	0.11	0.12	0.10	0.07	0.05	0.03	**0.02**	0.01	*0.00*	0.00
1970	0.00	0.02	0.09	0.11	0.09	0.07	0.06	**0.03**	0.02	0.01	*0.00*	0.00
1971	0.00	0.02	0.08	0.10	0.09	0.08	0.06	**0.04**	0.02	0.01	*0.00*	0.00
1972	0.00	0.02	0.07	0.09	0.09	0.09	0.06	**0.04**	0.02	*0.01*	0.00	0.00
1973	0.00	0.02	0.07	0.09	0.09	0.09	**0.07**	0.05	0.02	*0.01*	0.00	0.00
1974	0.00	0.01	0.06	0.08	0.10	0.09	**0.07**	0.05	0.02	*0.01*	0.00	0.00
1975	0.00	0.01	0.06	0.08	0.10	0.09	**0.08**	0.05	*0.03*	0.01	0.00	–
1976	0.00	0.01	0.05	0.08	0.10	**0.10**	0.09	0.06	*0.03*	0.01	0.00	–
1977	0.00	0.01	0.05	0.08	0.10	**0.11**	0.09	0.06	*0.03*	0.01	0.00	–
1978	0.00	0.01	0.05	0.08	0.10	**0.12**	0.10	*0.06*	0.03	0.01	–	–
1979	0.00	0.01	0.04	0.08	**0.10**	0.12	0.10	*0.06*	0.03	0.01	–	–
1980	0.00	0.01	0.04	0.07	**0.11**	0.12	0.10	*0.06*	0.02	0.01	–	–
1981	0.00	0.01	0.04	0.07	**0.11**	0.13	*0.10*	0.06	0.02	–	–	–
1982	0.00	0.01	0.04	**0.07**	0.12	0.14	*0.11*	0.06	0.02	–	–	–
1983	0.00	0.01	0.04	**0.08**	0.12	0.14	*0.11*	0.06	0.02	–	–	–
1984	0.00	0.01	0.04	**0.08**	0.13	*0.14*	0.10	0.05	–	–	–	–
1985	0.00	0.01	**0.04**	0.08	0.13	*0.15*	0.09	0.05	–	–	–	–
1986	0.00	0.01	**0.04**	0.08	0.13	*0.14*	0.08	0.05	–	–	–	–
1987	0.00	0.01	**0.04**	0.09	*0.14*	0.14	0.08	–	–	–	–	–
1988	0.00	**0.01**	0.04	0.09	*0.14*	0.12	0.08	–	–	–	–	–
1989	0.00	**0.01**	0.04	0.09	*0.14*	0.11	0.07	–	–	–	–	–
1990	**0.00**	0.01	0.05	*0.10*	0.12	0.10	–	–	–	–	–	–
1991	**0.00**	0.01	0.05	*0.10*	0.11	0.10	–	–	–	–	–	–
1992	**0.00**	0.01	0.05	*0.10*	0.11	0.10	–	–	–	–	–	–
1993	0.00	0.01	*0.06*	0.09	0.11	–	–	–	–	–	–	–
1994	0.00	0.01	*0.06*	0.09	0.11	–	–	–	–	–	–	–
1995	0.00	0.01	*0.06*	0.08	0.10	–	–	–	–	–	–	–

Age groups in the generations that include births in 2007 are highlighted in bold; age groups that include births in 2015 are highlighted in italics.
Source: own calculation using Rosstat data.

In the generations of women born in 1990–1992 the average number of second births in the age range of 23–25 years is the largest since the generation born in 1972. However, at the age of 26–28 it is lower than in the generations born in 1984–1989, and at the age of 29–31 it is lower than in the generations born in 1977–1989.

The generations of women born in 1993–1995 have the highest average number of second births in the age range of 20–22 years, starting with the generation born in 1976. However, in the age range of 23–25 years it is lower than in the generations born in 1990–1992. In the age range of 26–28 years it is lower than in the generations born in 1982–1990 (see Tab. 4).

Thus, an analysis of the average number of second births by age range in women's generations shows the following: if the increase in fertility rate for second births in 2007 was practically not associated with "timing" shifts, then with a significant increase in 2015 such shifts probably took place.

To assess changes in fertility rates for second births in real generations of women it is advisable to use not only the average number of second births, but also the proportion of those who gave birth to a second child among those who gave birth to their first child (*Tab. 5*). It is calculated as the average number of second births divided by the average number of first births. The quotient of the division is multiplied by 100, i.e. the indicator is calculated in %. Unlike the average number of second births, this indicator does not depend on the average number of first births and therefore makes it more accurate to assess the impact of demographic policy

Table 5. Average number of second births and the proportion of those who gave birth to a second child among those who gave birth to the first child by a certain age in Russia in generations of women born in 1965–1995 (per woman)

Year of birth of women	Average number of second births (per woman)						Proportion of those who gave birth to a second child among those who gave birth to the first child (%)					
	25	30	35	40	45	50	25	30	35	40	45	50
1965	0.28	0.47	0.54	0.57	0.57	0.57	37.4	53.8	59.9	62.0	62.4	62.4
1966	0.27	0.44	0.52	0.55	0.56	0.56	35.8	50.9	57.4	60.0	60.5	60.5
1967	0.25	0.41	0.50	0.53	0.54	0.54	33.4	47.8	55.0	57.9	58.6	58.6
1968	0.23	0.39	0.48	0.52	0.53	0.53	30.7	45.0	52.9	56.4	57.2	57.2
1969	0.21	0.37	0.47	0.51	0.52	0.52	28.0	42.7	51.4	55.2	56.1	56.1
1970	0.19	0.34	0.45	0.49	0.50	0.50	25.5	39.8	49.3	53.5	54.5	54.5
1971	0.17	0.32	0.43	0.49	0.50	0.50	23.6	37.9	48.3	53.2	54.2	54.2
1972	0.15	0.30	0.42	0.48	0.50	0.50	22.2	36.7	48.1	53.7	54.8	54.9
1973	0.14	0.29	0.42	0.48	0.50	0.50	21.2	36.2	48.3	54.5	55.7	55.7
1974	0.13	0.29	0.43	0.50	0.51	0.51	20.4	36.0	48.9	55.6	56.8	56.9
1975	0.12	0.29	0.43	0.50	0.52	–	19.8	35.9	49.7	56.7	57.9	–
1976	0.12	0.28	0.43	0.51	0.52	–	19.2	35.4	50.6	57.9	59.1	–
1977	0.11	0.27	0.44	0.52	0.53	–	18.8	35.1	51.6	59.4	60.6	–
1978	0.11	0.27	0.45	0.53	0.54	–	18.7	35.4	52.8	60.6	61.8	–
1979	0.10	0.27	0.45	0.54	0.55	–	18.6	35.9	53.8	61.6	62.7	–
1980	0.10	0.27	0.45	0.53	–	–	18.1	36.3	54.6	62.0	–	–
1981	0.09	0.28	0.46	0.54	–	–	17.7	37.2	56.0	63.1	–	–
1982	0.09	0.28	0.48	0.56	–	–	17.5	38.2	57.9	64.7	–	–
1983	0.09	0.29	0.49	0.57	–	–	18.1	39.7	59.6	66.1	–	–
1984	0.09	0.30	0.50	0.57	–	–	19.1	41.0	60.5	66.7	–	–
1985	0.09	0.30	0.49	–	–	–	19.9	42.1	60.6	–	–	–
1986	0.10	0.31	0.49	–	–	–	20.9	43.6	60.0	–	–	–
1987	0.10	0.34	0.50	–	–	–	22.2	46.0	61.3	–	–	–
1988	0.11	0.33	0.49	–	–	–	23.6	46.5	61.0	–	–	–
1989	0.11	0.32	0.47	–	–	–	24.7	46.9	60.3	–	–	–
1990	0.11	0.31	–	–	–	–	26.3	47.1	–	–	–	–
1991	0.12	0.31	–	–	–	–	28.4	47.6	–	–	–	–
1992	0.13	0.31	–	–	–	–	30.4	48.8	–	–	–	–
1993	0.13	0.30	–	–	–	–	31.6	49.0	–	–	–	–
1994	0.13	0.30	–	–	–	–	32.0	48.8	–	–	–	–
1995	0.12	–	–	–	–	–	32.4	–	–	–	–	–

Source: own calculation using Rosstat data.

on second births. It can only be used to characterize fertility rate for second births in real generations for a particular age of women and cannot be used to characterize fertility rate in the age range due to the incompatibility of the numerator and denominator, i.e. it is very likely that the second and first births in a given woman were not in the same age range.

The average number of second births decreased in the generations of women born in the second half of the 1960s and early 1970s.

The proportion of those who gave birth to a second child among those who gave birth to the first child increases slightly in the generation born in 1972 by the age of 40, 45 and 50 years. To some extent, this may be due to the beginning of the provision of federal maternity (family) capital. The women of this generation were 35 years old in 2007. This increase was even more pronounced in the generation born in 1973. At the same time, the proportion of those who gave birth to a second child among those who gave birth to their first child by the age of 35 increased slightly (in 2007, women of this generation were 34 years old).

For women born in 1974, the average number of second births increased slightly by the age of 35, 40, 45, and 50. The increase continued in the generations born in 1975 and 1976. If the average number of second births was small, then the proportion of those who gave birth to a second child among those who gave birth to the first child was more significant. The increase in these indicators was even more significant in the generation of women born in 1977.

Among women born in 1978, 1979 and 1980 the proportion of those who gave birth to a second child among those who gave birth to the first child increased slightly by the age of 30 (in 2007 they were, respectively, 29, 28 and 27 years old).

Since the generation born in 1981, there has been a more significant increase in the rates of second births. Among women born in 1983 there is a slightly higher proportion of those who have given birth to a second child among those who have given birth to the first child by the age of 25 (in 2007 they were 24 years old). The increase in indicators continues in the generation born in 1984, although the increase in the proportion of those who gave birth to a second child among those who gave birth to the first child by the age of 35 and 40 is less than in older generations.

Among women born in 1986, the proportion of those who gave birth to a second child among those who gave birth to the first child by the age of 25 and 30 is significantly higher than in older generations, but by the age of 35 it is lower than in the generations born in 1984 and 1985. However, in the generation born in 1987 this figure is higher than in older generations, and by the age of 35, too.

But in the next generation (born in 1988) by the age of 35 the proportion of those who gave birth to a second child among those who gave birth to the first child is slightly lower than that in women born in 1987. The average number of second births by the age of 30 and 35 is also lower. It is even lower in the generation born in 1989, but the proportion of those who gave birth to a second child among those who gave birth to the first child is lower only by the age of 35, and by the age of 25 and 30 it is higher than in previous generations. Probably, this can reflect "timing" shifts.

In the generations of women born in the first half of the 1990s, the average number of second births continues to decrease by the age of 30, but the proportion of those who gave birth to a second child among those who gave birth to the first child by this age rises to the generation born in 1993, and only among women born in 1994 it is slightly lower.

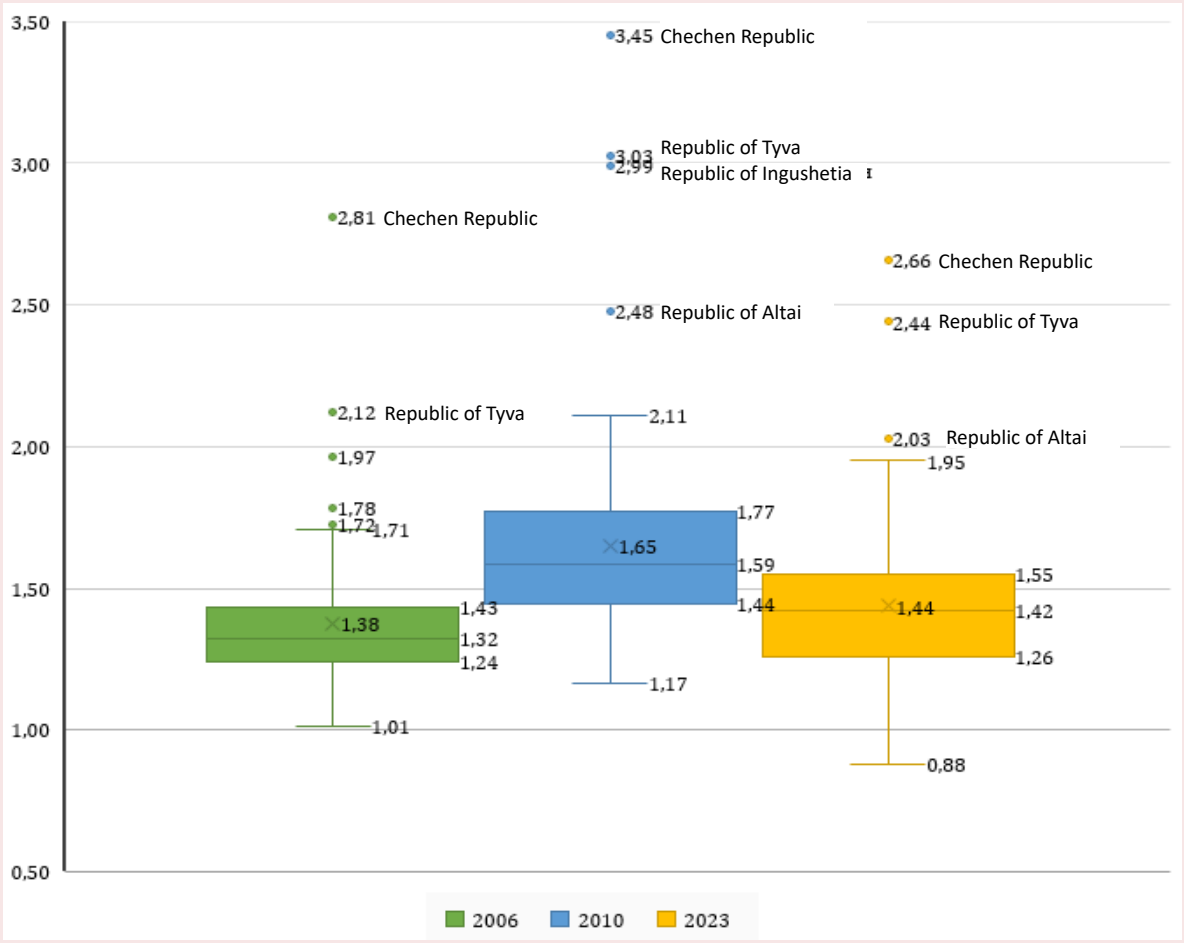
Based on the analysis of the dynamics of different fertility rates for second births, we can say that the provision of federal maternity (family) capital contributed to an increase in fertility rates for second and subsequent births. It occurred both in calendar indicators (total and age-specific fertility rates for the second, third and subsequent

births) and in real generations of women. The increase in fertility rate for second births in 2007, i.e. at the beginning of the maternity capital program, was most likely not accompanied by "timing" shifts (i.e. there were probably cases of an earlier birth of a second child, but at the level of statistical indicators they were compensated by the realization of previously postponed births). There is a high probability that "timing" shifts will affect the change in indicators in 2015 and, apparently, in the first half of 2016, i.e. on the eve of the originally set deadline for the completion of the federal maternity (family) capital program. A more correct assessment for real generations is provided by an analysis of the change in the proportion of those who gave birth to a second child among those who gave birth to the first child. This indicator does not depend on the average number of first births, which decreases in younger generations, thereby contributing to a decrease in the average number of second births.

Measuring the effectiveness of federal maternal (family) capital for the second or subsequent child according to census and micro-census data (the second approach)

Fertility rate varies significantly by region (*Fig. 2*); this is determined both by the specifics of regional demographic measures (for example, the presence and size of regional maternity capital, which is

Figure 2. Total fertility rate in the regions of Russia in 2022



Source: Rosstat.

absent in some regions of the country) and by socio-economic development of constituent entities of the Russian Federation themselves (Rostovskaya et al., 2023).

Considering the task of achieving fertility targets, it is important to note that the data from the population's micro-census on reproductive attitudes provide grounds for forecasting the average number of children born in real generations. Based on such a forecast, a forecast of total fertility rate can be made. Using such a forecast, it is possible to assess the achievability of the set targets for the indicator. If the forecast indicators turn out to be less than the targets, then based on the magnitude of the difference between them it can be judged how significant additional demographic policy measures aimed at increasing the birth rate should be.

Unfortunately, the forecasting possibilities of using the results of research on reproductive intentions have so far been very rarely analyzed, at least in Russia. Here we can highlight, first of all, the article by E.M. Andreev and G.A. Bondarskaya "Is it possible to use data on the expected number of children in the population forecast?" published in the journal *Voprosy statistiki* (Andreev, Bondarskaya, 2000), as well as an earlier work by V.A. Belova, G.A. Bondarskaya, A.G. Vishnevsky, L.E. Darsky and R.I. Sifman "How many children will there be in a Soviet family (survey results)"[5]. We should note that in foreign practice, when developing fertility scenarios for demographic forecasts, the results of systematically conducted surveys of women about the expected number of children are used (Predicting Fertility..., 1981); moreover, the first tests of this approach date back to the late 1940s (Whelpton et al., 1966).

In our study, in order to assess the predictive possibilities of information about reproductive intentions, we compared data on the average expected number of children according to the 2015 population micro-census and the average number of children born according to the 2020 population census. Taking into account the interval between the micro-census and the population census and the expediency of considering the average number of children born in generations close to the end of the reproductive period (otherwise, one could say that reproductive intentions had not yet been realized at the time of the population census, but would be realized later), the average numbers of children born in the 2020 population census are compared across constituent entities of the Russian Federation in the generations of 40–44-year-old and 45–49-year-old women with an average expected number of children according to the 2015 population micro-census in generations, respectively, of 35–39-year-old and 40–44-year-old (at the time of the micro-census) women (Appendix).

From the point of view of assessing the implementation of reproductive intentions expressed by the expected number of children (according to the responses to the question "How many children (including existing ones) are you going to have?"), we should note that even in 40–44-year-old women (at the time of the 2015 micro-census) it is higher than the average number of children born to 45–49-year-old women according to the 2020 census. Of course, it should be borne in mind that these two sets of women are not quite comparable, since only 1.5% of the population participated in the micro-census.

In Russia as a whole the difference between the average expected number of children in 40–44-year-old women according to the 2015 micro-census and the average number of children born to 45–49-year-old women according to the 2020 census is 0.11. The largest difference between them was observed in the Republic of North Ossetia–Alania (0.31)

[5] Belova V.A., Bondarskaya G.A., Vishnevsky A.G., Darsky L.E., Sifman R.I. (1977). How Many Children Will There Be in a Soviet Family (Survey Results). Moscow: Statistika. 104 p. Available at: https://www.demoscope.ru/weekly/knigi/IDEM_library/book074.php (accessed: October 9, 2024).

and the Karachay-Cherkess Republic (0.26). In one region it is 0.18, in four – 0.17, in two – 0.15, in ten – 0.14, in three – 0.13, in four – 0.12, in seven – 0.11, in six – 0.10, in nine – 0.09, in five – 0.08, in six – 0.07, in one – 0.06, in six – 0.05, in four – 0.04, in two – 0.03, in three – 0.02. In the Bryansk, Kurgan, Penza and Pskov regions, and in the Yamal-Nenets Autonomous Area these indicators coincide. In the republics of Altai, Mari El and Udmurtia, and in the Kostroma region, on the contrary, the average expected number of children according to the 2015 population micro-census is less than the average number of children born according to the 2020 population census.

The difference between the average expected number of children in 35–39-year-old women according to the 2015 micro-census and the average number of children born to 40–44-year-old women according to the 2020 census is 0.13 in Russia as a whole. The largest difference between them is observed in the republics of Chechnya (0.37), North Ossetia–Alania (0.32), Kabardino-Balkaria (0.31), Ingushetia (0.26), Bashkortostan (0.24) and Karachay-Cherkessia (0.23), in the Stavropol Territory (0.21), in the Murmansk (0.21) and Tula (0.21) regions, in the Chukotka Autonomous Area (0.25). In two regions it is 0.20, in two – 0.19, in three – 0.18, in one – 0.17, in three – 0.16, in five – 0.15, in five – 0.14, in three – 0.13, in four – 0.12, in four – 0.11, in eight – 0.10, in four – 0.09, in two – 0.08, in three – 0.07, in two – 0.06, in four – 0.05, in four – 0.04, in two – 0.02, in four – 0.01. In the republics of Altai and Mari El, and in the Nenets Autonomous Area these indicators coincide. In the republics of Komi, Crimea, Tyva, Udmurtia and Khakassia, in the Altai Territory and in the Kostroma Region, on the contrary, the average expected number of children according to the 2015 population micro-census is less than the average number of children born according to the 2020 population census.

Considering that Presidential Decree 309, dated May 7, 2024 "On the national development goals of the Russian Federation for the period up to 2030 and for the future up to 2036" highlights the task of "annual growth in the total fertility rate for a third child and subsequent children", it is advisable to make such a prognostic assessment in general by the number of children born, but also differentiated by order of birth. According to the population census, it is possible to calculate the average number of children born according to order of birth, the proportion of those who gave birth to a child of a particular order of birth among those who gave birth to a child of the previous order of birth. In order to compare these data with the data on reproductive intentions from the micro-census, it is advisable, along with the question of the expected number of children, to ask about the intention to have another child in the coming years (at the same time, it is necessary, apparently, to specify the time). In combination with information about the number of children born, the answers to this question will provide information about the proportion of those intending to have a child of a particular birth order.

Only a micro-census can provide representative information for such predictive assessments at the regional and municipal levels.

The study of large-family orientations and their determination within the framework of the micro-census is also important in the context of the implementation of Presidential Decree 63, dated January 23, 2024 "On measures of social support for large families".

Value orientations are, probably, among the most significant determinants of reproductive orientations. According to the data of the "Selective observation of the reproductive plans of the population" conducted by Rosstat in 2022, two groups of respondents were identified: family-oriented and individual-oriented. The first group includes those who scored the importance of

living in a registered marriage at 5 points and the importance of the value of "being free, independent and doing what only I want" at 1 point. On the contrary, the second group includes those who scored the importance of "being free, independent and doing what only I want" at 5 points and the importance of living in a registered marriage at 1 point.

The group of respondents focused on family includes 17.4% of women and 17.1% of men, while those focused on their own values comprise 2.5% and 3.6%, respectively (the rest of the respondents are not included in these groups, since they do not have diametrically opposed extreme assessments of the importance of these two values).

The selected groups of respondents have significantly different reproductive orientations. Family-oriented parents have an average desired number of children (according to the responses to the question "How many children (including existing ones) would you like to have it if you had all the necessary conditions?") equal to 2.19 for women and 2.24 for men, and 1.45 and 1.30 for those focused on their own values, respectively. The average expected number for family-oriented people is 2.04 for women and 2.05 for men, while for those focused on their own values it is 1.20 and 1.11, respectively (*Tab. 6*).

In this regard, it seems important to include the question of the importance of values (with an assessment on a five-point scale) in the population micro-census program.

The relevance of studying value orientations in a micro-census (i.e., in a survey representative at the regional and municipal levels) is primarily related to the task of evaluating the effectiveness of the policy provided for in Presidential Decree 809, dated November 9, 2022 "On approval of the foundations of state policy for the preservation and strengthening of traditional Russian spiritual and moral values". The Decree notes that monitoring the achievement of state policy goals for the preservation and strengthening of traditional values requires the development of an appropriate system of indicators based on the following data: a) official statistical information; b) results of sociological research. Official statistical information can be obtained based on the results of a micro-census.

Conclusion

The methodology proposed in this article for assessing the effectiveness of demographic policy measures, in particular federal maternal (family) capital, is based on two approaches: the possibility of making estimates by using a system of fertility indicators obtained on the basis of current accounting data, and a comparative analysis of the actual birth rate and forecast estimates obtained on the basis of data on reproductive intentions during censuses and micro-censuses of the population. Each of the approaches has its own specifics: in the first case the effectiveness is assessed using statistical and demographic data analysis, in the second the focus is on a value-based approach using survey data from target groups. At the same time, measurements during the testing of each of the approaches revealed the importance of federal maternity capital in the context of fertility growth.

The analysis based on the use of fertility rates by birth order and by the age of the mother indicates that the increase in the total fertility rate for second

Table 6. Average desired and expected number of children for family-oriented people and for those oriented on their own values

Respondents	Average desired number of children		Average expected number of children	
	Women	Men	Women	Men
Family-oriented	2.19	2.24	2.04	2.05
Focused on their own values	1.45	1.30	1.20	1.11
Source: Selective observation of the reproductive plans of the population, Rosstat, 2022				

births in the period up to 2015 indicates the absence of "timing" shifts at the initial stage of the implementation of the federal maternal (family) capital program. There were "timing" shifts in second births in 2015 and, probably, in 2016 due to the approaching completion of the originally set deadline for the implementation of the federal maternity (family) capital program (until the end of 2016).

The use of fertility rates for real generations of women allows for a more accurate assessment of the presence or absence of "timing" shifts. Beginning from the generation of women born in 1975, we can talk about a significant increase in fertility rate for second births compared to the previous generation with the beginning of the provision of federal maternity (family) capital. The analysis of age-specific fertility rates for second births in real generations of women allows us to formulate a conclusion about the effectiveness of fertility policy measures for real generations of Russians.

The uniqueness of the second approach consists in identifying the predictive possibilities of information about reproductive intentions obtained from the database of censuses and micro-censuses.

The convergence of the two approaches forms a comprehensive approach to assessing federal maternal (family) capital as one of the measures that can have an impact on promoting fertility, which is particularly important in light of the inclusion of the goal of birth rate growth in strategic documents in the field of demography and social policy[6].

In general, the proposed approaches expand the possibilities of assessing the effectiveness of measures aimed at increasing birth rate in a country and can be used in relation to various demographic policy measures. The prospect of research may be to test the proposed methodology for assessing the effectiveness of federal maternity (family) capital for the first child, regional maternal (family) capital, as well as a number of measures related to the impact of lump-sum payments on fertility.

Appendix

Average number of children born in real generations of women (according to the 2020 census) and the average expected number of children (according to the 2015 micro-census)

Region*	Women aged 40–44 according to the 2020 population census and aged 35–39 according to the 2015 micro-census		Women aged 45–49 according to the 2020 population census and aged 40–44 according to the 2015 micro-census	
	Average number of children		Average number of children	
	Born (40–44 years)	Expected (35–39 years)	Born (45–49 years)	Expected (40–44 years)
Russian Federation	**1.66**	**1.79**	**1.60**	**1.71**
Chechen Republic	2.79	3.16	2.72	2.84
Republic of Ingushetia	2.73	2.99	2.96	3.01
Republic of Dagestan	2.48	2.60	2.47	2.54
Republic of Tuva	2.41	2.28	2.33	2.38
Republic of Altai	2.29	2.29	2.18	2.03
Republic of Sakha (Yakutia)	2.18	2.31	2.10	2.19
Republic of Buryatia	2.03	2.16	1.92	1.97
Republic of Kalmykia	2.03	2.10	1.98	2.08

[6] Bulletin of the Accounts Chamber of the Russian Federation. 2021. No. 9. Maternity capital. Available at: https://ksp.mos.ru/upload/info(press-centr)/news/documents/Бюллетень%20СП%20РФ%20№9%202021_материнский%20капитал.pdf. (Accessed: November 9, 2024).

Continuation of Appendix

Region*	Women aged 40–44 according to the 2020 population census and aged 35–39 according to the 2015 micro-census		Women aged 45–49 according to the 2020 population census and aged 40–44 according to the 2015 micro-census	
	Average number of children		Average number of children	
	Born (40–44 years)	Expected (35–39 years)	Born (45–49 years)	Expected (40–44 years)
Karachay-Cherkess Republic	2.03	2.26	1.97	2.23
Nenets Autonomous Area	2.02	2.02	2.00	2.08
Kabardino-Balkarian Republic	1.94	2.25	1.91	2.04
Yamal-Nenets Autonomous Area	1.90	2.01	1.82	1.82
Trans-Baikal Territory	1.89	1.98	1.84	1.98
Chukotka Autonomous Area	1.88	2.13	1.80	1.97
Khanty-Mansi Autonomous Area – Yugra	1.86	1.92	1.75	1.84
Republic of Khakassia	1.85	1.80	1.76	1.79
Kurgan Region	1.84	1.85	1.73	1.73
Astrakhan Region	1.83	1.87	1.75	1.78
Chuvash Republic	1.82	1.83	1.74	1.76
Udmurt Republic	1.81	1.77	1.75	1.72
Republic of Adygea	1.81	1.91	1.76	1.81
Tyumen Region (excluding autonomous areas)	1.81	1.85	1.72	1.77
Republic of North Ossetia – Alania	1.81	2.13	1.79	2.10
Jewish Autonomous Region	1.79	1.87	1.74	1.86
Irkutsk Regio*n*	1.78	1.94	1.73	1.87
Orenburg Region	1.77	1.87	1.69	1.76
Republic of Mari El	1.76	1.76	1.69	1.63
Altai Territory	1.75	1.71	1.64	1.71
Republic of Komi	1.74	1.73	1.65	1.73
Arkhangelsk Region	1.74	1.85	1.65	1.74
Vologda Region	1.74	1.83	1.66	1.68
Stavropol Region	1.73	1.94	1.69	1.79
Kostroma Region	1.72	1.70	1.62	1.61
Tomsk Region	1.72	1.81	1.63	1.77
Perm Region	1.72	1.86	1.65	1.79
Omsk Region	1.71	1.75	1.61	1.72
Kirov Region	1.71	1.78	1.62	1.72
Republic of Crimea	1.71	1.68	1.63	1.65
Republic of Bashkortostan	1.71	1.95	1.71	1.89
Amur Region	1.69	1.87	1.65	1.70
Krasnodar Region	1.68	1.72	1.63	1.67
Republic of Karelia	1.67	1.77	1.58	1.62

End of Appendix

Region*	Women aged 40–44 according to the 2020 population census and aged 35–39 according to the 2015 micro-census		Women aged 45–49 according to the 2020 population census and aged 40–44 according to the 2015 micro-census	
	Average number of children		Average number of children	
	Born (40–44 years)	Expected (35–39 years)	Born (45–49 years)	Expected (40–44 years)
Chelyabinsk Region	1.66	1.75	1.60	1.69
Krasnoyarsk Region	1.65	1.77	1.61	1.75
Novosibirsk Region	1.65	1.72	1.57	1.66
Republic of Tatarstan	1.65	1.79	1.64	1.81
Khabarovsk Region	1.64	1.75	1.57	1.65
Kamchatka Region	1.64	1.74	1.56	1.71
Kaliningrad Region	1.64	1.81	1.57	1.71
Novgorod Region	1.63	1.73	1.54	1.68
Sverdlovsk Region	1.62	1.80	1.57	1.68
Bryansk Region	1.62	1.68	1.57	1.57
Ulyanovsk Region	1.61	1.66	1.55	1.62
Kursk Region	1.61	1.69	1.53	1.64
Ryazan Region	1.61	1.62	1.53	1.57
Primorye Territory	1.61	1.71	1.56	1.64
Volgograd Region	1.61	1.76	1.58	1.66
Murmansk Region	1.60	1.81	1.49	1.62
Yaroslavl Region	1.60	1.65	1.49	1.58
Magadan Region	1.60	1.75	1.56	1.70
Kemerovo Region	1.59	1.75	1.54	1.66
Kaluga Region	1.59	1.72	1.51	1.62
Tver Region	1.58	1.70	1.51	1.63
Oryol Region	1.58	1.76	1.52	1.63
Republic of Mordovia	1.58	1.74	1.50	1.58
Saratov Region	1.57	1.71	1.52	1.58
Pskov Region	1.57	1.62	1.48	1.48
Lipetsk Region	1.57	1.72	1.50	1.59
Rostov Region	1.56	1.71	1.53	1.62
Sevastopol	1.56	1.58	1.46	1.56
Tambov Region	1.55	1.56	1.50	1.57
Penza Region	1.55	1.60	1.50	1.50
Vladimir Region	1.55	1.57	1.46	1.50
Nizhny Novgorod Region	1.54	1.64	1.47	1.54
Ivanovo Region	1.53	1.68	1.44	1.53
Sakhalin Region	1.53	1.72	1.48	1.65
Belgorod Region	1.53	1.63	1.48	1.59
Leningrad Region	1.51	1.63	1.47	1.60
Smolensk Region	1.49	1.60	1.43	1.53
Samara Region	1.49	1.63	1.44	1.58
Voronezh Region	1.47	1.61	1.44	1.55
Tula Region	1.46	1.67	1.40	1.57
Moscow Region	1.46	1.66	1.43	1.53
Moscow	1.37	1.57	1.34	1.48
Saint Petersburg	1.36	1.55	1.29	1.44

* The regions are ranked according to reduction in the average number of children born to women aged 40–44.

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Received October 9, 2024.