Red Belt Fertility: the role of regional variation in benefits received, gender attitudes, inflation and political ideology in Russia

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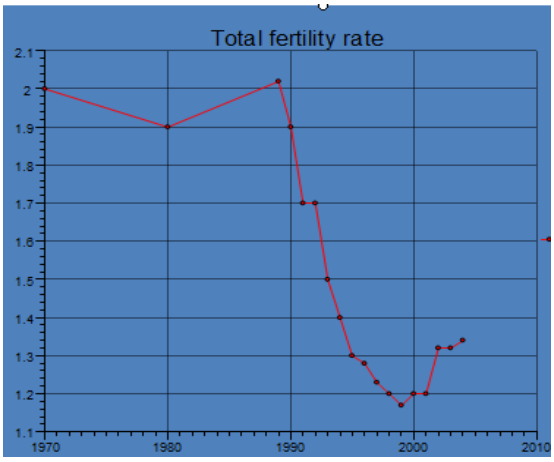
Abstract

Much research has attempted to explain why women began having fewer second children after the transition from communism began. Beyond individual-level factors, this study finds that variation in local gender attitudes, political ideology and factors affecting the household budget influenced the likelihood of having a second child. Specifically, from the Russian Longitudinal Monitoring Survey, survey responses to questions about voting behavior and women's and men's roles in the household, as well as whether the household received child benefits for the first child, were aggregated for 31 regions that were surveyed in the Russian Gender and Generations Survey. Whether the respondent lived in the "Red Belt" region also appears to have influenced second birth decisions. Estimates of these regional influences are not entirely consistent with each other and with expectations, however, leaving room for further research on better measures or theoretical developments that would explain unintuitive relationships.

I. Introduction

The majority of men and women had two children in Russia before 1990 (Zhakarov & Ivanova 1996), but the total fertility rate fell to below 1.2 children per woman by the end of the 1990s. Research has shown very little relevance of postponement to the majority of this fertility decline, nor does it appear due to an increase in childlessness; the decline seems to be due to stopping behavior in which second and higher order births declined (Sobotka, 2002). Bühler (2004) and Perelli-Harris (2006) found evidence that extra sources of income, through informal work or home production, supported second birth intensities, while Billingsley (2009) found that those with the least potential resources had the greatest decline in second birth transitions once the economy began to falter. Moreover, those who lose their footing in the labor market and experience unemployment (Billingsley & Sinyavskaya 2010) or intragenerational downward mobility (Billingsley 2010) postpone or forego having a second child.

Figure 1. Fertility decline in Russia



Source: Health for All Database, WHO

These studies all focus on individual-level determinants of fertility behavior. Broad variation in political and social norms as well as economic performance exists across the regions of Russia, which may be linked to women's perceptions and attitudes toward life chances and restrictions as well as the cost of childbearing and uncertainty about the future. Divergence occurred in the extent that local economies developed (Gerber 2006), local governments supported market transition and the local population remained committed to the Communist Party after the transition from communism began

(Berkowitz and De Jong 1999; Gaddy and Ickes 1998). Berkowitz and De Jong (1999) tried to understand why inflation was so high in some regions compared to others, since the transportation costs of delivering goods could not possibly account for the variation across regions. They discovered that this belt of regions shared some striking similarities. A main characteristic they focus on is that the Red Belt encompasses regions that most strongly supported the communist party in the 1996 election and voted against Yeltsin's reformist party. Along with this shared political orientation, the authors found evidence that these regions also favored traditional command economy practices. On the basis of an index that reflected the degree to which local government had eliminated subsidies and controls and maintained extensive manipulation of the market, the authors demonstrated that these regions can, in fact, be grouped together. They gave an example in which one local government was said to coerce manufacturers "to sell portions of their output at artificially low prices; they then block non-residential consumption by issuing ration coupons" p. 638. It has even been suggested that the Red Belt represents a "virtual economy', in which pricing inefficiencies result from heavy reliance on trade in kind and administrative-command allocation" (Gaddy & Ickes, 1998). In other words, economic reforms appear to have been resisted during the turbulent 1990s in these regions. This regional variation provides opportunity for gaining insight into the important issue of low fertility in Russia and has not been analyzed in previous research.

Despite much speculation about changing values and norms, in particular related to research on the Second Demographic Transition (e.g., Lesthaeghe and van de Kaa 1986), we know little about how attitudinal variation matters to fertility decisions in Russia. Moreover, beyond educational attainment and labor market success or preferences, little is known about other factors that affect the household budget. This study takes a first step in filling this gap as well.

This paper focuses on women's fertility behavior alone. The data used in this study do not allow the possibility of analyzing characteristics of both individuals in a couple. Although it would be possible to study men and women separately, the motivation of this study to understand the influence of contextual factors to which both members are exposed. Since couples make the decision to have another child within the same regional context, studying men and women separately is unnecessary.

In the next sections, I describe the data and indicators used in this research as well as initial expectations of how these factors might influence fertility. In the following sections I detail the analysis, methods and results. The final section discusses the findings and proposes interpretations of the results.

II. Data and Indicators

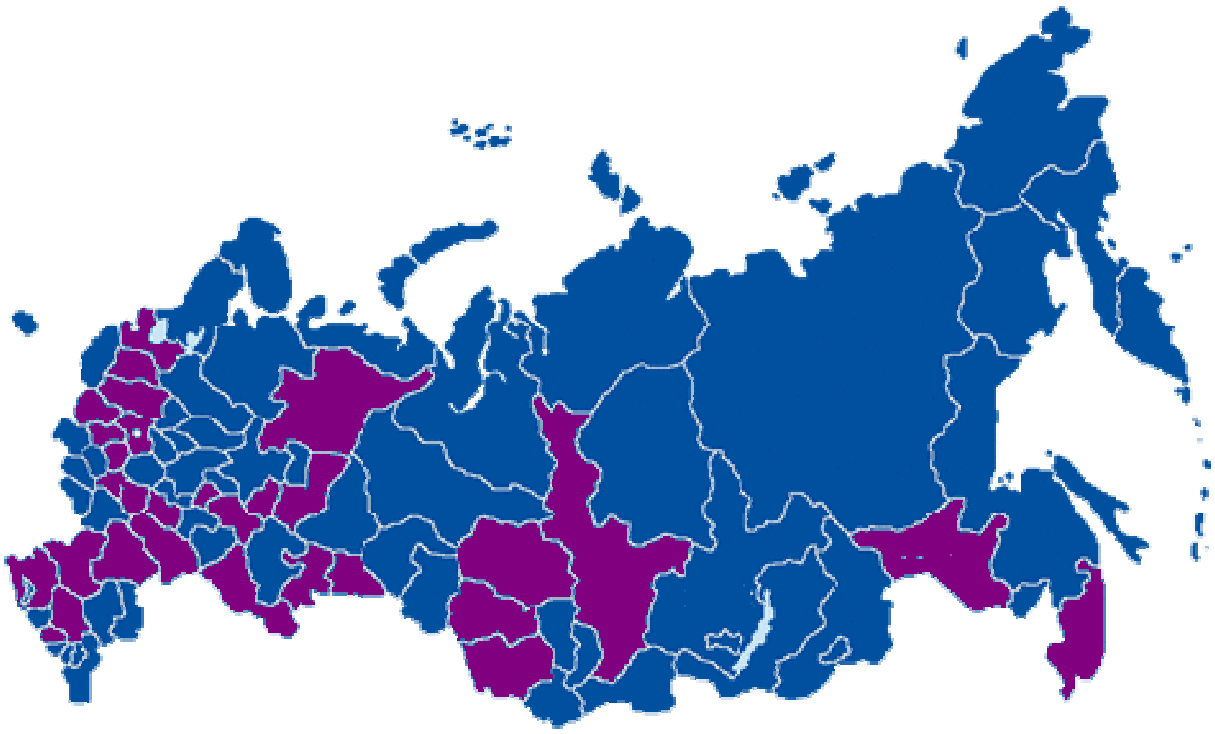
The data used in this analysis are from multiple sources. Fertility and partnership histories are drawn from the Russian Generations and Gender Survey (GGS). The GGS was given to a nationally representative sample of 18-79 year olds from June to August, 2004. It is part of the broader Generations and Gender Program initiated under the United Nations Economic Commission for Europe to gather comparative and prospective information about demographic and family behavior. Retrospective histories of residential moves, educational careers and employment experiences were drawn from the Employment and Education Survey (EES), which was administered to an 18-55 year old subsample of the GGS sample in 2005. The detailed life histories cover all activities since January of the year the respondent turned 17. Through these two sources, we have rich and complete knowledge of the main events occurring in the respondents' lives as they pertain to childbearing, work and education.

Contextual level information is drawn from two sources. First, annual changes in the consumer price index (CPI) by region are available through the Russian Federal State Statistics Service, which publishes regional level statistics annually in "Regions of Russia. Socio-economic Indicators". Other regional-level indicators were constructed from an alternative survey. The Russian Longitudinal Monitoring Survey (RLMS) was initiated in 1992 and "is a household-based survey designed to measure the effects of Russian reforms on the economic well-being of households and individuals" (Carolina Population Center). This study uses data drawn from the second phase of the survey (1994-2005), which had an improved sampling design and is more representative than the first phase of the survey.

Multiple types of data—cross-sectional, retrospective and panel—are therefore combined to create a unique data set with individual-level information covering many years of Russian's lives and contextual level information for various regions of Russia. In regards to the regions covered in this study, the GGS began the sampling process with territories that covered 95.6% of the entire population; 4.4% of the population were excluded because of transportation difficulties and severe weather, very low population density, or armed conflict in the area. Primary sampling units were drawn randomly from this sample frame using probabilities proportional to the size of the population living there. The interviews of the GGS respondents took place in 32 different regions. Although respondents were living in one of these 32 regions at the time of the interview, they could have lived elsewhere before being surveyed. The EES data provide this information, allowing us to track when the respondents were living in one of the regions covered in the survey and when they lived in other regions, foreign countries or former Soviet Republics. Time spent in unidentified regions unfortunately must enter the analysis as

missing data;[1] but this exclusion incurs only a 3.6% loss of all spells during this study's window of observation (between the first and second birth from 1991 to 2005). The regional level information drawn from the RLMS data covers 38 regions, seven of which do not match the GGS regions, leaving a total of 31 regional matches for which we have individual and contextual-level information,[2] which are displayed in Figure 2.

Figure 2. 31 Regions of Russia covered in this study



Note: The darker regions are those covered in this study. They are St. Petersburg, Moscow, Moscow Oblast (region), Komi Republic, Saratov Region, Leningrad Region, Smolensk Region, Tver Region, Tula Region, Kaluga Region, Nizhniy Novgorod Region, Chuvashia Region, Penza Region, Lipetsk Region, Tambov Region, Republic of Tatarstan, Krasnodar Kray, Chelyabinsk Region, Volgograd Region, Kabardino-Balkarskaya Republic, Rostov Region, Altayskiy Kray, Stavropolskiy Kray, Krasnoyarskiy Kray, Kurgan Oblast, Republic of Udmurtia, Orenburg Region, Perm Region, Tomsk Region, Primorskiy Kray, Amur Region

[1] The time spent in these unidentified areas still contributes to the duration analysis, but not to the exposure rates of any of the covariates.

[2] The RLMS did not cover the region of Novosibirsk in most of its surveys and the GGS does not cover Surgut in Khanty-Mansiiskiy Autonomous Okrug.

To analyze the transition to having a second birth, I use event history modeling, which is particularly useful when analyzing time dependent processes and spans of time in which individual or contextual characteristics may change. To allow for a variation in the hazard rate over time, I use a piecewise constant hazard model. The dependent variable is whether a respondent had a second child and the moment of observation begins when the respondent has a first child. All second birth events are pre-dated 8 months before the actual birth of the child, to account for a gestation period and to capture the moment in time in which a decision about having the child was likely made. Almost 2000 women had a first child before being surveyed and were therefore at risk of having a second child between 1992 and 2004. The next sections describe the independent variables in the analysis.

II.a The Red Belt

In this paper, Red Belt regions are those designated so by Berkowitz and De Jong (1999) and they are represented with a dummy variable in the analysis. [3] See Figure 3 below.

Figure 3. Red Belt region of Russia

[3] The red belt regions were classified on the basis of voting for Zyuganov in 1996: Saratov Region, Smolensk Region, Tver Region, Tula Region, Kaluga Region, Chuvashia Region, Penza Region, Lipetsk Region, Tambov Region, Volgograd Region, Rostov Region, Altayskiy Kray, Stavropolskiy Kray, Kurgan Oblast, Orenburg Region, Amur Region, and Novosibirsk. The great majority of these regions voted similarly in the two rounds of elections, but the following changed their vote to Yeltsin in the second round: Tula Region, Tver Region, Kaluga Region, and Rostov Region.

Source: Berkowitz & De Jong (1999)

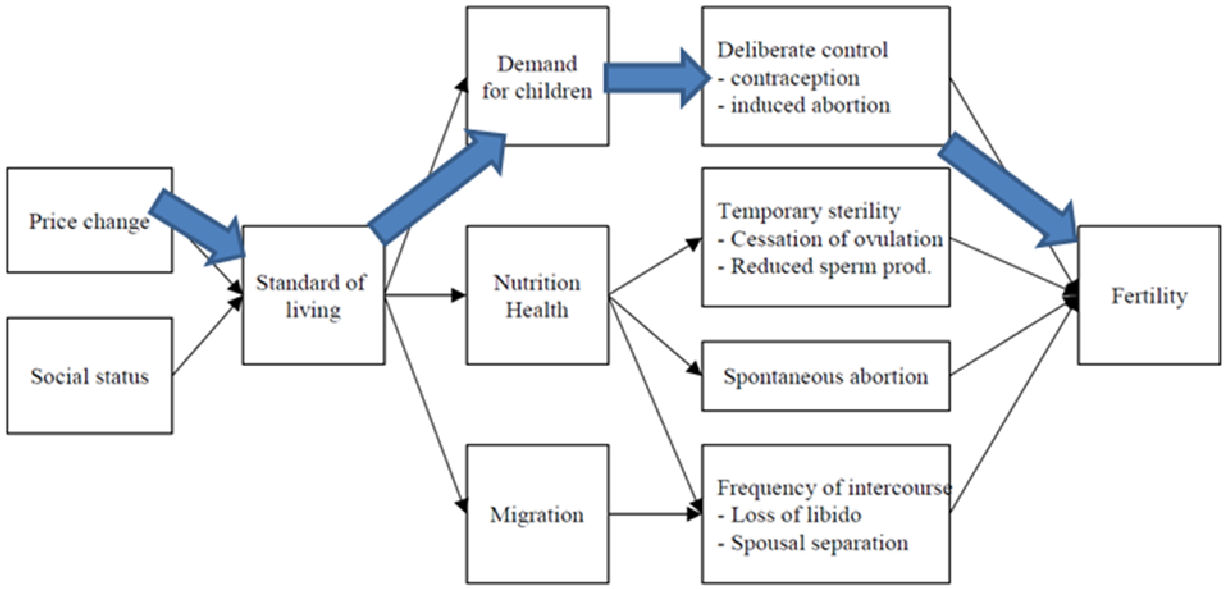
As being part of the red belt indicates dedication to the old order to some degree, communist ideals and values may have been more salient than in other areas of the country that accepted change and reform. Since economic developments may have been delayed, new mothers may have been more protected from economic instability and family/work conflicts by lagging reforms. This delay may have allowed them to continue having the second child that was previously more common, or loyalty to communist ideology may imply an environment in which norms and values remained more static over the transition, which supported higher second birth rates. These implications for fertility suggest a positive relationship with red belt membership, but the reverse relationship may exist as well. Individuals living in regions in which support for the old regime remained strong may have reacted with stronger uncertainly and pessimism to the changes occurring during these times. Moreover, the relationship between local economic conditions and political allegiance could work in the opposite direction. It may be that conditions were so poor that the populations in these regions were quickly

disillusioned with reforms and this strengthened or encouraged a preference to return to the previous system. Some evidence of this exists in nationwide election results, since support for the communist party was low at the beginning of the transition (below 20%), then increased to over 30% before falling to around 10% for remaining years. Considering that Red Belt regions had lower inflation rates than other regions, especially in the early years, this hypothesis appears to have limited explanatory power. Regardless, many issues remain unclear when considering the impact of living in the Red Belt. For example, it is not clear how long the Red Belt existed nor how similar the regions are when it comes to other potentially important indicators.

II.b Inflation

In the midst of the rapid economic restructuring that was introduced in the 1990s, prices increased dramatically. Inflation statistics reveal that Russia's annual price index increased over 1000% in the early 1990s (TransMonee database). Very large increases in prices from one year to the next suggest severe downward pressure on resources, which likely indicates an increase in the relative cost of having a child. Inflation is not typically linked to fertility in mainstream research, but Bengtsson and Dribe (2002) have described how price increases could matter to fertility in their study on pre-industrial Sweden. Their study focused on communities that were agricultural and in which livelihoods were highly dependent on the cost of food, which is why they argued that inflation may have been important to fertility decisions. The pathway that is being considered in the present study is highlighted in Figure 4, in which changes in prices affect the standard of living, which in turn alters the demand for children. At this point, fertility control is assumed, which could lower fertility. In addition, instability in the value of money may increase uncertainties about the future, which might also deter family expansion. Therefore, women are expected to be less likely to have a second child in regions and times in which inflation was particularly rampant. As price increases affect everyone, this relationship is assumed to be uniform for educational or occupational groups.

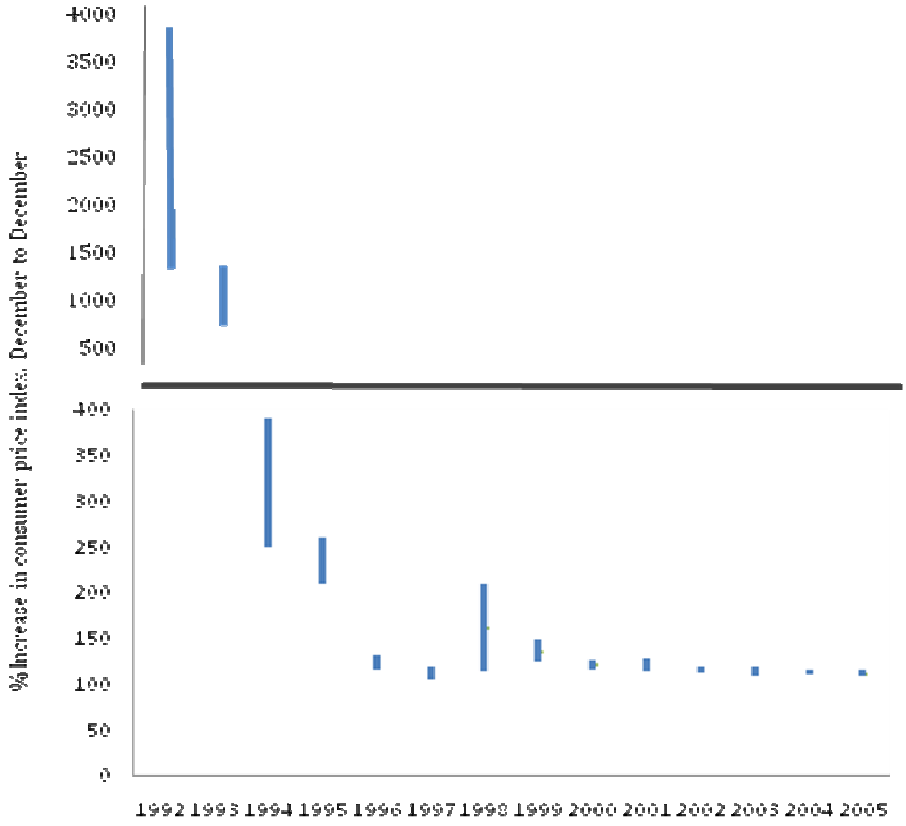
Figure 4. Model of fertility response to economic stress



Source: Bengtsson & Dribe (2002); blue arrows added by author

Across the time period and regions covered in this study, substantial variation in inflation exists. Time-series data on regional level inflation from 1992-2005 are displayed in Figure 5. The length of the vertical line indicates the dispersion in price increases across the regions for each year; the top of each bar marks the value for the region with the highest inflation and the bottom of the bar indicates the value for the region with the lowest inflation of that year. Notice that the highest numbers on the y axis are not on the same scale as the lower numbers in order to best demonstrate the variation at lower price changes as well. Not only do the values in the early 1990s reach levels indicating deep economic crisis, but there was remarkable variation in the extent that prices rose in the different regions. Moreover, we see that the second economic crisis in 1998 also impacted prices and, again, not uniformly across regions.

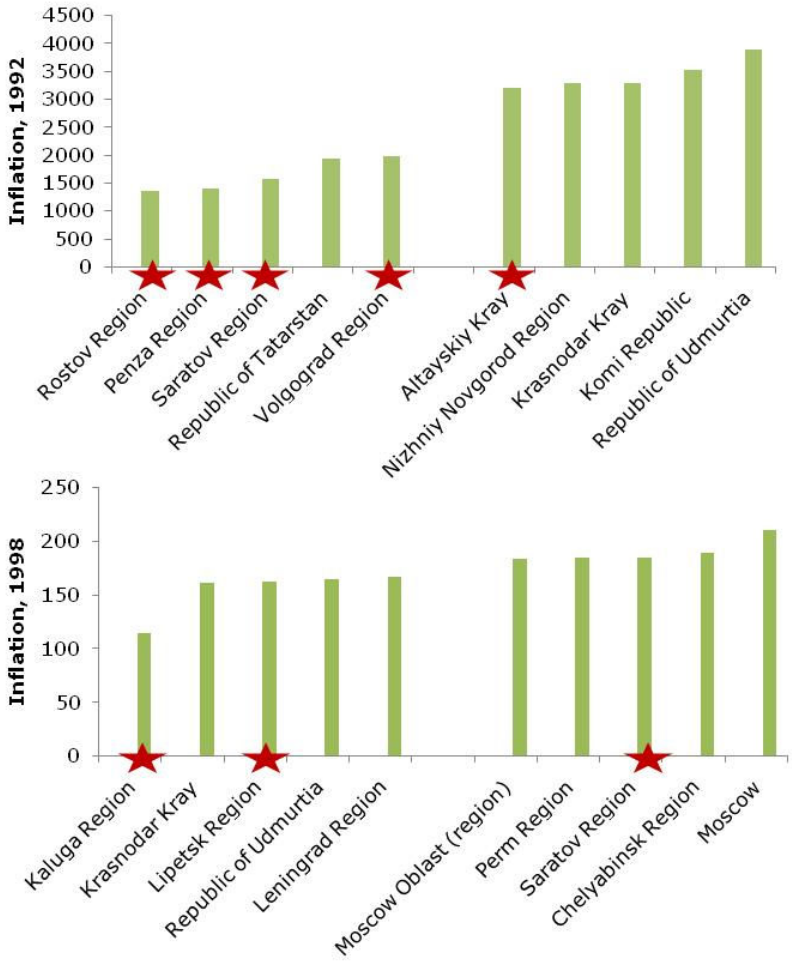
Figure 5. Regional variation in inflation within Russia, 1992-2005



Source: Data was taken from Russian Statistical Yearbooks

Since delayed reform in the red belt regions should have somewhat capped price increases, inflation is expected to vary by red belt membership. Taking the two years in which there was the highest regional variation in inflation during the two economic crises, 1992 and 1998, Red Belt regions seem to be over-represented among those that had the lowest price increases in the first year; four of the five regions with the lowest inflation were Red Belt regions in 1992. However, at least one Red Belt region ranked among the regions with the highest inflation in both years as well. See Figure 6.

Figure 6. The top five lowest and highest ranking regions for inflation in 1992 and 1998



Note: red stars indicate membership in the Red Belt

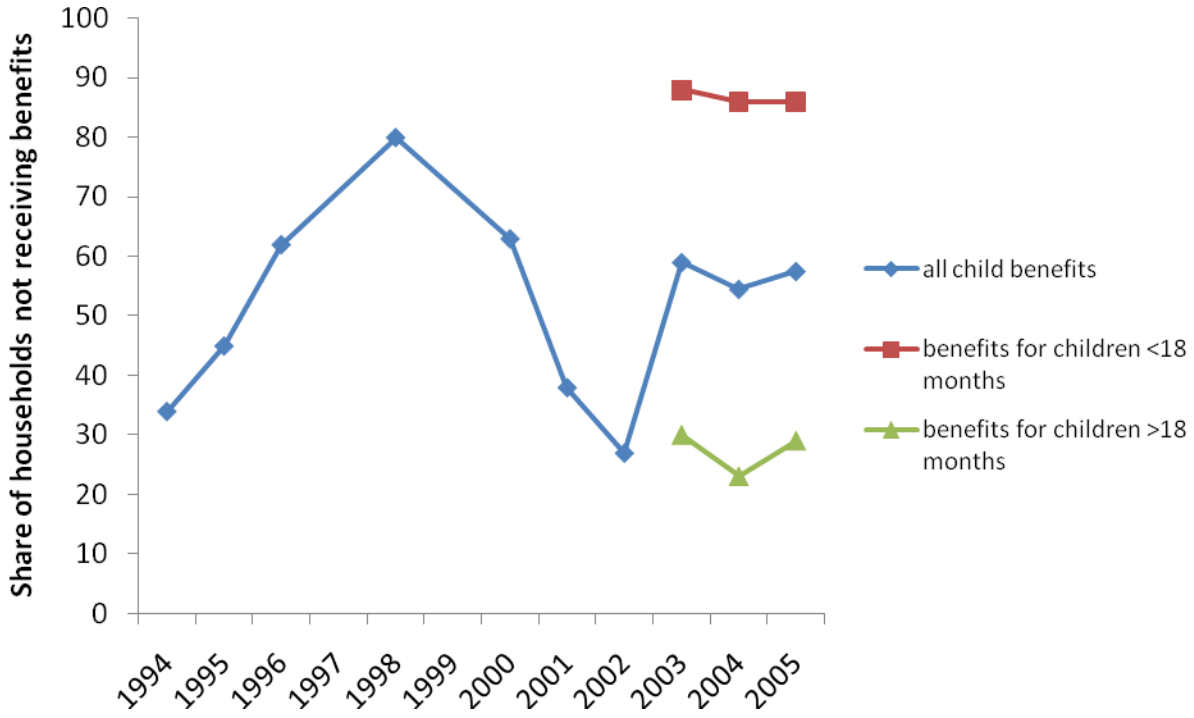
However, and despite the fact that the red belt region was used to partially explain pricing differentials by Berkowitz & De Jong (1999), these regions do not appear to fare better with inflation than non-red belt regions overall. By averaging inflation per year for red belt regions and those that are not, the red belt regions look remarkably similar to non-red belt regions and the advantage they should have does not exist. From 1992-2004, only in six out of the 13 years was the red belt average lower than the other regions. The greatest difference in average was in 1992, but from 1993-1997 the red belt inflation average was higher than in other regions.

II.c Receipt of Child Benefits

Another potentially important financial factor is whether households received the benefits they were supposed to receive, especially during times in which the household budget was most vulnerable. After the transition from communism began, some new policies were introduced to support families with children, including childbirth grants, maternity and parental leave payments, as well as child allowances. Milanovic (1998) reported that, unlike the countries of the former Eastern Europe and the Baltic States, many social assistance benefits were poorly targeted in Russia and were received more by better-off households than the poorest, indicating highly uncertain financial terrain for the poorest. Whether households received benefits related to childbearing might be important to the decision to have another child; if the support women previously thought existed to offset the cost of childbearing and rearing did not materialize, they may have been less likely to believe they have the resources to meet the cost of another child.

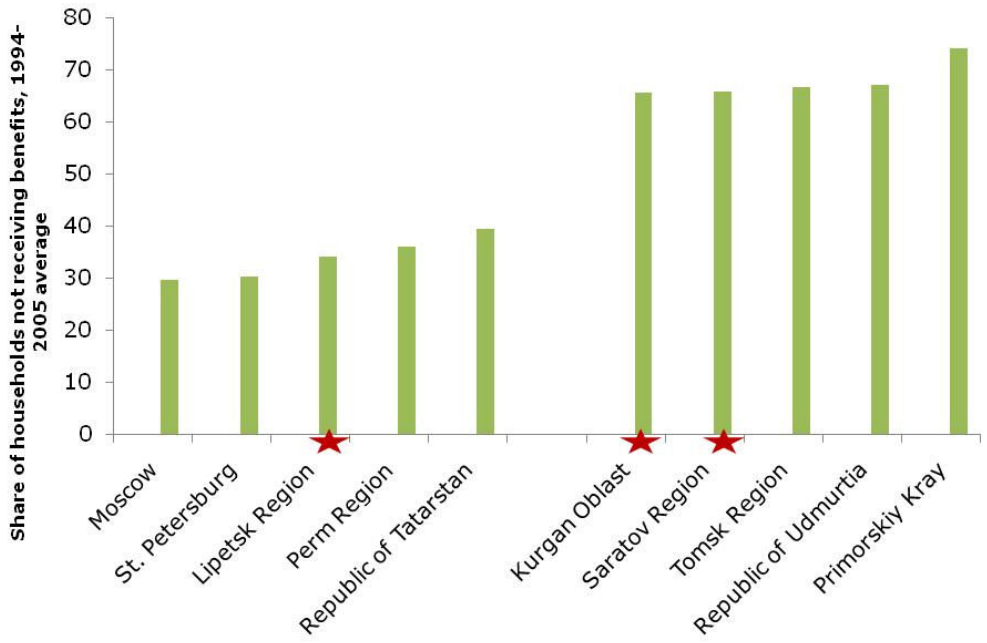
The RLMS asks respondents whether they were supposed to receive any child benefits and then asked whether they actually received the child benefit. The share of households per region that did not receive the benefits they were supposed to receive each year has been calculated and matched to the region/s the GGS/EES respondent was living in during those years. RLMS respondents report varying track records of actually receiving the benefits they were supposed to receive. As we might expect, more people did not receive their child benefits during tough economic times once the transition was in full swing. Figure 7 shows the time trend in the share of people that did not receive their benefits across all regions. It is unclear whether benefit arrears were a problem in the first few years of transition since we have no information for 1992 and 1993, but the trend suggests a steady increase from 34% in 1994 to 80% in 1998 in non-receipt. After 1998, when the second economic crisis subsided, more households again began to receive their child benefits until 2003. At this point, benefit arrears or non-payment again appeared to be on the rise, despite improved economic conditions at the national level. Later RLMS surveys asked more specific questions about the benefits households were supposed to receive; for the years 2003 to 2005, we know whether the child benefits were for a child under 18 months of age or older. This distinction appears to be very important as the difference in non-receipt is great. On average, non-receipt of benefits was 87% for children under 18 months and 27% for children over 18 months old for these three years. Whether this difference persisted in earlier years is unknown, but something appears to have happened around this time since the average non-receipt rate for all benefits more than doubled from 2002 to 2003. We know that child benefits were affected by the social benefit monetization reform in 2004 in which the responsibility of the local region grew (Chandler 2007), but an unexpected shift occurred in the year before this reform was implemented.

Figure 7. Share of households not receiving child benefits by year (1994-2005) and share not receiving benefits by age of child (2003-2005)



Although decentralization of the child benefit payment officially occurred in 2004, great variation among the regions in the non-receipt rate hints at some responsibility, at least, for these benefits by local government. As early as 1997, there is evidence that the Duma (the lower house of the Federal Assembly of Russia, or the parliament) was aware of the arrears in child benefits (Chandler 2007). Whether differential complications arose in securing or processing those funds at the local level is unknown, but blame was officially placed on regional governments for not paying the benefits (Chandler 2007). Figure 8 shows the five regions that performed the best and worst in paying child benefits if we average their non-receipt rates over the entire time span.

Figure 8. Best and worst regions for child benefit payments, average non-receipt rates over the years 1994-2005



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Officially, these policies were directed toward families with fewer resources (Sinyavskaya 2010?). In general, however, family policies aimed toward reconciling work and family demands for women and for income support of households with children in Russia are universal, since some level of support is accessible regardless of work tenure. But as mentioned, there is some evidence of a targeting bias in the opposite direction, in which the poorest families were under-represented in those who received benefits. Individual level characteristics such as education and income may have been important to whether households received their benefits, whether the local government managed to pay the benefits broadly or with limitations. Therefore, individual characteristics may play a role in the relationship between regional receipt of benefits and fertility decisions; hence, the effect of regional arrears in benefits will be analyzed according to the educational level of the respondent.

Only in five out of twelve years (from 1994-2005) did red belt regions on average have a lower share of child benefits unpaid than other regions. Therefore, it does not seem likely that local government responsibility or efficiency was necessarily better in the red belt regions or that individuals in these regions experienced a greater degree of social support by local governance.

II.d Voting preferences

Besides potentially important variation in local governance, political ideology may reflect important values, attitudes and orientations that are related to childbearing decisions. Certainly the speed of fertility decline in Europe has been associated with secular party support during the First Demographic Transition (Lesthaeghe and Wilson 1986). More recently, a highly robust association between conservative voting and fertility behavior in the US was documented and discussed by Lesthaeghe and Neidert (2006). The connection made by these authors between voting and demographic behavior rests mostly on the cultural profile of the political parties. Values—represented by religiosity, stance towards abortion and same-sex couples, as well as towards terrorism and the war in Iraq—were linked to a conservative or liberal political preference and these correlated with the timing of marriage and childbearing, the total fertility rate, and other demographic factors that are indicative of a Second Demographic Transition (SDT). SDT (Lesthaeghe and van de Kaa 1986; van de Kaa 1987) theorists argue that fertility levels will drop to or below replacement level due to a general increase in individualism and the desire for personal self-actualization. This shift in life focus originates in post-materialism and increased opportunities for women.

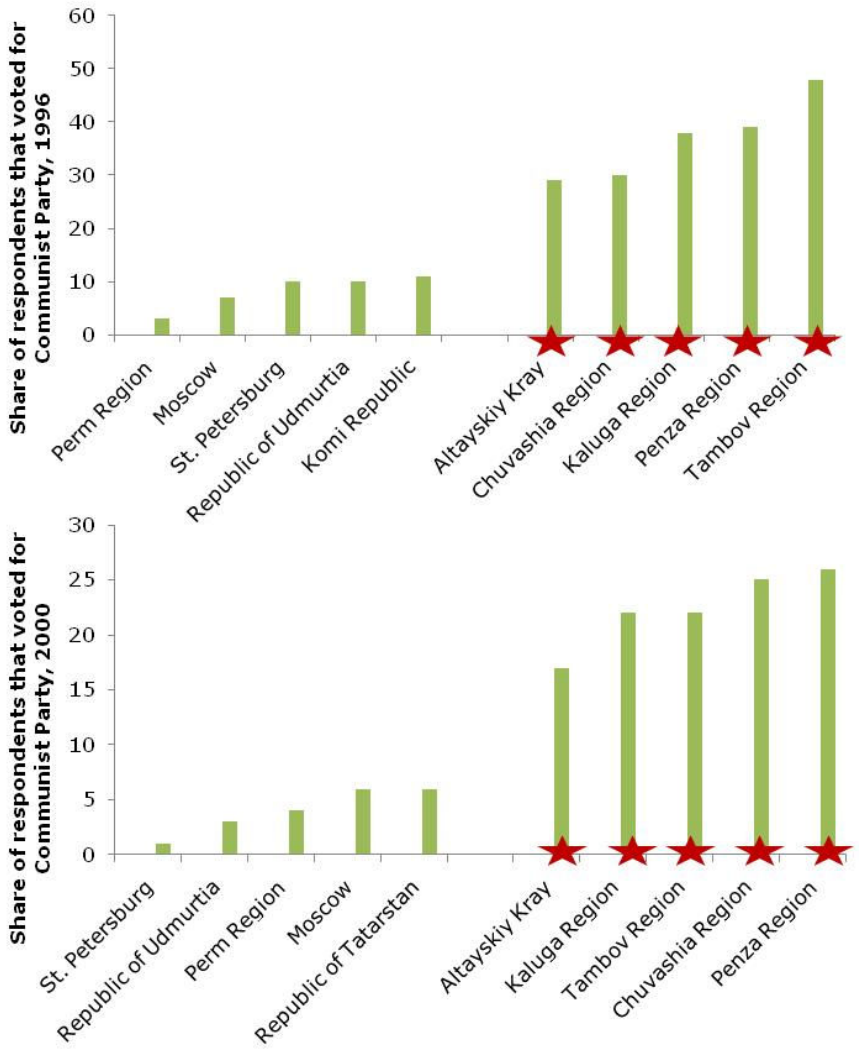
A priori, little theory or evidence exists to suggest how political orientations may be associated with demographic behavior in Russia. With the declining loyalty to communist ideology that is evident in Russian voting behavior, it is reasonable to assume an increase in individualist orientations. In its original formation, SDT theorists argued that changes in demographic behavior were "the expression of secular and antiauthoritarian sentiments of better educated young cohorts with an egalitarian world view and an accentuation of the "higher order needs" (i.e. self-actualisation, expressive values, recognition)." This list of elements poses some difficulty in reference to a Communist or reformist political orientation. On the one hand, Soviet communism undoubtedly emphasized secularism and an egalitarian world view. On the other hand, the capitalist and democratic reforms are likely to have encouraged antiauthoritarian sentiments as well as values associated with "higher order needs". The ideological shift from focusing on the collective good to the self is clearly in alignment with SDT. Firm expectations about this relationship are not formulated and this study will offer some first insights on the matter of political preferences and fertility behavior in Russia.

Since local political leanings may have been too simplistically represented in the delineation of a red belt region vs. non-red belt region, they are further explored by introducing the share of respondents within each region that voted for Zyuganov, the Communist Party candidate, in both the 1996 and 2000 elections. Having this information at two points in time allows for a somewhat time-varying indicator of political leanings across regions. In general, a decline in the share of Zyuganov

supporters is evident across all regions from 1996-2000. The range of support in 1996 was from 3-48% and this declined to 1-26% in 2000. Voting preferences in the years between the two elections are imputed as incremental changes between the two values. The values for the years before and after the 1996 and 2000 elections are held constant since we have no information on political preferences during these years. This indicator does not perfectly capture how political preferences changed over time, therefore, but does offer information on the variation in anti-reformist sentiment across these regions.

As we would expect, voting preferences do vary according to whether the region is part of the red belt. (See Figure 9.) The average support for the Communist Party across the red belt regions was 26% in 1996 and 15% in 2000, whereas the average across all other regions surveyed was 13% in 1996 and 8% in 2000. The decline over the four years in support was similar for both groups of regions.

Figure 9. Lowest and highest regional support for the Communist Party, averaged over 1996 and 2000



Note: red stars indicate membership in the Red Belt

II.e Attitudes toward gender roles, work and families

The next two variables aim to capture attitudes toward gender roles, family responsibilities and labor force participation. The first indicator is based on the following question that was asked in the 2000 survey: Do you agree or disagree with the notion that it is usually bad for a family if the wife works? Shares by region of those who agreed or completely agreed with this statement were calculated. This indicator can be interpreted in at least a few different ways. First, it could represent a perception that families depend on women's time and resources to the extent that women should not take on other responsibilities; second, it could be a reflection of how easy it is for women to meet the demands of

both work and family responsibilities, which might vary by the commitment to and success of reconciliation policies in the local area. Finally, if economic conditions are so poor in the area, it may be that families are considered worse off it the mother does not work, which has little to do with gender roles. The other question, which was asked in the RLMS 2003 is how much the respondent agrees with the following statement: It's a husband's responsibility to earn money and a wife's responsibility to take care of the house and children. Respondents who answered that they agree or absolutely agree were counted and the share in agreement for each region was calculated. This indicator may seem similar at first glance to the former, but contains distinct properties. In this question, men's role plays as strong a part as women's. This means it is picking up more than gender roles associated with women and work. Using this question, we should be able to estimate support for the breadwinner model.

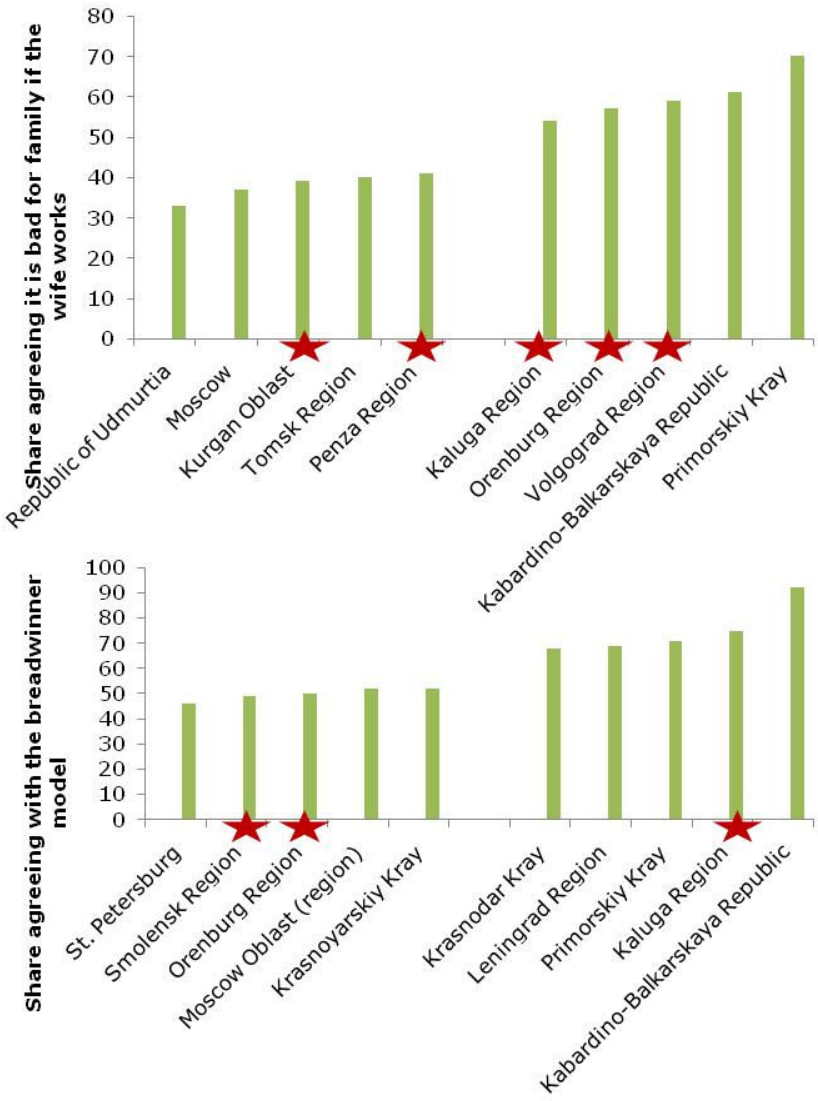
It is not necessarily clear how much these questions reflect attitudes that likely changed after the transition from communism began. On the one hand, we might have expected that the Soviet system alleviated many reconciliation issues, leaving women to more comfortably participate in the labor force. However, the possibility exists that women participated in the labor force at a high rate during Soviet rule even if they felt it was harmful to their families because of the pressure to be in paid employment. Likewise, the breadwinner model question does not rule out the possibility that home responsibilities are thought to be women's yet they were still expected to fully participate in the labor market. Teplova (2007, p. 290) writes "the Soviet state attached a special societal meaning to motherhood, and thus it abstained from supporting "shared" domestic and parental responsibilities between spouses, despite official egalitarianism." Regardless, if we assume some allegiance to the old values and attitudes, we might expect members of the red belt to support gender equality and women's important role in the workforce perhaps more than members of other regions. In this case, red belt regions should have a lower share of individuals who agree that it is bad for a family if the wife works and who agree with the breadwinner model. This hypothesis is further supported by the political agenda of the 1990s in which women were encouraged to return to the home as a way to solve demographic and labor market problems (Teplova 2007); this encouragement by the reformist politicians in power may have had more sway in areas in which their political support was stronger.

The relationship might work conversely as well, however; areas in which capitalist reforms were more accelerated and accepted may also be areas in which values and attitudes related to individualism have become more pronounced. The increase in opportunities and educational expansion that occurred simultaneously may have also encouraged ambitions and women's desire to focus on new career and

wealth opportunities. In this sense, we might see that red belt regions, in which adherence to old ideology appears stronger, are characterized by a higher share of individuals with “traditional” attitudes toward women, work and gender roles.

These two measures of attitudes and norms are not time varying and are introduced into the model as a constant regional effect. In this sense, we are not able to gain insight about how changes in attitudes matter to fertility behavior. However, these measures should be the most similar over time since we would not expect dramatic changes in attitudes to occur within a very short time span. Looking at the variation in responses to these questions by region, the share agreeing with the statement that it is bad for a family is a wife works ranges from 33-70%. The share agreeing with the breadwinner model ranges from 46-92%. In general, the Russian population generally supports a gendered division of labor within the household. Fewer consider it harmful for the family if the wife works. The regions in which we find the top and bottom five extremes are displayed in Figure 10. No obvious pattern appears according to the red belt regions. Mostly, they fit into the distribution in between the extremes. This finding of no pattern is evident again if looking at overall averages for the red belt region compared to others. The average for red belt regions is slightly higher for those who think it is bad for a family if the wife works and slightly lower for agreement with the breadwinner model, but the differences are minor.

Figure 10. Lowest and highest regional shares agreeing with attitudes toward gender roles, work and family



Note: red stars indicate membership in the Red Belt

This concludes the description of the main regional level indicators used in this analysis that represent the economic, political and social contexts. The next section briefly describes the individual-level variables that are used mostly as control variables in the model.

II.f Control variables for individual-level characteristics

Individual-level characteristics are introduced in this analysis mostly to remove important variation between respondents so the net effect of local context is visible; however, how these contextual factors influence fertility according to the educational attainment of women is also observed. Educational level is constructed in this study as either a low, middle or high level. Low includes those who did not complete secondary education, even if they took some vocational courses. Middle level educational attainment means that respondents completed secondary education and may have also received technical training. Those who have a high educational attainment received an undergraduate or graduate degree from an institute, university, or academy.

Labor force participation and occupational class is also included in the model to capture commitment to and success in the labor market as well as a measure of potential resources. Women are classified as either being unemployed, not participating in the labor market or working in paid employment, the latter being divided into occupational classes. Following other research on occupational class in Russia (Gerber & Hout 2004), I use the Erikson-Goldthorpe-Portocarero (EGP) and, specifically, the European Socioeconomic Classification (SeC) to construct occupational class. The bottom class (SeC1) is comprised of manual and routine workers, including agricultural or unqualified workers; SeC2 is comprised of low to mid-grade workers, including qualified workers and employees who perform relatively simple tasks; SeC3 is comprised of intermediate level employees, including foremen, team leaders and highly qualified workers; SeC4 is comprised of the Salariat, or professionals.

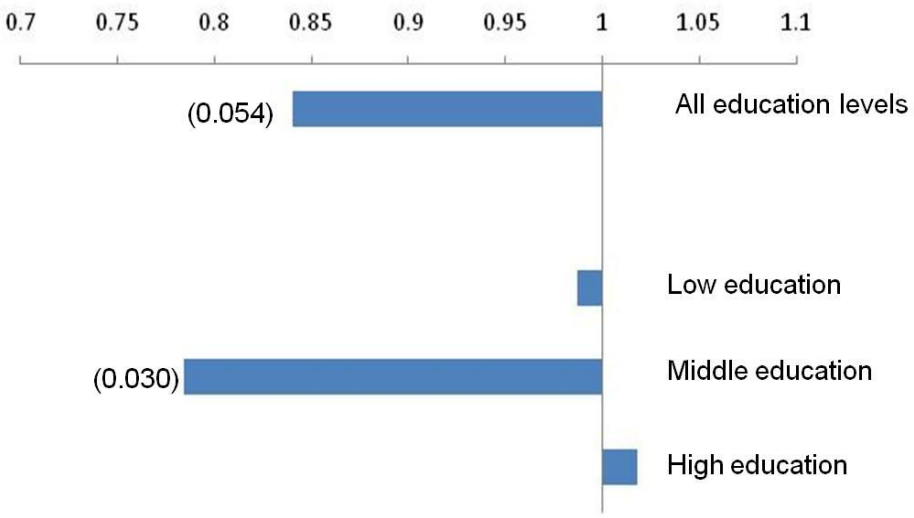
Other characteristics that are controlled for in the model are the following: A dummy variable reflects whether the survey took place in St. Petersburg or Moscow since the response rate was so low in these cities (14%) that selection into the survey may introduce bias. Also included are the number of siblings the respondent has, whether the respondent was born in an urban or rural location, whether the respondent is in a co-residential union (cohabiting or married), age at the time of the first birth, and time since the first birth occurred.

III. Results

The first result to be discussed is the impact of being in a red belt region on the second birth transition. Figure 11 displays first the relative risk of red belt membership for women of all education groups; living in a red belt region reduces the risk of second births by around 15%. This result is not strongly

statistically significant, however. In order to see if there is one education group that is driving the relationship or whether one education group is obscuring the effect for another, the impact of red belt membership is observed within education groups. Educational level appears to matter greatly to whether living in this region has an effect; women with middle level education—they completed secondary education and perhaps some technical training as well—are significantly less likely to have a second child, or more likely to postpone this birth, than women not living in red belt regions. Women with low education are also less likely, but this finding is not statistically significant. Red belt membership is associated with an increase in second birth risks for highly educated women; however, this relationship is also not statistically significant.

Figure 11. Second birth relative risks of the impact of living in a red belt region



Note: model controls for time since first birth, age at first birth, whether respondent was surveyed in St. Pet. or Moscow, missing categories, siblings, urban/rural birth, union status, educational status and attainment, and occupational class. Statistical significance: P>|z| in parentheses.

The next results are shown in Table 1, in which regional-level political, economic and social covariates are introduced independently into the model to observe whether the effect of red belt membership remains and whether these factors are relevant to systematic variation in fertility behavior. The first indicator introduced was the share of the population within each region that voted for the Communist Party in 1996 and 2000. As evident, red belt membership becomes even more important in the strength of its effect and statistical significance when political preferences are included. These

women are now about 30% less likely to transition to having a second child. In contrast, as the share of votes for the Communist Party increases across regions, the intensity of second birth events increases. Therefore, the characteristic that appeared to be most important to red belt identity appears to have the opposite effect of being in the red belt. Political ideology and red belt membership are highly correlated (0.53 correlation coefficient), which might be problematic in the model; when removing red belt membership from the model to remove this potential issue, however, the parameter estimate for the share that voted Communist is still positive. This finding implies that there is an effect of living in the red belt regions that goes beyond political preferences or ideology.

The other indicator that is strongly linked to the red belt region in the literature, although not necessarily in this study's descriptive analyses, is inflation. Including inflation in the model does not greatly alter the effect of red belt membership as the effect remains statistically significant and similar to that in the baseline model. The effect of inflation is positive, which is a quite unexpected result. Moreover, this finding is quite robust to alternative specifications of the model; controlling for regional effects should remove any influence of other conditions that might be associated with the varying inflation levels, but inflation remains positive and statistically significant in this re-specified model as well. When clustering on region, which should affect the standard errors if observations within the region are not dependent, the results also do not change.[4] Another sensitivity check of these findings was to start the window of observation in 1994, removing 1992 and 1993 from the model in which inflation was extremely high. The positive relationship appeared in these models as well.

The next regional-level variable to be introduced into the baseline model is the share of households that did not receive the child benefits they were supposed to receive each year. As benefit arrears or non-payment increased over time and across regions, women are more likely to postpone having a second birth or not have one at all. Controlling for this important regional variation does not neutralize the association between living in a red belt region and second birth risks.

The attitudinal variables, on the other hand, do render the effect of red belt membership statistically insignificant as well as slightly reduce the size of its negative effect. The direction of the attitudinal effects, however, are in opposite directions. When the share of people in a region agree that it is bad for a family if the wife works, women's second birth risks are lower. In contrast, when there is higher support for the breadwinner model, women's second birth risks are higher.

[4] Sensitivity checks for all the models included controlling for regional effects as well as clustering on region, which did not yield any important changes.

Table 1. Second birth relative risks for red belt membership and whether other covariates explain its effect

The effect of red belt membership on second birth risks for women 1991-2004

	Base model	Political ideology controlled	Inflation controlled	Benefits controlled*	Attitudes (wife works) controlled	Attitudes (brdwnr) controlled
Red belt	**0.84 +**	**0.712 ****	**0.813 ***	**0.788 ***	**0.865**	**0.868**
% voted for the Communist party		**1.018 ****				
Inflation			**1.0001 ***			
% did not receive child benefits				**0.996 +**		
% agree it is bad for family if wife works					**0.986 ***	
% agree with breadwinner model						**1.014 ****

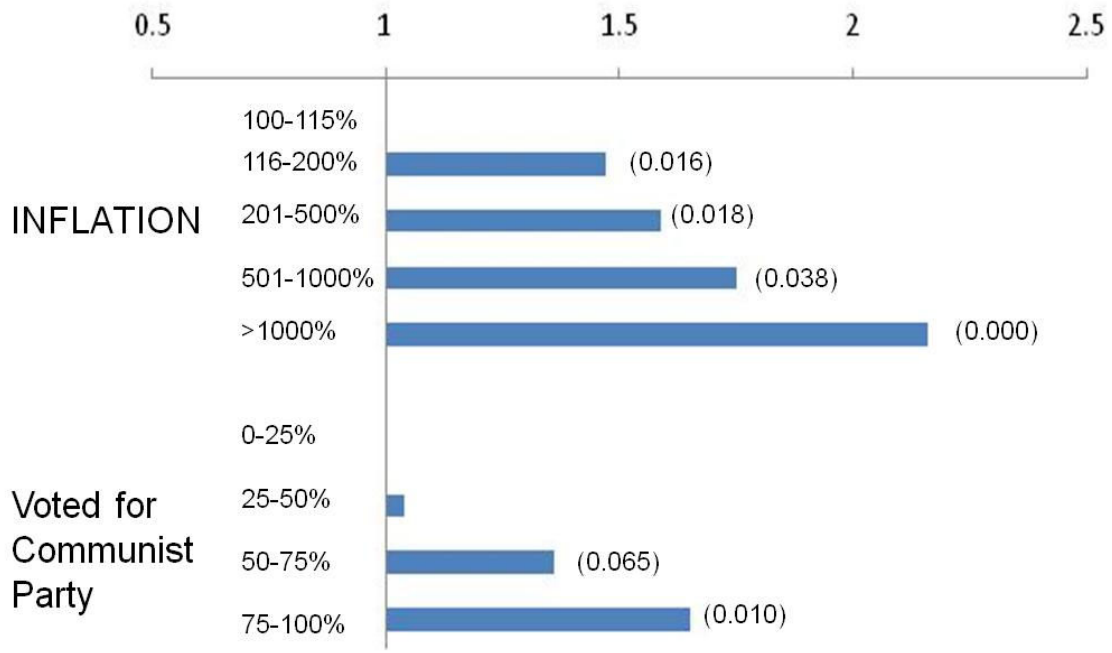
Note: model controls for time since first birth, age at first birth, whether respondent was surveyed in St. Pet. or Moscow, missing categories, siblings, urban/rural birth, union status, educational status and attainment, and occupational class. Statistical significance: + 10% level, * 5% level, ** 1% level.

In the previous models, the regional-level covariates were introduced as continuous variables, which assumes a linear relationship with childbearing risks. This may not be the case, however, for all these indicators. Therefore, the next figures depict effects that are allowed to vary over predetermined ranges of values. Quartiles are used for most of the percentages, however in the case of benefit non-receipt, quintiles appeared to better reflect the form of this relationship. In model specifications not shown here, the effects of these regional-level indicators were analyzed by education groups in order to observe whether the relationship varies over education groups or is being driven mostly by one education group's response to these indicators. The figures therefore reflect the non-linear relationship of the education group for which the impact of the contextual variable appears most important.

Figure 12 shows the two indicators that had a positive impact on fertility, controlling for red belt membership. Both of these indicators proved most important to women classified as having a middle education level. For inflation, the positive impact on second birth risks increases as prices increase. Compared to when and where the consumer price index (CPI) was 115% or less, middle-educated women were about 50% more likely to have a second child, or not postpone it, when the CPI was 116-

500%; about 75% more likely when the CPI was between 501-1000% and more than twice as likely when the CPI was over 1000%. The estimates for the share of people voting for the Communist Party increases monotonically as well, in which the risk is higher for each quartile. When a region is in the top 25% of the distribution, middle-educated women are at a 50% higher risk of second birth than middle-educated women in the bottom 25% of the distribution.

Figure 12. Second birth relative risks for middle educated women: The effect of inflation and Communist Party support

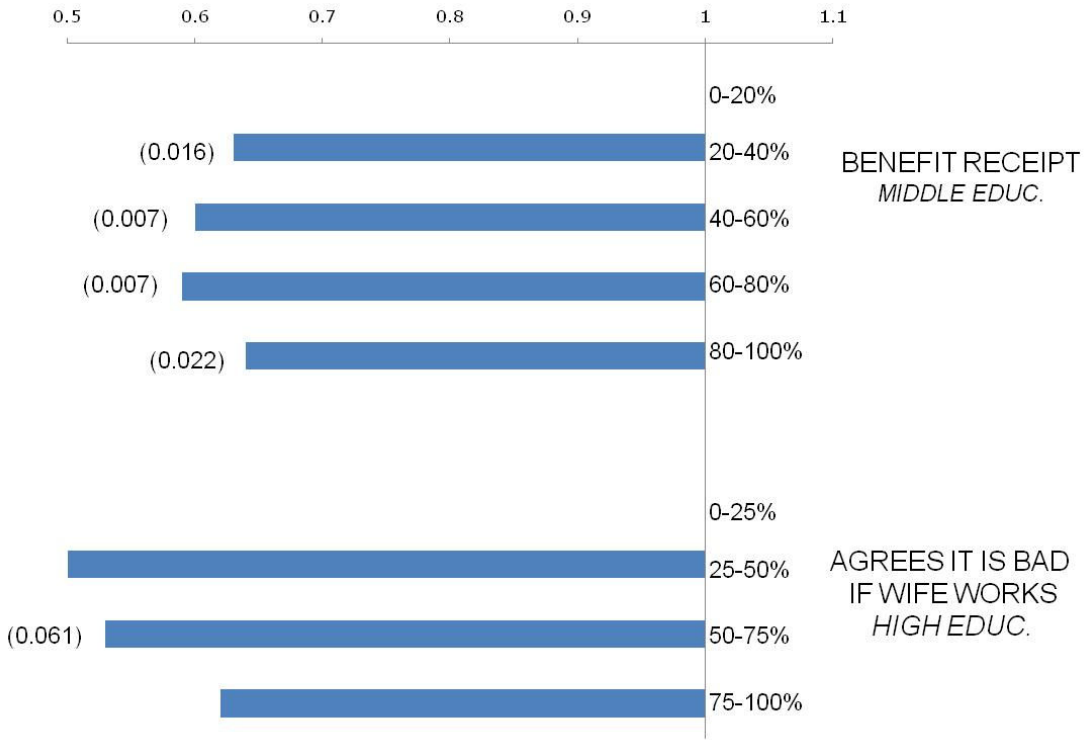


Note: model controls for time since first birth, age at first birth, whether respondent was surveyed in St. Pet. or Moscow, red belt membership, missing categories, siblings, urban/rural birth, union status, educational status and attainment, and occupational class. Statistical significance: P>|z| in parentheses.

The next results discussed are those that have a suppressing effect on second birth transitions. Figure 13 first displays the relative risks for the non-linear effect of child benefit arrears or non-payment for women with a middle educational level. Across all quintiles, the effect of non-receipt is around a 40% decrease in the relative risk of second birth. The second group of results in the figure is for the impact of the share agreeing it is bad for a family if the wife works. The impact of this attitudinal measure was most pronounced for women with the highest level of education and the results shown are for this group. Interestingly, the effect of this attitude is most visible when comparing intensities of women in

regions with the lowest share of people in agreement with this statement and the next quartile; these highly educated women had a 50% lower second birth risk. Because the effect of the breadwinner attitude measure appeared to be better estimated as a continuous variable and not driven by any particular educational group, further estimates for this indicator are not shown.

Figure 13. Second birth relative risks for the effect of benefit non-receipt on middle educated women and attitude on high educated women



Note: model controls for time since first birth, age at first birth, whether respondent was surveyed in St. Pet. or Moscow, red belt membership, missing categories, siblings, urban/rural birth, union status, educational status and attainment, and occupational class. Statistical significance: P>|z| in parentheses.

In regards to the time-varying contextual indicators, it is possible that a strong time trend could obscure variation among the regions and that correlations may override actual effects. For example, although there was regional variation in inflation, the variation over time was far greater and the highest peaks in the price index occurred when the fertility decline was just getting underway. For this reason, the time varying regional indicators were de-trended by using the average value of the indicator for each region and dummies for each year were entered into the model. Table 2 displays the relative risks for the three previously time-varying covariates: votes for the Communist Party, inflation and non-

receipt of benefits. Remarkably, the positive inflation effect remains. The negative effect for arrears or non-payment of benefits remains as well and appears to be even stronger when averaged and year effects are held constant. The effect of political preferences was not robust since it loses statistical significance, but the effect remained positive.

Table 2. Second birth relative risks for previously time-varying covariates, excluding a time effect

	De-trended relative risks
% voted for the Communist party	1.013
Inflation	1.003 ***
% did not receive child benefits	0.981 ***

Note: model controls for time since first birth, age at first birth, whether respondent was surveyed in St. Pet. or Moscow, red belt membership, missing categories, siblings, urban/rural birth, union status, educational status and attainment, occupational class, and year dummies. Statistical significance: *** 0.1% level.

IV. Discussion and conclusions

This study investigated whether regional variation in social, political and economic factors across Russia are able to partially explain the loss of the two child family norm in Russia. Event history models were employed and, net of all other personal characteristics, regional variation in many contextual conditions does appear to have played a role in suppressing or supporting the birth of a second child or having a second child sooner. The paper first looked at whether a regional distinction made in the literature called the red belt captures differences in fertility behavior. The red belt region has been argued to encompass those areas in Russia in which economic transformations were delayed due to local governance as well as areas in which loyalty to Communism persisted well into the 1990s, at least. These conditions offer a sort of natural experiment in the sense that they provide variation in the speed and extent of reforms. However, many pathways through which red belt membership may affect fertility exist and this study therefore has taken an exploratory approach.

The results suggest that second births were postponed or less likely in the red belt region. This result appears to be driven by middle educated women, or those who completed at least secondary education but did not complete university education. This group of women is the most numerous,

lending this result particular significance but also implying that parameter estimates for other groups may not be as stable due to smaller sample sizes. The finding that second birth risks were lower in red belt regions is intriguing; but exactly what it means to be part of the red belt is not altogether clear since it may reflect a division along economic, political or social lines or perhaps all three. Attempts to explain away this effect by directly controlling for some of these factors proved only partially successful in this study. Moreover, some unexpected relationships emerged that require further analysis.

First, despite the obvious expectation that party preference and red belt membership should operate similarly, the results suggest that stronger local Communist Party support is associated with a higher risk of second birth rather than a lower risk—as in the red belt membership/fertility association. While plausible hypotheses exist to support both of these relationships, the relationship between inflation and fertility is much less intuitive and more difficult to interpret. Increases in the consumer price index are strongly associated with a higher risk of second birth and this finding was robust to many different model specifications. This relationship requires further consideration as no theory exists that would justify a positive relationship between inflation and fertility. The first logical question is whether price increases accurately represent differences in living standards and the cost of childbearing. Gibson et al.'s (2008) research on whether the consumer price index is a suitable measure of living standard indicates that it actually is not a good measure and does not explain durables, home production or subjective well-being. This partially explains why Stillman and Thomas (2004) did not find nutritional instability in Russia according to economic shocks. Gibson et al. claim that large price shocks cause consumers to substitute goods and this offset the decline in living standards that we would associate with inflation. The commodity substitution bias alone is estimated to overstate the CPI rise by 35%, but they argue that the bias falls in the later 1990s. While this research may explain why a negative relationship between inflation and fertility was not found, it does not explain why a positive relationship emerged. The relationship may in fact be spurious and future developments in this study will focus on possible omitted regional factors.

Another robust finding was that second births were delayed or foregone in regions that did not pay the child benefits that households were supposed to receive. This finding was robust to models that remove time effects and was particularly strong for women with middle education level. There is some indication that the poorest households were the ones that were officially to be helped by these benefits as well as indication that benefits were actually more likely to be received by those better off. Perhaps this left the middle educated group of women the least likely to receive their benefits, but more

research needs to be conducted to understand this interplay between non-receipt rates and educational level. The effect of non-receipt is entirely as expected since not receiving benefits that mothers counted on for the first child would intuitively make them feel less supported as they had expected to be and may have increased feelings of uncertainty over future levels of support by the state as well as jeopardized the household budget during difficult economic times.

Finally, the two attitudinal measures that were introduced to represent local attitudes toward women, work and gender roles picked up two different relationships. These opposite findings are confirmation that the two attitudinal measures represent different things. First, areas in which it was more common to believe it is bad for a family if the wife works appear to be areas in which second births are suppressed. This association can be interpreted as perhaps reflecting the reluctance of women to have another child if they would be perceived or they themselves believe it cannot be combined with work. Considering the legacy of high female labor force participation as well as the increased need for two incomes during the transition from communism, which implies that women will be participating in paid work, this result is not surprising. Moreover, this was particularly true for highly educated women, who we would expect to be particularly committed to labor force participation.

On the other hand, local support of the breadwinner model appears to encourage second birth risks. Although this indicator may at first appear similar to the other attitudinal measure, it is likely that it more reflects feelings toward traditional gender roles and perhaps more traditional ideas of the family, which would include a desire for more children. At least we can assume that women in these areas are more likely to receive social rewards or support when they perform their role as a mother (van der Lippe 1994).

These are the first results in an exploratory analysis of regional level variation and how it impacts second birth risks, which are the births that account for the greater part of the fertility decline in Russia. Future steps in this study are to improve the modeling by using multi-level models. However, the general findings are not expected to greatly change given their robustness to regional clustering as well as using regional fixed effects. Additionally, a full set of economic variables at the regional level will be introduced in order to assess whether the positive effect of inflation is spurious.

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