Article

Family benefits public spending: Centralization or decentralization?

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Abstract: In order to overcome negative demographic trends in the Russian Federation, measures to stimulate the birth rate have been developed and financed at the federal and sub-federal levels. At the moment, on the one hand, there is a tendency to centralize expenditures for these purposes at the federal level, on the other hand, the coverage of the subjects of the Russian Federation, which introduce sub-federal (subnational) maternity capital (SMC), is expanding. The study was recognized to answer the question: whether the widespread introduction of SMC is justified, whether the effect of its use depends on the level of subsidization of the region and the degree of decentralization of expenditures.

Keywords: family allowance; family benefits public spending; fiscal federalism; fiscal centralization; fiscal decentralization; maternal capital

1. Introduction

For pro-natalist purposes, various forms of publicly funded family allowances are available in some countries around the world. These family benefits include direct cash payments to families with children, as well as various in-kind benefits. In the Russian Federation, one of the forms of public financial support for families with children is maternal (family) capital, the costs of financing which take up the largest share of budget expenditures on family and maternity protection (social security expenditures). The relevance of using various measures aimed at stimulating the birth rate in the Russian Federation is confirmed by the low level of population density (8.8 people per sq. km in 2021), which is 13 times lower than in the EU (European Union), while over the past 30 years this indicator in Russia has decreased by 0.3 people per sq. km. The additional importance of an active pro-natalist policy in Russia is determined by the realized geopolitical and macro-economic risks of the last decade. At the federal level, the Social Fund of Russia finances support measures for owners of maternal (family) capital through a transfer from the federal budget. The program of family (maternity) capital in Russia at the federal level, like the "baby bonus program" in Singapore (Tan, 2023), includes not only cash payments, which are intended for families with an average per capita income below the subsistence minimum in the region, but also the allocation of funds to providers of relevant goods and services for: improving housing conditions, education of the child, financing of the mother's funded pension, purchase of goods and services for disabled children. The implementation of the program of fiscal federalism in Russia (since 2005), which provides for the delineation of obligations between the federal and sub-federal levels, has defined support for families with children to the obligations of the subjects of the federation, financed from their own subnational budget revenues (in some cases, co-financed from the federal budget). But with the introduction of maternity capital at the federal level, which supplements

federal benefits for children, in accordance with social insurance, as well as some other family benefits, including subsidizing the mortgage loan rate for large families, there is fiscal centralization of expenditures in terms of family benefits (**Figure 1**). In addition, since 2024, the Russian Federation has introduced a single standard for the status of a large family (previously it was determined regulated by subnational legislation)—3 children.
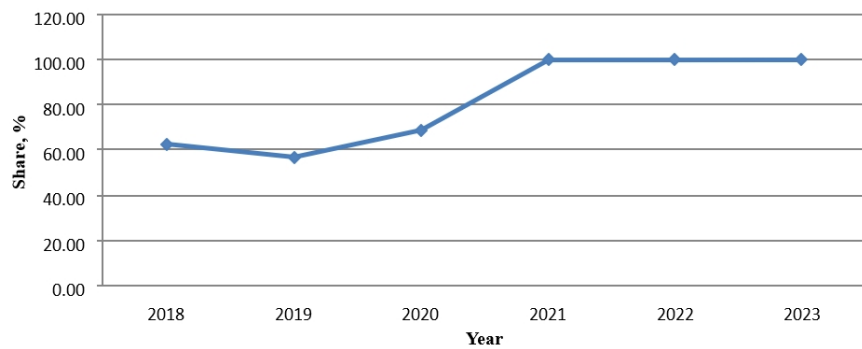
Figure 1. Change of the share of federal budget expenditures on family and maternity protection in the total amount of expenditures of the consolidated budget of the Russian Federation on these purposes, 2018–2023 (Based on data from the Russian Treasury, 2024).

At the same time, in addition to federal maternity capital, subnational maternity capital is provided at the level of certain subjects of the Russian Federation. However, Rosstat data for 2023 show that with the lowest fertility rate in Russia in the last 8 years (except for 2020)—1.41 children per 1 woman, there are maximum rates in 3 subjects of the Russian Federation: the Chechen Republic (2.66), the Republic of Tyva (2.44), the Republic of Altai (2.03), and the lowest rates in the Leningrad Region (0.98) and the city of Sevastopol (0.88). The indicated subjects of the federation-leaders and outsiders have been maintained over the last 10 years with slight changes within the group, this suggests that historical and religious traditions in the subject of the Russian Federation, climatic and environmental conditions, proximity or remoteness from hostilities over the last two years, the amount of subnational debt and the level of gross regional product per capita are not determinants of fertility rates.

The purpose of the study is to identify the degree of influence of family allowance programs in the form of subnational maternal family capital (SMC) on the level of fertility (fertility rate) in the constituent entity of the Russian Federation, the degree of dependence on the federal center influences the amount of funding and, accordingly, the size of which.

2. Guiding literature

The effect of incentive family allowances on fertility increases was confirmed by studies as early as 1960 by Becker (Becker, 1960), but further publications by Becker and Lewis (1973) recognized that "theoretical considerations lead to ambiguous predictions of fertility responses to reforms" (Malak et al., 2019). A woman's level of education and her professional realization also influence changes in fertility as a

response to stimulating measures.

The most recent empirical studies of the demographic problem in Japan show that even the most generous government programs of financial incentives for fertility and support for families with children cannot outweigh the opportunity costs for women, given certain labor market conditions, social norms, and family values. The birth of a second and subsequent children, given that the labor market norm in Japan is to work late into the evening, leaves no chance for women to decide to have additional children. It becomes physically impossible to do the work of raising them and running a household. The prevailing societal standards, national traditions, and family norms in Japanese society have a critical impact on the dynamics of family childbearing, so changing fertility patterns probably requires more than just compensatory financial incentives for women (Schoppa, 2020).

A study of demographic and socioeconomic data on married women in Israel for the period 1997–2005 found that financial incentives have a significant positive effect on fertility, regardless of age, cultural and religious characteristics (including orthodox Jews and older women). Public financial incentives for fertility increase fertility rates by 7.8% (Cohen et al., 2007), and slightly but still increase the probability of having a second and subsequent child by 0.04 percentage points (Nieto, 2022). However, the fiscal stimulus to fertility through benefits to families with children was expectedly insignificant for high-income groups. The authors obtained results confirming the hypothesis of Becker and Tomes (1976), which links income effects and the marginal propensity of families to have subsequent children. The negative effect of income on fertility is manifested in low come groups, as families postpone the decision to have a child due to limitations in the level of well-being and consider each subsequent child as an additional burden on the family budget. The positive effect of income, according to the hypothesis of Becker and Tomes (1976), is manifested in the fact that high-income families consider children as "expensive goods" that can increase the social status of the family and become an alternative investment in human capital. Therefore, rich families are more likely to have second and subsequent children, while poor families, other things being equal, are not. Thus, the authors confirm the high effectiveness of benefits for families with children to stimulate fertility, primarily for low-income families (An and Mikhaylov, 2020; An et al., 2024; An et al., 2020; Stepanova et al., 2024; Mikhaylov, 2021; Mikhaylov et al., 2023a; Mikhaylov et al., 2023b; Moiseev et al., 2023; Mutalimov et al., 2021; Mikhaylov, 2023).

A study by Gauthier and Hatzius (1997) at the end of the last century on the impact of cash payments to families with children, based on data for OECD (Organisation for Economic Co-operation and Development) member countries, showed the effectiveness of financial incentives for fertility. On average, a 25% increase in family allowances led to an increase in fertility of 0.6% in the short run and about 4% in the long run. The effectiveness of allowances for families with children as an instrument of state financial stimulation of fertility is also confirmed in a number of more recent studies of women's reproductive behavior (Alijanzadeh et al., 2023; Cohen et al., 2013; González, 2013; Luci-Greulich and Thévenon, 2013; Olivetti and Petrongolo, 2017; Raute, 2019; Riphahn and Wiynck, 2017; Spéder et a1., 2019; Vikat, 2004).

At the current stage of human evolution, society has to compensate families for

the costs of childbirth and upbringing. This policy is still effective on average, but the amounts and types of state financial support for motherhood and childhood are gradually increasing as the cost of reproduction of human capital becomes higher. Doepke and Kindermann (2019) find that of all measures of financial incentives for fertility, subsidizing the total cost of raising children is the most important and effective. Tax benefits, maternity payments, in their opinion, are less effective.

High social standards for parents in terms of birth and upbringing of children require a sufficient level of per capita income from the future family. A conscious decision to have a child is connected with the need to find an appropriate level of income, as well as to fulfill a number of other conditions, such as housing, social infrastructure, and so on. Combining the ideas of the effectiveness of budget support for low-income groups of the population, as well as the practice of postponing the birth of the first child to a later time in order for future parents to find a source of labor income to provide for the future family, the logical solution to the problem of low birth rate is the idea of expanding the scope of state financial stimulation of income of young families. In this regard, a number of researchers suggest stimulating fertility in young families through the development of the labor market and increasing the level of income of young professionals, as well as the development of targeted benefit programs related to the level of average per capita income in the family (Aksoy and Billari, 2018; Cowan and Douds, 2022; van Wijk and Billari, 2024). Given that young professionals are low-wage employees at the start of their careers, the regulation of minimum wage levels plays a huge role. Bergsvik et al. (2021) point out that such public financial regulation strategies are quite effective in practice.

Significant increases in financial incentives tend to lead to significant increases in fertility rates. Factor analysis of the effectiveness of financial incentives in Tudor (2020) shows that the increase in fertility in such cases is explained by a significant reduction in the probability of abortion, while the average conception rate does not change significantly. This effect is due to family planning decisions by women from low-income households, who are more likely to benefit from changes in the conditions of budgetary payments for maternity programs.

Since fertility has a positive relationship with budgetary incentives and payments to families with children, the policy of state financial stimulation of fertility can be estimated by various simple and complex statistical and econometric methods, in which the dependent variable is various fertility indicators, and the explanatory variable is both direct programs of social support to women in labor maternity and families with children. The decision to have a second and subsequent child is made not only on the basis of potential economic compensations associated with the loss of income due to the need to bear and raise children. It also depends on subjective expectations of economic well-being in the future, in which children will be able to realize themselves, as well as the quality and level of accessibility of public goods (health, education, security, culture and sports, etc.). Thus, the explanatory variable can be not only expenditures within the framework of direct, but also indirect financial regulation, namely, all public expenditures of the budget system.

Zhang et al. (2022) found that not only direct but also mixed (including indirect) measures of government financial regulation, which quantitatively represent total government expenditures, have a positive effect on women's intention to have more

children (2.3 to 3.4 children on average). At the same time, the effect of aggregate public expenditures is stronger for families with one male child and for families living in rural region, which indirectly indicates the specificity of the marginal propensity to have children and the influence of the urbanization factor.

There are also contradictory results in the scientific literature, in which the authors did not obtain evidence of the positive impact of the introduction of child allowance programs on changes in fertility in developing countries. For example, Parada (2024) evaluated the implementation of the 2008–2009 Family Allowances (AFAM-PE) program in Uruguay aimed at stimulating fertility and overcoming poverty in families with children. The authors found no statistically significant evidence that additional cash transfers to families with children had a positive impact on fertility. Parker and Ryu (2023) do a similar job of examining the impact of programs to support the poor in Mexico, but disaggregated by age group. In the case of Mexico, monetary incentives for students lead to postponement of the first child and reduce fertility among the younger generation, while such programs can stimulate adult fertility for women who are already educated. Stimulating fertility in developing countries that have not completed the demographic transition through cash transfers to low-income families alone may not be an effective measure with mixed results and requires additional conditions for successful implementation.

The introduction of financial incentive programs is a complex and irreversible process, because the negative social and economic effects of removing incentives or benefits for families with children may be greater than the short-term positive effects of introducing them. Thus, González and Trommlerová (2021) in a study of the effectiveness of the introduction of a fertility incentive program in Spain showed just such an opposite effect. After the introduction of incentive payments to the population in 2007, the birth rate increased and the abortion rate decreased. However, a few years later—in 2010—the program was phased out, from which the opposite effect was obtained, which was stronger (increase in the number of abortions and reduction in the birth rate), especially among the low-income population and migrants. To a greater extent, the negative effect of the curtailment of incentives manifested itself in the economically backward regions of the country. A similar effect of the abolition of family allowances was also recorded in Hungary (Aassve et al., 2006). These studies point to an important condition in stimulating fertility—the development of the policy of state financial stimulation of fertility should have a long-term progressive character. The state cannot abandon its social commitments to stimulate fertility too quickly, because this could undo all previous efforts. It is necessary to avoid ill-considered populist promises and taking excessive amounts of social commitments if there are high risks of their withdrawal in the short and medium term (Dorofeev, 2024).

The effect of the introduction of maternity (family) capital in Russia in 2010–2017 on the health, welfare of children and investment in human capital is considered in the study by Proshin (2023).

In most cases, fertility incentive programs are regulated and financed by the central government, but a study based on data from selected OECD and Brazil, Russia, India, China, South Africa (BRICS) countries (Vonk and Schoukens, 2019) shows that in many countries, the obligation to pay family allowance as a social security benefit, in accordance with ILO Convention 102 and ILO Recommendation 202, is divided

between central and subnational governments. Thus, among the reviewed countries (Belgium, Spain, Italy, Germany, the United Kingdom, Switzerland, the United States, Canada, Australia, Brazil, Russia) legal regulation, administration and financing of family allowance payments—only in Brazil, Italy and the United Kingdom belong to the exclusive competence of the federation/central government. In other countries, either there is a competition between the federal and sub-federal levels, with the federal level taking precedence (Russia, Germany and Australia), or these are the rights of federal subjects (Belgium), or these are joint competences of the federal/central and sub-national governments. Among the reviewed OECD countries, only in Australia, Belgium, Germany and Great Britain public expenditures on family benefits as a % of GDP are higher than the OECD average (OECD, 2024). At the same time fertility rates are just above the OECD average in 2021—in Australia (1.7), the US (1.66) and Belgium (1.6), and in Germany (1.58)—at the level of the average, in the rest of the countries—well below the average, especially—in Italy (1.25) and Spain (1.19). Thus, the combination of fiscal centralization and decentralization in the financing and administration of family allowances is a general trend and, in general, ensures a higher level of their financing as a share % of GDP, as well as above-average fertility rates. A significant share in the expenditures of the budgets of the subjects of the Russian Federation is occupied by payments to SMC recipients. While SMC financing takes a significant share of social security expenditures in the budgets of the subjects of the Russian Federation, its stimulating role is not sufficiently studied. At the moment we can only cite the study of Vakulenko et al. (2023), who, based on data from 1996–2020, consider the impact of SMC on fertility in the subjects of the Russian Federation. The authors conclude that the introduction of SMC has the greatest effect in the regions of central Orthodox Russia and at a size close to the federal level. This study does not take into account the peculiarities of formation of subnational budgets and their relationship to the size of SMC, as well as changes introduced at the federal level.

In the study by Vakulenko et al. (2023) the analysis is based on the "declared" average amounts of regional maternity capital. In the present study, we use actual expenditures of sub-federal budgets for 1 child under 1 year of age.

3. Institutional setting

Over the last 10 years the number of large families in Russia has doubled. The growth rate of births of third children has increased by 11%. However, in order to maintain sustainable population growth, it is necessary that at least 51% of families have many children.

Initially, the federal program of maternity capital, launched in the Russian Federation in 2007, provided for the right to capital at the birth of the second child, and from 2020 the right to receive SMC was transferred to the first child. At the same time at the birth of the second child and the third child there is an additional payment, if the family did not use the right to maternity capital at the birth of older children. Federal legislation of the Russian Federation in 2024 sets the amount of maternity capital at the birth (adoption) of the first child—about 630 thousand rubles (about 7 average salaries or 41 minimum subsistence wages), the second—a little more than

830 thousand rubles, if the family has not previously used the right to maternity capital. If the family used, it receives only the difference between these amounts (about 200 thousand rubles).

SMC programs were introduced later than the federal one since 2011 and do not compete with it, but complement it. Initially, the number of subjects of the Russian Federation that started financing their own SMC programs was 33 (39% of the total number of subjects of the Russian Federation); in 2024, SMC programs are in place in 76 subjects of the Russian Federation (85% of all subjects of the Russian Federation). The change in the coverage of the subjects of the Russian Federation by SMC programs was not linear: most of the subjects introduced their programs in 2012, while some of them have already completed their programs. For example, in Perm Kray, in accordance with the Law of Perm Kray dated 29 February 2012 N 5PK "On additional measures of social support for families with children" (ed. 02.03.2015), the program was in effect for 6 years (2012–2018). Despite the cancellation of the program, the fertility rate in this subject of the Russian Federation remains above the national average, but the peak values since the beginning of the federal program, as well as in Russia on average, are observed in the period 2007–2016 (**Figure 2**).
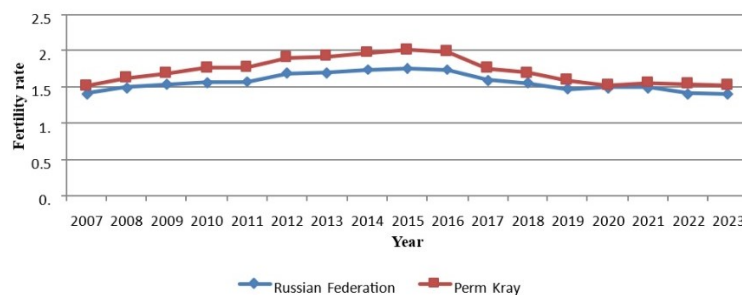
Figure 2. Change in the fertility rate in Perm Kray and on average in the Russian Federation in 2016–2023 (Rosstat, 2024).

It should be taken into account that the term "region" in English is not used to name all subjects of the Russian Federation. However, Russian legislation uses region and subject of the Russian Federation as equivalent concepts, so the literal name of the SMC program in Russian is "Regional maternity (family) capital". But this article uses the name of subnational or sub-federal maternity (family) capital (SMC) as traditionally the level of the subject of the federation is defined in the theory of fiscal federalism and statistics of state finances.

As of 2024—the SMC program operates in 76 subjects of the Russian Federation, along with the federal maternity capital. Subnational programs imply different conditions for its provision to families with children, which is illustrated in **Table 1**. Some subjects of the Russian Federation take into account not only the order of birth of a child, but also the age of the mother at the birth of the first child, the level of average per capita income in the family, the place of residence (rural area or urban settlement), as well as the simultaneous birth of two, three or more children, which is relevant in connection with the inclusion of IVF (in vitro fertilization) technology in the basic program of compulsory medical insurance as part of the program of state guarantees of free medical care for the population in the Russian Federation.

Table 1. Differentiation of conditions for granting subnational family capital in the subjects of the Russian Federation.

Conditions for granting family capital	Number of subjects of the Russian Federation	Names of subjects of the Russian Federation
Birth order of a child as a condition for the provision of SMC		
At the birth of the first child	7	Kamchatka kray, Magadan region, Novgorod region, Komi Republic, Republic of Tatarstan, Sakhalin region, Tyumen region
At the birth of a second child	18	Amur region, Voronezh region, Zabaikalye kray, Irkutsk region, Kaluga region, Kamchatka region, Magadan region, Moscow region, Primorsky region, Republic of Buryatia, Saha Republic, Sakhalin region, Sevastopol, Smolensk region, Ulyanovsk region, Khabarovsk kray, Chukotka Autonomous Okrug, Yamalo-Nenets Autonomous Okrug
At the birth of a third child	60	Altai region, Amur region, Arkhangelsk region, Belgorod region, Bryansk region, Vladimir region, Volgograd region, Voronezh region, Jewish Autonomous Region, Ivanovo region, Kaliningrad region, Kaluga Region, Kamchatka region, Kemerovo region, Kirov region, Kostroma region, Krasnodar region, Krasnoyarsk region, Kursk region, Leningrad region, Lipetsk region, Magadan region, Murmansk region, Nenets Autonomous Okrug, Nizhny Novgorod region, Novosibirsk region, Orenburg region, Orel region, Primorsky kray, Pskov region, Republic of Adygea, Republic of Buryatia, Republic of Kalmykia, Republic of Karelia, Republic of Komi, Republic of Mari El, Republic of Mordovia, Republic of Saha, Republic of Tatarstan, Republic of Khakassia, Rostov region, Ryazan region, Samara region, St. Petersburg, Saratov region, Sakhalin region, Sverdlovsk region, Tambov region, Tver region, Tomsk region, Tula region, Tyumen region, Udmurt Republic, Ulyanovsk region, Khabarovsk kray, Khanty-Mansi Autonomous Okrug, Chelyabinsk region, Chuvash Republic, Chukotka Autonomous Okrug, Yamalo-Nenets Autonomous Okrug
At the birth of the fourth child	6	Kaliningrad region, Kamchatka kray, Karachay-Cherkess Republic, Republic of Altai, Republic of Mordovia, Tomsk region
At the birth of the fifth child	5	Kaliningrad region, Kamchatka kray, Republic of Dagestan, Republic of Mordovia, Republic of Tyva
At the birth of the sixth child	1	Kamchatka region
At the birth of the eighth child	1	Republic of Ingushetia
At the birth of the ninth child	1	Republic of Ingushetia
At the birth of the tenth child	2	Republic of Dagestan, Republic of Ingushetia
Birth of twins or triplets		
At the birth of twins	5	Bryansk region (if one of the twins is the third in number of births), Kurgan region, Lipetsk region, Republic of Dagestan, Republic of Ingushetia
At the birth of triplets	8	Bryansk region, Kaliningrad region, Kursk region, Leningrad region, Lipetsk region, Republic of Dagestan, Republic of Ingushetia, Sverdlovsk region.
Other conditions of granting		
Consideration of mother's (father's) age	6	Ivanovo region (maternity student capital—if mother and father are not more than 24 years old and both are full-time students), Magadan region (mother under 25 years old), Novgorod region (born before 2022 to a mother under 29 years old), Komi Republic (under 25 years old), Republic of Tatarstan (under 25 and under 29 years old)
Accounting of average per capita income in a family	3	Republic of Buryatia, Smolensk region, Tomsk region
Residence in rural Okrugs, urban-type settlements, residents of small villages	2	Republic of Tatarstan, Yaroslavl region
Form of granting		
One-time cash payment	Most subjects of the Russian Federation	
Referral for improvement of housing conditions	4 Kirov region, Kostroma region, Primorsky kray (down payment and mortgage repayment), Leningrad region (for purchase of housing)	

Source: Tinkoff (2024).

The amount of SMC is set by the legislation of the subjects of the Russian Federation either as a % of the federal maternity capital or in a fixed annually indexed amount. At the same time, there is a very large variation in the values of these amounts by region, as shown in **Table 2**.

Table 2. SMC's size and parameters in 2024

SMC size or its range	Number of subjects of the Russian Federation	Names of the subjects of the Russian Federation
30% of the federal maternity capital	8	Amur Region, Zabaikalye kray, Magadan region, Primorsky kray, Republic of Buryatia, Saha Republic, Khabarovsk Region, Chukotka Autonomous Okrug.
From 10,000 to 50,000 rubles	6	Kaliningrad region, Kaluga region, Kirov region (50,000 as a lump sum payment at the birth of the third child, but may be in addition to subsidizing mortgages in the amount of 100,000 rubles), Kurgan region, Republic of Adygeya, Republic of Dagestan, Republic of Ingushetia (11,000 rubles for the birth of the ninth child, 12,000 rubles for the birth of the tenth child, 25,000 for the birth of two children at the same time, 50,000 for the birth of three children at the same time), Republic of Tatarstan (for women up to 25 years of age in rural Okrugs), Ulyanovsk region.
From 50,001 to 100,000 rubles	25	Altai Region, Amur region, Belgorod region, Vladimir region, Volgograd region, Ivanovo region, Kaliningrad region (in addition to previously received capital), Kaluga region, Kirov region, Kostroma region, Lipetsk region, Moscow region, Nizhny Novgorod region, Republic of Altai, Republic of Dagestan (in case of birth of triplets), Republic of Mari El, Republic of Tatarstan (for women under 29 years old in rural Okrugs), Ryazan region, Samara region, Tambov region, Tver region, Tomsk region, Tyumen region, Ulyanovsk region, Yaroslavl region.
From 100,001 to 200,000 rubles	40	Arkhangelsk region, Bryansk region, Voronezh region, Jewish Autonomous Region, Ivanovo region, Irkutsk region, Kaliningrad region, Kamchatka Region, Karachay-Cherkess Republic, Kemerovo region, Kostroma region, Krasnodar kray, Krasnoyarsk kray, Kursk region, Leningrad region, Magadan region, Murmansk region, Novgorod region, Novosibirsk region, Orenburg region, Orel region, Pskov region, Republic of Kalmykia, Republic of Karelia, Republic of Komi, Republic of Mordovia, Republic of Khakassia, Rostov region, Saratov region, Sakhalin region, Sverdlovsk region, Sevastopol, Smolensk region, Tula region, Tyumen region, Khanty-Mansiysk Autonomous Okrug, Chelyabinsk region, Republic of Karelia, Republic of Komi, Republic of Mordovia, Republic of Khakassia, Chukotka Autonomous Okrug, Yamalo-Nenets Autonomous Okrug.
From 200,001 to 300,000 rubles	10	Kabardino-Balkar Republic, Kamchatka Region, Primorsky Region, Republic of Dagestan (for the tenth and subsequent children, Komi Republic, Saha Republic, St. Petersburg, Sakhalin region, Sverdlovsk region, Udmurt Republic.
From 300,001 to 400,000 rubles	4	Bryansk region, Kamchatka Region, Nenets Autonomous Region, Khabarovsk region
From 400,001 to 500,000 rubles	4	Kamchatka kray, Primorsky Region, Komi Republic, Yamalo-Nenets Autonomous Okrug
From 500,001 to 750,000 rubles	1	Republic of Bashkortostan
1,000,000 rubles	1	Kaliningrad region (in case of simultaneous birth of three or more children)
1,200,000 rubles	1	Bryansk region (in case of simultaneous birth of three or more children)
3,138,000 rubles	1	Leningrad region (for purchase of housing)

Source: Tinkoff (2024).

Table 2 shows that the interval from 100,001 to 200,000 rubles has the largest share in the number of subjects of the Russian Federation. Individual subjects of the federation fell into different groups due to the fact that their legislation differentiates the amount of SMC depending on the order of birth of the child or other conditions. It should also be noted that it was at the subnational level that the practice was first introduced whereby the use of maternity (family) capital at the birth of older children

does not cancel the right to payments at the birth of younger children.

4. Data and method

Open data were used in the study. The analysis of fertility differentiation in the subjects of the Russian Federation is based on the data of the Unified Interdepartmental Information Statistical System (UIISS) on fertility rate (total fertility rate) in 2018–2023 (Fedstat, 2024).

The relationship between these two variables not linear. The is no moderating variables. The paper uses a log transformation due to the significant heterogeneity of SMC. Typically, log transformation is used to reduce data skewness. However, many authors like in other papers (Alijanzadeh et al., 2023; Olivetti and Petrongolo, 2017; Spéder et a1., 2019) without providing the distribution or skewness of the data, the need for this transformation is not questionable. Like in papers (Alijanzadeh et al., 2023; Olivetti and Petrongolo, 2017; Spéder et a1., 2019) authors do not discuss why they used the value 1 for imputation. Considering that the range after log transformation is from negative infinity to positive infinity, the reason for using the value 1 (which becomes 0 after log transformation) for imputation is used by authors too (Alijanzadeh et al., 2023; Olivetti and Petrongolo, 2017; Spéder et a1., 2019). The authors only consider the SMC distribution and do not address the preprocessing of the birth rate data, which usually show normal distribution.

It should be noted that not only the dynamics of the fertility rate has changed on average for the subjects of the Russian Federation, but also its differentiation (**Figure 3**).
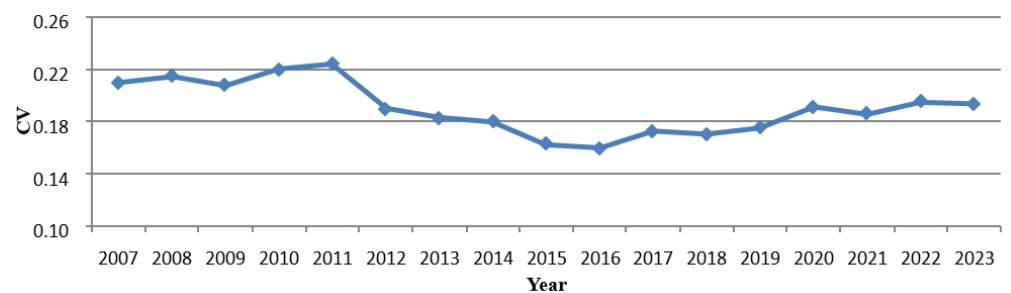
Figure 3. Change in the coefficient of variation of birth rate values by subjects of the Russian Federation in 2007–2023
Source: Tinkoff (2024).

SMC is significantly differentiated in size, and its value in some cases depends on different conditions of provision even in one constituent entity of the Russian Federation. For this reason, the explanatory indicator is not the average size of SMC, but the expenditures of the consolidated budget of the constituent entity of the Russian Federation on payments to SMC holders as a percentage of the number of children under 1 year of age in the constituent entity of the Russian Federation, as parents usually realize their right to SMC before the child turns 1. Source of information on SMC expenditures, unemployment—EMISS data.

Before conducting analysis, all data in the study information base related to SMC expenditures, average per capita income were adjusted to prices at the beginning of

the study period (2018) based on EMISS data on annual consumer price indices. Since the size of the SMC is significantly differentiated, the decimal logarithm of expenditures of the consolidated budgets of the subjects of the Russian Federation on SMC is used. For those subjects of the Russian Federation that have not introduced or repealed legislation on SMC, the value 1 is taken.

Information on the share of non-targeted grants from the federal budget in the total amount of revenues of the consolidated budget of the subject of the Russian Federation for 2018–2023 obtained from the information base of NPO Krista, one of the developers of subprograms of the government information system "Electronic Budget".

Since there was a sharp jump in non-targeted grants by the subnational government in 2020, as well as a change in the methodology for calculating nontargeted grants in 2023, the median values of the share of federal non-targeted grants in the total the consolidated budgets of the subjects of the Russian Federation's revenues were used.

The study was based on the assumption that the stimulating role of SMC on the increase of fertility rates is constrained by the budgetary resources of the subjects of the Russian Federation, affecting its size, as well as the effect of other factors (infantile behavior, on the one hand, the proximity of military operations, increased macroeconomic and geopolitical risks), the effect of other factors—cannot be accurately statistically accounted for.

To assess the impact of SMC on the birth rate, the subjects of the Russian Federation were grouped into. The first group includes the subjects of the Russian Federation with the share of non-targeted grants in the revenues of the consolidated budget of the subject of the Russian Federation—above 20%, and the second group below and equal to 20%. The third group includes the subjects of the Russian Federation, in which the fertility rate is higher to the average Russian value; the fourth group—he subjects of the Russian Federation, in which the fertility rate is higher to the average Russian value.

Pearson and Spearman's correlation analysis was used to assess the impact of budget expenditures on SMC (LogExpSMC), the level of dependence on federal non-targeted grants (DepFedN-TGr), the level of per capita income in the subject of the Russian Federation (IncpCap), and the unemployment rate (UnempR) on fertility rates (FertR). Descriptive statistics are shown in **Table 3**.

Table 3. Descriptive statistics.

All subjects of the Russian Federation (2018–2023)					
	LogExpSMC	DepFedN-TGr	IncpCap	UnempR	FertR
Max	2.17	44.20	188,298.80	30.90	2.97
Average	1.03	12.46	39,427.90	5.90	1.49
Min	0.90	0.30	29,959.45	1.60	1.36
Median	1.00	8.77	33,538.20	4.90	1.46
Max/Min	2.42	147.33	6.29	19.31	2.18
StDevP	0.65175	54.4313	66,438.42	11.0004	0.6126
Subjects of the above 20% Russian Federation with the share of non-targeted grants in the revenues of the consolidated budget					

Table 3. (*Continued*).

All subjects of the Russian Federation (2018–2023)

	LogExpSMC	DepFedN-TGr	IncpCap	UnempR	FertR
Max	1.7293	44.2	188,298.7965	30.9	2.97
Average	0.84	27.53	37,025.08	8.94	1.67
Min	−1.0559	20.01	16,484.9437	1.9	0.98
Median	1	24.68	29,584	7.6	1.62
Max/Min	1.7293	1.7909	6.3649	4.0658	1.8333
StDevP	0.5223	8.7115	25,394.0417	5.7040	0.3813

Subjects of the Russian Federation with the share of non-targeted below and equal 20% grants in the revenues of the consolidated budget

	LogExpSMC	DepFedN-TGr	IncpCap	UnempR	FertR
Max	2.1712	20	131,567.4917	8.9	2.26
Average	1.1	6,87	40,319.27	4.78	1.43
Min	−1.9906	0	20,069.4692	1.2	0.87
Median	1.0522	6.365	35,233.6616	4.65	1.425
Max/Min	2.0636	3.1422	3.7341	1.9140	1.5860
StDevP	0.3903	5.2137	16,801.9699	1.5133	2.26

Subjects of the Russian Federation in which the fertility rate is higher to the average Russian value

	LogExpSMC	DepFedN-TGr	IncpCap	UnempR	FertR
Max	2.1712	44.2000	188,298.7965	30.9000	2.9700
Average	1.0316	15.9808	43,435.3315	7.5672	1.7270
Min	−1.9906	0.0000	19,424.6436	1.6000	1.5100
Median	1.0000	12.4000	35,355.0000	6.3000	1.6400
Max/Min	0.4140	0.2285	0.1878	0.2039	0.5354
StDevP	0.5658	14.4509	25,395.8856	4.9632	0.2737

Subjects of the Russian Federation in which the fertility rate is low and equal to the average Russian value

	LogExpSMC	DepFedN-TGr	IncpCap	UnempR	FertR
Max	1.8042	30.3800	128,016.9307	1.8042	1.5000
Average	1.0229	9.9472	36,567.7538	1.0229	1.3248
Min	−1.0559	0.0000	16,484.9437	−1.0559	0.8700
Median	1.0180	8.7000	33,158.6813	1.0180	1,3400
Max/Min	0.5642	0.2864	0.2590	0.5642	0.8933
StDevP	0.3340	7.0197	13,252.5367	0.3340	0.1230

5. Results and discussion

The results of the correlation analysis are shown in **Table 4**.

Table 4. The results of the correlation analysis.

All subjects of the Russian Federation (2018–2023)

Pearson correlation

	LogExpSMC	DepFedN-TGr	IncpCap	UnempR	FertR
LogExpSMC	1	−0.30052	0.42009	−0.16863	−0.029379
DepFedN-TGr	−0.30052	1	−0.20283	0.64375	0.4375598
IncpCap	0.42009	−0.20283	1	−0.29400	0.1347927
UnempR	−0.16863	0.64375	−0.29400	1	0.5180552
FertR	−0.02938	0.43756	0.13479	0.51806	1

Spearman's rank correlation coefficient

	LogExpSMC	DepFedN-TGr	IncpCap	UnempR	FertR
LogExpSMC	1	0.23121	0.61017	0.30744	0.44648
DepFedN-TGr	0.23121	1	0.11415	0.71823	0.41223
IncpCap	0.61017	0.11415	1	0.08751	0.39054
UnempR	0.30744	0.71823	0.08751	1	0.62407
FertR	0.44648	0.41223	0.39054	0.62407	1

Subjects of the Russian Federation with the share of non-targeted grants in the revenues of the consolidated budget—above 20%

Pearson correlation

	LogExpSMC	DepFedN-TGr	IncpCap	UnempR	FertR
LogExpSMC	1	−0.02239	0.3777312	−0.0415997	−0.1242343
DepFedN-TGr	−0.02239	1	−0.0003855	0.614984	0.685532
IncpCap	0.3777312	−0.0003855	1	−0.3310496	−0.0393712
UnempR	−0.0415997	0.614984	−0.3310496	1	0.508836
FertR	−0.1242343	0.685532	−0.0393712	0.508836	1

Spearman's rank correlation coefficient

	LogExpSMC	DepFedN-TGr	IncpCap	UnempR	FertR
LogExpSMC	1	0.09009	0.3718792	−0.1740457	−0.0852332
DepFedN-TGr	0.09009	1	0.3718792	0.6061822	0.582519
IncpCap	0.3718792	−0.3047091	1	−0.60032	−0.17939
UnempR	−0.1740457	0.606182	−0.60032	1	0.651678
FertR	−0.0852332	0.582519	−0.17939	0.651678	1

Subjects of the Russian Federation with the share of non-targeted grants in the revenues of the consolidated budget—below and equal 20%

Pearson correlation

	LogExpSMC	DepFedN-TGr	IncpCap	UnempR	FertR
LogExpSMC	1	−0.2682338	0.446258	−0.0721887	0.271959
DepFedN-TGr	−0.2682338	1	−0.4824319	0.2675933	−0.284231
IncpCap	0.4462577	−0.4824319	1	−0.3102162	0.4115183
UnempR	−0.0721887	0.2675933	−0.3102162	1	0.2198997
FertR	0.2719594	−0.284231	0.4115183	0.2198997	1

Table 4. (*Continued*).

All subjects of the Russian Federation (2018–2023)

Spearman's rank correlation coefficient

	LogExpSMC	DepFedN-TGr	IncpCap	UnempR	FertR
LogExpSMC	1	0.3094103	0.559547	0.3177904	0.438911
DepFedN-TGr	0.3094103	1	0.1592865	0.6753749	0.2328088
IncpCap	0.559547	0.1592865	1	0.0393402	0.362481
UnempR	0.3177904	0.675375	0.0393402	1	0.4434585
FertR	0.438911	0.2328088	0.362481	0.46365	1

Subjects of the Russian Federation in which the fertility rate is higher to the average Russian value

Pearson correlation

	LogExpSMC	DepFedN-TGr	IncpCap	UnempR	FertR
LogExpSMC	1	−0.3460967	0.5224689	−0.230193488	−0.0521974
DepFedN-TGr	−0.3460967	1	−0.1966151	0.650932028	0.4711524
IncpCap	0.5224689	−0.1966151	1	−0.397701567	−0.0111658
UnempR	−0.2301935	0.650932	−0.3977016	1	0.4305932
FertR	−0.0521974	0.4711524	−0.0111658	0.430593219	1

Spearman's rank correlation coefficient

	LogExpSMC	DepFedN-TGr	IncpCap	UnempR	FertR
LogExpSMC	1	0.209763	0.678523	0.222175	0.446854
DepFedN-TGr	0.209763	1	0.233149	0.824609	0.450078
IncpCap	0.678523	0.233149	1	0.138245	0.340664
UnempR	0.222175	0.824609	0.138245	1	0.512025
FertR	0.446854	0.450078	0.340664	0.512025	1
	1	0.209763	0.678523	0.222175	0.446854

Subjects of the Russian Federation in which the fertility rate is low and equal to the average Russian value

Pearson correlation

	LogExpSMC	DepFedN-TGr	IncpCap	UnempR	FertR
LogExpSMC	1	−0.2400214	0.2009667	−0.4073501	−0.0487833
DepFedN-TGr	−0.2400214	1	0.2009667	−0.408069	0.0194006
IncpCap	0.2009667	−0.4475967	1	−0.4073501	0.1090299
UnempR	−0.0511569	0.4571353	−0.4073501	1	0.1793715
FertR	−0.0487833	0.0194006	0.1090299	0.1793715	1

Spearman's rank correlation coefficient

	LogExpSMC	DepFedN-TGr	IncpCap	UnempR	FertR
LogExpSMC	1	−0.2148058	0.2269603	−0.0934686	−0.073984
DepFedN-TGr	−0.2148058	1	−0.51603	0.3682857	−0.078034
IncpCap	0.2269603	−0.51603	1	−0.4294102	0.1667433
UnempR	−0.0934686	0.3682857	−0.4294102	1	0.2959613

The study revealed that SMC does not a factor determining the birth rate in the Russian Federation, especially in the subjects of the Russian Federation, which demonstrate a fertility rates below the national average. The correlation coefficients

between SMC expenditures and fertility rates differ in the subjects of the Russian Federation with higher budget provision and subjects with low budget provision, however, for both groups, the indicators do not allow us to talk about statistical significance. Among the considered factors affecting the fertility rates, the unemployment rate is of average importance, but contrary to general trends in Russia, higher unemployment is observed in the subjects of the Russian Federation with a fertility rate above the national average. As expected, there is a correlation between the level of non-targeted grants from the federal budget and the fertility rates.

The analysis shows that the centralization of expenses for the protection of family and childhood in modern Russian conditions is justified, as well as the policy of influencing non-financial factors of fertility can be considered justified. Maternity capital programs have proved to be the only effective measure to support the birth rate in Russia. The impact of the federal maternity capital exceeds the impact of regional maternity capital programs by many times. Obviously, this is the result of the fact that the amounts paid under regional maternity capital are several times smaller than under federal maternity capital, and the criteria for receiving them are often unreasonably strict.

The study was commissioned by the Russian federal executive authorities, but can be used by the authorities of the constituent entities of the Russian Federation, international organizations, groups of researchers specializing in the choice of financial instruments for regulating demographic processes, in particular stimulating fertility, as well as studying trends related to fiscal centralization and decentralization.

Authors should discuss the results and how they can be interpreted from the perspective of previous studies and of the working hypotheses. The findings and their implications should be discussed in the broadest context possible. Future research directions may also be highlighted.

6. Conclusion

The study was commissioned by the Russian federal executive authorities, but can be used by the authorities of the constituent entities of the Russian Federation, international organizations, groups of researchers specializing in the selection of financial instruments to regulate demographic processes, in particular fertility stimulation, as well as those studying trends related to fiscal centralization and decentralization. Further areas of research could be devoted to assessing the impact of other financial instruments on the demographic situation: subsidized mortgages for young families, mortgage subsidies for families with many children, budget financing of assisted reproductive technologies.

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