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ABSTRACT

In the context of a fertility decline across the countries of the former Eastern bloc, this paper analyzes the fertility decline in Armenia and Moldova using 2005 Demographic Health Surveys (DHS) data. Easterlin's (1976) hypothesis about the negative impact on fertility of reducing living standards is contrasted with Becker's (1981) theory of opportunity costs. If Easterlin's hypothesis is true, we would expect to see women with lower resources suppress fertility because of the hardships brought on by the economic transition, especially for those with fewer marketable skills. Conversely, if Becker's theory is correct, opportunity costs would lead women with the highest earning potential to suppress their fertility. Specifically, the extent of parity declines is analyzed during the transition from Communism, with special attention given to identifying women for whom parity declines are greater. The conditions under which women currently want children are also analyzed to determine if a relationship exists between economic conditions and the desire for another child or the desired timing of childbirth. Since 1986, parity progression ratios have declined more for women with vocational education than for women with higher education or secondary education only. Logistic analyses of current fertility preferences suggest that women who are employed are more likely to want a second birth in both countries, whereas the wealthiest women in Armenia have higher odds of wanting a third birth. Armenian women have higher odds of wanting to postpone the next birth if their partners are unemployed, whereas Moldovan women who are employed prefer to postpone their next childbirth.

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INTRODUCTION

According to national statistics, fertility declined across the entire region of eastern Europe and central Asia during the transition from Communism. Countries that had fertility levels already below replacement level experienced declines to below the "lowest low" fertility level (below 1.3 children per woman), as did many countries that had a fertility level above replacement level before the transition. Even countries that had a total fertility rate (TFR)[1] above 3 children per woman saw dramatic declines in fertility.

This research takes advantage of rich survey data on two understudied countries in the region—Armenia and Moldova—with the goal of contributing to the debate on the reasons for the fertility decline in the post-Soviet countries. Using 2005 Demographic and Health Survey (DHS) data for Armenia and Moldova, elements of the fertility decline in these two post-Communist countries as well as current preferences with respect to childbearing are examined.

The path to a restructured economy was tumultuous for both Armenia and Moldova. At the time of the Soviet dissolution, Moldova was the wealthier country of the two in terms of gross domestic product (GDP) per capita, US$2,650 purchasing power parity (PPP) in 1991 versus US$2,400 in Armenia. However, by 1994, Armenia's GDP per capita surpassed Moldova's, which has still not recovered. As of 2004, Armenia's GDP per capita was US$4,101 PPP, whereas Moldova's was US$1,729. Therefore, substantial divergence emerged during the transition from Communism, albeit similar economic starting points.

The availability of recent data provides an opportunity to study fertility patterns within Armenia and Moldova. The 2005 Demographic and Health Surveys (DHS) in Armenia and Moldova are used to provide detailed information about population, health, and nutrition trends. The surveys provide a wealth of information about global health and population trends in countries where these issues are especially important. These data provide rich information on fertility histories, fertility preferences, current

[1] TFR is interpreted as the average number of children a woman would have by the end of her childbearing years if her fertility career unfolded according to current age-specific fertility rates.

living conditions, household composition, and health, all of which serve to support this research endeavor.

Two distinct aims structure this paper. The first purpose is to assess the characteristics of the fertility decline during the transition as well as for which groups of women within the countries the decline was greater. The second purpose is to identify important determinants of current fertility preferences.

The report begins with background information and an overview of what we already know about the fertility decline in Armenia and Moldova from secondary sources. The report reviews theory about the determinants of fertility and research specifically related to fertility decline in the post-Communist region to provide a framework for analyzing the empirical evidence. The report then reviews an analysis of fertility changes within subgroups of women, which could provide information on which women experienced the greatest decline in childbearing and the parity births in which these declines occurred. The next analysis focuses on the role of socioeconomic characteristics in determining fertility preferences for having a second or third child and the preferred timing of the next child. Although the forces behind the fertility decline are loosely addressed in the discussion of the results of the descriptive analyses over time, the relationships between fertility behavior and multiple covariates could only be tested with richer and more current data. The findings of these explorations are considered comprehensively in the conclusions section.

BACKGROUND

Both Armenia and Moldova claimed independence in 1991, following the fall of the Soviet Union, but the transition to independence was not peaceful in either country. Moldova experienced internal conflict over the eastern region of Transnistria, and more than 1,000 people were killed or injured as a result. Armenia experienced conflict as well, although not within its own borders; the Nagorno-Karabakh armed conflict between Armenia and Azerbaijan began in 1988 and ended with a ceasefire in 1994 after thousands were killed and more than a million Armenians and Azeris were displaced.

Armenia has 3.2 million inhabitants in a geographical area of almost 30,000 square kilometers (National Statistical Service et al., 2006). The country is divided into 11 regions and 64 percent of the population lives in urban areas. Moldova's population, 3.4 million (excluding the Transnistrian population), is similar to that of Armenia, and the country has almost 34,000 square kilometers (National Scientific and Applied Center for Preventive Medicine [NCPM] and ORC Macro, 2006). But unlike Armenia, the majority of the population of Moldova (58 percent) resides in rural areas. Almost 95 percent of Armenians follow the Armenian Apostolic religious tradition and another 4 percent belong to other Christian denominations (Central Intelligence Agency, 2008). Approximately 95 percent of Moldovans are Orthodox Christians.

According to aggregate statistics provided by national statistics offices, Armenian TFR declined from 2.6 in 1991 to 1.4 in 2004, while Moldovan TFR declined from 2.3 in 1991 to 1.3 in 2004.[2] However, the TFR for Armenia and Moldova, according to 2005 DHS data calculated over the last three years, is the same: 1.7. The official statistics were probably calculated using incorrect information, which can happen in turbulent times when migration is difficult to monitor and, thus, the denominator for age-specific fertility rate calculations is incorrect.[3] Because survey data are not available on reproductive behavior in the early 1990s and the national statistics greatly

[2] See Innocenti Research Centre, UNICEF, among others, for this reported statistic.

[3] Although the TFRs calculated from TransMONEE data (Innocenti Research Centre, UNICEF), which are gathered from national statistics offices, are suspect because of a lack of information on the impact of unknown migration patterns, no reasons exist to doubt the accuracy of the other data offered by this source.

differ from the survey data statistics, it is not clear exactly how much the TFR has changed since the onset of the transition from Communism.

What is known about TFR changes over time in Armenia and Moldova is limited and comes from only a few sources. The 2000 Armenian DHS data (National Statistical Service et al., 2006) indicate that there has been no overall change in fertility levels in the last five years. According to the 1997 Reproductive and Health Survey in Moldova, which excludes the lower rates of Transnistria, fertility was approximately 1.9 to 2.0 in 1997 (NCPM and ORC Macro, 2006), which indicates a decline in at least the last eight years. Given the diverse, limited, and sometimes contradictory information on fertility declines in these countries, one of the primary goals of this paper is to definitively show evidence of a decline.

Understanding the changes underlying a fertility decline requires disentangling multiple causal strands. Fertility decline can occur for different reasons, such as the desire for fewer children; postponement of the first child, which can lead to both a distortion of period fertility levels and smaller numbers of children born due to a reduction in the number of childbearing years; and greater access to fertility control. How these factors apply to the post-Communist context of Armenia and Moldova is discussed here, beginning with fertility control.

According to Avdeev et al. (1995), the total abortion rate in 1989 was 2.4 per woman in Moldova and 0.77 in Armenia; in contrast, the TFR was 2.5 in Moldova and 2.6 in Armenia. Induced abortion was the main method of fertility control during the Soviet era and was predominantly used as a means to limit family size once the desired number of children had been achieved, rather than to prevent a first birth (Sobotka, 2002).

Popov (1991) offers some contraceptive and abortion statistics from after the fall of the Soviet Union, providing a background for this discussion. In the Soviet Union, the "government prescribed reproductive behavior—from the formulation of the motives for human reproduction to the selection of birth control methods and reproductive goals" (p. 369). But within this context, much variation existed; according to Popov, the Moldavian Soviet Socialist Republic (SSR) counted 89.7 induced abortions per 1,000 women age 15-49 in 1975 and 96 in 1985, whereas the Armenian SSR rates were 60.5

in 1975 and 38.4 in 1985.[4] These data show that abortion prevalence was increasing in the decades before the transition from Communism in Moldova, while it was decreasing in Armenia.

The significant differences in abortion prevalence trends between Moldova and Armenia are a result of different family planning dynamics. After independence, most former Soviet countries experienced an increase in the use of other forms of contraception, albeit at different speeds, along with a decrease in abortion rates (Sobotka, 2002). Official national statistics show a decline in abortion rates in Moldova from 82.8 per 1,000 women age 15-49 in 1989 to 17.6 in 2004, while the rate in Armenia declined from 29.4 to 11.5 (Innocenti Research Centre).

The simultaneous declines in abortion and fertility rates in Moldova and Armenia raise the possibility of a contraception revolution. Perhaps women in these countries had wanted fewer children during the Soviet era but only had the ability to limit fertility through prevention rather than abortion after the transition; a shift in forms of birth control might have offered women greater control over family size.

Little in-depth country-level research exists for the region on contraceptive uptake and abortion rates. Ross and Winfrey (2002) updated estimates of unmet family planning need in the developing world as well as the former Soviet Union for the 1990s. They found evidence of increased access to contraception. However, they also found significant unmet need in the former Soviet republics: around 9 million women. The authors used the DHS definition of unmet need, which includes fertile, sexually active women if they are not using any contraceptive method and do not want children in the next two years. Also, in Russia, Troitskaya and Andersson (2007) found that women are more likely to use contraception as parity increases; this finding confirms that contraception is important for limiting fertility once the desired family size has been achieved in the former Soviet countries. This finding is important to note because it shows that contraception is used in the context of marital fertility once a family has been created rather than premaritally to inhibit the beginning of a family.

[4] Popov (1991) also offers statistics for 1988, which is closer to the years of this study and thus more interesting, but the numbers for this year exclude abortions in departmental health services, which may explain the decline from 1985-1988.

According to DHS data, Armenia lags behind Moldova in contraceptive uptake; in Moldova, 64 percent of all women have used any modern method, in contrast to only 26 percent of all women in Armenia (National Statistical Service et al., 2006; NCPM and ORC Macro, 2006).[5] This difference between Moldova and Armenia is not due to different levels of knowledge of modern contraception because 98 to 99 percent of women surveyed in both countries knew about at least one modern method (National Statistical Service et al., 2006; NCPM and ORC Macro, 2006). However, great diversity in modern contraception usage rates exists between women residing in rural and urban areas. For example, a higher proportion of rural Armenian women indicate unmet need than urban Armenian women, whereas unmet need appears to be higher in urban women than rural women in Moldova.

The 2005 DHS data indicate that dramatic differences still exist between the two countries with respect to modern contraceptive uptake, in spite of their currently similar TFR of 1.7. Because abortion rates decreased at the same time as fertility declined, it would appear that contraception became an undeniably more important player than abortion in birth control. However, contraception usage has recently decreased compared to recent estimates from 1997 in Moldova and 2000 in Armenia (National Statistical Service et al., 2006; NCPM and ORC Macro, 2006). Tracking the uptake of modern contraception over time will indicate the degree to which there has been a "contraception revolution" since the transition from Communism in these countries.

Figure 1 displays two concurrent trends: on the left axis of each graph is the average number of abortions per woman who has reached her 35th birthday in a given year, and on the right axis is the share of women turning 35 in a given year who have ever used a modern contraceptive. A different scale is used for each country to show variations in the two trends in both countries; this must be taken into account when comparing trends in these countries. The figure offers information regarding the cohorts of women born from 1956 to 1970, for whom estimates that are almost complete are available.

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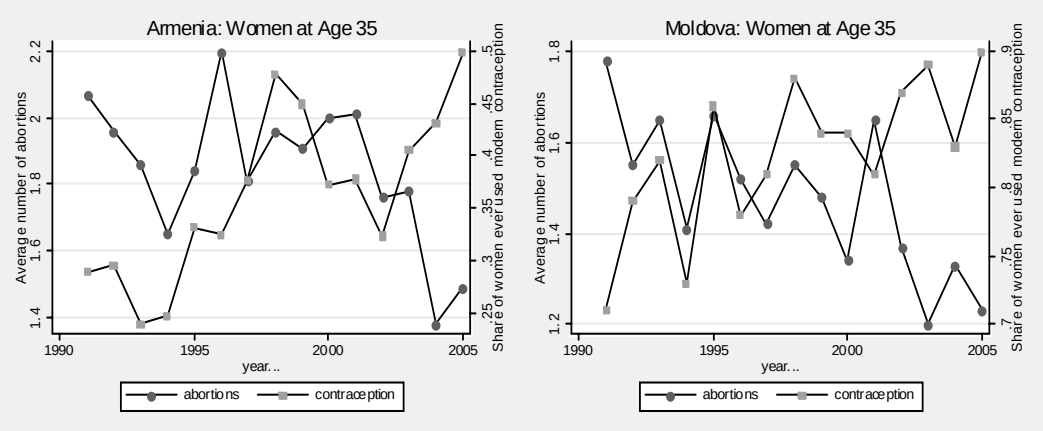
[5] As defined in DHS reports, modern contraception includes female sterilization, male sterilization, contraceptive pill, intrauterine contraceptive device (IUD), contraceptive injection, contraceptive implants (Norplant®), condoms, emergency contraception, and vaginal methods (diaphragm, foam, jelly, suppository).

Figure 1. Changes in Abortion Prevalence and Modern Contraceptive Uptake in Armenia and Moldova, 1956-1970 Cohorts



Source: Author's calculations from 2005 Armenia and Moldova DHS data.

If a contraceptive revolution had occurred, one would expect the slopes to have a crisscross design in which the number of abortions decreased and the number of women who have ever used modern contraception increased by cohort. Figure 1 shows that in general, a crisscross pattern does exist in which abortion has decreased while use of modern contraception has increased. However, the changes are neither as great nor as consistent as one would expect to see if, indeed, a contraceptive revolution had taken place. According to the 2005 DHS survey, Armenian women born in 1956 had more than 2 abortions on average, whereas their Moldovan counterparts had less than 1.8. A decrease occurred until the Armenian 1970 cohort reached 1.5 abortions per woman and the Moldovan cohort around 1.2. However, the decline in abortions was not continuous; in Armenia, very little change occurred until 2004 and the rate stayed primarily between 1.8 and 2 abortions per woman. The abortion rate stayed primarily at around 1.4 and 1.6 per women in Moldova, with continual fluctuation. The coinciding lowest point for both Armenia and Moldova in the 1968-69 cohort invites speculation regarding what was different about this cohort.

With regard to the share of women turning 35 each year who have ever used a modern contraceptive, the increase was similar in Armenia and Moldova but the scale was much higher in Moldova. Of the 1956 cohort in Armenia, only approximately 28 percent had ever used a modern contraceptive but this rate increased to 50 percent by

the 1970 cohort. In Moldova, more of the 1956 cohort had ever used modern contraception than the 1970 cohort in Armenia. By 2005, 90 percent of the 1970 cohort had ever used a modern contraceptive.

In summary, it appears that the use of modern contraception is on the rise, but induced abortion is still widely used in Moldova and Armenia. The nature of family planning in Armenia and Moldova therefore does not seem to have undergone radical change. However, this descriptive analysis excludes the youngest cohorts in whom the greatest change is likely to be observed.

This conclusion resonates with that of Westoff et al.'s (2002) study on the relationship between abortion and contraception in Armenia using Armenian DHS data for 2000. They found that the abortion decline from 1995 onward could be attributed to the exposure of fewer women to pregnancy because fewer women were married.[6] However, marriage postponement cannot explain previous declines in abortion rates because these cohorts of women were actually marrying at a younger age on average. The authors also indicated that an increase in modern contraceptive uptake in the future would decrease the demand for abortion.

In the context of other determinants of fertility decline, research on the desired number of children in the formerly Communist countries has yielded interesting findings. Lithuanian surveys found a significant drop in the desired number of children shortly after the transition: from 2.8 in the 1988 and 1990 surveys to 2.1 by 1995 (Stankuniene, 1997). However, the period fertility rate in 1995 was 1.55, far below the desired number. According to a 1994 microcensus in Russia, women expected to have, on average, 1.7 children during their lifetime, but actually desired 1.9 children (Borisov, 1997). The actual TFR for Russia was 1.4 in 1994 and continued to decline to 1.17 in 1999.

The debate in fertility research from developed countries currently involves two theoretical perspectives: van de Kaa's (1987) Second Demographic Transition (SDT) and Becker's (1960, 1981) microeconomic theory of the family. SDT theory posits that

[6] The postponement of marriage would also impact period fertility rates because postponement of childbirth follows. This topic deserves its own analysis, especially as postponement becomes more pronounced.

fertility will decline to levels below replacement level, as in the cases of Armenia and Moldova, due to women shifting toward postmaterialist values that are attached to greater individual autonomy (Lesthaeghe and Neidert, 2006). The transition from Communism brought increased female enrollment in higher education and increased political and economic decisionmaking power in most post-Communist countries. Therefore, the possibility of an SDT must be considered and an attempt must be made to disentangle the impact of the SDT from that of economic forces.

The plausibility of an SDT in Armenia and Moldova is jeopardized by a theoretical element of SDT theory—postmaterialism—and an important symptom of SDT—postponement. During "postmaterialism," changes in women's fertility behavior are stated to be related to value shifts that occur when material needs are no longer a focus in life. But along with an increase in autonomy, the transition brought radical social change, severe economic crisis, and uncertainty about the future. Material needs probably became a greater, rather than a lesser, focus during this time; the economic shock of the transition increased the difficulty of maintaining economic stability for many households because of rising unemployment, inflation, and decreased value of wages.

Postponement of first birth, also an important part of an SDT, does not fit the Armenian and Moldovan context either at first glance. According to national statistics, the average age of Armenian mothers at first birth was remarkably stable: 22.5 in 1991 and 22.7 in 2004 (Transmonee Innocenti Research Centre). A somewhat greater age growth is evident in Moldova: from 22 in 1998 (the earliest year for which data are available) to 23.6 in 2004. However, the majority of this increase took place in the last year for which data are available: from 22.4 in 2003 to 23.6 in 2004. These considerations cast doubt on the likelihood that a fertility decline can be explained in terms of an SDT in Armenia and Moldova. However, the shift that has very recently taken place within Moldova may foreshadow other SDT components.

Hotz et al. (1997) summarize the micro-economic theory of fertility decline as being "the result of variations in family incomes and the 'prices,' or opportunity costs of children" (p. 276).

Outside the current mainstream economic debate is an alternative explanation offered by Easterlin (1976). His theory of the conflict between aspirations and resources predicts that if women or families experience a conflict between the level of resources at their disposal and the level to which they are accustomed, they cease to expand their family. Although living standards were notoriously low under the Soviet regime, the early years of transition saw tremendous declines in the value of wages and increases in job loss rates. Therefore, it is plausible that resources dropped to a lower level than that to which individuals were accustomed. Moldova has experienced a recent recovery in real wages (almost 100 percent of the value of wages in 1989 by 2004) that Armenia has not experienced, (46 percent of real wages by 2004) (Innocenti Research Centre). Conversely, although employment levels continued to decline in both countries over the 1990s and early 2000s, Armenia barely leads in 2003 with 70 percent of its 1989 employment status compared to Moldova's 65 percent level.

Easterlin's aspirations and conflict theory is similar to Becker's theory on the direct costs of children with regard to the direction of the proposed relationship; childbearing ceases if the cost outweighs the perceived benefits of the child. As the economic situation in Moldova and Armenia deteriorated, children probably became more expensive, possibly leading those with fewer resources to forego having another child. However, the Easterlin theory and direct cost theory are distinct from Becker's opportunity cost theory in that opposite relationships between resources and children are predicted. A negative relationship would exist if opportunity costs played the main causal role, with women with a higher earning capacity being less willing to have children due to the costs associated with opting out of the labor market. In this sense, evidence in support of one theory is evidence against the other. These two distinctive relationships between the economic situation and fertility form the basis for interpreting the changes in fertility behavior and preferences of women with different levels of education and resources.

As a summary of the basic information available about the two countries, some stylized facts and implications are offered. Despite the economic growth in Armenia, there has been little wage recovery over the years following the most tumultuous time of the transition. This may increase the likelihood that women will choose not to participate in the labor force because their reservation wages are probably not being met in the market. Indeed, the 2005 DHS finds that only 27 percent of women age 15-

49 are employed in Armenia. Unfortunately, the nonworking population cannot be separated into those who are unemployed and those who are not participating in the labor force on the basis of DHS data. The World Bank (2008) reports that 48 percent of all Armenian women participated in the labor force in 1990, 42 percent in 1995, and 46 percent in 2004. Evidence exist then that women retreated from the labor market during the transition to capitalism and experienced high rates of unemployment (estimated at 64 percent of all registered unemployment) (World Bank 2001). As long as the market wage is not a real competitor for women's time, women probably remain outside the labor force or employment, leading to a possible return to the breadwinner model. If this is the case in Armenia, the most important determinants of childbearing are probably related to direct costs; moreover, the level of resources received through partners' employment may be more important than that of the respondents.

The Moldovan case shows the opposite scenario in one regard: wage recovery has occurred even if employment levels have not returned to their pre-capitalism levels. This indicates that jobs are also scarce but quite valuable in Moldova. Therefore, a woman who is in the labor force is likely to earn a wage that surpasses the value of her non-labor time; hence, she is more likely to incur opportunity costs from opting out of her reward from the labor market than her Armenian counterpart. These contrasting scenarios for the Armenian and Moldovan context draw on "stylized facts" because information is lacking on women's income in both countries and whether or not they are unemployed or not participating in the labor market. Therefore, the facts provide a rough structure for what may be expected in the two countries: namely, the impact of direct costs in Armenia and opportunity costs in Moldova. To see these mechanisms at work, each analysis is conducted using variations in earning power or resources among the women.

Given these expectations, the question of whether there is an indication that the decline in socioeconomic conditions during the transition impacted fertility behavior is determined by assessing whether women with fewer resources had fewer children than previous cohorts or if women with more resources had fewer children than previous cohorts. The question is a matter of degree because it is assumed that instability and uncertainty, along with greater educational attainment for women, probably impacted women in all social strata. Some researchers have attempted to answer this question for the Russian case by focusing on the risk to a birth event within a short time period (e.g.,

Kharkova and Andreev, 2000; Kohlman et al. 2001; Kohler and Kohler, 2002). They concluded that negative economic circumstances for individual women are not a determinant of declining fertility because women with fewer resources have a higher risk of having a second child. However, these findings only confirm that women with fewer means are still more likely to have more children than women with greater resources, a relationship that has been robust across countries and time, except in recent years. Instead of pursuing this strategy, subgroups of women in whom fertility has declined to a greater extent are identified.

Descriptive Analyses

Degrees of fertility decline are assessed by analyzing completed fertility at the age of 35. Women may still become pregnant after the age of 35, but family size is considered to have generally been achieved by this time. If patterns hold stable over time, the excluded births would be negligible losses; this assumption would exclude 15 births per 1,000 women in the 35-39 age group in Armenia and 4 births in the 45-49 group (National Statistical Service et al., 2006). In Moldova, this assumption would lead to a loss of 13 births per 1,000 women in the 35-39 age group and 4 births in the 45-49 group (NCPM and ORC Macro, 2006).

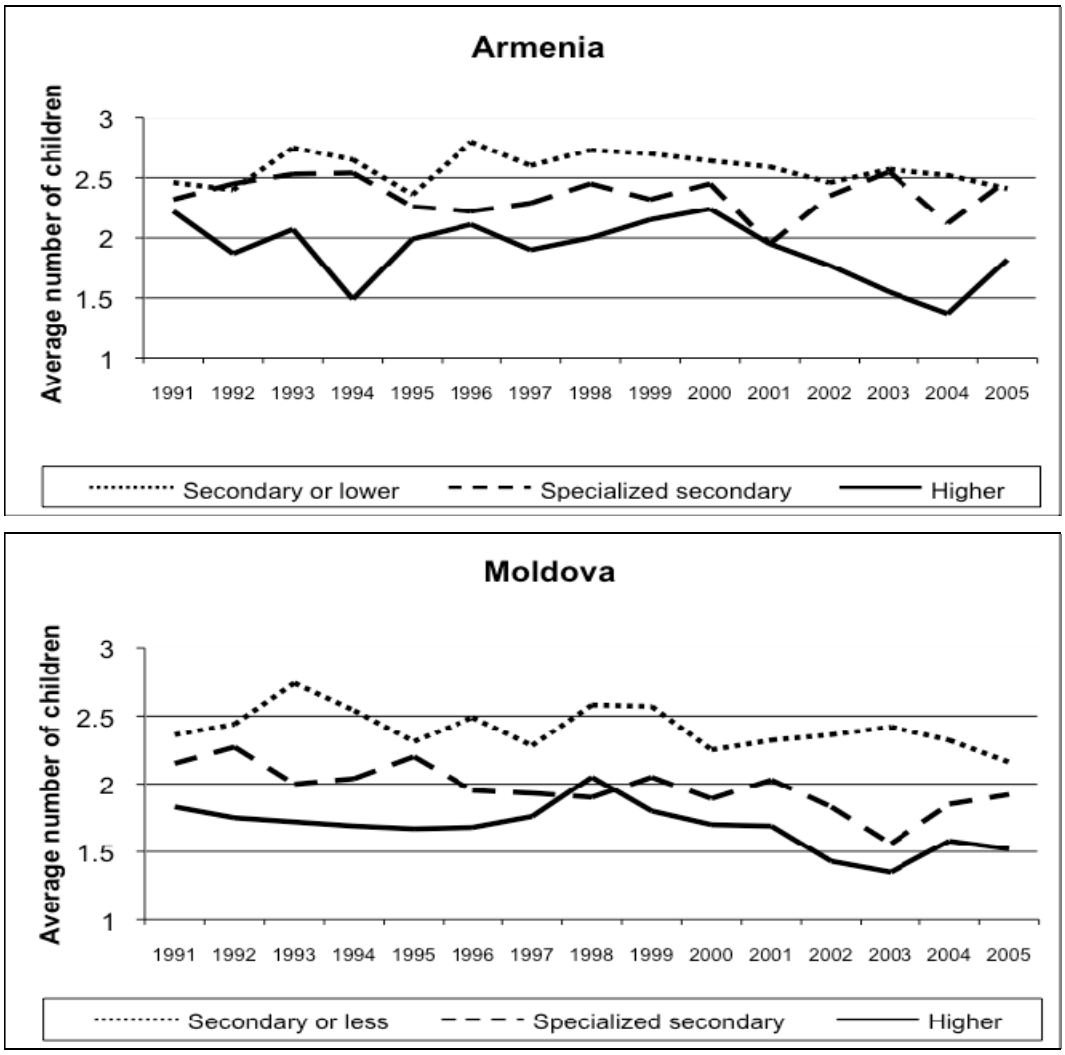
The oldest cohort of women, who were 49 at the time of interview, turned 35 in 1991, the year the Soviet Union dissolved. Hence, this analysis offers results that tell us mostly about the changes in fertility patterns before the transition began because only women who turned 35 after 2000 made the majority of their fertility decisions during the 1990s.

Figure 2 includes information on the highest educational level achieved (secondary, lower, secondary special, or higher education). In Moldova (as described in NCPM and ORC Macro, 2006), completing compulsory education entails completion of at least nine grades. Secondary special education is an option for those who finish secondary school that takes two to three more years and provides specialized training in a field requiring specific skills such as nursing, agriculture, or construction. Secondary special education qualifies the graduate to work in these fields. Higher education attainment means that the student completed 12 years of schooling, or primary education and secondary special education, and continued on to a university. In Armenia (as described

in National Statistical Service et al., 2006), compulsory education is completed in the eighth year of education. Students at this point may finish general secondary education or choose secondary special education, which includes professional-technical training and training to obtain mid-level qualifications in such fields as teaching, midwifery, and mechanics. Secondary special education takes either two or four years to complete, depending on whether the student joins secondary special education after the eighth or tenth grade. Women who have completed higher education include those who have completed secondary education and attended a university. Figure 2 provides information on the women in which the greatest decline in completed fertility occurred before the transition from Communism and the first cohorts of women who experienced childbearing during the transition.

Figure 2 displays clear evidence that an educational gradient in fertility existed before the transition began and still persists. Particularly in Moldova, the differences in the number of children women had were great. In the first cohort of women, those with secondary or less education had 2.4 children on average, women with specialized secondary education had 2.2, and women with higher education had 1.8 children. In Armenia, the initial gradient was minimal; the difference in fertility between the least and most educated women was 0.2 children. However, Armenia exhibits greater volatility over the years, especially with regard to women with higher education. Also noticeable is that the decline in the average number of children women had was minimal until after 2000, which is when the cohorts that lived most of their childbearing years during the transition from Communism reached 35.

Figure 2. Average number of children ever born to women age 35, 1956-1970 cohorts, by education level



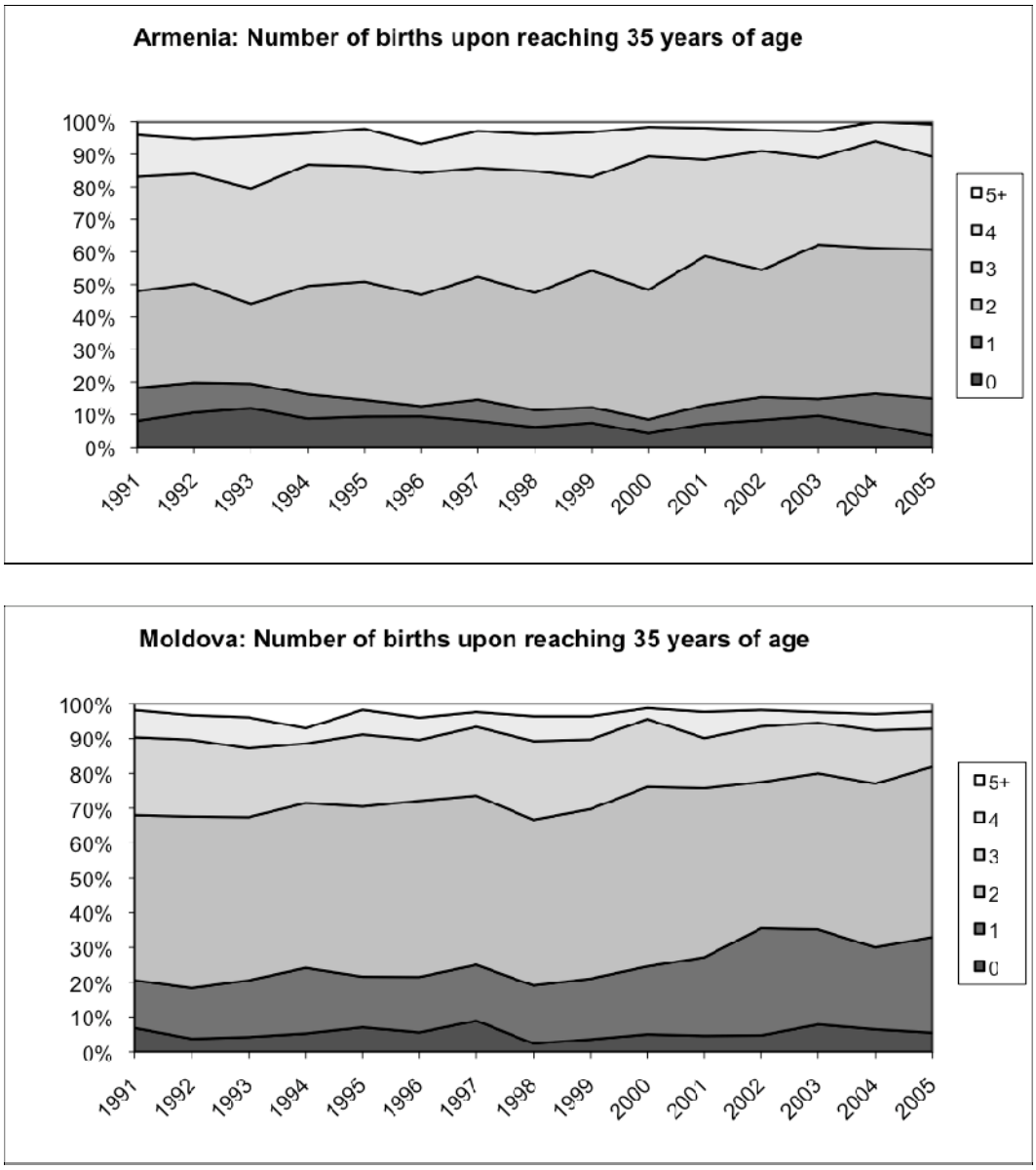
Source: Author's calculations from 2005 Armenia and Moldova DHS data.

Based on a three-year average at the beginning and end of the series (not displayed in Figure 2), the relative rate of change among these groups of women shows two patterns. In Armenia, the overall relative rate of decline was 23 percent for women with higher education, whereas the change for women with secondary education was less than 2 percent and 2 percent for those with specialized secondary education. The relative rates of decline were much greater overall in Moldova, but in this case women with specialized secondary education experienced the largest decline: 17 percent compared with 9 percent for women with secondary education and 16 percent for

women with higher education. In terms of absolute, rather than relative, changes, the greatest losses in average number of children per woman, reaching 35 each year, was 0.47 for the higher education subgroup in Armenia, followed by 0.36 for the secondary special education subgroup in Moldova (based on the three-year averages).

The Council of Europe (2002) has shown that across the formerly Communist countries, the share of first births compared with total births increased dramatically from 1988 to 2000. Figure 3 displays how each parity birth contributes to total births. The share of births is portrayed again for women reaching their 35^{th} birthday from 1991 to 2005. This early look at shifts in parity shares shows no consistent trend in the share of women who are childless; an increase in the share of women with only one child, particularly in Moldova; an increase in the share of women with two children; a decrease in the share of women with three, four, or five or more children; and an almost nonexistent share of women with five or more children in Armenia by 2004.

Figure 3. Parity Shares of Total Births for Women with Almost Completed Fertility at age 35, 1956-1970 Cohorts



Source: Author's calculations from 2005 Armenia and Moldova DHS data.

To include younger cohorts than those that had turned 35 by the time of the DHS interview and further analyze changes over this time period, changes specific to each parity progression were assessed next. This assessment used parity progression ratios (PPRs), which are displayed in Figure 3. PPR is the "proportion of women of a given parity who go on to have another child" (Hinde, 1998, p. 109). The PPRs calculated

here are period PPRs rather than cohort PPRs and combine “true PPRs” with “synthetic PPRs.” True PPRs include data for up to ten years after a birth in a certain year. In order to calculate PPRs that are more recent than 10 years ago, the synthetic method allows efficient use of the up-to-date data that are available, even if the complete ten-year time-series is lacking (see also Ní Brolcháin, 1987).

Because most of the action appears to revolve around changes in the second (1-2, from one to two children) and third (2-3, from two to three children) parity progressions, these parity progressions are the foci of this analysis. Fourth births would also have been interesting to analyze, considering that almost 8 percent of currently married women in Moldova and more than 10 percent in Armenia have given birth to four or more children. However, the sample of women who have had a fourth birth is too small to yield significant associations with personal characteristics.

PPRs are presented for the years 1986-2005. Of particular interest is the timing of the greatest decline in second and third births and in whom this decline occurred. In contrast to the last empirical analysis of changes in fertility patterns by educational level, an issue of sequencing exists here. It is almost certain that women at the age of 35 have finished their education, whereas PPRs are calculated for all women at a specific parity, regardless of age. Therefore, educational level may be assigned to women who have not yet finished their education. In this sense, the results are to be interpreted cautiously because some women may not have completed their education by the time they are included in the PPRs. However, because these analyses are descriptive, no direction of causality is assumed.

Figure 4. Parity-progression ratios for second and third births by year of previous birth, all women in Armenia and Moldova, by education level

Note: Author's calculations using 2005 DHS data for Armenia and Moldova.

In terms of timing, Figure 4 shows sharp declines in the percentage of women who go on to have a second or third birth in various years in the two countries. If economic crisis were an important factor, we would expect to see two declines: the first should occur around 1991-94, whereas the second should occur around 1998. This pattern does not clearly emerge, but a sharp decline does appear in many cases before 2001.

However, the interpretation of timing may not be straightforward. It may be that the PPRs for women who had the initial birth two years or so before the crisis years would deviate from the trend because these women would have had the next birth during the crisis years.

More consistently, declines and increases in PPRs occurred almost simultaneously for the two parities within education groups. For example, the trajectory of PPRs after 1993 for women with secondary special education is quite similar in those having a second and a third child in Armenia and Moldova. The 2-3 PPR trajectory for women with higher education mirrors the 1-2 PPR trajectory in Armenia after 1994; similarly, the 2-3 PPR trajectory of women with higher education in Moldova after 1991 mirrors that of the 1-2 PPRs. This indicates experiential cohesion among women in the same educational group by time. This experiential cohesion points to important contextual changes that are specific for these different groups of women, regardless of their parity.

To identify which group experienced the greatest overall decline, three-year averages were again used for the first and last years to smooth fluctuations. Table 1 summarizes information related to overall declines.

Table 1. Summary of changes in parity progression ratios within education groups

	Armenia			Moldova		
	Sec	Sspec	High	Sec	Sspec	High
1-2 Parity	0.06	0.24	0.08	0.23	0.39	0.31
2-3 Parity	0.32	0.37	0.33	0.24	0.37	0.16

Note: Sec = secondary education, Sspec = secondary special education, High = higher education

If we believe that the transition impacted all women similarly, changes might be expected to be similar across all subgroups. A gradient might also be expected in the changes in which the fertility of women with higher education would decline more due, perhaps, to an increase in opportunity costs. However, the summary statistics show that neither of these expectations was fulfilled.

Armenia experienced a lower shift in childbearing patterns than Moldova across the transition for the 1-2 parity progression. An inverted U-shaped relationship appears between education and parity within Armenia in which both women with secondary or less education and those with higher education had a smaller loss in PPR than women with secondary special education. Based on three-year averages again, which are not presented in the figure, the 1-2 PPR declined from 0.96 to 0.9 for Armenian women with secondary or less education and from 0.95 to 0.87 for women with higher education, compared to a decline from 0.93 to 0.69 for women with secondary special education. These results are different from what one would expect based on the analysis of changes in the average number of children born to women reaching 35, in which the Armenian women with secondary special education had the lowest loss in average number of children. This difference may be due to the relative importance of this parity decline in relation to the total loss in the number of children born to women. Alternatively, it could reflect an entirely different process that was brought about by the inclusion of women who were having these births during the years of the transition. This analysis is more effectively capturing any impact of the transition from Communism because few women in the last analysis would have had their first child during these years. This different pattern, if it holds for the 2-3 parity progressions, indicates a dramatic shift in patterns from pre- to posttransition eras in Armenia.

In Moldova, the results were as would be expected from the last analysis: women with secondary special education and higher education experienced a similar decline in 1-2 parity progressions—0.39 and 0.31, respectively. Moldovan women with secondary special education experienced a decline from 0.81 to 0.42, whereas the decline was from 0.73 to 0.42 in the higher education group and 0.82 to 0.59 in the secondary education group.

The decline in the 2-3 PPRs was greater across the board in Armenia than in Moldova, and both countries demonstrate more volatility in 2-3 PPRs than 1-2 PPRs. In Armenia, the 2-3 PPR was remarkably similar for all women: 0.6 for women with secondary and secondary special educational and 0.58 for women with higher education. By 2003-05, the PPRs for the higher and secondary education categories were 0.28 and 0.25, respectively, and the secondary special education PPR was 0.23. The decline was greatest, 0.37, for women with secondary special education and an

almost equal loss of parity progression occurred for other women: 0.32 for the secondary education group and 0.33 for the higher education group.

In Moldova, the disparity among educational groups was greater to start with but was even greater by the end of the decline in 2005. The PPRs from 1986 to 1988 are 0.48, 0.39, and 0.19 for women with secondary, secondary special, and higher education, respectively, and 0.24, 0.02 and 0.03 in 2003, 2004, and 2005, respectively. The declines in PPR for the secondary and higher education groups were 0.24 and 0.16, respectively, and the greatest decline, 0.37, was found in the secondary special education category.

The previous discussion focused on absolute changes in the proportion of women having an additional birth. In terms of relative changes, women with secondary special education still experienced the greatest decline in parity progressions. But the relative declines are greater than the absolute declines for women with higher education. In Armenia, the relative declines for 1-2 parity were -6 percent, -26 percent and -8 percent for women with secondary, secondary special, and higher education, respectively, and -53 percent, -62 percent and -57 percent for 2-3 parity, respectively. In Moldova, the relative declines for 1-2 parity were -28 percent, -48 percent and -42 percent for secondary, secondary special and higher educated women, respectively, and -50 percent, -95 percent and -84 percent for the 2-3 parity, respectively.

These results confirm the findings of the previous analyses in Moldova but indicate other patterns in recent fertility developments in Armenia; namely, the greatest loss in fertility occurred in women with secondary special education. Women with secondary and higher education had remarkably similar rates of decline in Armenia for both second and third birth progression, whereas women with secondary education had a lower decline in second births but a greater decline in third births than women with higher education.

In summary, Figures 2 and 4 show that the decline in the number of children born to the 1956-70 cohorts has evolved in a way that has not eradicated the educational gradient. The absolute loss in 1-2 parity progressions was higher in Moldova, whereas the absolute loss in 2-3 parity progressions was greater in Armenia. Moreover, women with secondary

special education consistently had the greatest parity progression decline among all women in both countries for both the second and third progressions.

Interpreting this observation in terms of the opportunity cost theory and the direct cost and conflict-aspirations theories is more complicated. If the scenarios based on stylized facts are justifiable, then both mechanisms may be working in tandem. Although this might be speculative, women with secondary education may not have been able to find lucrative employment during the transition and might therefore have left the labor force. Because of this, they were able to continue childbearing at a similar rate because opting out of the labor market did not incur a great loss or greatly impact the balance of direct costs. However, women with secondary special education, who had received job-specific training, may have received a return from their job-specific education that was high enough to surpass their reservation wage; hence, they remained in the labor market. But this wage may not have been high enough to provide them with the level of resources on which they previously lived, possibly leading these women to have fewer children than women of the same educational level in the past.

Determinants of Fertility Preferences

The previous analyses have given detailed information about past fertility trends in Armenia and Moldova. However, the determinants of fertility behavior can only be assessed when covariates match the timing of the behavior. Studying current preferences will yield information that makes use of the rich information available at the time of the interview. Therefore, the social determinants of current fertility preferences in Armenia and Moldova are analyzed now.

Data

The 2005 Armenia DHS is a nationally representative survey of 6,566 women age 15-49 in September to December. The Moldova DHS offers data on 7,440 women in March to June. The DHS surveys have a very high response rate: in Moldova, the

response rate for eligible women was 95 percent and the rate was 97 percent in Armenia.[7]

A few differences exist between the Armenian and Moldovan DHS questionnaires. These differences impose restrictions on the covariates that can be used. For example, the Moldovan questionnaire offers information on past migration, ethnicity, and religion; these variables are not included in the Armenian survey. With regard to household characteristics, the Moldovan questionnaire asks about a more complete list of household goods than the Armenian survey. Conversely, the Armenian survey asks many useful questions to determine quality of life instrumentally as well as questions to determine whether a household was able to make ends meet and engage in luxury consumption. Where differences existed, the covariates were excluded from the analyses.

Another important difference exists with regard to questions about fertility preferences. The Armenian respondents were asked about their ideal number of children, whereas the Moldovan respondents were not. This creates difficulties in creating a concrete fertility preference that is comparable; the only way to capture the number of children wanted by the women is through a question that asks if the respondent would like to have a child or another child and how long would she like to wait until having this child. Both questionnaires include these questions; therefore, they are the measures used here for fertility preferences. The limitation of the first question is that whether this is the final child the woman would like to have is not known. In other words, preferences related to family completion or ideal family size are not necessarily captured; rather, only preferences concerning having another child are captured.

Models

Two different dependent variables are analyzed. The first analysis identifies determinants of the desire to have another child (0 = does not want another child or has

[7] To ensure that the data represent the country proportionally, by geographical population density, and to prevent any bias due to geographical clustering, a sampling weight and Stata's package of survey commands were used.

been sterilized, 1 = does want another child) in separate models with discrete samples based on whether the respondent has (1) one child at the time or (2) two children.[8]

The disparity between fertility preferences and actual fertility is well known. Blake (1967) argues that analyzing the timing of desired childbirth helps to qualify analyses of fertility desires. Therefore, the second dependent variable is the preferred timing of the next birth.

The sample includes women who indicated that they would like another child. Rather than split the sample by parity, all women who desire another birth are pooled together for this dependent variable. To control for the impact of parity and time lapsed since the last birth, two indicators capturing this information are included in the model.[9] This dependent variable takes the value of 0 if women prefer to have the next child in the next two years and the value of 1 if they prefer to wait more than two years.

In this sample, descriptive results show a high number of women who prefer to wait more than two years to have the next child, for those who know when they want a child and are married. For second births, 58 percent of women in Moldova prefer to wait two years compared with 42 percent who want to have another child soon; these figures are 68 percent vs. 32 percent, respectively, in Armenia.

It may be that this postponement, once a childbearing career has begun, reflects different determinants of childbearing than what can be ascertained from the preference for having another child in general. The desired timing of the next childbirth may reflect not only the strength of the intention, but also how conditional it is. For example, it may be that women with high opportunity costs are more reluctant to have a child. However, once they have the first child and decide to have another, they may be less likely to postpone the second birth because they are less likely to have uncertainty about being able to provide for another child. Moreover, the next birth is less likely to require a significant sacrifice of current living standards than their poorer counterparts would have to make.

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[8] Additional births could not be analyzed due to the small number of women with a parity of three or more.

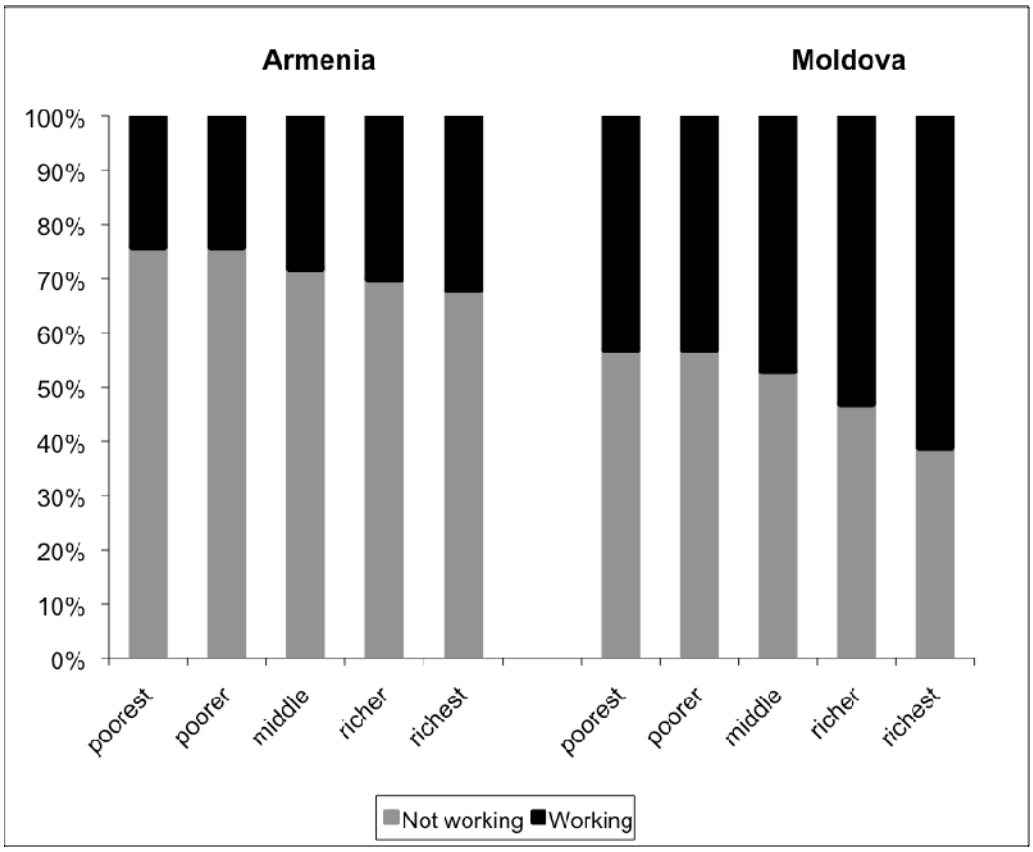
[9] The number of months since the last birth is also included in the first models regressing desire for another child to capture any impact that the age of the youngest child may have on current preferences.

Hotz et al. (1997) argue that spacing works in two ways, according to life cycle models of fertility. First, rising incomes increase the incentive to space births further apart because parents prefer to have the next birth while income is high. Second, parents wait until the price of having another child is low, based on the cost of the mother's time. The strategy of using these two specific dependent variables mirrors the strategy of Philipov et al. (2006) in their analysis of fertility preferences in Bulgaria and Hungary. The present study follows their lead by confirming the importance of analyzing factors that contribute not only to quantum but also to tempo.

The independent variables included in the models are grouped into three categories: personal, household and partner's characteristics. The first category consists of age, education level, and employment status. Age is divided into seven 5-year categories to absorb the variations in its impact. The categorization of education levels is described in a previous section. In Armenia, 46 percent of the respondents have only secondary education or less compared with 60 percent of Moldovan respondents. However, almost the same share of women obtained higher education in both countries: 20 percent in Moldova and 21 percent in Armenia. The major educational difference between the two countries, therefore, is the extent to which women choose specialized secondary training; the percentages are 34 percent in Armenia compared with only 21 percent in Moldova. Armenian women appear then to have more occupation-specific skill development.

Occupational status is measured by determining whether a woman was employed or not. Ideally, the indicator would have three categories: not participating in the labor force, unemployed, or working. However, the questions in the survey do not allow for such precise coding. Thus, the coding is 0 = not working and 1 = working. Because 60 percent of women are working in Moldova compared with only 28 percent in Armenia, very different patterns of family formation strategies can be expected. To offer some insight into the characteristics of the working women, Figures 5 and 6 offer supplementary information. Figure 5 shows working and nonworking women by distribution of household wealth. In Armenia, little difference exists in wealth among women who work; 8 percent more of the richest women work than the poorest women. A greater difference exists among Moldovan women, in whom 18 percent more of the richest women work than the poorest women.

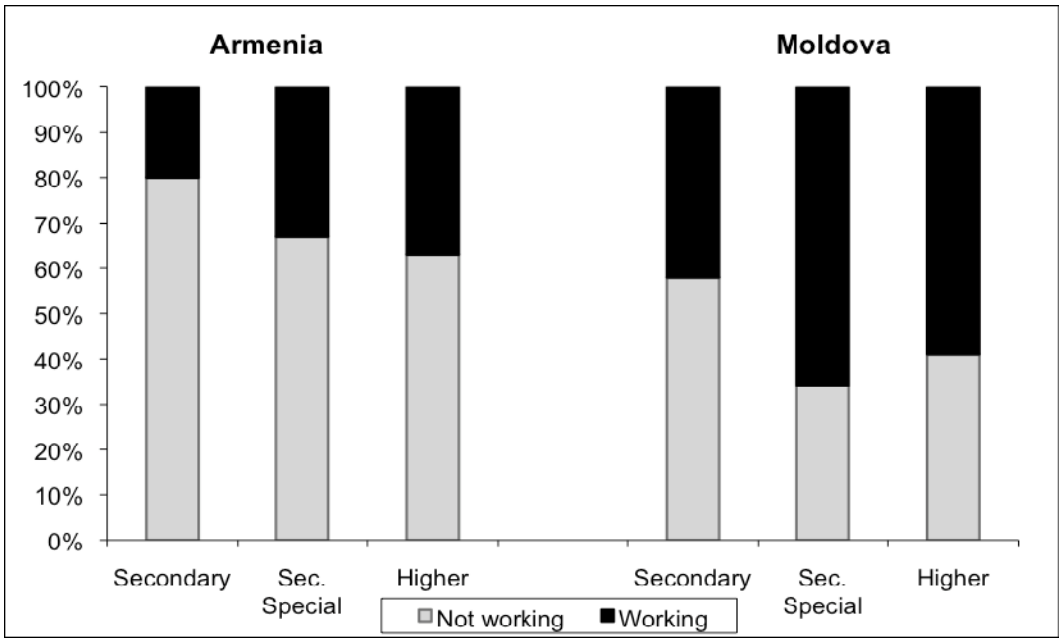
Figure 5. Shares of women who are working or not working by wealth ranking



Note: Sample includes women who are in a union.

Figure 6 displays the distribution of educational attainment by work status. If education endowed women with higher skills to be utilized in the labor force, more women would work as their educational level increased. This is the case in Armenia, in which the expected gradient exists and fewer women with secondary education work than women with secondary special or higher education. However, the difference in the share of women working with secondary special or higher education was minimal. Moldova displays a different trend, in which the greatest share of working women was among those with secondary special education rather than higher education. As mentioned, the women who are not working may not be unemployed; rather, they might not want employment. Women with the highest skill levels might also have married a man with a higher skill level, reside in a household with greater wealth, and hence, be more comfortable opting out of the labor force to spend time in home production.

Figure 6. Share of women who are working or not working by education level



Note: Sample includes women who are in a union. Sec = secondary education, Sec Spec = secondary special education, High = higher education

Whether the respondent works in the home or away from home could have been important in the decision to have another child, but not enough women worked at home—7 percent of all surveyed in Armenia and 6 percent in Moldova—to include this covariate in the model. Age at first cohabitation was thought to be a possibly important indicator due to its obvious impact on the family formation process and what it might tell us about the respondent. However, Pearson's correlation scores show that this variable is highly correlated with the age group in which a woman was ranked in Moldova (0.53) and, thus, is excluded from the models. The number of siblings a respondent has is a variable commonly considered important due to its capacity to capture the influence of upbringing on fertility preferences, but this information is not available for Armenia. Finally, data on months since the last birth and age at first birth are included as control variables. Because the relationship between desire for another child and months since the last birth is not likely to be linear, this indicator is squared and included.

These indicators of personal characteristics provide tools to control for obvious factors that would influence childbearing, as well as to test the impact of opportunity

costs using education and employment status. The second group of explanatory variables includes household characteristics: household size, urban or rural location, and wealth ranking. Household size averages 5.03 persons in Armenia and 3.96 persons in Moldova. The wealth indicator is an estimation based on asset accounting and a multistep index calculation (Rutstein and Johnson, 2004). The wealth index value has been classified into three-level quantiles: poorest, middle, and richest. These indicators are essentially an attempt to identify a lack of resources to test Easterlin's and the direct cost hypotheses. It can be assumed that the greater the household size, the lower the wealth ranking. It can also be assumed that rural households are more likely to have fewer resources than urban households.

The final variable included is related to the woman's partner: partner's occupational status. This indicator has been derived in a similar manner to respondents' status; the difference is that the DHS survey does not have a question asking if the partner is currently working. The only relevant question is about the partner's occupation; this question's responses include the option of "not working." This indicator is less problematic than the indicator for women because men are not as likely to remain outside the labor force. This means that not working is more likely to signify unemployment in men than women. Ten percent of Armenian partners are not working, as are 11 percent of Moldovan partners. This variable offers an additional dimension for assessing the impact of household resources.

The partner's preference for having more children would also be an important variable to include; however, the survey captures this preference only as it is related to the respondent's preference, rendering the indicator endogenous with the dependent variable of preference for another child. The partner's educational attainment is not included either due to collinearity—0.56 in Armenia and 0.54 in Moldova—with respondents' educational attainment.

The final sample used in this analysis includes only those respondents who have at least one child and are in a union at the time of the survey. Thirty-eight percent of the Armenian sample and 34 percent of the Moldovan sample are not living in a union. Women who are not in a union are highly likely to answer these questions with "undecided" or "waiting until married," and are therefore excluded. Analyzing the determinants of wanting a second or third child requires excluding women who do not

have a first or second child, thus creating selection bias. Unobserved characteristics of women who do not choose motherhood may correlate with unobserved characteristics of women who prefer to have a second or third child. Women are also included in the analysis of desired timing for the next birth based on their preferences because they all prefer to have another birth.

Despite the likelihood of selection bias, the rho (correlation of the residuals of the two equations used in the Heckman probit selection model) is consistently insignificant, even with different specifications for the selection equation. This means that independence of the two equations cannot be rejected and selection bias does not influence the results. This is not unexpected for the sample of women with one child—analyzed for preferences regarding a second child—because having at least one child remains mostly universal. However, a selection process would be expected with regard to the sample in which women have two children and the desire for a third birth is analyzed. This was not the case, though and, in fact, does not bode well for the findings because if there are specific determinants of the desire to have a second or third child, these determinants should appear as selection bias. Finally, because Heckman's selection corrections were not necessary, the probit model was exchanged for a logistic model, yielding results that can be understood in terms of relative likelihoods.

Results

The results presented in Table 2 show few statistically significant relationships for the variables that are theoretically important.[10] In the results of the model for the desire to have a second birth, whether the respondent is working or not is significant in both countries and is in the same direction: working respondents have higher odds of wanting a second child than nonworking women. The lack of other significant variables is surprising in and of itself, but more so because it is true for both countries. Despite the decreasing likelihood that all women will have a second birth and the prevalence of women who currently prefer not to have a second birth (24 percent of women with one child in Armenia and 40 percent in Moldova), this preference varies little according to the characteristics that are represented in the model. However, this does somewhat

[10] Age is statistically significant, but the results are not discussed here because they are as expected and provide a control for the other variables of interest.

explain the lack of selection bias for those women who have a second birth and are asked about their preference for a third child.

Table 2. Logistic regression results for preference for another child in women currently in a union and with 1 child or with two children

Preference for Another Child: Wanting Another Child								
	2nd child preference				3rd child preference			
	Armenia		Moldova		Armenia		Moldova	
# of observations	452		1253		1373		1840	
	Odds ratios	P>z	Odds ratios	P>z	Odds ratios	P>z	Odds ratios	P>z
Woman's characteristics								
Secondary or less education	1		1		1		1	
Secondary Special education	1.72	0.348	0.85	0.419	1.21	0.42	0.82	0.348
Higher education	2.13	0.285	1.12	0.554	1.11	0.73	1.07	0.772
Not working	1		1		1		1	
Working	**3.03**	**0.037**	**1.45**	**0.023**	1.07	0.769	0.99	0.964
Months since last birth	0.99	0.524	**0.98**	**0.002**	0.99	0.953	**1.01**	**0.002**
Months since last birth, squared	0.99	0.598	0.99	0.815	0.99	0.163	**0.99**	**0.004**
Age at first birth	0.87	0.272	**0.86**	**0.003**	0.98	0.771	1.06	0.135
Household characteristics								
Household size	1.11	0.401	0.95	0.494	0.96	0.6	0.9	0.212
Urban	1		1		1		1	
Rural	1.31	0.565	0.99	0.972	1.11	0.667	0.87	0.57
Poorest wealth ranking	1		1		1		1	
Middle wealth ranking	1.13	0.802	0.8	0.352	0.97	0.893	1.17	0.472
Richest wealth ranking	1.95	0.212	1.25	0.479	**1.73**	**0.667**	1.24	0.49
Partner's characteristics								
Not working	1		1		1		1	
Working	0.51	0.237	1.25	0.309	0.84	0.611	0.74	0.283
Notes: All models control for age and have a probability >chi2=0.0000. Odds ratios that are at least significant at the 90% level are higlighted in bold.								

Eighty-five percent of women with two children in Armenia prefer not to have a third child, as do 89 percent of their Moldovan counterparts. Preference for a third child appears to be influenced by at least one theoretically interesting characteristic in Armenia. Armenian women in the richest wealth ranking had 73 percent higher odds of wanting a third child than women in the poorest wealth ranking. Although the wealth indicator pointed to a relationship in the same direction as in Armenia, in which wealth is positively related to preference for a third child, no variables related to the hypotheses proved to have a statistically significant relationship with preference for a third child in Moldova. Before including in the model the variable that captures the number of months since the last child was born, Armenian women with secondary special education had 37 percent higher odds of wanting a third child than those with only

secondary education. However, this indicator lost its statistical significance when the timing of the last birth variable was included.

Table 3 presents the results of a logistic regression in which the same characteristics are regressed on the likelihood of wanting the next child more than two years later.[11] In this case, the reference category is "wanting to have the child within two years," so the outcomes are referred to as "sooner" or "later," with the odds ratios predicting "later." The number of children the woman already has is included as an important control variable because women of all parities are pooled in this analysis. The number of months that have passed since the last birth took place is again included, along with a squared term and age at first birth as control variables.

The impact of these variables, except for age at first birth, is remarkably similar across the two countries. Whether or not the respondent's partner was working at the time of the survey is significant in Armenia; the odds of preferring to have another child later are lower for respondents with a working partner than those whose partner is not working when all else is held constant. In contrast, whether Moldovan respondents are working rather than their partner matters; the odds are higher that women who are working would prefer to have the next child later rather than sooner in comparison to nonworking women. The only other significant variable related to the research questions of this study is whether the respondent resides in an urban or rural area. In Armenia, women in rural areas have half the odds of urban women of preferring to wait more than two years for the next child. In other words, different spacing preferences are observed in Armenia among rural and urban women when all else is held constant.

[11] As in the case of the regressions on fertility preference, these regressions also proved not to be biased by selection. The selection effect in these models is probably captured by the control variables of number of children, age at first birth, and timing of the last child's birth.

Table 3. Logistic regression results for desiring the next child later rather than sooner in all women who have had one birth and are currently in a union

Odds Ratios of Timing Preference for the Next Child:				
	Armenia		Moldova	
# of observations	583		881	
	Odds	P>z	Odds	P>z
Woman's characteristics				
Secondary or less education	1		1	
Secondary Special education	1.03	0.914	1.25	0.368
Higher education	1.31	0.459	1.43	0.142
Not working	1		1	
Working	0.82	0.627	**1.37**	**0.088**
Months since last birth	**0.97**	**0.004**	**0.96**	**0.000**
Months since last birth, squared	**1**	**0.005**	**1**	**0.001**
Age at first birth	**1.13**	**0.174**	0.96	0.461
Number of children	**3.32**	**0.000**	**2.28**	**0.004**
Household characteristics				
Household size	1.04	0.618	1	0.998
Urban	1		1	
Rural	**0.51**	**0.043**	1.14	0.638
Poorest wealth ranking	1		1	
Middle wealth ranking	0.83	0.619	0.99	0.997
Richest wealth ranking	0.82	0.6	1.49	0.258
Partner's characteristics				
Not working	1		1	
Working	**0.45**	**0.031**	1.07	0.836
Notes: All models control for age and have a probability >chi2=0.000. Odds ratios that are at least significant at the 90% level are higlighted in bold.				

In summary, it seems that in both Armenia and Moldova, working women have higher odds of wanting a second child. The odds of wanting a third child are greater for wealthier women in Armenia. In terms of timing, the odds are higher for respondents with a nonworking partner of preferring to have another child later than those whose partner is working when all else is held constant. In contrast, the odds are higher for working women, rather than women with a working partner, in Moldova of preferring to wait until later to have another child. Either way, employment matters for the preferred timing of the next birth when another child is desired. Finally, urban women in Armenia prefer to have the next child later than rural women.

DISCUSSION AND CONCLUSION

Fertility patterns in Armenia and Moldova are analyzed in this study in the effort to contribute to research on the fertility decline that occurred across the region that transitioned from Communism in the 1990s. A contraceptive revolution does not seem to have taken place, given the extent of changes in fertility control methods. A second demographic transition is also not a likely explanatory factor in these two countries because postponement of first births has been nonexistent for the most part. Therefore, this analysis has explored two themes to determine whether opportunity costs or direct costs of childbearing may have played a role: (1) the characteristics of the fertility decline during the transition from Communism by subgroup of women, and (2) the determinants of current fertility preferences in Armenia and Moldova.

During the transition, childbearing rates by education level changed dramatically in both Armenia and Moldova. Women who completed their childbearing mostly before the transition from Communism display an educational gradient in how many children they had; women with higher education had fewer children than women with secondary education. After the transition from Communism began, fertility declined for women of all education levels.

Interestingly, a consistently high decline in parity births occurred for women with secondary special education. This finding is interpreted as possibly reflecting the earning power of women with job-specific education in comparison with women with only secondary education. In contrast, labor force participation may not have been worthwhile for women with only secondary education and staying out of the labor force enabled these women to continue childbearing with less disruption. Unlike women with secondary education, women with job-specific education were able to reap rewards from the labor market that were sufficient to stay engaged but not sufficient to secure a lifestyle conducive to having children at the same rate as before. This interpretation is corroborated by the less dramatic fertility decline in women who have higher education in Armenia and Moldova for both the second and third parity progressions.

The findings on current fertility preferences must be qualified before being summarized. The inability to distinguish unemployment from not participating in the labor force renders this analysis particularly susceptible to issues of endogeneity

because women who prefer to have more children may also prefer not to join the labor force. However, the results do not indicate the possibility of bias in that direction. More women who are working prefer to have a second birth than women who are not working in both Armenia and Moldova. Work status does not appear to be important for either country with regard to third birth preferences. Women's employment matters for the timing of fertility intentions in Moldova by delaying the desired timing; but when the partner is working in Armenia, respondents prefer to have the child sooner rather than later. When wealth matters to fertility preferences, being wealthier than the poorest group of women increases the likelihood of desiring another child.

Education itself is not an important determinant of current fertility preferences, probably because other covariates are absorbing the impact of education. Because a positive relationship between education and fertility is a common sign of selection bias, this is further evidence that the results are probably free from selection bias.

Urban and rural differentials are not observed in current preferences for another child but are observed for timing preferences in Armenia, where rural women preferred to have the next child sooner than urban women. Although women in rural areas may have fewer resources, the interpretation of this indicator is not straightforward.

In summary, this analysis contributes preliminary evidence that the decline in fertility over the transition and current low preference levels for children are not easily explained by opportunity costs. The findings related to employment status indicate that women prefer to have more children when they are contributing to household income, which is evidence that direct costs are important to the desire for a second child rather than opportunity costs. Also, lower potential earnings—measured through education level—seem to have furthered the fertility decline that occurred during the transition whereas lower household wealth currently decreases the odds that women will want children. The possibility that women play a less central role in bringing in household income than men in Armenia arose in the analysis because the partner's employment status matters more for the timing of the next childbirth. In contrast, women's employment had a more substantial impact on a women's timing preference for more children in Moldova.

These findings are important for determining the direction of policies related to increasing fertility rates in the post-Communist context. Rather than strictly focusing on relieving the conflict between managing paid and unpaid work for women who have high earning capacity and, therefore, often a lower fertility level, policies might more successfully impact fertility rates by ensuring that women have access to employment and the capacity to increase their household welfare.

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