

STUDYING BIRTH RATE DETERMINANTS STIPULATED BY RUSSIA'S PRIORITY NATIONAL PROJECTS

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Abstract

In Russia, birth rate stimulation, family and parenthood support are particularly relevant amidst the recent population decline. Our study aims to analyse the birth rate determinants related to the development of infrastructure for pre-school childcare, as well as women's labour force participation rates. We analysed the following indicators: availability of places in pre-school educational institutions, enrolment of children in pre-school education, employment rate of women with children of pre-school age, labour force participation rate of women at childbearing age, total fertility rate. We obtained the following results: 1) the correlation analysis did not show any statistically significant correlation between the birth rate and indicators of pre-school infrastructure development; 2) examination of outlier regions based on the indicators examined did not show any correlation between the birth rate and pre-school infrastructure development; 3) examination of the relationship between the birth rate and female labour force participation also showed no correlation between these indicators. The results obtained do not allow us to consider the development of pre-school childcare infrastructure or the level of women's labour force participation as birth rate determinants. To overcome negative demographic trends, the government should change the emphasis of its policies aimed at supporting families with children.

Key words: birth rate determinants, pre-school childcare, women's labour force participation, demographic policy, Russia

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Introduction

Since 2019, the Russian Federation has again seen a decline in the resident population (Population Base, 2021). In these circumstances, it is of special relevance to develop measures aimed at stimulating the birth rate. In 2007, the Russian government developed The Concept of the Demographic Policy (The Concept, 2007), which focuses on the accessibility of childcare services and enabling mothers to continue working after giving birth. Russia is

currently implementing the second part of The Concept of Demographic Policy for the period up to 2025, which aims to provide comfortable conditions for families with children.

For developing the Demographic Policy Concept, factors influencing birth rate were not chosen accidentally. As these very factors, foreign studies often consider the availability of childcare services, as well as the ability of mothers to continue working after birth. Boca (2002), for instance, identifies the availability of childcare and part-time work; Mörck et al. (2011) consider lower childcare costs and increased government assistance as conditions for higher birth rate; Hardoy & Schone (2013) examine the impact of childcare costs on the labour supply of mothers in an economy with high female labour supply. Huebener's, Pape's & Spiess's (2020) study of how reforms to abolish childcare fees in pre-schools influence labour supply in Germany showed that the measure increased the intensity of day care use and mothers' working hours. Fehr & Ujhelyiova (2013) suggest investing in childcare facilities for children of all ages to increase both the birth and employment rates simultaneously.

Russian scholars have also studied the availability of childcare services and the impact of mothers' re-employment on the birth rate in Russia. For example, Chernova (2012) emphasises that in a situation of insufficient state support for parenthood, the way of combining professional, family and maternal responsibilities is developed at household level and depends on available resources and individual choices of parents.

Pishnyak & Nadezhdina (2020) showed that key challenges to increased maternal employment lie in the inability to place a child in a preschool institution, in finding flexible or remote work, and in the predominance of families' attitudes towards female unemployment and motherhood.

Our study aims to analyse those determinants of fertility which are related to affordability, the development of pre-school childcare infrastructure, and level of women's participation in labour.

1 Data and Methods

We used official statistical data from the Federal State Statistics Service of Russia and analysed the following indicators:

- Availability of places in pre-school educational organisations for children at preschool age (number of places per 1,000 children);

- Preschool education coverage of children at preschool age (percentage of children attending preschool educational organisations as a proportion of the total number of children aged 1-6);

- Employment rate of women with children at preschool age (percentage of women aged 20-49 with children aged 0-6)

- Labour rate of childbearing-age women (percentage of the total number of childbearing-age women; we calculated the indicator based on official statistics on the number of childbearing-age women and the number of women employed)

- Total fertility rate (TFR).

The first two indicators refer to those of the availability and development of infrastructure for taking care of children at preschool age. Russian statistics possesses these data for every region for the period of 2005-2017 (Child Availability, 2021; Child Coverage, 2021). Women labour rates in Russian statistics are only available at the national level and for the period 2009/2010-2019 (Employed Population, 2021; Employment rate, 2021). Thus, birth rate determinants related to childcare infrastructure accessibility and development were studied more thoroughly and conducted not only with regard to overall dynamics but also to the regional variation; those birth rate determinants related to the level of women's labour participation were analysed only on the time series of national indicators.

To study birth rate determinants, we used correlation analysis and examined the relationship between the TFR and the indicators selected for the study. For the analysis, we used Spearman Rank correlation with estimation of its statistical significance.

With delayed effects of some determinants on the birth rate, we analysed the relationship of not only synchronous (one-year) indicators but also with a lag of 1-5 years, where it was possible and feasible.

The analysis also examined the distribution of baseline data and identified region outliers by the development and availability of preschool infrastructure and birth rate. Such regions include those where the value of indicators differed by more than 1.5 interquartile range from the first and third quartiles (in accordance with SPSS Statistics software criteria). These regions were excluded from the data set for the correlation analysis and studied separately.

2 Results

We obtained the following results:

1. Since 2016, Russia has experienced an annual birth rate decline. At this period, the country's TFR fell from 1.777 in 2015 to 1.504 in 2019. In 2020, Russia recorded a very slight increase in this indicator - to 1.505 (Total Fertility, 2021).

2. Russia has historically had and still has a high regional differentiation of fertility rates. There are also significant regional variations in the decline of this indicator. At the same time, for each year under analysis, we identified a group of region outliers, where birth rates proved to be atypically high. Traditionally, this group included the Chechen Republic, Altai Republic, and Tuva Republic. In different years, the group accumulated other regions. Importantly, these regions had considerably different levels of two indicators studied - children preschool education coverage and availability of places in pre-school educational organisations (Table 1). Thus, high birth rates in the regions-frontrunners according to this indicator cannot be unambiguously associated with the development of preschool infrastructure. To note, in certain years, both maximum and minimum regional levels of the indicators studied were observed in the group of regions with atypically high birth rate.

Tab. 1: Indicators studied in regions-frontrunners by birth rate in certain years

Years	Number of regions with atypically high TFRs	Availability of spots in pre-school educational organisations for children at preschool age (number of children per 1,000 sports)		Children preschool education coverage level, %	
		Range of indicator values in the group of regions with atypically high birth rates	Range of indicator values in all regions of Russia	Range of indicator values in the group of regions with atypically high birth rates	Range of indicator values in all regions of Russia
2006	7	From 58 to 953	From 58 to 953	From 5.9 to 84.9	From 5.9 to 84.9
2011	4	From 55 to 367	From 55 to 867	From 7.5 to 40.4	From 7.5 to 88.1
2016	4	From 274 to 843	From 197 to 924	From 21.3 to 92.0	From 21.3 to 92.0

Source: Total Fertility, 2021; Availability for Children, 2021; Children Coverage, 2021; authors calculations

The study also identified regions with atypically high/low levels of pre-school infrastructure development indicators (the Karachay-Cherkessia Republic and Komi Republic). However, birth rate in these regions was both higher and lower than the national average at the time period studied.

On the whole, the study of region outliers does not allow considering the level of development and availability of preschool infrastructure as a birth rate determinant.

3. The analysis did not reveal a statistically significant relationship between birth rates and indicators of the development of pre-school infrastructure in Russian regions. The Spearman Rank correlation between the indicators studied was not statistically significant in any year within the time period examined. The correlation was confirmed by neither synchronous data nor lagged data; we analysed the relationship between current levels of preschool infrastructure development indicators and the TFR with a lag of 1-5 years (Table 2).

4. The study of the relationship between birth rates and women's employment in the national data also showed no correlation. In the period explored, the trends of the indicators studied did not coincide. Thus, the dynamics of the indicators that characterise the employment rate of women showed an upward linear trend (Figure 1, 2), and the TFR dynamics did not show a unidirectional trend; up to 2015 inclusive, this indicator increased and then decreased (Figure 3).

The results we obtained show negative demographic trends in the Russian Federation, despite the state's efforts to address the challenges in this area. The analysis revealed a positive, but extremely insignificant change in this indicator in 2020 to a value of 1.505. In our opinion, the change may have been influenced by an increase in the number of second and third births. The reason behind it may lie in the adoption of additional state support measures - increased maternity capital, favourable mortgage conditions for higher order births. At the same time, the government has strictly limited the timeframe for additional state support measures to 2023; therefore, all desired (or postponed) births are likely to be given at this period. Presumably, after 2023, the birth rate may significantly decrease, as all desired/postponed births will have been given. In these circumstances, searching for new measures to support and stimulate birth rate becomes particularly relevant.

Russian scholars identified such challenges as insufficient quality pre-school care services and lack of flexibility at the workplace, which could hinder tackling demographic challenges in the country (Chistruga-Sinchevici & Bargan, 2019). One of Russia's priority national projects aimed at birth rate support is designed to address these challenges. However, our research show that the development of pre-school childcare infrastructure, as well as the level of women's employment, cannot be considered birth rate determinants, which may be due to births of different order possibly having different determinants. With this, statistics on birth order have only been collected in Russia for the last few years, which does not allow for an in-depth analysis. At the same time, when designing measures to support and stimulate

birth rate, it is important to take into account the high regional differentiation characteristic of the Russian Federation.

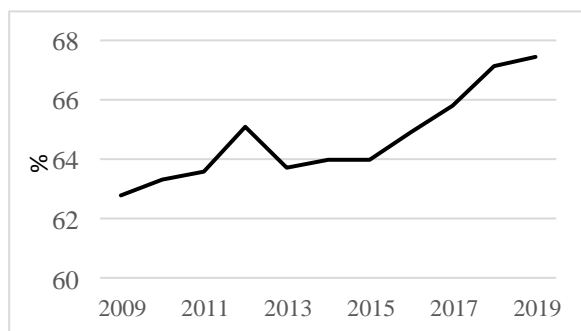
Tab. 2: Spearman Rank correlation of preschool infrastructure development indicators and TFR in regions

Year	Variable	For one-year values		For TFR with a 1-year lag		For TFR with a 2-year lag		For TFR with a 3-year lag		For TFR with a 4-year lag		For TFR with a 5-year lag	
		Value	Approximate Significance	Value	Approximate Significance	Value	Approximate Significance	Value	Approximate Significance	Value	Approximate Significance	Value	Approximate Significance
2005	Var 1	-0.133	0.260	-0.146	0.212	-0.179	0.117	-0.261	0.021	-0.160	0.161	-0.146	0.201
	Var 2	0.040	0.733	0.036	0.760	-0.024	0.834	-0.097	0.394	0.000	0.998	0.020	0.858
2006	Var 1	-0.090	0.441	-0.122	0.287	-0.201	0.077	-0.097	0.400	-0.088	0.442	-0.057	0.621
	Var 2	0.031	0.790	-0.034	0.763	-0.107	0.349	-0.007	0.951	0.012	0.919	0.043	0.709
2007	Var 1	-0.095	0.410	-0.172	0.131	-0.069	0.550	-0.063	0.586	-0.030	0.795	-0.033	0.772
	Var 2	-0.029	0.803	-0.096	0.401	0.003	0.979	0.023	0.841	0.057	0.618	0.046	0.686
2008	Var 1	-0.213	0.061	-0.108	0.349	-0.100	0.384	-0.068	0.554	-0.069	0.548	-0.056	0.623
	Var 2	-0.114	0.319	-0.011	0.923	0.008	0.947	0.045	0.691	0.036	0.754	0.053	0.643
2009	Var 1	-0.144	0.205	-0.125	0.272	-0.090	0.429	-0.091	0.420	-0.075	0.511	-0.070	0.535
	Var 2	-0.026	0.821	0.000	0.997	0.035	0.761	0.028	0.803	0.045	0.694	0.060	0.594
2010	Var 1	-0.160	0.165	-0.113	0.328	-0.115	0.317	-0.090	0.433	-0.087	0.448	-0.035	0.765
	Var 2	-0.012	0.918	0.023	0.838	0.016	0.887	0.035	0.755	0.053	0.642	0.129	0.259
2011	Var 1	-0.144	0.210	-0.143	0.210	-0.116	0.310	-0.114	0.316	-0.060	0.600	0.006	0.958
	Var 2	-0.037	0.745	-0.041	0.717	-0.022	0.847	-0.002	0.986	0.080	0.483	0.152	0.180
2012	Var 1	-0.167	0.141	-0.140	0.218	-0.131	0.251	-0.072	0.530	-0.009	0.938	-0.061	0.596
	Var 2	-0.061	0.594	-0.041	0.717	-0.024	0.831	0.054	0.634	0.122	0.282	0.076	0.503
2013	Var 1	-0.143	0.209	-0.129	0.257	-0.067	0.557	0.000	0.999	-0.042	0.717	-0.140	0.222
	Var 2	-0.048	0.674	-0.027	0.810	0.052	0.651	0.118	0.302	0.076	0.507	-0.002	0.989
2014	Var 1	-0.089	0.430	-0.040	0.724	0.033	0.772	-0.012	0.915	-0.112	0.325	-0.183	0.105
	Var 2	0.022	0.845	0.093	0.403	0.160	0.148	0.113	0.307	0.011	0.921	-0.079	0.484
2015	Var 1	-0.056	0.617	0.019	0.867	-0.026	0.818	-0.124	0.275	-0.199	0.077	-0.228	0.042
	Var 2	0.084	0.453	0.149	0.179	0.107	0.334	0.012	0.913	-0.083	0.459	-0.092	0.413
2016	Var 1	0.020	0.860	-0.021	0.853	-0.106	0.350	-0.175	0.120	-0.205	0.069	–	–
	Var 2	0.110	0.321	0.071	0.524	-0.029	0.798	-0.124	0.270	-0.130	0.247	–	–
2017	Var 1	0.019	0.865	-0.076	0.498	-0.143	0.201	-0.173	0.120	–	–	–	–
	Var 2	0.078	0.482	-0.004	0.970	-0.092	0.406	-0.105	0.345	–	–	–	–

* Calculated by the authors according to: Total Fertility Rate, 2021; Availability for Children, 2021; Children Coverage, 2021

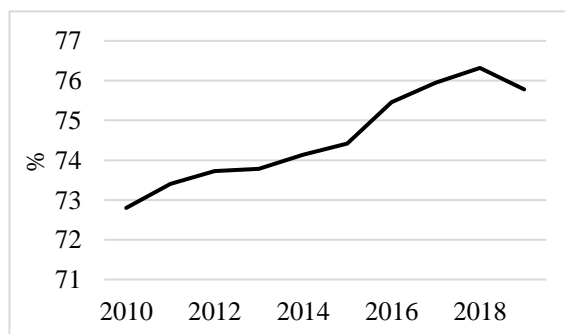
** Var 1 - Availability of places in pre-school educational organisations for children; Var 2 - Preschool education coverage of children

Fig. 1: Employment rate of women with children at preschool age (0-6) in Russia



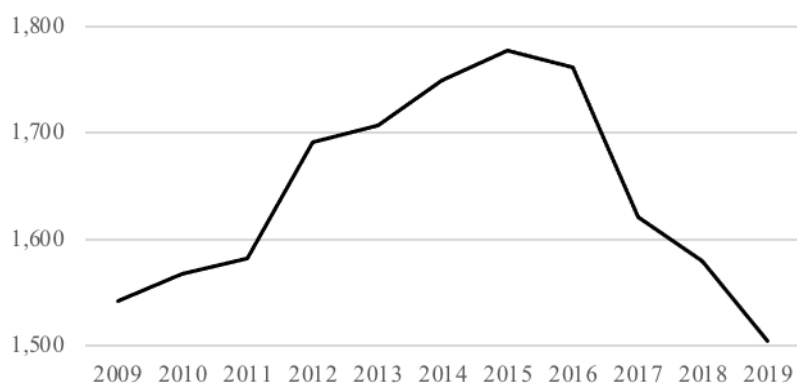
Source: Employment rate, 2021

Fig. 2: Labour participation of childbearing-age women in Russia



Source: Employed Population, 2021

Fig. 3: Total Fertility Rate in Russia



Source: Total Fertility, 2021

Conclusion

The results of our study demonstrate that there is no statistically significant relationship between birth rate and indicators describing the development of pre-school childcare infrastructure and women's employment rates. Thus, the results do not allow us to consider these indicators birth rate determinants. However, to address demographic challenges in the Russian Federation, the government should, in our opinion, continue to implement policies aimed at supporting families with children. At the same time, the focus in the development and adjustment of measures to stimulate fertility should be on other determinants, and the inherent regional differentiation in Russia should be taken into account. Our further research is to concentrate on birth rate determinants, taking into account the order of birth.

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