Demography

УДК 314.374.3

Zaynullin A. F.
student
National Research University – Higher School of Economics

HOW DOES THE RUSSIAN FERTILITY STIMULATION PROGRAM AFFECT BIRTH SPACING? EVIDENCE FROM RLMS

Summary: The matter of the Maternity capital program effectiveness is still arguable. Among demographers, it is widely believed that monetary stimulation of birth rate simply shifts the birth calendar and does not increase the net fertility rate. However, this prediction is only hypothesis and it was not tested before.

In my research, I test the prediction, that that program affects the inter-birth interval. My analysis confirmed this hypothesis, and showed that women without higher education indeed shorten the interval between births. The birth interval in this group is shortened, on average, by 4.6 months. At the same time, women with a higher education are not affected.

This result reveals drawback of fertility stimulation program and point out that the less educated women are more sensitive to finance stimulus therefore population growth, which is made under that fertility stimulation program, may be rather extensive than intensive.

Key words: fertility, birth spacing, maternity capital.

Introduction

In the last 25 years, Russia's birth rate has experienced a sharp decline. According to data provided by Rosstat, the total fertility rate declined from 1990 to 2006 and reached a value of 1.3 births per woman. In order to encourage women to have more children, the State Duma (Russian Parliament) passed a law in December of 2006 establishing new government support measures for

families with children, commonly referred to as “maternity capital.” As a result of this program, any woman who gives birth to a second (or a subsequent child) after January 1, 2007 is entitled to a certificate for a substantial amount of money (originally 250,000 rubles), which is to be spent on purposes predefined by the policymakers. By the beginning of 2015, more than 5.5 million Russian families had received maternity capital.

The “Concept of the Demographic Policy of the Russian Federation” set a goal of increasing the birth rate by 2025 as a result of increased second and subsequent births in families. To meet this goal, the net fertility rate must be increased to 1.95 children per woman of reproductive age. This means that Russia must match the fertility rate of the Scandinavian countries and France[8,c. 9-14]. Questions about the quality of families, within which second and third children will be born and raised, remain outside of the scope of the Concept. Among demographers, it is widely believed that monetary stimulation of birth rate simply shifts the birth calendar and does not increase the net fertility rate. [4, c. 10-13] In fact, as a result of significant discounting of future expenditures and distrust of the government, families may shift childbirth to an earlier date in attempts to receive the maternity capital earlier[7, c. 15-19].

If this hypothesis about reduction of the inter-birth interval is correct, the key indicator of fertility – total fertility rate – does not properly reflect the birth rate. Given this, the effectiveness of birth-rate stimulation programs is arguable.

Total Fertility Rate (TFR) is the average number of children that would be born alive to a woman (or group of women) during her lifetime if she were to pass through her childbearing years conforming to the age-specific fertility rates of a given year. This rate is sometimes stated as the number of children women are having today. This birth-rate indicator is shifted in a positive direction when families decide to have second or subsequent children earlier.

In 2012 Fabian Slonimczyk and Anna Yurko estimated a structural dynamic programming model of fertility and labor force participation in order to

evaluate the effectiveness of the policy of maternity capital. They used the estimates of the structural parameters to predict the effect of the policy. They found that the maternity capital policy has had almost no effect in increasing the number of births. Their results indicate that women in Russia are sensitive to economic incentives, therefore a well-designed pronatalist policy should be effective. [10, c. 2-25]

On September 30, 2014 the Ministry of Economic Development announced its proposals on optimization of budgetary expenditures for 2015 and the planning period of 2016-2017, suggesting the closure of the maternity capital program in 2015 because of its inefficiency. According to the Ministry's estimates, this measure would save 300 billion rubles per year.

This proposal was not supported by the Government of the Russian Federation. However, in light of the 2015 economic crisis, the future of the maternal capital program remains indiscernible. However, studies on the effects of reduction of the inter-birth interval still remain valuable as this phenomenon affects children's health. There are a large number of academic papers which find that a shorted inter-birth interval negatively impacts both mother and infant health.

Conde-Agudelo, Rosas-Bermudez, Castaño, Norton reviewed 58 papers on this topic in their work entitled "Effects of birth spacing on maternal, perinatal, infant, and child health: a systematic review of causal mechanisms." Their studies identified the following hypothetical causal mechanisms explaining the negative effects of shortened inter-birth intervals: maternal nutritional depletion, folate depletion, cervical insufficiency, vertical transmission of infections, suboptimal lactation related to breastfeeding-pregnancy overlap, sibling competition, transmission of infectious diseases among siblings, incomplete healing of uterine scar from previous cesarean delivery, and abnormal remodeling of endometrial blood vessels. [5, c. 5-15]

Previous investigations found that policies similar to the maternal capital program have a significant effect on the inter-birth interval. In 2013 Katherine Meckel found that receiving antipoverty wage subsidies, such as the Earned Income Tax Credit, one year earlier following the birth of a first child is associated with shorter inter-birth intervals to the second child, and that these effects are concentrated among low- income mothers. [7, c.8-13]

To this day, hypotheses regarding the negative effects of the maternal capital program on the inter-birth interval have not been tested with empirical evidence. In my research, I intend to fill this gap and use data from the Russia Longitudinal Monitoring Survey to answer the following question: "How does the maternal capital program affect birth spacing?"

This document is organized as follows:

In the first part I present the results of my research survey, which was conducted among a sample of 47 workers in female counseling centers. The survey dealt with the factors which affect the decision-making process in planning the spacing between childbirths.

In the second part I describe the data I analyzed, the process of working with these data. Further I present the evaluated specification models.

In the third part I provide the results of regression analysis of these data.

1. Investigation work

It is often difficult to separate the decision-making factors in determining the inter-birth interval from the factors affecting having children in general. The majority of existing theoretical models, such as model, which consider children as consumer durables [2, c. 21-25], and the dynamic model, in which women, choosing the time of birth, maximize the discounted flow of future utility[7, c. 10-13], do not directly explain the factors in deciding birth-interval. For this reason, in order to compile a sheet of the possible factors affecting the interval between childbirths, I interviewed workers in women's clinics. The sample

population consisted of people who work directly with women pregnant with their first or second child (or subsequent children). Often, women share their emotional distresses with these workers. For this reason, specialists in women's clinics can intuitively posit the decision-making factors, which affect birth interval.

47 specialists were polled from 13 different regions. 7 people were from Moscow and Saint Petersburg, 23 were from regional centers (not including Moscow or Saint Petersburg), and 17 from smaller towns with a population from 30,000 to 300,000 people. Additionally, the sample population included specialists from both paid clinics and from clinics, whose services are paid for by the medical insurance fund, i.e., these services are provided free of charge.

The poll was structured in a conversational format. The main questions under discussion were:

- What typical recommendations do doctors have about the interbirth interval?
- Which factors guide families when they are deciding the interbirth interval?
- What percentage of the time is the interbirth interval not consciously chosen?
- Since the beginning of the maternal fund program, has a tendency toward shortened interbirth intervals appeared?

As a result, I received the following information:

More than 50% of doctors recommend delaying conception of a second child until the first (or previous) child has reached two years of age. Usually mothers need time to recover from giving birth. The lactation period may be up to 1.5 years. After that, a woman needs additional time for the skin, hair, and nails to recover. The recommended period for full recovery is about 3 or more years. Generally, families who consciously plan the interval between births take these data into account.

There is a range of other factors, which can influence family decision. Usually experts highlighted the issues:

1. Women who are older then 30 years old and intend to have more than one baby usually choose comparatively short intervals because of the high probability of genetic disease when giving birth later in life.

2. Women who rigorously plan the time of giving birth often choose intervals around 3 or 7 years because those mark important stages of the first child's life. At the age of 3 a baby usually enters kindergarten and at the age of 7 – school. It is a very common practice in Russia. Schools often refuse to enroll children younger than 6.5 years old.

3. Financial reasons. All experts agree that the one of the most essential part of the decision of giving birth is family income. Usually parents do not want to launch into harsh conditions because of a new baby. However, The problem is that every family has the unique personal level of sufficient income and low income can be strongly correlated with low level of education, which often has a negative impact on birth spacing.

4. Another critically important factor is the living space. Rational families usually first of all try to provide their future infants with at least enough space for a bed. This factor is especially important for Russia because of the low quantity of living space per person (21 square meters; USA – 53 square meters)

5. In big cities women usually delay having children because of career incentives. This is not a common practice for small towns. In any case, a rational woman tries to give birth when she is working because in such case she gets maternity leave and the employer pays around 40% of her salary for up to 3 years.

6. The inter-birth interval is typically smaller in families with a larger number of children. This makes sense given that women can give birth only within a certain age range. If a family plans on having many children, then the interval between children must be shortened.

There is another problem with measuring the interval between births – sometimes families do not plan to have a child at all and give birth randomly. Experts estimate that this is the case in 30-35% of childbirths.

Beyond the information outlined above, those surveyed note that the level of conscious decision when determining the inter-birth interval depends on the mother's level of education.

Summarized results of the poll are given in appendix 1.

2. The model specification and data analysis

Model specification

I proceed from the premise that the inter-birth interval is decided directly after the birth of the previous child. It is assumed that in this case, the inter-birth interval between the previous child and the next is a factor of several demographic and economic variables observed at the previous child's birth. Based on existing research and our own poll results, I used the following models of determinants:

1. Characteristics of the wife: age, self-evaluation of health, level of education, religion, nationality, marital status (having a spouse).
2. Family characteristics: household income, location (city, countryside).

A range of model specifications were estimated on both the entire population sample of women and on separate subsambles (having a higher education, having more than two children.)

Empirical base and preparing the data

For empirical estimates, we use data RLMS for the 1994-2013, Which contain information about a large set social-demographic parameters of the family and the individuals, and what is more important - data set about fertility behavior of women. This database contains the best publicly available information about reproductive behavior and health of women in Russia. Panel

nature of the data makes it possible to check the dependence of the child's birth on the family parameters in the previous periods, and use the methods of panel regressions where adequate analysis of the problem. (fixed and random effect).

The number of all observations of women in all 17 rounds is 47959 women. I removed women who had two or more children at any of years. Then removed from the sample of women older than 50 years.

After these filters sample consisted of 3235 observations. Last filter is connected with the fact that often I can not observe relevant factors, such as the health of the mother or household income in the year the decision about interbirth interval was taken or, in other words, in the year following the year of birth of the first child. The reason for this is that the date of birth of children are known to us from the family questionnaire. In other words, common cases when I know the date of birth of the children, but I am interested in the socio-demographic factors at the moment of the child's date of birth, but it is unknown, since the family in the year were not surveyed.

I assumed that parameters such as health, income, marital status and other socio-demographic and economic parameters did not significantly change over 3 years, so the sample have been removed observations, in which the time lag with the necessary analysis and best observed a moment more than 3 year.

In this case, the question arises how many observations satisfy our time-lag request. The graph below shows the distribution of that for the majority of women we have the necessary surveillance in the year, so the distortion of the sample at this stage can be considered small.

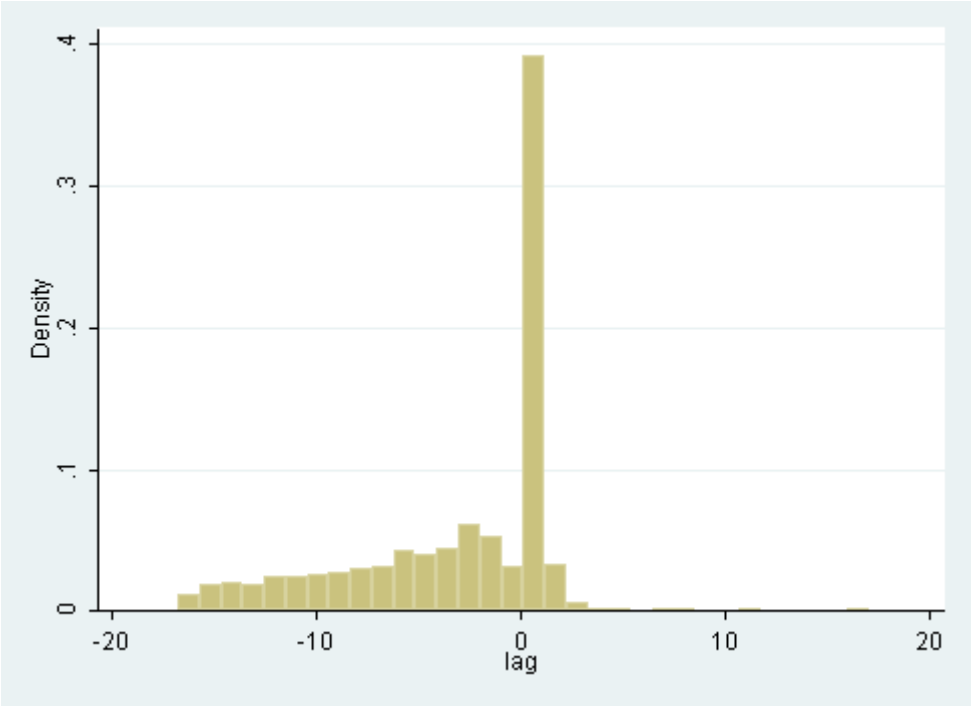

Figure 1.Timelag

For my studies, the right to receive maternal capital is the most interesting decision-making factor of all. The maternal capital program was put into effect January 1st, 2007. The first announcement of this new program was made on December 28th, 2006. This allows me to contend that if the birth-rate stimulation program affects the birth calendar, I should observe a change in the data from roughly the beginning of 2008. Accordingly, I have just 5 years of data to examine since the beginning of this program. To balance the analysis and in order to avoid the years of economic crises, I took the data 5 years prior to 2008. Thus, the final sample only includes women who gave birth to a second or subsequent child from January 1st 2003 to January 1st 2013.

To characterize the big picture, I cite the distribution of birth intervals before and after January 1st, 2008.

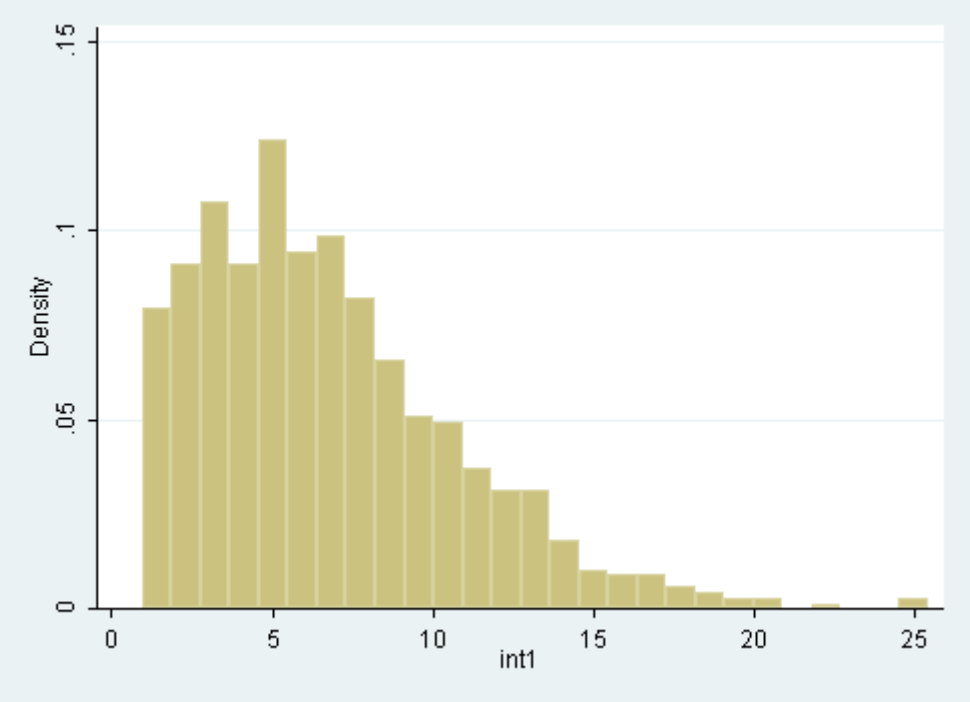

Figure 2. The Birth interval under maternity capital (2008-2012)

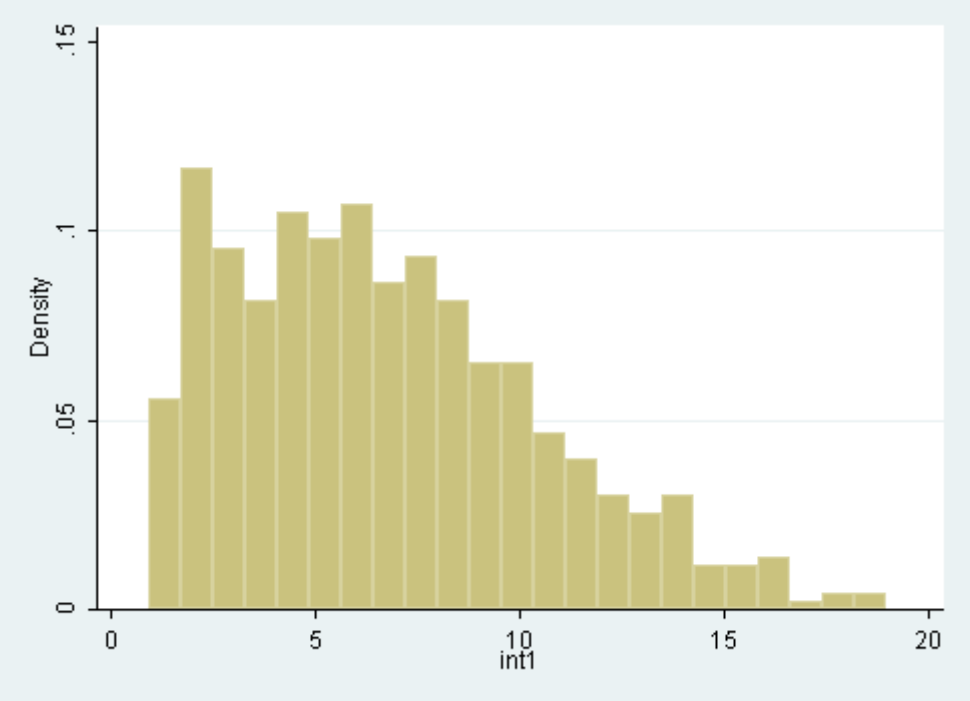

Figure 3. The Birth interval before maternity capital (2003-2007)

The distribution of inter-birth interval shown in the chart for 2007 confirms the prediction by experts that 3 to 7 years is the most common interval between births.

According to the available data in RLMS and the opinion of our respondents, I composed an initial list of factors for regression analysis. Below, I offer the descriptive statistics for each variable.

Descriptive statistics

Table 1

Variable	Mean	Std. Dev.	Min.	Max.	N	
int	6.772	3.946	0.918	25.43	1283	Birth interval before two last children in years (twins excluded)
mt	0.574	0.495	0	1	1283	1 if gives birth after 2008 and eligible for MC
educ	17.009	4.011	2	23	1276	Years of schooling
rural	0.269	0.444	0	1	1283	1 if lives in rural place
health	2.498	0.608	1	5	1283	self estimated health. 1 - good, 5- bad
step	4.189	1.434	1	9	1283	self estimated welfare position in society.
senior	0.041	0.199	0	1	1283	1 if had first child after 30 y.o.
mskspb	0.11	0.313	0	1	1283	1 if live in Moscow or Spb
work	0.249	0.433	0	1	1283	1 if works before having second or third child
mleave	0.106	0.308	0	1	1283	1 if is on maternity leave before giving birth
ago5	2.946	0.881	1	5	1283	Estimated life 5 years ago compare to

						today
satis	2.619	1.058	1	5	1283	Life satisfaction
ch3	0.127	0.333	0	1	1283	1 if has 3 children
tincm	18845.131	18860.699	210.29	1465263.29	1283	family income
incpp	4639.838	12866.483	52.493	306177.188	1283	family income per person
lnpp	8.074	0.736	3.961	12.632	1283	log of family income per person
lninc	9.585	0.78	5.347	14.241	1283	log of family income

3. Results

I conducted a single-factor analysis, in which each variable within the list was estimated by a linear model. The deciding factor in whether to include or exlude variables in the final model was a P value <=.1. Furthermore I conducted an analysis on the internal correlation of the model factors. The final list was evaluated by a linear regression model using the least squares method. The results of this analysis are shown in table 2.

Regressionresults

Table 2

	(1)
VARIABLES	int
mt	0.0887
	(0.225)
educ	0.0838***
	(0.0291)
rural	-0.794***
	(0.258)
health	0.580***
	(0.184)
msksрb	0.406***
	(0.103)

work	1.312***
	(0.257)
senior	-2.731***
	(0.554)
Constant	4.942***
	(0.926)
Observations	1,276
R-squared	0.105

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The dummy variable for maternal capital was not significant. The dummy variable linked to giving birth to the first child after 30 years of age was highly significant. However, this could be linked to the fact that there is a limited period of fertility, and accordingly we cannot observe wide birth intervals.

The work variable, which showed that the woman worked before the birth of the latest child, was highly significant with a plus sign. On one hand, this could mean that women who return to work after the birth of their first child prefer a wider birth interval due to their career. On the other hand, the causality can be reversed, and we observe women leaving work because the birth interval was sufficiently wide.

The dummy variable which answers for 3+ children turned out to be insignificant, and therefore was not included in the final specification.

The dummy variable related to living in a village was 99% significant. This can be explained by prevailing traditions seen among village populations in Russia, which are significantly different from the traditions seen among city population. Historically, living in a village was the main driver of fertility in Russia (Historical TFR is in appendix). Along with the tendency towards larger families, obviously, tendency toward shorter inter-birth intervals stuck.

The coefficient of the dummy variable for living in Moscow or Saint Petersburg was also significant. The minus sign shows that women living in the

two largest cities in Russia prefer a shorter birth interval, perhaps due to career aspirations. In other words, women in large cities decide on a longer birth interval less frequently, as childbirth distracts from career building.

The number of years of education is a strongly significant variable, indicating that more educated individuals prefer a wider inter-birth interval. This can be explained by two things: first, the need to return to career building, and second, smaller quantity of extremely shortened inter-birth intervals (less than 2 years). Indeed, among women without higher education, 31% of interbirth intervals are less than 2 years. Among women with higher education – 14%.

Neither annual household income nor individual were significant in the linear and logarithmic specifications. Existing studies on the decision factors related to childbearing found income to be strongly significant. (Roshina, Boykov 2005). However, these studies focused on the decision factors of childbirth in general, not on the determination of birth interval.

According to the respondents' observations, studies on women with a higher education and without a higher education should be executed separately, as the decisions on inter-birth interval strongly differ. For this reason, we estimated similar linear specifications for two groups of women. The decision rule to place women in the first group was less than 15 years of education, which in Russia, as a rule, shows a lack of higher education.

Below we offer the distribution of birth interval for both groups.

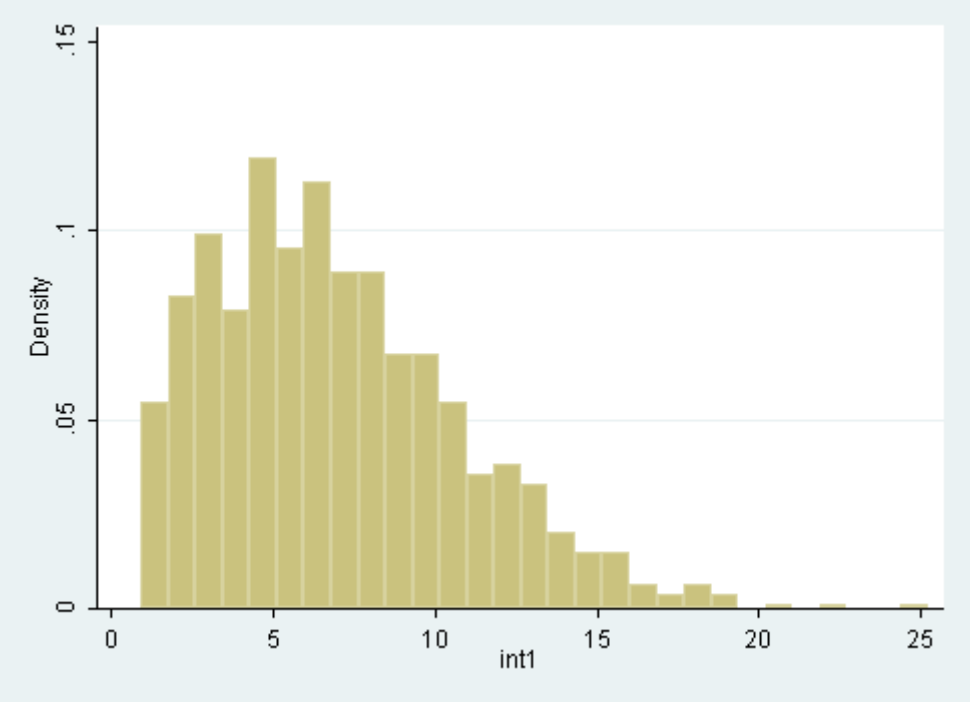

Figure 4. Birth spacing if women with education is over 15 years

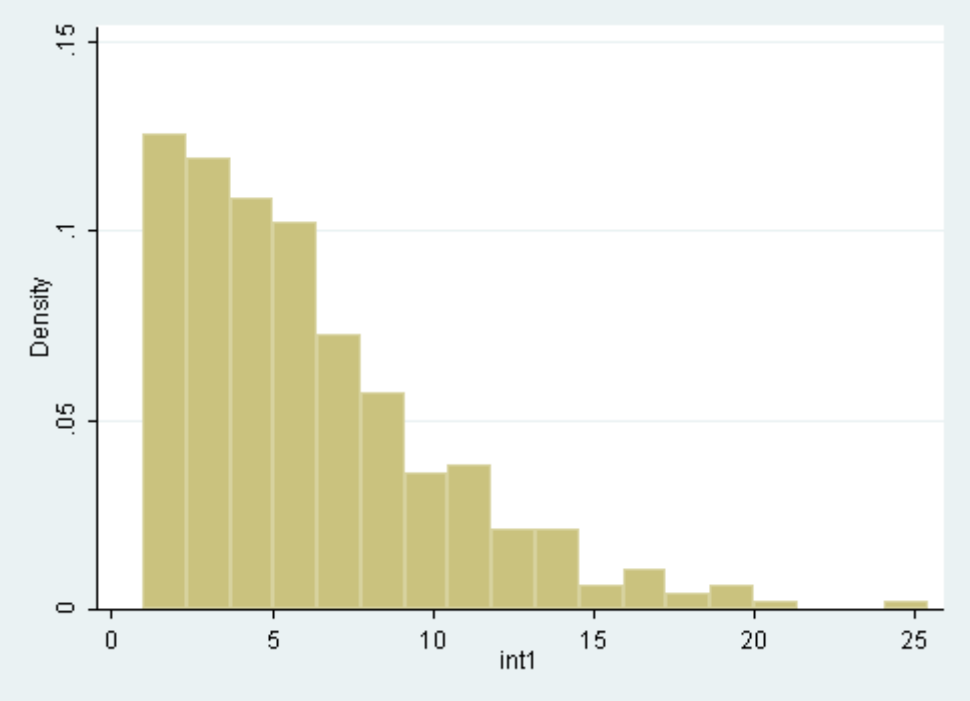

Figure 5. Birth spacing if women with education is less than 15 years

Below I present the linear model estimation similar to the model for the full sample group.

Regression 2 results

Table 3

	(1)
VARIABLES	int
mt	-0.398*
	(0.285)
educ	0.179*
	(0.0989)
rural	-1.088**
	(0.487)
health	0.398
	(0.388)
work	1.808***
	(0.568)
mskspb	-0.125
	(0.152)
senior	-1.870
	(2.471)
Constant	3.068
	(2.080)
Observations	345
R-squared	0.187

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

This result suggests that maternity capital has a significant impact on the inter-birth interval among uneducated women. The sign of influence is negative, e.g. with all else equal, women without higher education decide on second childbirth 4.5 months earlier, on average. The coefficients of education, work between children, and status of housing (city, countryside) remain significant as before. The coefficients of self-estimated health and the dummy variable for women older than 30 lost significance.

For the group of women with a higher education, I estimated a similar specification model.

Regression 3 results

Table 4

	(1)
VARIABLES	int
mt	-0.093
	(0.134)
educ	0.035
	(0.0432)
rural	-0.835*
	(0.523)
health	0.426*
	(0.238)
work	1.926***
	(0.425)
mskspb	-0.335*
	(0.193)
senior	-2.952*
	(1.427)
Constant	5.375
	(2.352)
Observations	931
R-squared	0.227

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Indeed, on the sample of high-educated mothers dummy variable for maternity capital is not significant at all. This proves the experts prediction.

Conclusion

I conducted an economic analysis of reproductive behaviors of the Russian population with the goal of identifying which decision-making factors affected the inter-birth interval. The key question was the effect of the maternal capital program on the birth calendar. The answer to this question is important both theoretically and for the development of effective demographic policy measures. In general, I can say that the category of women without a higher education demonstrate high sensitivity to the measures used to stimulate birth rate, and as a result of the maternal capital program, reduce the inter-birth

interval by 4.6 months on average. I did not find such significant effects on the group of women with higher education.

The analysis of reproductive behavior was conducted on the basis of classic economic models of fertility, included as determinants of a significant number of economic factors. As our calculations showed, the major factors which determine reproductive behaviors are demographic. The range of included economic parameters, which I expected to find as highly influential, were not significant in the models.

The hypothesis on the influence of family income on inter-birth intervals was not confirmed in any modifications of the income variable. The hypothesis on the importance of self-evaluated societal position, future expectations, and size of place of residence were also not confirmed.

However, I cannot say that economic factors do not play a role in the decision of interbirth interval. Women working between births showed a significant positive influence. This suggests that working mothers delay the birth of their next child.

I found that the number of years of education had a significant positive effect on chosen birth interval. This can be explained by the fact that highly-educated women more often follow recommendations of doctors, and, consequently, less frequently choose a birth interval of less than 3 years. At the same time, the percentage of shorter birth intervals among the non-educated group is much higher.

Beyond this, the group of women with a higher education tend to decide on the more popular birth intervals of three to seven years. This phenomenon is observed from 2007-2012. Before this, the birth interval distribution was more uniform. This could indicate a movement towards more conscious family planning.

The decision-making factors affecting birth interval are different between women with and without higher education. Women belonging to the first group

significantly prolong the birth interval when living in Moscow or Saint Petersburg, the two largest cities in Russia. At the same time, this tendency is not observed among the second group. This could be explained by the fact that larger cities offer well-educated women alternative options, because of which they postpone child birth. At the same time, women without higher education living in the countryside choose a short birth interval, while the first group is not sensitive to this factor.

The respondents' predictions about shorter birth interval among women, whose first child was born after 30 was confirmed. This is due to the limited period of fertility and the increased likelihood of genetic diseases as maternal age increases. I found that women with the worst self-assessment of their heath preferred longer birth intervals.

In conclusion, the inter-birth interval is a more sensitive indicator of fertility than the total fertility rate. Since I observe a stable birth interval in the group of women with higher education, it can be argued that this group is less sensitive to the government programs stimulating birth. I am unable to conclude if the second group of women increases the overall number of children, or simply shortens the birth interval. However, even in the case of increased overall number of children in the less-educated group, the effects of the birth-rate stimulation will be extensive rather than intensive in terms of the quality of the new generation.

References:

1. Agustín Conde-Agudelo, Anyeli Rosas-Bermudez, Fabio Castaño and Maureen H. Norton. of birth spacing on maternal, perinatal, infant, and child health: a systematic review of causal mechanisms. Studies In Family Planning www3.interscience.wiley.com/journal/118493830/home. Volume 43, Issue 2, June 2012;

2. Becker G. (1976) An Economic Analysis of Fertility, in: The Economic Approach to Human Behavior (Chicago and London: The University of Chicago Press). [21-24];

3. Chen, D. Can Countries Reverse Fertility Decline? Evidence from Frances Marriage and Baby Bonuses, 1929-1981. International Tax and Public Finance, 18(3):253 272, 2011;

4. Chernova Z. (2011) Semeinaya Politika Sovremennoy Rossii: Genderniy analiz i Otsenka Effektivnosti. (Contemporary Russian Family Policy: Gender Analysis and Evaluation of Efficiency) Zhenshchina v Rossiyskom Obshchestve. [10-13];

5. Dickert-Conlin, S. and Chandra, A. Taxes and the Timing of Births. Journal of Political Economy, 107 (1):161 177, 1999. [5-15];

6. Kashina M., Yukina I. (2009). Rossiiskaia Demograficheskaia Politika: Opit Gendernogo Analiza [Russian Demographic Policy: a Gendered Analysis] Zhurnal Sotsiologii i Sotsial'noi Antropologii 12 (1): 109-123. [15-17];

7. Montgomery M., Trussel J. (1986) Models of Marital Status and Childbearing, Handbook of Labour Economics 1, Chap. 3 (Elsevier Science Publishers BV). [8-13];

8. Ovcharova L. ed. (2010) Determinant Reproductivnogo Povedenia Naselenia i Faktori Semeinogo Neblagopoluchia: Rezul'tati Panel'nih Issledovanii (Determinants of Peoples' Reproductive Behavior and Factors of Family Ill-being: Results of Panel Researches). Moscow: NISP. [9-14];

9. Presidential Address to the Federal Assembly of Russian Federation, May 10th, 2006;

10. Slonimczyk, Fabian and Yurko, Anna V., Assessing the Impact of the Maternity Capital Policy in Russia Using a Dynamic Model of Fertility and Employment. IZA Discussion Paper No. 7705. [2-25];

11. Source: "Russia Longitudinal Monitoring survey, RLMS-HSE», conducted by Higher School of Economics and ZAO “Demoscope” together with Carolina Population Center, University of North Carolina at Chapel Hill and the Institute of Sociology RAS. (RLMS-HSE sites: http://www.cpc.unc.edu/projects/rlms-hse, http://www.hse.ru/org/hse/rlms);

12. Zakharov S. (2008) Russian Federation: From the First to Second Demographic Transition. Demographic Research 19: 907 - 972.

Appendix 1

Survey results

Factor	Percent of supporters
Physiology. Recommended interval is not less then 3 years	56%
Women after 30 y. o. choose short intervals	76%
The most popular intervals are 3 and 7 years	48%
Family income	88%
Education of the mother	60%
Living space	24%
Number of children	42%