Casualties of Turbulent Economic Transition

Premature Mortality and Foregone Fertility in the Post-Communist Countries

Sunnee Billingsley

TESI DOCTORAL UPF / 2009

DIRECTOR DE LA TESI

Dr. Gøsta Esping-Andersen (Department of Political and Social Sciences)

UNIVERSITAT POMPEU FABRA

Dipòsit Legal:
ISBN:

Acknowledgments

Mentorship during the process of writing this thesis has involved many scholars; however, there are three in particular that I feel fortunate to have had the pleasure of working with and that deserve special mention. First and foremost, my thesis advisor, Gøsta Esping-Andersen of UPF, was instrumental in the inception of this research project. In the process of guiding me through my graduate education he instilled in me a thriving interest in social demography, which ultimately was the frame through which I chose to study the post-communist transition. Through our many conversations, I became convinced that studying both fertility and mortality offered a more balanced and interesting contextualization of the transition. I thank him as well for the guidance that expanded my understanding of research methods and the need for methodological rigor, which continue to refine my work. I could not have asked for a better teacher of the pitfalls and possibilities of socioloiogcal research.

I also thank Jan Hoem for his commitment to my academic growth while I worked with him at MPIDR. His willingness and enthusiasm to answer my never-ending questions on fertility related literature and methods were tremendously helpful and played an instrumental role in the final analyses of this thesis. Moreover, a major part of my research would not have taken place if it were not for Jan's generosity with data. Finally, I thank him for his warm encouragement of my research.

The third mentor that critically shaped this thesis is Vladimir Shkolnikov. I thank him for all the stimulating discussions on the varying health and mortality perspectives in the post-communist literature. His staunch attention to research design and methods, as well as his personal knowledge of the context I studied proved immensely influential in my work. Finally, I thank him for his thought-provoking feedback and ideas for improvement, which greatly augmented my research.

During my years in Barcelona, I thank other researchers at UPF, including Javier Polavieja, Pau Baizán, M. José Gónzalez, Luis Ortíz, Sebastià Sarasa, Berkay Ozcan, Hande Inanc, Anna Garriga, and Vicente Navarro, as well as Pompeu Fabra University's Demosoc Working Group, Carme Borrell and Francesco Billari for stimulating conversations, feedback on my research and crucial support along the way.

While living in Rostock, I thank Gerda Neyer, Evgueni Andreev, Michelle Budig, and Karl Ulrich Mayer for their insightful feedback on my research. I must gratefully acknowledge the warm professional support and friendship given by David Alich, Sutay Yavuz, Elke Loichinger, Uta Ziegler, Harold Wilkoszewski, Brienna Perelli-Harris, Katherine Grace and Jude Mikal while I finished my thesis as well. I also thank Olga Grigorieva, Pavel Grigoriev, Aiva Jasilioniene and Domas Jasilionis for allowing me to pester them with a thousand questions related to life in a socialist environment as well as for countless evenings of good food and good company while we all lived in Rostock.

Finally, I doubt this thesis would have been written without the support, encouragement and strength provided by Alexandra Pittman. Not only do I thank her for reading every word I have written since I began this endeavor, but for keeping me believing in the project through every move (geographical and professional) that I made. Seeing my research through her eyes kept it fresh and exciting, as well as kept it grounded and on track.

All errors in this thesis are my own and do not reflect the contributions of any of these individuals.

Abstract

In this thesis, I analyze the contribution of the economic context to the fertility and mortality crises that took place across the former Soviet Union and Central and Eastern Europe during the transition from communism. At the macro-level, findings reflect a relationship between a negative economic context and stopping behavior of childbirth, whereas a positive economic context appears to encourage postponement of having a first child. Macro-economic conditions appear to be related to variations in mortality rates as well, particularly for the demographic group that drove the mortality crisis and the causes of death that have been linked to alcohol consumption. At the micro-level, evidence emerges in Russia that downward social mobility and unemployment were two experiences that particularly influenced early deaths and second birth risks. Both women and men were less likely to have a second child if they had experienced downward mobility after the first child was born. While excessive alcohol consumption and poor health did not predict downward social mobility or unemployment, the reverse relationship did appear in the findings.

Resum

En esta tesis, analizar la contribución del contexto económico de la fecundidad y la mortalidad de las crisis que tuvo lugar en la antigua Unión Soviética y Europa Central y Oriental durante la transición del comunismo. A nivel macro, los resultados reflejan una relación entre un contexto económico negativo y detener el comportamiento del parto, mientras que un contexto económico positivo parece fomentar el aplazamiento de tener un primer hijo. Condiciones macroeconómicas parecen estar relacionadas con variaciones en las tasas de mortalidad y, en particular para el grupo demográfico que llevó a la crisis de mortalidad y las causas de la muerte que se han vinculado al consumo de alcohol. A nivel micro, la evidencia que surge en Rusia la baja movilidad social y el desempleo son dos experiencias en particular que influyó en las muertes tempranas y el segundo nacimiento riesgos. Tanto hombres como mujeres tenían menos probabilidades de tener un segundo hijo si habían experimentado movilidad descendente después del primer hijo nació. Mientras que el consumo excesivo de alcohol y la mala salud no predicen la baja movilidad social o el desempleo, la relación inversa que aparecen en los resultados.

Preface

This thesis investigates the social impact of the economic, political and social transition that redefined the existence of 420 million[1] people in the post-communist region. This analysis comes 20 years after the Berlin Wall fell and scholars and laypeople alike began to contemplate the scope of what this meant. Even in 2009, there is arguably still a sense of ambiguity surrounding the outcomes of these profound socio-economic changes. Simply put, this thesis describes how the coinciding demographic crises may have been related to the less successful reforms. Specifically, I focus directly on how income loss, constraints and hardship led to fewer children being born per family and premature death of men and women in their later working years.

In order to achieve my research goals, I draw from a diverse range of macro and micro-level data that include the following. The macro-level data analyses use the European Health for All database (HFA-DB), Copenhagen, published by the WHO Regional Office for Europe, (http://www.euro.who.int/ hfadb) and the TransMONEE database, created by UNICEF Innocenti Research Centre, Florence. The micro-level data analyses use the Russian Generations and Gender Survey (GGS) and Employment and Education Survey (EES), which were conducted by the Independent Institute of Social Policy (Moscow) with the financial support of the Pension Fund of the Russian Federation and the Max-Planck-Gesellschaft, Germany. The design and standard survey instruments of the GGS and EES were adjusted to the Russian context by the Independent Institute of Social Policy (Moscow) and the Demoscope Independent Research Center (Moscow) in collaboration with the Max Planck Institute for Demographic Research (Rostock, Germany). Finally, I used the Russia Longitudinal Monitoring Survey (RLMS) Phase 2, funded by the USAID and NIH (R01-HD38700), Higher School of Economics and Pension Fund of Russia. The data was kindly provided by the Carolina Population Center and Russian Institute of Sociology.

Generous funding support from the Agència de Gestió d'Ajuts Universitaris i de Recerca (AGAUR) of Catalonia, Spain, through the Universitat Pompeu Fabra (UPF) facilitated the writing of this thesis. I am grateful as well to the Max Planck Institute for Demographic Research (MPIDR) for providing important financial and institutional support for later stages in the thesis development process as well as for providing access to the GGS and EES data. I am also grateful to the Deutscher Akademischer Austausch Dienst (DAAD), which supported a research visit to MPIDR. Finally, I thank the Social Science Research Council (SSRC) for investing in my research through the SSRC Eurasia Program/Princeton Dissertation Development Workshop.

[1] Milanovic (1998).

Table of Contents

List of figures

List of tables

1. ECONOMIC TRANSITION AND DEMOGRAPHY

1.1 Introduction

The fall of the Soviet Union initiated an era of unparalleled political and economic reform given the breadth, depth and speed of the changes. The social implications of such reform were profound and complex. The shift towards democracy and capitalism entailed greater personal freedom of thought, expression and lifestyles. The dismantling of the command economy allowed competition to flourish, thus improving productivity of the individual as well as the firm, which leads to real economic growth. Overall, individual well-being should have been enhanced through increased freedom and economic resources. However, in many countries that underwent market reform, the transition was accompanied by an economic crisis, which decreased well-being through material hardship and insecurity. Populations that had never dealt with extreme social risk suddenly found themselves unemployed, unpaid or unable to cope with inflation, while lacking a sufficient safety net and watching the "winners" of the transition achieve unprecedented wealth. Indeed, the increase in inequality during this time period was the largest and most accelerated ever recorded (Milanovic, 1998b). Undoubtedly, these complicated transformations greatly influenced the timing and occurrence of major life course events for the post-communist population.

This dramatic social change offers a unique opportunity to evaluate the demographic imprint of turbulent economic conditions, which is the primary focus of this dissertation. Changes in demographic trends offer insight into just how contextual factors affected individuals in the new post-communist regimes. Taking a life course perspective (Elder, 1974; Mayer, 2005), I address the impact of rapidly shifting opportunities and constraints in the social and economic spheres by looking at demographic changes across countries, within social groups and over time. The two life course events that focus this investigation are fertility and mortality.

In particular, early death and the choice to have more than one child are two life events that may be particularly malleable and, therefore, reflect broader social change. A rise in premature mortality indicates negative changes in the social environment (Sen 1998). On the other hand, while having a child may remain universal, dramatic declines in fertility may imply an inhospitable context for family expansion (Myrdal & Myrdal, 1934 in Gustafsson, 2002). But population dynamics are essential to study not only as indicators of social change, but because they themselves have a tremendous economic and social impact. Population ageing and depopulation are considered increasingly significant concerns globally (UN Population Division, 2006), as their future economic implications are grave. Taking these motivations together, as with Mayer's (2006) thematic focus on life course changes in the former East Germany, the life course serves this thesis as a tool to understand systemic change as well as an object that reveals how systemic change impacted individuals.

Not only are these demographic outcomes particularly well-suited to a study of rapid social change and economic turbulence, as well as important to study in their own right, they reflect a central issue in the post-communist region since market reform began. Indeed, many countries of the former Eastern Bloc have experienced a two-fold demographic crisis. Mortality rates dramatically increased during the 1990s while fertility rates declined, frequently to levels far below population replacement. In Russia alone, it is estimated that the population is decreasing by 700,000 people per year (Leon, Saburova, & Tomkins, 2007). According to the Population Reference Bureau's 2007 World Population Data Sheet, not a single country in Central and Eastern Europe has a positive population growth rate. Outside the post-communist region, only three other countries in the world currently have a negative population growth rate. [2]

[2] These countries are Botswana, Swaziland and Germany. Of the formerly communist countries, only some countries in the Caucasus and Central Asia still have population growth rates that are positive.

In general, this dissertation's aim is to better understand whether these demographic changes are consequences of rapid social change and turbulent economic transitions. As intuitive as this connection may seem, the debates over the fertility and longevity decline in this region present competing explanations. Indeed, some scholars attribute the rising rates of mortality in post-communist countries to poor health behaviors, such as high alcohol consumption, that evolved under the Soviet regime and continue due to a legacy of health irresponsibility. The fertility decline has been explained as a result of the modernization of childbearing patterns, often described as the second demographic transition, in which women have responded to greater individual freedom to pursue increased options in life. In this thesis, I argue that these interpretations are insufficient and at odds with particular pieces of evidence. Furthermore, I propose that a new phenomenon within this region—downward social mobility—may have contributed to the decline in fertility and deterioration of health.

Downward social mobility is not linked to fertility behavior in mainstream fertility literature and its link to mortality is indirect in the epidemiological literature. In this dissertation, I present two unique arguments for how downward mobility fits within the two bodies of literature. I argue that downward mobility particularly mattered during transition because of two important aspects of the transition experience. The first to consider is that economic conditions deteriorated in relation to previously stable economic terrain. The second factor is that inequality grew, rendering class more salient and amplifying the importance of one's location in the class system. In the Soviet Union, where wage dispersion was low before the transition, class should have mattered less as a determinant of fertility or mortality. Recent research (Gerber & Hout, 2004) shows that in the years after the transition, class mobility has tightened up; there is less mobility now than before the transition. If wage dispersion has grown, then the differences between classes should have become more significant, and the difference in respective rewards increased. Downward social mobility likely began to imply lower living standards for a population that was unaccustomed to such risk. The rich literature on status attainment and social mobility may then be particularly relevant in this context of increasing variation in returns to class. Gerber and Hout also found that when mobility occurred during market reform, it was more likely to be downward. Taking these considerations as a starting point, this study brings together multiple strands of economic, sociology, epidemiology and demographic theory in an attempt to explore a new possible contributor to the widely debated demographic crisis in the post-communist countries.

The first step in this research agenda is to take a broad view and assess whether the general trends in fertility and mortality rates appear to be related to the economic context. Therefore, the first half of the dissertation establishes the linkages between changing mortality and fertility rates and macro-level changes. This step is accomplished using descriptive and statistical analysis of a cross-sectional time-series data set I created, covering 22 post-communist states from 1990-2003.[3] In chapters two and three, these analyses cast doubt on prominent explanations for the fertility and longevity decline, as well as provide evidence to justify the position of the dissertation: the turbulent economic context played a major role in the demographic crises. The second step is to shed light on the link between context and these demographic shifts and gain a better understanding of how the transition and crisis impacted health and fertility decisions. Specifically, this step involves analyzing the impact of downward social mobility using Russian data collected from retrospective and panel surveys.

[3] These countries include Armenia, Azerbaijan, Belarus, Bulgaria, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyz Republic, Latvia, Lithuania, Moldova, Poland, Romania, Russia, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan. In the regression analyses, restricted samples are used for reasons discussed later. Throughout the entire chapter, countries of the former Yugoslavia (excluding Slovenia) and Albania are not discussed due to missing data; nor is the former East Germany included for reasons also discussed later.

In addition to these theoretical contributions, my dissertation addresses three key methodological issues. First, I reaffirm the importance of complementing micro-data analyses with macro-data analyses, which is particularly important during times of tremendous social change. Explanations that do not fit the social context may be called into question using aggregate analyses, regardless of symptoms that appear at the micro-level. Tension between macro and micro findings may serve to push the debate further as it invites deeper evaluation of methods and interpretations. Second, when the data allows, I study demographic changes within subgroups of individuals over time rather than the more common strategy of comparing individuals across different subgroups using only a few years of micro-level data. This methodological distinction has the impact of validating macro findings in this study and casting doubt on previous micro-data findings because it more accurately uses longitudinal methods to address the causes of changes in rates.

Finally, I pay special attention to how gender interacts with causal mechanisms, which carries important implications for the debates at hand. While men bore the brunt of the mortality crisis, and women are the most important unit of analysis in studying fertility, these two phenomena provide an interesting gendered response to turbulent economic conditions. But both men and women are studied in both the mortality and fertility analyses of this dissertation. I adopted this strategy because not only was there an important increase in women's mortality rates as well as men's, but also because men are important in the decision-making process to have another child as well. Moreover, comparing the relationships that emerge for men and women may provide extra information that is useful for interpreting results. For example, we may see a relationship between downward mobility and fertility as not just a selection mechanism in women if the relationship is similar for men and women. Through these strategic choices, my research yields results that challenge certain explanation in the debate, and suggests a need to transcend the current approaches in the literature on the post-communist demographic crises.

While this thesis does not bind changes in mortality and fertility rates together through a causal relationship, nor through an identical causal pathway, studying both demographic phenomena simultaneously situates them within a shared context. So although not directly related, the dual changes lend contextual nuance to the studies of both when considered together. This becomes particularly clear in chapter two in which I discuss the plausibility of major explanations for the fertility decline. However, if relationships emerge in which both mortality and fertility are affected by economic loss or uncertainty, then we can assume that both fertility and mortality may be driven by factors that are interrelated. In other words, the demographic crisis may be endogenously embedded within the reaction to transition and crisis. For example, given the high importance of alcohol consumption to the mortality crisis, it may be that this increased risk-behavior also mediated the impact of economic conditions on the desire to have more children. Although this thesis does not directly connect these outcome variables to each other on the basis of this pathway, finding that the same economic conditions impacted both outcomes implies an endogenous story.

Despite the symmetry that emerges throughout this thesis, in regards to structure and similar analyses at different analytical levels, the mortality and fertility studies are designed according to the literature surrounding each dependent variable as well as tailored to make the most of each respective data source.[4] Whereas social stratification and inequality are major themes of the individual-level studies, reliable and complete inequality indicators do not exist at the aggregate level for the range of countries and years studied in the first half of this thesis. Likewise, the way in which downward social mobility is constructed reflects the questionnaires on which the data is based, as well as idiosyncrasies of the fertility and mortality literature. Finally, even though all analyses are longitudinal, the time periods covered vary according to

[4] Four datasets are used in this thesis, which will be described in more detail in the chapter summaries and within the chapters.

the data as well. While a retrospective questionnaire covers years preceding the fall of the Soviet Union in the Russian fertility study, the Russian mortality study begins during market reform.

The remaining sections of this introduction are as follows: In the next section, I broadly introduce the transition from communism across the entire region in terms of contextual changes that may be related to either health or fertility. In the following sections, I discuss the general fertility and mortality literature and trends across the region as well as chapters two and three in which I conduct analyses of these trends. This completes the introduction to the first half of the dissertation, which takes a broad view of the entire post-communist region. The second half of the dissertation focuses on one country in order to analyze the impact of the transition at the individual level and gain a better understanding of the causal mechanisms at work. Therefore, the next section introduces Russia as a case study. The final sections introduce chapters four and five in which I analyze the influence of downward social mobility on second birth events and mortality with survey data.

1.2 The general post-communist context

The two dueling perspectives of the benefits and consequences of market reform that were previously referenced can be discerned in discussions on the transition from communism, both of which may be correct depending on the national context in mind. Certainly, the more successful and less traumatic transitions have increased the well-being of individuals living in those areas, whereas the transitions that were accompanied by crisis generated mixed conditions in which there were periods of severe economic instability and uncertainty. Difficult transitions were not the exception across the post-communist countries, however great variation does exist in terms of the depth of reforms as well as their success. Therefore, one can hardly speak of the effects of "transition" itself, or the benefits of capitalism versus communism; rather, one must refer to what type of transition a country experienced. Given this starting point and the diversity of transition experiences, we should expect variation in economic indicators, demographic outcomes as well as the explanations underlying demographic change. As such, this section offers a brief summary of initial conditions and divergent pathways of the countries under analysis.

Nicholas Barr (2001, p.170), in his exploration of welfare state reform in the post-communist countries, summarizes five stylized facts that describe the old order: workers all received the same, low wage; these wages were supplemented with universal benefits; work was guaranteed; resources were allocated by central planning; and the government was totalitarian. After 1989 in Central and Eastern Europe (CEE) and 1991 in the former Soviet Union (FSU), most of these countries implemented reforms that significantly altered their social, political and economic institutions. Depending on the degree and speed to which privatization and restructuring occurred, either employment and wages fell, or employment levels were kept stable while wages plummeted even further. Besides the drastically reduced value of wages, payments were not always paid in full or on time (Gimpelson, 2001). Since jobs were becoming scarce and some social benefits were still attached to many jobs, employees often continued their work despite wage arrears (Blanchard, 1997).

Not only was the macro-environment unstable, breeding uncertainty, but for the first time in the collective memory of individuals across the region, severe poverty engulfed millions (World Bank, 2000; Klugman, Micklewright, & Redmond, 2002). Due to the remarkable comparability between Russia's and Poland's decline in GDP to that of Germany and the US in 1927-1935, Milanovic (1998b, p.23) terms this era the "Post-communist Great Depression". The World Bank (2000) describes poverty rates across the region for the late 1990s, using two-thirds of the median expenditure by household as a measure of poverty. Poverty rates reached 18.4% in Central Europe, 22.2% in the Baltic states, 25% in the Western CIS (Commonwealth of

Independent States), 27% in the Caucasus, and 28.4% in Central Asia. These estimates are low according to Klugman et al. (2002). However, poverty rates were not negligible in the Soviet Union and tremendous variation existed among the satellite states as well as the republics of the Soviet Union. Atkinson and Micklewright (1992) estimate that Estonia had the lowest percent of population (1.9%) with per capita monthly income below 75 rubles in 1989 of USSR republics, while Tajikistan had the highest (51.2%). Except Azerbaijan, Kyrgyzstan, Turkmenistan, Uzbekistan and Tajikistan, however, the percent living in poverty in all other republics did not exceed 16%.

Simultaneously, income inequality grew, but to different degrees: the average Gini coefficient in the Commonwealth of Independent States (CIS) rose from 0.26 in the late 1980s to 0.43 in the late 1990s, whereas in CEE the change was from 0.25 to 0.30 (UNICEF, 2001).

In the midst of these changes, inflation—and hyperinflation in many countries—occurred. Changes in the consumer price index reveal that almost all of the FSU countries' annual price indexes increased >1000% during the 1990s (TransMonee database). Only Czech Republic, Hungary, Poland, Slovakia and Slovenia avoided inflation in the triple digits.

Another way of looking at the economic impact of the transition and the various levels of success is through changes in real total consumption expenditure (UNECE 2004) compared to 1989 levels. Figures 1.1-1.3 below chart the decline and recovery experienced across the region on different scales. The first group shows that until 1992, all of these countries had lower consumption expenditure than before the transition and Hungary and Slovakia did not achieve previous levels until well into the 1990s. The second group of countries did not fare as well, where almost half of the ten countries still have not achieved pre-transition levels. In Figure 1.2, the scale is adjusted to fit those countries, due to much greater falls in consumption expenditure and because Estonia recovered even beyond Poland, the best case in the first group. Figure 1.3 displays an even more serious drop in consumption expenditure for a third group of countries and a more modest recovery by those countries that appear to have recovered.

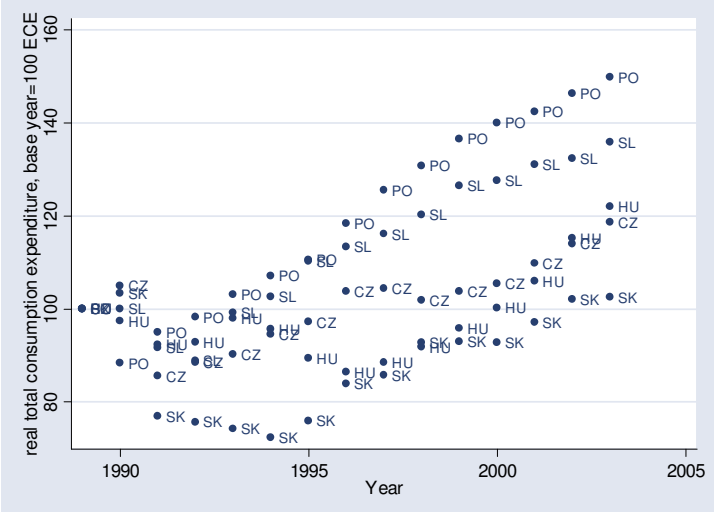


Figure 1.1 Real total consumption expenditure, first group.
Source: Data taken from UN ECE (2004). Countries include Czech Republic, Hungary, Poland, Slovakia and Slovenia.

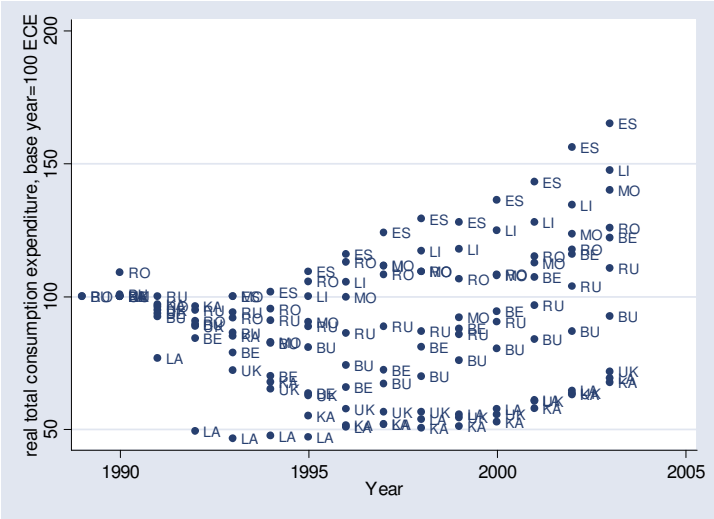


Figure 1.2 Real total consumption expenditure, second group
Source: Data taken from UN ECE (2004). Countries include Belarus, Bulgaria, Estonia, Kazakhstan, Latvia, Lithuania, Moldova, Romania, Russia and Ukraine.

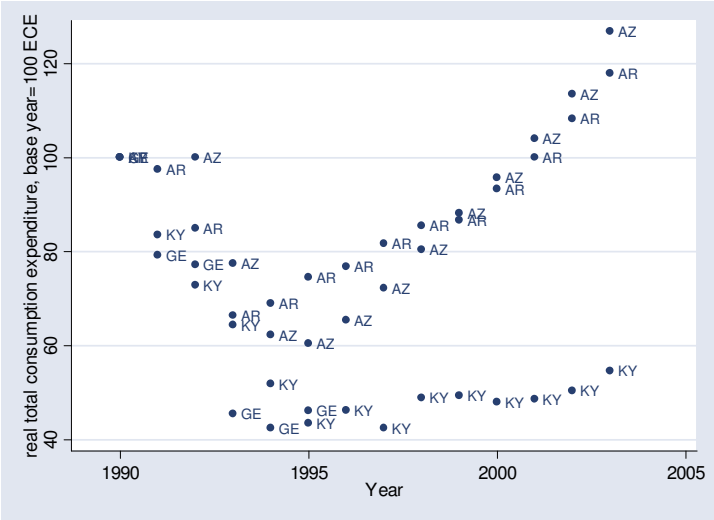


Figure 1.3 Real total consumption expenditure, third group
Source: Data taken from UN ECE (2004). Countries include Armenia, Azerbaijan, Georgia and Kyrgyzstan.

These figures demonstrate wide variation in the extent and longevity of economic collapse. Moreover, they indicate that this variation roughly coincides with geography; the further east the country, the more likely the transition was accompanied by severe reductions in consumption expenditure.

Further exacerbating the economic crisis were cuts in social spending across many post-communist countries. Health care coverage was universal during the Soviet Union (Frejka 2008). Although there does not appear to have been major health care policy reform in the early 1990s across the region, a decline in state spending on health care occurred for many countries, despite the growing health crisis. Examining changes in different types of public expenditure, similar downward slopes emerge. Particularly, the slope of changes in public health care expenditure closely mirrors the slope of changes in education expenditure[5] (TransMonee

[5] Figures excluded due to reasons of space, but available upon request.

database). It is within reason to believe that the general level of social expenditures, and therefore benefits, are reflected in the continued commitment to public health care or the cutting of its budget. It is not difficult to imagine that reduced social protection for those in countries that cut expenditures contributed both to economic hardship and to the element of insecurity. Expenditure data comes with limitations, as we cannot say anything about how the money is spent or about the quality of the care; however, a simple scatterplot reveals a visible relationship between health care expenditure and mortality due to circulatory diseases (See Figure 1.4 below).

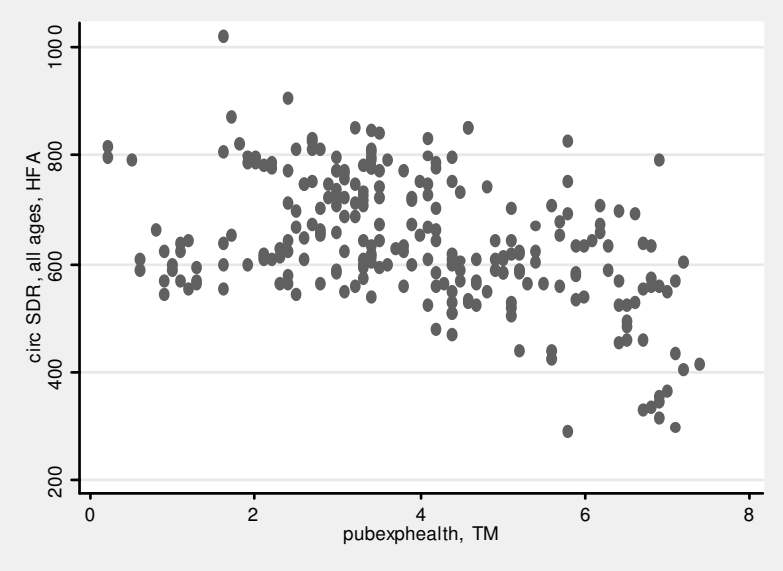


Figure 1.4 Health care expenditure and deaths due to circulatory diseases
Note: Author's own calculations based on data from the WHO-HFA database and TransMONEE database. X-Axis is public health expenditure as a per cent of GDP. Y-Axis is the standardized death rate of deaths due to circulatory causes for men and women of all ages. Sample includes all post-communist countries except East Germany, Albania and the former Yugoslavia for the years 1990-2003.

While the causes behind mortality increases are discussed at length in later chapters, the relationship that appears with health expenditure offers some indication that continued state social support may be relevant in this discussion. Suffice to say for now, that the causal mechanism behind health expenditure is difficult to identify. It may be that even though the leading causes of death were immediate in the mortality crisis, a better functioning health care system may have been able to save the lives of more people. For instance, in the Czech Republic, the number of cardio-surgery interventions almost quadrupled from 1989-1995, while the number of hospitals that actually perform these operations increased from five to nine (Blazek & Dzurova, 2000). This leads one to ask the counterfactual question of what the mortality rates would have looked like in the Czech Republic had health care expenditure per capita at PPP$ not increased from $550 in 1990 to $876 in 1995. Or we may ask what mortality would have looked like, especially for deaths due to circulatory diseases, if the CIS states as a group, on average, had not reduced expenditure from $187 in 1991 to $80 in 1995 (HFA database, 2005).

The loss of state and firm-sponsored family services (Fajth 1999), were also extensive, which may have particularly impacted women by increasing reconciliation difficulties of paid and unpaid work. Teplova (2007) describes in detail how the benefits associated with one's workplace—which she terms "microwelfare states"—including childcare facilities, schools, rest

houses, food provision and other amenities, increasingly disappeared once firms were forced to lower costs and increase productivity during the 1990s.

As for social support that would have directly relieved some of the consequences of transition, Milanovic (1998b) reports that governments responded with the creation of new transfers (unemployment benefits), while continuing old transfers (social assistance). While unemployment benefits generally were received by poorer households, the author found more inconsistency in the distribution of social assistance as well as increased mis-targeting of social assistance in many cases after transition began. He explains this finding with the difficulty in the region to target social assistance as well as such variation in the make-up of social assistance programs that comparisons across the region are difficult. Despite the undoubtedly crucial role the shift in provision of welfare from the state to the market and family played in demographic changes across the region, a full analysis of this factor is beyond the scope of this thesis. Therefore, an important omission of this thesis is a discussion on the impact of deteriorating state support to households during transition. Because there is extensive variation in levels of support not only among the countries but within each country over time, this aspect requires its own analysis.

Two more areas of general change across the region that are worth considering are educational attainment and labor force participation. Drawing on market transition theory (Nee 1989), we might have expected that when market forces took prominence, human capital investment increased since the returns to employment and competition for employment increased. Therefore, we would have expected widespread expansion of higher education. Yet, this shift is only partially observed across the region. Figures 1.5 and 1.6 present CEE and Baltic countries in which enrolment in higher education, as a percent of all 19-24 year olds, has increased substantially since the transition from communism.

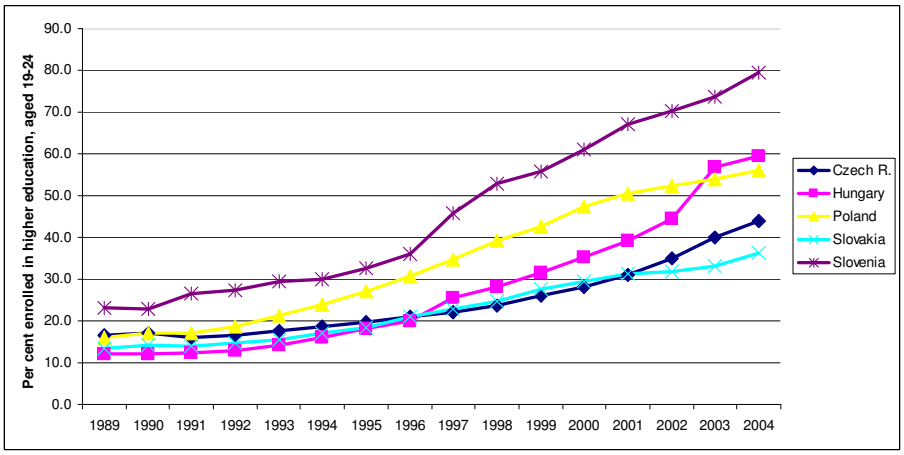


Figure 1.5 Tertiary education expansion for Czech Republic, Hungary, Poland, Slovakia and Slovenia
Source: TransMonee data

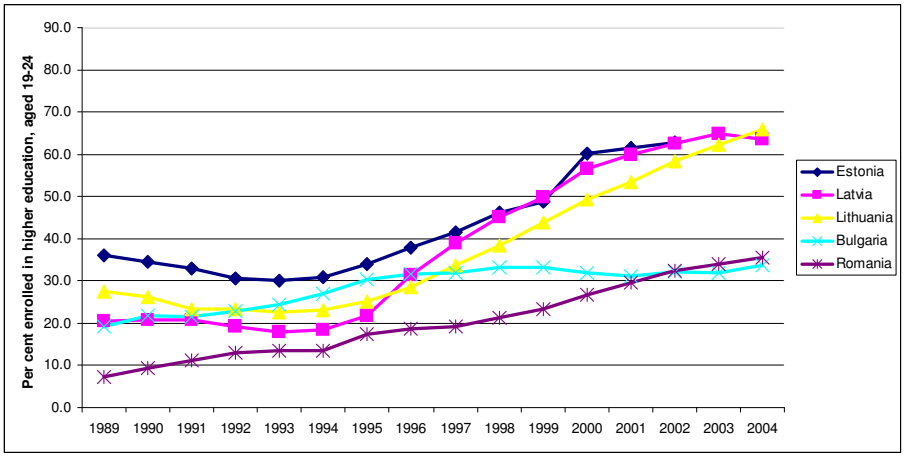


Figure 1.6 Tertiary education expansion for Estonia, Latvia, Lithuania, Bulgaria and Romania
Source: TransMonee data

However, greatly increased investment in human capital does not seem to characterize the remaining FSU countries. Although there was a general increase over time in the share of 19-24 year olds enrolled in higher education for most of the remaining countries (Figure 1.7), it was rather limited. Figure 1.8 highlights five countries where there was virtually no expansion of higher education. Although enrolment rates may indicate desire to invest in human capital, it may also be the case in some countries that economic crisis and difficult market reforms had consequences for the running of higher education institutions, reducing available places for students and quality.

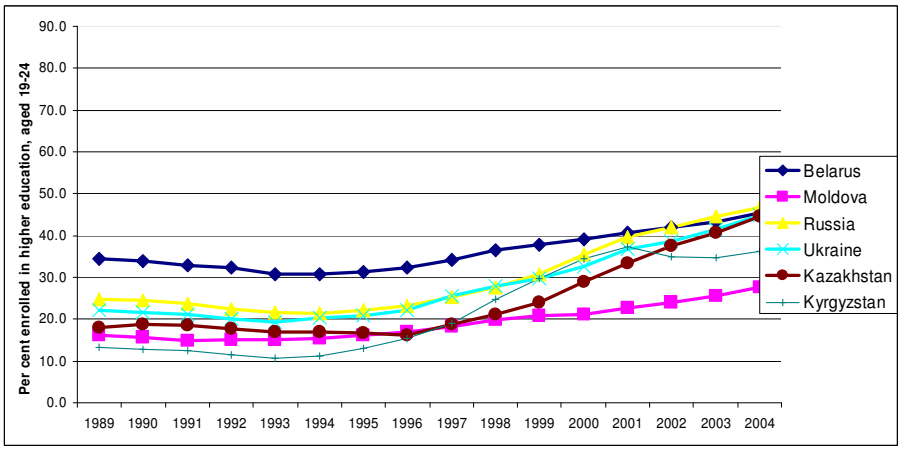


Figure 1.7 Tertiary education expansion for Belarus, Moldova, Russia, Ukraine, Kazakhstan and Kyrgyzstan. Source: TransMonee data

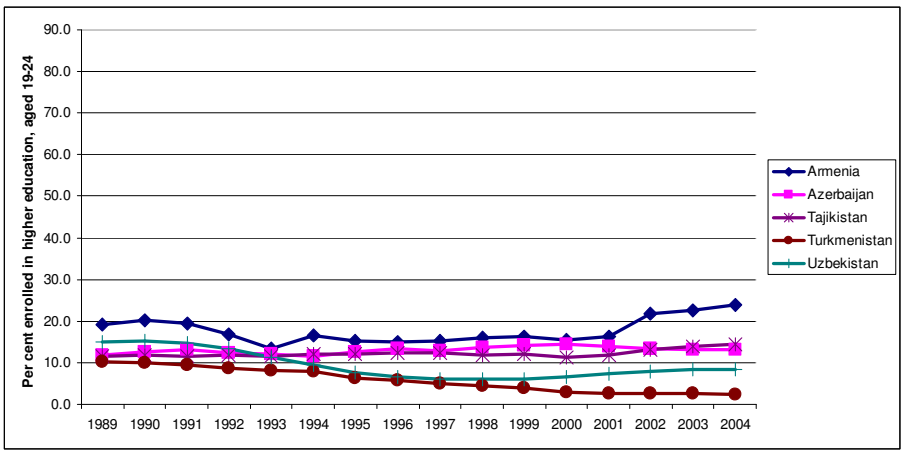


Figure 1.8 Tertiary education expansion for Armenia, Azerbaijan, Tajikistan, Turkmenistan, and Uzbekistan. Source: TransMonee data

Employment ratios depict a more uniform picture across the region. Except for the case of Azerbaijan, the number of people employed as a percent of all individuals 15-59 has declined since 1989. While all countries began market reform with between 70-90% of the working aged employed, by 2004 this percent ranged from 50-73% (TransMonee database). Disaggregating these figures to show unemployment rates and the share of the working-aged population that participated in the labor force is not possible for the countries and time period considered due to unavailable figures that are comparable. However, there is some evidence that women have increasingly left the labor force due to the lack of childcare facilities and a general ideological shift away from encouraging female labor force participation (Teplova, 2007).

1.3 Trends in fertility rates across the post-communist region

As of 2004, 15 FSU and CEE countries have entered lowest-low fertility at least once,[6] and all FSU and CEE countries have experienced a remarkable decline in fertility since the onset of transition from communism. To put the recent fertility changes in a historical context, Table 1.1 shows changes in total fertility rates (TFR) over the last decades. TFR almost halved during this time, with the majority of the decrease taking place after the end of the Soviet Union. What this table fails to convey is that many countries experienced small increases in TFR during the 1980s. This is thought to be due to pro-natalist policies and programs that were implemented during the 1980s to increase fertility (Zakharov & Ivanova, 1996; UN ECE, 2000). Before the transition from communism, family policies varied among the countries, but generally sought to ease the costs of childrearing through child allowances, provision of child care institutions, and subsidized costs of food and clothing for children; moreover, incentives such as preferential housing allotment were offered to young parents (Frejka, 2008). Despite institutional support for raising children, fertility hovered around replacement level over the last decades of state socialism since women were over-burdened with paid employment and unpaid household and caring work (Frejka, 2008; Zakharov, 2008).

The post-communist countries, in general, present a very different picture of family formation than other European countries during the decades before the fall of the Berlin Wall. While the TFR remained similar across Eastern and Western Europe, the age at entering marriage and having a first child increased across all Western European countries, whereas they generally stayed the same or even decreased in Eastern Europe. This divergence is explained by Zakharov (2008) as resulting from the sexual revolution on both sides, but the lack of contraceptives to prevent early pregnancies in the East.

[6] The classification of lowest-low fertility follows Kohler, Billari, & Ortega's (2002) definition, as any total fertility rate (TFR) below 1.3. TFR refers to the average number of children a woman would have, if she lives until the end of her childbearing years and fulfills childbearing according to the current age-specific birth rates.

Table 1.1 TFR from 1970 to 2000

Country	1970	1980	1990	2000
Armenia	3.2	2.3	2.6	1.1
Azerbaijan	4.7	3.2	2.6	1.9
Belarus	2.4	2.0	1.9	1.3
Bulgaria	2.2	2.0	1.7	1.3
Czech R.	1.9	2.1	1.9	1.3
Estonia	2.2	2.0	2.1	1.4
Georgia	2.6	2.3	2.2	1.5
Hungary	2.0	1.9	1.8	1.3
Kazakhstan	3.4	2.9	2.7	1.8
Kyrgyzstan	4.9	4.1	3.6	2.4
Latvia	1.9	2.0	2.0	1.2
Lithuania	2.4	2.0	2.0	1.4
Poland	2.2	2.3	2.0	1.3
Moldova	2.6	2.4	2.4	1.3
Romania	2.9	2.4	1.5	1.3
Russian	2.0	1.9	1.9	1.2
Slovakia	2.4	2.3	2.1	1.3
Slovenia	2.1	2.1	1.5	1.3
Tajikistan	5.9	5.6	5.1	3.1
Turkmenistan	6.0	4.9	4.2	2.3
Ukraine	2.1	2.0	1.9	1.2
Uzbekistan	5.7	4.8	4.1	2.6

Source: TransMonee 2006 Database, UNICEF IRC, Florence.,
and the Council of Europe's Demographic Yearbook 2003.

The driving force behind the fertility decline since 1990 remains debatable. To date, macro-level analyses offer evidence that worsening economic conditions contributed to the decline (e.g., UNECE, 2000; Cornia & Paniccià, 1998; Kohler & Kohler, 2002 macro-data analysis). However, some micro-level studies found no evidence in support of the economic crisis explanation (e.g., Kharkova & Andreev, 2000; Kohlman & Zuev, 2001; Kohler & Kohler, 2002 micro-data analysis). Other researchers have turned to demographic theory and argued that the decline is evidence of Lesthaeghe and van de Kaa's (1986) second demographic transition (SDT) (Zakharov & Ivanova, 1996; Vishnevskii, 1999), while others suggest that the presence of lowest-low fertility in the region can be called a "postponement transition" (Kohler et al., 2002).

In chapter two I further explore the debate over the conditions related to general fertility declines across the region. I then relate the explanations to variation in fertility behavior over time among these countries and assess to what degree three explanations are applicable: second demographic transition (SDT), postponement transition (PPT) or reaction to the economic crisis. The aim of the descriptive analysis in this chapter is to identify the countries and time periods in which the different explanations are appropriate. This spatial and temporal differentiation is delineated on the basis of multiple measures, which are contrasted and compared across the countries and years.

Moreover, I hypothesize that the economic context is linked to two different processes of fertility decline, conversely. Using a cross-sectional time-series data set constructed from aggregate measures, including age-specific fertility rates, postponement of childbearing indicators and economic variables, multiple methods are used to assess the disparate relationships over time in this country sample for economic conditions and childbearing or

postponement. The findings reflect multiple processes of fertility decline across the region, calling for different explanations for different countries at varying points of time. Moreover, the economic context is empirically demonstrated to be linked to two alternative processes of declining fertility: negative economic conditions inhibit live birth rates while positive economic conditions encourage postponement of childbearing.

1.4 Trends in mortality rates across the post-communist region

While all countries in the post-communist region experienced a decline in fertility, not all countries' mortality rates increased substantially. In fact, many of the CEE countries saw an increase in longevity after the transition commenced rather than a decline. Figure 1.9 depicts this divergence and shows how standardized mortality rates of the post-communist region compare to EU rates. In the early years of the transition alone, 3 million excess deaths have been estimated across the region (UNICEF, 1994; Cornia, 2000, p. 63).

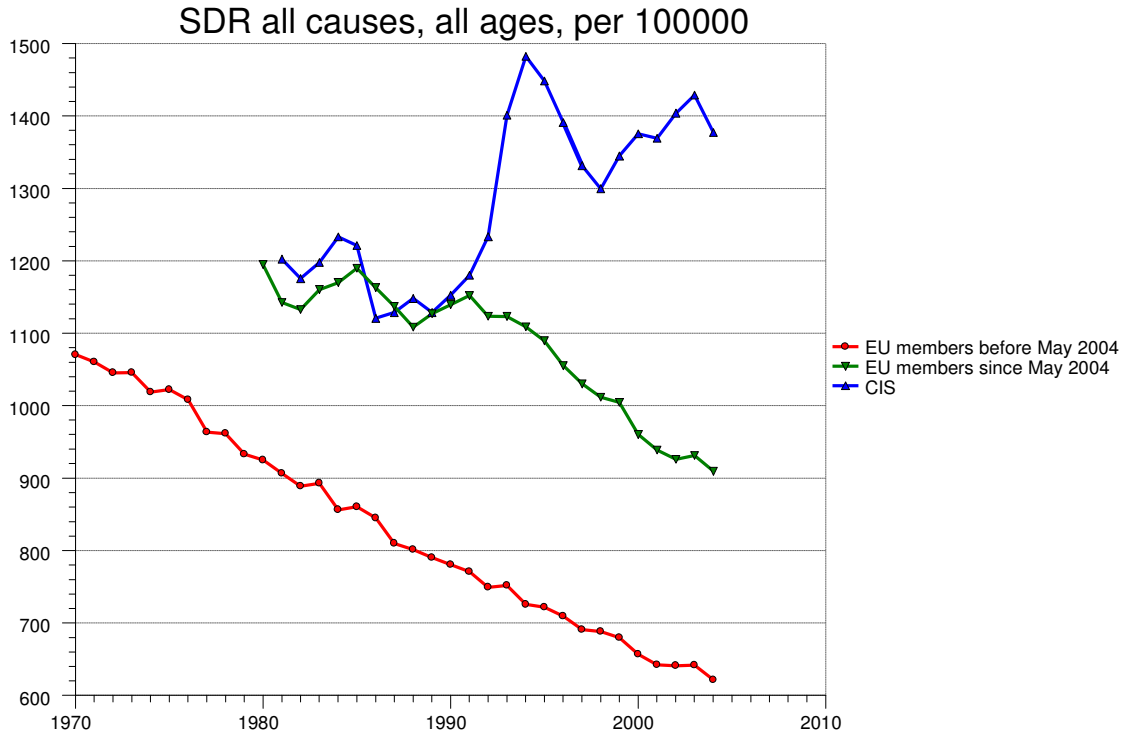


Figure 1.9 Standardized death rates of the EU and CIS. Source is WHO-HFA database. Note: Y-Axis represents standardized death rates (SDR) per 100,000. EU members since May 2004 include eight post-communist countries, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, and Slovenia, as well as Cyprus and Malta. The Commonwealth of Independent States (CIS) includes all other former Soviet Republics, including Russia, Belarus, Moldova, Ukraine, the Caucasus and Central Asian Republics. Romania and Bulgaria are not included in these summary statistics.

Much effort has been invested into unraveling the causes behind increased death rates in the FSU. What do we now know about the mortality crisis from the research? First, the mortality crisis was driven by the increase in deaths of working-age males; and second, excessive alcohol consumption, related directly and indirectly to cardiovascular disease and deaths due to external causes, was the leading cause of this increase in death rates (Shkolnikov, McKee, & Leon, 2001). These findings clearly address questions about the mortality crisis regarding *whom* and *how*, but ambiguity still remains as to *why* the mortality crisis occurred.

The debate over the causes of the mortality crisis in Russia has been limited in its capacity to disentangle contributing factors at the individual level, in contrast to macro-level factors, as few resources exist that offer detailed information about personal conditions before death occurred. After over a decade of scholarship on the subject, the debate revolves around two co-existing explanations:[7] Researchers have argued that 1) increased economic insecurity and hardship created psychosocial stress and led to poorer health and mortality (Cornia & Paniccià, 1998; Shkolnikov, Cornia, Leon, & Meslé, 1998; Leon & Shkolnikov, 1998; Vågero & Kislitsyna, 2005) and; 2) poor health behaviors inherited from lifestyles that were developed under the Soviet regime led to an increase in mortality (Cockerham 1999, 2000, 2006; Shkolnikov, Andreev, Leon, McKee, Meslé, & Vallin, 2004). As mentioned, alcohol consumption has particularly proven to be a major factor in increased death rates; Leon et al. (2007) estimate that almost half of all deaths can be attributed to hazardous drinking for working-aged men in their study on Izhevsk in Russia. Other epidemiological studies that have established the relationship between alcohol and mortality in Russia are the Novosibirsk cohort study (Malyutina, Bobak, Kurilovitch, et al., 2002) and a case-control study of working-aged men across the Udmurt Republic (Shkolnikov, Chervyakov, McKee, Leon, 2004).

The two explanations are not necessarily mutually exclusive; indeed, Brainerd and Cutler (2005), among others, found evidence that both stress and alcohol consumption contributed to higher mortality in men. However, Siegrist (2000) points out there has still been relatively little cross-fertilization of research on the two explanations. Difficulties in assessing the validity of the economic context and stress explanation at the micro level may have restricted efforts at empirically confirming the stress hypothesis, although many researchers acknowledge its plausibility. One epidemiological study of the city of Taganrog (Vågero & Kislitsyna, 2005) found a strong relationship between poverty, both present and past, and heart symptoms for both men and women. But findings that support the stress hypothesis have been called into question because of the possibility of endogeneity in the relationship between health and performance in the labor market, as well as poor health behavior and economic circumstances (Shkolnikov et al., 2004a).[8]

Chapter three enters this debate by reconfirming the importance of taking context into account when interpreting evidence related to the mortality crises. An in-depth discussion of the debate and interpretations of evidence highlights ambiguities and conflicts in the literature and proposes explicit reconciliation of the two major explanations. Descriptive evidence reveals three major differences across the post-communist region, within which economic contexts vary as well. As in chapter two, an aggregated data set is used to assess the relationship between macro-economic indicators and age-specific as well as cause-specific mortality rates using pooled cross-sectional time-series methods. As the male working-age population bore the brunt of economic transition and crisis, as well as the burden of extra deaths, the statistical relationships that emerge between economic indicators—wages, employment levels, GDP and inflation—and death rates of males 40-59 years old are particularly considered. Morever, the causes of death that have been linked to harmful alcohol consumption in the literature are also analyzed for their relationship to the economic context in an effort to establish the complementarity of the stress and alcohol related explanations. The results offer evidence that the economic conditions did particularly impact death rates of the most vulnerable population, as well as death rates that have been linked to alcohol consumption. Finally, the economic context appears to consistently absorb meaningful differences among the countries in mortality rates for men and women, various age groups and causes of death.

[7] See Stillman (2006) for an extensive review of explanations and research on mortality trends across the entire post-communist region.
[8] The issue of endogeneity is addressed in the micro-level analysis of chapter five.

1.5 Russia as a case study

In the remaining chapters, I narrow the discussion to Russia, which allows for a more fine-tuned assessment of how the economic context, and specifically downward social mobility, may have impacted fertility behavior and health. Russia is a unique and interesting case for analysis given the following reasons: 1) Russia has been in the spotlight for its dual demographic crises, more so than most other countries due to the extent of its crises as well as its geopolitical importance. 2) Moreover, demography has become a central political issue in Russia, manifested by Putin's Federal Assembly address in 2006 in which he listed the utmost national priorities as the reduction of mortality, increased migration flows to Russia and increased fertility (Zakharov, 2008). 3) Rich longitudinal and retrospective data exist for Russia, unlike other post-communist countries, which are essential for this research agenda. 4) The foundation for studying downward social mobility has already been established in Russia since the concept of social class has been implemented and validated in past research on the Soviet Union and Russia (Marshall, Sydorenko, & Roberts, 1995; Gerber & Hout, 2004). This past research essentially has paved the way for my research to apply the construct of downward social mobility to this context.

The first years of transition in Russia brought about rapid economic changes that increased the proportion of households living below the poverty line from 11% in 1992 to 36% in 1996,[9] while the ratio of income in the top 20% to the bottom 20% increased 68% (Zohoori, Mroz, Popkin, Glinskaya, Lokshin, et al., 1998). Milanovic (1998b) reports that, unlike the countries of the former Eastern Europe and the Baltic States, unemployment benefits were poorly targeted in Russia and were received more by better-off households than the poorest. The same finding applied to social assistance benefits.

As in all former Soviet Republics, Russia's educational legacy is one in which the state controlled who, how many, and what kind of education was achieved (Saar, 1997). This was considered one mechanism through which the state engendered equality and supplied the economic apparatus with workers of the exact skill composition that were considered necessary (Marshall et al., 1995). As seen in Figure 1.7 of section 1.2, enrolment in higher education stagnated and even declined slightly during the early years of transition in Russia. It was not until 1995, the first year of economic recovery, that enrolment rates increased. Gerber (2000) explains this early decline, which was driven by lower enrolment of men, as a response to economic crisis and the opportunity costs of remaining in school when inflation and economic instability increased the need for earnings, even through work in the informal economy. From 1995 to 2004, there has been a steady increase in enrolment rates, resulting in a doubling of the percentage enrolled and an overall increase of 24.4%.

Changes in the labor force have occurred as well. Using census and Labor Force Survey data, Katz (2001) calculates that labor force participation rates in Russia declined from approximately 85% of women aged 20-29 in 1989 to 68% in 1998, 95% of women aged 30-49 to 85%, and 82% to 75% of women aged 50-54.ILO data (Laborsta) show a marked drop in the rate of the economically active. In 1989, 77% of all men 15 years or older were economically active, whereas 61% of women were. A decade later, a 10% decline was evident for both men and women. The economically active share of the whole population has shown a steady, although modest, increase during the early 2000s, which is expected given the economic growth that occurred during this time period. Labor force survey data on unemployment show a steady increase from 1992-1999, in which the unemployment rate more than doubled (5.2-12.6%). Men's unemployment rates were slightly higher than women's throughout this increase, but both have declined similarly from 2000-2007.

[9] The percentage of individuals living under the poverty level varied from 45% of children aged 0-6 to 31% of pensioners (Zohoori et al. 1998).

To briefly introduce demographic change specifically in Russia, it is now renowned for the "Russian cross" (Korotayev & Khaltourina, 2008), in which falling fertility rates are crossed by rising mortality rates. This phenomenon stands outside predictions of demographic theory.

1.6 Fertility decline in Russia and downward social mobility

During the tumultuous transition from communism in Russia, the two-child family—which had been a well-established tradition in Russia (Zakharov & Ivanova, 1996)—became a norm of the past. Due to the increase in the fertility rate brought about by pronatalist policies in the 1980s[10], the initial decrease in the TFR that occurred in the early years of the transition has been argued to be a reaction to the changes in timing of births brought about by the end of these policies (Zakharov & Ivanova, 1996). But beyond these first years, fertility continued to decline beyond what can be explained by the loss of pronatalist policies (Philipov & Jasilioniene, 2007). The most pronounced changes were a reduction in the incidence of second births throughout the transition and a slight postponement of first births in the most recent years (Sobotka, 2002). In other words, the most remarkable difference between fertility behavior now and before transition is that fewer second children are being born.

The same general debate over how changing fertility behavior can be best explained, revolving around second demographic transition and economic context arguments, applies to the Russian case. However, as discussed in chapter two, the specific events that coincided with the dramatic declines in fertility point to the need for a context-appropriate explanation, related to the economic transition and crisis. Using micro-level data, there have been attempts to characterize the transition experience in other post-communist countries in terms of social anomie (Philipov, Spéder & Billari, 2006), social capital (Bühler & Philipov, 2005; Philipov, Spéder & Billari, 2006), and uncertainty (Bhaumik & Nugent, 2002; Kreyenfeld, 2005). In the case of Russia, Bühler (2004) found a positive relationship between extra sources of income or sustenance and second births. Perelli-Harris (2006) also found a positive relationship between informal work, subjective well-being and second/higher order births. Besides these attempts, which capture important aspects of managing economic transition and crisis, the three studies already mentioned (Kharkova & Andreev, 2000; Kohlman & Zuev, 2001; Kohler & Kohler, 2002) have attempted to address the straightforward impact of transition or crisis on fertility and did not find evidence of such a relationship.

A main focus of chapter four is to propose a new link establishing how economic transition and crisis impacted fertility behavior. The negative impact of the transition is characterized through downward social mobility. The theoretical foundation for linking downward social mobility to fertility is built upon Easterlin's (1976) hypothesis and research demonstrating that a conflict between aspirations developed over the past and current levels of resources suppress fertility.

Using Russian survey data (Generations and Gender Survey and the Employment and Education Survey), this chapter assesses whether downward social mobility (DSM), which has become more frequently experienced and meaningful in Russia, contributed to the dramatic decline in second births in the last decades. Using event history analysis, men and women are studied separately to assess the impact of 1) intergenerational DSM, measured through parents' occupational class and 2) intragenerational DSM, measured through over-education and changes in respondents' own occupational class.

Specifically, two main strategies are used to assess the importance of downward social mobility to fertility. First, I compare relative risks of second births to women and men who experienced

[10] In 1981, the 26th Congress of the Communist Party of the Soviet Union established a set of policies intended to increase the fertility rate. Zakharov (2008, p. 922) lists the most important of these as 1) extension of maternity leave, 2) two new types of child allowances, 3) changes in housing policies to benefit families with children, and 4) special privileges and subsidies for mothers of many children.

downward mobility before and after the transition from communism to assess whether downward mobility is an experience that matters to fertility decisions and whether its impact has increased in the new institutional context. Second, I decompose the timing of experiencing downward mobility relative to when the first child was born to try to better understand why downward mobility is influential and to address possible issues of endogeneity and selection bias. The findings offer support that a link between downward mobility and fertility exists. Moreover, when downward mobility occurs after the first child is born, it is particularly consequential.

This chapter also assesses the direct and combined effect of education level and occupational class to uncover which subgroups of men and women experienced the greatest decline in fertility since market reform. The results in which both characteristics are controlled for reveals strong class associations to fertility for women, indicating the presence of income constraints and opportunity costs. Finally, the impact of unemployment was also considered, as an important even brought about by economic transition and crisis, and evidence emerges that experiencing unemployment after the first child is born also significantly suppresses women's fertility.

1.7 Premature mortality in Russia and downward social mobility

The most dramatic decline in longevity occurred in Russia: Life expectancy dropped from 63.8 to 57.7 from 1992 to 1994 for men and from 74.4 to 71.2 for women, resulting in the most significant peacetime decrease of any industrialized country (Gavrilova, Semyonova, & Evdokushkina, 2002). Another way of conceptualizing the mortality crisis is by considering the fact that Russians lived longer in 1965 than in 1999 (Field & Twigg, 2000). In contrast, almost a decade more was added to the average life expectancy in EU countries (of those that joined before 2004).

As in the previous chapter, I propose that downward social mobility might offer a unique way of understanding how the negative experiences of the economic transition and crisis may have impacted health in chapter five. However, this mechanism is not new in epidemiological studies; social mobility has been well analyzed in past health research and has been linked to the continuing and, at times, increasing health differential among classes (e.g., Dahl & Kjaersgaard, 1993; Claussen, Smits, Naess, & Davey Smith, 2005; Hart, Davey Smith, & Blane, 1998; Davey Smith, Hart, Blane, Gillis, & Hawthorne, 1997; Hemmingsson & Lundberg, 2005; Nilsson, Nilsson, Östergren, & Berglund, 2005; Power, Matthews, & Manor, 1996; Stern, 1983). In this tradition of research, researchers have attempted to understand whether the health divide continues to exist simply because people are sorted into classes through mobility according to health or whether the environment that is characteristic of a class supports or inhibits health. Therefore, much attention has been given to whether mobile individuals reflect the health and longevity characteristics of the origin or of the destination class. One important assumption in the debate over the health divide is that there is selectivity into mobility based on health; so those who are unhealthy are more likely to be downwardly mobile and vice versa. Another assumption reflects a cumulative life course perspective; prolonged exposure to a class environment is how class location and mobility matter to health.

While both of these assumptions are based on supporting evidence in the literature and are not being called into question, in chapter five I propose an altogether different interpretation of the impact of mobility. Rather than further assess the importance of selection into a class or exposure to the risks associated with a class, I propose that experiencing downward mobility may in and of itself be detrimental to health due to the stress experienced over the loss of previous resources and social status. In other words, this research focuses on whether there is a health *reaction* to this event, which is a fundamentally different way of conceptualizing downward mobility's impact. Siegrist (2000) outlines a theoretical framework for understanding

how a threat to individuals' perceived core social roles, such as the work role, matter to health through inhibiting successful self-regulation, leading to "adaptive breakdown" and "addictive behaviors as a means of compensating for unsuccessful self-regulation" (p. 1286). As such, I argue that downward mobility has not received the space it deserves in research on health and longevity. Rather than perceive downward mobility as merely a recalibrating mechanism of the health divide, downward mobility may be a factor worth studying on its own, as it captures a critical life event that can be disorienting, devaluing and financially difficult for individuals.

Chapter five, therefore, offers fresh evidence 1) on the contribution of social mobility to health differentials by proposing a new link between downward mobility and health: downward mobility itself may have an immediate impact on health, above and beyond selection, origin or destination effects, and 2) on causes behind the mortality crisis in Russia by testing an innovative operationalization of the negative impact of economic crisis and transition. Downward mobility, as well as unemployment, are assessed in this chapter as possible contributors to increased risk of death from 1994-2005 in Russia using the Russian Longitudinal Monitoring Survey (RLMS) and Cox proportional hazard models. The results of these analyses provide convincing evidence that both downward mobility and unemployment are detrimental to men's health, whereas only unemployment appears to impact women's health, controlling for a health or alcohol consumption selection into both experiences. Moreover, there is some evidence as well that downward mobility and unemployment increase the odds that men will engage in excessive alcohol consumption.

In summary, this dissertation explores demographic changes and how they may be related to rapid social change and the economic context in post-socialist contexts. Not only does the transition from communism to capitalism provide a unique opportunity to observe how new social constraints and opportunities influence behavior, but the concomitant economic crisis provides further occasion for assessing the impact of labor force adjustment and lower material resources due to recession. The increasing job turnover and unemployment currently characterizing many economies due to the 2008 economic crisis lend this research agenda particular relevance, especially as it uniquely explores the demographic implications of downward social mobility, which is likely to become of greater significance during the widespread economic crises. Finally, this thesis comes almost two decades after market reform began in the region; yet, the health and fertility of its population is still a central issue in Russia.[11]

[11] For examples of the social and political importance of alcohol-related health issues and low fertility in Russia, see Appendix A1.1 and A1.2 for social marketing ads that appeared in the Russian subway system (Moscow, June 2009).

2. THE POST-COMMUNIST FERTILITY PUZZLE[12]

2.1 Introduction

This chapter makes two arguments: First, different processes underlie the fertility declines across the post-communist region[13] as well as across the years of transition from communism: postponement of childbearing on the one hand and a decline in higher order births on the other. Research on the declining fertility rates of the post-communist countries has not adequately distinguished between countries and time periods according to important differences in these underlying processes, which has resulted in a conflation of explanations and obscured the links between applicable theories and discrete empirical situations. The second argument is that both postponement and stopping behavior are differentially linked to the economic context: improving economic conditions are linked to postponement of childbearing and stopping behavior is linked to deteriorating economic conditions.

Three competing explanations of the decline in fertility over the post-communist region are discussed and contrasted in this chapter: second demographic transition (SDT) (Lesthaeghe & van de Kaa, 1986), postponement transition (PPT) (Kohler et al., 2002) and economic crisis (UNECE, 2000; Cornia & Paniccià, 1998). Descriptive analyses demonstrate that contextual conditions in only a few countries were in line with those in which a SDT is argued to occur. Furthermore, postponement of childbirth appears to explain the lion's share of fertility decline in no more than five of the post-communist countries studied here. Although conditions were not conducive to a SDT in the first years of transition from communism in more than a few countries, substantial economic recovery and postponement of childbirth had begun by the mid-1990s in a few more. Regression analyses demonstrate that distinct processes are associated with different countries and that the economic context is related to the specific process that drove each decline in fertility. Having countries in the sample that experienced both processes of fertility decline as well as both extremes in economic contexts strengthens these findings.

A few limitations of this study must be acknowledged. First, the task of determining whether postponement of childbirth is due to a PPT, associated with economic uncertainty, or rather the SDT, associated with increased opportunities, value shifts and economic growth, is not attempted here. Rather, the study attempts to identify whether and when either one is a possible explanation. Distinguishing between these two underlying mechanisms of postponement requires a more fine-tuned instrument than a macro-data analysis. This research operates at the macro-level to supplement the micro-data research that is more common in the literature and to offer a contextual analysis of the conditions under which 1) fertility was likely to decrease to a greater degree and 2) significant postponement more likely to occur. Not only is an aggregate analysis especially appropriate when studying transitions due to macro-level changes, individual experiences are linked to factors operating in the larger institutional context and not influenced solely by micro-level factors (Spielauer, Kostova, Kotzeva, Jekova, & Borissova, 2005).

The second limitation is that this analysis is restricted to analyzing short-term causes of fertility decline. The comprehensive cultural and institutional changes that occurred during the latter half of the twentieth century across the region are assumed to have had an impact on fertility

[12] This chapter and section 1.3 in the introduction form a paper that is forthcoming in *Population Research and Policy Review.*

[13] In the descriptive analyses, Armenia, Azerbaijan, Belarus, Bulgaria, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyz Republic, Latvia, Lithuania, Moldova, Poland, Romania, Russia, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan are included. In the regression analyses, a restricted sample is used for reasons discussed later, in which the majority of the Central Asian Republics are excluded. Throughout the entire chapter, countries of the former Yugoslavia (excluding Slovenia) and Albania are not discussed due to missing data; nor is the former East Germany included for reasons also discussed later.

behavior. However, clarification is still needed on possible short-term causes such as the role of the economic crisis.

This chapter contributes to the debate by systematically reviewing both causal and outcome indicators in light of what we would expect to see given the most popular theoretical explanations. Furthermore, it addresses the recent competing explanation of a PPT, as well as links postponement behavior explicitly to the economic context and explains the decline beyond what postponement can account for. To the best of my knowledge, no other research has attempted to comprehensively discuss these explanations and consider their connection to economic contexts, either theoretically or empirically, even though economic conditions are either an implicit or explicit part of each explanation. The arguments posited in this chapter are, however, implied in existing literature, particularly in Sobotka's (2002, 2003) work in which he found evidence of two distinct fertility trends within the region. He also found some evidence of a positive association between mean age at first birth and improved economic conditions. This chapter seeks to confirm the opposite relationship as well, in regards to a decline in age-specific fertility rates, and to more concretely tie empirical findings to disparate theoretical strands in the literature that have not been considered comprehensively. This study therefore contributes to the literature on the post-communist fertility decline, but also to literature on fertility declines more generally since it has relevance to SDT and PPT theories. Moreover, this study also covers a range of post-communist countries and years beyond what is included in other analyses.

In the next section, the literature on fertility decline is discussed. In the third section, descriptive analyses demonstrate important differences among the post-communist countries and the plausibility of the three explanations. The fourth section discusses the analytical models and results of regression analyses that determine the links between economic conditions and both fertility decline and postponement. The fifth section briefly discusses the findings and concludes.

2.2 Review of literature

The debate in fertility research of developed countries currently involves two major theoretical perspectives: those that focus on ideational forces and those that focus on economic forces. Lesthaeghe and van de Kaa's (1986) SDT leads the ideational literature. Lesthaeghe and Surkyn (2004) argue that a desire for self-actualization has become predominant and was fueled by three revolutions: (1) a contraceptive revolution, which permits postponement of childbearing; (2) a sexual revolution, which broke the boundaries that kept sexual activity within marriage; (3) a gender revolution, which allowed women to no longer be subservient to men or biology. All three of these revolutions combined re-oriented values and were said to occur "during the peak years of economic growth" (p. 5). The SDT theory dictates that families will gradually become smaller due to greater individualism and post-materialism, which are associated with increased urbanization and post-industrialization. Lesthaeghe and Neidert (2006, p. 669) further describe the forces at work as "not solely the outcomes of changing socioeconomic conditions or rising female employment, but equally the expression of secular and anti-authoritarian sentiments of better-educated men and women who held an egalitarian world view, placed greater emphasis on Maslow's (1954) 'higher order needs' (i.e., self-actualization, individualistic and expressive orientations, need for recognition), and, to use Inglehart's term (1990), had stronger 'postmaterialist' political orientations." The reaction to these forces includes a list of changes in life course events of young adults, including postponement of union formation and childbearing, as well as increased non-marital cohabitation and childbirth. The resulting demographic outcome is fertility below population replacement level.

Demographic research has primarily concentrated on the symptoms of SDT rather than the causal elements within the theory. This strategy is sound when research involves OECD countries in which continued economic growth and stability are given conditions. Indeed, the

references to both Maslow and Inglehart indicate a stage of personal evolution that is conditional upon material needs no longer being the main focus in life. This ranking of needs is clearly stated by Lesthaeghe and Surkyn (2004, p. 8), where they argue that Maslow's (1954) higher order needs can only be expressed once material preoccupations end and financial security is established. However, in many national contexts, economic conditions may be quite different.

Had the high hopes for market transformation been unanimously realized after the breakdown of the Soviet Union, the post-communist fertility narrative might have nicely paralleled the scenario involving affective value shifts as described. The elimination of almost complete redistribution would have resulted in more people being able to accumulate wealth and realize individual desires, expression, and lifetime goals through greater autonomy and increased consumption choices. While the break with totalitarian regimes provided further opportunity for greater individualism, it also cohered with the anti-establishment sentiments that have historically brought about increasing heterogeneity in the timing of major life course events. However, the restructuring of the communist economies and governments, in many cases, resulted in economic crises that may have prohibited ascension to post-materialism and self-actualization. Under these conditions of increased poverty and inequality, as well as decreased consumption power, conditions do not appear to have been amenable for a postmaterialist value shift to have occurred in many countries.

Most prominent in the economic discussion is Becker's (1960, 1981; Hotz, Klerman, & Willis, 1997) micro-economic theory of the family. The economic theory of fertility can be summarized as focusing on the costs of children, which are mediated by household income. Costs are considered both directly, in which the benefits of a child are weighed against the costs, and indirectly, which includes costs related to lost opportunities. Not surprisingly, widespread economic deterioration during the transition from communism encouraged an intuition that the economic crisis might be related to declining fertility in the region. Indeed, researchers have paid explicit tribute to the transition experience by directly linking the post-communist transition and the correlated economic crisis to the decline in fertility. Cornia and Paniccià (1998) found a relationship between economic conditions, as well as family related services and policies, and fertility for the early years of the transition. Their results confirm the importance of the loss of resources that was brought about by structural change. The UN Economic Commission (2000) for Europe found that the decline in income put downward pressure on fertility for ten post-communist countries from 1989 to 1998.

Other researchers focused on explanations related specifically to the transition from communism to capitalism. Sobotka (2002) argues that the "socialist greenhouse," which encompasses a broad range of socialist institutions from the labor market to family/work conciliation policies, artificially kept fertility rates high during the decades in which they would have declined, as in the case of Western Europe. Thornton and Philipov (2007) add a new perspective by viewing general changes in this region through the lens of developmental idealism. Similar to the tenets of SDT theory, they argue that norms have shifted in the region; in this case however, the shift is due to adopting norms and behaviors of a model that is perceived as more modern and successful such as the Western European and North American model. Frejka (2008) sidesteps the issue of crisis versus culture in his recent essay by claiming that both economic and ideational explanations are part and parcel of the main explanation, which is broadly the transition to capitalism. His argument allows both frameworks to coincide in our understanding of the fertility decline—as well as numerous other factors that have as of yet been unaccounted for (welfare state change, increased consumerism, etc.). However, other researchers (e.g., Zakharov 2008) clearly still argue against the validity of the economic crisis explanation and argue in favor of the SDT explanation.

Another valuable contribution by Frejka (2008) is his discussion of the ambiguity of the economic crisis explanation. He claims that "by default, economic determinants were understood to fall within the 'crisis' category" (p. 161). He also conceded the difficulty of separating those factors that are solely related to crisis from those traditional economic factors that would operate in a stable economy (p. 164). For example, "competition in the labor market, job insecurity, and rising costs of children" (p. 160) are all economic factors associated with capitalism in general and can all be studied discretely in that context. But in the case of economic crisis, we would expect these myriad economic factors to be at work simultaneously. Most simply, the economic crisis explanation might be understood as a rendition of Becker's direct cost mechanism insofar as we focus on the dramatic devaluation and loss of resources during the transition. This mechanism already has been contextualized as it has been argued to be at work in another economic crisis: In the Myrdals' (Myrdal & Myrdal 1934, summarized in English in Gustafsson 2002) Crisis in the Population Question, they argue that during the Great Depression people sought to have the highest standard of living possible to them and that when the costs of childbearing were too high, fertility declined. Another contextual explanation is Easterlin's (1976) thesis: a conflict between aspirations and resources will reduce the willingness of a couple to have children. Easterlin grounds aspirations in terms of "relative affluence," which refers not to the affluence of other people in a cohort, but to the affluence of a person's family of orientation. If current resources cannot sustain the aspirations an individual has developed over time, childbearing is limited. This perspective may be particularly applicable to post-communist countries, considering that during transition to a market economy the bottom dropped out of previously stable economic terrain.

Although the relationship between Becker's opportunity costs and declining fertility usually accompanies increased female labor force participation, the transition saw a retreat in women's labor force participation as well as an overrepresentation of women among the unemployed (European Foundation, 2005). In some cases, economic uncertainty was likely rampant during transition (Bhaumik & Nugent, 2002; Kreyenfeld, 2005). Ranjan (1999) models the relationship between fertility behavior and income uncertainty in the context of the FSU and CEE countries and demonstrated that postponing fertility until a later time is optimal during times of economic uncertainty due to the irreversibility of the decision. Rindfuss, Reed, and St. John (1978) found that uncertainty due to social change in general can also play a role in fertility decisions by looking at the fertility rates of white and black women in the segregated South of the US after the Brown versus Board of Education ruling in 1954 de-segregated the school system. They found an immediate decrease in births following this ruling. Finally, other causal mechanisms that have been the focus of micro-level research such as social capital (Bühler & Philipov, 2005; Philipov et al., 2006), social anomie (Philipov et al., 2006), and specific coping strategies such as extra sources of sustenance (Bühler, 2004) and informal work situations (Perelli-Harris, 2006) also may fit within the broader economic crisis explanation. Given these various arguments connecting economic conditions to fertility behavior, and since it is true that economic conditions were related to both the crisis and market reform, this chapter explicitly considers the economic explanation as encompassing the various economic explanations of fertility decline. In keeping with this purpose is the decision to analyze economic and fertility changes at the aggregate level rather than at the micro-level, which would be more appropriate to assess the contribution of single economic factors discretely.

A recent theoretical addition to the debate over low fertility rates, which bridges the literature on post-communist demographic studies and research on lowest-low fertility in Europe, is Kohler et al.'s (2002) study. They pooled European and formerly communist countries that have entered lowest-low fertility and found evidence of a "postponement transition" (PPT). At the time of their analysis, 3 countries in Southern Europe, 5 in CEE and 6 in the FSU had lowest-low fertility levels. They found this low TFR level to be due to postponement in childbearing, which distorts the TFR and is a rational reaction to uncertainty originating in the labor market. Moreover, at the aggregate level, changes in the timing of childbirth and lower quantum were found to be reinforcing, due to feedback effects and institutional incentives. This paper is

notable in the context of the current research for two reasons: (1) the authors propose a causal mechanism behind postponement that is substantively different than the causal mechanism behind postponement in the SDT theory, and; (2) by pooling Southern European countries with FSU and CEE countries, the authors are implicitly proposing that declines in the latter countries are not particular to the experience of transition from communism or severe economic crisis, but only to more general economic uncertainty. The extent to which this proposed framework is a major competing explanation is debatable, but its presence in the debate is not (See, e.g., Frejka & Sardon, 2003).

The literature, therefore, yields three distinct arguments to explain fertility decline in the post-communist countries: SDT, PPT and economic crisis. Table 2.1 provides an outline of elements that ought to cohere according to the specific tenets of these frameworks. The main points relevant to these three explanations are summarized, as well as their commonalities and differences. SDT is a theory of cultural change to explain the presence of permanent below-replacement level fertility or postponement of childbearing. PPT is a theory of rational action and feedback effects to explain period fertility levels that have fallen to lowest-low levels. The economic crisis explanation encompasses economic theories of fertility behavior and has arisen as a somewhat ad-hoc explanation in response to the events in the post-communist region. The main motivation behind SDT is self-realization (Lesthaeghe & Surkyn, 2004, p. 3). The main motivation behind PPT is delaying long-term decisions due to uncertainty. The main motivation in the economic crisis explanation is preoccupation with material needs, which is played out according to many economic explanations. Both SDT and PPT manifest themselves in fertility patterns through significant postponement of childbirth, whereas we would expect to see less postponement of childbirth and more stopping behavior according to the economic crisis explanation. In other words, people may have chosen to have fewer children than they would have had if the economic crisis did not occur because securing material needs became a higher priority than fulfilling a desired family size. According to the PPT theory, people may choose to have fewer children, but more importantly, they wait to have children, as a rational reaction to economic uncertainty. Finally, SDT links postponement behavior to increased opportunity for self-actualization due to the increasing array of options and affective value shifts that accompany economic stability and growth.

Table 2.1 Theoretical diagram of explanations for fertility decline

	Economic Crisis Explanation	**Postponement Transition**	**Second Demographic Transition**
Economic Context	Crisis	Transition/stability	Stability
Fertility Process	Stopping behavior/ postponement of higher order births	Postponement of childbirth	Postponement of childbirth
Motivation behind Family-Planning	Material needs prioritization	Uncertainty	Self-actualization

Two more commonalities exist between SDT and PPT that are not reflected in the table. First is the importance of adaptation effects—"life course choices feed back onto value orientations, either to reinforce or to alter them" (Lesthaeghe & Surkyn, 2004, p. 13)—or social feedback effects (Kohler et al., 2002), which suppress already low fertility and may be distinct from the motivations for the original decline. Both of these elements offer explanations that may explain why fertility has not recovered to pre-transition or pre-crisis levels after some countries have experienced economic recovery. Moreover, they allude to the possibility of one driving force being replaced by another over time, which is another reason this analysis takes a "when/when

not" perspective rather than an "either/or" perspective. For example, it may be that the economic crisis explanation explains the decline in fertility only until the point at which economic recovery relieved the pressure on individuals and, henceforth, normative or cultural change—brought about by lower fertility and broader social changes—became the driving force (Lesthaeghe & Surkyn, 2002).

The second commonality is the emphasis placed on tertiary education in SDT and PPT. In SDT theory, women's choices and autonomy increase as female tertiary education enrollment increases, leading to a disruption of women's traditional roles in the family. Prolonged education becomes a delaying force for major life course events such as family formation as well as an influential force on values. PPT theorists, however, argue that with labor market uncertainty, higher education enrollment increases not only as an investment strategy for labor market success, but also as an alternative strategy to entering the job market when youth unemployment is high (Kohler et al., 2002). As we would expect, the authors found that tertiary education enrollment for women increased the most in those countries in which significant postponement of first birth occurred. But because the authors point out that the economic crisis might encourage continued education rather than labor market entrance while also suppressing fertility, the role of higher education in fertility decline becomes ambiguous. Hence, although higher education enrollment rates will be commented upon in the descriptive analyses, these rates are not discussed further in terms of major explanatory forces of declining fertility.

A final consideration in distinguishing between shifts in fertility behavior and their respective explanations is why the economic crisis would not also impact the decision to have a first child, which would likely lead to postponement. Indeed, PPT theory argues that economic uncertainty would induce postponement of the first birth. The literature on the post-communist region does not provide a link between continued early childbearing and the economic crisis. However, Perelli-Harris (2005) found that women still had the first child at a young age in Ukraine because of traditional norms. This evidence presents a counterfactual to the SDT theory, in which we see that although fertility decreased dramatically, ideational change has not been paired with postponement. One other theoretical basis for understanding the relationship between continued early childbearing and economic crisis is Friedman, Hechter, and Kanazawa's (1994) "uncertainty reduction strategy" in which women who experienced obstacles to alternative life paths continued the traditional early childbearing pattern because it provided certainty during an uncertain time.

2.3 Descriptive evidence: Characterizing fertility decline in the FSU and CEE

The first purpose of this chapter is to enhance our understanding of the compatibility of major explanations or theories with empirical evidence, keeping context in mind. The descriptive analysis is structured in response to the three major competing explanations: SDT, PPT and economic crisis. The first part therefore refers to the likelihood of SDT in this region. The second part focuses on whether significant postponement of childbirth occurred in each country, whereas the third part examines the timing of postponement onset and its contribution to overall fertility decline. These three sections offer descriptive information that allow us to establish where and when SDT conditions occurred, where and when it appears likely that a PPT may have been in force, and where and when the economic context, coupled with no significant postponement of childbirth, rule out SDT or PPT explanations.

Many similar demographic changes occurred across countries in the sample. For example, the average age at first marriage increased during the 1990s in every country. Adolescent live births decreased in every country, even though many countries experienced a brief increase in adolescent births during the first few years of transition. Also worth noting is the considerable increase in live births to non-married women. The average increase in the share of non-marital

births to total births across the region was 20%, with Estonia leading the ranks with a 33% increase and Turkmenistan with the lowest increase of 7% (if we exclude the Central Asian Republics, the lowest increase was found in Ukraine at 10%). Not surprisingly, the marriage rate fell across the board during the transition. All of the findings thus far systematically describe indicators of SDT. Moreover, some postponement of childbirth can be observed in increases of mother's age at first birth, which is a crucial symptom of a SDT as it relates to fertility.

Despite the smoking gun pointed towards SDT, these symptoms could be related to a PPT due to economic uncertainty. Conversely, they could also indicate a disruption of most life course events brought about by the social and economic disruption. Research on single countries has pointed to the fact that many symptoms associated with SDT may in fact be driven by other forces (see, e.g., Perelli-Harris, 2005 on Ukraine; Gerber & Cottrell, 2006 on Russia; Rotariu, 2006 on Romania). Establishing the link between demographic change and SDT requires more than simply the presence of interconnected demographic changes or a logical sequencing of these changes.[14] Rather, we must be able to connect the context in which these changes occur, or actual ideational change, to demographic changes. While it is not possible to study ideational change for many of the countries in the region, we can assess the conditions under which SDT is argued to occur. Therefore, I offer other information to characterize the context in which these changes occurred and shed light on whether SDT can compete in this context with the PPT thesis. Specifically, the contextual indicator that I argue offers a powerful clue is whether mortality was under control at the time of fertility decline.

Mortality rates are relevant to SDT theory; according to van de Kaa (2002), "In the second transition fertility and mortality are both strongly influenced by normative changes in advanced industrialized societies" (p. 8). He expected the value shifts that take place in a SDT to improve health behavior, but that improvements in longevity would probably lag behind changes in fertility rates. We have yet to see this improvement in many post-communist countries and van de Kaa's statement can hardly be considered an accurate characterization of the post-communist context in which mortality rates significantly deviated from long-term trends (Cornia & Paniccià, 1998; Shkolnikov et al., 1998), despite incremental increases in some mortality rates since the 1960s (Shkolnikov et al., 2004). However, no direct relationship between mortality and fertility can be assumed since the greatest increase in mortality during the transition from communism occurred for men past the age of usual family formation (Shkolnikov et al., 2004). The increase in mortality rates during the concurrent decline in fertility is not important solely because it defies SDT theorists' expectations, but also because it qualifies each country's transition experience. Fertility declines that have led to below replacement level fertility and currently to lowest-low fertility have historically occurred in high-income countries, characterized by a nation-wide "post-materialist" individualistic state that leads to SDT (Lesthaeghe & Neidert, 2006), a context in which longevity is on the rise. Therefore, it is a fair assumption that mortality levels would continue to improve or at least maintain stable levels under conditions that would be suitable to a SDT.

Longevity did not increase for the majority of the post-communist countries and, in fact, mortality rates declined along with fertility in only a few cases. Figure 2.1 displays concurrent mortality and fertility trends to demonstrate how the trajectories complement each other for three countries that represent major differences in trajectories (See Figs. A2.1, A2.2, and A2.3 in the Appendix for the remaining countries). The Czech Republic represents Group 1, also including Hungary, Poland, Slovakia and Slovenia, in which only a minimal increase in mortality rates occurred for the entire population and in which mortality declined along with fertility for the remaining years of transition. All remaining countries experienced significant increases in mortality after the transition to a market economy. Some variation among these

[14] See Sobotka, Zeman, and Kontarova (2003) for a discussion on the three conceptualizations of SDT they discern in the literature.

countries exists: Bulgaria, Estonia, Latvia, Lithuania and Romania form Group 2 in which considerable increases in mortality rates occurred while fertility rates plummeted, but later recovered to pre-transition mortality levels. Russia represents Group 3, including Belarus, Moldova, Russia, Kazakhstan, Ukraine, Armenia, Georgia, Azerbaijan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan all of which have either only tentatively achieved stable mortality rates or have not at all. In general, and particularly in regards to Estonia, Russia and Armenia, the point at which mortality peaked and began to decline coincides with a shift in fertility trends in which the declines markedly reduced speed; these parallel shifts point to contextual forces.

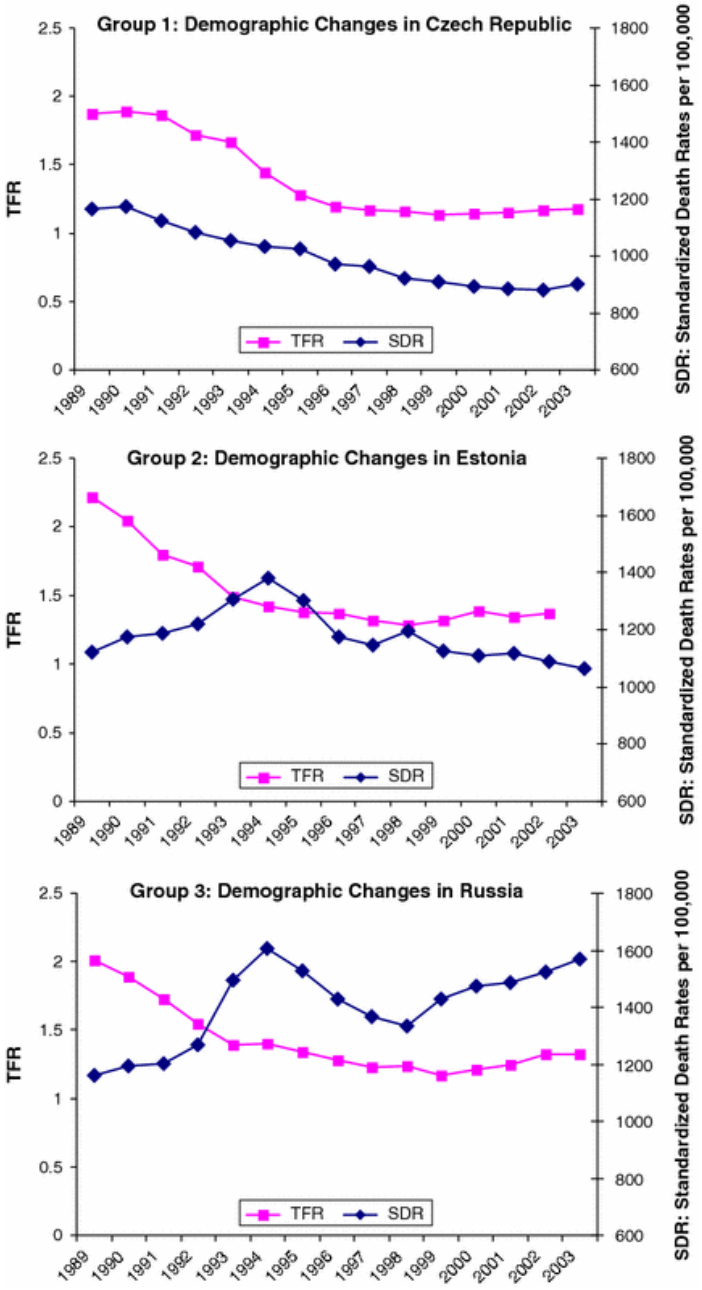


Fig. 2.1 Three countries representing three different patterns of fertility and mortality trajectories.
Source: Author's calculations based on WHO Health for All DB and UNICEF's TransMONEE DB

In summary, this indicator demonstrates that conditions in the FSU, Romania and Bulgaria differed enough from the CEE countries in the early 1990s that they were not able to keep mortality rates stable during the initial years of transition from communism. As mentioned, the relationship between mortality and fertility trends is not argued here to be causal; merely, the implication of mortality instability is that only the five countries of Group 1 (Czech Republic,

Hungary, Poland, Slovakia, and Slovenia) could be characterized as having conditions amenable to a SDT or post-materialist revolution in the first half of the 1990s, while conditions for those countries in Group 2 (Bulgaria, Estonia, Latvia, Lithuania and Romania) appear amenable only in the second half of the 1990s and conditions in the remaining countries (Group 3) appear unsuitable for a SDT until at least 2003.

Besides a context that is in line with the theoretical tenets of SDT, we would also expect evidence of the major SDT symptom associated with fertility decline: postponement of childbearing. However, postponement may be brought on by an altogether different motivation than argued in SDT. A "postponement transition" (Kohler et al., 2002) might occur if families decide to wait to have children because of socioeconomic insecurity. Contextually, this thesis aligns with the post-communist experience; therefore, there are no major theoretical conflicts with applying this explanation to the complete range of post-communist countries. However, this thesis clearly relates the issue of low fertility to postponement and its distortion of the period fertility measure that has defined lowest-low fertility. Therefore, the extent to which significant postponement occurred must be systematically assessed.

Kohler et al. (2002) found evidence of a PPT for countries ranging from Southern Europe to Russia, combining countries that have not experienced recent economic crises with countries that have only recently achieved economic stability; by implication, this effectively rules out the economic crisis explanation for fertility decline. Not only is there great variation in the socioeconomic contexts in these authors' sample, but there is also great variation in the timing of descent into lowest-low fertility: Greece, Italy and Spain slowly declined from 1985 to 1999, losing between 0.2 and 0.4 children per woman, while in the same time period the CEE countries lost between 0.5 and 1 children per woman and the FSU countries between 0.8 to 1.4 children per woman. These dramatic differences are not solely due to different starting levels of TFR and invite further research into specific aspects of the post-communist decline.

The next descriptive analyses explore to what extent postponement of childbirth is a major pattern in these countries during the first years of transition, as well as offer some indication of how important this postponement has been to achieving the depths to which fertility had fallen by the end of the 1990s. As the largest decrease in fertility occurred in the 20–24 year old population, postponement seems a likely culprit. However, the 25–29 year old age group in most countries continually mirrored the younger trend, even if to a slightly less intensity, rather than began to increase by the end of the 1990s as we would expect to see for postponement within cohorts.[15] Birth rates to 30–34 year old women also stayed stable after an initial decline, rather than increasing in the late 1990s, which we would likely see if women had expected to have children at ages 25–29 and postponed until their early 30s. This is not to say that recuperation did not happen, but that birth rates still declined enough at these ages to offset the importance of any recuperation to the overall trends.

A common method of separating the impact of tempo from quantum in period fertility rates is Bongaarts and Feeny's (1998) "adjusted total fertility rate." This measure has proven a useful tool for a truer construction of what the period fertility rate is supposed to offer. However, this measure is less useful if postponement is not later matched by recuperation (Lesthaeghe & Moors, 2000), as just discussed. In the present analysis, the adjusted fertility rate is not used as a measure; this is partly due to the fact that these rates have already been provided elsewhere for the countries where there is evidence of postponement over the duration of the transition. I also do not calculate the adjusted total fertility rate because the purpose here is to merely show whether significant postponement exists at all in the time period studied, the intensity of postponement and if it coincided with the initial decline in fertility rather than estimate what the TFR would be if tempo is removed from its calculation. Instead, a postponement ratio, as used

[15] Figures depicting the slopes of age-specific birth rates by country are excluded for reasons of space, but available upon request.

by Lesthaeghe and Neidert (2006), is used to determine the degree of postponement that has taken place. However, where these authors constructed their ratio by summing age-specific fertility rates above age 30 and dividing by the sum of age-specific fertility rates for ages 20–29, the formula is altered here to reflect the post-communist context in which women have the majority of their children at a relatively young age. Therefore, the ratio used here is the sum of live births per 1,000 women to women ages 25+ over the number of live births to women ages 15–24.[16]

If postponement explains the steep decline in fertility rates in the early 1990s, an increase in the birth rates of higher age groups is inevitable after a time lag. Most countries studied here at the onset of transition had an almost equal ratio (located between 0.8 and 1.2) of children born to women ages 15–24 to all women 25 years and more, demonstrating the young age structure of childbearing in these countries. The exceptions are the countries that still had a prevalence of high-parity births at the transition onset, demonstrated through a high ratio (Azerbaijan, Kyrgyzstan and Uzbekistan: 1.5, Tajikistan: 1.9, and Turkmenistan: 2.3), and Bulgaria, which had an unusually low ratio of 0.7 at the beginning of the transition. Figure 2.2 shows the changes in the postponement ratio from 1989 to 2003 on similar scales for better comparison. The five countries that stood out in the first descriptive analysis again are distinct from the others. More heterogeneity among the remaining countries is evident in regards to the postponement ratio; therefore, four different figures that represent the patterns appear in Fig. 2.2.

[16] Using the standard measure based on the traditional age division (30+/29>) reveals identical groupings of countries, in any case. The most noticeable difference between the two measures is the scale on which the changes occur. Using an older age threshold as the numerator reduces the ratio dramatically, as well as the fluctuation in the ratio after the transition commenced. The trajectories of change in ratios remain the same across the two specifications.

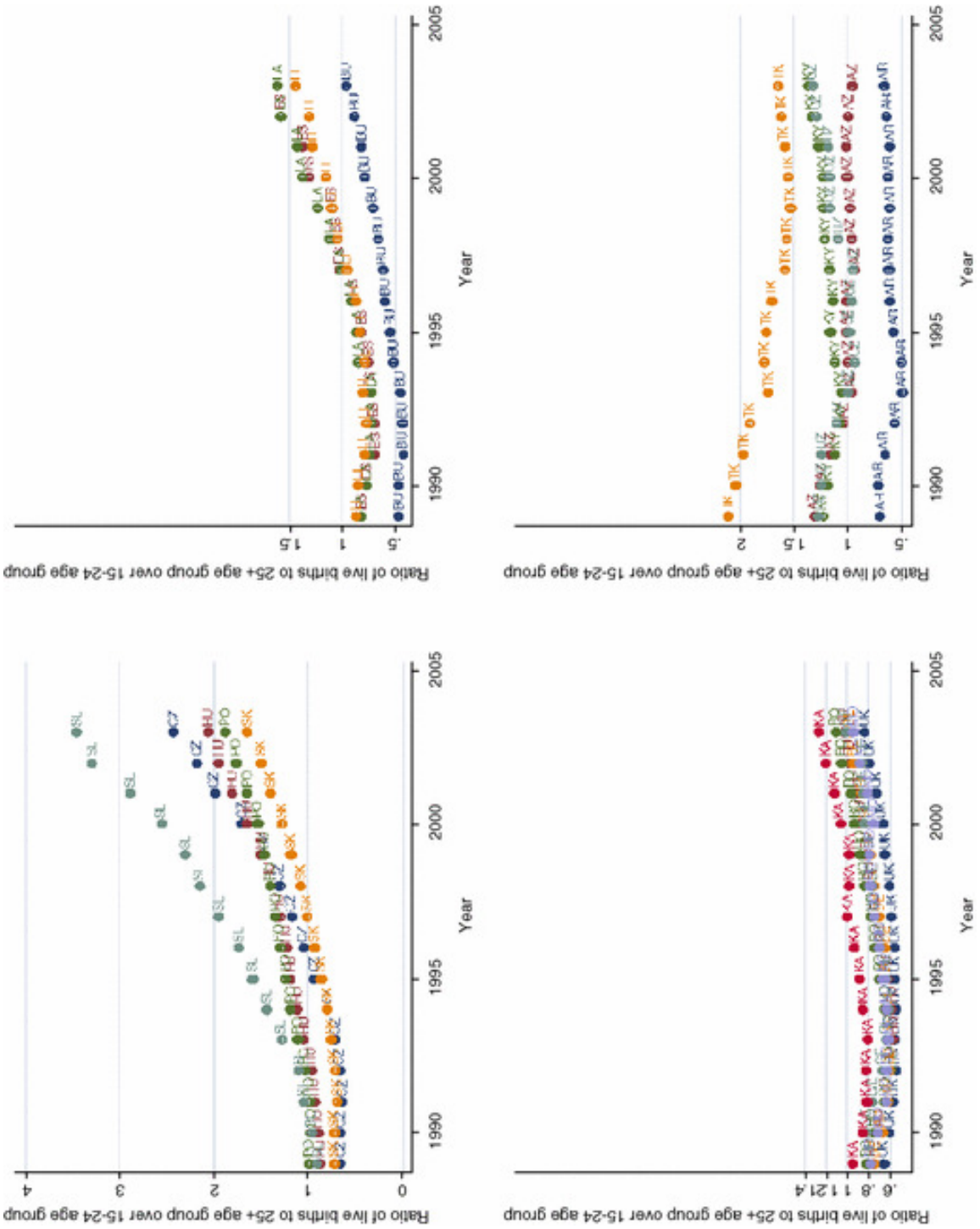


Fig. 2.2 Postponement ratios. *Source*: Author's calculations based on UNICEF's TransMONEE DB

The initial distinction between Group one and the remaining countries is one in which a decline in the ratio is nonexistent or negligible, whereas the others all experienced a decline in the ratio at some point. The Czech Republic, Hungary, Poland, Slovakia and Slovenia form a distinct group because all experienced significant postponement. They all began at 1 or lower and the lowest ratio by 2003 was 1.7 in Slovakia and the highest was 3.5 in Slovenia. The postponement ratios for the second group, including Bulgaria, Estonia, Latvia and Lithuania, increased to a much lesser degree than the first group after an initial decline. At transition onset, the ratios varied from 0.5 to 0.9 and by 2003 the highest ratio reached was Latvia's at 1.6, while Bulgaria only reached 1. In fact, the Baltic states' ratios closely parallel each other's throughout the time

period. But although Bulgaria began at a much lower ratio, the trajectory in terms of the magnitude of initial decline and later increase was quite similar. The third group, including Belarus, Georgia, Kazakhstan, Moldova, Romania, Russia and Ukraine, experienced much more of a decline in the initial ratios and much less of a later increase. The range in initial ratios was 0.7 (Ukraine) to 1 (Kazakhstan). All ratios decreased in the early 1990s and a few (Kazakhstan and Moldova) decreased again in the late 1990s (in 1998 and 1999, and in 2000, respectively). This was followed by a modest increase with ranges varying between 0.9 in Ukraine to 1.3 in Kazakhstan by 2003. As evident in the figure, Belarus, Georgia, Moldova, Romania and Russia mirror each other so closely in their postponement ratios that separating their trajectories is difficult. The final group consists of countries that have not experienced any notable postponement throughout the entire transition, according to the postponement ratio: Armenia, Azerbaijan, Kyrgyzstan, Turkmenistan and Uzbekistan.[17] However, as mentioned earlier in regards to some of these countries, this ratio captures more than postponement if the fertility quantum is also high, since higher parity births are born at later ages and a decrease in high parity births would obscure an increase in births to older women due to postponement. Therefore, it is not as useful a tool for capturing postponement in these latter countries as in the others in which fertility hovers around replacement level.

The point at which postponement began may indicate how strongly it is related to the initial decline in TFR; therefore, the earlier the postponement the more important it should be to the decline. To determine the year of postponement onset, this chapter follows the definition set by Kohler et al. (2002) in which the year of onset is the first year in a consecutive three-year increase of at least 0.3 in the average age of mother at first birth. Figure 2.3 shows the postponement trend starting with the year of onset, plotted against the TFR to see at what point in the TFR decline postponement begins.

Group 1 countries remain distinct and are again represented by the Czech Republic in Fig. 2.3; their overall average onset was 1992.8. The earlier year of postponement onset is important since it further strengthens the likelihood that postponement contributed to low fertility levels, as the steepest decline in period fertility occurred during the early 1990s. Slovenia in particular may well be a case in which postponement is absolutely driving the fertility decline, as the onset of postponement began at the very beginning of the serious decline in TFR. Overall, these countries experienced between a 4 and 12% decrease in TFR by the time postponement onset officially occurred.

[17] Tajikistan is excluded due to missing information on age specific birth rates.

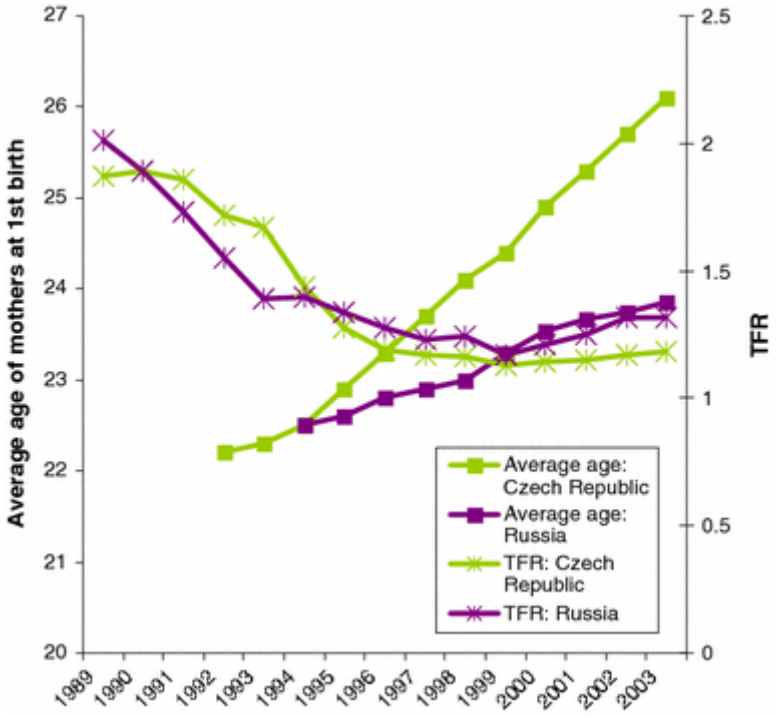


Fig. 2.3 Postponement onset and TFR. *Source*: Author‘s calculations based on UNICEF‘s TransMonee DB. Missing years for Russia (1999–2003) were substituted with Zakharov’s (2008) estimations, as published in Vishnevskii (2008)

All other countries that experienced postponement are represented by Russia in Fig. 2.3. In general, postponement began later in these countries than in Group 1 countries. Overall, these countries experienced between a 22 and 38% decrease in TFR before postponement onset occurred. Figure 2.3 also shows that postponement preceded Russia’s entrance into lowest-low fertility (below 1.3). However, more than 80% of the decline in TFR from 2 in 1989 to lowest-low levels of 1.3 preceded the onset of postponement. In fact, postponement began around the end of the TFR decline in Russia. See Figures A2.4 and A2.5 in the Appendix for the figures of all countries, except those in which the postponement ratios did not increase at all as a general trend.

In summary, postponement of childbirth appears to be a prominent reason the period fertility measure has declined across the Czech Republic, Hungary, Poland, Slovakia and Slovenia; whereas the extent to which postponement has played a major role in the decline in TFR of the remaining countries appears limited. This finding confirms that the PPT theory cannot explain fertility decline in Armenia, Belarus, Bulgaria, Estonia, Latvia, Romania, and Russia, although postponement may still have been the final push that suppressed TFR to lowest-low fertility levels. Besides the lack of explanatory power the PPT thesis has for the majority of these lowest-low post-communist countries, the ramifications of postponement may be different in this region from those in Western Europe. With a later onset of childbearing, the quantum of fertility is known to decrease (Kohler et al., 2002; Billari & Kohler, 2004). The strength of this negative association in the post-communist countries remains to be seen; there is reason to doubt the total impact given the disparity between the degrees of postponement discussed. According to Kohler et al., the average age of Southern European mothers at first birth in 1999 was 28.3 years, while the average age of mothers in post-communist countries at first birth in 1999 was 23.9. This difference of almost five years puts current mothers in the post-communist countries at the same age as mothers in Southern Europe *before* their PPT began. In other words, the argument that “fertility postponed is fertility foregone” may not apply when postponement occurs at a relatively young age.

Despite the simple tools used in this analysis, findings confirm those of other researchers. Using Bongaarts and Feeney's adjusted TFR (1998), Philipov and Kohler (2001) found a significant difference between the declines in Bulgaria and Russia and those in the Czech Republic, Hungary and Poland. Whereas the declines were clearly due to tempo effects in the latter cases, quantum drove the early years of decline in Bulgaria and Russia. Sobotka (2002, 2003) found a wide variation in the contribution of tempo to declining period fertility rates as well. These authors also attribute these findings to the more severe economic reaction to transition in these two cases.

To summarize this descriptive exploration, three discrete country groups emerge in this region. Due to escalating mortality rates, only five countries display conditions amenable to a SDT throughout the entire transition: Czech Republic, Hungary, Poland, Slovakia and Slovenia. These same five countries also exhibit signs of significant postponement of first birth as well as fertility declines that coincide with the increase in age at first birth. Therefore, for five of the post-communist countries discussed here, either SDT or a PPT may be the force behind their entire fertility decline; as stated earlier, this analysis does not attempt to distinguish between SDT and PPT in the cases where either might fit. Research using disaggregated data may be more able to distinguish the mechanism behind postponement.

Figure 2.4 summarizes the following findings. While postponement appears to be the process behind fertility decline during most of the transition in those five countries of Group 1, it appears to be the process behind fertility decline in only the later half of the 1990s in the four countries of Group 2: Bulgaria, Estonia, Latvia and Lithuania.[18] These four countries appear to be a mixed-process group in which the economic crisis explanation appears to be at work in the turbulent early 1990s because postponement was minor and conditions were not amenable to an SDT. However, after the mid-1990s, economic recovery, mortality stability and the presence of substantial postponement leave room for either a SDT or PPT explanation. Group 3 includes countries that did experience postponement by the end of the 1990s, but because mortality rates have still not recovered, conditions appear unlikely for SDT to be a major explanatory force for declining fertility, leaving PPT as a likely explanation for only recent low levels of fertility. In summary, two processes seem to be at work—postponement of childbearing and stopping behavior—and one of these two processes characterizes the majority of the fertility decline for two groups of countries (Groups 1 and 3), while both processes are almost equally present in the mixed-process group (Group 2).

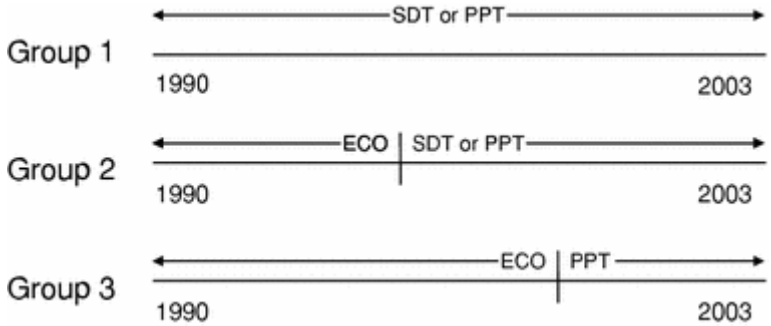


Fig. 2.4 Summary of descriptive findings. *Note*: *Group 1* includes Czech Republic, Hungary, Poland, Slovakia and Slovenia; *Group 2* includes Bulgaria, Estonia, Latvia and Lithuania; *Group 3* includes all remaining former Soviet Union countries and Romania. *SDT* Second demographic transition, *PPT* postponement transition and *ECO* economic crisis explanation

[18] Romania also experienced significant postponement and recovery of mortality rates, but the ratio of age-specific births to older women over age-specific births to younger women indicates a scenario much closer to the third group of countries.

Including more countries and later years, this analysis confirms the general findings of Sobotka (2004): although TFR was negatively affected to some degree by the postponement of childbirth, regional differences in period fertility still existed even after taking postponement into account and, thus, there were at least two pathways of fertility change for the post-communist countries. Moreover, the data that is available shows what we would expect according to theory and past research: the countries showing the most striking increase in higher education enrollment rates (Group 1 countries) are the ones that also demonstrate evidence of significant postponement, rather than stopping behavior.

2.4 Regression Analyses

This section contributes to the study of fertility decline in the post-communist region by analyzing whether: (1) the variation in fertility behavior can be statistically linked to two different processes: stopping behavior and postponement of first birth; and (2) whether these different processes are conversely related to economic context. Specifically, the hypotheses are as follows:

H1 The fertility declines of Group 3 were distinct from those of Group 1 and were driven by economic crisis.

Hence, if stopping behavior drove the decreases in fertility in Group 3, then a reduction in age specific birth rates, especially at older ages, should be evident for those countries. Moreover, if the economic crisis drove these declines in birth rates, then the difference between the groups of countries should disappear if we account for economic context.

H2 Postponement of childbearing drove the fertility decline of Group 1 and a more positive economic environment encouraged this delay in childbearing.

Hence, the likelihood of experiencing postponement onset, as defined in the previous section, will be lower for countries of Group 3 than Group 1. Moreover, if a positive economic context is related to the likelihood of postponement onset, the difference between the two groups should be rendered statistically insignificant with the inclusion of variables that capture the economic context.

Due to the presence of Group 2 countries, which clearly exhibited both processes in the descriptive analyses, a static two-group categorization may not be appropriate. Ideally, these mixed-process countries would be able to contribute to both groups according to which process was underway by year. Unfortunately, complications arise with this strategy;[19] instead, the strategy adopted is to run the models twice, putting these mixed-process countries first in Group 1, then 3. If these countries truly experienced both processes, and variation in the economic context explains these processes, then the placement in either group should work almost equally

[19] The countries were selected into the groups according to multiple pieces of evidence, which increases the difficulty of selecting one variable that would indicate a single year when a country transitioned from crisis as a driving force of fertility decline to economic stability and postponement. When analyzing age-specific birth rates, it was possible to take the year of postponement onset or beginning of mortality recovery, whichever happened first, as the year in which these countries moved from Group 3 to 1. While neither of these bases is directly endogenous to the age specific birth rate models, this basis is problematic for determining the groups for the postponement models. Due to the lack of one clearly exogenous variable to establish a single point in time, I did not attempt this strategy for the postponement models. It is worth noting that the results presented in the following selection are robust to the group categorization in which the mixed-process countries change groups over the time series in this analysis. See Tables A2.7 in the Appendix.

well. Results confirm this assumption and although I present findings of only one classification for simplicity, the models for the additional group specifications can be found in Tables A2.6, A2.7 and A2.8 in the Appendix.

a) Data and Sample

To test these hypotheses, I use cross-sectional time-series data mostly taken from the TransMonee database. This database "contains data related to the social and economic situation and wellbeing of children, young people and women in CEE, the CIS and the Baltic States (CEE/CIS)." It is associated with the MONEE Project: Public Policies and Social Conditions: Monitoring the Transition in CEE and the CIS and was initiated by UNICEF Innocenti Research Centre in 1992. The database consists of annual data received from the National Statistical Offices of each country and uses a standardized template. I include as many post-communist states as the data allow, excluding most Central Asian Republics (CAR), for the 13 year period of 1990–2003. The sample includes Armenia, Azerbaijan, Bulgaria, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Lithuania, Poland, Moldova, Romania, Russia, Slovakia, and Ukraine. Not included are the Southeastern European countries of Albania and the former Yugoslavia as well as Belarus and Latvia, due to complete lack of data for one or more variables, and the former East Germany (GDR).[20] Although the CARs were included in the descriptive analyses, they are not included here due to the confounding influence of the decline in much higher order births.[21] Kazakhstan remained in the analysis as the TFR was already well below 3 before the transition from communism began. Although this sample does include a few countries that experienced conflict within their borders (Azerbaijan, Georgia, and Moldova) during the early years of transition, the results proved to be robust when excluding these countries. In summary, the analysis includes 15 countries for the years 1990-2003[22] and the range in TFR at 1990 was 1.81 (Bulgaria) to 2.77 (Azerbaijan).

b) Measures

Five different dependent variables (DVs) are used: age-standardized live birth rates (live births per 1,000 women) for 15–19, 20–24, 25–29, 30–34 and 35+ year old women. The majority of variables show greater within variance than between.[23] All independent variables have been lagged by 1 year. Originally, a 2 year lag was considered more likely, due to a 9 month gestation period; however, tests consistently showed the relationship to be stronger with a 1 year lag.

Fertility rates are subject to non-stationarity; for this reason, I took the first differences of all my DVs. This solution is a viable approach as my theoretical interest is in the changes in fertility rates caused by the explanatory variables and not the absolute levels. Maddala's (Maddala and Wu 1999) Fisher test for panel unit root using the augmented Dickey–Fuller test rejected the possibility of a unit root for all my DVs once they were transformed into first differences. The theta score in a random effects regression and the Breusch and Pagan Lagrangian multiplier test for random effects revealed the adequacy of a pooled model to represent the variance in this

[20] The former GDR is not included in the Trans Monee database, and therefore the comparable standardized indicators used in the analysis are not readily accessible. The former GDR would be an interesting inclusion to this sample due to the remarkable drop in TFR during the early years of transition (1.5 in 1990 to 0.8 in the years 1992–1995), but the contextual differences brought about by its absorption into a wealthy country and national culture characterize its transition with specific and unusual conditions in comparison to all other post-communist cases.

[21] Nevertheless, previous models that include Kygyz Republic, Tajikistan and Uzbekistan demonstrate that the results are robust whether they are included or not.

[22] There are a few years in which data is missing for a few countries within this time period.

[23] Correlation charts and summary statistics are omitted for reasons of space and are available upon request.

data. Before taking the first differences of my DVs, a fixed effects estimator proved to be the best fit, but transforming the DVs into changes in rates rather than actual rates removed country specific effects. Moreover, the inclusion of a control variable for the initial TFR also removes substantial fixed effects. Durbin's M-test and the Baltagi and Li test for serial correlation in panel data indicated that taking first differences removed autocorrelation from this data. To deal with heteroskedasticity, I estimated the model by using the Linearization/Huber/ White/sandwich robust estimates of variance.[24]

"Economic crisis" is represented with four variables: GDP, inflation, employment ratio and wage growth. The indicator used for inflation is the (log) "annual percent change in consumer prices" (IMF World Economic Outlook 2000, 2003). The measure for GDP is per capita and expressed in purchasing power parity (PPP). Because the interest here is not in the absolute wealth of a country, but rather the changes from year to year, or more specifically the decline in GDP, this indicator is the difference in GDP from 1 year to the next. This means that the starting year of the time series—1990—reflects the difference between GDP in 1990 and 1989.

Rather than focus on unemployment rates, which offer a rate based on the total labor force, employment rates are used to better capture the influence of how many individuals are working in relation to the total working age population, not just those technically in the labor force. This measure should be more sensitive to assessing women's status since they move in and out of the labor force more often than men for family reasons or may be more likely to not participate in the labor force due to family reasons when the economy is performing poorly. But it also ensures we are capturing shifts in employment levels that would also affect spouses and, hence, are reflecting conditions at the household and not just individual level. Specifically, the measure used in this analysis is an employment ratio: the number of employed as a percent of population aged 15–59.

Real average wage growth is "a proxy for the quantity of goods and services a money wage can buy; the real wage represents the money wage adjusted for inflation.[25] Values are an index based on the value of 100 at the base year" (TransMonnee) and, therefore, reflect cumulative changes in wages since the onset of transition and not year-to-year wage growth.

The key indicator is "group," which separates the countries according to the division that emerged in the descriptive analysis. As mentioned, the intermediate group of countries, or the mixed-process group (Bulgaria, Estonia, Latvia and Lithuania), are dealt with by: (1) placing them in analyses with Group 1 countries (Czech Republic, Hungary, Poland, Slovakia and Slovenia), where a more stable economic environment is argued to be driving postponement, (2) placing them with Group 3 countries (Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Moldova, Romania, Russia and Ukraine), where economic crisis is argued to have contributed to stopping behavior. The results that are displayed are those for the best model, but results for the alternative country groupings can be viewed in Tables A2.6, A2.7 and A2.8 in the Appendix.

Finally, I include one control variable: initial TFR. Including the fertility rate at the starting point of the fertility decline—according to the years analyzed here—may capture any country-specific effects such as the impact of culture on overall fertility behavior. Moreover, it may also account for specific characteristics of fertility behavior at certain levels of TFR that might confound the analysis.

---

[24] I also attempted models based on nonlinear specifications, but without better results.

[25] "IRC estimate. Consumer price index taken from EBRD (2003) Transition Report Update, 2003. London: European Bank for Reconstruction and Development; 2002–2003 are preliminary data." (Trans Monee).

The model is designed to be sparse; only those aspects that will confirm whether economic conditions explain changes in fertility rates are introduced into the model. Therefore, the regression analyses are not testing the explanatory power of alternative hypotheses. Other research has included explanatory variables in the models such as the marriage rate, age of first birth, and divorce rate (e.g., Cornia & Paniccià, 1998; UNECE, 2000). These are important determinants of fertility and have themselves been the foci of much research. However, as these factors themselves may be impacted by deteriorating economic conditions, they would likely introduce endogeneity into the model. Therefore, I do not include them as explanatory or control variables.

c) Model and Strategy

In this analysis, the benefits of having time-series data that include pre-transition years are sacrificed in order to have data that covers most of the countries that were part of the Eastern Bloc. In identifying causality, the "no cause-no effect" condition (Bhrolcháin & Dyson, 2007) is best satisfied by observing a single or a few cases over long periods of time, but here it has been satisfied by observing the degree of effects based on the degree of changes across many countries over a shorter period of time, which adequately meet counterfactual criteria (Esping-Andersen & Przeworski, 2000). As such, the conclusions found here are more relevant to the speed and intensity of fertility decline than to the occurrence of decline, since all countries experienced a decline to some degree.

To formally test the claim that there are significant differences between the country groups that emerged according to the process behind the fertility decline, as well as a mixed-process group, step-wise regressions are used. First, bivariate regression analysis with a dummy variable separating the groups will tell us if there is a significant and meaningful difference between the two when regressing the fertility measure on the groups. The descriptive evidence suggests that declines in the fertility rates of countries of the third group will be more intense. Hence, in Model 1 being a country of Group 3 will have a negative impact, in reference to Group 1, on changes in fertility. Second, adding the economic indicators to this model will indicate if economic context variables explain the differences between the country groups. If the continued worsening of the economic situation was an important condition under which the fertility decline was more intense or consistent, the effect of the Group dummy should disappear. Hence, in Model 2, worsening economic conditions should negatively impact fertility, while rendering the Group dummy no longer significant.[26] In other words, the first model will confirm the overall difference between groups and show in what direction the difference is, whereas the second model will show that the difference becomes negligible or reversed if we take into account the economic context. The value of the second model is in seeing the change in the group dummy coefficient/odds ratio between the two models when we include the economic indicators. Therefore, the final model is:

$$\Delta\text{Fertility}_{it} = \beta_0 + \beta_1\text{type}_{it-1} + \beta_2\text{wagegrowth}_{it-1} + \beta_3\text{empgrowth}_{it-1} + \beta_4\text{inflation}_{it-1} + \beta_5\Delta\text{GDP}_{it-1} + u_{it}$$

Where Δ indicates the change in the age specific birthrate for country i at time t. βs are the coefficients of the explanatory variables at $t-1$ and u is the error term.

[26] One important concern over using such interrelated economic variables (GDP, inflation, employment ratio and wage growth) is the extent to which multicollinearity biases my results. Indeed, the dummy separating the two groups of countries had a correlation score of .69 with GDP. Transforming GDP into the difference in GDP greatly relieved the collinearity between these variables. In any case, the variance inflation factor (VIF) score reads 1.67, which is below the danger realm of 2.0–10 VIF score (Cohen, Cohen, West, & Aiken, 2003) and assures that the results are not biased by multicollinearity.

Finally, to further confirm the distinct processes behind the fertility declines of the two groups—and whether economic context is also related, but conversely, to postponement—a logistic regression analyzes whether the group dummy captures the difference in likelihood of postponement. The DV in these regressions is dichotomous, in which 0 indicates there was no increase in the average age of mother at first birth and 1 indicates an increase. To conform to the idea of postponement as a transition, the increase is considered to exist only if it is past the point of postponement onset, as defined above, to exclude the minute fluctuations both up and down in mothers' average age at first birth. However, to test the robustness of these findings I also analyze the relationship between economic context and postponement of childbirth linearly, using the difference between the average age of first birth from year to year as a continuous dependent variable.

The second model in the postponement logistic regression includes the same economic variables as discussed above to test whether the same forces behind the declines in fertility are behind the increase in mothers' ages at first birth when postponement had begun. Step-wise inclusion of the economic indicators is used here as well, following the strategy outlined above. It is expected that in Model 1, being a country of Group 3 will reduce the likelihood of postponement; while the addition of the economic variables will render the type dummy insignificant in Model 2 and improvements in the economic indicators will increase the likelihood of postponement.

2.5 Results

Table 2.2 displays results for the linear regression models of age-specific birth rates. Model 1 regresses the age-specific birth rates on the group dummy only. In general, the hypothesis related to Model 1 holds: Except for the two youngest age groups, the coefficient for belonging to Group 2 is negative, meaning that the decline in births at higher ages is greater for countries in Group 2. This coefficient is statistically significant in the country grouping for births to 30–34 and 35+ year old women in this country grouping. It is also statistically significant for the 25–29 year olds when the mixed-process countries are included in Group 3, rather than Group 1, as well as when their contribution to the groups varies by year (see Tables A2.6, A2.7 in the Appendix). In the case of teen birth rates and the 20–24 year olds, the coefficient for the group dummy was consistently positive and insignificant. A positive relationship makes sense for women of younger ages in Group 3 countries; postponement is most likely to suppress age-specific birth rates at younger ages and we expect to see greater postponement in Group 1. However, these coefficients are not statistically significant at the younger ages and, in the case of 15–19 year olds, it is particularly low.

Table 2.2 Pooled cross-sectional time-series regression results, mixed-process countries categorized as Group 1

	Δ16-19		ΔLBR 20-24		ΔLBR 25-29		ΔLBR 30-34		ΔLBR 35+	
	M1	**M2**	**M1**	**M2**	**M1**	**M2**	**M1**	**M2**	**M1**	**M2**
Prob > F	0.9719	0.0363	0.2321	0.0000	0.1691	0.0000	0.0203	0.0000	0.0488	0.0003
R-squared	0.0000	0.0501	0.0059	0.3893	0.0126	0.2752	0.0539	0.4484	0.0499	0.2918
# of clusters	15	15	15	15	15	15	15	15	15	15
Obs.	170	170	170	170	170	170	170	170	170	170
	0.01	0.328	1.08	6.01	-1.20	2.06	-1.53	0.90	-0.27	0.06
Group	(0.39)	(0.47)	(0.86)	(1.10) ***	(0.83)	(0.78) **	(0.58) **	(0.39) **	(0.13) **	(0.09)
		0.62		-6.75		-5.00		-3.12		-0.45
Initial TFR		(0.91)		(1.42) ***		(1.57) ***		(1.11) **		(0.31)
		-0.000		0.004		0.004		0.003		0.001
ΔReal GDP pc		(0.001)		(0.001) ***		(0.001) **		(0.001) ***		(0.000) ***
		0.06		-1.32		-0.40		-0.33		-0.02
(log) Inflation		(0.25)		(0.36) ***		(0.24)		(0.14) **		(0.03)
Employment		-0.05		-0.04		-0.08		-0.05		-0.01
ratio		(0.07)		(0.09)		(0.06)		(0.02) **		(0.01)
		0.03		-0.03		-0.02		-0.01		-0.002
Wage growth		(0.01) **		(0.02)		(0.02)		(0.01)		(0.002)
	-2.31	-2.13	-7.73	12.50	-1.26	15.05	0.61	10.56	-0.03	1.206
Constant	(0.24) ***	(4.87)	(0.45) ***	(7.21)	(0.49) **	(6.27) **	(0.35)	(3.05) ***	(0.08)	(0.838)

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, Robust standard errors in parentheses. Group 1 is the reference category and includes Bulgaria, Czech Republic, Estonia, Hungary, Lithuania, Poland and Slovakia. Group 3 includes Armenia, Azerbaijan, Georgia, Kazakhstan, Moldova, Romania, Russia and Ukraine (Group 2 countries—mixed-process countries—are absorbed into Group 1 in these models)

Model 2 also displays results in line with the hypothesis: the difference in the intensity of decline in fertility between Group 1 and Group 3 is mediated by the economic context and especially so at older ages. The impact of the country group dummy disappeared or completely reversed when the economic variables were introduced into the model. The exceptions again are the younger age groups (teens and the 20–24 year old women), in which the coefficients for belonging in Group 3 have the same direction when the economic context variables are included as when they are not included, although their size increases.

In regards to the specific impact of these economic indicators, the results are complex. Only in the case of live births to teens did wage growth prove to be important. This finding was consistent across the two parallel analyses that distribute the countries among the groupings differently (see Tables A2.6, A2.7 in the Appendix). In Model 2, inflation consistently has the expected relationship (negative) with birth rates of all women 20 and above, but it is significant only for the 20–24 and 30–34 age groups. The employment ratio also had a negative relationship with fertility, which contradicts the crisis-related expectation that when employment increases fertility should increase. Rather, the relationship is what we would expect to see according to traditional economic theory: increased employment—assuming this translates into increased employment for women as well—decreases fertility due to the indirect costs associated with childbearing. However, it is only statistically significant for the 30–34 year old women. GDP per capita was significant and had the expected relationship with all fertility outcomes except the 15–19 age group. As the economy improved in general, changes in fertility were positive as well. The control variable, initial TFR, was significant for women between the ages of 20 and 34 in which the coefficient was negative but its impact diminished at higher ages.

Overall, these results demonstrate that not only does the economic context absorb important variation in the underlying processes of fertility decline of the country groups, but that worsening economic conditions were related in general to the decreasing fertility rates. Where this was not the case was for the age group that would be most impacted by postponement, rather than stopping behavior.

Logistic regressions on the likelihood of postponing childbirth are displayed in Table 2.3.[27]http://www.springerlink.com/content/fw652412xr8513j6/fulltext.html - Fn16 As expected, Model 1 indicates that countries of Group 3 had a lower odds ratio of experiencing a significant increase in the average age of mother at first birth than countries of Group 1 during this time frame, demonstrating once again that different processes occurred in these two groups during the fertility decline. This difference reversed entirely once economic indicators were included in the model; the odds ratio became positive, although statistically insignificant. In the final model, change in GDP per capita was significant, where increases in GDP improved the likelihood that postponement would occur. Although the employment ratio and inflation did not have the expected impact on postponement, the odds ratios are not statistically significant, whereas the direction of wage growth is as we would expect. Finally, this general story holds true for the alternative grouping of countries, which is displayed in Table A2.8 in the Appendix.

Table 2.3 Logistic regression results for postponement of childbirth, mixed-process countries categorized as Group 3

Logistic Regression Postponement		
	M1	**M2**
Prob > chi2	0.0052	0.0000
Pseudo R-squared	0.0670	0.4515
Log pseudo likelihood	-89.660	-52.707
Obs.	147	147
Group	0.22 (0.12) ***	1.82 (1.93)
Initial TFR		0.13 (0.20)
ΔReal GDP pc		1.004 (0.001) ***
(log) Inflation		0.84 (0.13)
Employment ratio		0.99 (0.07)
Wage growth		1.02 (0.02)

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, Robust standard errors in parentheses. Group 1 is the reference category and includes Czech Republic, Hungary, Poland and Slovakia. Group 3 includes Armenia, Azerbaijan, Bulgaria, Estonia, Georgia, Kazakhstan, Latvia, Moldova, Romania, Russia and Ukraine (Group 2 countries—mixed-process countries—are absorbed into Group 3 in these models)

In the models in which postponement of first birth is analyzed with a continous dependent variable, which captures the difference in the average age from one year to the next, the results are similar.[28] The impact of the Group dummy becomes statistically insignificant, while both GDP growth and wage growth increase the average age of first births. This alternative specification of the relationship between country groups, economic context and postponement of first births attests to the robustness of the results in Table 2.3.

[27] The comparison of the results for the two different country groupings reveals that including the mixed-process countries with Group 1 does not achieve a statistically significant model at any level; therefore, the results for the model in which the mixed-process countries are placed in Group 2 are displayed. However, the direction of all odds ratios is the same in the two groupings, as well as the significance of all other indicators in Model 2.

[28] Results available upon request.

In summary, these two sets of regression analyses establish a clear distinction between two groups of post-communist countries that appeared distinct in the descriptive analyses. Those in Group 1 demonstrated postponement behavior, whereas those in Group 2 demonstrated stopping behavior. The fact that the mixed-process countries perform almost equally as well in either group, with the results telling the same story, further reinforces the hypothesis that two processes underlie the country group distinction. Moreover, the changes in the group dummy coefficient between Model 1 and Model 2 systematically show that the relationship between the country grouping and the fertility measure is mediated by the economic context. In other words, from 1990 to 2003, postponement was linked to improvements in the economic context, whereas stopping behavior was related to worsening economic conditions.

2.6 Discussion

The first purpose of this chapter was to establish that there were indeed different processes behind declines in post-communist fertility rates. Three groups emerged across this region. The first group appeared to have undergone a PPT or SDT early on in the transition from communism (Czech Republic, Hungary, Poland, Slovakia and Slovenia). The second group appears to have undergone a PPT or SDT later in the transition from communism. They experienced fertility decline before major postponement of childbirth (Bulgaria, Estonia, Latvia and Lithuania). The third group appears to have experienced postponement of childbirth, if at all, only much later in the transition from communism and after extensive fertility decline had already occurred (Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Moldova, Romania, Russia and Ukraine). The countries and time periods that do not display strong postponement appear to have undergone a more traumatic transition in which major health crises ensued and fertility declines were more intense. These distinct findings, regarding the divergence among countries, confirm Sobotka's (2002) findings as well as specific research on individual countries (e.g., Sobotka et al. 2003 on the Czech Republic; Perelli-Harris 2005 on Ukraine).

The second purpose of this study was to empirically test whether this profound drop in fertility rates indicates a reaction to problematic transitions, or economic crisis. The results reaffirm research that has found a link between depressed economic conditions and declining fertility for the countries where postponement of childbirth did not appear to play a major role in the initial decline in fertility rates. Conversely, when the economic context was more stable, postponement was more likely to take place. The results contribute to the empirical verification that the economic crisis, or its absence, mattered to the manner and intensity of fertility decline.

The framing of this study—looking beyond static country groups—accommodates the dynamic reality that the economy decreases in importance to fertility decisions according to its performance. Therefore, finding evidence of countries moving between the two groups according to changes in the economic context offers more support for the proposed mechanisms behind fertility decline than would a static grouping of countries, since it renders the country grouping mechanism less likely to be spurious.

The limitations of this study are many. First, the small sample size may have decreased the statistical significance of the models. Second, the approach and modeling of this analysis are not able to accommodate long-term factors that may be important to fertility decline. Therefore, the findings are generalizable only to the relationship between fertility and the economic context as it varies from 1 year to the next and, specifically, between 1990 and 2003. Finally, data on trends in parity births for this range of countries and years is not yet available. As this data becomes available in the future, further analyses can more conclusively determine the exact processes underlying the fertility declines.

3. EXPLORING THE CONDITIONS FOR A MORTALITY CRISIS: BRINGING CONTEXT BACK INTO THE DEBATE

3.1 Introduction

In this chapter, I focus on the mortality crisis that took place in a majority of countries that underwent market reform in the post-socialist region. As in the case of the debate over the fertility crises in the region, most relevant research falls along two separate lines of investigation. The two explanations revolve around the contribution of stress and alcohol consumption to increased mortality. I argue that a context versus agency rift appears in the debate when these two explanations are considered independently from each other. This distinction is particularly apparent in the scholarly interpretations of research findings related to the role of alcohol consumption, which tend to either support the findings in stress-related research on the consequences of economic instability for health or attribute the mortality crisis to lifestyle choices and the remnants of Soviet cultural norms.

The purpose of this chapter is to explore the extent to which the two main explanations of stress and alcohol consumption can be integrated and considered together rather than as disparate explanations, providing a more comprehensive explanation of the mortality crisis. I approach this challenge by first discussing the state of the debate and the interpretations of evidence in the literature. I highlight shortcomings in these interpretations and emphasize the areas of research in which a convergence of the two explanations has furthered the debate. Empirically, I consider meaningful differences in mortality rates across the region during the transition from communism as well as demonstrate the way in which these differences appear related to the economic context. Finally, I assess the relationship between these country groups and economic indicators, focusing particularly on causes of death that may be alcohol-related. As such, this chapter contributes to the current debate over the causes of mortality crisis in the post-communist countries by comprehensively taking stock of the interpretations given to various empirical findings and explicitly assessing how they may fit together. Before I begin with the literature review, I first sketch the history of the debate over the mortality crises, explaining why a change in interpretations of evidence may have taken place and discussing why a reframing of the debate is necessary.

At risk of over-simplification, two interpretations of the mortality crisis have dominated the literature. Interestingly, a historical shift occurred in terms of how the debate was framed and discussed. The first interpretation, with a focus on context and structural dynamics, was prominent after the mortality crisis began until the early 2000s: In 1998, Shkolnikov, Cornia, Leon and Meslé published "Causes of the mortality crisis: Evidence and interpretations". In the research summary, the authors find that "psychological stress caused by the shock of an abrupt and severe economic transition is likely to have played a major role mediated by the adverse health effects of excessive alcohol consumption" (p. 1995). Six years later, Shkolnikov, Andreev, Leon, McKee, Meslé and Vallin (2004) summarized the current state of the literature and argued, on the basis of findings, that alcohol consumption was a key element in the mortality crisis and that psychological stress was a factor that originated before the transition and was created in the communist environment. Their conclusions regarding the role of stress originating from economic transition were inconclusive, suggesting that there was not enough direct evidence to link this stress to increased death. In regards to stress being an indirect factor leading to alcohol consumption during the transition, they cast doubt on research that has attempted to link these two elements for reasons of endogeneity; the individual-level relationship between alcohol consumption and economic circumstances can operate in both directions. Therefore, if one were to assess the state of the debate through this seminal article, the agency strand of the debate takes prominence; health behavior and excessive alcohol consumption was found to be the leading cause of the mortality crisis and this harmful alcohol

consumption during the crisis was attributed to poor health lifestyles and stress rooted in the previous Soviet society.

This summary of the current status of the debate presents the agency (health behavior) versus context (stress) explanations as competing rather than complementary. However, few researchers would likely deny that the economic transition and crisis have played a role in the mortality crisis. Indeed, discussions with these researchers and participation in debates[29] over the causes of the mortality crises have highlighted reservations based on the lack of tools and data to assess the validity of the economic argument with methodological rigor, rather than disbelief that the economic context played a role. Bobak and Marmot (2009) attribute the difficulty in substantiating the social contributions to the mortality crisis to problems with measurement and confounding factors. Moreover, due to a lack of rich data over time and the passing of time, the possibility of establishing psychosocial stress as a causal mechanism has eroded. Therefore, the economic context explanation lies somewhat in ambiguity in published literature while, on the other hand, evidence of harmful alcohol consumption in the region has mounted. Particularly, several methodological innovations in the debate—in which the scope of investigation has been narrowed to smaller geographical areas and often include case controls in the research design—have made it possible to more directly test the role of alcohol consumption (e.g., the Izhevsk Family Study: Tomkins, Leon, Kiryanov, Saburova, Andreev, McKee, & Shkolnikov, 2006; the Novosibirsk study: Malyutina et al., 2002; and the Udmurt Republic study: Shkolnikov et al., 2004b).

However, without continued investigation into societal variation, these micro-level analyses limit findings to the individual level, thus obscuring contextual contributions. For example, there is an important analytic distinction between finding the unemployed to be more prone to death due to excessive alcohol consumption and the finding that alcohol-related mortality increases when unemployment increases. I argue that these differences matter, particularly given the vital role this research can play in policy-making. Therefore, although researchers may perceive both explanations as complementary, the prevalence of mounting evidence of agentic explanations over contextual is likely to bias policy outcomes. Indeed, recent policy recommendations from the World Bank's Human Development Report (2005), "Dying Too Young: Addressing Premature Mortality and Ill Health Due to Non-Communicable Diseases and Injuries in the Russian Federation", advocate increased effort on the part of the Russian government to change the lifestyle behaviors of Russians. Specifically, they encourage control of alcohol and tobacco, changes in diet and promotion of physical activity, along with interventions for preventing road traffic injuries. While these positive recommendations were likely outlined in response to prominent scholarly explanations of the contributions to the mortality crisis, they may be overlooking another important contributor to increased mortality: the reaction of individuals to a highly unstable economic environment, including increased stress and alcohol consumption.

This brief sketch of the literature has described the academic shift from a contextual to an agentic perspective on the causes of the mortality crisis. My aim now is to explore whether contextual conditions during the transition add an important interpretative lens, which taken together with the agency perspective provides a holistic understanding of the dynamics that contributed to increased mortality rates. I do this by first engaging in greater depth with the literature on mortality across the post-communist region. Next I examine trends in mortality rates, exploring how they may be related to contextual changes during the 1990s and early 2000s. I then analyze cross-sectional time-series data of age-specific and cause-specific mortality rates to empirically test whether there is a relationship between contextual conditions and changes in mortality rates, keeping causes of death particularly related to alcohol consumption in mind.

[29] This theme particularly emerged in discussions at the conference "Mortality in Countries of the former USSR. Fifteen Years after the Break-up: Change or Continuity?" (Kiev, Ukraine; October 2006)

3.2 Mortality research

Research on mortality crises has largely focused on developing countries where the causes of high mortality are related to infectious diseases and nutritional deficits. Research on mortality rates during economic recession—e.g., in Latin America (Palloni, Hill & Aguirre, 1996)—has also found similar mortality causes. However, these findings do not explain the leading causes of adult mortality in wealthier countries or even in the poorest post-communist countries. Exploring the differences between contexts, Livi Bacci (2000) underlines three types of mortality crises arising from epidemics, subsistence crises and social dislocation. The author summarizes his analysis of mortality crisis models by suggesting "while past crises had a very strong exogenous origin, the more recent and future ones are mainly endogenous, i.e., are due to dislocations in the social structure and social fabric caused by the breakdown of the labour market, welfare and health systems, general impoverishment and rising inequality, and deterioration of personal behaviour" (p. 58). This perspective highlights the social and contextual contributors to mortality crisis.

a) Discarded hypotheses

Research specifically on the mortality crises in the formerly socialist states undertaken in the 1990s generally agreed that smoking, environmental causes, poor nutrition, deterioration of the health care system, and cohort effects were, at best, only partial explanations of increased mortality rates in the post-communist region (e.g., Leon & Shkolnikov, 1998; Cornia & Paniccià, 2000; Notzon, Komarov, Ermakov, Sempos, Marks, et al., 1998). By now, many of these early explanations, which are explored in more detail below, have been discarded. Specifically, Shkolnikov et al. (1998), Cornia and Paniccià (2000), Shkolnikov et al. (2004) and Stillman (2006) offer detailed guides to this research and highlight the hypotheses that have passed empirical examination.

For example, living standards had not declined enough across the region, in absolute terms, to be a likely culprit in the mortality crisis, even though consumption decreased. Material deprivation was also not a likely suspect because it would have impacted vulnerable age groups, such as infants and the elderly, instead of working-aged adults. Indeed, Brainerd and Cutler (2005) found that material deprivation as well as changes in diet and obesity did not prove important to mortality risks. The 2004 report (Shkolnikov et al.) found that the shift in diet during the 1990s was beneficial for the population, but also offers evidence for concern over the lack of physical exercise and level of fruits and vegetables being consumed.

In terms of environmental causes, one lauded side effect of the transition was dramatically reduced pollution as industrial production decreased; moreover, deaths due to respiratory diseases and cancer did not prove to be among the leading causes of death during this crisis.

Cohort effects were also thought to possibly play a role, as there were certain age groups that experienced extreme hardship during the world wars, the 1929-1933 famine and Stalin's early years (Caselli, Vallin, Vaupel, & Yashin, 1987; Cornia & Paniccià, 2000, p. 23). However, a strong relationship did not emerge between cohort effects and the leading causes of death in the mortality crisis (pp. 23-25).

In their survey of hypotheses, Cornia and Paniccià (2000) review the possibility that mortality data may not be accurate due to misreporting or measurement error. It could be that an increase in death rates may reflect nothing more than improved accuracy in the accounting and reporting of deaths once market reform began, which means that mortality would have been much higher in actuality before the transition than it was reported to be. They set the issue aside as much research has validated the quality of death statistics in the last decades (see Anderson & Silver,

1990; Shkolnikov & Mesle, 1996).[30]

The role of the health care system in the mortality crisis was likewise abandoned as an important contributor (Shkolnikov et al., 1998). However, in the 2004 report (Shkolnikov et al.), the role of the health care system seems less clear. Specifically, Rychtarikova's (2004) account of the mortality reversal in the Czech Republic has been perceived as new evidence that keeping up to date with technological improvements in prevention and treatment played a decisive role.

b) Explanations with empirical support

I now turn to the individual and social explanations that have stood up to empirical examination. Shkolnikov et al.'s 1998 report found support for the role of alcohol consumption and maladaption/stress brought about by the transition from communism. Bobak and Marmot (2009) describe these two explanations as representing the biomedical and social dimensions of mortality. First, I give an overview of alcohol-related research, followed by an overview of stress-related research.

The contribution of alcohol consumption to the increased mortality in the post-soviet context has been represented in a number of studies. Alcohol consumption has been linked to mortality through alcohol poisoning, accidental death, homicide and suicide, as well as cardiovascular death (Chenet, Leon, McKee, & Vassin, 1998; Leon et al., 2007; Pridemore, 2004; Stickley, Leinsalu, Andreev, Razvodovsky, Vågerö, & McKee, 2007; Shkolnikov et al., 2004b; Mäkinen, 2000). Although alcohol consumption fell to levels lower than found in Europe in the predominantly Muslim Central Asian Republics and Azerbaijan (TransMonee data), and these countries also experienced a mortality crisis, some recent research has found that Russians, or Slavs, carried the burden of mortality increases in Kyrgyzstan (Guillot, Gavrilova, & Pudrovska, 2006), as well as in Estonia (Leinsalu, 2006). Therefore, there seems to be no reason to doubt the importance of alcohol consumption to the mortality crisis, even when looking across the range of countries.

Moreover, Shkolnikov, McKee, and Leon (2001) found that alcohol consumption was a likely explanation for the difference between 1994 and 1998 life expectancy rates in Russia. Using sibling data, Bobak, Murphy, Rose, & Marmot (2003) demonstrate that mortality was higher among men and women who binge drink once a week or once a month, respectively. Shkolnikov, Mesle and Leon (2002) found the unemployed to be more prone to death due to excessive alcohol consumption, which was linked to cardiovascular disease.

On the other hand, stress, which has been defined as being relational and situational, occurs "when person/environment transactions lead the individual to perceive a discrepancy—whether real or not—between the demands of the situation and resources of the person's biological, psychological or social systems" (Serafino, 1994 in Shapiro, 1995). Stress has also been defined and operationalized as an effort-reward imbalance (Bobak, Pikhart, Rose, Hertzman, & Marmot, 2000). Marmot and Bobak (2000) offer an analysis of the psychosocial and biological mechanisms at work in the crisis. They argue that psychosocial factors existing before and after the transition play an important role in the mortality crisis. According to their model of how psychosocial factors affect people's working lives, they trace the connections from the social structure to the social, work, and early life environments to health behavior and psychological conditions to the biological aspects of the neuroendocrine immune systems and patho-physiological organ impairment to the final culprit: circulatory and heart disease well-being (p. 132).

[30] This excludes Central Asia and the Caucasus, which have been least in the spotlight of all these countries. The numbers reported for this area for adult mortality do not seem unbelievable given the comparability to other nearby republics with similar levels of economic performance.

The evidence for stress reviewed in the 2004 report by Shkolnikov et al. excluded macro-data analyses. However, an empirical verification of the "acute psychosocial stress hypothesis", conducted by Cornia (2000), demonstrates the important relationship between psychosocial stress and crude death rates for 13 countries. Cornia (1998, 2000) analyzed 12 macro-regions and 72 *oblasts* in Russia, finding similar results: "that the main cause of excess mortality lies in the acute stress connected with the unexpected increase in unemployment and turnover, and to the weak policy responses to this problem" (2000, p. 74). Covering only the early years of transition, Brainerd (1998) finds evidence of a negative relationship between successful economic reforms and death rates. Stuckler, King and McKee (2009) find that rapid and mass privatization, which is argued to increase stress due to unemployment and an unstable labor market, is related to mortality rates across the post-communist region as well. Bobak, Murphy, Rose and Marmot (2007) find that even when controlling for individual-level socioeconomic characteristics, economic performance at the societal level impacted health across 13 formerly communist countries.

Other important research that supports stress as a potential contributor to the mortality crisis is Kristenson and Kucinskiene's (2002) study linking the physiological reaction of a cortisol response to high levels of psychosocial stress. Using an exploratory factor analysis, Gavrilova, Semyonova and Evdokushkina (2002) found that during three mortality shifts in Russia—the incline after 1991, the decline after 1994 and the second incline after 1998—three factors explained the increases in mortality: 1) stress; 2) increasing TB, drug dependence, and sexually transmitted diseases; and 3) factors related to selective mortality (e.g., asthma and diabetes). Pietilä and Rytkönen (2008) conducted interviews with St. Petersburg residents and found that stress ranked as one of the most often referred to sources of poor health.

The literature suggests, therefore, that alcohol consumption and stress are both related to increases in mortality. McKee (2005) describes how particularly rapid changes can be damaging to health and cites not only the case of the former Soviet bloc but other incidences in which populations resorted specifically to alcohol consumption during times of rapid change. But little has been written directly about how alcohol consumption and stress may have worked together in the crisis. Indeed, Siegrist (2000) pointed out that there was relatively little cross-fertilization of research on the two explanations. A few cases in which both are explicitly addressed together do exist. Brainerd and Cutler (2005) found that both alcohol consumption and stress were important to mortality changes through cross-country as well as Russian survey data analysis. Focusing on the regions of Russia, Andreeva (2006) found that the hypotheses of stress versus alcohol consumption were both correct in that they acted together to increase deaths due to suicide and homicide. Jukkala, Mäkinen, Kislitsyna, Ferlander, and Vågerö (2008) found that men who experienced substantial economic strain were twice as likely to binge drink.

The area of ambiguity in the debate, therefore, lies in the interpretation given to harmful alcohol consumption in the region. Even as the relationship between alcohol consumption and mortality continues to be well established, it is important to take a further step in the debate and ask why alcohol consumption behavior changed to the degree that it produced a mortality crisis. A perspective that integrates the findings on stress might argue that alcohol consumption is operating as an intermediary mechanism between the stress induced by economic crisis and mortality. This was the original position argued in Shkolnikov et al.'s (1998, p.2008) research summary: alcohol consumption increasingly occurred at lethal levels as a response to "mass psychological stress" and was associated with an inability to adapt to the rapid and unexpected changes that occurred during economic restructuring.

However, another perspective has arisen in the debate. Within the health behavior literature, researchers have explicitly separated the two explanations and argued for an alternative interpretation of harmful alcohol consumption in the region. Cockerham (1999) developed a theoretical framework in which culpability for elevated mortality fell on health lifestyles. In his 1999 study of increased mortality in seven post-communist countries, he argues that the most

important social determinant behind lower life expectancy is the health lifestyle chosen in these societies. These health lifestyles—primarily harmful alcohol consumption—are argued to have been fostered under communism, particularly through the values, propensities and behaviors encouraged under the old regime. Cockerham (2006) later clarifies that the damaging behaviors are mostly associated with the working class of Russia and that it is the permeation of poor health behaviors from this particular social class throughout society that has caused the mortality crisis.[31]

This perspective focuses explicitly on the impact of a cultural transmission of values and behavior from the communist era on behavior during the post transition period; thus Soviet culture is assumed to be influencing behavior years later. Culture, from this perspective is perceived as generating predispositions toward certain behaviors, which is entirely plausible. Yet the very fact that a critical juncture in mortality rates, or alcohol consumption behavior, exists indicates that an explanation must include a component that is dynamic. The inherited lifestyle explanation, therefore, may be useful to understand why alcohol consumption plays a key role in deaths, but falls short of explaining a sudden and dramatic increase in deaths; an explanation for the mortality crisis requires an impetus for the sudden and dramatic increase. Furthermore, the explanation should be in alignment with two critical junctures in mortality trajectories, in the countries that experienced the most intense mortality increases: first after the initial collapse of the economy and, second, after the economic crisis of 1998.

The possibility that harmful alcohol consumption might be related to stress has been dismissed in this strand of literature. For example, Cockerham has explicitly analyzed determinants of high alcohol consumption (2000) and whether psychological distress increased poor health behavior (Cockerham, Hinote, & Abbott 2006). Although men in the lowest economic strata were not the heaviest drinkers, drinking frequency decreased with rising income. The impact of psychological distress (2006) is more strongly related to the frequency of drinking than the amount drunk e.g., whether someone drinks more than 100g of vodka per occasion. This is interpreted as evidence that distress is not as important a factor in comparison to lifestyles; the authors consider the amount drunk, regardless of how often, as the most important outcome. In addition, the researchers find that Russian women rate themselves as more stressed than men, but men's health behavior is worse than women's. This evidence is interpreted as an important fact that undermines the validity of the stress hypothesis.

Although this deduction is plausible, the relationship between stress and lethal alcohol consumption is likely mediated by other factors, some of which the authors mention. The possibilities for variation between men and women, and indeed all people, along the causal chain are many. For example, I would suggest that men and women may equally encounter stressful circumstances, but the *perception* of stress may vary, and women may actually feel stress more intensely or at least be more willing to admit to high stress levels. The second step in this process involves individual *behavioral responses* to stress, where women may have a different set of coping mechanisms they rely on from men or may have the benefit of stronger social support. Even if all remains equal between men and women through these first steps, there is room for variation in the final step, which is how stress and coping behavior are *physiologically experienced* by men and women. For example, it is widely known that women survive longer than men, even though they live more years in poor health (McKee, 2005). These

[31] He views these observations through the structure versus agency debate as well; however, in his discussion it is the Soviet norms, values and ideology that are portrayed as structural forces limiting life chances and creating poor health lifestyles rather than the rapidly shifting political, economic and social structures as communism gave way to capitalism and democracy. In this sense, the distinction in interpretations then might be considered a difference of current structural forces versus past structural forces. From the standpoint of policy makers, however, the implications of health behavior interpretations directly reflect agentic interpretations.

three possible deviations along the causal pathway suggest that dismissing stress as an important factor on the grounds of gender difference is insufficient.

Although empirical evidence on gendered differences in the causal chain described is scarce, Watson (1995) theoretically outlines how gender mattered during the transition from communism in a way that might explain greater increases in deaths for men. Specifically, the different value placed on core social roles for men and women in post-communist societies leaves men particularly vulnerable to adaptive breakdown in the face of economic and labor market disruption. The reservations outlined, in regards to the interpretation of gendered differences, highlight the need for further research on many areas of the causal pathway leading from context to poor health. Moreover, they indicate the ways in which studying men and women together might aid interpretations.

Finally, I locate this discussion of psychosocial causes in the lively debate on the social determinants of health. Wilkinson's (1996) thesis of psychosocial causes of mortality and poor health has been met with much resistance (Lynch, Smith, Kaplan, & House, 2000; Muntaner, & Lynch, 1998; Navarro, 2002). These critics argue that health inequalities result from differential access to resources and that these differences arise according to the political context; moreover, the concept of psychosocial factors is argued to shift the responsibility of health to the social and civic realm rather than the political realm (Szreter & Woolcock, 2004). Wilkinson's use of the psychosocial relies on a social capital perspective and the impact of low status and lack of social cohesion on health. In contrast, "psychosocial" stress in the post-communist mortality debate is based on the experience of an extreme asymmetry between the demands of a situation and what is on hand in the environment to meet the demands. The importance of the political context is affirmed in this research, even as it confirms the psychosocial over the material causal mechanism. However, there are many links to be verified along the path from political context to demographic change. It is my intention to establish a relationship that covers only a few of those links: the fiscal and labor market outcomes to longevity decline.

In summary, this discussion has suggested that there may be great scope for research that explicitly addresses how stress and alcohol consumption may have interacted during the transition from communism. Moreover, including contextual variation in analyses of mortality is important in order to interpret individual-level variation in death rates. Therefore, macro-data analysis of contextual and mortality variation may augment the debate over the mortality crisis, particularly if both major explanations can be taken into consideration. Of course the macro-data analysis strategy does not allow us to gain a clearer understanding of specific causal mechanisms at work in the mortality crisis, but given that the main goal of this chapter is to demonstrate the importance of both context and agency perspectives in the mortality debate, this strategy is best suited to the analytic goals.

3.3 Descriptive evidence

This section sets the stage for an empirical analysis of the economic context and increased mortality by presenting descriptive information about the intensity and duration of mortality crises across the post-communist region. The countries covered in this analysis are all the countries of the former Soviet Union (including the Central Asian Republics, the Caucasus, Belarus, Moldova, Russia and Ukraine) and Central and Eastern Europe. Not included in the analysis are the former East Germany, Albania and the countries of the former Yugoslavia due to missing or incomparable data. I use WHO's European Health for All aggregated and standardized death rates, as well as UNICEF's TransMonee data.

First, I search for meaningful differences in the mortality trajectories across the region. To create a comprehensive picture of mortality, I focus on the intensity of mortality rates and the trajectories of change in mortality rates. On the basis of descriptive information, I highlight the

main trends in mortality trajectories and distinguish among the countries of this region. Observing the slope of change in mortality rates, particularly from 1990 to 2003, very different patterns emerge. Three main mortality patterns emerge across the post-communist countries according to 1) the extent of increase in mortality rates, 2) when the changes occurred, and 3) if/when pre-transition rates were again achieved. On the basis of these divergences in slopes, I constructed a typology that identifies the trajectory characteristics of these countries. The three types are displayed according to standardized death rates (SDR).

Transition Type 1 (Figure 3.1) includes countries where mortality increases were minimal (an increase of less than 200 deaths per 100,000) after the transition and increases generally occurred only for a very short time period (1-2 years). Moreover, this group is characterized by mortality rates that have since decreased below pre-transition levels (Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovakia and Slovenia). The variation within this group is mostly related to the timing of the mortality increases; Romania's and Bulgaria's mortality peaks occurred in 1996 and 1997, respectively, rather than in the first few years of transition. Transition Type 2 (Figure 3.2) includes countries in which mortality increased more dramatically (from over 100-400 extra deaths per 100,000) in 1991 or 1992 and for a longer period of time (elevated rates lasting around 5 years). However, mortality rates reversed and consistently decreased below pre-transition levels, or very near, in this group (Armenia, Azerbaijan, Estonia, Georgia, Latvia, Lithuania, Tajikistan and Uzbekistan).

Transition Type 3 (Figure 3.3) countries experienced the most severe crisis, in which mortality also increased dramatically (200-450 extra deaths per 100,000 from 1991 levels), but either the first mortality crisis was followed by a second crisis or rates simply never recovered to levels anywhere near pre-transition levels by 2003 (Belarus, Kazakhstan, Kyrgyzstan, Republic of Moldova, Russia and Ukraine). This group of countries shares an additional characteristic that was not part of the selection criteria, yet emerges as a difference in the typology: the mortality rates before the transition occurred in these countries was remarkably unstable. All Type 3 countries show a decline in mortality rates from 1980-1982, followed by a minor increase until 1985. In 1985, Gorbachev's anti-alcohol campaign was initiated, resulting in a decrease in deaths in 1986, followed by stability or a slow increase again until 1990. Although none of these fluctuations resemble the dramatic increases during the 1990s, it is worth noting they existed in such a uniform manner across this country group. Other countries of the Soviet Union that fall into Type 2 also show fluctuations in mortality rates before 1990; however, not uniformly. The Baltic States all reflect this pattern, but the Caucasus, as well as Tajikistan and Uzbekistan do not.

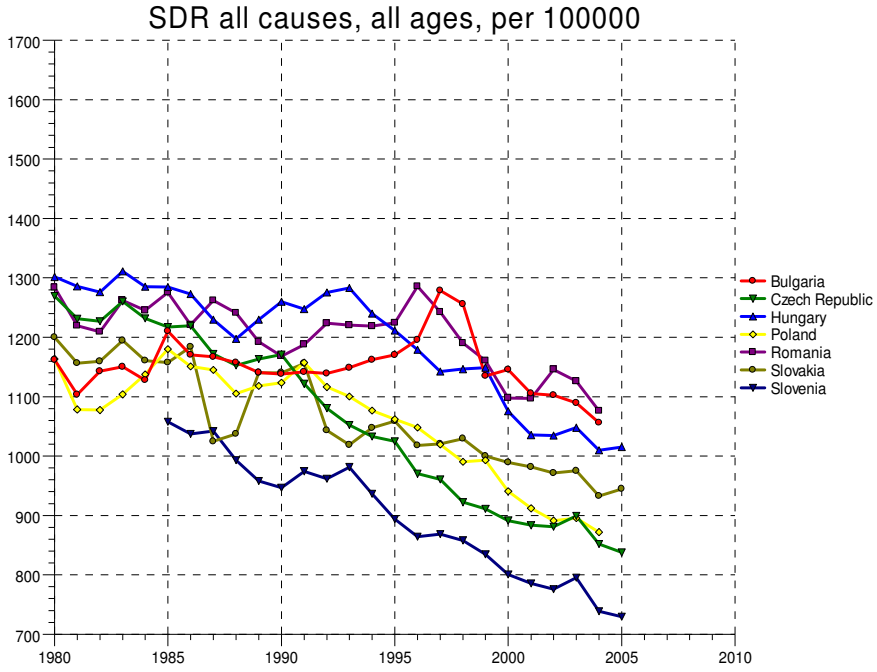


Figure 3.1 Transition Type 1 standardized death rates
Notes: Y-Axis represents SDR per 100000, X-Axis represents the year for which the data was taken. Source is WHO-HFA database.

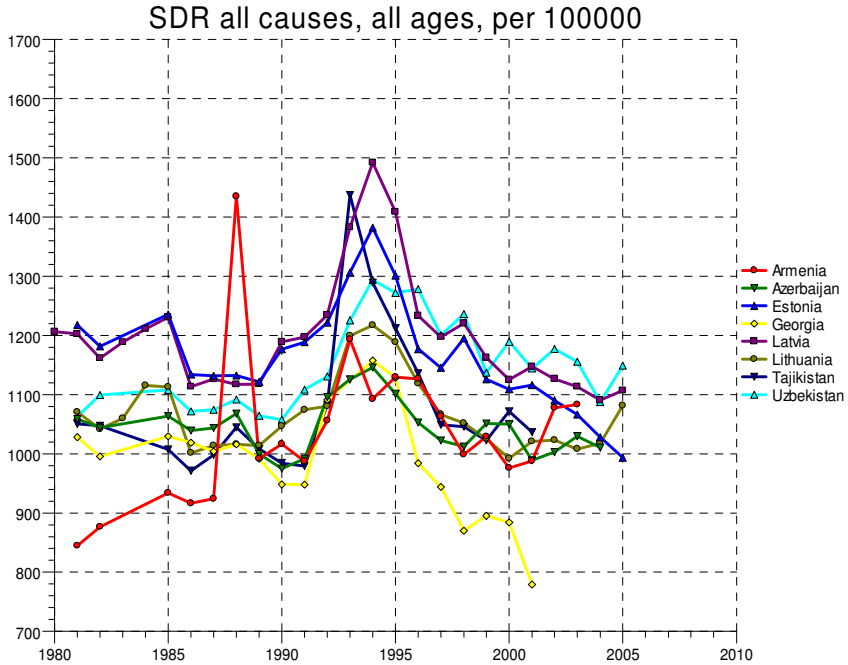


Figure 3.2 Transition Type 2 standardized death rates
Notes: Y-Axis represents SDR per 100000, X-Axis represents the year for which the data was taken. Source is WHO-HFA database.

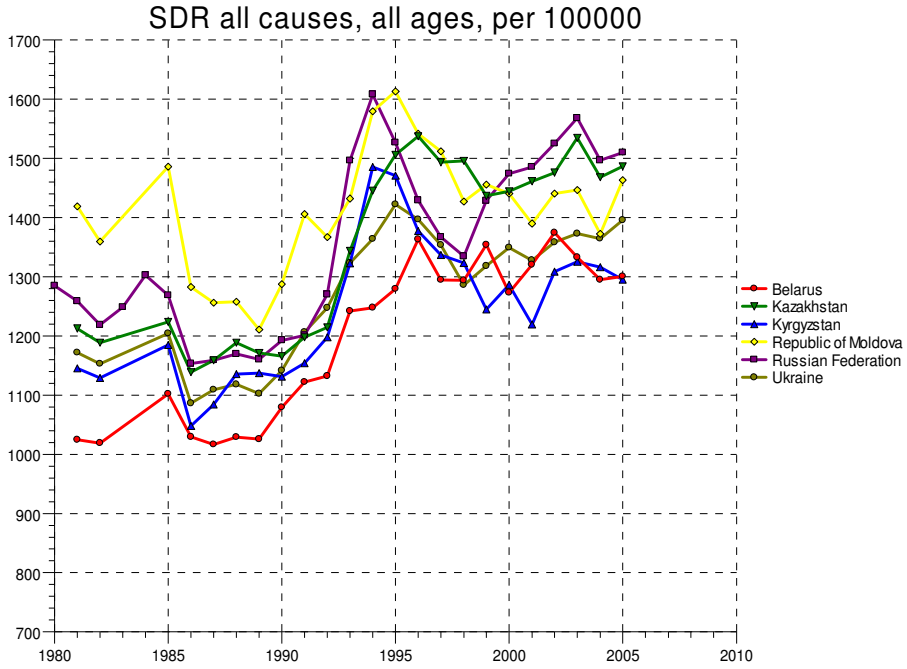


Figure 3.3 Transition Type 3 standardized death rates
Notes: Y-Axis represents SDR per 100000, X-Axis represents the year for which the data was taken. Source is WHO-HFA database.

The next part of this descriptive analysis focuses on age differences in the increasing mortality rates. The majority of countries did not experience a mortality crisis within the populations usually afflicted by economic crises. Maternal and infant mortality rate increases were almost nonexistent across most of the region and only minimal in the Central Asian Republics (CAR) and Caucasus, which were likely due to disintegrating health care systems in the CAR (European Observatory on Health Care Systems 2002; Veneema 2000). Likewise, the elderly population does not appear to have been as afflicted as the working-age population. Figure 3.4 reveals mortality trajectories according to each Transition Type and by specific age groups for both men and women. Due to the overwhelming increase in male mortality rates, female mortality rates are often overlooked, although they significantly increased as well in some countries. In fact, without any decline over the decades of communism—in contrast to male life expectancy in some areas of the former Soviet Union—female life expectancy declined in Russia from 74.5 years in 1989 to 71.1 years in 1994, yielding a non-negligible decline in life expectancy of 3.4 years.

Because there is great variation between the death rates of males and females, as well as death rates by age, the scales for each age group within Figure 3.4 are different. What is important to note is the consistency of differences among the Transition Types in mortality trajectories by age group and sex. Transition Type 1 countries show a consistent and gradual, slightly downward slope for men and women of all age groups. Type 2 countries show an increase in death rates for men and women of all age groups only in the first half of the 1990s, except for death rates of females 25-39 years old in which the decline was less consistent in the late 1990s. Type 3 countries consistently experienced their first peak in mortality a year after Type 2 countries. They also show some leveling of rates in the mid 1990s and a second increase for men and women of all age groups, albeit a very minor and late increase for females in the 40-59 age group. Despite the heavy focus on middle-aged men in the research, therefore, there is evidence that what impacted working-aged men's health and longevity also appears to have impacted women and men of other age groups similarly from a temporal perspective. These similar trends according to timing distinctly point to an importance of contextual conditions.

The most important increases in mortality—in regards to an age group's contribution to total increases in mortality rates—occurred for men and women between the ages of 40-59. Whereas the greatest increase according to the Transition Types was less than 300 for the 25-39 year old men (less than 60 for these women), an increase of almost 700 deaths per 100,000 occurred for 40-59 year old men (almost 200 for women) during the 1990s. However, if we look at percent increases from 1990 to the year mortality first peaked, a few differences emerge. Whereas Type 2 men aged 40-59 experienced a 33% increase and Type 3 a 45% increase, Type 2 men aged 25-39 experienced a 78% increase and Type 3 a 58% increase. Therefore, death rates of men aged 25-39 deviated more from their 1990 level in both Type 2 and 3 countries than men aged 40-59. The same finding applies to women aged 25-39 of Type 2 and 3 countries. So although it is true that the most excess deaths in this time period were in the 40-59 year old age group, the 25-39 age group is equally as interesting to study.

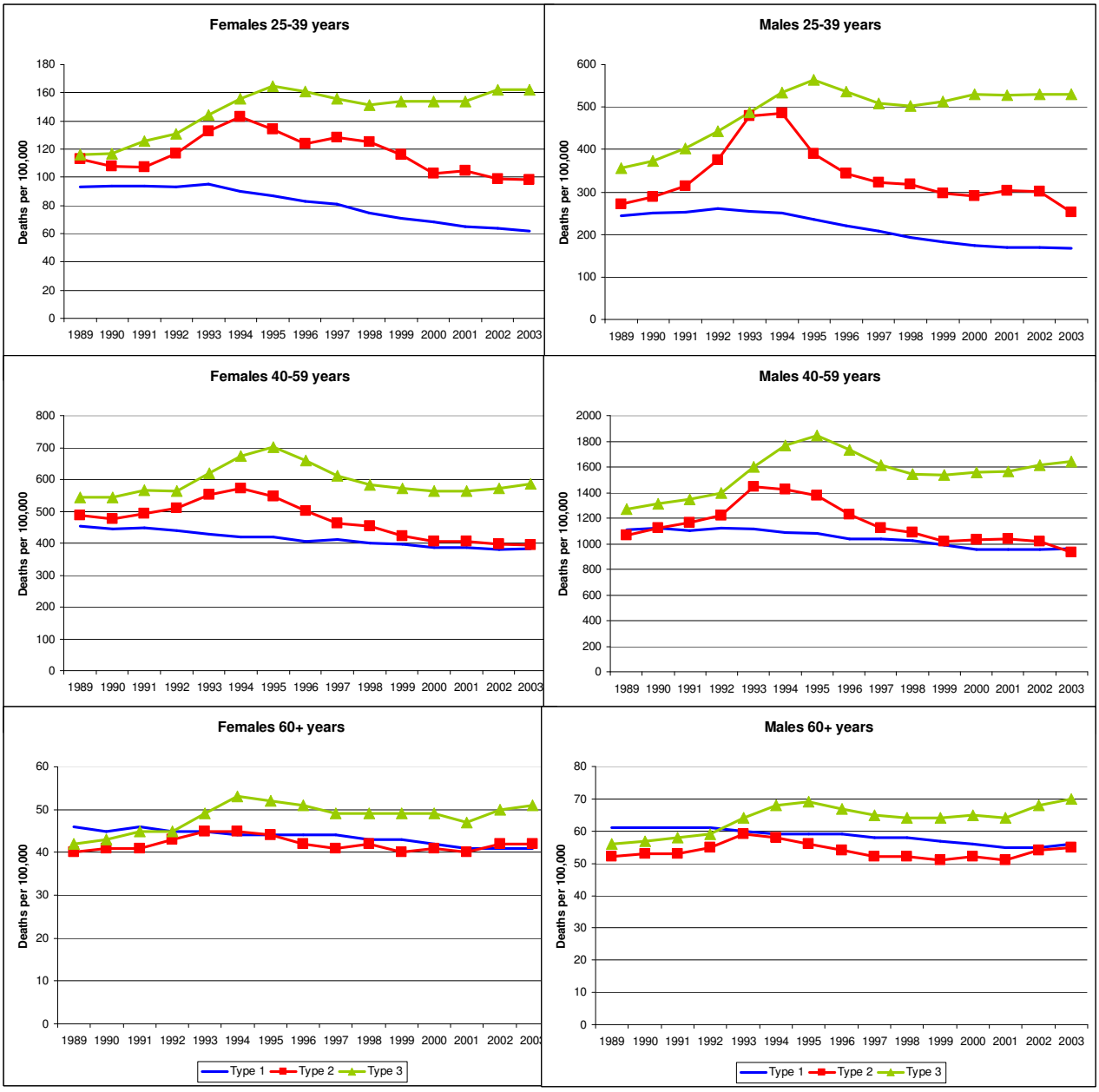


Figure 3.4 Average mortality rates by age group, according to each Transition Type
Notes: Transition Type 1 includes Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovakia and Slovenia. Transition Type 2 includes Armenia, Azerbaijan, Estonia, Georgia, Latvia, Lithuania, Tajikistan and Uzbekistan. Type 3 includes Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russia and the Ukraine. Death rates are all per 100,000 population.

Now that a consistent pattern of mortality trajectories emerges across the three different Transition Types, I explore contextual indicators to see whether differential patterns appear in them as well. Significant differences in the contextual factors according to the typology will both confirm the saliency of the typology and give a first indication of important covariates to consider. Figures 3.5 to 3.8 display Transition Type averages for selected economic indicators over the course of market reform. First, for visual comparisons, I present life expectancy at birth for males according to Transition Type. The economic indicators reviewed are GDP growth, real average wages and inflation.

As expected, differences among the means of the three groups are consistently noticeable across time. Life expectancy at birth for males (Figure 3.5) shows a divergence particularly after 1992 and a convergence for Transition Type 1 and Transition Type 2 beginning in 1995. This convergence was never completed though because life expectancy in Transition Type 2 countries began to increase at more or less the same rate as Transition Type 1 countries following 1997. The Transition Type averages in Figure 3.6 show that all countries experienced a decline in GDP growth in the first years of transition, but the Transition Type 1 countries began to recover by 1992. This divergence continued until 1995/1996 at which time Transition Type 2 and 3 countries began to recover and their average GDP growth began approaching Transition Type 1 countries. By 1998, countries in the Transition Type 2 group pulled ahead of Transition Type 3 countries in GDP growth and performed slightly better than Type 3 countries for the remainder of years shown here. Average real wages (Figure 3.7) depict a similar picture in which the initial unanimous decline in real wages diverged in 1992 by recovery for Transition Type 1 countries. Although the decline in real wages was more dramatic for Transition Type 2 than Type 3 countries, these declines ceased two years earlier for Transition Type 2 than Type 3 countries and the significant variation in real wage levels according to the three types lessened throughout the 2000s. Finally, inflation averages (Figure 3.8) by Transition Type show extreme increases for both Transition Type 2 and 3 countries, of which Type 2 reached the greatest heights in the early 1990s, but almost complete recovery occurred for all types by 1996.

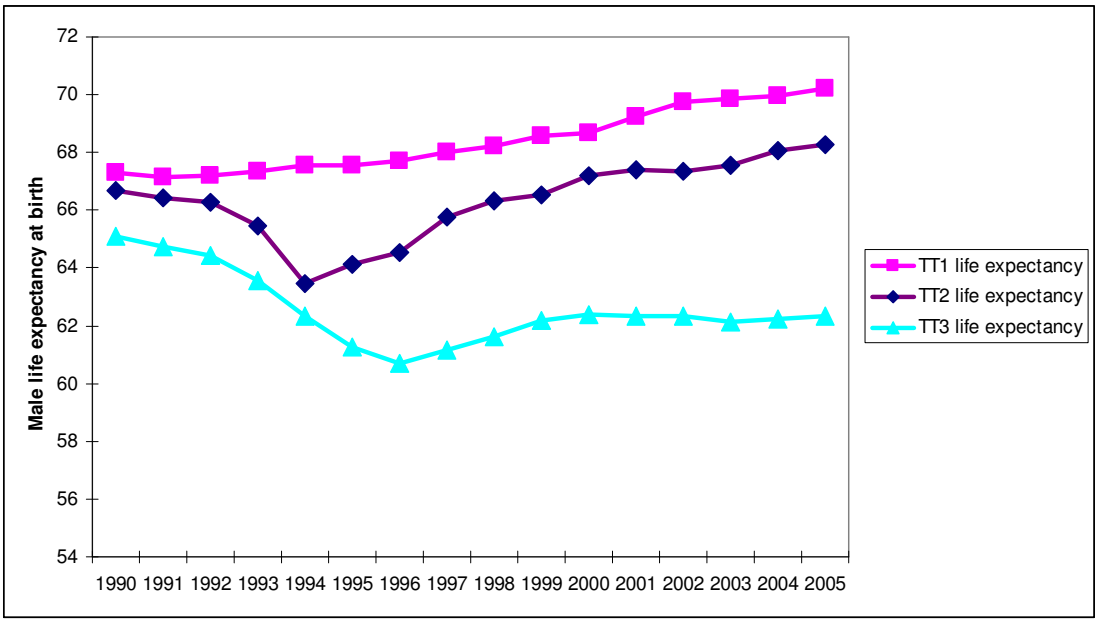


Figure 3.5 Life expectancy at birth for males, according to Transition Type
Note: Author's calculations based on UNICEF's TransMonee data. Countries**:** Transition Type 1—Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovakia, and Slovenia. Transition Type 2—Armenia, Azerbaijan, Estonia, Georgia, Latvia, Lithuania, Tajikistan and Uzbekistan. Transition Type 3—Belarus, Kazakhstan, Kyrgyzstan, Republic of Moldova, Russian Federation and Ukraine. Data sources: IMF World Economic Outlook 2000 and 2003, TransMonee Database 2004 and WHO-HFA database.

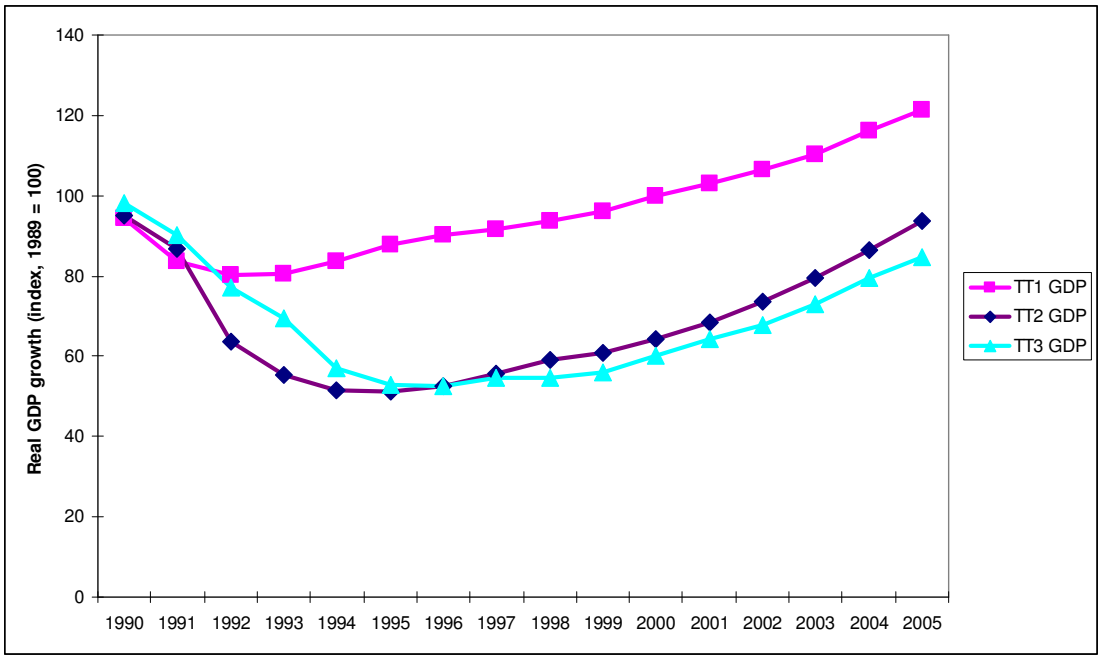


Figure 3.6 GDP growth, according to Transition Type
Note: Author's calculations based on UNICEF's TransMonee data.

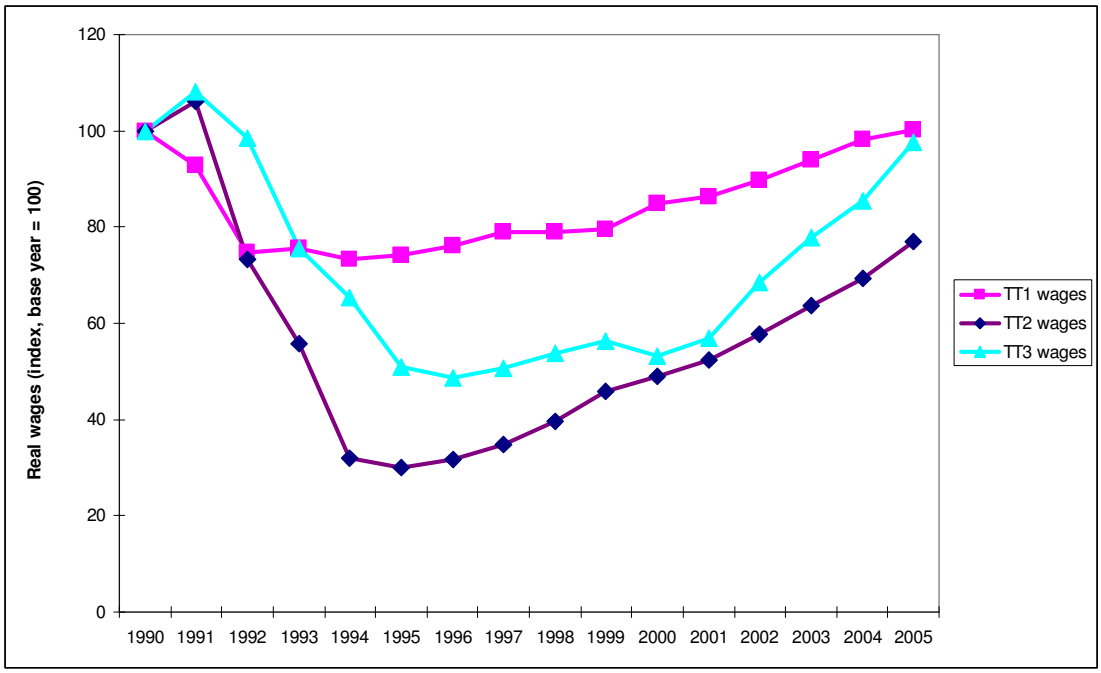


Figure 3.7 Real wages, according to Transition Type
Note: Author's calculations based on UNICEF's TransMonee data.

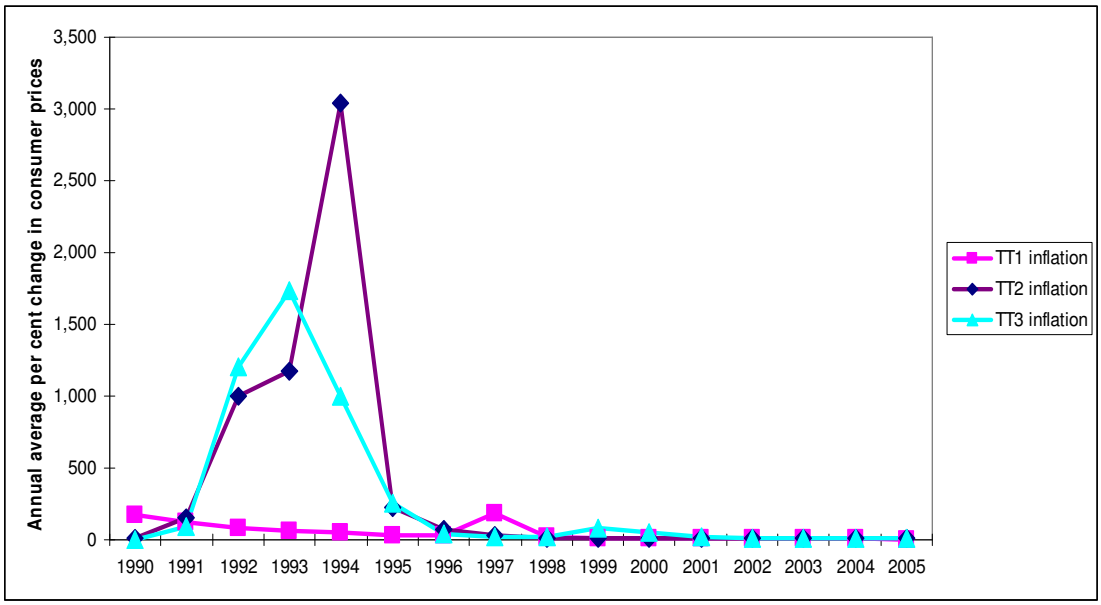


Figure 3.8 Inflation, according to Transition Type
Note: Author's calculations based on UNICEF's TransMonee data.

In summary, the CEE countries of Transition Type 1 outperform both Types 2 and 3 in terms of lower inflation and higher wage and GDP growth. This is what we would expect to see if a better economic context was important to maintain stable mortality rates. Therefore, at first glance, a link exists between poor economic performance and increased mortality rates. Because meaningful differences appear to exist among the Transition Types, I conduct a statistical analysis to confirm these differences, as well as indicate whether the link between death rates and economic context is plausible. The analysis will also identify which indicators, including those described above, have the strongest relationships with increasing mortality.

3.4 Regression analyses: Data, method and results

I use cross-sectional time-series data constructed from aggregate level indicators taken from the WHO's European Health for All database, UNICEF's TransMonee database, the IMF's World Economic Outlook 2000 and 2003, and the ILO. The sample of this analysis includes as many of the post-communist states considered in the descriptive analyses as the data allows, for the period of 1990-2003. This includes Armenia, Azerbaijan, Bulgaria, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Lithuania, Poland, Moldova, Romania, Russia, Slovakia, Slovenia, Tajikistan, Ukraine and Uzbekistan.[32]

Before describing the variables and model, I first present and justify the analytical strategy shaping this analysis. If stress originating in economic instability is an important factor, those who are responsible for supporting the household and dependents should have experienced more stress from the transition than those who are retired and no longer participate in the labor force or directly provide for dependents. Therefore, being able to separate working-age adults from those who are of retirement age is important. If factors related to being in the labor market were important, we should see a relationship emerge that is particularly strong between economic indicators and working-aged adults; we should see less of an impact of economic and labor market conditions on mortality rates of the 65+ population. Therefore, step one of the analysis is to assess the impact of economic indicators on different age groups, which will highlight the

[32] Because of conflict during the early years of transition, Azerbaijan, Georgia and Tajikistan were removed for those regressions in which deaths due to conflict might inflate the number, in order to test whether the results are robust beyond the inclusion of these countries.

nature of these relationships. For the dependent variable, this step makes use of disaggregated mortality data for men and women by age: 25-39, 40-59, and 60 years or older. Step two is to restrict the dependent variable to the causes of death that have been particularly linked to alcohol consumption in the literature: deaths due to circulatory diseases, external causes (including accidents and homicide) and suicide. Only men and women below the age of 65 are included in these analyses to narrow the focus to premature deaths during the life course stage in which labor market involvement can be assumed and, hence, a stress and alcohol consumption link would be more likely. This section is aimed at explicitly connecting economic conditions to harmful alcohol consumption, even though these causes of death may also be unrelated to alcohol consumption. These causes are, in either case, still likely to be influenced by stress.

What this strategy and analysis cannot take into consideration directly are long-term causes of health decline in the region. So, although long-term exposure to unhealthy lifestyles or effort-reward imbalances during the Soviet era may contribute to mortality, this analysis is only able to capture changes in death rates that are immediately related to previous contextual elements. Therefore, results are limited to demonstrating whether stress brought on by rapid economic transition and stress-related alcohol consumption are related to increasing mortality rates. However, given the critical juncture in mortality rates early in the transition experience, short-term causes are worth investigating. Moreover, one benefit of studying a range of countries that share a similar history or legacy is that certain permanent characteristics are held constant. By analyzing the post-communist countries together and across time, since the beginning of the 1990s, the Soviet inheritance in Type 2 and Type 3 countries are taken as fixed effects and any systematic variation according to contextual elements may be considered net of the original propensity for destructive lifestyles that the Soviet regime may have fostered.

Both of these steps are implemented using a stepwise regression. First, only an indicator that captures whether the country belongs to Transition Type 1, 2 or 3 is entered into the model to see the straightforward impact of this division. The sample of countries analyzed represents the three groups of countries according to the Transition Typology, allowing the maximum variance in the extent and trajectories of mortality rates: Type 1=7 countries, Type 2=7 countries, Type 3=5 countries. On the basis of the descriptive evidence, we should expect to see that belonging to Type 2 and 3 groups increases mortality for all indicators relative to Type 1 countries; moreover, Type 3 membership should increase mortality more than Type 2. This step of the modeling is merely to statistically confirm significant differences in mortality trajectories across the region and set the stage to see whether economic indicators can explain the differences among the three groups. Hence, the second model introduces economic variables, described below, to assess how they modify the impact of membership to Type 2 and 3. Moreover, the economic variables should impact each respective mortality rate according to the direction of economic improvement. If stress-inducing factors are represented by the economic indicators and stress matters to the death rates studied, the dummy variable for the Transition Type should become statistically insignificant or reduce in magnitude. Coefficients that remain statistically significant after the adjustment of economic context indicate other meaningful characteristics of the Transition Type countries.

The first set of dependent variables, related to the age expectations, are death rates for the age groups of 25-39, 40-59 and 60+ per 100,000 male or female populations. The second group of dependent variables encompasses deaths due to circulatory related causes, external causes and suicide per 100,000 male or female populations less than 65 years old. All mortality rates are adjusted to follow the independent variables by one year,[33] as the change in contextual conditions must precede the increase in mortality in order for causality to be established. This time lag adjustment ensures a uni-directional relationship between economic performance and mortality. Endogeneity ought not to be an issue in this analysis in any case. Kontorovich (2001) tested the endogeneity hypothesis in regards to mortality and concluded that the increase in

[33] Longer time lags did not prove to be necessary.

mortality was the effect and not the cause of the economic recession.

a) Independent variables

The independent variables that are included in the models to capture the economic context are (log)inflation, employment growth, wage growth, GDP and the transition Type to which a country belongs. Employment growth measures yearly changes in the number of people employed. The choice to use employment growth instead of unemployment rates was due to availability and to measurement problems in unemployment data. Unemployment statistics are offered only sporadically, only for some countries and usually for registered unemployment. This is problematic as registered unemployment may not capture all unemployment since people are less likely to register themselves as unemployed once unemployment benefits expire, generally between 6-12 months (Barr 2001). The relationship between unemployment and mortality at the micro-level has been established for a diverse range of countries (see Blazek and Dzúrová 2000 for Czech Republic; Cornia 2000 for Russia; Krumins and Usackis 2000 for Latvia; Riphan and Zimmerman 2000 for the former GDR; Abdala, Geldstein and Mychaszula 2000 for Argentina). The impact of decreased wages and increased inflation may amplify the stress related to economic survival. This includes the difficulty of purchasing needs due to inflation. Current values of the price index have also been argued to measure "worsening expectations about future living standards" (Cornia and Paniccia 1998, p. 236).

For employment growth, as well as real average wage growth, the indicator is an index based on the value of 100 at the base year. Real average wage growth represents the value of wages and proxies for the quantity of goods and services the wage can buy.

GDP (PPP) per capita is often used as an important control variable, but in this model it is theoretically important as well because it captures the impact of relative changes, in a temporal sense, in the greater economic context as it is transformed to an indicator of the difference between the current and the previous year's GDP. In Brainerd and Cutler's study (2005), GDP was excluded as they hoped to capture the impact of the independent variables in all of their power, rather than net of the financial situation. In this analysis, the changes in GDP are argued to represent the greater economic context of the post-communist transition.

b) Model

Durbin's M-test indicated that there is autocorrelation in my dependent variables. To remedy this, I fit the cross-sectional time-series regression models according to a first-order autoregressive disturbance term. This specification, implementing methods derived from Baltagi and Wu (1999) can accommodate unbalanced panels in which observations are unequally spaced over time. The model, therefore, is a cross-sectional time-series linear models using feasible generalized least squares. The model also uses random-effects. Cross-sectional time series methods control for unobserved individual effects in the data and the random effects model assumes that the unobservables are not correlated with the explanatory variables. The Hausman test ensured that the random-effects model fits the data in this analysis. One advantage of using a random effects model is that it allows for time invariant variables, which means that the model can accommodate dummy variables for Transition Types. The random-effects model is also a more efficient estimator and, therefore, gives more accurate p-values. Finally, the random-effects model deals with small *t* better, which is important for this sample since it includes only 13 years but 19 countries. The model can be formally written as the following:

$y_{it} = a + Bx_{it} + u_i + e_{it}$, in which the u_i are independent of the x_{it}, and where

$e_{it} = rho * e_{i, t-1} + z_{it}$, in which $|rho| < 1$ and z_{it} is independent and identically distributed.

c) Results

In the results of models using age-specific mortality as the dependent variable (Tables 3.1 and 3.2), membership in Transition Type 3 rather than Type 1 proved to be highly statistically significant and had a large impact. This impact was much greater for men's mortality than women's, except for mortality rates of the population over the age of 60, which was more or less similar. Belonging to Transition Type 2 rather than Type 1 proved to generally increase mortality rates as well, although this coefficient was not statistically significant for men or women aged 40-59. The impact was negative, however, for both women and men aged 60 years or more and was only statistically significant for men. The finding that belonging to Type 3 rather than Type 2 approximately doubles—or more—the average number of deaths per year, in relation to Type 1, for all age groups, sexes and causes of death is strong evidence that consistently different mortality profiles characterize these three country groups. Moreover, the countries that have not returned to pre-transition death rates, Type 3, had dramatically higher mortality on average each year.

The second model, in which all the economic indicators were introduced, yielded results in which the impact of Transition Type was attenuated but remained statistically significant in the cases in which it had been significant in the first model. For men 25-39 years old, the coefficient for belonging to Transition Type 3 reduced from 312 more deaths per 100,000 to 282 on average; for men 40-59 the change was from 582 to 525 deaths and for men over 60 the change was from 8 to 7 deaths. For women, the corresponding differences are the following: 25-39 years old: 81 to 74 deaths; 40-59 years old: 203 to 189 deaths; over 60 years old: 7 to 6 deaths. The reduction in deaths for Transition Type 2 countries, when statistically significant, was from 127 to 90 deaths for the 25-39 year old men and from 39 to 28 deaths for the 25-39 year old women. Contrary to expectations, belonging to Type 2 instead of Type 1 decreased the number of deaths of the 60 year old or the older male population.

In regards to the specific effect of the economic indicators, differences emerged across age groups and sex. Inflation increased death rates across all age groups for men and had the largest impact for men in the 40-59 year old age group. This was the only statistically significant coefficient in the results for men 25-39 years old. All other results for men in the 40-59 and 60 years or older age groups were statistically significant, at least at the 10% level, and many were highly significant (1% level of confidence). Moreover, all indicators impacted mortality rates in the expected directions: increases in GDP per capita, employment growth and wage growth all decreased mortality. The greatest of these impacts was for men 40-59, the demographic group of most interest.

The results for women's age-specific mortality indicate that mortality across all age groups decreased when GDP increased and the largest impact was for women aged 40-59. Likewise, wage growth decreased mortality, but these results were not statistically significant for women aged 40-59 although they were in the expected direction. Inflation increased mortality and the effect was greatest for women aged 40-59, but not statistically significant for women aged 25-39. The effect of employment growth on mortality was negative for women ages 40-59 and over 60, but these results were not statistically significant.

Table 3.1 Regression results of men's age-specific mortality rates and economic indicators

Cross-sectional Time-series analysis with Random Effects and AR(1) Disturbances

Men						
	25-39		40-59		60+	
Transition Type 2	127.063***	90.922**	68.038	3.614	-4.802*	-5.820**
	(45.68)	(44.93)	(135.17)	(122.12)	(2.48)	(2.25)
Transition Type 3	311.900***	282.399***	581.75***	525.025***	8.111***	7.204***
	(49.74)	(47.34)	(147.56)	(130.95)	(2.71)	(2.39)
D.GDP per capita		-.008		-.025**		-.001**
		(.00)		(.01)		(.000)
(log)inflation		10.000***		32.665***		.387**
		(3.58)		(7.24)		(.16)
employment growth		.205		-3.272*		-.104**
		(.91)		(1.94)		(.04)
wage growth		-.517		-1.139*		-.027*
		(.32)		(.66)		(.015)
constant		209.138***		1311.74***		67.614***
		(77.42)		(174.43)		(3.75)
number of obs	188	188	188	188	188	188
number of groups	19	19	19	19	19	19
prob>chi2	.0000	.0000	.0005	.0000	.0000	.0000
rho_ar	.385	.282	.676	.545	.676	.691

Notes: Significance levels indicated by *=p<0.10, **=p< 0.05, ***=p<0.01. Transition Type 1 (Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovakia, Slovenia) is the reference category for the Transition Type 2 (Armenia, Azerbaijan, Estonia, Georgia, Lithuania, Tajikistan, Uzbekistan) and Type 3 (Kazakhstan, Kyrgyzstan, Moldova, Russia, Ukraine) coefficients.

Table 3.2 Regression results of women's age-specific mortality rates and economic indicators

Cross-sectional Time-series analysis with Random Effects and AR(1) Disturbances

	Women					
	25-39		40-59		60+	
Transition Type 2	39.143***	28.485**	51.383	32.957	-.992	-2.250
	(12.89)	(12.24)	(34.84)	(34.56)	(1.62)	(1.60)
Transition Type 3	81.42***	74.27***	203.018***	188.785***	6.912***	5.951***
	(14.07)	(13.11)	(37.92)	(36.90)	(1.76)	(1.69)
D.GDP per capita		-.002*		-.007**		-.001**
		(.001)		(.003)		(.000)
(log)inflation		1.123		8.644***		.292**
		(.74)		(2.255)		(.12)
employment growth		.023		-.365		-.027
		(.20)		(.62)		(.03)
wage growth		-.248***		-.308		-.024**
		(.07)		(.20)		(.01)
constant		93.927***		441.653***		46.585***
		(18.22)		(55.54)		(2.70)
number of obs	187	187	188	188	188	188
number of groups	19	19	19	19	19	19
prob>chi2	.0000	.0000	.0000	.0000	.0000	.0000
rho_ar	.708	.687	.819	.758	.668	.611

Notes: Significance levels indicated by *=p<0.10, **=p< 0.05, ***=p<0.01. Transition Type 1 (Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovakia) is the reference category for the Transition Type 2 (Armenia, Azerbaijan, Estonia, Georgia, Lithuania, Tajikistan, Uzbekistan) and Type 3 (Kazakhstan, Kyrgyzstan, Moldova, Russia, Ukraine) coefficients.

In Tables 3.3 and 3.4, the regression results of mortality rates by cause of death are reported. As in the previous models, membership to Transition Type 3 in general showed higher mortality rates, relative to Type 1 than Type 2 membership for men and women. However, the effect of the Transition Type dummies was not statistically significant for deaths due to suicides for men or women. Moreover, only the coefficients for Type 3 membership were statistically significant for external causes of death for men and women. In other words, the Transition Typology appears to meaningfully differentiate among these countries for deaths due to circulatory diseases, partly for external causes of death and not at all for deaths due to suicide. Where membership in the Transition Types did matter, introducing economic indicators in the second model again minimized the effect of Transition Type.

For men, all economic indicators had a statistically significant effect on deaths due to circulatory diseases and these relationships were in the expected direction. Inflation increased deaths due to external causes as well, but this was the only statistically significant economic effect in the model for external causes of death. Both GDP growth and wage growth decreased deaths due to suicide for men.

The results for women's cause-specific mortality models are similar. While wage growth decreased circulatory-related deaths, inflation increased them. Inflation had a lesser but

statistically significant effect on external causes of death, but in this model GDP growth also decreased deaths. For deaths due to suicide, both GDP and wage growth decreased women's suicide rates, whereas employment growth increased suicide rates. This finding is unexpected and is highly statistically significant.

Table 3.3 Regression results of men's cause-specific mortality rates and economic indicators

Cross-sectional Time-series analysis with Random Effects and AR(1) Disturbances

Men, less than 65 years old						
	circulatory		external		suicide	
Transition Type 2	49.629**	35.617	48.227	36.764	-3.800	-6.868
	(24.03)	(22.84)	(33.06)	(31.19)	(10.10)	(9.09)
Transition Type 3	121.404***	111.067***	142.748***	129.506***	15.395	13.33
	(26.27)	(24.59)	(36.11)	(33.20)	(11.07)	(9.92)
D.GDP per capita		-.003*		-.005		-.001***
		(.002)		(.004)		(.000)
(log)inflation		5.111***		7.860***		.158
		(1.22)		(2.08)		(.21)
employment growth		-.814**		-.320		-.057
		(.35)		(.55)		(.06)
wage growth		-.403***		-.042		-.082***
		(.11)		(.19)		(.02)
constant		280.393***		105.593**		38.651***
		(32.09)		(47.92)		(8.10)
number of obs	189	189	189	189	189	189
number of groups	19	19	19	19	19	19
prob>chi2	.0001	.0000	.0013	.0000	.3578	.0000
rho_ar	.794	.748	.378	.250	.713	.692

Notes: Significance levels indicated by *=p<0.10, **=p< 0.05, ***=p<0.01. Transition Type 1 (Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovakia) is the reference category for the Transition Type 2 (Armenia, Azerbaijan, Estonia, Georgia, Lithuania, Tajikistan, Uzbekistan) and Type 3 (Kazakhstan, Kyrgyzstan, Moldova, Russia, Ukraine) coefficients.

Table 3.4 Regression results of women's cause-specific mortality rates and economic indicators

Cross-sectional Time-series analysis with Random Effects and AR(1) Disturbances

Women, less than 65 years old						
	circulatory		external		suicide	
Transition Type 2	36.762***	28.220**	6.734	3.243	-1.62	-2.317
	(12.12)	(10.89)	(6.65)	(6.46)	(1.73)	(1.52)
Transition Type 3	64.890***	59.425***	31.919***	28.886***	.999	.524
	(13.26)	(11.78)	(7.27)	(6.98)	(1.90)	(1.65)
D.GDP per capita		-.001		-.002***		-.0002*
		(.00)		(.001)		(.000)
(log)inflation		2.086***		.804***		.073
		(.49)		(.30)		(.05)
employment growth		-.119		.015		.040***
		(.14)		(.08)		(.01)
wage growth		-.211***		-.045 (.03)		-.009*
		(.05)				(.004)
constant		91.875***		23.61***		3.222**
		(13.60)		(7.88)		(1.57)
number of obs	189	189	189	189	189	189
number of groups	19	19	19	19	19	19
prob>chi2	.0000	.0000	.0001	.0000	.5655	.0011
rho_ar	.799	.728	.602	.479	.658	.522

Notes: Significance levels indicated by *=p<0.10, **=p< 0.05, ***=p<0.01. Transition Type 1 (Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovakia) is the reference category for the Transition Type 2 (Armenia, Azerbaijan, Estonia, Georgia, Lithuania, Tajikistan, Uzbekistan) and Type 3 (Kazakhstan, Kyrgyzstan, Moldova, Russia, Ukraine) coefficients.

Finally, the models in which the dependent variables were men's mortality of age groups 25-39 and 40-59, as well as men's mortality due to external causes of death, were restricted to countries that did not experience conflict resulting in many deaths.[34] This exclusion includes Azerbaijan, Georgia and Tajikistan, which are all countries of Transition Type 2. Although some effects in these additional models are altered, as well as the level of statistical significance, the general findings of the previous models remain robust even with a smaller sample. Specifically, not including these countries dramatically increased the coefficient of membership in Transition Type 2 for men aged 40-59, but did not increase the confidence level of this coefficient. Also for this age group, the impact of employment growth became stronger when these countries were removed and became highly statistically significant: the decrease in deaths expanded from 3 to 5 deaths. For younger men, the impact of inflation lessened when conflict countries were excluded, while the effect of wage growth became stronger. Both the coefficients of wage and GDP growth became more statistically significant as well. In regards to deaths of men to external causes, restricting the sample increased the effect of belonging to Transition Type 2, making it significant. Moreover, the coefficients for wage growth and GDP became statistically significant and the impact of wage growth grew stronger. However, the impact of inflation lessened.

[34] Results available upon request.

3.5 Discussion

The results of the descriptive analysis indicated three different mortality trajectories among post-communist countries: The countries of Central and Eastern Europe experienced minimal increases in mortality and were grouped into Transition Type 1. Type 2 countries experienced more serious mortality increases and include the Baltic States, the Caucasus and two CARs (Tajikistan and Uzbekistan). The remaining countries (Belarus, Kazakhstan, Kyrgyzstan, Russia, Moldova and Ukraine) form Type 3 and displayed even more intense increases in mortality in the 1990s. Type 3 countries have not achieved the mortality levels that existed during the Soviet Union. Other descriptive evidence confirms what we know from the literature: men of later working-aged years experienced the most severe increase in mortality rates. However, increases in mortality at all ages, as well as for women, demonstrate important increases. Importantly, these increases were consistent with all three types across demographic groups. Finally, the descriptive analysis showed that economic performance also mirrored the Transition Type differences, with the best performers having the lowest mortality increases; however, the difference between Type 2 and 3 according to economic indicators was not always clear.

On the basis of this evidence, regression analyses were implemented and confirmed the distinction between the Transition Types generally, however some variation emerged. The overall impact of belonging to Type 2 was less consistent than Type 3 and particularly seemed ambiguous for men and women 40-59 and 60 years or older. One notable exception in which the Transition Typology did not matter to mortality rates was deaths in relation to suicides of men and women.

The second step of the regression analyses established that economic indicators do indeed absorb some of the impact of the differences among mortality trajectories. What is remarkable about this finding is the consistency with which the economic indicators decreased the impact of transition type membership. For Transition Type 3 countries, the coefficient reduction in model two was around 10% and the reductions hovered around this magnitude for men and women of all ages and for all causes of death when they were statistically significant. In contrast, when the coefficients were significant for belonging to Transition Type 2 countries, before and after including economic indicators, there was a reduction in the effect around 27% for men and women and for circulatory-related causes of death. Table 3.5 summarizes these reductions. This seems to indicate that death rates in Transition Type 2 countries were either more responsive to the economic context than Transition Type 3 countries or that their health profile is more similar to the reference category's to begin with. Particularly the Baltic States might be expected to have mortality rates at a similar level to the countries of Central and Eastern Europe; therefore, absorbing the impact of economic crisis would reduce the difference between Type 1 and Type 2 countries more than it would the difference between Type 1 and Type 3 countries. Moreover, the consistency of reduction within the types seems to indicate that the economic context has a similar impact on men's and women's mortality rates and on the causes of death that are highlighted here.

Table 3.5 Magnitude of reductions in the impact of Transition Type membership when adjusting for economic indicators, summary results

	Transition Type 2	Transition Type 3
Men		
25-39	-28%	-10%
40-59	ns	-10%
60 +	n/a	-12%
Circ. causes	ls	-8%
Ext. causes	ns	-9%
Suicide	ns	ns
Women		
25-39	-29%	-9%
40-59	ns	-7%
60 +	ns	-14%
Circ. causes	-24%	-9%
Ext. causes	ns	-9%
Suicide	ns	ns

Note: Calculations based on regression results presented in Tables 3.1 to 3.4. "ns" indicates that both the coefficients in models 1 and 2 were not significant. "ls" indicates that the statistically significant coefficient in model 1 lost significance in model 2. "n/a" indicates the coefficients are not applicable to this summary table because the impact increased in model 2 rather than decreased.

Another important finding of the regression analyses is that certain economic indicators are related to death rates and these relationships confirm that worsening economic conditions increase mortality. GDP and inflation had the most consistent effects, but wage and employment growth also impacted certain countries' mortality rates and particularly those for men. The relationship between the economic context and mortality rates was expected, but it is worth noting that these relationships emerge even after adjusting the model for dummy variables that capture the basic geographical division of Central and Eastern Europe versus those countries that are even further east of Europe, as well as the division of former satellite states and the republics of the former Soviet Union. These divisions represent many basic differences that are held constant, including cultural, lifestyle and social characteristics that are developed and influenced by EU involvement; basic levels of economic development; great differences in the extent that inequality has increased; and variation in governments' commitment to social support. Overall, the results of these analyses confirm the hypothesis that there were specific contextual conditions under which mortality increased. The fact that results were strongest for the age group and sex (males) that drove the mortality crisis in the region particularly lend credibility to the explanatory power of contextual conditions.

A few unexpected findings emerged from the analysis as well. Membership to Transition Type 2, relative to Type 1, decreased mortality rates in the population of men that are over 60 years old. Moreover, economic indicators amplified this coefficient rather than minimized it. A second unexpected finding is that women appear to commit suicide more following years of employment growth. A second unexpected finding is that women appear to commit suicide more after years of employment growth. By plotting the leverages of all observations against their squared residuals to see which countries are driving the female suicide results, I find two outlying countries: Lithuania and Estonia. Removing these countries from the sample renders the coefficient for employment growth statistically insignificant and half its previous size. Moreover, inflation then picks up significance and shows the expected positive relationship. The

fact that the unexpected result was due to the Baltic States is not altogether surprising given their unusually high suicide rates, particularly in Lithuania, currently and historically. Suicide rates in Lithuania showed great volatility throughout the 1990s and remained high even after those for Latvia and Estonia returned to a lower level in the late 1990s. What we know about this high suicide persistence is that it largely occurs in rural areas (Gailiene, 1999; Jasilionis, 2003) and that this high prevalence may be historically related to the changes in rural life that were brought about by forced collectivization during the 1950s (Gailiene, 1999). However, exactly why the relationship between employment growth and suicide appears at all and only for women remains an area of speculation. It may be that there is a unique cultural component to suicide occurrences in these countries that is not related to the economic context, but somehow is correlated with some of its elements. Additionally, Lithuania has taken a path that could be called a "re-traditionalization" of gender roles in which women are once again expected to primarily be mothers and wives after decades of high labor force participation (Juozeliunienė & Kanopiene, 1995). This retrogression, which became more salient as economic recovery picked up speed, may be contributing to changes in women's demographic profile.[35]

Finally, little was said in this paper about the shortcomings associated with macro-level research, as they are well-established in the literature. This endeavor has not sought to overcome these methodological shortcomings so much as attempted to show that valuable information about the relationship between economic change and mortality, as well as economic change and health behavior, resides at the macro-level.

[35] Many thanks to Domas Jasilionis for his ideas on this relationship.

4. DOWNWARD SOCIAL MOBILITY AND FERTILITY DECLINE IN RUSSIA

4.1. Introduction

This chapter engages with the question of whether the economic transition and crisis were related to declining fertility by systematically taking into account individual factors that are likely related to economic conditions. Therefore, this chapter builds on the analyses of Chapter Two by taking a micro-level perspective and focusing on causal mechanisms. One contribution to the debate is a new mechanism that I propose particularly captures how the economic transition and crisis may have impacted fertility decisions in Russia: downward social mobility (DSM). However, I also analyze other relevant factors such as unemployment and individual characteristics that reflect potential levels of resources. Methodologically, I contribute to the debate by analyzing changes in relative risks over time within subgroups, comparing and contrasting the results of models analyzing men and women for more insightful interpretations, as well as decomposing the timing of DSM and unemployment according to when the first child was born.

Specifically, I use event history techniques to analyze the conditions under which a second birth occurred in Russia. Having a second child was still the norm in Russia before 1991 (Zakharov & Ivanova, 1996), but the universality of the two-child family has disappeared. Although there was some postponement of first births in more recent years, there does not appear to be an increasing trend in childlessness (Sobotka, 2002). Therefore, studying changes in the second birth event is particularly appropriate in the context of Russia for understanding fertility decline.

I begin the empirical analysis by systematically assessing the subgroups of women in which second birth risks have declined the most. This is an alternative strategy to how the contribution of economic conditions has been assessed in the literature. Kharkova and Andreev (2000) found no evidence that economic conditions were linked to births born in Russia in 1993. In their micro-data analysis, Kohler and Kohler (2002) in fact found a positive relationship between labor market uncertainty/hardship and births between 1994 and 1996. Kohlman and Zuev (2001) were not able to control for economic background characteristics but found that higher parity births in the last 12 months (between 1994 and 1998) were more likely to occur for women who were unemployed. The strategy used in these micro-data analyses was to focus on whether or not a specific birth occurred among a sample of women in a short time period. This approach may not actually assess the validity of the economic explanation.

Although these studies may capture valid differences in the fertility behaviour of women with varying education or economic statuses, they do not offer information about *changes* in fertility behaviour, which is key to understanding the decline. In other words, finding evidence of the traditional educational gradient, for example—in which well educated women with higher potential earnings have fewer children than those less educated—confirms a long-standing relationship across many contexts but does not indicate whether the decline in fertility rates had anything to do with a change in economic conditions. The transition from communism is not argued to have reversed long-standing patterns, but it may have suppressed fertility in some women and men more than others. More to the point of the economic thesis then is identifying in which subgroup the decline in fertility was greater over the transition period. Therefore, I argue that analyzing relative changes within groups over time is a more strategic approach for identifying the impact of economic conditions.

The subgroups in which I assess relative changes are grouped according to educational level and occupational class. Women and men working in the lowest occupational classes or with the lowest educational level may have experienced the most detrimental loss in their overall income

due to the decline in the value of their already low earnings and their lower capacity to find higher wages. This hardship may have deterred women and men from increasing the costs of family maintenance by not having further children. In other words, we may see a similar reaction to what the Myrdals (1934) wrote about in regards to the fertility decline during the Great Depression, where living conditions were so poor that people suppressed fertility in order to increase living standards. This mechanism indicates that individuals with lower potential earnings, i.e. low education level or low occupational class, will have a greater decline in fertility after the transition than individuals with higher potential earnings.

In keeping with the overall aim of assessing whether the economic transition and crisis in Russia played a role in declining fertility rates, I also assess the impact of unemployment on second birth risks. The entire nature of employment changed during market reform; jobs were no longer guaranteed for life, leading to a more precarious relationship with the labor market. Therefore, spells of unemployment should occur more frequently and take on a different meaning than the few that occurred before the transition. Childbearing may be delayed or avoided if an individual did not have a job but was participating in the labor market; if the economic explanation is correct, then unemployment should decrease fertility after the transition.

Finally, I empirically investigate the impact of downward social mobility on second births. Three specific questions guide this part of the study: 1) Is DSM an important factor in the likelihood of having a second birth? 2) Did the importance of downward social mobility to the decision to have a second birth increase after the transition from communism? 3) Did downward social mobility impact the second birth decision consistently, regardless of whether it occurred before or after the first child was born? The first question will indicate whether the link between DSM and fertility is empirically justified. Given that downward social mobility should have become more consequential after the transition from communism began, the second question will tell us whether the increased importance of downward mobility contributed to the decline in fertility in Russia after 1991. The purpose of the third question is to better understand the nature of the relationship between downward mobility and fertility, by allowing us to explore the duration of its impact, as well as potential issues of selectivity and endogeneity.

Past research on the fertility decline in Russia has been limited in its capacity to analyze explanatory factors that change over time, describe the personal context in which decision-making took place, as well as cover both the pre and post-transition periods. With the recent addition of the Generations and Gender Survey (GGS), we have detailed union and fertility histories for men and women in Russia. Additionally, the supplementary Employment and Education Survey (EES) offers retrospective employment and education histories for a sub-sample of the GGS. These data allow the possibility of undertaking the research agenda described, by providing the opportunity to link changes in childbearing behavior to Russians' career and educational trajectories.

The next section highlights the bridges between the theories and literature that structure the analysis and addresses the important issues that could confound this research agenda. Next, the data are introduced and the operationalization of important indicators discussed. The fourth section details the models and results, while the final two sections discuss the findings and offer conclusions and ideas for future improvement of research on the fertility decline in post-communist countries.

4.2 Theoretical framework

As summarized in chapter two, the main debate in mainstream literature on fertility behavior revolves around explanations that prioritize either the impact of income or changing values. To generalize, the economic explanation of fertility assumes fertility behavior takes place according

to a calculation of the price or costs—direct or indirect—associated with having a child. Hotz et al. (1997) summarize the economic explanations as all building on Becker's (1960) neoclassical framework, which considers time allocation, household production, and human capital investment and how they contribute to fertility decisions. On the other hand, the ideational explanation is based on the Second Demographic Transition theory (Van de Kaa 1987), which links several demographic changes, including the decline to a fertility level that is below the population replacement level, to changes in values. These ideational changes are argued to accompany post-materialism, individualization and increased urbanization.

In chapter two, I also discussed the explanations that have been put forth to address fertility decline specifically in the post-communist countries or those with lowest-low fertility. Moreover, I discussed the shortcoming in the literature that were summarized by Frejka (2008). In response to his call for a need to clarify economic explanation, I am proposing specific ways in which the economic context and personal economic conditions mattered to fertility decisions in the Russian context: income constraints that are reflected in earning capacity, unemployment and downward social mobility. While the impact of education and unemployment are not new to the debate, research on the impact of class status and downward social mobility requires theoretical justification.

In this section, I outline the importance that social class and mobility took on during the transition from communism as well as the mechanism through which it may have impacted fertility. This link is discussed in light of early sociological and demographic research and then further developed in conjunction with Easterlin's (1976) economic perspective of fertility behavior.

a) Social mobility

In recent research, the relationship between fertility and social mobility has not been explored. However, there are historical precedents for the hypothesis that social mobility may in fact be important to fertility decisions. Arsene Dumont (1849-1902) was one of the first to write about a relationship between mobility and fertility, in which he coined the term "social capillarity" and explained declining fertility by an increased desire for upward mobility that was brought about by the development of capitalism and democracy in France (Bejin, 1989). A formalized relationship between social mobility and fertility can be traced back to research from the mid 20th century, but its place within academia extended hardly more than 30 years. Berent (1952) appears to be one of the first researchers to empirically test the relation between social mobility and fertility. The following decades saw a flurry of activity over the question, but the results are not discussed here due to inconsistency in measurements, models and results that would in any case need retesting now that more sophisticated methods and diagnostics have been developed. However, the theoretical frameworks on which these analyses were based deserve attention. Bean and Swicegood (1976) discuss four ways in which fertility might be impacted by social mobility: First, a *social disintegrative* effect[36] may arise when mobility disrupts family and social ties and creates a desire to compensate for the loss; or alternatively, lowers fertility by increasing strain and stress. The second mechanism is *status enhancement*,[37] in which families seek to maximize their resources—by limiting fertility—to obtain higher mobility, maintain their current status or avoid downward mobility. A third possible pathway is through a *relative economic effect* in which a downward turn in economic status will induce fertility avoidance and vice versa. The final pathway is deemed *selectivity*, in which couples may choose to have children according to their mobility trends.

[36] Stevens (1981) splits this category of explanations into two: stress effects and isolation effects.
[37] This mechanism mirrors that proposed by Dumont (Bejin, 1989).

The social disintegrative effect could have a positive or negative impact on fertility, rendering it impossible to disaffirm without information on mediating factors. Moreover, since the processes argued to be at work in this mechanism involve a change in social support, research that addresses changes in social networks and capital due to mobility might better address this hypothesis. In regards to selectivity, it is unclear whether the authors refer to a true issue of selectivity or whether their concern was one of endogeneity. Increasing family size may impact mobility opportunities as well as mobility may impact family size; this issue can be somewhat explored when working with longitudinal data since the order of events can be considered. It could be, though, that couples either select themselves into having a certain family size based on their mobility expectations or select themselves into career paths based on family size expectations, which could lead to class mobility. Hakim's (2000) preference theory, for example, would suggest that "home-centered women" would be unlikely to pursue status enhancement, via career choices, over family formation. The issues of selection and endogeneity will be considered at greater length in this analysis. But one of the selection possibilities essentially mirrors the mechanism of status enhancement if we take that to mean couples will always prefer to have the highest status that they can reach. In fact, a fundamental drive in mobility decisions is avoiding downward mobility (Breen & Goldthorpe, 1997). As such, it can be assumed that couples will have considered the impact of a/another child on their social status.

This assumption provides us with some reason to believe that non-mobile couples may reflect the childbearing behavior of their origin class, or of their parents. This is likely why we see some consistency within classes, since the family size that worked for one's parents should be considered an acceptable family size for maintaining that status. The socialization explanation described by Stevens (1981) corroborates the status quo relationship between non-mobile couples and fertility. She terms the socialization explanation the "null hypothesis" in which we might expect individuals to make fertility decisions simply on the basis of the behavior associated with either the origin or the destination class. Kasarda and Billy (1985) take this point further, by discussing the need to separate the effect of mobility as a process from the additive effects of origin and destination statuses.

These assumptions all can be considered implicit within the relative economic explanation as well. In this hypothesis, couples continue to have children only if they perceive their economic situation as acceptable. They are also expected to avoid a lower status or try to achieve a previous status through limiting family size. One element of the status enhancement or social capillarity hypothesis that differs from the relative income explanation and complicates matters is that we have no way of knowing to what heights an individual aspires. The relative economic perspective grounds us in the assumption that aspirations are related to the point of origin. For this reason, relative economic status is further explored as the most practical mechanism through which social mobility may impact fertility, although the selectivity explanation is also considered at greater length in the analysis.

b) Easterlin's hypothesis

Perhaps the most popular rendition of the relative economic explanation was proposed by Richard Easterlin (1976) as he attempted to explain the baby boom and bust trends in the US. He claimed that the size of one's generation had a pervasive impact on early adulthood conditions, especially income. In other words, the relative size of a cohort impacted relative levels of income. Moreover, if the income level is not sufficient for young adults to live according to the aspirations that were developed in the parental home, fertility would decline. The conditions he listed as occurring when a cohort is larger than previous cohorts are the following: adversely affected fortunes of young workers through lower earnings, unemployment, and lower upward occupational mobility; hesitation to marry; delayed childbearing; increased female labor force participation; increased divorce and marital strain;

relatively high psychological distress among young adults; and an unfavorable economic context, including stagflation (1987, p. 4).

Easterlin's aspirations/resource conflict is generally considered in a long-term framework, as it was theorized in relation to the effect of generations' differing cohort sizes on labor markets. However, the transition from communism rapidly brought about conditions that were in stark contrast to the immediate past and previous generations without a long-term shift in cohort size. The conditions listed above are widely known to have developed during Russia's transition from communism. So although relative cohort size is not key to this discussion, Easterlin's hypothesis of the aspirations/resource conflict remains useful, as conditions during the transition from communism were ripe for generating a similar conflict. Despite relatively low aspirations that may have developed during the Soviet era, the economic transition brought about severe decreases in economic well-being, which were manifested through increasing poverty rates and decreased consumption (World Bank, 2000; Klugman et al., 2002). In particular, real total consumption expenditure in Russia dramatically fell during the transition and did not reach 1989 consumption levels again until 2003 (UNECE, 2004).

Relative income measures, divorced from relative cohort size, have often been used in research on Easterlin's hypothesis. Macunovich (1998) provides an exhaustive survey of research on the Easterlin hypothesis, including 185 published articles and books. Her analysis walks the reader through the variations in operationalization of the Easterlin hypothesis as well as success rates and the relationships between the measures and success rates. Relying on this exposé to navigate the pitfalls of other research, three issues arise: one is directly related to Easterlin's hypothesis, while the other two arise in conjunction with the post-communist context. The first to consider is how to operationalize relative income in a way that does not assume young adults' income to be equal to the parents', but rather as a function of parents' income. We would not expect the income of young adults to be as high as their parents' who were in a later stage of career tenure during the young adults' adolescence, nor does Easterlin argue that young adults expect the same income when beginning their career and family. But we do expect it to be related, perhaps "with a distribution of young people around some mean probably located below the mean parental income" (Macunovich, 1998, p. 102). In this study, this issue is somewhat mitigated by the lack of income data in the first place and the substitution of occupational class as a proxy for long-term income *potential* rather than absolute income.

Another issue revolves around two peripheral aspects of research on Easterlin's hypothesis: gender and endogeneity. At the time of Easterlin's proposal, the male breadwinner model dominated household specialization in the United States. For this reason, men's earnings were typically analyzed. Whether women joined the labor force or not—an important decision made alongside fertility intentions—was considered endogenous to the hypothesis since he argued that women would join the labor force to ease the household's aspirations/resource conflict. However, the Soviet Union put great emphasis on employing women, as well as provided assistance to women to balance paid and unpaid labor. Therefore, the "default" status of women in this context should not be non-participation in the labor market, neither for young adults beginning their family around the time of transition from communism, nor for their mothers. For this reason, women's potential earnings are very important to consider, and women's participation in the labor market is not considered endogenous to the relative income story.

The final issue involves the role of consumption. When Easterlin (1976) wrote about an aspirations/resource conflict, he referred to young adults not being able to continue consumption patterns that were developed while the young adults lived with their parents. As mentioned, young adults are not expected to consume exactly as they were able to within the parental home, but rather to a related degree or style. However, the entire idea of consumption patterns is complicated if applied to the post-communist case. Luxuries and extras were attached to the workplace during the Soviet era (Fajth, 1999) and were not necessarily a matter of preference. However, we can expect that the limited range of benefits were appreciated and that having

lived with these benefits cultured tastes accordingly. There are also complications in the early transition period in which prices skyrocketed and goods became scarce with the restructuring of the economy and loss of production. Furthermore, the new "market" economy that eventually developed increasingly offered consumption possibilities that were previously nonexistent. This period likely caused much frustration as consumption aspirations increased while income decreased. These three stages may seem to over-ride any consistency in consumption profiles inherited by adult children.

That said, there are three reasons the Easterlin hypothesis may prove useful even in this context. First, regardless of the changing nature of consumption during the transition from communism, a real and significant drop in consumption expenditure did occur throughout the entire 1990s (UNECE, 2004). Second, even though resources and aspirations were characterized in terms of consumption by Easterlin, there is no reason that the same argument should not hold for living standards in general, despite how living standards are achieved—via direct occupational rewards or preferences played out in a market full of choices via earnings. Finally, this issue would be particularly problematic if I were to compare Russians with citizens of a country that did not experience a transition from communism; however, given that all individuals' experiences studied here are related—in terms of a history of communism, transition, inflation, and new consumption opportunities—the changing meaning of consumption is neutralized. The analytical method used in this analysis presents findings as they are directly related to other members of this population.

The operationalization of relative income changes, or social mobility, here relies on occupational class, which is discussed in detail later. Real income, instead of potential, might be more informative in some ways, but is also problematic as previously discussed. In any case, information on income and its components over the time period in question are unavailable. Panel surveys, such as the Russian Longitudinal Monitoring Survey, have not existed long enough to be able to track income and living standards from before the transition. Because income details are difficult to remember over one's history, retrospective surveys focus on more categorical life history descriptions; therefore, following income changes in the Soviet Union and Russia is not a possibility. Likewise, the data offer no measure of living standards across one's life history; for these reasons, the best source for capturing relative income change is through social mobility. Therefore, the main explanatory variables in this study are location in the social strata and, particularly, changes in location.

Easterlin spoke of relative income in relation to family of origin; however, relative income may also be measured in relation to one's own history. The latter relationship is likely to be more important as young adults become older, i.e., in relation to second or higher order births. These alternative experiences have been developed in social mobility literature and termed intergenerational mobility—between two generations—and intragenerational mobility—within one generation. Both types of mobility are considered here since the longevity of a possible impact from changes in economic status is unclear; it is intuitive that at some point in adults' lives, they will adapt to their own consumption capacity and living standards. This is likely why Easterlin was critical of research that studied the second generation well into their adult lives, rather than at the beginning (Macunovich, 1998).

An example of intragenerational mobility in this context follows: an individual would experience an aspirations/resource conflict if he/she once held a position in the highest class—including politicians, professors, and top level managers of large businesses—and experienced a shift to a lower class, even if that class is not the lowest. In this sense, we may assume the individual experienced a loss in resources, which may conflict with aspirations that had developed. So we can assume that a person has fewer resources if moving downward in social class, but we cannot assume that all people who stayed in the same strata did not experience an aspirations/resource conflict because of the massive economic changes during market reform. Because a dramatic loss occurred in wages due to inflation and widespread wage arrears,

aspirations/resource conflicts may be hidden in cases where people remained in the same job or occupational status. The bias introduced by this shortcoming would minimize the size or significance of my findings and, therefore, the results should only be stronger with a better measure. The strategy for dealing with the ambiguous economic status of those who do not experience downward social mobility is to make no further claims in relation to fertility; in other words, I do not argue that upward social mobility should lead to increased fertility in this context, as in the Easterlin tradition.

4.3 Data and the operationalization of indicators

GGS data are part of a larger Generations and Gender Program designed as "a system of national Generations and Gender Surveys (GGS) and contextual databases, which aims at improving the knowledge base for policy-making in UNECE countries. The GGS is a panel survey of a nationally representative sample of 18-79 year-old resident population in each participating country with at least three panel waves and an interval of three years between each wave. The contextual databases are designed to complement micro-level survey data with macro-level information on policies and aggregate indicators" (UNECE, 2006). The response rate was particularly low in the urban areas of St. Petersburg and Moscow (around 15%), but was 57% in all other areas (Independent Institute for Social Policy 2004).[38] The Employment and Education Survey (EES) includes a GGS sub-sample of 18-55 year old men and women and covers all employment and educational activity over the life of the respondent, starting from January of the year he or she turned 17. The response rate for this survey was 86%.[39] Other information covered in this retrospective survey are children born, non-work activities—such as parental leave and retirement—and migration histories.

An important limitation of working with EES retrospective histories is that we cannot assess whether social mobility has occurred at the household level. Although information exists at the individual and macro levels during many of the years under study, only data on household characteristics for the year 2004 are available. With the unit of analysis being an individual at a certain time (person/month units), transitions into a lower occupational class will not be able to tell us the impact on the entire household and whether the class position of the whole household has changed. However, if important determinants of the risk of childbirth at this level of analysis do emerge, the contributions to understanding fertility patterns during times of social change are many, not the least of which is an estimation of the difference in impact of men's and women's mobility.

The strategy to analyze separate samples of men and women, none of whom are partners, may be unusual. Traditionally, men have been studied when considering work and the public life, while women have been the focus of family studies (Goldscheider & Kaufman, 1996). Given the link made here between the rewards of work and family planning in this study, and despite the absence of men in most studies on fertility behavior, both men and women are equally as important to study. In the literature calling for the inclusion of men into fertility research (e.g., Greene & Biddlecom, 2000, Goldscheider & Kaufman, 1996), one criticism of past research is that men and women have been considered as mirror images of preferences, rendering the study of both unnecessary. A more appropriate framework would analyze men and women together as partners negotiating preferences based on their bargaining power. This is not possible in this analysis; however, being able to estimate which factors are important to the event of having a second birth for men and women separately will tell us whether there are factors that vary in

[38] The model will include a dummy variable to capture whether the survey took place in either St. Petersburg or Moscow, which should account for any bias introduced by this low response rate. Because the results section presents mostly truncated results, it is important to note that in no case was the St. Petersburg/Moscow dummy variable statistically significant.

[39] For information about the technical aspects of this survey and its sample, see: Independent Institute for Social Policy (2005): Education and Employment Survey on Russia - Technical Report, Moscow.

importance to men and women, regardless of the partner's class. Moreover, men may be particularly important when studying the role of social mobility to family planning, as some Western research has found that men are more likely to have aspirations for expensive consumer goods than women (Crimmins, Easterlin, & Saito, 1991). As female labor force participation was high in the Soviet Union, we can assume that any change in one worker's trajectory would be important to a dual-earner household. Finally, to the extent that women and men in partnerships resemble each other and, hence, changes in trajectories can be considered to be important at the household level, Cheidvasser and Benítez-Silva (2007) found substantial educational homogamy among Russians in the Russian Longitudinal Monitoring Survey (RLMS). For these reasons, analyzing men and women separately is considered a strategy that may yield important results, even if it does have shortcomings. If statistically significant relationships only exist when analyzing women, we will know that what happens in mens' labor force careers is less important to family planning than what happens in women's labor force careers.[40] Alternatively, if similar relationships appear for both men and women, we have extra information to use in our interpretations; in other words, we may be able to rule out some forms of selectivity or endogeneity if results apply to both men and women.

a) Occupational class as a construct in Russia

Little research on either intragenerational or intergenerational social mobility exists in the English literature that analyzes the Soviet Union or the former Soviet republics after 1991. Fortunately, at least two studies provide the foundation on which occupational class mobility in Soviet and post-Soviet contexts can be studied. Marshall, Sydorenko and Roberts (1995) analyzed whether greater social mobility described life under the Soviet regime in comparison to social mobility trends in Britain. Despite the claims of many Soviet scientists, they determined that social mobility did not differ greatly in the Soviet Union from Britain. However, the authors described multiple ways in which the occupational distribution was unique to the Soviet system. Their findings in regards to the extent of vertical mobility were that equal opportunities did not exist among the social classes and that the origin class did matter to the destination class in the Soviet Union. However, it appears that this is less true for women; a slightly higher degree of mobility from all classes appeared in analyses of women's mobility. Even taking education into account as a possible mediator between class origins and destination, the authors did not find evidence that adults from lower class backgrounds in the Soviet Union were more likely to achieve higher educational attainment than those in Britain. Because of Marshall et al.'s (1995) work, we now know the similarity of Soviet mobility patterns to Britain's mobility patterns. This finding indicates that the mobility literature geared toward capitalist countries may actually be useful as a reference for the Soviet case as well.

Gerber and Hout (2004) pursued a similar strategy in studying social mobility during the 1990s in Russia. The authors confirm the findings of Marshall et al. (1995), by demonstrating the existence of social inheritance under Soviet rule. Even so, their analysis of the years following the transition from communism demonstrates that rates of social mobility greatly diminished; hence, the delineation between classes grew and the possibility to move out of one's class of birth lessened. Moreover, when class shifts did occur, they were more likely to be downward than upward. Finally, they found that those workers who experienced the most upward mobility under the Soviet regime were the workers who were often displaced when the transition began and found new jobs that were closer to their class origins than previous jobs.

These studies offer an empirical foundation for using occupational class as a meaningful indicator during the Soviet and post-Soviet eras, as well as suggest an occupational class

[40] However, there remains the possibility that men's fertility histories are incomplete due to unknown children. For this reason, the results might be more accurately generalized only to men's marital fertility.

framework. Both studies relied on an operationalization of the Erikson-Goldthorpe occupational class schema.

The remaining part of this section details the operationalization of indicators to be used in the analysis: education, occupational class, intergenerational downward social mobility, and intragenerational downward social mobility.

b) Education

Education is discussed according to three levels here: low, middle, and high. Respondents with a "low" education level did not complete secondary school, even if they attended a vocational or "factory and work" college.[41] Those who did complete secondary education are included in the "middle" category, as well as respondents who completed a vocational or technical college after completing secondary education. All respondents who completed secondary special education, which includes technical, medical, musical, pedagogical or arts training, are classified as having a middle education regardless of whether they completed secondary school or not. The "high" educational level includes those respondents who completed university education at the undergraduate or postgraduate level. An important element to take into account when analyzing respondents over time is that it is not uncommon for Russians to leave the educational system between each stage to join the labor market and subsequently return (Cheidvasser & Benítez-Silva, 2007).

c) Occupational Class

I rely on nominal class categories for this analysis rather than prestige measures (e.g., Treiman, 1977) or socioeconomic indexes (Ganzeboom, De Graaf, & Treiman, 1992), thus adhering to the convention in studying occupational class in Russia. I use a variant of the Erikson-Goldthorpe occupational class schema: the European Socioeconomic Classification (SeC), which closely follows the Erikson-Goldthorpe-Portocarero (EGP) Schema. The conceptual basis of this schema relies on employment relations, or whether a person is an employer, employee, self-employed or supervisor. GGS educational information complies with the International Standard Classification of Occupations (ISCO88) classification, which can be transferred into the SeC schema using Harrison and Rose's (2006) process. ISCO88 uses as its conceptual basis not just employment relations, but also skill level as a means for differentiating classes (Ganzeboom & Treiman, 1996). Unfortunately, the raw occupational data in EES does not correspond to the usual questions used in constructing a SeC schema, nor is it coded according to the ISCO88. Therefore, I adhered as closely as possible to the coding principles of SeC in classifying the occupational class of respondents.

The more classes in a schema, the richer the schema and the finer the instrument. However, this refinement comes at the price of less room for classification error and fewer differences between the classes. Due to the volatile shifts in the labor market over the years studied here, caution should be exercised and, hence, a less refined instrument is used. The SeC schema is a ten category model that collapses into six, five and three class models. Although the three class model would be more robust to possible peculiarities of the Soviet and post-Soviet class structure, the two lowest classes were not collapsed into one category due to how bottom-heavy the occupational structure was; therefore, instead of combining unskilled manual workers with low grade white collar workers and skilled manual workers, the former is kept in a separate

[41] A significant difference between Russians who have completed secondary school and those who have not has been observed in previous research on Russia, particularly in relation to research on health and mortality differentials by education (Shkolnikov, Leon, Adamets, & Andreev, 1998; Shkolnikov, Andreev, Jasilionis, Leinsalu, Antonova, & McKee, 2006). Many thanks to Evgueni Andreev for his observations and guidance on educational differences in Russia.

class. This decision equalized the distribution of respondents within the classes to a greater degree. Table 4.1 details the SeC categories that have been created according to the parent's occupational class in the GGS and the respondents' occupational class in the EES.[42]

Table 4.1. European Socioeconomic Classification (SeC) coding of occupational classes according to GGS and EES categories

	GGS: ISCO88 to SeC Parents' occupational classes		**EES: Author's SeC classification Respondents' occupational classes**
4	Large and small employers (excluding agriculture) and high-grade professionals and managers	4	Significant leader, professional, autonomous employee, self-employed in industry or trade
3	Lower-grade professionals and managers, higher-grade technicians and supervisors, and intermediate occupations	3	Team leader, foreman, highly-qualified worker, employee with complex tasks and some autonomy
2	Self-employed in agriculture, lower supervisors, technicians, clerks and service employees	2	Qualified worker and employee performing simpler tasks
1	Routine occupations	1	Unqualified worker and agricultural employee

Whether or not this class structure is relevant when talking about social mobility depends on the rewards of belonging to a class; it follows that the greater the reward for being in a class, the narrower the passage ways in and out of a class and the greater the aspirations/resource conflict when moving into a lower class. One way of estimating whether there are meaningful differences between the classes in terms of rewards is to look at the income levels associated with the occupational classes. Table A4.2 in the Appendix displays income information according to the class categories. This brief exploration into the income characteristics of a 4 class schema offers support for assuming a meaningful change in resources when the threshold of these classes has been crossed. However, this support must be accepted with caution, as GGS offers information for the year 2004 and EES offers information from multiple time points. Given the dramatic shifts in the nature of the labor market, it is also likely that the income-class link is stronger at other times than others, which might weaken the results.

Rather than consider both mother's and father's occupational status separately when considering intergenerational mobility, I constructed *household* class standing at age 15. Due to instances where parents separated or died, keeping the parents' qualifications separate introduced substantial missing data into the model. Some individuals lived only with one parent and, therefore, did not know the other parents' occupation. The strategy used to construct class standing at the household level was to take the highest occupational class of either parent. It is assumed that the highest ranking of household members will better reflect the class standing than the average of the two.

Included into the operationalization of *respondents'* occupational class are two extra categories: unemployed and not participating in the labor force. Unemployment was coded as such only when the respondent indicated they were actually unemployed, rather than using unemployment as a default category for short periods not clearly designated. Rather, these unclassified moments, as well as times when individuals reported being in the military, in education, out of education for three months or less before finding employment, or "housewives", are coded as times of no labor force participation (NLFP).

[42] Because it was not possible to apply an internationally used coding system to the EES occupational classification, I detail exactly how the EES responses were coded in Table A4.1 in the Appendix.

d) Intergenerational and intragenerational social mobility

Based on the previously defined categories for educational levels and occupational class, *intergenerational* downward social mobility (DSM) is constructed in the following way: The occupational classification of the respondent's job is lower than the parents' occupational classification at age 15. Downward mobility is only possible if the respondent is participating in the labor force at the time and not unemployed.

A similar coding strategy was used to capture *intragenerational* social mobility: The occupational classification of the respondent's job is lower than the previous job held. Once again, mobility is only a possibility if the respondent is employed in the paid labor market. In contrast to intergenerational mobility, intragenerational downward mobility can also occur if the respondent left education and was not able to match their job to their educational level.[43] General guidelines for determining education and job matching were taken from Elias and Birch (1994), Ortiz (2007), and Solga and Konietzka (1999) and are displayed in Appendix A4.3.

4.4 Models

Since the most remarkable change in fertility trends in Russia is the decline in second births, this is the event analyzed in this study. Using GGS and EES data, I analyze second birth events for two separate samples: men and women. The dependent variable of the second birth event is constructed as a binary dummy: 0=no second birth, 1=second birth. 4926 respondents are included in this analysis, since they had had at least one child by the time of the interview. Of these respondents, 2666 went on to have a second child. The respondents are censored eight months before their second birth, to account for a gestation period, or at the time of the interview, if they had not had a second child.[44] A great many of these second births occurred before 1991, leaving only 336 second births to women and 143 to men after the transition began. A piecewise constant event history model is estimated to achieve the relative risks of a second birth, according to different model specifications. Using a piecewise model allows the baseline hazard to vary according to pre-determined time segments, since we would expect the hazard rate to differ over time. A second child is more likely to follow the first in the first few years rather than many years later. Therefore, the baseline hazard rate is specified to vary in the time up to one year after the first birth, between the second and third year, etc., until the fifth year after the first birth, in which the baseline hazard becomes constant.

An important consideration when studying higher order births is selectivity introduced by whether or not the respondent has had a child in the first place. Not all respondents choose to be a parent and it may be that the characteristics of selection into having one child are related to the characteristics of having a second, which would bias the estimates. However, the high rate of first births in Russia implies minimal bias. To carefully assess whether selection effect does exist, this paper followed the protocol suggested by B. Hoem (1996), which is based on the idea that we can control for some selection bias by introducing into the model the timing of the first birth as it is related to others' timing in the same educational class. She argued that by taking into account relative first birth timing, we can capture the social meaning of the age at first birth

[43] Solga and Konietzka (1999) found that occupational matching to credentials dictated job placement in the former East Germany, which is not surprising given that the state planned educational enrollment based on occupational needs.

[44] Since EES data only record histories from January of the year in which the respondent turns 17, all information recorded in the months before the respondent turns 17 are censored. Eliminating those respondents who had their first child before the explanatory variables can be introduced excludes 118 men and women, 81 of which conceived in the 16th year. 17 more respondents were excluded because they did not know the year of their first birth.

and, thus, deal with some unobserved heterogeneity and selection bias.[45] When implementing this tool in the current analysis, no significant changes occurred in the main results. Rather the results presented are of models in which an indicator measured the absolute age at first birth, which might capture a "time-squeeze" effect. For example, mothers or fathers with higher education may be more likely to have the following birth sooner to catch up for years spent in education (Kreyenfeld, 2002), which would inflate the relative risk of having a second birth for this education group once enrolment status was controlled for. Moreover, other unobservables related to the act of postponing childbirth in general are captured with this indicator.

Another important issue to consider in the analyses is that people in the lowest class or educational level have no opportunity for downward social mobility. Moreover, these individuals are the ones who traditionally have higher fertility. For this reason, it is important to include controls for origin points, which should absorb this form of bias.[46]

My main expectations of the results are that, if economic constraints played a role in declining fertility during market reform, the relative risks for women and men in the lower educational levels and occupational classes will have decreased more than those with higher levels of education and occupational class. Moreover, experiencing unemployment will also lower the relative risk of having a second child, relative to those who are either gainfully employed or not participating in the labor market.

In regards to downward mobility, my expectations are that, despite Easterlin's claim, intragenerational mobility will be more important than intergenerational mobility to the decision to have any children beyond a first; by this time in the life course, one's own career path and recent living standards are likely more important than those of one's parental home. Moreover, it may be that adult children do not expect to have reached the class standing of their parents due to differences in career tenure. I also expect that class mobility will matter more to fertility decisions after the transition from communism than before, since class became more salient and meaningful.

Even though this analysis covers the time period between the first and second births only (or at time of censoring), the time period preceding the first birth may also offer important information. For example, an individual may have received university education, been unable to find a suitable job in the labor market, decided to have a first child anyways, but did not have a second child because of a conflict between aspirations and resources. Therefore, information about DSM occurrences before the first birth is kept as a memory, in order to assess whether they have their own impact. The expectation is then that experiencing DSM lowers the relative risk of having a second birth, regardless of whether the DSM occurs before of after the birth. However, there may be issues of endogeneity if we consider the timing of DSM in relation to childbearing. If DSM impacts fertility choices according to whether it occurred before or after the first birth, there may be alternative ways of interpreting these relationships. This differentiation in timing is explored in the case of experiencing unemployment as well.

The following covariates are included in the models. Following these definitions and summary statistics, model specifications are described and specific hypotheses re-stated. The level of

[45] Gerster and Keiding (2008) discuss the limitations of this approach and suggest that the estimates of the education effect on higher-order births will be biased if using such an age-adjustment. However, the main purpose of implementing Hoem's tool was merely to search for evidence of influential unobserved heterogeneity, which might indicate selection bias.

[46] To ensure that this approach controlled this form of bias, I also checked the robustness of my results by excluding those respondents in the lowest occupational class or with the lowest educational level and found that the relative risks that are important to my hypotheses did not change, nor did they lose their level of significance.

detail given serves to highlight multiple changes that are made in each model according to its purpose; however, the full model results are not all presented here due to space.[47]

a) Time-constant covariates

St. Petersburg and Moscow dummy: Because the response rate was so low in these two cities (15%), a dummy for where the survey took place is introduced into the model to capture any bias this may cause. 8% of this sample was surveyed in St. Petersburg or Moscow.

Siblings: The number of siblings is included as a categorical variable: only child (14%), 1 sibling (39%), 2 siblings (21%), 3 + siblings (24%), and unknown/missing (2%).

Birth residence: This variable captures the impact of being born in an urban or rural environment, but not the impact of this environment at the time of the survey or childbearing. Specifically, the coding collapses regional centers, other cities and urban-type communities into "urban" (54%) and countryside as "rural" (42%). Missing answers constitute 5%.

Age at first birth: This variable is continuous and simply introduces how many years old the respondent was when he/she had the first child. Although age is not entered into the model, some summary statistics of the sample's age distribution are the following: Despite sample selection on already having one child, the sample is still quite young with 40% of spells[48] occurring in the 17-21 age group. This is not surprising, given that very little postponement has occurred for first births. 26% of the spells occur in the 22-26 age group, 15% in the 27-31 age group, 9% in the 32-36 age group, and 10% in the 37+ age group.

b) Time-varying covariates

Period: A dummy variable indicates whether the spell occurs before or after the political and economic regime change in 1991. 1991 is chosen as the year for distinguishing between two periods because this is the year that the Soviet Union was dismantled.[49]

Union status: Respondents are classified as being either single or in a cohabiting union, including marriage. The majority of person/time units in which the respondent already had one child were spent in unions: 69%.

Time since first birth: Because the impact of time since the first child was born is not likely to be constant, respondents pass through categories of time: 0-1 years, 1-2, 2-3, 3-4, 4-5 and 5 years or more since the first child was born.

Educational status and level: Education enrollment status and level are combined into one variable in which respondents' spells are coded as being in education (21%) and being out of

[47] Full results and summary statistics are available upon request.

[48] Because the number of spells is generated by the number of changes within categories of time-varying covariates, the interpretation of the number of spells in a given state is not informative in a straightforward way; the number of spells could be inflated by changes within other unrelated categories.

[49] One may argue that other years may be more appropriate as a cut-off point. For example, Blanchard (1997) takes 1990 as the year the economic regime changed in Russia because this is the year during which industrial production decreased. However, the decrease was modest in this year compared to the decrease in 1991. 1992 may also be considered an appropriate year due to price and trade liberalization (Fleisher, Sabirianova, & Wang, 2005). Still others might advocate for an earlier year that would capture *perestroika*, or restructuring, which begun in 1985. Although many things changed before and many effects were not experienced until after, 1991 saw the actual fall of the previous political and economic regime and is therefore used here to delineate the time periods.

education, which then takes three possibilities: low (12%), middle (52%), and high education (15%).

Labor force status and occupational class: Labor force status and occupational class includes the categories unemployed (1.5%), SeC1 (manual workers) (5%), SeC2 (low-grade workers) (16%), SeC3 (intermediate employees) (9%), SeC4 (salariat) (7%), and not participating in the labor force (NLFP) (62%). NLFP includes such categories as women and men still in education, in the military, as well as those who choose not to participate in the labor force for other reasons such as caring for a child.

Ever experienced unemployment: Spells are coded according to whether the respondent has ever experienced unemployment, therefore this is a time varying covariate, but with variation only occurring once: respondents are coded as never having experienced unemployment until unemployment occurs, then forever after as having experienced unemployment. Unemployment is counted if it occurred before the first birth and, thus, before the respondent was at risk for a second birth. However, the timing of the occurrence is separated in the model.

Ever experienced intergenerational DSM: Spells are coded according to whether the respondent has ever experienced intergenerational DSM, in the same manner as "ever experienced unemployment", described above.

Ever experienced intragenerational DSM: Spells are coded according to whether the respondent has ever experienced intragenerational DSM, in the same manner as "ever experienced unemployment", described above.

I constructed these last measures as "ever experienced" for the following reasons. First, it is difficult to know when to end a spell of DSM since there can be many quick job changes after DSM occurs, but they may not result in status recovery. There is not theoretical basis for deciding when to stop classifying each new job spell as DSM. It seems likely that there may be some adaptation or acceptance of the new class status eventually. Second, along with experiencing unemployment, the impact of losing one's footing in the labor market may have long-lasting effects on feelings of security. This is especially likely when we consider intragenerational DSM, whereas the reaction to intergenerational downward mobility may be weaker since adult children may not expect to reach their parent's class level until later in their occupational trajectory. This specification strategy runs the risk of watering down the impact of unemployment or DSM, but differentiating the timing of unemployment/DSM relaxes this risk somewhat since it essentially starts the clock over for "ever experienced" at the first birth. For example, in the "post-1st birth ever experienced DSM" indicator, respondents are only considered as having experienced DSM if it occurred after the first child was born and not before. In this way, the initial dip in career trajectories from an intergenerational perspective is somewhat controlled for.

Table 4.2 describes the incidence rates of both forms of downward social mobility throughout the respondents' educational and employment histories, according to the total number of women and men. Interestingly, we see remarkably similar rates for men and women. Slightly more men, relative to the total number of men, experienced intergenerational DSM (24.7% vs. 23.3% for women), but women experienced an even smaller margin of more intragenerational DSM. No information is given in the table regarding repeated occurrences of downward social mobility experienced in this sample: there were 109 episodes of downward social mobility that were second or third incidences within respondents' history.

Table 4.2 Summary of respondents who experienced DSM according to sex

	Interg. DSM	Intrag. DSM
Total	1179	912
Men	24.7%	18.0%
Women	23.3%	18.6%

Note: Window of observation is 17th birthday to 2nd birth and sample includes only those women and men who have one child. Author's estimations based on EES data

In the following models, all of the indicators used to measure the impact of economic constraint (education, occupational class, unemployment and downward social mobility) are interacted with the time period to see how the impact changed after the transition from communism. Previous specifications of the models relied rather on an interaction between the mobility indicators and cohorts, instead of time period, and the findings remain very similar.[50]

M1: Baseline Time Period Model

The first model is the baseline model, in which results that compare risks strictly within groups of women and men are assessed. These findings will affirm or contradict the findings of other research that compared the behavior of women in different groups across a few years to draw conclusions about the impact of economic transition.

H1: Respondents of lower education or occupational status are less likely to have a second birth after regime change than before, compared to the change in relative risks over time for respondents within higher occupational classes or education levels. Interactions of time period and occupational status as well as time period and education are the key indicators in this model.

$$\text{Ln } h_i(t) = y(t) + \beta_1 Stpet/Mosc_i + \beta_2 siblings_i + \beta_3 urban_i + \beta_3 age1stbirth_i + \gamma_1 timesince_i + \gamma_2 unionstat_i \; [+ \boldsymbol{\gamma_3(period_i * LFstatus_i)}], \; [+ \boldsymbol{\gamma_4(period_i * educ_i)}]$$

Where h_i = the intensity of transition to 2nd birth and t = time since 1st birth. β = coefficient of time constant covariate, γ = coefficient of time varying covariate, where only y(t) is a duration variable (the baseline). Education and occupational class interactions are introduced separately as well as together to explore their differential impacts.

M2: Ever unemployed

H2: Experiencing unemployment lowers the risk of having a 2nd birth in the post-transition period a) relative to experiencing unemployment during the pre-transition period and b) relative to not experiencing unemployment in the post-transition period.

$$\text{Ln } h_i(t) = y(t) + \beta_1 Stpet/Mosc_i + \beta_2 siblings_i + \beta_3 urban_i + \beta_3 age1stbirth_i + \gamma_1 timesince_i + \gamma_2 LFstatus_i + \gamma_3 educ_i + \gamma_4 unionstat_i + \boldsymbol{\gamma_5(period_i * everunemp_i)}$$

Model 3: Ever Experienced Intergenerational DSM

H3: Experiencing intergenerational DSM (interDSM) lowers the risk of having a 2nd birth in the post-transition period a) relative to experiencing DSM during the pre-transition period and b) relative to not experiencing DSM in the post-transition period.

[50] The only findings that significantly differ are those for the Baseline Model, in which changes in relative risks by subgroup are assessed. The results for the cohort interactions are available upon request.

$$\text{Ln } h_i(t) = y(t) + \beta_1 Stpet/Mosc_i + \beta_2 siblings_i + \beta_3 urban_i + \beta_3 age1stbirth_i + \gamma_1 timesince_i + \gamma_2 LFstatus_i + \gamma_3 educ_i + \gamma_4 unionstat_i + \boldsymbol{\gamma_5(period_i * interDSM_i)} + \beta_4 parentoccup_i$$

Where interDSM is a dummy indicating whether the respondent has ever experienced a spell of intergenerational DSM. Parents' occupation is included to control for the origin point in the mobility process.

Model 4: Ever Experienced Intragenerational DSM

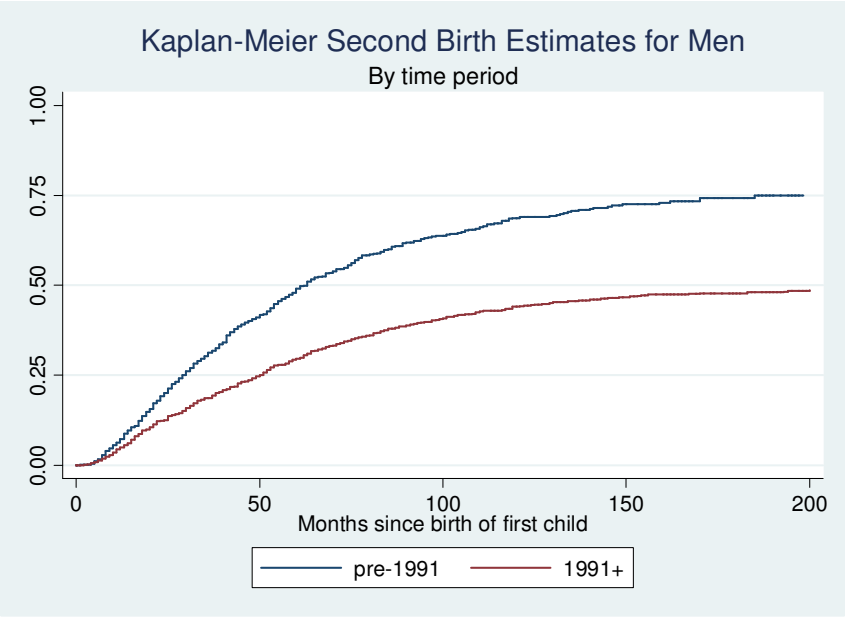
H4: Experiencing intragenerational DSM (intraDSM) lowers the risk of having a 2nd birth in the post-transition period a) relative to experiencing DSM during the pre-transition period and b) relative to not experiencing DSM in the post-transition period.

$$\text{Ln } h_i(t) = y(t) + \beta_1 Stpet/Mosc_i + \beta_2 siblings_i + \beta_3 urban_i + \beta_3 age1stbirth_i + \gamma_1 timesince_i + \gamma_2 LFstatus_i + \gamma_3 educ_i + \gamma_4 unionstat_i + \boldsymbol{\gamma_5(period_i * intraDSM_i)}$$

Where intraDSM is a dummy indicating whether the respondent has ever experienced a spell of intragenerational DSM. Including educational level is one way of controlling for the origin point as much of this form of DSM is due to over-education. Including the previous spell's occupational class cannot be entered into the model due to high autocorrelation.

4.5 Results

First, I display Kaplan-Meier failure estimates in Figure 4.1, which indicate a great decline in second birth events between the two periods of pre and post-1991 for both men and women. 51% of all spells take place in the pre-transition period.



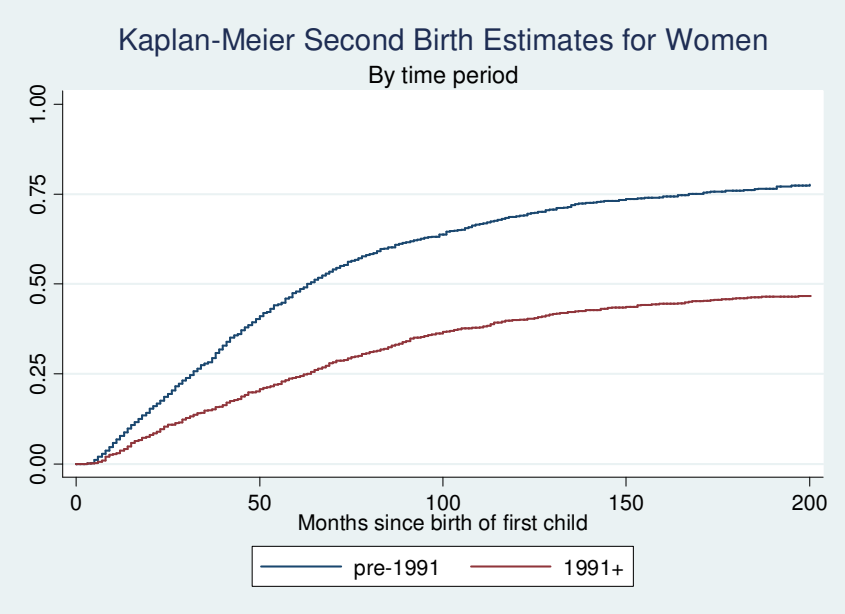


Figure 4.1 Second birth estimates for men and women by time period
Source: Author's own calculations using GGS and EES data.

The results of Model 1 are discussed first as they provide a baseline impact of market reform and the economic context. Figures 4.2 and 4.3 show how the impact of education and occupational class has changed over the two time periods. They also show how the impact of one of these indicators changes with the inclusion of the other. So in the first charts within the figures, all control variables are included in the models, but only education or only occupational class is entered in order to see the full impact of these individual characteristics. The same model was run multiple times, with only the reference category changed to get strict comparisons within groups over time; the reference categories are all pre-transition relative risks. In other words, each relative risk is in relation to the group of women or men of the same educational or occupational status in the pre-1991 time period. Hence, direct comparisons can now be made between the subgroups to see in which educational level or occupation class the risk of having a second child has decreased the most.

First, remarkable similarities exist among the declines according to education when occupational class is not included. The decline in second births was dramatic across all education levels. Men's relative risk differences by education were slightly less than women's between the two time periods. The greatest decline for men occurred in the middle education category in which these men had a 53% lower risk after the transition than before. The decline in second birth risks for women across education levels occurred with a gradient in which women with the highest level of education had a 66% lower risk, middle educated women had a 60% lower risk and low educated women had a 57% lower risk impact of education after the transition.

Figure 4.2 displays results of the second model as well, in which both education and occupational class are included simultaneously to see which effects remain and how they change if we control for both. With occupational class in the model, men exhibited no statistically significant difference in their likelihood of having a second birth according to education over the two time periods. Educational level remained meaningful in the difference in relative risks over time for women though. A very strong gradient emerges for women once occupational class is controlled for. Women with the lowest education were twice as likely to have a second child in the post-transition period, relative to the pre-transition period, if their job was taken into account. The relative risk for women with a middle education level was not

statistically significant, but a highly statistically significant difference exists for women with the highest education: they were 68% less likely to have a second child.

Changes in second birth risks by occupational class when results are not adjusted for education level are displayed in Figure 4.3. As with education level, declines were similar across all occupational classes when education was not controlled for. One notable difference among men's relative risks is that men in the highest class had the least decline of all classes (48%), whereas men in the intermediate class had a 68% lower risk of second birth after the transition. A slightly inverted U-shape relationship emerges among women's occupational classes in which both women in the highest and lowest classes had the lowest risk of second birth after transition (71% lower).

The results of the period effects models in which both education and occupational class are included show significant differences in the magnitude of change over the two time periods by occupational status for women, but hardly any relative risks proved statistically significant for men. Men in all occupational rankings have a lower risk of second birth after market reform began, but only the relative risk for intermediate employees was slightly statistically significant: 52% lower risk. Holding education constant dramatically changed the impact of occupational class for women; women in the lowest occupational classes had an 85% lower risk of second birth after the transition than before. The impact was similar for low grade workers and the highest class: 62% and 64% lower risk, respectively. Only the relative risk for intermediate employees lost its statistical significance when including education.

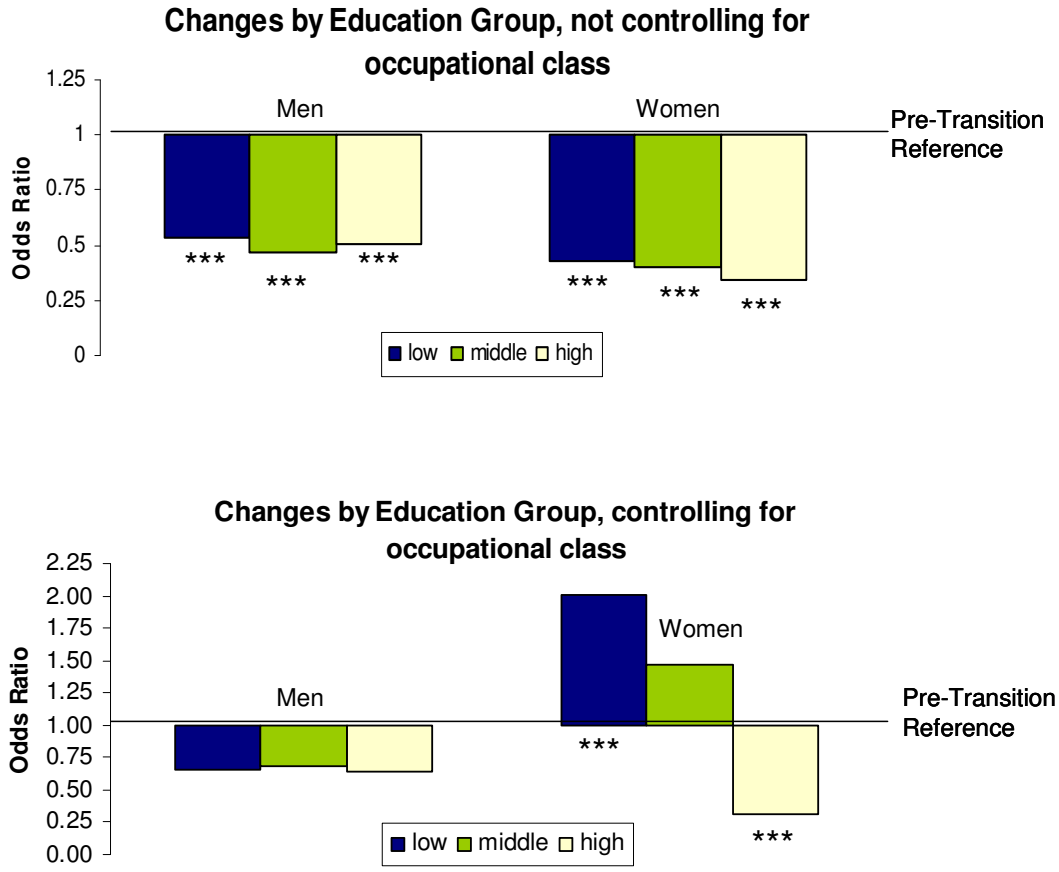


Figure 4.2 Summary Results for second birth estimates from piecewise constant event history models, Education. Note: model controls for time since first birth, age at first birth, whether respondent was surveyed in St. Pet. or Moscow, missing categories, siblings, urban/rural birth, and union status in the first

chart and occupational class as well in the second. Statistical significance: * =10%, ** =5%, *** =1%. Reference category for all odds ratios are the same education groups in the pre-transition time period.

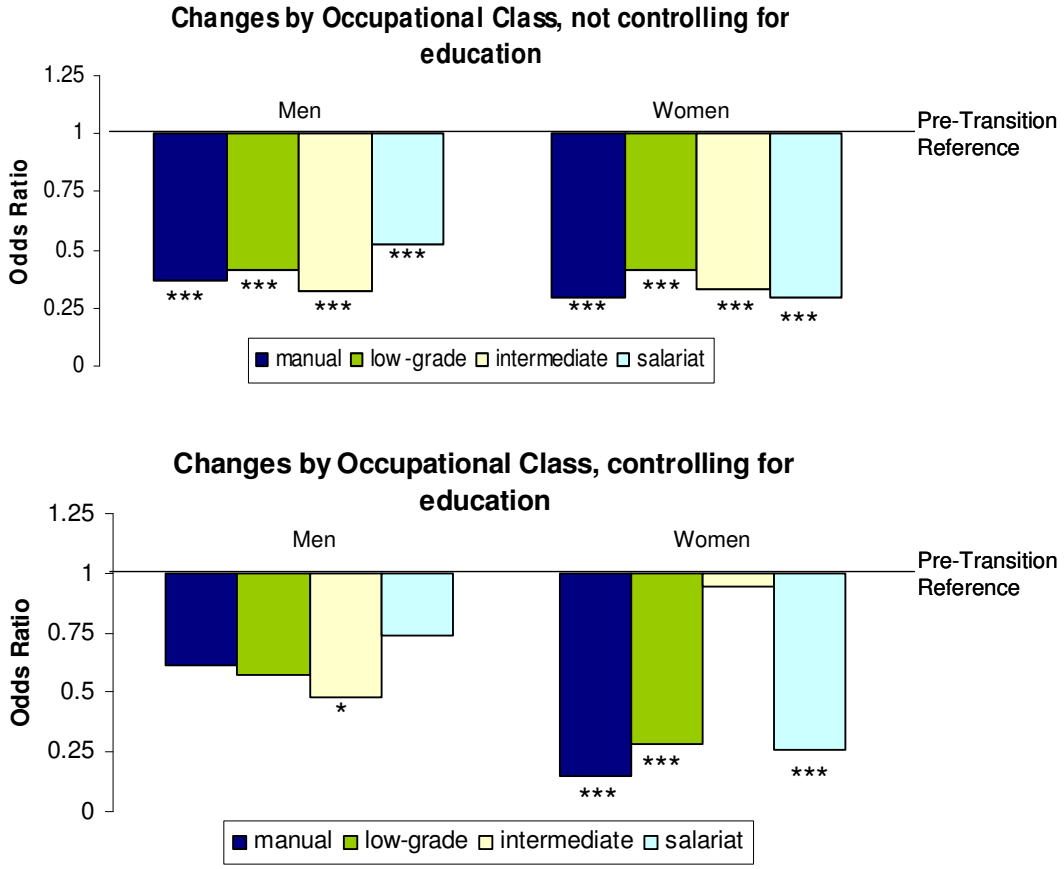


Figure 4.3 Summary results for second birth estimates from piecewise constant event history models, Occupational Class. Note: model controls for time since first birth, age at first birth, whether respondent was surveyed in St. Pet. or Moscow, missing categories, siblings, urban/rural birth, and union status in the first chart and educational level as well in the second. Statistical significance: * =10%, ** =5%, *** =1%. Reference category for all odds ratios are the same education groups in the pre-transition time period.

Table 4.3 shows results of the model that assesses whether ever having been unemployed matters to the decision to have a second child. The model is run twice with a change in reference groups in order to present results that show the impact of unemployment in the two time periods and facilitate easier interpretation of the results according to the hypotheses. The timing of unemployment is decomposed by its relation to the timing of the first childbirth. All results indicate that the timing of unemployment matters greatly. Focusing first on the Soviet Union time period, the results suggest that on the few occasions respondents experienced unemployment, they were less likely to have a second child. The results are remarkably strong and similar for both men and women: 87% and 89% lower risk, respectively. The impact of unemployment on second birth risk if unemployment occurred before having had a first child is not statistically significant. The change in the impact of unemployment in the post-transition time period appears to be a slight weakening for women, now a 79% lower risk, and an ambiguous impact for men. The relative risk for men is no longer statistically significant in the post-transition era, but it is in the same direction.

Table 4.3 Second birth estimates from piecewise constant event history models: Unemployment Model

Unemployment Model: Changing effect of ever having experienced unemployment across pre & post-transition periods		
	Men	Women
Period 1: never was unemployed	1	1
Period 1: unemployed before first birth	0.95	0.67
Period 1: unemployed after first birth	0.13 **	0.11 ***
Period 2: never was unemployed	1	1
Period 2: unemployed before first birth	0.81	0.89
Period 2: unemployed after first birth	0.66	0.21 ***
# of subjects	1655	3219
Log Likelihood	-2015.41	-3875.88
Prob > chi2	0.0000	0.0000
LR chi2 (31)	541.33	1417.2

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 level, labor force status and occupational class. Statistical significance: * =10%, ** =5%, *** =1%. The results are from two separate models, one for men and one for women, and the period results are obtained by changing the reference category.

The results of the models in which downward social mobility are analyzed are displayed in the tables below. In tables 4.4 and 4.5, the results are presented in the same fashion as the unemployment results. First, some patterns in the results evident for intergenerational DSM mirror those for the impact of unemployment. DSM mattered more for men before the transition to second birth risks than after transition from communism. Moreover, its impact was limited to its occurrence after the first child was born, rather than before and after. However, three differences emerge in the findings of intergenerational DSM in the post-transition era: First, the impact on men's fertility did not disappear after transition; after transition men had a 35% lower risk of second birth if they experienced DSM after the birth of a first child. Second, the impact of DSM for women's second birth decisions did not greatly decrease: 47% versus 44%. Third, the experience of intergenerational DSM after the transition actually gained in importance when it happened before the first child was born. Women were at exactly the same lower risk of second birth whether it happened before or after the first child: 44% lower risk.

Table 4.4 Second birth estimates from piecewise constant event history models: Intergenerational downward social mobility

Intergenerational Mobility Model: Changing effect of ever having experienced downward intergenerational occupational mobility across pre & post-transition periods		
	Men	Women
Period 1: never had downward mobility	1	1
Period 1: DSM before first birth	1.01	1.06
Period 1: DSM after first birth	0.32 ***	0.53 ***
Period 2: never had downward mobility	1	1
Period 2: DSM before first birth	0.77	0.56 ***
Period 2: DSM after first birth	0.65 **	0.56 ***
# of subjects	1656	3218
Log Likelihood	-2013.98	-3867.60
Prob > chi2	0.0000	0.0000
LR chi2 (31)	544.77	1426.41

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 level, labor force status, occupational class, and parents' occupational status. Statistical significance: * =10%, ** =5%, *** =1%. The results are from two separate models, one for men and one for women, and the period results are obtained by changing the reference category.

In regards to the intragenerational downward mobility results (Table 4.5), the same pattern of results emerge. The impact of DSM lessened over the two time periods for men (71% lower risk versus 59%) and the impact was restricted to occurrence after the first child was born. For women, DSM occurrence before the first child is born picked up significance, but remained less than the impact of occurrence after the first child was born in the pos-transition era: 35% lower risk versus 55%, respectively. These results indicate that the impact of DSM became more long-lasting after the transition.

Table 4.5 Second birth estimates from piecewise constant event history models: Intragenerational downward social mobility[51]

Intragenerational Mobility Model: Changing effect of ever having experienced downward intragenerational occupational mobility across pre & post-transition periods	Men	Women
Period 1: never had downward mobility	1	1
Period 1: DSM before first birth	0.88	1.07
Period 1: DSM after first birth	0.29 ***	0.41 ***
Period 2: never had downward mobility	1	1
Period 2: DSM before first birth	0.86	0.65 **
Period 2: DSM after first birth	0.41 ***	0.45 ***
# of subjects	1651	3218
Log Likelihood	-1982.39	-3843.6
Prob > chi2	0.0000	0.0000
LR chi2 (31)	593.36	1476.51

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 level, labor force status and occupational class. Statistical significance: * =10%, ** =5%, *** =1%. The results are from two separate models, one for men and one for women, and the period results are obtained by changing the reference category.

4.6 Discussion

The first question asked in this chapter was whether men and women of lower potential resources, measured through occupational class and educational level, had fewer second births than they would have had according to pre-transition rates (a period effect). Results indicate large declines in second birth rates across all education levels and occupational classes. Perhaps most interesting are the results of the model in which both occupational class and education level are included. On their own, it is difficult to know how to interpret class and education since they both capture similar information if operating alone. However, controlling for occupational class reveals the impact of education as it is stripped of information about earnings potential. While class represents incomes associated with different class levels, education introduces into the model non-pecuniary aspects such as culture as well as the norms and values associated with education levels. Remarkably different results emerge across education and class for women when controlling for both. The decreasing gradient that appears by education mirrors what we would expect for women who differentially invest in human capital: lower second birth risks for women with the highest education levels. The relationships that emerge for women by occupational class point to opposite forces at work: economic constraints for women in the lowest occupational classes and opportunity costs for women in the highest. However, the economic constraint appears to have been stronger since the relative risk for this group of women showed the greatest decline in second birth risks during market reform. The results for men were inconsistent and showed few patterns.

In regards to the impact of unemployment, it had a statistically significant impact on second birth risks for both men and women in the USSR, but only for women in the post-transition

[51] I display the baseline hazard of the intragenerational model in Figure A4.4 in the Appendix. I also display the full model results in Table A4.5. Slight differences in relative risk size exist in the reported results in the full model table because the pre-transition group was not separated by DSM or no DSM.

period. When a statistically significant effect appeared, it was only when unemployment was experienced after the first child was born. This result contradicts the possibility that continued childbearing may have been considered a solution to unemployment for women.

In general, the results decisively demonstrate that downward mobility is a significant factor that exerts negative pressure on the likelihood of a second child. This indicates that Easterlin's (1976) hypothesis about the conflict between aspirations and resources may have merit in the Russian context. Interestingly, the magnitude of DSM impact over the time periods was virtually the same for both types of DSM for women. However, the finding that it suppressed fertility even when DSM occured before the first birth indicates that experiencing DSM after the transition made family expansion less likely than it would have before transition.

The fact that we do see significant results if we account for the timing of DSM according to the first birth indicates that without this distinction, unobserved heterogeneity may have biased the relative risks for this group in a simpler specification. Whether downward mobility occurs before or after the first birth matters greatly to whether DSM impacts second birth decisions for men and across the two time periods. The impact of DSM appeared more limited before transition for women since they only significantly impacted second birth decisions if they happened after the first child was born. The differential timing finding in general may offer more insight into what DSM means in the context of fertility decisions and indicates that there might be issues of selection or endogeneity to consider. The expectations regarding a similar impact by timing were based on the idea that the mechanism argued to be at work is relative income loss and not selectivity. It may have been that labor market and fertility choices were decisions that were made together, hence, there could have been selection into DSM. An individual may prioritize family formation over career moves and, hence, we may see that they experience DSM before starting their family, but continue to have a first and second child regardless. This may be an interpretation of DSM if it did not have an impact before the first birth or if there was a positive impact of DSM on second birth risks. In no cases does DSM appear to encourage having a second child, but results do indicate that it is not always a significant factor if it occurs before the first birth.

In fact, the opposite appears to be the case for the impact of downward mobility on women in the post-transition era, in which the influence is similar or identical before and after the first birth. The fact that being downwardly mobile before having a first child did not influence men after the transition, nor men and women before the transition, in their decision to have a second child requires interpretation such as the former explanation. But because the results are similar for men and women before transition, and since the selection story is one told for women more than men—since family preferences do not necessarily impact men's career choices—it is more likely that the impact of income loss due to downward mobility simply weakened over time in the USSR and still does for men.

For both men and women who experience DSM, the results resoundingly show that this experience matters after the first birth and not before. At least two explanations for this time difference are possibilities. First, it may be that these occurrences of DSM are in some way related to the fact that one child has been born already; in other words, there may be an endogenous relationship between the first birth and DSM. Perhaps difficulties in reconciling the demands of work and family led to DSM, either through the choice of the new parent or otherwise. In this case, a second child would be less likely, given that there is already evidence of difficulty in keeping up with one's career and family responsibilities. Once again, this explanation is much less likely to be valid for men than women, given that reconciliation issues typically are experienced by women more than men. Due to the findings that not only were men also impacted by this event after the first birth, but they were impacted to a greater degree when DSM was experienced within one's own career path, intragenerationally rather than intergenerationally (59% lower relative risk for men vs. 55% for women), endogeneity of DSM and fertility seems a weak explanation at best. The second explanation, in line with the

hypotheses in this chapter, is that experiencing DSM altered the desire to have a second birth because the cost of another child became too high, given the loss in income associated with DSM, and because of the desire to re-achieve a previous class location.

Although many interpretations of the findings related to the timing of DSM have been considered and the selection and endogeneity explanations deemed unlikely, these findings indicate room for further research, specifically on how a differential impact of DSM on fertility might be best understood. These interpretations are tentative, therefore, and should be further explored in future analyses.

My overall expectations regarding the effects of labor market experiences, including unemployment and downward social mobility, were only partially correct. Downward mobility and unemployment did suppress fertility, but differently according to sex and not necessarily more after transition than before. Perhaps the most unexpected finding is that both of these experiences also suppressed fertility in men and women during the socialist era. Given the emphasis put on egalitarianism, redistribution of income and a ruling working class in Soviet rhetoric, the existence and the impact of these events is somewhat surprising. Nevertheless, the results are robust to various re-specifications and therefore require consideration.

Relative income loss is less likely to be the causal mechanism at work in downward mobility during the Soviet era given the compressed wage distribution and stability of jobs. The rarity of unemployment and downward mobility point to an alternative causal mechanism that may be at work in the pre-transition time period. For example, there may have been significant selectivity into unemployment and downward mobility in the command economy, in contrast to the job losses and downgrading that occurred in the market economy and economic crisis. Braithwaite (1997) writes that the unemployed in the USSR were often homeless or people who had been institutionalized. Having resided in a mental health institution or having been convicted had long-term consequences for career trajectories since these incidences were recorded in one's labor book, which was mandatory to present to future employers. On the other hand, Gregory and Collier (1988) found a positive relationship between education and unemployment, indicating that it might not always be individuals who commit crimes or have mental health issues that fall into this experience. They cite two reasons for this unusual relationship: First, graduates with higher education are usually assigned their first job and this assignment is more likely to be in a remote area than jobs given to lower educated individuals; both factors created a high mismatch between candidates' preferences and assigned jobs. Second, an over-abundance of human capital investment by the Soviet authorities generated more college graduates than available jobs. Matthews (1986) also writes about the mismatch in the number of available jobs for the number of highly educated individuals and describes highly educated school-leavers as reluctant to take manual jobs, which contributed to high unemployment in young adults.

This evidence points to at least two different pathways into unemployment during the Soviet era; the unemployed either had difficulty in finding a job due to their record of institutionalization or they opted out of available jobs to avoid being over-educated for their position. This latter pathway was likely of more limited duration, given the social and legal mandate to work in Soviet society (Fainstein, 1973). Moreover, besides the loss of wages that accompanied unemployment, Granick (1987) also refers to the humiliation suffered by the unemployed due to Soviet norms. Unemployment and its determinants have been written about in greater detail than downward mobility in the USSR, however, this summary of Soviet literature offers some insight into downward mobility as well: Taking a job in a lower occupational class for which one is educated was avoided to the point of opting for unemployment. Therefore, other job-related factors such as prestige, job benefits or the satisfaction of skill utilization were tremendously meaningful in the USSR. In conclusion, there is some evidence that selection into unemployment was likely stronger pre-transition than post-transition, which means that there are other important characteristics not being taken into

account when considering the relationship between unemployment and fertility. Moreover, there is evidence that class also mattered before the transition since being in the right class, at least according to one's educational level, was of great importance.

The impact of unemployment and downward mobility may have been greater before the transition than afterward because these experiences were much rarer events. This implies that the reasons for unemployment and downward mobility were likely to be more unusual, in regard to conditions surrounding the event, as well as more stigmatizing. During economic transition and crisis, unemployment and downward mobility occurred more often and, thus, may have been perceived more as occurrences related to economic turbulence than related to one's individual characteristics.

Finally, all results of these analyses require caution when generalizing to residents of St. Petersburg and Moscow, since the response rate in these cities was so low that characteristics of these respondents may not reflect the population as best they could. In addition, all results are relevant only to a parent's individual influence on the decision to have a second birth since covariates could not be measured at the household level.

5. DOWNWARD SOCIAL MOBILITY AND MORTALITY IN RUSSIA[52]

5.1 Introduction

The debate over the causes of the mortality crisis has been discussed in Chapter 1 and Chapter 3 of this thesis. The present chapter contributes to the discussion by attempting a new strategy to assess whether experiences related to economic crisis and transition, reflected in micro-level data, contributed to deaths in Russia over the time period 1994-2005. Special attention is given in this analysis to issues of selection and endogeneity in order to better interpret the relationships that emerge and avoid problematic issues in past micro-level analyses. Furthermore, this chapter specifically takes into account the findings on the role of alcohol consumption in the Russian mortality crisis and seeks to integrate into the research design of this study both the stress-related and alcohol-related explanations in the literature.

During the transition from communism, market reform increased the importance of income through wage dispersion and price liberalization; moreover, economic restructuring and crisis increased the difficulty of making ends meet through inflation, wage arrears, and job loss (Blanchard, 1997; Barr, 2001). The transition from communism essentially increased returns to being located in a higher class and having more resources at the same time that it knocked workers out of previous jobs and increased the cost of living. Given the tension between increasing returns to resources and the widespread loss of resources, I propose using downward social mobility and unemployment as proxies for the individual negative consequences of economic transition and crisis during this critical juncture. Downward mobility and loss of job imply a loss of previous resources, which can include social standing, income, embeddedness in social networks and prestige (Erikson & Goldthorpe, 1992; Treiman, 1977). This loss of resources likely had negative effects on well-being and was also likely accompanied by psychosocial stress for those, and their family members, who were not fortunate in the labor market; hence, this research will investigate whether downward mobility and unemployment impacted health.

The relationship between unemployment and mortality at the micro-level has been explored, particularly in relation to the post-communist transition and economic crisis (see Blazek & Dzúrová, 2000 for Czech Republic; Cornia, 2000 and Walberg, McKee, Shkolnikov, Chenet, & Leon, 1998 for Russia; Krumins & Usackis, 2000 for Latvia; Riphan & Zimmerman, 2000 for the former GDR; Abdala, Geldstein, & Mychaszula 2000, for Argentina). Strully (2009) recently investigated the link between unemployment and health by studying the impact of unemployment on workers who lost their jobs due to plant closure and not for health reasons, thus, avoiding the endogeneity problem often inherent in such research. She finds that with the closing of a firm, those who were laid off, and did not have a previous health condition, had 83% higher odds of developing a new health condition. The odds of experiencing fair or poor health increased by 54%. Strully's research demonstrates not only an immediate health reaction to labor market turnover but that the experience of losing one's job also has lasting effects on health.

In the case of Russia, and using the same data source as in this study, Denisova (2009) finds that experiencing poverty increases the risk of death for men and women of all ages in Russia. Although this finding has a different meaning than downward mobility, it does capture the impact of minimal resources, especially as an experience that is new. But downward mobility carries implications beyond relative income loss; the loss of one's status in society and the prestige associated with previous standing may also have consequences for health. Watson

[52] This chapter and parts of section 1.7 in the introduction have been published as a Max Planck Institute for Demographic Research Working Paper 2009-015.

(1995) argued that the gender disparity in increased mortality rates during the early 1990s may have been partly due to the fact that men's core social role, which was performed within the labor market rather than in the family, was put in jeopardy during the tumultuous transition. Being forced out of a job or having to take one in a lower class, even if not the lowest, may have caused stress and frustration. However, downward mobility and the loss of income, social status or prestige may be experienced beyond occupational class shifts. Due to firm-specific changes in social benefits and wage arrears, as well as wage devaluation, inflation and increasing inequality, some households may have felt that their social status shifted without experiencing downward mobility through employment changes. Therefore, this study focuses on downward shifts using multiple measures of social status.

To summarize, I argue that the economic crisis and transition brought about downward mobility and unemployment, which contributed to the mortality crisis. While downward mobility and unemployment likely both increase stress due to loss of resources, including income and status, the difference between the two may be one of degree. Therefore, we may expect unemployment to have a greater impact since overall loss of resources and increased uncertainty should be greater when experiencing unemployment. We may also expect a differential impact of downward mobility based on the level from which one drifts downward. These are empirical issues that will be addressed in the analysis.

Finally, beyond analyzing mortality, this chapter moves deeper into the causal chain linking economic crisis and mortality by assessing the relationship between downward mobility and health, as well as unemployment and health. I also build on the literature demonstrating the link between alcohol consumption and mortality (Chenet et al., 1998; Leon et al., 2007; Pridemore, 2004; Stickley et al., 2007; Shkolnikov et al., 2004b; Mäkinen, 2000) by investigating whether there is a relationship between downward mobility or unemployment and excessive alcohol consumption. The contribution of alcohol consumption to mortality in this context does not appear to be through long-term causes (e.g., through cirrhosis of the liver); rather, deaths are related to alcohol consumption in a short time-frame: through unusual alcohol consumption, including binges that last multiple days and drinking non-beverage alcohols, which can lead to increased deaths of a violent, accidental, circulatory, or suicidal nature. Because harmful alcohol consumption might be a catalyst for unemployment and downward mobility, and vice versa, this study systematically analyzes this multi-directional relationship as well. In sum, I demonstrate how both economic experiences may have impacted alcohol consumption, health and, ultimately, mortality.

I use the Russian Longitudinal Monitoring Survey (RLMS), which allows for an analysis that distinguishes between factors related to economic crisis and transition and pre-existing health conditions and behavior. Specifically, I address the following questions: 1) What characteristics were related to an increased risk of death, especially in regards to resources? 2) Did experiencing downward mobility or unemployment increase the risk of death above and beyond individual characteristics and economic conditions? 3) If mobility or unemployment matter to health and longevity, is the nature of the risk immediate or prolonged? 4) Does excessive alcohol consumption or poor health preceding downward mobility or unemployment explain the increased risk of death? 5) Does the experience of DSM or unemployment increase the odds of excessive alcohol consumption or poor health? The next sections describe the data and analytical strategy as well as the results. I conclude with a discussion of the results, possible forms of bias in this study and further areas of research needed to illuminate the link between turbulent economic contexts and health.

5.2 Data and methods

The RLMS data used in this analysis cover the years 1994-2005 and relied on a multistage probability sampling of dwelling units from over 2000 raions (similar to counties). These raions

cover 95.5% of the total population of Russia. Highly remote areas, as well as Chechnya, were not included in the sample. To allow for lower response rates in highly urbanized areas, each round of data collection oversampled accordingly, leading to a sample target of over 4700 dwellings a year. Around 4000 households were surveyed each year and the response rate varied from 50.8% in the most recent wave to 87.6% in the first. Within the household, the response rate was at least 97% in each round. Although this survey was not designed to be a true panel data set, it is possible to follow individuals over many waves.[53] Therefore, this analysis includes individuals that participated in multiple survey rounds.

Whereas the retrospective data available to study fertility allowed for an analysis in chapter four that included the pre-transition time period, chapter five focuses only on the post-transition period. As interesting as comparing death risks before and after transition might be, the opportunity does not exist in any data source to the best of my knowledge. However, a benefit of the RLMS is that it allows crucial indicators to be controlled for when mortality is the outcome being studied. Specifically, health and alcohol consumption status preceding the experience of downward mobility are included in the analysis so that results are not called into question by the order of events. Only in this way will we know if downward mobility has a causal impact on mortality risks rather than being part of a process related to health deterioration or destructive alcohol consumption.

a) Variables

The independent variables that were included in all models were age, sex, urban/rural residence, type of household, union status, smoking status, excessive alcohol consumption, diagnoses of heart attack or stroke, missing work status, self-rated health, labor force status and class, and education level. Exposure and occurrence rates of all variables are provided in Table A5.1 in the Appendix. Age was introduced as a series of dummy variables in which respondents were either under the age of 40, between 40-44, 45-49, 50-54, 55-59, or above the age of 60. Disaggregating age between 40 and 60 will give a closer look at the age groups that are particularly interesting to study in Russia's mortality crisis. A series of dummies capture whether the respondent currently lives in an urban area, township or rural area. Type of household identifies households according to their head. The three household types are 1) having a working-aged male as head of the household, 2) a working-age female as head of the household or 3) having only a retired male or female or a young head of the household who is not employed. Union status reflects whether the respondent is in a cohabiting union.

Smoking status is a dichotomous variable in which the respondent is coded as either being a current smoker or not. Excessive alcohol consumption is measured with a dichotomous variable indicating whether the respondent falls into the top decile of total grams of alcohol consumed daily.[54] The construction of these deciles is gender-specific and is based only on those who drink alcohol so the amounts were not biased by those who do not drink. Therefore, the bottom 10% is inflated with the addition of all the non-drinkers. The mean number of grams of alcohol consumed by excessive drinkers who are women and men was 54 and 201, respectively. The respondents who reported high consumption levels most often consumed vodka and other hard liquor. A dummy variable is introduced into the model as well that indicates whether the respondent has drunk any alcohol at all in the last month in order to make a distinction between those who do not drink alcohol at all. The risk of death for non-drinkers is expected to be higher

[53] An idiosyncrasy in this data is that although the majority of surveys were annual, two years were skipped. This analysis is based on data from 1994, 1995, 1996, 1998, 2000, 2001, 2002, 2003, 2004, 2005.

[54] Although other research based on RLMS data has used the top 20% as a cutoff point for excessive alcohol consumption, sensitivity tests demonstrated that mortality was more highly associated with a narrower definition of excessive alcohol consumption.

since this is a common finding across various contexts and is assumed to be driven by non-drinkers who abstain because of health problems.

Four indicators are included to reflect the health status of each respondent. Health conditions were captured with two dichotomous variables indicating whether a respondent has ever been diagnosed with a heart attack or a stroke. New health conditions are therefore included as soon as diagnosis occurs. Another dichotomous variable captures whether a respondent has missed "any work or study days due to illness" in the past month. This variable is particularly useful in understanding the extent to which respondents' livelihoods are affected by health. The final health variable is self-rated health and indicates whether the respondent rates his/her health as being bad or very bad versus average, good or very good.

Education was introduced as a series of dummies in which respondents were classified as 1) not having completed secondary education, 2) having completed secondary education at least, including those who received vocational or technical training as well, and 3) having completed university education. The labor force variable harmonizes participation and occupational class information[55] and consists of the following categories: 1) unemployed; 2) not participating in the labor force due to caring responsibilities; 3) not participating in the labor force because respondent is studying, retired, disabled or other; 4) a manual or routine worker; 5) a low-grade employee; 6) intermediate employee, or; 7) part of the "salariat" or professional class.

Other measures were introduced to capture level of resources as well. The most objective indicator of the level of individual financial resources would be earnings or income. Loss of personal earnings might best approximate a cause of psychosocial stress, given that stress is likely to increase if one is not able to contribute to or maintain one's contribution to household income. However, total household resources may smooth the loss of part or whole earnings. Therefore, household income might be the more appropriate measure for assessing resources and mobility. Moreover, the existence of wages implies that respondents remain in the labor market and that they are healthy. It may be that once unemployed or a health condition develops, an individual is less likely to be in the labor force. Therefore, a healthy worker effect may bias a measure that relies strictly on labor market involvement.[56] For this reason, the sample is not limited to workers only and the impact of being downwardly mobile is considered after adjusting for all other labor market statuses, which should bias results downwards given that some level of health is required to maintain employment.[57] As such, real household total income is assessed for its impact on the risk of death. This measure includes all home production and other household-level and individual-level income variables and reflects real household income since all amounts have been pegged to values in June 1992. I also adjusted this measure to reflect economies of scales, by using the revised OECD equivalence scale in which the first adult in the household retains the value of 1, every additional adult is assigned the value of 0.5 and every child (less than 14 years old) is assigned a value of 0.3. The total household income is divided by the sum of these values and the measure is, thus, the equivalent income per person within the household. Quartiles of income were constructed on a yearly basis and reflect the respondent's rank in a distribution of real adjusted income. Finally, some underreporting of household income is to be expected. Because this analysis uses quartile distribution of income, under-reporting is only problematic if it occurs at one end of the income distribution more than another. One possible way to check if there is a more or less uniform

[55] Occupational class was constructed using ISER's approach that transforms 3-digit ISCO88 codes into the European Socioeconomic Classification, which is based on the EGP (Erikson-Goldthorpe-Portocarero) framework (Rose & Harrison, 2007). ISCO88 codes were assigned with particular care to take into account Russian idiosyncrasies of occupations (Carolina Population Center, 2009).

[56] This is not to say that all workers are healthy, but rather that there is some selectivity into working based on health status.

[57] Indeed, limiting my analyses to only those with a paid position in the labor market increased the magnitude of my findings for men.

gradient in income by another related variable is to compare mean expenditure by income quartiles. Figure 5.1 demonstrates that the gradient in expenditure conforms nicely to income, which indicates that underreporting of income is likely more or less uniform and does not vary greatly according to income levels.

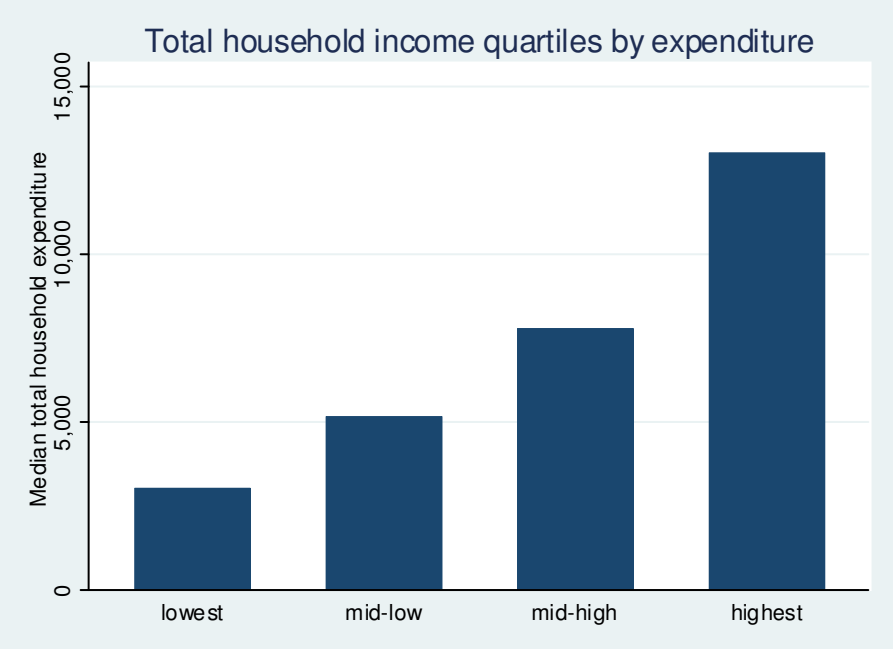


Figure 5.1 The gradient in income according to expenditure
Source: author's calculations based on RLMS data

The second measure of resources is subjective and indicates whether the respondent experienced a downward shift in his/her location on a 9-step latter that ranks personal wealth according to others.[58] Because minute shifts in the steps of this ranking system may be arbitrary, the 9 steps are consolidated into 3 categories, representing the 3 bottom poorest steps, the 3 middle steps and the 3 highest steps. This measure may come closest to capturing the link between the economic context and health since it is possible that individuals or households experience a real loss in resources yet it may not always change their perception of how they fit into the larger context. Therefore, this measure introduces the important element of inequality, which may have intensified or lessened feelings over loss of resources. It may be that wage arrears and job loss diminished household income for many simultaneously, rendering the experience less personally significant. Indeed, RLMS data report between 40-63% of all individuals experienced wage arrears or in-kind payment of wages from 1994-1998. Finally, although it comes at the price of objective clarity of external conditions, a subjective wealth measure moves one step deeper into the causal chain leading from the economic context to a health impact, in that it reflects the perceptions of individuals.

b) Dependent Variable and Sample

The dependent variable is death of the respondent and all deaths are reported by other members of the household in the survey following the year in which a death took place. Since deaths are reported through proxy respondents, it is not possible to capture deaths of individuals living alone.[59] Moreover, all individuals who skipped participation in one or more survey rounds are

[58] The exact wording of the question in the survey is the following: "And now, please, imagine a 9-step ladder where on the bottom, the first step, stand the poorest people, and on the highest step, the ninth, stand the rich. On which step are you today?"
[59] Between 3 and 12% of all respondents in the sample lived alone, depending on the wave.

censored at the moment they skip a round since it is not possible to accurately account for individuals' status during the missing waves. When studying relative changes in status from one year to the next, as in the case of mobility, those deaths in which we only have information for one wave are excluded as well, since it is not possible to capture mobility without at least two waves of data before the death. For these reasons, 267 deaths are excluded over the 11 years for which we have at least one wave of information about the remaining individuals.[60] In the baseline static models that exclude the impact of mobility, 934 deaths are possible to study; whereas the dynamic models analyze 860 deaths. Rather than exclude observations and deaths to those who only completed one survey round before death, these extra deaths are kept in the static models in the interest of analyzing as large a sample of men and women as possible, despite incomparability with the reduced samples studied for mobility.

Attrition is a problem with the RLMS data since households and individuals sometimes left the sample by moving into a new dwelling. Each wave included new entrants to the survey to make up for the loss of movers. In general, these movers were not followed to remain in the survey. Denisova (2009) reports that 1-2% of all households or individuals who leave the sample are due to deaths, which is a negligible amount. However, she also reports that the average crude death rate given by the Russian statistical office is almost twice as high as the rate observed in the RLMS data, indicating that the RLMS presents a downward biased death rate, which could be due to attrition for other reasons that may be related later to death. This issue is important as it may be intimately related to the process being studied in this analysis. For example, an individual may experience downward social mobility or unemployment, be unable to make ends meet and have to move into a cheaper dwelling or co-reside with family/friends. If this is the case, it may be that the most detrimental experiences of downward mobility and unemployment are missing from the analysis. This form of bias, however, means that actual statistical results presented in this study are weaker than they may be in reality.

On the other hand, Perlman and Bobak (2008, p. 94) find that, regardless of attrition, pooled age-specific death rates of men and women in the RLMS sample are quite similar to the average national Russian mortality rate. The greatest discrepancy was found for women over the age of 60. Nevertheless, logistic regression of those likely to attrit reveal that those who remain in the panel are a somewhat selected group. Using the characteristics of individuals in the final wave of data available for each respondent and predicting those who attrit relative to those who were censored either through death or participated in the final interview reveals the following differences (statistically significant at $p<0.05$). First, those who attrit are more likely to be under the age of 40 than 45-59, but less likely to be under the age of 40 than over 60. Attriters are also less likely to be non-drinkers and more likely to report being in poor health. They are more likely to be urban and not in a union, as well as have incomplete secondary education. Finally, they are more likely to be a low-grade employee than unemployed, not participating in the labor force or in any other occupational class.

The actual composition of the RLMS sample analyzed bears close resemblance to the total Russian sample in terms of education according to the All-Russian Population Census in 2002. Those who had completed tertiary education were 17.2% of the total Russian population in 2002 versus 18.3% of the RLMS 2002 sample. A greater difference was found in regards to the lower two educational attainment groups: 56.6% of RLMS respondents completed secondary education and 25.1% did not, in contrast to 50% and 32.8% in the total population. This difference is to be expected given that we know those with very low education levels were the

[60] The only statistically significant differences ($p<0.05$; measured through logistic regression) between the characteristics of individuals who died after only one survey round or after having missed one or more survey rounds (taken from the last survey in which they participated) and the characteristics of those whose deaths were captured in the analysis, were that the excluded deaths were less likely to occur in the oldest age groups.

ones more likely to leave the sample through attrition. Besides this discrepancy, the education profile of the RLMS sample appears relatively similar to the general population.

Kaplan-Meier survival estimates in Figures 5.2 and 5.3 present mortality estimates of this RLMS panel sample used, according to age groups and sex. As expected, women lived longer than men; nearly 80% of women over the age of 60 survived all years of analysis in contrast to less than 65% of men. And, as we know from much documentation on the scope and structure of increased mortality during transition from communism, men in the 40-60 year old age group were much more likely to die than women in the same age group. Particularly interesting is that the survival rates of men in the 50-54 age group were slightly better than men in the 45-49 year old age group. A perfect gradation by age is therefore not seen for the Russian men in this sample. Women's survival rates for all age groups under the age of 60 were more or less the same.

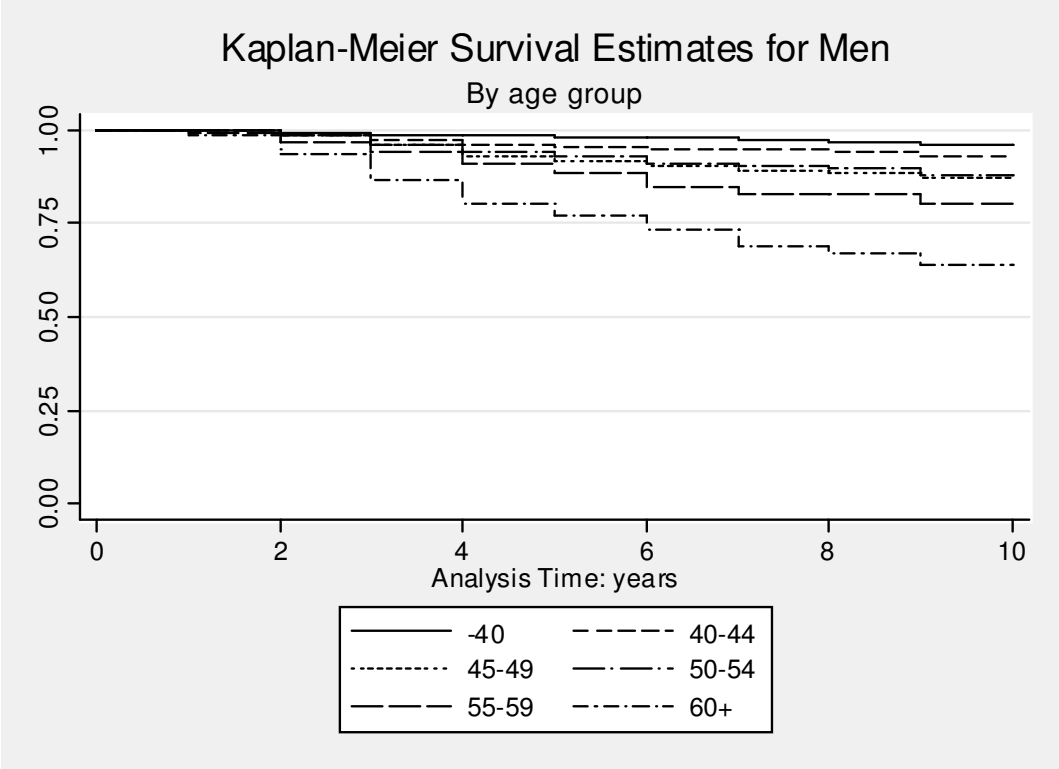


Figure 5.2 Survival estimates of men in the RLMS sample, 1994-2005

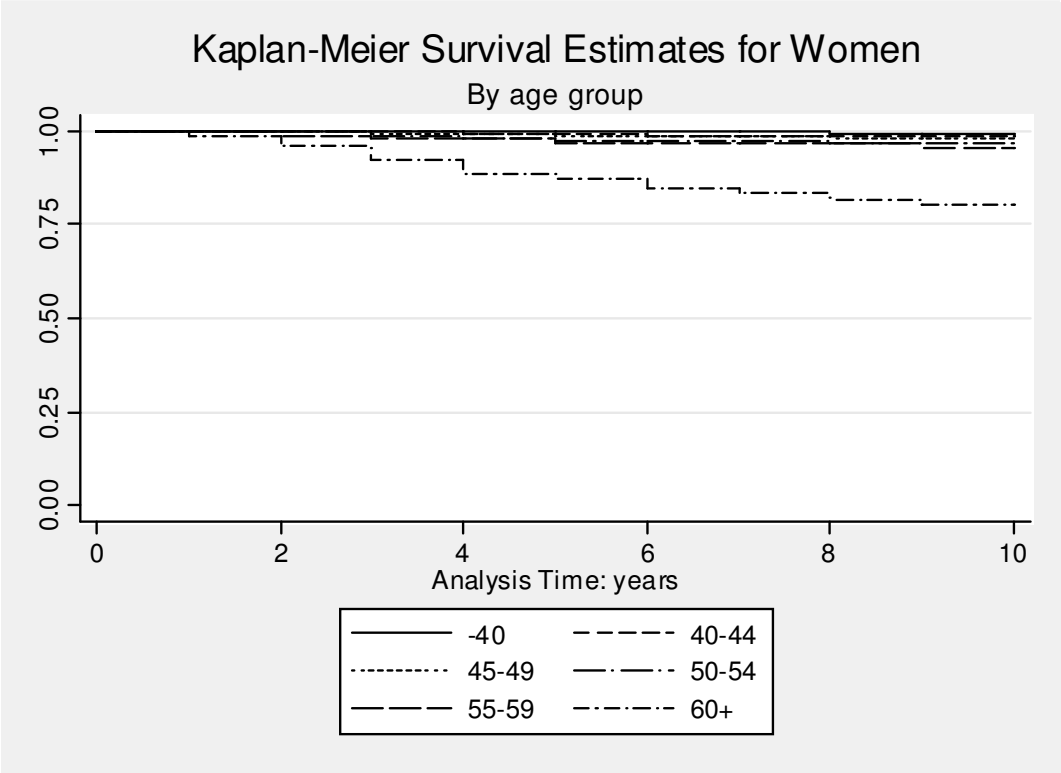


Figure 5.3 Survival estimates of women in the RLMS sample, 1994-2005
Source: Author's calculations from RLMS data.

c) Model and analytical strategy

Cox proportional hazard models are used to estimate the impact of time-constant and time-varying factors on the risk of death, using a discrete event history format. The proportionality assumption required for using the Cox model was confirmed first by checking the consistent nearness of the predicted and observed values of a survival probability plot and, second, by observing a statistically insignificant interaction of time and age. These two tests ensure that a time-dependent process is not at work in these models and that there are no strict duration effects. Robust standard errors are estimated by clustering on individuals.

The first step in this analysis is to analyze static characteristics, including unemployment, on the full sample, to understand the way these characteristics impact the risk of death on their own. The second step is to test the impact of experiencing downward mobility. The third step is to check the robustness of these results by assessing whether there is a health selection or alcohol consumption selection into downward social mobility or unemployment. It may be that it is not downward mobility or job loss that impacts death risks, but rather poor health or excessive alcohol consumption before downward mobility occurred that leads to both downward mobility and death. This aspect of the analysis, therefore, addresses the issue of endogeneity in the debate over the mortality crisis in Russia and addresses the assumption in the health divide literature that mobility occurs because of selection. The strategy used here is to control for health and alcohol consumption in the year preceding downward mobility. Still relying on at least two waves of data, the model now includes not only current characteristics and whether downward mobility or unemployment has occurred (at time t) but health status or excessive alcohol consumption status in the preceding year (t-1). The results of these models will indicate whether downward mobility or unemployment still has an impact on the risk of death when health and alcohol consumption are controlled for in the year preceding downward mobility. To further assess this issue, separate models analyzed the direct impact of health or excessive alcohol consumption on the risk of downward mobility and unemployment, adjusting for all other

variables in the original models. The final step in this analytical strategy is to assess whether there is a relationship between downward mobility or unemployment and excessive alcohol consumption. I also assess whether a relationship exists between downward mobility or unemployment and poor health. This final step may shed light on the causal mechanisms through which stress impacts mortality.

When working with mobility as an explanatory variable, there is risk of merely picking up effects that are related to the origin or destination class. Researchers assessing mobility within the health divide debate have two opposing perspectives that would recommend different approaches to capturing these different effects (e.g., Dahl & Kjaersgaard, 1993; Claussen et al., 2005; Hart et al., 1998; Davey Smith et al., 1997; Hemmingsson & Lundberg, 2005; Nilsson et al., 2005; Power et al., 1996; Stern, 1983). Those who believe that longevity is related to initial conditions that factor into cumulative health would consider origin class the appropriate class to include. Conversely, if it is the impact of the destination class environment that matters, then destination class would be more important to control for. The logic behind controlling for origin and destination class is somewhat different in this study, however. First, the "origin" class is not an indicator of early life conditions since the data do not offer this information, but rather it is a measure of class in the preceding year; therefore, it may have less relevance and will be called "previous" class. On the other hand, the previous class will control for the fact that those who are in the lowest class already are not able to experience downward mobility.[61] In regards to the traditional reasons for controlling for destination class, it is unlikely that respondents' health is detrimentally affected by destination class environment in the short time period that is considered here. Regardless, the issue of which class status should be controlled for is not easily resolved theoretically and, therefore, the models are run twice, once with origin class and once with destination class.[62] A comparison of the results of the two might empirically tell us which status bears more weight on the risk of immediate death. As destination class is controlled for in all the previous steps, the fourth step in this analysis is therefore to control for the confounding effect of the previous class.

The final step is to test whether the impact of experiencing downward mobility or unemployment is lasting or short-term. This strategy includes comparing estimates of the impact of downward mobility and unemployment when the respondent is currently in that situation with the impact of having ever experienced unemployment or downward mobility. Because unemployment and downward mobility can only be captured in the waves in which the respondent participated, past negative labor market experiences that might have occurred in the earliest years of the transition are unfortunately not accounted for.

5.3 Results

Tables 5.1 to 5.3 display the full model results of static characteristics on the risk of death for both men and women, analyzed separately. The results of these models are discussed together, since the impact of most variables does not greatly change depending on the measure of resources used. Over all three models, age has the expected and increasing impact on the risk of death, especially for women. The impact of age increases when labor force status is removed from the analysis as being in retirement shared the impact of age when it was included.

Concerning risk factors, the impact of being a smoker was consistent across all three models with different resource measures, although there was some variation in the size of the relative risk. For men, being a smoker increased the risk of death from 32-33%, whereas it increased the

[61] This potential source of bias is not of great concern given that it would only weaken the results and not inflate them, since we know that health is poorest in the lowest occupational class ranking and since they are the ones that cannot experience downward mobility.

[62] Due to multicollinearity—since most people do not change classes from year to year—both previous and destination class cannot be included in the model simultaneously.

risk from 74-105% for women, relative to non-smokers. In contrast to expectations, the relative risk of death for men in the top decile of alcohol consumption was not large, nor statistically significant, although in the expected direction. It varied from having a 3-11% increase. However, excessive alcohol consumption greatly impacted women's relative risks of death; their risk of death was three times as high as women who did not consume such amounts of alcohol. Being a non-drinker also did not appear to matter greatly for men, while it almost doubled the risk of death for women, relative to drinkers.

One health condition also showed variation by sex. While the relative risk of death was between 40-43% higher for men if they had been diagnosed with a heart attack, a heart attack diagnosis had no statistically significant impact on women's risk. Both men and women were significantly impacted by diagnosis of stroke. Men had an increased risk of 64-71%, whereas women had twice as high a risk as those who had not been diagnosed with a stroke. Concerning health status, subjective ratings of poor health were highly predictive of death in the next wave: death risks for both men and women were between two and three times higher and the risk was higher for men than women, relative to those whose health was average or good. Finally, neither for men nor women did the incidence of having missed work due to illness predict death with any statistical significance. The directional change in the impact of this indicator is consistent with whether labor force status is controlled for in the model, indicating the presence of a healthy worker effect.

In regards to the type of area in which the respondent lives, men were at a higher risk (22-28%) of death if they lived in a rural area compared to an urban area. This finding is not unexpected since some research has shown that rural mortality is higher in rural areas due violent causes of death and preventable health problems (Semyonova, Ivanova, Gavrilova, Evdokushkina, Gavrilov, & Devichenskaya, 2002), the latter of which likely stems from a lower concentration of public health facilities and providers in rural areas. Type of area did not have a statistically significant relationship to mortality for women. Residing in a household in which the head is either retired or very young reduced the risk of death for women and men significantly.

Perhaps surprisingly, education was not related to the risk of death with statistical significance for men in these models. The results for education are quite different in a reduced model, however, demonstrating that measures of the level of resources absorb the impact of education for men, but not for women. Tables A5.2 and A5.3 in the Appendix display simplified models to show the straightforward impact of education, as well as smoking status, which reflect what we know from past research. All the estimates for men are in the expected direction, however. For women, in contrast, having completed secondary or university education significantly reduced the risk of death (43-44% and 33-48%, respectively), relative to women who had not completed secondary school.

The impact of labor force status was as expected, in which non-participation due to caring for someone was statistically insignificant (although the direction of the estimates indicates it increases the risk of death for both men and women) and non-participation due to retirement, disability, studying or other unspecified reasons increases the risk of death. Most importantly, after adjusting for the impact of all these characteristics and statuses, men who were unemployed had twice as high a risk of death and women had a risk ten times as high, relative to men and women who were working as low-mid grade employees.

Turning now to the measures of resources, the first—in Table 5.1—is occupational class, which did not prove to have a statistically significant relationship with mortality. Membership in none of the classes predicted a statistically significant higher death risk for men and the direction of the impact of membership was the same for all classes: belonging to the manual worker class, the intermediate employee class and the professional class all show a reduced risk of death, relative to those in the low-mid grade employee class. For women, membership in the lowest

class (routine or manual workers) increased the risk of death to almost three times the risk of belonging to the low-mid grade class.

The model in Table 5.2 uses an alternative specification of resources that is one's location in a quartile distribution of real equivalent household income. In contrast to occupational class, a statistically significant relationship emerges between mortality and income for men. Relative to those in the lowest ranking of income, men in the mid-high and the highest ranks had a 30% and 28% lower risk of death, respectively. Men in the low-mid ranking of income had an increased risk of 6% but this result was not statistically significant. Along with all results for women being statistically insignificant, they were not in the expected direction.

Table 5.3 displays results of the final static model in which the measure of resources was location in a subjective wealth distribution. Here, a perfect gradient in health emerges for men, in which mid-ranking men had a 18% lower risk and the highest ranking men had a 50% lower risk of death, relative to the lowest ranking men. Women in the mid ranking had a 12% lower risk than women of the lowest ranking; women in the highest ranking were at a 3% higher risk, but none of the results for women were statistically significant.

Table 5.1 Estimates of static characteristics and occupational class as a measure of resources

Cox Proportional Hazard Risks of Death in Russia, 1994-2005

Relative Risks of Static Model 1: Labor Force Participation and Class Status	Men	Women
<40 years	1	1
40-44	2.01***	2.42*
	(0.44)	(1.20)
45-49	3.33***	3.15***
	(0.63)	(1.33)
50-54	2.64***	1.03***
	(0.58)	(1.64)
55-59	4.06***	4.09***
	(0.78)	(1.61)
60+	5.56***	10.59***
	(1.24)	(3.62)
smoker (ref: no)	1.33***	1.74**
	(0.12)	(0.45)
heavy alcohol cons (ref: no)	1.03	3.46***
	(0.18)	(1.15)
non-drinker (ref: drinker)	0.99	1.98***
	(0.09)	(0.31)
heart attack diagnosed (ref: no)	1.40***	0.95
	(0.17)	(0.20)
stroke diagnosed (ref: no)	1.64***	2.03***
	(0.24)	(0.34)
missed work from illness (ref: no)	1.24	1.38
	(0.29)	(0.64)
perceives health as poor (ref: no)	2.81***	2.72***
	(0.28)	(0.34)
urban residence	1	1
townships	0.94	1.16
	(0.17)	(0.24)
rural residences	1.22**	0.95
	(0.12)	(0.11)
male-headed household	1	1
female-headed household	0.82	0.87
	(0.12)	(0.14)
retired or young head	0.63***	0.38***
	(0.07)	(0.04)
not in union (ref: in union)	1.04	1.08
	(0.11)	(0.12)
incomplete secondary educ	1	1
complete secondary or more	0.99	0.57***
	(0.10)	(0.08)
university or institute	0.90	0.67**
	(0.13)	(0.14)
unemployed	2.16***	9.98***
	(0.44)	(4.54)
routine/manual worker	0.93	2.79
	(0.19)	(1.81)
low-mid grade employees	1	1
intermediate employees/ers	0.60	0.24
	(0.25)	(0.28)
salariat	0.86	0.45
	(0.26)	(0.52)
caring for someone	3.51	2.58
	(3.27)	(1.91)
other reasons not particip.	2.16***	5.94***
	(0.40)	(3.56)
# of subjects	8847	10622
# of deaths	544	384
Time at risk	37195	50215
Log Pseudolikelihood	-4115.5	-2861.3
Prob > chi2	0.0000	0.0000
Wald chi2 (25)	780.54	628.38

Note: Statistical significance: * =10%, ** =5%, *** =1%

Table 5.2 Estimates of static characteristics and real equivalent household income as a measure of resources

Cox Proportional Hazard Risks of Death in Russia, 1994-2005

Relative Risks of Static Model 2: Location in the Distribution of Real Equivalent Household Income	Men	Women
<40 years	1	1
40-44	1.83***	2.29*
	(0.42)	(1.15)
45-49	2.27***	3.36***
	(0.63)	(1.45)
50-54	2.89***	5.40***
	(0.64)	(2.21)
55-59	4.64***	7.79***
	(0.89)	(3.04)
60+	9.75***	23.23***
	(1.71)	(7.67)
smoker (ref: no)	1.32***	2.05***
	(0.12)	(0.50)
heavy alcohol cons (ref: no)	1.11	3.60***
	(0.20)	(1.24)
non-drinker (ref: drinker)	1.03	2.17***
	(0.09)	(0.38)
heart attack diagnosed (ref: no)	1.43***	0.93
	(0.18)	(0.20)
stroke diagnosed (ref: no)	1.69***	2.08***
	(0.25)	(0.36)
missed work from illness (ref: no)	1.01	0.88
	(0.23)	(0.41)
perceives health as poor (ref: no)	3.09***	2.92***
	(0.31)	(0.38)
urban residence	1	1
township	0.96	1.15
	(0.18)	(0.25)
rural residence	1.26**	0.99
	(0.12)	(0.11)
male-headed household	1	1
female-headed household	0.80	0.87
	(0.15)	(0.14)
retired or young head	0.61***	0.37***
	(0.07)	(0.05)
not in union (ref: in union)	1.07	1.09
	(0.11)	(0.13)
incomplete secondary educ	1	1
complete secondary or more	1.01	0.56***
	(0.10)	(0.08)
university or institute	0.90	0.52***
	(0.13)	(0.11)
Lowest HH income (<25%)	1	1
Low-mid HH income (25-50%)	1.06	1.19
	(0.12)	(0.16)
Mid-high HH income (50-75%)	0.70**	1.21
	(0.09)	(0.18)
Highest HH income (>75%)	0.72**	1.05
	(0.10)	(0.18)
# of subjects	8740	10465
# of deaths	531	373
Time at risk	36010	47796
Log Pseudolikelihood	-4011.3	-2780.8
Prob > chi2	0.0000	0.0000
Wald chi2 (22)	829.17	696

Note: Statistical significance: * =10%, ** =5%, *** =1%

Table 5.3 Estimates of static characteristics and subjective wealth distribution as a measure of resources

Cox Proportional Hazard Risks of Death in Russia, 1994-2005

Relative Risks of Static Model 3: Location in the Subjective Wealth Distribution	Men	Women
<40 years	1	1
40-44	1.86***	1.93
	(0.41)	(0.95)
45-49	3.21***	2.83**
	(0.61)	(1.18)
50-54	2.69***	4.55***
	(0.59)	(1.79)
55-59	4.31***	6.68***
	(0.82)	(2.49)
60+	9.01***	19.97***
	(1.57)	(6.16)
smoker (ref: no)	1.33***	1.93***
	(0.12)	(0.48)
heavy alcohol cons (ref: no)	1.06	3.62***
	(0.19)	(1.20)
non-drinker (ref: drinker)	1.03	2.04***
	(0.09)	(0.35)
heart attack diagnosed (ref: no)	1.43***	1.01
	(0.18)	(0.21)
stroke diagnosed (ref: no)	1.71***	1.97***
	(0.25)	(0.34)
missed work from illness (ref: no)	0.93	0.86
	(0.21)	(0.40)
perceives health as poor (ref: no)	3.10***	2.81***
	(0.31)	(0.36)
urban residence	1	1
township	1.01	1.09
	(0.18)	(0.23)
rural residence	1.28***	0.97
	(0.12)	(0.11)
male-headed household	1	1
female-headed household	0.80	0.90
	(0.15)	(0.14)
retired or young head	0.64***	0.38***
	(0.07)	(0.04)
not in union (ref: in union)	1.15	1.04
	(0.11)	(0.12)
incomplete secondary educ	1	1
complete secondary or more	0.99	0.57***
	(0.10)	(0.08)
university or institute	0.84	0.54***
	(0.12)	(0.11)
lowest ranking of subjective wealth	1	1
mid ranking of subjective wealth	0.82**	0.88
	(0.07)	(0.11)
high ranking of subjective wealth	0.50*	1.03
	(0.20)	(0.47)
missing	1.68**	2.21***
	(0.38)	(0.38)
# of subjects	8847	10622
# of deaths	544	384
Time at risk	37195	50215
Log Pseudolikelihood	-4134	-2875.8
Prob > chi2	0.0000	0.0000
Wald chi2 (18)	824.84	750.59

Note: Statistical significance: * =10%, ** =5%, *** =1%

The next results discussed (Table 5.4) are those that assess whether the relationship between unemployment and mortality was attenuated when controlling for past alcohol or poor health, which may have led to job loss. In this model, unemployment is a dummy variable and the results are relative risks of mortality when unemployed relative to being gainfully employed or not participating in the labor force. Unemployment increases the risk of death for men by 82% when controlling for alcohol consumption and 89% for women, both of which are statistically

significant results. The risk of death when having been an excessive alcohol drinker in the previous wave is not statistically significant, although it is in the expected direction (increase of 25% in the risk of death). Controlling for poor health also does not weaken the relationship between unemployment and risk of death for men and women; however, the impact of having been in poor health in the previous wave increases the risk of death by 45% and this result is highly statistically significant. Finally, having ever been unemployed in the years surveyed here, as a long-term effect, still increases the risk of death for men by (66%), which is lower than the risk of mortality when unemployed in a current spell but still a large impact; whereas the results for women decrease to only an increase of 31%, which is not statistically significant.

Table 5.4 Estimates of unemployment models

Cox Proportional Hazard Risks of Death in Russia, 1994-2005

	Relative risks of experiencing unemployment		
	Past alcohol	Past health	Ever experienced
Men: not unemployed	1	1	1
Men: unemployed	1.82*** (0.29)	1.83*** (0.29)	1.66*** (0.20)
Women: not unemployed	1	1	1
Women: unemployed	1.89** (0.59)	1.95** (0.61)	1.31 (0.24)
Past excessive alcohol consumption	1.25 (0.20)		
Past health status was poor		1.45*** (0.12)	
# of subjects	14804	14804	14804
# of deaths	860	860	860
Time at risk	68111	68111	68111
Log Pseudolikelihood	-7062.98	-7054.30	-7063.21
Prob > chi2	0.0000	0.0000	0.0000
Wald chi2	1726.92	1743.69	1665.07

Note: Statistical significance: * =10%, ** =5%, *** =1%. Results are adjusted for current age, health conditions, health status, alcohol and smoking status, urban/rural residence, household type, union status, and education.

The results of the dynamic models, analyzing the impact of change in one's level of resources differ between men and women. Table 5.5 displays the results of downward mobility according to a downward shift in the subjective wealth distribution.[63] Downward mobility did not prove to have a statistically significant relationship with women's risk of death. However, it increased the risk of death for men by 33% and this relationship was highly statistically significant. Moreover, none of the extra models that were implemented to check the robustness of these results altered the relationship between mobility and mortality for men. Whether controlling for the possibility that the impact of mobility is related to alcohol consumption or health status in the previous wave, men who experienced downward mobility had a 33-34% higher risk of death than men who did not experience downward mobility. As in the case of the unemployment models, past excessive alcohol consumption did not prove to be related to death with statistical significance, whereas being in poor health in the previous wave was statistically significant and increased the risk of death by 39%.[64] Adjusting the models to include the subjective wealth distribution rank that individuals reported before downward mobility occurred (origin effect) further strengthened the relationship between downward mobility and mortality by increasing

[63] For reasons of space, the results for downward mobility according to a decrease in ranking of real equivalent household income are not displayed since this measure or form of mobility did not prove to have a statistically significant relationship with the risk of death. However, it is worth noting that the results were in the expected direction, i.e., experiencing this form of downward mobility increased the risk of death.

[64] Further investigation of selection into downward mobility or unemployment—using separate models to analyze the direct impact of health or excessive alcohol consumption on the risk of downward mobility or unemployment for those participating in the labor market, adjusting for all other variables in the original models—revealed no statistically significant relationship. Results are not shown for reasons of space, but they are available upon request.

the impact to 52%. Moreover, having ranked oneself in the mid-category of wealth distribution decreased the risk of death by 17%, relative to being in the lowest rank. The results of this specific model, which controls for origin state, are in line with expectations; we should expect weaker results in the models that do not control for the origin state since we would expect health to be poorest in the lowest ranking and those in the lowest ranking cannot experience downward mobility. Not shown in the table, for reasons of space, are interactions between downward mobility and previous wealth ranking. It appears that the negative health effect of downward mobility for men is driven by those in the middle ranking who experience a fall, not those in the highest (according to statistical significance, although results for both the interaction for the mid and highest rank show an increase in mortality risk when downwardly mobile). Finally, re-specifying the downward mobility measure to one that indicates whether the respondent has ever experienced downward mobility (i.e., in the waves covered here), did not prove to better estimate the impact of downward mobility.

Table 5.5 Estimates of downward mobility models, subjective wealth ranking

Cox Proportional Hazard Risks of Death in Russia, 1994-2005

Relative risks of a downward shift in subjective ranking of wealth					
	Mobility	Past alcohol	Past health	Origin state	Ever experienced
Men: no downward mobilty	1	1	1	1	1
Men: downward mobilty	1.33***	1.33***	1.34***	1.52***	1.05
	(0.14)	(0.14)	(0.14)	(0.19)	(0.10)
Women: no downward mobilty	1	1	1	1	1
Women: downward mobilty	0.96	0.96	0.97	1.15	0.83*
	(0.14)	(0.14)	(0.15)	(0.20)	(0.09)
Past excessive alcohol consumption		1.27			
		(0.19)			
Past health status was poor			1.39***		
			(0.11)		
Past lowest ranking of subj. wealth				1	
Past mid ranking of subj. wealth				0.83**	
				(0.08)	
Past highest ranking of subj. wealth				0.88	
				(0.24)	
# of subjects	14804	14804	14804	14380	14804
# of deaths	860	860	860	792	860
Time at risk	68111	68111	68111	64078	68111
Log Pseudolikelihood	-7027.81	-7026.85	-7020.00	-6447.30	-6936.23
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000
Wald chi2	1591.53	1595.83	1610.33	1610.56	1610.33

Note: Statistical significance: * =10%, ** =5%, *** =1%. Results are adjusted for current age, health conditions, health status, alcohol and smoking status, urban/rural residence, household type, union status, education, labor force status and occupational class.

The final Tables, 5.6 and 5.7, display logistic regression results of the impact of downward mobility and unemployment on poor health and on excessive alcohol consumption. In these models, the dependent variables have been adjusted to lead by one year, so that the timing of excessive alcohol consumption or poor health now coincides with conditions and characteristics of the previous year. In this way, we can more directly test a direct relationship between these characteristics. In 5.6, in which the determinants of excess alcohol consumption are examined, current alcohol consumption is controlled for in the adjusted model, as well as all other covariates in previous models. Likewise, health is included in the model predicting the next year's health. Robust standard errors are achieved through clustering on the individual so that non-independence of observations does not bias the results. The impact of the two measures of downward mobility, income and subjective ranking, as well as unemployment, are all assessed in separate models, even though the results are shown in one table. Finally, in the unemployment model, the indicator of occupational class and labor market participation was removed and a dummy variable captured whether the individual was participating in the labor market in that year.

Table 5.6 displays clear evidence that downward mobility and unemployment increase the odds of excessive alcohol consumption. Controlling for all individual characteristics, men were 21% more likely to excessively consume alcohol in the next survey when they were downwardly mobile according to income measures and 21% more likely when they had experienced a fall in subjective wealth ranking. Adjusting for these individual characteristics decreased the impact of unemployment on alcohol consumption, but even in the adjusted model, men were significantly more likely to excessively drink after experiencing unemployment (15%). The unemployment impact was ever more attenuated for women when other factors were controlled. The remaining impact was the largest of all for both men and women: they were 39% more likely to excessively drink after experiencing unemployment, relative to not having been unemployed. A downward shift in subjective ranking did not appear to increase the odds that women will excessively drink, where as a downward shift in income quartiles increased their odds by 17%, which was similar to men's likelihood.

Table 5.7 yields fewer significant relationships in the adjusted models, but an interesting finding nonetheless. Men who experienced unemployment were 40% more likely to report being in poor health the following year, all other characteristics held constant. Therefore, the impact of unemployment is even stronger for men in regards to poor health than it is to excessive alcohol consumption. Downward mobility did not predict poor health in men, and neither downward mobility nor unemployment predicted poor health in women.

Table 5.6 Estimates of logistic regression models for excessive alcohol consumption

Logistic Regressions of Excessive Alcohol Consumption in Russia, 1994-2005

Odds Ratios of experiencing DSM or unemployment				
	Men		Women	
	Bivariate Model	Adjusted Model	Bivariate Model	Adjusted Model
downward income mobility	1.18***	1.21***	1.05	1.17**
downward ranking of subjective wealth	1.19***	1.20***	1.02	1.05
unemployment	1.47***	1.15**	2.34***	1.39***

Note: Statistical significance: * =10%, ** =5%, *** =1%. Results are adjusted for current age, health conditions, health status, alcohol and smoking status, urban/rural residence, household type, union status, labor force status, occupational class and education. The unemployment model only includes labor force participation for its occupation related indicators.

Table 5.7 Estimates of logistic regression models for poor health

Logistic Regressions of Poor Health Status in Russia, 1994-2005

Odds Ratios of experiencing DSM or unemployment				
	Men		Women	
	Bivariate Model	Adjusted Model	Bivariate Model	Adjusted Model
downward income mobility	1.14***	1.07	1.06*	0.99
downward ranking of subjective wealth	1.10*	1.02	0.96	0.95
unemployment	0.49***	1.40***	0.30***	1.02

Note: Statistical significance: * =10%, ** =5%, *** =1%. Results are adjusted for current age, health conditions, health status, alcohol and smoking status, urban/rural residence, household type, union status, labor force status, occupational class and education. The unemployment model only includes labor force participation for its occupation related indicators.

5.4 Discussion

These results indicate many findings worth considering. Unemployment appears to be strongly related to the risk of death for men, no matter how the relationship is measured—immediate or prolonged, continued or short-term—and no matter which mediating variables, such as past alcohol consumption and poor health, are included. When measured as a relative risk against those who were employed in a low-mid grade job, the impact of unemployment was strikingly high for women. The gender difference in impact is perhaps surprising, but when the impact of unemployment is measured instead as a relative risk against all those who were participating in the labor force and those who were not, the gender difference almost disappears. The relative risk for women was slightly higher than men's but with a slightly lower degree of statistical significance. This indicates that the first large discrepancy has more to do with class differences within gender than overall differences between genders. In sum, the relationship between unemployment and mortality remained strong in multiple specifications for both men and women. This relationship is an important finding in a context in which unemployment steadily increased during the 1990s and that is once again facing an economic crisis. In addition, the finding that unemployment matters and matters even after a respondent returns to paid employment for men confirms the long-lasting relationship Strully (2009) found in her results for the U.S.

The results of other variables in the static models yield very different results for men and women. The relationship between mortality and education for women was not attenuated by including measures of resources. In contrast, the relationship between education and mortality for men was no longer statistically significant when the level of resources was included in the model. Moreover, while membership in the lowest occupational class appears to be somewhat related to deaths for women, higher objective and subjective rankings of wealth or income appear to lessen the risk of death for men. The strongest of these results involved real equivalent household income. Additionally, reducing the sample to only wage-earners reveals the expected and statistically significant mortality gradient by wage:[65] men in the 50-75% quartile of the wage distribution had a 49% lower risk of death, relative to men in the bottom quartile, and men in the top quartile had a 55% lower risk. Men in the 25-50% quartile were 34% less likely to die, but this estimate was not statistically significant. None of the estimates for location in the wage distribution were significant for women. The difference in these results according to sex may be due to idiosyncrasies of the measures, especially in light of the fact that all results are already controlling for education level, which in and of itself should absorb much of the impact of long-term risk exposure.

Estimates of the impact of downward mobility on mortality revealed a robust and statistically significant relationship for men, but not for women. However, this relationship is statistically significant only when the measure is a direct reflection of how the respondent feels about his/her current class compared to class in the previous wave (i.e., subjectively measured and not objectively). Theoretically, this may be the most fitting indicator of downward mobility. Although real total household income most directly reflects financial circumstances, the experience of downward mobility may be just as meaningful, or more so, when experienced subjectively and in relation to individual perceptions of status and inequality (Runciman, 1971; Watson, 1995). Moreover, the objective measure refers to the household and not just to the individual. This difference may be important, since ranking is mediated by others in the household, and could work in opposite ways. It may be that the total household welfare matters more than individual income; conversely, it may be just as likely that one's own contribution to household welfare is what matters most. The essence of the subjective ranking is the latter, since it is a measure of personal wealth.

[65] Not shown for reasons of space but full results are available upon request.

That a more direct form of measuring resources, objectively or subjectively, and that downward mobility appear to matter more for men's health than women's remains an area of speculation. The differential impact may be due to women experiencing stress differently in terms of their mental, emotional, behavioral and physical responses to stress. Or, men may perceive their role in providing material resources to be of greater importance to household welfare, leaving them with feelings of greater pressure and responsibility. Without doubt, much research along these lines would help shed light on causal mechanisms at work, which are not covered in the scope of this study. For example, empirical investigation of Watson's (1995) theoretical framework may yield evidence to support her idea that the devaluation of the public sphere and increasing importance of the private sphere left men without a realm in which their needs were adequately fulfilled and their role valorized. In any case, this study does provide evidence that it is not strictly a matter of selection into unemployment and downward mobility on the basis of poor health and excessive alcohol consumption that relates these experiences to mortality. Furthermore, findings that are more relevant to men are welcomed in this study given that men's mortality increases drove the mortality crisis in Russia.

Much room exists still for exploration into the relationship between downward mobility and mortality. One important limitation of this study is that the link between downward mobility and mental or emotional well-being, as well as the link between well-being and physical conditions that lead to death remain unidentified and are not commented upon in this study. Some important biases in this research must also be acknowledged. First, because the study begins in 1994, there is left truncation in the sample since many of the most susceptible people, including those most unfortunate in the labor market, may have died in the first peak of the economic and mortality crises in Russia. Because of the great number of lives lost in the early years of transition, living until 1994 in a sense may have already introduced selectivity into the sample. Furthermore, attrition has likely biased the sample composition, even though the surveyed sample appears relatively similar to the total population. Another potential source of bias lies in how the dependent variable is measured; because a second person in the household is necessary for a report of death, the sample excludes all those who live alone. Therefore, the results cannot be generalized beyond the mortality of people who co-reside with another person. This is perhaps the most important reason the results of this study cannot be widely generalized. We know that it is men without partners who were particularly at risk during the transition (Watson, 1995) and these men are more likely to live alone.

Another limitation of this study is that there are at least three reasons why the impact of excessive alcohol consumption may not be entirely accounted for in this study. First, individuals with the most severe alcohol consumption tendencies are likely selected out of being in the sample due to the disruption in private lives this health behavior entails. Second, the questions used to assess excessive alcohol consumption in this survey may not be the best. Both questions about non-beverage alcohol consumption (e.g., surrogate alcohols in the form of colognes, medicines, etc.) and "markers of problem drinking" have been shown to be important in assessing the nature and impact of alcohol consumption in Russia (Leon et al., 2007). Questions related to amount too easily lead to underreporting of consumption, which Nemtsov (2003) claims is a problem in the RLMS data, especially for women. Third, the relationship between alcohol consumption and mortality may be obscured in this survey due to the short-dose response time of harmful alcohol consumption. Because the surveys are generally administered annually, the information in the last wave before death may not reflect the most important information. In other words, we may be missing an important increase in alcohol consumption that quickly leads to death (Perlman & Bobak, 2008). Despite the shortcomings of the alcohol consumption measure, attempts to predict excessive alcohol consumption with downward mobility and unemployment were strikingly successful. This indicates that the measure is picking up what we would expect to see if alcohol mediated the impact of economically driven stress.

6. CASUALTIES OF ECONOMIC TURBULENCE: CONCLUSION

6.1 Conclusion outline

Twenty years after the Soviet Union showed outward signs of crumbling, what do we know about how these often turbulent socio-economic and political reforms impacted lives? The results of this thesis indicate that the social reverberations of economic restructuring had a tremendous demographic impact. Not only was fertility suppressed during this time period, but health and health behavior deteriorated, particularly in Russia. The new dependency on a market, especially when the market was grievously underdeveloped, entailed loss of guaranteed employment and livelihood, which critically influenced the timing and occurrence of two major life course events.

The research agenda of this thesis was shaped mostly by life course theory, which lies at the intersection of sociology and demography. The dual motivations of this research, to understand the demographic crises in the post-communist region as well as to understand the social impact of market reform and turbulent transitions, was well served by life course methods and outcome variables. However, other themes guided this research endeavor as well. An interest in observing individual-level response to institutional change first drew my attention to post-communist studies. Moreover, the rapid changes in social stratification and inequality in the region mandated a perspective that took these factors into account. Finally, the theories within demography and health behavior literature that are related to culture or affective value changes provided provocative counter explanations to the main argument of this thesis: that the turbulent transitions from communism incurred cost in the form of human lives.

In this concluding chapter, I summarize the most important findings of the four empirical chapters of this thesis and theoretically situate them according to the major debates in the literature. I also outline the implications of these findings, particularly focusing on policy implications. Because the greatest omission in this thesis is an analysis of social policies, I conclude by considering their importance in mediating the impact of a turbulent economy and suggest future research questions.

6.2 Main findings and implications of the fertility research

In chapter two, I demonstrated that no single theoretical explanation is sufficient to explain the complex fertility declines across the entire post-communist region from 1990-2003. Postponement of first births, either through forces related to a postponement transition (Kohler et al., 2002) or a second demographic transition (Lesthaeghe & van de Kaa, 1986), appeared to contribute to fertility decline in only a few countries and, in particular, those of Central and Eastern Europe. In most countries, a great part of the fertility decline occurred before significant postponement of childbearing began, which indicates that the dramatic decline was due to stopping behavior after the first child or postponement of higher order births.

Pooled cross-sectional time-series analyses of age-specific birthrates confirmed that two distinct processes—stopping behavior and postponement—are behind the major differences between the post-communist countries. Moreover, regression results showed that the negative economic conditions contributed to declining birth rates. In contrast, logistic regression results demonstrated that the likelihood of postponing childbirth increased with better economic conditions.

In chapter four, I explored how economic conditions may have mattered to fertility decisions at the micro-level. Specifically, I analyzed the decline of second births in Russia. Controlling for

occupational class, women with less than secondary education had twice the risk of having a second child after the transition than before, whereas women with university education had less than half the risk of having a second child. These findings may reflect differing norms and values associated with these education groups, since the impact of education is net of income related factors. Occupational class, which can be interpreted as a more pure income or cost of time effect when it is net of education, reveals that women in the lowest occupational class experienced a decline in fertility of 85%, which was the greatest decline in all classes. However, women in the highest occupational class were not far behind in their decrease, which was a 74% lower risk of having a second child in the post-transition time period. I interpret these findings as evidence that both income constraints and opportunity costs contributed to the overall fertility decline, although the income effect was stronger. Given that women in lower classes traditionally have more children than women in the upper classes, the contribution of decline within this subgroup of women would have particularly impacted the overall decline in fertility. For men, no clear patterns regarding education or occupational class were statistically significant.

Moreover, I hypothesized that two labor market experiences may have particularly influenced fertility decisions in Russia: unemployment and downward social mobility. Due to wage dispersion, class location became more important after the transition than during the Soviet era. I have argued that relative income loss, captured with downward social mobility and unemployment, put pressure on family consumption capacity and suppressed fertility. Specifically, I suggested that unemployment and downward mobility mattered to fertility decisions and that they mattered more after the transition than before. The first general finding is that downward social mobility and unemployment do matter to fertility decisions. The results indicate that they even had an impact during the Soviet regime, despite lower wage dispersion and saliency of class. The second general finding is that, notwithstanding an overwhelming focus on the determinants of women's fertility, there are conditions under which men also are more or less likely to have a second child regardless of the partner's situation. Men's occupational trajectories matter as much to fertility decisions as women's, if not slightly more in the case of intragenerational downward mobility. This chapter is the first in decades to show that social status shifts matter for fertility decisions in general, and the first ever to show that it also mattered in the Soviet Union and post-Soviet Russia. As such, this chapter offers a new perspective for understanding fertility behavior in diverse contexts, including countries experiencing rapid economic and social change, along with increasing inequality. In sum, these findings offer new evidence for a specific pathway through which the economic transition and crisis impacted fertility trends in the post-communist context. Moreover, they demonstrate how increasing income inequality and radical labor market restructuring may have implications for fertility behavior.

Beyond understanding the post-communist fertility decline and whether it was in part due to the economic crisis, the findings of these two chapters have implications for second demographic transition and postponement transition theories. First, the findings offer support for the theoretical tenets of SDT theory. When the economic conditions allow for material needs to be met, postponement of childbirth does appear more likely to occur. Because the results support a relationship between positive economic performance and postponement, PPT theory does not seem as robust in this context. However, given the overwhelming social upheaval even in countries that did not experience lengthy economic crises, the uncertainty proposed in Kohler et al.'s (2002) research may also be a likely motivation for postponement of childbearing. Further exploration of the different motivations according to these two theories is needed to push the debate further. For instance, the empirical conditions for a PPT could be more clearly differentiated from those in which a SDT is likely. Another area of PPT theoretical refinement could be how increased tertiary education enrollment impacts fertility differently in a PPT context than in a SDT context. PPT theorists could also enhance their theoretical claim by addressing the role of unemployment more clearly. Some results in my macro-analyses seem to indicate that family formation was either a coping mechanism for women when employment

levels dropped or that there were restrictions to continuing previous family formation patterns for those women who managed to maintain employment. These issues and, in general, the question related to postponement behavior and its underlying causal mechanism—economic uncertainty PPT versus SDT—should be further examined at the micro-level but keeping context in the model as well. In sum, the macro-analysis results confirm the importance of taking the economic context into account when discussing explanations for fertility decline. More specifically, the results indicate that the severity and duration of economic crisis, or absence thereof, influenced the path through which fertility decline occurred.

Given these findings, there are many practical implications that can be used to augment or strengthen policy making in the region.

- *Improving economic contexts may lift countries out of lowest low fertility levels.*

  First, the results suggest that lowest-low fertility levels are not necessarily permanent. With economic recovery, many countries have begun to climb out of lowest-low fertility already; in fact, as of 2006 only Belarus, Moldova, Poland and Slovakia have TFRs that remain below 1.3. Partly these fertility increases are due to postponement recovery in the countries that had experienced significant postponement of first births. But for the remaining countries, there are indications that with better economic conditions, fertility will increase.

- *Policies and programs supporting job security, development and placement according to individuals' human capital may augment individuals' desire to have a second child.*

  The finding that men and women both suppress fertility when they have lost previous levels of income and skill matching due to unemployment or downward mobility indicates that job security or robust job opportunities might provide the stability that appears to matter to young couples' fertility decisions beyond the first birth. Therefore, policies aimed at stabilizing paid employment and job security as well as household income may be important.

- *Implementing benefit incentives for childbearing, and second births in particular, may also increase fertility.*

  In 2007, the Russian state implemented a set of policies[66] to increase fertility in Russia. Specifically, pregnancy and childbirth benefits rose from 11,700 to 16,125 roubles, increased the monthly federal benefit per child—decided at the regional level—and instituted a maternity leave benefit at 40% of wages until 1.5 years after a child is born. Aiming to increase second and higher order births particularly, the final and most innovative of all of the 2007 policies was the "maternal capital" benefit, which is a one-time payment of 250,000 roubles (approx. 7200 euro) to mothers who have a second or higher order birth. This payment does not arrive for three years after the birth of the child and is earmarked for use only for the private education of a child, housing, or investment into a pension. The impact of this policy package remains to be seen, and its coinciding implementation with economic recession may make its impact difficult to isolate.

- *Implementing policies that support childbearing as well as participation in the labor force may support fertility of women with high skills.*

[66] See Zakharov (2008) for a more in-depth explanation of these new policies.

The finding that not only women in the lowest occupational class, but women in the highest have experienced a dramatic fertility decline emphasizes the likelihood that opportunity costs have increasingly become important during the transition from communism. Policies providing job security for women who want to have a child, as well as easily available and affordable childcare arrangements may help to reconcile paid and unpaid work conflicts for these women.

6.3 Main findings and implications of the mortality research

Almost 20 years since transitioning from communism, the mortality crisis continues in many post-Soviet states. During this time period, many explanations have been set forth regarding the primary causes of mortality crisis. In chapter two, I explored the validity of the two main theoretical trends that dominate the literature, particularly responding to recent findings that primarily link the mortality crisis to health behavior. I elucidated the division of interpretations given to alcohol consumption in the debate and drew parallels to the context versus agency debate in order to clarify the policy relevance of these alternative interpretations. Connecting alcohol consumption to the economic context serves to shift the interpretation of alcohol consumption toward an explanation that straddles the agency/structure divide, which creates new implications for policy-makers interested in a health intervention.

By analyzing the relationship between contextual elements and increased mortality, increased death rates were located within a more holistic framework. This level of analysis illuminates the social conditions that triggered changes in health behavior or led to increased mortality through stress. Utilizing a macro-level perspective and obtaining results that are in alignment with other findings, the analyses reaffirmed the importance of bringing context back into the debate. This research served as a crucial supplement to the micro-level analyses in the following chapter on mortality increases in the region and places the role of health behaviors, such as alcohol consumption, within a broader context.

Using cross-sectional time-series data in chapter three, four general findings emerged from the analyses. First, meaningful and systematic differences exist in mortality rates and trajectories among countries across the post-communist region. Second, economic performance explains some of the important differences in absolute levels of death rates among countries. For example, macro-economic indicators accounted for 10% of the difference in mortality rates between the most extreme mortality crises (Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russia and Ukraine) and the Central and Eastern European countries. This difference was consistent across age groups, sex and deaths due to circulatory or external causes, which have been linked to alcohol consumption in the literature. Moreover, controlling for economic crisis accounted for around 25% of the difference in mortality rates between the CEE countries and a second country grouping (the Baltic States, the Caucasus, Tajikistan and Uzbekistan).

Third, above and beyond the basic division of countries that mirror levels of economic development, economic performance on a year by year basis impacted death rates. The working-age population likely bore the brunt of economic transition and crisis, and analyses demonstrate that under worsening economic conditions mortality increased. Specifically, economic indicators had the greatest impact on death rates of males 40-59 years old; not surprisingly this is the group that drove the severity of the mortality crisis. Finally, economic indicators not only most impacted working-aged men and women who were most susceptible to labor market stress, but economic performance also appeared to be related to causes of death associated with alcohol consumption in the literature on the post-communist mortality crisis.

In Chapter 5, downward mobility and unemployment were assessed in this study as possible contributors to increased risk of death from 1994-2005 in Russia. In doing so, this chapter illuminated a new link between downward mobility and mortality: one that is immediate, does

not rely on long-term risk exposure, is not directly related to selection into mobility and is indicative of what we would expect if psychosocial stress were at work. Therefore, I have proposed a new and worthwhile time-frame in which to analyze downward mobility that is appropriate to this context and stands apart from past research that has looked at social mobility only as an influence on the health divide through long-term risk exposure or selectivity (e.g., Dahl & Kjaersgaard, 1993; Claussen et al., 2005; Hart et al., 1998; Davey Smith et al., 1997; Hemmingsson & Lundberg, 2005; Nilsson et al., 2005; Power et al., 1996; Stern, 1983).

Five main findings emerged from the analysis: first, unemployment substantially increased the risk of mortality for both men and women, relative to workers of a low-mid occupational class. Second, downward mobility impacted men's mortality risks, if the measure avoided the healthy worker effect and was measured through subjective wealth distribution. Third, the impact of downward mobility was limited, at least with statistical significance, to currently being in a state of downward mobility; whereas the impact of unemployment continued after the spell of unemployment had ended. Fourth, excessive alcohol consumption and poor health did not predict downward mobility or unemployment directly, nor did they attenuate the impact of downward mobility on death, measured currently and in the past wave. However, excessive alcohol consumption had a markedly strong impact on women's risk of death, independent of all other factors. The fifth set of findings, however, indicates that the opposite relationship does exist: downward mobility and unemployment predicted excessive alcohol consumption for men and women while unemployment predicted poor health for men. These results support the theoretical and empirical goals of this section of integrating the alcohol and stress explanations in the literature.

Given widespread economic recession and increasing labor market disruption, downward mobility and unemployment is not unique to economies undergoing market reform. Depending on institutional differences, such as the degree of labor market regulation and safety nets in place, the occurrence and impact of downward mobility and unemployment will likely vary. Nevertheless, in the current economic climate, the traditional relationship argued to exist between health and downward mobility must be re-conceptualized. Turbulent labor markets may create more downwardly mobile individuals than ever before. Drawing conclusions about the health of these individuals based on the assumption that they selected themselves into downward mobility and unemployment through unrelated poor health or health behaviors would be erroneous. In the end, the results of this study demonstrate how economic turbulence matters to health. Therefore, these findings support the need for further theoretical development regarding the relationship between health and turbulent economic contexts.

In regards to policy implications related to mortality in Russia, these research findings support some similar recommendations to those related to the fertility crisis in Russia. Without doubt, taking both structural and individual factors into account while crafting policy to stem mortality is key.

- *Improving economic contexts may alleviate stress and poor health behaviors.*

  First, the results suggest that macro-economic policy making, as it impacts inflation, GDP, and wage and employment growth, may be able to provide the economic and social stability necessary to maintain level death rates.

- *Policies and programs supporting job security, development and placement according to individuals' human capital may prevent stress and harmful alcohol consumption.*

The finding that men particularly react to a loss in previous income or skill matching due to unemployment or downward mobility indicates that job security or new opportunities might provide the stability that appears to matter to mortality.

- *Policies and campaigns against harmful alcohol consumption that also propose alternative stress responses may help to decrease deaths and poor health due to excessive alcohol consumption.*

  As represented in Appendix A1.2, propaganda against alcohol consumption in Russia exists. However, these campaigns are not new, as photos from years as early as the 1920s show ad campaigns to decrease alcohol consumption in Russia. The facts that both binge drinking and consumption of surrogate alcohols are particularly tied to mortality indicate that campaigns addressing these specific behaviors, as well as product control, might also decrease mortality in Russia.

6.4 Future research

Much research still needs to be done on variation in 1) the policies that created these diverging macro-economic contexts, 2) the policies that were created to alleviate the burden of increasing social risks, and 3) the policies that were already in place to support the goals of socialism. As the aim of this dissertation was to connect economic contexts to outcomes of different life course events, I relied on measures of the outcomes or success of macro-economic policies rather than the actual policies themselves. Moreover, since social policies are not assessed in this thesis, no findings relate to how the economic contexts were mediated by social policies. In this country range, it appears that economic contexts and social policies may conflate; in the case of the Central and Eastern European more successful reformers, not only was the economic reform less turbulent but they generally also maintained a stronger commitment to social support than the FSU countries. Separating these two issues is therefore challenging, but worth considering.

One case that confirms the importance of studying social policies as well economic contexts and which may serve to provide a counterfactual to the post-communist countries is Finland. Finland has a universalistic welfare state that is relatively generous (Esping-Andersen 1990). Because Finland's economy was linked to the Soviet Union's economy, the collapse of the USSR led Finland into economic crisis in the 1990s as well. Jäntti, Martikainen, and Valkonen (2000) describe the context and claim that unemployment rates rose from 3% before economic collapse in 1990 to 18% in 1993, which continued at 17% in 1997. GDP decline in these first years was estimated at 15%. However, the economic crisis was not accompanied by major changes in the distribution of income, nor declines in social and health services. Indeed, transfers to households in the form of unemployment insurance or other payments increased rapidly during the crisis. The authors find no impact of unemployment on mortality rates and descriptive analyses show that life expectancy continued to increase throughout the crisis. The main argument they present for why unemployment did not create a health crisis or adversely impact health at all in Finland was because there was a well developed welfare state that fulfilled its function during this sensitive time.

Likewise, Vikat (2004) did not find that the economic crisis in Finland led to a fertility decline. He argued that two explanations may explain why fertility did not decline due to economic hardship or uncertainty. First, long-term economic prospects may not have been influenced by the economic recession because of a general belief in economic recovery. The second reason he cited was that the Finnish welfare state upheld its duties, lessening the impact of job income loss and providing incentive to take time off work at a time when career advancement was unlikely (p. 204). Particularly, family policies supported the dual-earner family and provided long leave periods with high levels of allowances, which supported women staying home and out of the

labor market, as well as a high level of daycare provision. In sum, studies of Finland provide an important contrast to the results of this thesis. They point to intriguing implications of the role of perceptions on the strength of the economy as well as the level of social support available during economic crisis. Of course, one other important difference is the scale of change that took place during this time period in the two countries.

The general ideological shift toward "neofamilialist" policies (Teplova, 2007) in Russia, which could arguably be initiating the re-familization[67] of welfare, provides a fascinating opportunity to observe the impact of policy on childbearing. As institutional changes appear to have weakened the negative relationship between women's labor force participation and fertility (Brewster & Rindfuss, 2000; Castles, 2003), we might expect institutional changes in the opposite direction—shifting the distribution of welfare toward the family—to have strengthened the negative relationship between women's labor force participation and fertility. This is indeed what some of the results of this thesis indicate.

Given these factors to consider, the next step in estimating the social impact of the transition from communism is to analyze how shifts in the balance of welfare provision from the state to the market and family impacted life course events. Future research agendas should highlight how states have and can mediate the impact of social and economic change. As household income composition dramatically changed over the years studied here (Milanovic, 1998), this question seems particularly relevant.

In sum, this thesis has added a dimension to the economic context that has not been studied in the post-communist context or in mainstream research on health and fertility. Using downward social mobility as a construct to understand how transition and crisis impacted health and fertility behavior, I parsed out how economic constraints matter as they are relative to past economic conditions as well as how this mobility can increase stress. The sociological orientation of this dissertation offers insight into outcome variables relevant to epidemiology and demography. Moreover, this research design and theoretical foundation contributes to sociology by reaffirming the relevance of social stratification, institutions and the importance of their shifting relations in contexts undergoing post-industrialization and economic globalization. The lessons from the post-communist economic crisis can be extended to other contexts that are also undergoing financial turmoil and change. This study is particularly timely as the current global financial crisis has impacted nations around the world. Historical examples may provide clues for ensuring a healthy and thriving population.

[67] This term is based on Esping-Andersen's (1999) concept of defamilization, in which provision of welfare shifts from the family to the State.

BIBLIOGRAPHY

Abdala, F., Geldstein, R., & Mychaszula, S. (2000). Economic restructuring and mortality changes in Argentina: Is there any connection? In G.A. Cornia & R. Paniccia (Eds.), *The mortality crisis in transitional economies* (pp. 328-350). New York: Oxford University Press.

All-Russian Population Census. (2002). Vol. 3 (Book 1) Education and Training.

Anderson, B., & Silver, b. (1990). Trends in mortality of the Soviet population. *Soviet Economy, 6*(3), 191-251.

Andreeva, E. (2006). Analytical models of mortality due to external causes of death in the regions of Russia. Paper presentation at the Mortality in Countries of the former USSR. Fifteen Years after the Break-up: Change or Continuity? Conference in Kiev, Ukraine, 12-14 October, 2006.

Atkinson, T., & Micklewright, J. (1992). *Economic transformation in Eastern Europe and the distribution of income.* Cambridge, UK: Cambridge University Press.

Baltagi, H. & Wu, P. (1999). Unequally Spaced Panel Data Regressions With Ar(1) Disturbances. *Econometric Theory*, Cambridge University Press, 15(06), 814-823.

Barr, N. (2001). Reforming welfare states in post-communist countries. In L.T. Orlowski (Ed.), *Transition and Growth in Post-Communist Countries: The Ten-Year Experience* (pp. 169-218). Cheltenham, UK: Edward Elgar, 169-218.

Bean, F., & Swicegood, G. (1979). Intergenerational occupational mobility and fertility: A reassessment. *American Sociological Review, 44*(4), 608-619.

Becker, G. (1960). An economic analysis of fertility. In Demographic and economic change in developed countries, Universities-National Bureau of Economic Research Conference Series 11, NBER, Princeton, NJ, pp. 209–231.

Becker, G. (1981). *A treatise on the Family*. Cambridge, MA: Harvard University Press.

Bejin, A. (1989). Arsene Dumont and social capillarity. *Population, 44*(6), 1009-1028.

Berent, J. (1952). Fertility and social mobility. *Population Studies, 5*(3), 244-260.

Bhaumik, S.K., & Nugent, J.B. (2002). Does Economic Uncertainty Have an Impact on Decisions to Bear Children? Evidence from Eastern Germany. William Davidson Institute Working Paper No. 491. Available at SSRN: http://ssrn.com/abstract=323592.

Bhrolcháin, M., & Dyson, T. (2007). On causation in demography: Issues and illustrations. *Population and Development Review, 33*(1), 1–36.

Billari, F., & Kohler, H. P. (2004). Patterns of lowest-low fertility in Europe. *Population Studies, 58*(2), 161–176.

Blanchard, O. (1997). *The Economics of Post-Communist Transition.* Clarendon Lectures in Economics. New York: Oxford University Press.

Blazek, J. & Dzúrová, D. (2000). The decline of mortality in the Czech Republic during the transition: A counterfactual case study. In G.A. Cornia & R. Paniccia (Eds.), *The mortality crisis in transitional economies* (pp. 303-327). New York: Oxford University Press.

Bobak, M., & Marmot, M. (2009). Societal transition and health. *Lancet, 373*, 360-361.

Bobak, M., Murphy, M., Rose, R., & Marmot, M. (2003). Determinants of adult mortality in Russia: Estimates using sibling data. *Epidemiology 14*(5), 603-611.

Bobak, M., Murphy, M., Rose, R., & Marmot, M. (2007). Societal characteristics and health in the former communist countries of Central and Eastern Europe and the former Soviet Union: A multilevel analysis. *Journal of Epidemiology and Community Health, 61*, 990-996.

Bobak, M., Pikhart, H., Rose, R., Hertzman, C., & Marmot, M. (2000). Socioeconomic factors, material inequalities, and perceived control in self-rated health: Cross-sectional data from seven post-communist countries. *Social Science & Medicine, 51*, 1343-1350.

Bongaarts, J., & Feeney, G. (1998). On the quantum and tempo of fertility. *Population and Development Review, 24*(2), 271–291. Brainerd, E. 1998. Winners and losers in Russia's economic transition, *American Economic Review, 88*(5), 1094-1116.

Brainerd, E. (1998). Market reform and mortality in transitional economies. *World Development, 26*(11), 2013-2027.

Brainerd, E., & Cutler, D.M. (2005). Autopsy of an Empire: Understanding Mortality in Russia and the Former Soviet Union. *Journal of Economic Perspectives 19*(1), 107–30.

Braithwaite, J.D. (1997). The old and new poor in Russia. In J. Klugman (Ed.), *Poverty in Russia: Public policy and private responses.* Washington, D.C.: World Bank Publications.

Breen, R., & Goldthorpe, J. (1997). Explaining education differentials: Towards a formal rational action theory. *Rationality and Society, 9*(3), 275-305.

Brewster, K., & Rindfuss, R. (2000). Fertility and women's employment in industrialized nations. *Annual review of Sociology, 26*, 271-296.

Bühler, C. (2004). Additional work, family agriculture, and the birth of a first or a second child in Russia at the beginning of the 1990s. *Population Research and Policy Review, 23*(3), 259-289.

Bühler, C., & Philipov, D. (2005). Social capital related to fertility: Theoretical foundations and empirical evidence from Bulgaria. *Vienna Yearbook of Population Research 2005.* Vienna: Austrian Academy of Sciences Press.

Carolina Population Center. (2009). Occupational Coding. Retrieved from the University of North Carolina Chapel Hill's Carolina Population Center Website on March 19, 2009: http://www.cpc.unc.edu/projects/rlms/data/ occupationalcoding.html

Caselli, G., Vallin, J., Vaupel, J., & Yashin, A. (1987). Age-specific mortality trends in France and Italy since 1900: Period and cohort effects. *European Journal of Population, 3*, 33-60.

Castles, F. (2003). The world turned upside-down: Below replacement fertility, changing preferences and family-friendly policies in 21 OECD countries. *Journal of European Social Policy, 13*(3), 209-227.

Cheidvasser, S., & Benítez-Silva, H. (2007). The educated Russian's curse: Returns to education in the Russian Federation during the 1990s. *Labour, 21*(1), 1-41.

Chenet, L., Leon, D., McKee, M., & Vassin, S. (1998). Deaths from alcohol and violence in Moscow: Socio-economic determinants. *European Journal of Population, 14*, 19-37.

Claussen, B., Smits, J., Naess, O., & Davey Smith, G. (2005). Intergenerational mobility and mortality in Oslo: Social selection versus social causation. *Social Science & Medicine, 61*, 2513-2520.

Cockerham, W. (1999). *Health and social change in Russia and Eastern Europe*. New York & London: Routledge.

Cockerham, W. (2000). Health lifestyles in Russia. *Social Science & Medicine, 51*, 1313-1324.

Cockerham, W. (2006). Class Matters: Health lifestyles in post-Soviet Russia. *Harvard International Review, Spring,* 64-68.

Cockerham, W., Hinote, B., & Abbott, P. (2006). Psychological distress, gender and health lifestyles in Belarus, Kazakhstan, Russia, and Ukraine. *Social Science & Medicine, 63*, 2381-2394.

Cohen, J., Cohen, P., West, S., & Aiken, L. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Cornia, G.A., & Paniccià, R. (1998). The transition's Population crisis: Nuptiality, Fertility, and Mortality Changes in Severely Distressed Economies. In M. Livi-Bacci & G. de Santis (Eds.), *Population and Poverty in the Developing World* (pp. 217-249). Oxford: Clarendon press.

Cornia, G.A. (2000). Short-term, long-term, and hysteresis mortality models: A review. In G.A. Cornia & R. Paniccia (Eds.), *The mortality crisis in transitional economies* (pp. 59-80). New York: Oxford University Press.

Cornia, G.A., & Paniccià, R. (2000). *The mortality crisis in transitional economies*. New York: Oxford University Press.

Council of Europe. (2003). Demographic yearbook 2003. Retrieved February 12, 2009, from http://www.coe.int/t/e/social_cohesion/population/demographic_year_book/2003_edition/04%20Country%20Data/Default.asp#TopOfPage.

Crimmins, E., Easterlin, R., & Saito, Y. (1991). Preference changes among American youth; Family, work, and goods aspirations, 1976-86. *Population and Development Review, 17*(1), 115-133.

Dahl, E., & Kjaersgaard, P. (1993). Social mobility and inequality in mortality: An assessment of the health selection hypothesis. *European Journal of Public Health, 3*, 124-132.

Davey Smith, G., Hart, C., Blane, D., Gillis, C., & Hawthorne, V. (1997). Lifetime socioeconomic position and mortality: Prospective observational study. *BMJ, 314*, 547.

Denisova, I. (2009). Mortality in Russia: Microanalysis. Centre for Economic and Financial Research at New Economic School Working Paper, No. 128.

Easterlin, R. (1976). The conflict between aspirations and resources. *Population and Development Review, 2*(3/4), 417-425.

Easterlin, R. (1987). *Birth and Fortune: The impact of numbers on personal welfare.* 2nd Edition. Chicago: University of Chicago Press.

EBRD. (2003). *Transition Report Update, 2003*. London: European Bank for Reconstruction and Development.

Elder, G. (1974). *Children of the Great Depression: Social change in life experience*. Chicago, IL: University of Chicago Press. (Reissued as 25th Anniversary Edition, Boulder, CO: Westview Press, 1999).

Elias, P., & Birch, M. (1994). Establishment of community-wide occupational statistics: ISCO88 A guide for users. Retrieved from University of Warwick's Institute for Employment Research Web site: http://www.warwick.ac.uk/ ier/isco/intro.html

Erikson, R., & Goldthorpe, J. (1992). *Changing classes. Stratification and mobility in post-industrial societies.* Oxford: Oxford University Press.

Esping-Andersen, G. (1990). *The three worlds of welfare capitalism*. Cambridge: Polity Press.

Esping-Andersen, G. (1999). *Social foundations of postindustrial economies*. Oxford: Oxford University Press.

Esping-Andersen, G., & Przeworski, A. (2000). Quantitative cross-national research methods. In N. J. Smelser & P. B. Baltes (Eds.), *International Encyclopedia of the Social and Behavioral Sciences*. New York: Elsevier Science.

European Foundation for the Improvement of Living and Working Conditions. (2005). *Working conditions and gender in an enlarged Europe.* Luxembourg: Office for Official Publications of the European Communities.

European Observatory on Health Care Systems. (2002). Policy brief: Health care in Central Asia. Retrieved February 16, 2005, from the World Health Organization Web site: http://www.euro.who.int/document/OBS/ Carbrief120202.pdf

Fainstein, A.L. (1973). Taking up and terminating employment in the Soviet Union. *Industrial Law Journal, 2*(1), 137-151.

Fajth, G. (1999). Social Security in a Rapidly Changing Environment: The Case of the Post-Communist Transformation, *Social Policy and Administration 33*(4):416–436.

Field, M., & Twigg, J. (2000). *Russia's torn safety nets: Health and social welfare during the transition.* New York: St. Martin's Press.

Fleischer, B., Sabirianova, K., & Wang, X. (2005). Returns to skills and the speed of reforms: Evidence from Central and Eastern Europe, China, and Russia. *Journal of Comparative Economics, 33*, 351-370.

Frejka, T. (2008). Determinants of family formation and childbearing during the societal transition in Central and Eastern Europe. Overview Chap. 5 in T. Frejka, T. Sobotka, J. M. Hoem, & L. Toulemon (Eds.), *Childbearing trends and policies in Europe* (pp. 130–170). *Demographic Research*, Special Collection 7, Vol. 19(7), retrieved from http://www.demographic-research.org/volumes/vol19/7/.

Frejka, T., & Sardon, J. P. (2003). Fertility trends and prospects in Central and Eastern Europe: The cohort perspective. *Population of Central and Eastern Europe: Challenges and Opportunities.* In European Population Conference, Warsaw, Poland, 26–30 August, 2003.

Friedman, D., Hechter, M., & Kanazawa, S. (1994). A theory of the value of children. *Demography, 31*(3), 375–401.

Gailienė, D. (1999). Suicide trends in Lithuania. *Revue Baltique*, No 14, Vilnius, pp.131-139.

Ganzeboom, H., De Graaf, P., & Treiman, D.J. (1992). A standard international socio-economic index of occupational status. *Social Science Research, 21*, 1-56.

Ganzeboom, H., & Treiman, D. (1996). Internationally comparable measures of occupational status for the 1988 International Standard Classification of Occupations. *Social Science Research, 25*, 201-239.

Gavrilova, N., Semyonova, V., & Evdokushkina, G. (2002). Mortality crisis in Russia: New health threats. Paper presented at The 2002 Annual Meeting of the Population Association of America, Atlanta, Georgia.

Gimpelson, V. (2001). The politics of labor-market adjustment: The case of Russia. In J. Kornai, S. Haggard, & R. Kaufman (Eds.), *Reforming the State: Fiscal and Welfare in Post-Socialist Countries* (pp. 25-52). Cambridge, UK: University of Cambridge Press.

Gerber, T. (2000). Educational Stratification in Contemporary Russia: Stability and Change in the Face of Economic and institutional crisis. *Sociology of Education, 73*(4), 219-246.

Gerber, T., & Cottrell, E. B. (2006). *Fertility in Russia, 1985–2001. Insights from individual fertility histories*. Paper presented at the Annual Meeting of the Population Association of America 2006, Los Angeles.

Gerber, T., & Hout, M. (2004). Tightening up: Declining class mobility during Russia's market transition. *American Sociological Review, 69*, 677-703.

Gerster, M., & Kieding, N. (2008). Interpretations of age-adjustment in studies of higher order birth rates. *Demographic Research, 19*(31), 1205-1216.

Gimpelson, V. (2001). The politics of labor-market adjustment: The case of Russia. In J. Kornai, S. Haggard, & R. Kaufman (Eds.), *Reforming the state: Fiscal and welfare in post-socialist countries* (pp. 25–52). Cambridge, UK: University of Cambridge Press.

Goldscheider, F., & Kaufman, G. (1996). Fertility and commitment: Bringing men back in. *Population and Development Review, 22*, Supplement: Fertility in the US: New patterns, new theories, 87-99.
Granick, D. (1987). *Job Rights in the Soviet Union: Their Consequences*. Cambridge, UK: Cambridge University Press.
Greene, M., & Biddlecom, A. (2000). Absent and problematic men: Demographic accounts of male reproductive roles. *Population and Development Review 26*(1), 81-115.
Gregory, P., & Collier, I. (1988). Unemployment in the Soviet Union: Evidence from the Soviet Interview Project. *The American Economic Review, 78*(4), 613-632.
Guillot, M., Gavrilova, N., & Pudrovska, T. (2006). Understanding ethnic differentials in adult mortality in Central Asia Evidence from Kyrgyzstan. Paper presentation at the Mortality in Countries of the former USSR. Fifteen Years after the Break-up: Change or Continuity? Conference in Kiev, Ukraine, 12-14 October, 2006.
Gustafsson, S. (2002). Why do people want children? *The 1934 Theory of the Myrdals and modern fertility theory*. Paper presentation for the conference on Alva Myrdal's Questions to Our Time. March 6–8, 2002, Uppsala.
Hakim, C. (2000). *Work-lifestyle choices in the 21st century: Preference theory.* New York: Oxford University Press.
Harrison, E., and Rose, D.(2006). The European Socio-economic Classification (ESeC) User Guide. Institute for Social and Economic Research, University of Essex, Colchester, UK. http://www.iser.essex.ac.uk/esec/guide/
Hart, C., Davey Smith, G., Blane, D. (1998). Social mobility and 21 year mortality in a cohort of Scottish men. *Social Science and Medicine, 47*(8), 1121-1130.
Hemmingsson, T., & Lundberg, I. (2005). Can large relative mortality differences between socio-economic groups aong Swedish men be explained by risk indicator-associated social mobility? *European Journal of Public Health,* 1-5.
Hoem, B. (1996). The social meaning of the age at second birth for third-birth fertility: A methodological note on the need to sometimes respecify an intermediate variable. *Yearbook of Population Research in Finland, 33*, 333-339.
Hotz, V. J., Klerman, J. A., & Willis, R. (1997). The economics of fertility in developed countries. In M. R. Rosenzweig & O. Stark (Eds.), *Handbook of population and family economics* (pp. 275–347). Amsterdam: Elsevier Science B.V.
IMF World Economic Outlook Databases (2000, 2003). Available at IMF webpage http://www.imf.org/external/ns/cs.aspx?id=28.
Independent Institute for Social Policy. (2005): Education and Employment Survey on Russia - Technical Report, Moscow.
Inglehart, R. (1990). *Culture shift in advanced industrial society*. Princeton, NJ: Princeton University Press.
Innocenti Research Centre, UNICEF. TransMONEE Database. Available at http://www.unicef-irc.org/databases/transmonee/#TransMONEE.
Jäntti, M., Martikainen, P., & Valkonen, T. (2000). When the welfare state works: Unemployment and mortality in Finland. In G.A. Cornia & R. Paniccia (Eds.), *The mortality crisis in transitional economies* (pp. 351-369). New York: Oxford University Press.
Jasilionis, D. (2003). Lietuvos gyventoju mirtingumo miesto-kaimo skirtumu sociodemografiniai veiksniai [Sociodemographic determinants of urban-rural differences in mortality in Lithuania]. Kaunas University of Technology, Institute for Social Research: Kaunas [in Lithuanian].
Jukkala, T., Mäkinen, I.H., Kislitsyna, O., Ferlander, S., & Vågerö, D. (2008). Economic strain, social relations, gender, and binge drinking in Moscow. *Social Science and Medicine, 66*(3), 663-674.
Juozeliūnienė, I., & V. Kanopienė (1995). Women and Family in Lithuania; in B.Lobodzinska (Ed.) *Family, Women, and Employment in Central-Eastern Europe Westport* (pp. 155-165). Connecticut, London: Greenwood Press.

Kasarda, J., & Billy, J. (1985). Social mobility and fertility. *Annual Review of Sociology 11*, 305-328.

Katz, K. (2001). *Gender, work and wages in the Soviet Union*. New York: Palgrave.

Kharkova, T., & Andreev, E. (2000). Did the economic crisis cause the fertility decline in Russia? Evidence from the 1994 Microcensus. *European Journal of Population, 16,* 211-233.

Klugman, J., Micklewright, J., & Redmond, G. (2002). *Poverty in the transition: Social expenditure and the working-age poor*. Innocenti Working Papers, No. 91, UNICEF, Florence, Italy.

Kohler, H. P., Billari, F., & Ortega, J. (2002). The emergence of lowest-low fertility in Europe. *Population and Development Review, 28*(4), 641–680.

Kohler, H.P., & Kohler, I. (2002). Fertility decline in Russia in the early and mid 1990s: The role of economic uncertainty and labour market crises. *European Journal of Population, 18,* 233-262.

Kohlman, A., & Zuev, S. (2001). Patterns of childbearing in Russia 1994-1998. Max Planck Institute for Demographic Research Working Paper 2001-018, July 2001.

Kontorovich, V. (2001). The Russian health crisis and the economy. *Communist and Post-Communist Studies 34*, 221-240.

Korotayev, A., & Khaltourina, D. (2008). The Russian Demographic Crisis in Cross-National Perspective. In D.W. Blum (Ed). *Russia and globalization: Identity, security, and society in an era of change* (p. 37-78). Washington, D.C.: Woodrow Wilson Center Press.

Klugman, J., Micklewright, J., & Redmond, G. (2002). Poverty in the transition: Social expenditure and the working-age poor. Innocenti Working Papers, No. 91. Florence, Italy: UNICEF.

Kreyenfeld, M. (2002). Time-squueze, partner effect or self-selection? An investigation into the positive effect of women's education on second birth risks in West Germany. *Demographic Research, 7(*2), 15-48.

Kreyenfeld, M. (2005). Economic uncertainty and fertility postponement: Evidence from German panel data. MPIDR working Paper 2005-034.

Kristenson, M., & Kucinskiene, Z. (2002). Possible causes of differences in coronary heart disease mortality between Lithuania and Sweden: the LiVicordia Study. In G. Weidner, M. Kopp, M. Kristenson (Eds.), *Heart disease: Environment, Stress and Gender* (pp 328-340). Amstrdam: IOS Press.

Krumins, J., & Usackis, U. (2000). The mortality consequences of the transition to market economy in Latvia, 1991-1995. In G.A. Cornia & R. Paniccia (Eds.), *The mortality crisis in transitional economies* (pp. 227-252). New York: Oxford University Press.

Leinsalu, M. (2006). Does mortality of Russians in Estonia follow the mortality trend in Russia or in Estonia? An analysis of mortality changes over the last 15 years. Paper presentation at the Mortality in Countries of the former USSR. Fifteen Years after the Break-up: Change or Continuity? Conference in Kiev, Ukraine, 12-14 October, 2006.

Leon, D., Saburova, L., Tomkins, S., et al. (2007). Hazardous drinking and premature mortality in Russia: A population based case-control study. *Lancet, 369*, 2001-2009.

Leon, D., & Shkolnikov, V. (1998). Social stress and the Russian mortality crisis. *Journal of the American Medical Association, 279*, 790-791.

Lesthaeghe, R., & Moors, G. (2000). Recent trends in fertility and household formation in the industrialized world. *Review of Population and Social Policy, 9*, 121–170.

Lesthaeghe, R., & Neidert, L. (2006). The second demographic transition in the United States: Exception or textbook example? *Population and Development Review, 32*(4), 669–698.

Lesthaeghe, R., & Surkyn, J. (2002). New forms of household formation in Central and Eastern Europe: Are they related to newly emerging value orientations? *Economic Survey of Europe 2002/1*, New York and Geneva, Economic Commission for Europe, United Nations, pp. 197–216.

Lesthaeghe, R., & Surkyn, J. (2004). *When history moves on: The foundations and diffusion of a second demographic transition*. Paper presented at the seminar on "Ideational perspectives on international family change", Population Studies Center, Institute for Social Research (ISR), University of Michigan, Ann Arbor. From http://sdt.psc.isr.umich.edu/pubs/online/WhenHistoryMovesOn_final.pdf.

Lesthaeghe, R., & van de Kaa, R. (1986). Twee demografische transities? In D. van de Kaa & R. Lesthaeghe (Eds.), *Bevolking: groei en krimp* (pp. 9–24). Deventer: Van Loghum Slaterus.

Livi Bacci, M. (2000). Mortality crises in a historical perspective: The European experience. In G.A. Cornia & R. Paniccia (Eds.), *The mortality crisis in transitional economies* (pp. 38-58). New York: Oxford University Press.

Lynch, J., Smith, D., Kaplan, G., & House, J. (2000). Income inequality and mortality: Importance to health of individual income, psychosocial environment, or material conditions. *British Medical Journal 320*, 1200-1204.

Macunovich, D.J. (1998). Fertility and the Easterlin hypothesis: An assessment of the literature. *Population Economics, 11*, 53-111.

Maddala, G., & Wu, S. (1999). A comparative study on unit root tests with panel data and a new simple test. *Oxford Bulletin of Economics and Statistics, 61*(S1), 631–652.

Mäkinen, I.H. (2000). Eastern European transition and suicide mortality. *Social Science & Medicine, 51*(9), 1405-1420.

Malyutina, S., Bobak, M., Kurilovitch, S., et al. (2002). Relation between heavy and binge drinking and all-cause abd cardiovascular mortality in Novosibirsk, Russia: A prospective cohort study. *Lancet, 360*, 1448-54.

Marmot, M., & Bobak, M. (2000). Psychosocial and biological mechanisms behind the recent mortality crisis in Central and Eastern Europe. In G.A. Cornia & R. Paniccia (Eds.), *The mortality crisis in transitional economies* (pp. 127-148). New York: Oxford University Press.

Marshall, G., Sydorenko, S., & Roberts, S. (1995). Intergenerational social mobility in communist Russia. *Work, Employment & Society, 9*(1), 1-27.

Martikainen, P., Mäki, N., & Jäntti, M. (2007). The effects of unemployment on mortality following workplace downsizing and workplace closure: A register-based follow-up study of Finnish men and women during economic boom and recession. *American Journal of Epidemiology, 165*(9), 1070-1075.

Maslow, A. (1954). *Motivation and personality*. New York: Harper and Row.

Matthews, M. (1986). *Poverty in the Soviet Union: The Life-styles of the Underprivileged in Recent Years.* Cambridge, UK: Cambridge University Press.

Mayer, U. (2005). Life Courses and Life Chances in a Comparative Perspective. In S. Svallfors (Ed.) *Analyzing Inequality: Life Chances and Social Mobility in Comparative Perspective* (pp. 17-55). Stanford, CA: Stanford University Press.

Mayer, K.U. (2006). After the fall of the wall: Living through the post-socialist transformation in East Germany. In M. Diewald, A. Goedicke & K.U. Mayer (Eds). *After the fall of the wall: Life courses in the Transformation of East Germany* (p. 1-28). Stanford, CA: Stanford University Press.

Mckee, M. (2005). Understanding population health: Lessons from the Soviet Union. *Clinical Medicine 5*(4), 374-378.

Milanovic, B. (1998a). Explaining the increase in inequality during the transition. World Bank Research Working Paper No. 1935. Available at SSRN: http://ssrn.com/abstract=156088

Milanovic, B. (1998b). Income, inequality, and poverty during the transition from planned to market economy. Washington, D.C.: World Bank.
Muntaner, C., Lynch, J., (1998). Income inequality and social cohesion versus class relations: A critique of Wilkinson's neo-Durkheimian research program. *International Journal of Health Services, 29*, 59-81.

Myrdal, A., & Myrdal, G. (1934). *Crisis in the population question*. Stockholm: Bonniers.

Navarro, V. (2002). A critique of social capital. *International Journal of Health Services, 32*, 423-432.

Nee, V. (1989). A theory of market transition: From redistribution to markets in state socialism. *American Sociological Review, 56*, 267-282.

Nemtsov, A.V. (2003). Alcohol consumption in Russia: A viewpoint on monitoring health conditions in the Russian Federation RLMS. *Addiction 98*, 369-370.

Nilsson, P.M., Nilsson, J., Östergren, P., & Berglund, G. (2005). Social mobility, marital status, and mortality risk in an adult life course perspective: The Malmö Preventative Project. *Scandinavian Journal of Public Health, 33*, 412-423.
Notzon, F.C., Komarov, Y.M., Ermakov, S.P., Sempos, C.T., Marks, J.S., et al. (1998). Causes of declining life expectancy in Russia. *JAMA, 279*, 793-800.
Ortíz, L. (forthcoming). Not the right job, but a secure one: Over-education and temporary employment in France, Italy and Spain. *Work, Employment & Society.*
Palloni, A., Hill, K., & Aguirre G.P. (1996). Economic swings and demographic changes in the history of Latin America. *Population Studies, 50*(1), 105-132.
Perelli-Harris, B. (2005). The path to lowest-low fertility in Ukraine. *Population Studies, 59*(1), 55–70.
Perelli-Harris, B. (2006). The influence of informal work and subjective well-being on childbearing in post-Soviet Russia. *Population and Development Review*. *32*(4), 729-753.
Perlman, F., & Bobak, M. (2008). Socioeconomic and behavioral determinants of mortality in post-transition Russia: A prospective population study. *Annals of Epidemiology, 18*(2), 92-100.
Power, C., Matthews. S., & Manor, O. (1996). Inequalities in self rated health in the 1958 birth cohort: Lifetime social cicumstances or social mobility? *BMJ, 313*, 449-453.
Philipov, D., & Jasilioniene, A. (2007). Union formation and fertility in Bulgaria and Russia: A life table description of recent trends. Max Planck Institute for Demographic Research Working Paper 2007-005.
Philipov, D., & Kohler, H. P. (2001). Tempo effects in the fertility decline in Eastern Europe: Evidence from Bulgaria, the Czech Republic, Hungary, Poland, and Russia. *European Journal of Population, 17*, 37–60.
Philipov, D., Spéder, Z., & Billari, F. (2006). Soon, later or ever? The impact of anomie and social capital on fertility intentions in Bulgaria (2002) and Hungary (2001). *Population Studies, 60*(3), 289–308.
Pietilä, I., & Rytkönen, M. (2008). Coping with stress and by stress: Russian men and women talking about transition, stress and health. *Social Science and Medicine, 66*(2), 327-338.
Population Reference Bureau. (2007). 2007 World population Data Sheet. Retrieved May 26, 2009, at the Population Reference Bureau's Web site: http://www.prb.org/pdf07/07WPDS_Eng.pdf
Pridemore, W. (2004). Weekend effects on binge drinking and homicide: The social connection between alcohol and violence in Russia. *Addiction, 99*(8), 1034-1041
Ranjan, P. (1999). Fertility behaviour under income uncertainty. *European Journal of Population, 15*, 25–43.

Rindfuss, R., Reed, J., & St. John, C. (1978). A fertility reaction to a historical event: Southern white birth rates and the 1954 desegregation ruling. *Science, 201*(4351).
Riphan, R., & Zimmerman, K. (2000). The mortality crisis in East Germany. In G.A. Cornia & R. Paniccia (Eds.), *The mortality crisis in transitional economies* (pp. 280-302). New York: Oxford University Press.
Rose, D., & Harrison, E. (2007). The European socio-economic classification: A new social class schema for comparative European research. *European Societies, 9*(3), 459-490.
Rotariu, T. (2006). Romania and the second demographic transition. The traditional value system and low fertility rates. *International Journal of Sociology, 36*(1), 10–27.
Runciman, G.W. (1971). Relative deprivation and social justice: A study of attitudes to social inequality in Twnetieth-Century England. London: Routledge.
Rychtarikova, J. (2004). The case of the Czech Republic. Determinants of the recent favourable turnover in mortality. *Demographic Research,* Special Collection 2, Article 5.
Saar, E. (1997). Transitions to tertiary education in Belarus and eh Baltic countries. *European Sociological Review, 13*(2), 139-158.
Semyonova V.G., Ivanova A.E., Gavrilova N.S., Evdokushkina G.N., Gavrilov L.A., & Devichenskaya M.N. (2002). Medico-demographic conditions in urban and rural areas – similarity and differences. Disease Prevention and Health Promotion [Obshch Zdor Profilac Zabol -- Общественное здоровье и профилактика заболеваний], 5, 8-14.
Sen, A. (1998). Mortality as an Indicator of Economic Success and Failure. *Economic Journal, Royal Economic Society, 108*(446), 1-25.
Shapiro, J. (1995). The Russian mortality crisis and its causes. In A. Aslund (Ed.), *Russian Economic Reform at Risk.* London: Pinter.
Shkolnikov, V., Andreev, E., Jasilionis, D., Leinsalu, M., Antonova, O., & McKee, M. (2006). The changing relation between education and life expectancy in central and eastern Europe in the 1990s. *Journal of Epidemiology and Community Health 60*: 875-881.
Shkolnikov, V., Andreev, E., Leon, D., McKee, M., Meslé, F., & Vallin, J. (2004a). Mortality reversal in Russia: The story so far. *Hygiea Internationalis, 4*(4), 29–80.
Shkolnikov, V., Cornia, G.A., Leon, D., & Meslé, F. (1998). Causes of the Russian mortality crisis: Evidence and interpretations. *World Development, 26*(11), 1995-2011.
Shkolnikov, V.M., Chervyakov, V.V., McKee, M., Leon, D. (2004b). Russian mortality beyond vital statistics: Effects of social status and behaviours on deaths from circulatory disease and external causes—a case control study of men aged 20-55 years in Udmurtia, 1998-99. *Demographic Research, S2*(4), 71-104.
Shkolnikov, V., Leon, D., Adamets, S., & Andreev, E. (1998). Educational level and adult mortality in Russia: an analysis of routine data 1979 to 1994. *Soc Sci Med 47*: 357–69.
Shkolnikov, V., McKee, M., & Leon, D. (2001). Changes in life expectancy in Russia in the mid-1990s. *The Lancet, 357*, 917-921.
Shkolnikov , V.M., & Meslé, F. (1996). The Russian epidemiological crisis as mirrored by mortality trends. In J. DeVanzo (Ed.), *Russia´s Demographic Crisis.* Santa Monica: RAND.
Shkolnikov, V.M., Meslé, F., & Leon. D. (2002). Premature circulatory disease mortality in Russia: Population- and individual-level evidence. In G. Weidner et al. (Eds.), *Heart Disease: Environment, Stress and Gender*. IOS Press.
Siegrist, J. (2000). Place, social exchange and health: Proposed sociological framework. *Social Science & Medicine, 51*, 1283-1293.
Sobotka, T. (2002). Ten years of rapid fertility changes in the European post-communist countries: Evidence and interpretation. Population Research Centre Working Paper Series 02-1, July.
Sobotka, T. (2003). Re-emerging diversity: Rapid fertility changes in Central and Eastern Europe after the collapse of the communist regimes. *Population, 58*(4/5), 451–485.
Sobotka, T. (2004). Is lowest-low fertility in Europe explained by the postponement of childbearing? *Population and Development Review, 20*(2), 195–220.

Sobotka, T., Zeman, K., & Kontarova, V. (2003). Demographic shifts in the Czech Republic after 1989: A second demographics transition view. *European Journal of Population, 19*, 249–277.

Solga, H., & Konietzka, D. (1999). Occupational matching and social stratification: Theoretical insights and empirical observations taken from a German-German comparison. *European Sociological Review, 15*(1), 25-47.

Spielauer, M., Kostova, D., Kotzeva, T., Jekova, V., & Borissova, K. (2005). *The contextual database of the generations and gender program in Bulgaria: Conceptual framework and an overview of the Bulgarian context concerning the central database topics*. MPIDR WP 2005–2006, Max Planck Institute for Demographic Research, Rostock.

Stern, J. (1983). Social mobility and the interpretation of social class mortality differentials. *Journal of Social Policy, 12*(1), 27-49.

Stevens, G. (1981). Social mobility and fertility: Two effects in one. *American Sociological Review, 46*(5), 573-585.

Stickley, A., Leinsalu, M., Andreev, E., Razvodovsky, Y., Vågerö, D., & McKee, M. (2007). Alcohol poisoning in Russia and the countries in the European part of the former Soviet Union, 1970-2002. *European Journal of Public Health, 17*(5), 444-449.

Stillman, S. (2006). Health and nutrition in Eastern Europe and the former Soviet Union during the decade of transition: A review of the literature. *Economics and Human Biology, 4*, 104-146.

Strully, K.W. (2009). Job loss and health in the U.S. labor market. *Demography, 46*(2), 221-246.

Stuckler, D., King, L., & McKee, M. (2009). Mass privatization and the post-communist mortality crisis: A cross-national analysis. *Lancet, 373*, 399-407.

Szreter, S., & Woolcock, M. (2004). Health by association? Social capital, social theory, and the political economy of public health. *International Journal of Epidemiology, 33*, 650-667.

Teplova, T. (2007). Welfare state transformation, childcare, and women's work in Russia. *Social Politics, 14*, 284 - 322.

Thornton, A., & Philipov, D. (2007). *Developmental idealism and family and demographic change in Central and Eastern Europe*. European Demographic Working Paper 3, Vienna: Vienna Institute of Demography of the Austrian Academy of Sciences.

Tomkins, S., Leon, D., Kiryanov, N., Saburova, L., Andreev, A., McKee, M., Shkolnikov, V. (2006). Alcohol and Premature Mortality in Russia: The Izhevsk Family Case-Control Study of men Aged 25-54 years, 2003-5. Paper presentation at the Mortality in Countries of the former USSR. Fifteen Years after the Break-up: Change or Continuity? Conference in Kiev, Ukraine, 12-14 October, 2006.

Treiman, D.J. (1977). *Occupational prestige in comparative perspective.* New York: Academic Press.

UNECE. (2000). Fertility decline in the transition economies, 1989-1998: Economic and social factors revisited. In *Economic Survey of Europe 2000, No. 1.* Economic Commission for Europe, UN New York and Geneva.

UNECE. (2004). Economic Survey of Europe, No.1, Statistical Appendix. Economic Commission for Europe, UN New York and Geneva.

UNECE. (2006). Gender and Generations Program: Summary description. Available at the UNECE website: http://www.unece.org/pau/ggp/materials/ GGP_SumDescr.pdf

Vågero, D., & Kislitsyna, O. (2005). Self-reported heart symptoms are strongly linked to past and present poverty in Russia: Evidence from the 1998 Taganrog interview survey. *European Journal of Public Health, 15*(4), 418-423.

van de Kaa, D. (1987). Europe's second demographic transition. *Population Bulletin, 42*(1), 1–57.

van de Kaa, D. (2002). *The idea of a second demographic transition in industrialized countries*. Paper presented at the sixth welfare policy seminar of the national institute of population and social security, Tokyo, Japan, 29 January 2002.

Veneema, T.G. (2000). Health systems and maternal and child survival in Central Asian Republics. *Journal of Nursing Scholarship, 32*(3), 301-306.

Vikat, A. (2004). Women's labor force attachment and childbearing in Finland. *Demographic Research, Special Collection 3*(8), 175-211.
Vishnevskii, A. (1999). The demographic potential of Russia. *Russian Social Science Review, 40*(4), 11.
Vishnevskii, A. (2008). НАСЕЛЕНИЕ РОССИИ 2006. (Population of Russia. 14th Annual Report, In Russian.) *Demoscope Weekly*, Moscow. Retrieved February 12, 2009, from http://demoscope.ru/weekly/knigi/ns_r06/ sod_r.html.
Walberg, P., McKee, M., Shkolnikov, V., Chenet, L., & Leon, D. (1998). Economic change, crime, and mortality crisis in Russia. Regional analysis. *BMJ 317*, 312-318.
Watson, P. (1995). Explaining rising mortality among men in Eastern Europe. *Social Science & Medicine, 41*(7), 923-934.
Wilkinson, R. (1996). *Unhealthy societies: The afflictions of inequality.* London: Routledge.
World Bank. 2000. Making transition work for everyone: Poverty and inequality in Europe and Central Asia. Washington, D.C.: The World Bank.
World Bank. (2005). Dying too Young: Addressing Premature Mortality and Ill Health Due to Non Communicable Diseases and Injuries in the Russian Federation. *Europe and Central Asia Human Development Report.*

WHO-HFA. (n.d.) European health for all database, WHO Regional Office for Europe, Copenhagen, Denmark. Retrieved February 16, 2005, from the World Health Organization Regional Office for Europe Web site: http://www.euro.who.int/hfadb
Zakharov, S. (2008). Russian Federation: From the first to the second demographic transition. *Demographic Research, 24*(19), 907–972.
Zakharov, S., & Ivanova, E. (1996). Fertility decline and recent changes in Russia: On the threshold of the second demographic transition. In DaVanzo (Ed.), *Russia's Demographic "Crisis"*. Santa Monica, CA: RAND.
Zohoori, N., Mroz. T., Popkin, B., Glinskaya, E., Lokshin, M., Mancini, D., et al. (1998). Monitoring the economic transition in the Russian Federation and its implications for the demographic crisis—The Russian Longitudinal Monitorino Survey. *World Development, 26*(11), 1977-1993.

APPENDIXES

Figure A1.1 Fertility Propaganda in Moscow, June 2009
Translation: “Love for the motherland begins with the family. F. Bacon”

Figure A1.2 Mortality propaganda in Moscow, June 2009
Translation: “Men do many things in their drink that they are ashamed of sober. Seneca”

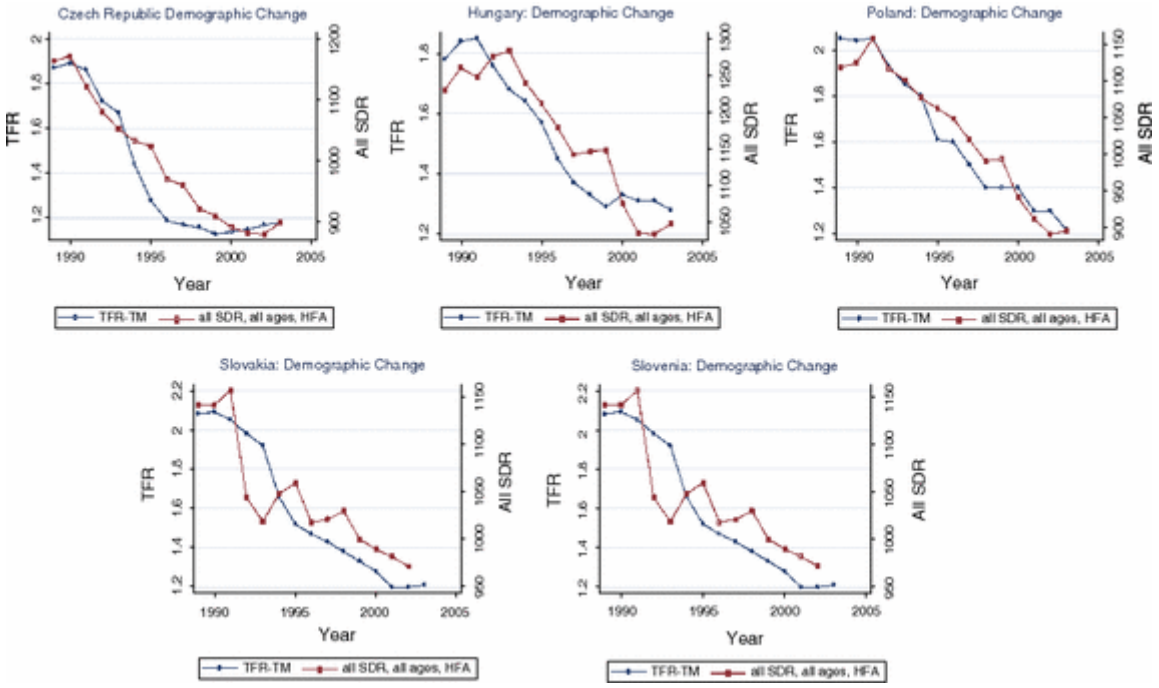


Fig. A2.1 Group 1 countries

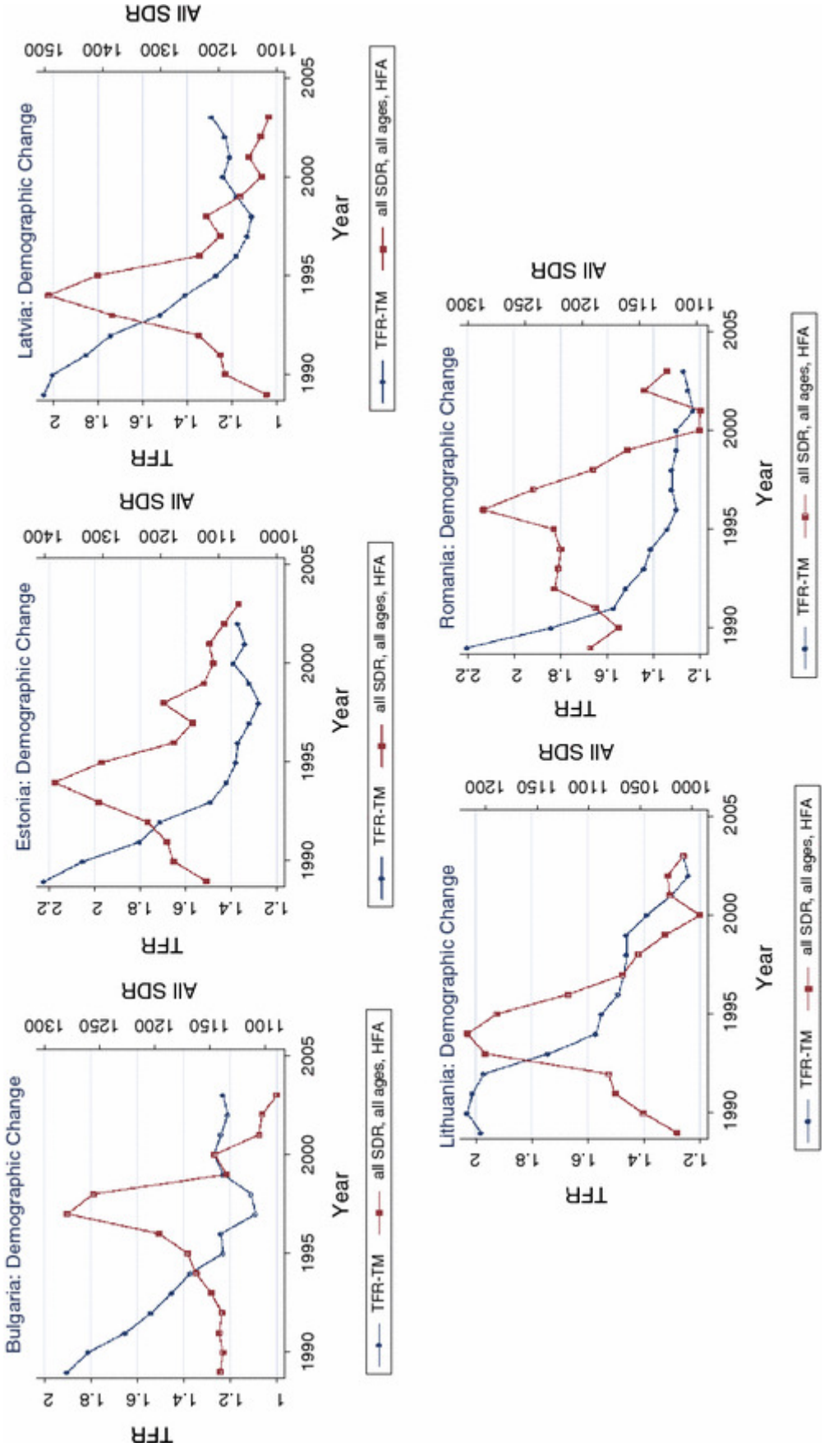


Fig. A2.2 Group 2 countries

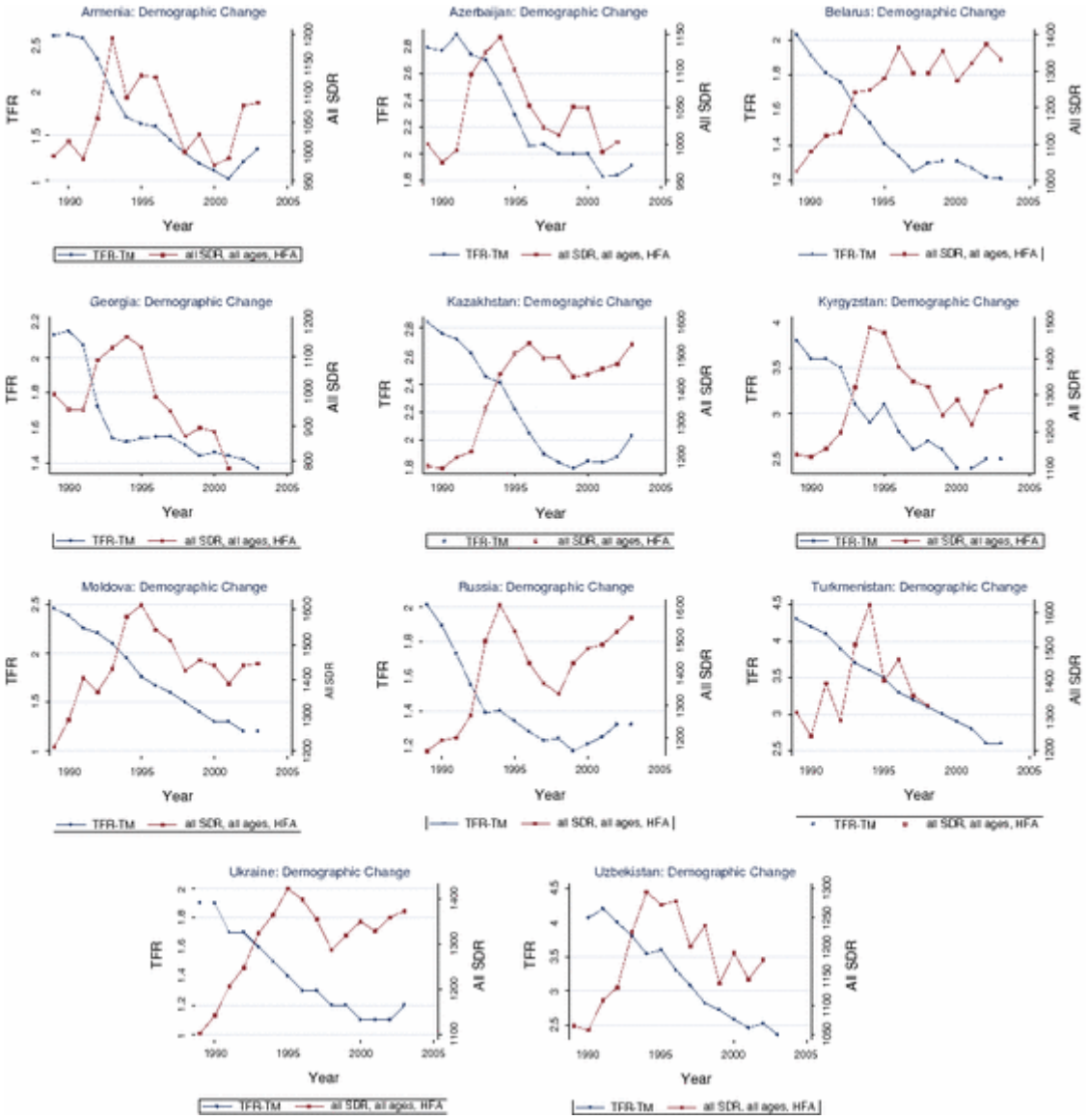


Fig. A2.3 Group 3 countries

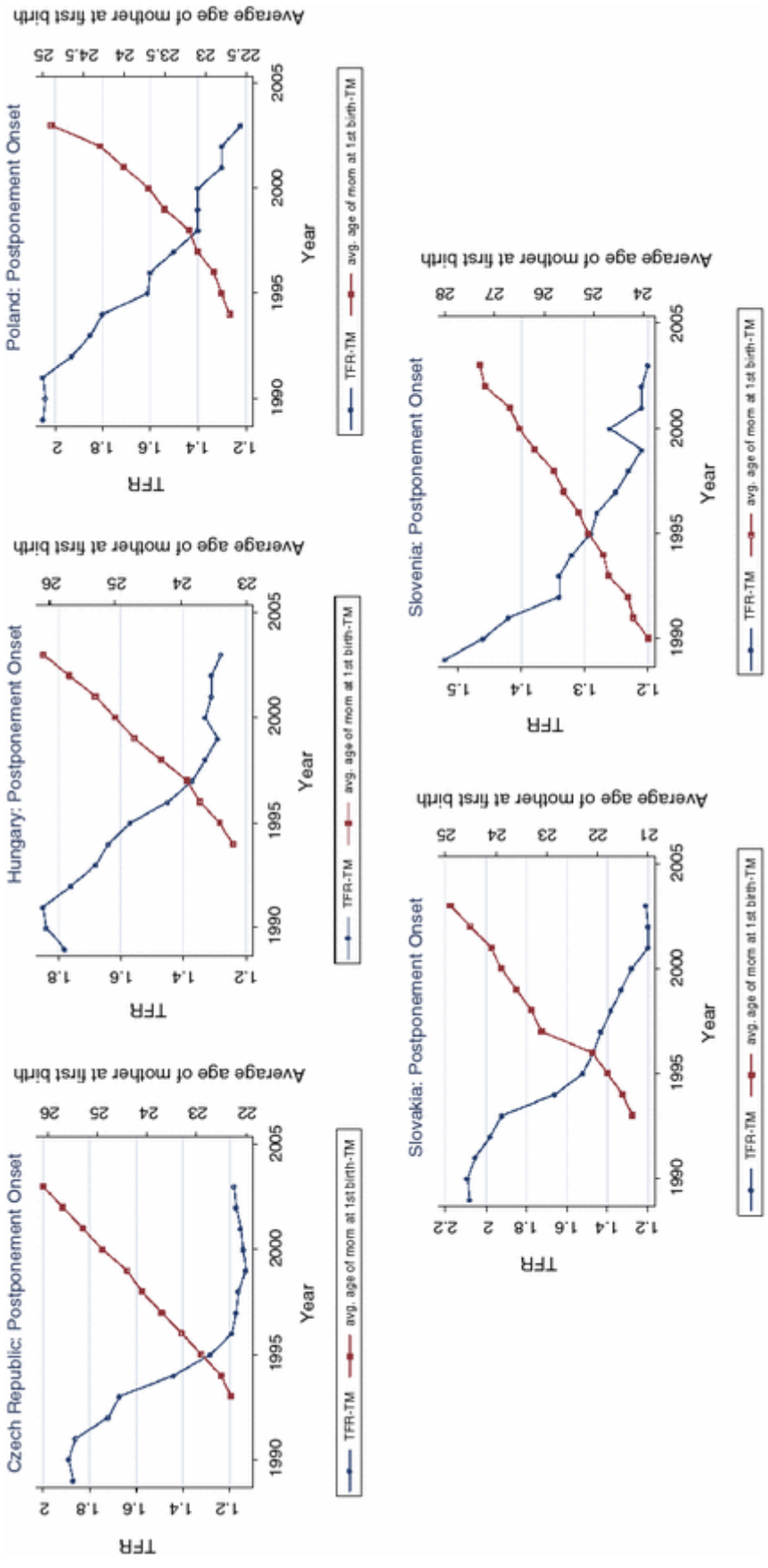


Fig. A2.4 Group 1 countries

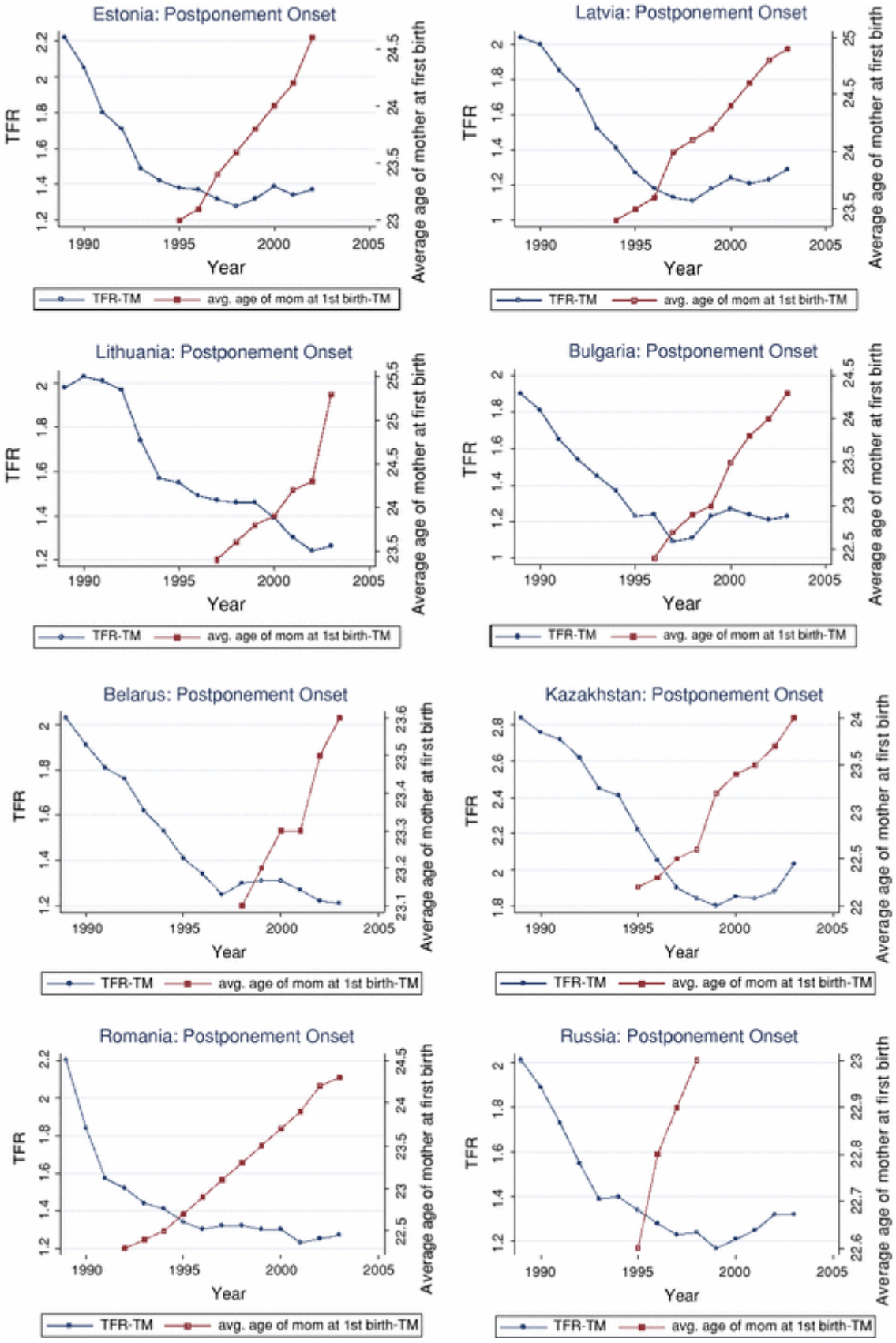


Fig. A2.5 Remaining countries

Table A2.6 Pooled cross-sectional time-series regression results, mixed-process countries categorized as Group 3

	Δ16-19		ΔLBR 20-24		ΔLBR 25-29		ΔLBR 30-34		ΔLBR 35+	
	M1	**M2**	**M1**	**M2**	**M1**	**M2**	**M1**	**M2**	**M1**	**M2**
Prob > F	0.4961	0.0426	0.0150	0.0002	0.9327	0.0000	0.0656	0.0000	0.2988	0.0003
R-squared	0.0019	0.0635	0.0137	0.4053	0.0000	0.3157	0.0282	0.4632	0.0144	0.3067
# of clusters	15	15	15	15	15	15	15	15	15	15
Obs.	170	170	170	170	170	17	170	170	170	170
	-0.30	1.16	1.87	8.28	-0.08	4.34	-1.25	1.75	-0.17	0.25
Group	(0.42)	(0.73)	(0.68) **	(1.68) ***	(0.78)	(1.16) ***	(0.63) *	(0.54) ***	(0.15)	(0.15)
		0.84		-2.70		-3.59		-2.49		-0.41
Initial TFR		(0.90)		(1.57)		(1.39) **		(1.06) **		(0.30)
		-0.000		0.005		0.004		0.003		0.001
ΔReal GDP pc		(0.000)		(0.002) **		(0.001) **		(0.001) ***		(0.000) ***
		0.08		-1.01		-0.27		-0.28		-0.01
(log) Inflation		(0.73)		(0.00) **		(0.25)		(0.15) *		(0.04)
Employment		-0.07		-0.16		-0.14		-0.08		-0.01*
ratio		(0.30)		(0.08) *		(0.06) **		(0.02) ***		(0.01) *
		0.04		0.05		0.02		0.01		0.00
Wage growth		(0.02) **		(0.03)		(0.03)		(0.01)		(0.00)
	-2.08	-2.92	8.53	2.82	-1.84	11.15	0.72	8.89	-0.05	1.04
Constant	(0.35) ***	(4.99)	(0.40) ***	(5.41)	(0.53) ***	(5.25) *	(0.48)	(2.87) ***	(0.13)	(0.79)

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, Robust standard errors in parentheses. Group 1 is the reference category and includes Czech Republic, Hungary, Poland and Slovakia. Group 3 includes Armenia, Azerbaijan, Bulgaria, Estonia, Georgia, Kazakhstan, Latvia, Moldova, Romania, Russia and Ukraine (Group 2 countries—mixed-process countries—are absorbed into Group 3 in these models)

Table A2.7 Pooled cross-sectional time-series regression results, mixed group models in which the mixed-process countries contribute to both groups according to the year

	Δ16-19		ΔLBR 20-24		ΔLBR 25-29		ΔLBR 30-34		ΔLBR 35+	
	M1	**M2**	**M1**	**M2**	**M1**	**M2**	**M1**	**M2**	**M1**	**M2**
Prob > F	0.4394	0.0263	0.9496	0.0000	0.0906	0.0000	0.0034	0.0000	0.0277	0.0003
R-squared	0.0029	0.0483	0.0000	0.3984	0.0206	0.2943	0.0996	0.4518	0.0777	0.2939
# of clusters	15	15	15	15	15	15	15	15	15	15
Obs.	170	170	170	170	170	170	170	170	170	170
	-0.32	0.08	-0.08	6.94	-1.57	3.06	-2.12	1.17	-0.35	0.10
Group	(0.41)	(0.72)	(1.24)	(1.94) ***	(0.86) *	(0.98) ***	(0.60) ***	(0.56) *	(0.14) **	(0.12)
		0.80		-5.66		-4.91		-2.99		-0.46
Initial TFR		(0.95)		(1.24) ***		(1.49) ***		(1.08) **		(0.30)
		-0.000		0.006		0.004		0.003		0.001
ΔReal GDP pc		(0.000)		(0.002) ***		(0.001) ***		(0.001) ***		(0.000) ***
		0.06		-1.34		-0.43		-0.33		-0.02
(log) Inflation		(0.25)		(0.34) ***		(0.25)		(0.13) **		(0.03)
Employment		-0.05		-0.07		-0.10		-0.06		-0.01
ratio		(0.06)		(0.08)		(0.06)		(0.02) **		(0.00)
		0.03**		-0.02		-0.01		-0.00		1.21
Wage growth		(0.01) **		(0.02)		(0.02)		(0.01)		(0.81)
	-2.10	-2.42	-7.11	10.74	-0.95	14.90	1.09	10.36	0.04	1.21
Constant	(0.25) ***	(4.87)	(0.82) ***	(5.77) *	(0.63)	(5.93) **	(0.43) **	(2.86) ***	(0.11)	(0.81)

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, Robust standard errors in parentheses. Group 1 is the reference category and includes Czech Republic, Hungary, Poland and Slovakia as well as Bulgaria from 1995 to 2003 and Estonia and Latvia from 1994 to 2003. Group 3 includes Armenia, Azerbaijan, Bulgaria, Estonia, Georgia, Kazakhstan, Latvia, Moldova, Romania, Russia and Ukraine, as well as Bulgaria from 1990 to 1994 and Estonia and Latvia from 1990 to 1993

Table A2.8 Logistic regression results for postponement of childbirth, mixed-process countries categorized as Group 1

Logistic Regression		
Postponement		
	M1	**M2**
Prob > chi2	0.1490	0.0000
Pseudo R-squared	0.0323	0.4883
Log pseudo likelihood	-92.999	-49.177
Obs.	147	147
Group	0.42 (0.25)	6.25 (4.41) ***
Initial TFR		0.03 (0.05) **
∆Real GDP pc		1.01 (0.00) ***
(log) Inflation		0.79 (0.15)
Employment ratio		0.99 (0.07)
Wage growth		1.01 (0.02)

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, Robust standard errors in parentheses. Group 1 is the reference category and includes Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Poland and Slovakia. Group 3 includes Armenia, Azerbaijan, Georgia, Kazakhstan, Moldova, Romania, Russia and Ukraine (Group 2 countries—mixed-process countries—are absorbed into Group 1 in these models)

A4.1 Detailed description of the categories included in the respondents' occupational class coding (EES data)

SeC4=The Salariat

a. Leader with significant managerial authority with the right to make important decisions
b. Self-employed lawyer, doctor, notary, who has a private practice and hires own employees
c. Self-employed, i.e., a person who has own business in industry, trade, or the service sector and hires own employees
d. Employee who performs autonomously an important task or has a few subordinates
e. Self-Employed: a person who has own business in industry, trade or service sector and does not hire own employees

SeC3=Intermediate Employee (high grade white and blue collar workers)

f. Team leader
g. Employee who performs more complex tasks, implying some autonomy
h. Highly qualified workers
i. Foreman

SeC2=Low-grade white and blue collar workers:

j. employee who performs relatively simple tasks
k. qualified workers

SeC1=Lower technical and routine occupations:

l. unqualified workers
m. agricultural employees

A4.2 Income distribution by SeC levels

Income Distribution in 2004 by the 4 SeC classes

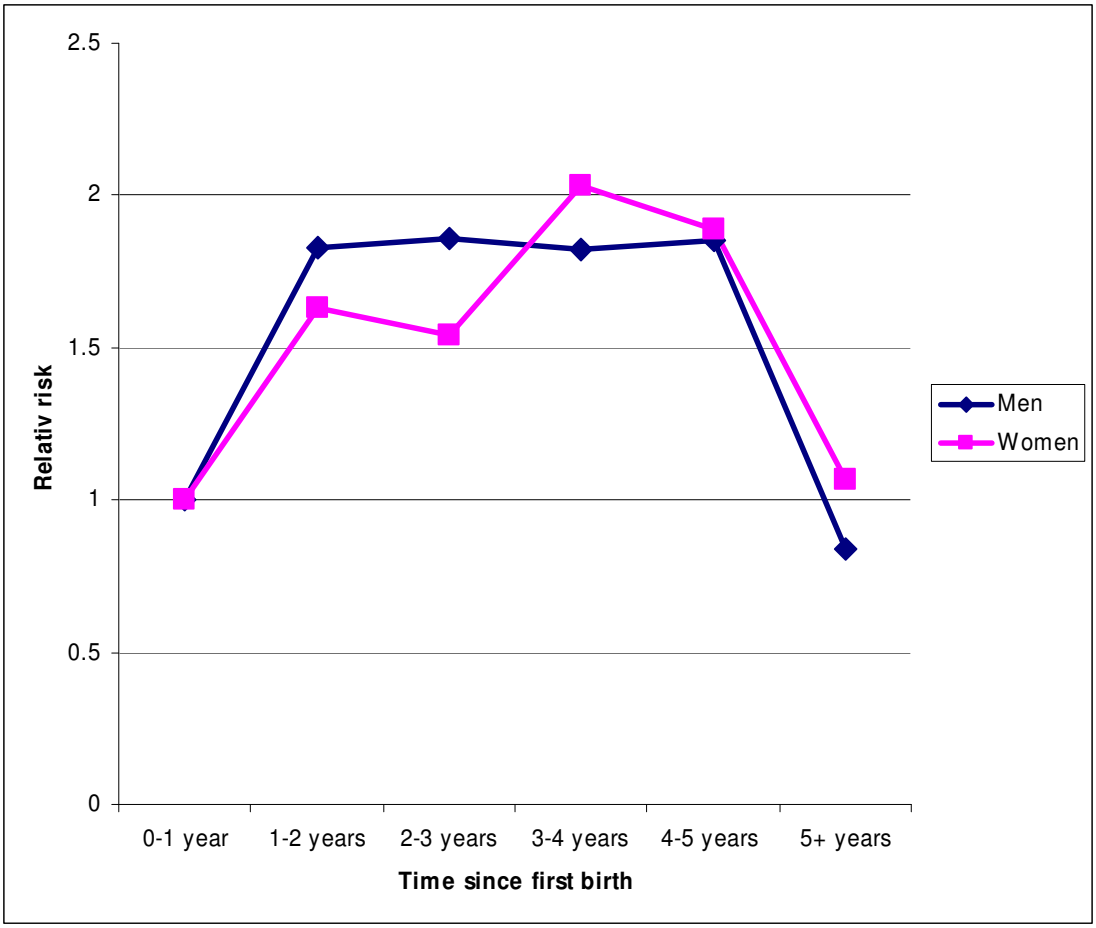
SeC	mean	med	25%	75%	St. Dev	highest	obs
4	76316	48000	30000	84000	217753	5671500	812
3	72025	37200	24000	65200	267295	5472500	1328
2	60189	42000	23880	72000	162316	4980000	2077
1	49850	26400	14400	54000	173194	4378000	1536

Author's calculations based on GGS data for respondents that also participated in the EES.

A4.3 Over-education classification:

1. Low educational level corresponds to the lowest two SeC categories: unqualified worker and agricultural employee or qualified worker and employee performing simpler tasks.
2. Middle educational level corresponds to SeC 2 or 3: qualified worker, employee performing simpler tasks or team leader, foreman, highly-qualified worker, or employee with complex tasks and some autonomy.
3. High educational level corresponds to the highest SeC class: significant leader, professional, autonomous employee, self-employed in industry or trade.

A4.4 Baseline hazard of the intragenerational DSM model



Note: Estimates from piecewise constant event history model, controlling for all covariates introduced and ever experienced intragenerational downward social mobility

A4.5 Full model results for the intragenerational downward social mobility model

Intragenerational Mobility Model: Changing effect of ever having experienced downward intragenerational mobility across pre & post-transition periods						
	Men			Women		
	relative risk	sign. level	standard errors	relative risk	sign. level	standard errors
Time since first birth						
0-1 year	1			1		
1-2 years	1.83	***	0.23	1.63	***	0.15
2-3 years	1.86	***	0.24	1.54	***	0.15
3-4 years	1.82	***	0.25	2.03	***	0.19
4-5 years	1.85	***	0.26	1.89	***	0.19
5+ years	0.84		0.10	1.07		0.09
Age at first birth						
17-21	1			1.00		
21-24	0.83		0.11	0.84	***	0.05
24-29	0.77	*	0.11	0.79	***	0.05
30+	0.51	***	0.09	0.33	***	0.05
St. Petersburg or Moscow survey	0.78		0.14	0.88		0.10
Union status: married or cohabiting	3.04	***	0.46	3.34	***	0.24
Number of siblings						
only child	0.98		0.11	0.89		0.07
1 sibling	1			1		
2 siblings	1.46	***	0.14	1.24	***	0.07
3+ siblings	1.79	***	0.16	1.25	***	0.08
Born in urban place	0.82	**	0.06	0.74	*	0.12
Education status/level						
in education	1			1		
out/ low level	0.93		0.13	1.59	***	0.20
out/ middle level	1.06		0.14	1.27	**	0.14
out/ high	1.11		0.17	1.4	***	0.18
Labor force status						
unemployed	0.82		0.29	0.63	*	0.17
SeC 1 (manual)	1			1		
SeC 2 (low-grade)	0.81		0.12	0.81	*	0.08
SeC 3 (intermediate)	0.78		0.13	0.81	*	0.09
SeC 4 (salariat)	0.85		0.16	0.79	*	0.10
not participating in labor force	0.78	*	0.11	0.85	*	0.08
Ever Intragenerational downward mobility * period						
Period 1	1.85	***	0.15	2.31	***	0.13
Period 2: never had downward mobility	1			1		
Period 2: experienced downward mobility before first birth	0.93		0.20	0.68	*	0.15
Period 2: experienced downward mobility after first birth	0.45	***	0.09	0.48	***	0.07
# of subjects	1656			3221		
Log Likelihood	-2012.29			-3891.21		
Prob > chi2	0.0000			0.0000		
LR chi2 (27)	548.13			1391.5		

Statistical significance: * =10%, ** =5%, *** =1%

A5.1 Summary Statistics

Variable	Exposures	Occurrences	Rate
<40 years	37689	78	0.002
40-44	8809	37	0.004
45-49	8369	46	0.007
50-54	6323	46	0.007
55-59	5865	69	0.012
60+	21390	643	0.030
men	37549	547	0.015
women	50896	387	0.008
smoker	29824	334	0.011
heavy alcohol cons.	10076	124	0.012
non-drinker	39757	558	0.140
heart attack diagnosed	2457	103	0.042
stroke diagnosed	1622	92	0.057
missed work from illness	4808	25	0.005
perceives health as poor	15321	547	0.036
unemployed	8632	70	0.008
routine/manual worker	14372	62	0.004
low-mid grade employees	13630	48	0.004
intermediate employees/ers	10562	8	0.001
salariat	7250	17	0.002
caring for someone	4626	6	0.001
other reasons not particip.	29373	723	0.025
urban residence	59555	566	0.010
township	5370	54	0.010
rural residence	23064	313	0.014
male-headed household	65140	545	0.008
female-headed household	8679	82	0.010
retired or young head	14170	306	0.022
in union	58039	554	0.010
not in union	30053	379	0.013
incomplete secondary educ	34987	636	0.018
complete secondary or more	37989	202	0.005
university or institute	15469	96	0.006
lowest real household income quartile	21103	251	0.012
low-mid real household income quartile	21079	311	0.015
mid-high real household income quartile	21089	203	0.010
highest real household income quartile	21088	144	0.007
relative wealth: lowest 3 steps	40962	561	0.014
relative wealth: mid 3 steps	43572	302	0.007
relative wealth: highest 3 steps	2413	11	0.005
DSM: subjective wealth distribution	10897	155	0.014
no DSM	77548	779	0.010
ever experienced unemployment	42427	535	0.013
never	46018	399	0.009
ever experienced DSM	32234	368	0.011
never	56211	566	0.010

A5.2 Reduced model, education

Cox Proportional Hazard Risks of Death in Russia, 1994-2005

Relative Risks of Age and Education Model		
	Men	Women
<40 years	1	1
	2.02***	1.93
40-44	(0.44)	(0.94)
	3.73***	3.10***
45-49	(0.70)	(1.28)
	3.39***	5.16***
50-54	(0.73)	(1.99)
	5.59***	6.10***
55-59	(1.04)	(2.21)
	10.98***	22.39***
60+	(1.56)	(6.33)
incomplete secondary educ	1	1
	0.83*	0.48***
complete secondary or more	(0.08)	(0.06)
	0.63***	0.38***
university or institute	(0.08)	(0.08)
# of subjects	8938	10830
# of deaths	547	387
Time at risk	37549	50896
Log Pseudolikelihood	-4275.9	-3029.4
Prob > chi2	0.0000	0.0000
Wald chi2 (7)	430.41	378.84

A5.3 Reduced model, Smoking

Cox Proportional Hazard Risks of Death in Russia, 1994-2005

Relative Risks of Age and Smoking Status Model		
	Men	Women
<40 years	1	1
	2.02***	2.01
40-44	(0.44)	(0.99)
	3.73***	3.36***
45-49	(0.70)	(1.39)
	3.43***	6.02***
50-54	(0.73)	(2.33)
	5.94***	8.30***
55-59	(1.10)	(3.02)
	12.85***	39.08***
60+	(1.77)	(10.74)
	1.33***	1.70**
current smoker	(0.11)	(0.38)
# of subjects	8938	10830
# of deaths	547	387
Time at risk	37549	50896
Log Pseudolikelihood	-4277.2	-3052.1
Prob > chi2	0.0000	0.0000
Wald chi2 (6)	440.71	345.97