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Second and third births in Armenia and Moldova: An economic perspective of recent behaviour
and current preferences

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Abstract:

Little is known about fertility in Armenia and Moldova, two countries that have both, according to national statistics, experienced very low levels of fertility during the dramatic economic, social and political restructuring in the last two decades. This paper fills this gap and explores recent fertility behaviour and current fertility preferences using 2005 Demographic and Health Survey data. Educational differences in fertility decline and the association between socioeconomic indicators and fertility preferences are considered from an economic perspective. Special emphasis is given to determining whether and how diverging economic conditions in the two countries as well as crisis conditions may have influenced fertility. Second parity progression ratios (PPR) reveal a positive relationship between the degree of decline from 1990 to 2005 and education, whereas third PPR declines appear the greatest for women with both the lowest and highest education. In both countries, logistic regression results suggest that working women are more likely to want a second child, as well as want the child sooner rather than later

in Armenia, and the wealthiest women in Armenia have a higher odds of wanting a third child. Dual-jobless couples are less likely to want a second child in Moldova and more likely to postpone the next child in Armenia. These findings offer some insight into the shifts in fertility behaviour in these two post-Soviet countries and suggest that despite diverging economic trajectories and a lessening commitment to the two-child norm in Moldova, determinants of fertility behaviour and preferences have remained similar in both countries.

4-6 key words: higher-order births, fertility preferences, post-communist, postponement, employment

Abstract

Little is known about fertility in Armenia and Moldova, two countries that have both, according to national statistics, experienced very low levels of fertility during the dramatic economic, social and political restructuring in the last two decades. This paper fills this gap and explores recent fertility behaviour and current fertility preferences using 2005 Demographic and Health Survey data. Educational differences in fertility decline and the association between socioeconomic indicators and fertility preferences are considered from an economic perspective. Special emphasis is given to determining whether and how diverging economic conditions in the two countries as well as crisis conditions may have influenced fertility. Second parity progression ratios (PPR) reveal a positive relationship between the degree of decline from 1990 to 2005 and education, whereas third PPR declines appear the greatest for women with both the lowest and highest education. In both countries, logistic regression results suggest that working women are more likely to want a second child, as well as want the child sooner rather than later in Armenia, and the wealthiest women in Armenia have a higher odds of wanting a third child. Dual-jobless couples are less likely to want a second child in Moldova and more likely to postpone the next child in Armenia. These findings offer some insight into the shifts in fertility behaviour in these two post-Soviet countries and suggest that despite diverging economic

trajectories and a lessening commitment to the two-child norm in Moldova, determinants of fertility behaviour and preferences have remained similar in both countries.

Keywords : fertility preferences, parity progression, postponement, post-communist, economic explanations, Armenia, Moldova

Deuxième et troisième naissance en Arménie et en Moldavie : Une approche économique des comportements récents et des préférences actuelles

Résumé

Il y a peu d'informations sur la fécondité en Arménie et en Moldavie, deux pays qui, selon leurs statistiques nationales, ont connu de très faibles niveaux de fécondité durant la spectaculaire restructuration économique, sociale et politique survenue au cours de ces deux dernières décennies. Cet article vise à combler ce vide et analyse les comportements de fécondité récents et les préférences actuelles de fécondité à partir de données de l'enquête démographique et de santé de 2005. Les différences de fécondité selon le niveau d'instruction et l'association entre les indicateurs socioéconomiques et les préférences en matière de fécondité sont étudiées sous un angle économique. Une attention particulière est apportée aux situations économiques divergentes des deux pays ainsi qu'aux caractéristiques de la crise afin de déterminer si ces deux facteurs ont pu influencer la fécondité et de quelle manière. Les probabilités d'agrandissement du premier au deuxième enfant montrent une relation positive entre l'ampleur du déclin entre 1990 et 2005 et le niveau d'instruction, alors que la diminution des probabilités d'agrandissement du deuxième au troisième enfant est la plus importante chez les femmes ayant le niveau d'instruction soit le plus faible, soit le plus élevé. Les résultats de régressions logistiques réalisées suggèrent que dans les deux pays les femmes qui travaillent sont plus disposées à vouloir un deuxième enfant, qu'en Arménie elles souhaitent avoir cet enfant plus tôt, et que les femmes les plus aisées en Arménie ont une probabilité plus élevée de vouloir un troisième enfant. Les couples de chômeurs sont moins disposés à vouloir un deuxième enfant en Moldavie et plus disposés à retarder la venue du prochain enfant en Arménie. Ces résultats donnent un aperçu des modifications des comportements de fécondité dans ces pays après la période soviétique et suggèrent qu'en dépit de trajectoires économiques différentes et d'une moindre adhésion à la norme de deux enfants en Moldavie, les déterminants des comportements et des préférences en matière de fécondité sont restées semblables dans les deux pays.

Mots clés : préférences de fécondité, probabilité d'agrandissement des familles, ajournement des naissances, post-communiste, explications économiques, Arménie, Moldavie

I. Introduction

The fall of the Berlin Wall and Soviet Union ushered in dramatic changes in fertility patterns across the post-communist region. A great decline in the total fertility rate (TFR) unanimously occurred and in many countries childbearing was delayed. These demographic shifts have begun to be analysed and understood in some countries, while they remain largely unexplored in others. In particular, the countries of Central and Eastern Europe (CEE) have been the subject of much research on individual level determinants of fertility behaviour.¹ Little research, however, has been conducted on changes in fertility behaviour in some areas of the former Soviet Union (FSU).² In fact, we know virtually nothing about fertility patterns in the Caucasus, Latvia, Turkmenistan, Belarus and Moldova. This lack of information is noteworthy given the TFR declines into “lowest-low fertility” levels of 1.3 in the last two decades reported by many of these countries, which is a phenomenon that has been widely studied elsewhere (see Kohler et al. 2002). This oversight is most likely due to scarcity of data, but sources have increasingly become available in recent years. This paper contributes to our knowledge of fertility trends within the former Soviet Union by analysing survey data on two countries in which individual fertility and parity specific fertility trends have not been analysed: Armenia and Moldova.

Studying these two under-studied countries also develops our understanding of how social change, such as the post-communist transition, influences fertility behaviour and they provide an instrumental contrast when analysed together. Neyer and Andersson (2008) highlight the analytical usefulness of studying cases in which many similarities are offset by a major difference in context. In the cases of Armenia and Moldova, both had similar economic and

¹ See, for example, *Bulgaria*: Bühler and Philipov (2005), Philipov et al. (2006), Philipov and Jasilioniene (2007); *Czech Republic*: Kantorová (2004), Klasen and Launov (2006), Sobotka (2003); *Hungary*: Oláh and Fratzak (2004), Philipov et al. (2006), Spéder (2006); *Poland*: Bühler and Fratzak (2007), Kotowska et al. (2008); *Romania*: Muresan and Hoem (2009), Rotariu (2006); *Slovakia*: Potančoková et al. (2008); *Slovenia* : Stropnik and Šircelj (2008).

² Russia is an exception (see Billingsley 2010a; Bühler 2004; Gerber and Cottrell 2006; Kharkova and Andreev 2000; Kohler and Kohler 2002; Perelli-Harris 2006) and a few analyses have documented changes in Ukraine (Perelli-Harris 2005; 2008), Estonia (Katus 2000; Klesment and Puur 2010), Lithuania (Stankuniene and Jasilioniene 2008) and in a few Central Asian Republics (Agadjanian et al. 2008; Agadjanian and Makarova 2003).

institutional contexts in 1991, but their paths of economic restructuring and recovery from crisis diverged. These differences and how they may be related to developments in fertility behaviour and preferences will be further explored in this paper.

Our knowledge of recent shifts in fertility patterns in Armenia and Moldova is limited and comes from only a few sources. According to national statistics, the Armenian TFR declined from 2.6 in 1991 to 1.3 in 1998, remained below lowest-low levels until 2002, and was 1.4 in 2005. The Moldovan TFR declined from 2.3 in 1991 to 1.3 in 2000, remained below lowest-low levels until 2004, and fell again to 1.2 in 2005 (Transmonee Database). However, the TFR for Armenia and Moldova according to calculations over the last three years of 2005 Demographic and Health Survey (DHS) data is the same: 1.7.³ Without survey data on reproductive behaviour for the early part of the 1990s and since national statistics greatly differ from survey data calculations, it is not clear exactly how much the TFR has changed since the onset of transition from communism. Armenian 2000 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,⁴ the TFR was 1.9 in 1997 (NCPM & ORC Macro 2006), which indicates some decline in the last 8 years.

While contrasting economic trajectories after Armenia's and Moldova's independence, this paper assesses past and current fertility measures from an economic perspective, which could be particularly relevant during a period of tremendous economic restructuring and crisis (Billingsley 2010b; Frejka 2008). A few distinct aims and questions structure this paper. First, is there evidence of a significant post-transitional decline in fertility and, if so, for which parities? Which women experienced the lowest rates of parity progression in comparison to their

³ This estimation is much higher than what official reports claim, indicating that either the DHS samples are not representative or official statistics were calculated with incorrect information. The first possibility is unlikely due to the nature of the DHS sample selection design but the latter explanation is highly possible, especially in turbulent times when migration is difficult to monitor and, thus, the denominator in calculating age-specific fertility rates may be incorrect.

⁴ This source excludes the lower rates of Transnistria.

predecessors? This study considers changes within educational groups to isolate for which groups of women we see the most change over time in order to better understand the nature of the decline.⁵

The second aim of this study is to better understand the circumstances surrounding parity progressions. Using the rich information available at the time of the survey, I identify associations between socioeconomic characteristics and parity-specific fertility preferences as well as their desired timing. Ajzen's (1985) theory of planned behaviour leads us to believe behaviours are preceded by intentions, which result from attitudes, norms and perceived behavioural control. Realised fertility may not correspond perfectly with fertility intentions, however, which Bongaarts (2001; 2002) explains is due to many factors including competing preferences, infecundity, and family instability and relations. Nevertheless, we would expect fertility behaviour to be related to previous intentions. The second investigation, therefore, addresses the impact of education, employment and socioeconomic status on parity-specific preferences. Particularly dire household conditions, for example when both partners are jobless, are explored as well to gain insight into how conditions created by economic crisis might affect fertility intentions.

The paper proceeds as follows. I first provide background information on Armenia and Moldova, then review relevant theoretical perspectives. The following section presents descriptive analyses of fertility in Armenia and Moldova and an analysis of changes in parity-progression ratios within subgroups of women. Next, I focus on the relationships between personal, couple and household characteristics and preferences for having another child as well as the preferred timing for the next child. The final section discusses the findings and outlines steps for future research.

⁵ Without longitudinal data, the possibilities for investigating the relationships of other individual characteristics and fertility behaviour over the 1990s and early 2000s are limited.

II. Background

Both Armenia and Moldova claimed independence in 1991, following the fall of the Soviet Union and neither had a peaceful start to independence. Moldova experienced internal conflict over the eastern region of Transnistria, in which over 1,000 people were killed or injured. 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 over a million Armenians and Azeris displaced.

The two countries are similar in many other ways, including size, population and religious homogeneity. Armenia has 3.2 million inhabitants in a geographical area of almost 30,000 square kilometres (National Statistical Service et al. 2006). The country is divided into 11 regions and 64% of the total population lives in urban areas. Similarly, Moldova has a population of 3.4 million—excluding the region of Transnistria—covering almost 34,000 square kilometres (NCPM & ORC Macro 2006). The majority of the population in Moldova (58%), however, resides in rural areas. Around 93% of Moldovans are Orthodox Christians, 2% are other Christian denominations and the remaining are other religions, atheist or not religious (Moldovan National Bureau of Statistics 2010). Almost 78% of Armenians are of the Armenian Apostolic religious tradition, 6% are of other Christian denominations and at least 13% are atheist or non-religious (Barett et al. 2001; Sarkissian 2008). In terms of the ethnicity of the populations, Armenia is remarkably homogeneous for a former Soviet Republic; the 2001 Census found that 98% are ethnic Armenians and the next largest group are the Yezeds (Asatryan & Arakelova 2002; National Statistical Service of Armenia 2010). Moldovan nationality according to mother tongue was claimed by 76% of the population; of the remaining 24%, 8% were Ukrainian, 6% Russian, 4% Gagauz, more than 2% Romanian and less than 2% were Bulgarian (Moldovan National Bureau of Statistics 2010).

The path to a restructured economy was tumultuous for both Armenia and Moldova. At the time of Soviet dissolution, Armenia and Moldova had virtually the same GDP per capita: \$2,650 PPP in 1991 in Moldova versus \$2,400 in Armenia. However, by 1994, Armenia's GDP per capita surpassed Moldova's, which has still not recovered to previous levels; as of 2004, Armenia's GDP per capita was \$4,101 PPP while Moldova's was a mere \$1,729. Therefore, the two countries share similar economic starting points, but conditions substantially diverged as the transition from communism progressed.

However, economic circumstances in Armenia were not necessarily better than in Moldova. Moldova saw recent recovery in terms of real wages that Armenia has not experienced, reaching 100% of the value of wages at 1989 by 2004, where Armenia had only recovered 46% of real wages by this time (Transmonee Database). According to ILO data (Laborsta), the unemployment rate for women was 16% in Armenia in 2000 and 7% in Moldova, whereas for men the rates were 8 and 10% respectively. By 2005, Armenia's rates had improved to 12% for women and 5% for men, whereas unemployment rates held mostly stable in Moldova: 6% for women and 9% for men.⁶ However, Moldova has experienced continued problems with inflation from which Armenia has mostly recovered. Since 1999, inflation in Armenia has not surpassed 5%, whereas inflation in Moldova has not fallen below 5% since independence and has remained in the double digits (except in 2002; Transmonee Database). Another important difference is that remittances from migrant workers abroad are a major source of income in Armenia; some estimates place remittances in 2005 at one-fifth of the total GDP (Danielyan 2006).

In terms of developments in education, other similarities emerge between Armenia and Moldova. According to market transition theory (Nee 1989), human capital investment becomes more important as the economy transitions due to wage dispersion and increased competition for jobs. We would expect, therefore, to see increased enrolment rates in higher education during

⁶ Note that the unemployment rates were calculated differently in the two countries, but the most comparable statistics were presented. Armenian rates are official estimates based on registered unemployment of ages 16-63 and Moldova's rates are calculated with Labor Force Survey data for all individuals over the age of 15.

this time period. In fact, Figure 1 shows what appears to be abandonment of vocational and technical training during the 1990s. Of the 15-18 year old population, 40% of Armenians and 55% of Moldovans were enrolled in vocational education in 1990. By 1996, the enrolled share had declined by 25% in both countries. Before transition began, less than 20% of men and women 19-24 years of age attended a university and increases in enrolment rates have been modest; rates did not surpass 30% in either country by 2005. In contrast, all other countries of CEE and FSU had higher education enrolment rates above 30% (and many above 40%) by 2005 except the Central Asian Republics. The composition of those enrolled changed in Armenia, however, in which the share of women enrolled in universities increased from 46% to 55% in Armenia from 1989 to 2005, whereas these rates remained constant at 55% in Moldova (Transmonee Database).

Figure 1 about here.

University enrolment rates may have less to do with demand, as we would expect according to market transition theory, than with supply. It may be that more individuals would have preferred to attend university than the higher education system could accommodate. Indeed, this may have particularly been the case in Armenia, where the share of public expenditure that was spent on education declined dramatically from almost 9% in 1992 to less than 3% in 1994 (See Figure 2). This low rate remained more or less constant for the remaining years in Armenia. In Moldova, the share of expenditure on education fluctuated at a higher level than in Armenia, but halved from around 9% in 1997 to less than 5% in 1999.

Figure 2 about here.

Besides changes in the educational trajectory of young adults, market reform was also accompanied by a decline in pre-primary enrolment rates of three to six year olds. The decline was remarkably similar in both Armenia and Moldova, but enrolment rates began and remained higher in Moldova. Whether this decline reflects supply or demand of pre-primary care is unknown. Nevertheless, it is important to note that it entails a shift in the options or choices of parents for care of their children during working hours.

Figure 3 about here.

In sum, many important structural shifts can be observed in both Armenia and Moldova. During a substantial and lengthy economic deterioration, particularly in Moldova, there were only minor increases in higher education enrolment at the same time that employment rates and the value of wages declined, particularly in Armenia. Moreover, parents appear to have either opted more for keeping young children at home or they were not able to use pre-primary services at the same rate as before. All of these shifts may have implications for childbearing.

III. Literature review

Fertility decline can occur for many reasons, including fewer children desired, increased constraints to realising desired family size, postponement of childbearing—which can lead to both a distortion of period fertility measures and fewer children ever born—and greater access to fertility control. According to Avdeev, Blum & Troitskaya (1995), the total abortion rate in 1989 was 2.4 per woman in Moldova and 0.8 in Armenia. Official national statistics show a decline in abortion rates in Moldova per 1000 women aged 15-49 from 83 in 1989 to 18 in 2004, while in Armenia the decline was from 29 to 12 (TransMonee Database). However, Westoff et al.'s

(2002) study on the relationship between abortion and contraception in Armenia does not find evidence of a massive shift in fertility control in Armenia. Bulgaru et al. (2000) find reason to suspect under-reporting of abortions and argue that the availability of modern contraceptives has evolved only slowly in Moldova. According to DHS data, Armenia lags behind in contraceptive uptake; 64% of all women have used a modern method in Moldova, in contrast to only 26% of women in Armenia (National Statistical Service et al. 2006; NCPM and ORC Macro 2006). Of the 1956 cohort in Armenia, only around 28% had ever used a modern contraception but this increased to 50% by the 1970 cohort. In Moldova, 90% of the 1970 cohort had ever used a modern contraception by 2005. In summary, it appears that the use of modern contraception is on the rise, but induced abortion is still widely used. It may be too soon to know whether more recent cohorts exhibit greater fertility control, since evidence in Russia (Troitskaya and Andersson 2007) indicates that contraception is most important to limiting fertility in later years, once desired family size has been achieved.

Beyond fertility control, the transition from communism entailed systemic change that had repercussions for all economic and social institutions, including the family.

Postponement has been widely noted across countries of Central and Eastern Europe, and Kohler, Billari and Ortega (2002) argue that economic transition in this region may have increased uncertainty and led to a significant postponement in childbearing, which depressed TFRs. However, a general trend of postponement does not appear in Armenia and Moldova; according to national statistics, the average age of Armenian mothers at first birth held remarkably stable during the 1990s: 22.5 in 1991 and 22.7 in 2004 (Transmonee Database). Slightly more postponement of childbearing is evident in Moldova: from 22 in 1998 (the earliest year available) to 22.4 in 2004.

Changes in social policy and a decline in state and firm-sponsored family services (Fajth 1999; Teplova 2007) increase the likelihood that new constraints emerged for family expansion.

Unfortunately, analysing these factors is not yet possible due to a lack of in-depth policy analysis over time in these two countries. What we do know from official sources (collected in the Social Security Worldwide (SSW) database) in 2004 is that Moldovan mothers are entitled to 100% of their average wage over the last six months for 126 days (following the beginning of leave, which begins the 30th week of pregnancy). In Armenia, the maternity benefit is the same, but for 70 days before and 70 days after childbirth. Armenian mothers receive a childbirth lump-sum payment as well as a small child-care leave benefit if they stay home to take care of their child for the first two years. A lesser child family allowance benefit is paid for women who return to work before the child is two years old. A cash benefit per child is paid each month as well. Moldova's family allowances are means-tested whereas Armenia's are available to all mothers who were previously employed. Since the value of benefits changed dramatically over time and payments have been known to be delayed or never received in the region (see Bulgaru et al. 2000 in reference to Moldova), incorporating information on reciprocity rates and real amounts would be necessary to analyse the impact of family benefits.⁷ How changes in family policy mattered to fertility, therefore, is not explored in this study.

The demand for children was likely altered as well and two possible pathways exist in the literature that could explain this development. First, to the degree that new political or economic freedoms accompanied independence, norms and attitudes toward childbearing and family size may have changed. This shift in turn could have encouraged self-actualisation among women and individualised decision-making about major life course events. This pathway is most often referred to as the Second Demographic Transition (Lesthaeghe and van de Kaa 1986) and has been argued to account for below-replacement level fertility across a wide range of countries. Postponement of childbearing is one key symptom of a second demographic transition, which is an element missing from demographic shifts in Armenia and Moldova during the transition from

⁷ The Armenian report in the SSW explicitly states that "Benefits are adjusted on an ad hoc basis according to available resources".

communism. This pathway is not analysed here for this reason, as well as because the data at hand do not provide information on changes in values and attitudes toward childbearing or family size.

Finally, demand for children may have declined due to economic forces. Hotz, Klerman, and Willis (1997) summarise 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). This pathway can affect fertility in two ways. First, women’s participation in the labour market implies a loss of earnings or human capital investment in the event of childbearing and childrearing (Becker 1981; Rindfuss et al. 1999). Second, resource levels may be too low to meet the direct cost of childbearing. Wage devaluation and rampant inflation during the transition from communism likely increased the cost of childbearing for families across the entire income distribution, but at a much higher relative level for low-income families.

From an economic perspective then, and excluding the branch of economic explanations that considers household bargaining and decision-making, fertility may have declined due to two different mechanisms: direct and indirect costs. Both of these pathways are intimately related to whether or not a mother has paid employment. If she does not, then childbearing implies minimal opportunity costs. If she does, then her contribution to household income may help offset the cost of childbearing. Direct cost effects may be particularly relevant during an economic crisis, when partners may be jobless.

Not only may the decision to have a child reflect economic circumstances, but the timing of that decision may as well. The desired timing of the next childbirth may be based not only on the strength of a preference to have another child, but also how conditional it is. It may be that postponement, once a childbearing career has begun, reflects different determinants than those of the preference to have another child. Hotz et al. (1997) see the spacing of parity progressions working in two ways: 1) rising income increases the incentive to space births since parents will

prefer to have the next birth when income is high and 2) parents will wait until the price of having another child is low, according to the cost of the mother's time. This would lead us to expect higher parity progression preferences when mothers are not employed. However, if job loss or a decline in income precludes meeting the direct cost of childbearing, then parents may prefer to have another child when income is higher, even if this is through dual-earnership. At the very least, we would expect the preference for another child and the time horizon for this wanted parity transition to be pushed further into the future if the father is not employed.

On the basis of information we have about the two countries, a few stylized facts and implications emerge. Despite 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 to not participate in the labour force, as their reservation wages are likely not being met in the market. However, we also know from official statistics that unemployment is very high in Armenia, which indicates that jobs are wanted but not available. As long as the market wage is low and jobs are scarce, women's opportunity costs are low and we may see a return to the breadwinner model. The most important determinants of childbearing in Armenia may therefore be related to direct costs; partners' employment and earnings may be just as, or more, important than the respondents'.

The Moldovan case shows the opposite scenario: wage recovery has occurred and jobs appear to be more available. This indicates that women's time spent in paid employment is both more likely and more valuable; therefore, a woman who is in the labour force is more likely to earn a wage that surpasses the value of her non-labour time; hence, opting out from the labour market is more likely to incur opportunity costs than her Armenian counterparts. In the Moldovan case, opportunity costs could therefore be expected to play a significant role in childbearing. However, Moldova also has experienced continued and high inflation, which means uncertainty and the cost of having a child are high. Hence, we may also see more

postponement and the impact of direct costs at work. These scenarios draw on “stylized facts”, because we lack detailed information on women’s income and labour force participation⁸, and the facts provide only a rough structure of what we may expect to see in the two countries.

IV. Data, Strategy and Hypotheses

The Demographic and Health Survey was implemented in Armenia and Moldova in 2005 to provide detailed information about population, health, and nutrition. DHS surveys provide a wealth of information about global health and population trends in countries where these issues are especially important. The 2005 Armenia and Moldova DHS are nationally representative surveys of 6,566 women aged 15-49 in Armenia given from September to December and 7,440 women in Moldova given from March to June. The DHS surveys have a very high response rate: 95% in Moldova and 97% in Armenia.⁹ These data provide rich information on fertility histories, current fertility preferences, living conditions, household composition, and health, all of which serve to support this research endeavor.

In the descriptive analyses of the fertility decline during the 1990s, education serves as a proxy of resources and opportunities. If women with high educational attainment—who have higher earnings potential—experienced the most significant decline in fertility, then opportunity costs likely contributed to fertility decline. Conversely, if women with the lowest educational attainment—who have lower opportunity costs due to lower earning potential, as well as contribute less to overall household income—experienced the greatest decline in fertility, then direct costs likely played a role in the fertility decline.

⁸ Unfortunately, the non-working population cannot be separated into those that are unemployed and those that are not participating in the labour force on the basis of DHS data.

⁹ To ensure that the data represent the country proportionally, according to geographical population density, and to prevent any bias due to geographical clustering, a sampling weight was used as well as Stata’s package of survey commands.

In the regression analyses of current preferences, more indicators of resources are available.¹⁰ These analyses incorporate measures of household wealth and the employment status of both the respondent and her partner as well. Whether women's work status is related to fertility preferences indicates whether opportunity costs are a likely explanation for parity progression preferences. If women with employed partners or those who live in wealthier households have higher odds of preferring to have another child, or wanting the next child sooner, direct costs of childbearing are important to parity progression decisions. If dual joblessness, in which both the respondent and partner are jobless and which represents difficulties occurring in economic crisis, decreases the likelihood of wanting another child or postpones the timing of a desired child, crisis conditions are associated with lower fertility preferences.

As described in the previous section, opportunity costs are primarily expected to emerge in Moldova, if they emerge at all, and we expect to see evidence of a stronger breadwinner model in Armenia, in which the women's status is less important than the partner's. In both countries, direct costs are expected to matter to fertility decisions, given the generally poor economic conditions in the two countries, as well as dual joblessness.

V. Past Fertility Behaviour in Armenia and Moldova

In this section, I explore the fertility decline following Armenia's and Moldova's independence. I first look at the percent of women at each parity when they have reached 35, or an age that they can be considered to have almost completed their fertility. Women may still become pregnant after the age of 35, but due to early family formation in these countries, completed family size has generally been achieved by this time. If patterns held stable over time, the excluded births are few: 15 births per 1000 women in the 35-39 age group in Armenia and 4 births in the 40-49

¹⁰ These analyses also remain descriptive, however, in the sense that findings are cross-sectional and limited to interpretation as associations only.

category (National Statistical Service et al. 2006), and 13 and 4 births in Moldova, respectively (NCPM & ORC Macro 2006). This age threshold means that women born as late as 1970 are included, who reached the average age of first birth (22 years old) at the beginning of the transition and completed most of their childbearing during the transition.

Figure 4 displays changes in parity shares over time and demonstrates a few parity-specific patterns. The two-child family norm appears to be increasingly prevalent in Armenia, whereas two-children families have remained somewhat constant in Moldova over time and families with only one child have become more common. In neither country does childlessness appear to be increasing; rather, both countries demonstrate a recent decline in the share of women who have no children by the age of 35. Women with three or more children have become increasingly rare in both countries.

Figure 4 about here.

The next descriptive evidence separates women into three different birth cohorts to observe differences in the average number of children born. The oldest women, who were 49 at the time of interview and were born in 1956, turned 35 in 1991, the year the Soviet Union dissolved. These three cohorts of women allow a comparison of women who completed most of their childbearing under the Soviet regime (1956-1961), began childbearing before 1991 but may have completed their fertility career after transition began (1962-1967) and likely had all of their children during the transition (1968-1970). I also compare these cohorts' average number of children according to their educational attainment. Caution is required in interpreting these associations because we do not know exactly when women completed their education; the direction of causality between education and fertility may run in both directions. Women's fertility choices may be influenced by their educational level and time spent in education,

whereas educational attainment may also be influenced by childbearing. For example, a woman may delay childbearing until finished with her education or not continue her education after having a child. These scenarios imply that women do not see education as compatible with parenthood (Thornton et al. 1995). Indeed, studies of other post-communist countries show that women who are studying have a 72% lower relative risk of having a first child in Bulgaria (Koytcheva 2006) and 50% lower risk in Ukraine after the transition from communism began (Perelli-Harris 2008). Moreover, since childlessness does not appear to be increasing in these countries—which means the changes in completed fertility are related to higher order births—and since the great majority of higher parity births occur once education is complete, higher-order parity comparisons according to women's educational attainment should not generate substantial anticipatory bias related to education.

The respondent's educational level is categorised as secondary or lower, specialised secondary, or higher education. In Moldova, completing compulsory education entails completion of at least nine grades (NCPM & ORC Macro 2006). Specialised secondary education is an option after finishing secondary school that takes 2-3 more years and provides specialised training in a field requiring specific skills such as nursing, agriculture, construction, etc., and qualifies the graduate to work in these fields. Higher educational attainment means the student completed their education at a university. In Armenia, compulsory education is completed in the 8th year of education (National Statistical Service et al. 2006). Students at this point may finish general secondary education or choose specialised secondary, which includes professional-technical training and training for mid-level qualifications such as teachers, midwives and mechanics. Specialised secondary education takes either two or four years, depending on whether the student joins specialised secondary education after the 8th or 10th grade. Higher education includes those who completed a full secondary education and attended university.

Figure 5 clearly shows an educational gradient in almost completed fertility that existed before the transition began and persists. The average number of children born to all three cohorts is lower in Moldova than in Armenia. The difference between the average number of children born for the lowest and highest educated in Armenia was greater for the youngest cohort than the oldest. In Moldova the difference in the span between cohorts was slightly lesser, but the youngest cohort still had a slightly greater difference between education groups than the oldest. Except for women with a secondary or lower education in Armenia, fertility declined from the oldest to youngest cohorts within each education group. In Moldova, a more continual decline in average number of children born emerged over the cohorts; only university-educated women in the 1962-1967 cohort had a higher number of children than the previous cohort. In summary, an expected educational gradient appeared as well as a general decline in fertility when we look across cohorts, but to varying degrees by educational attainment.

Figure 5 about here.

Taking a longitudinal view and comparing fertility within subgroups over time provides insight into which groups of women experienced the greatest change in fertility behaviour. Moreover, including younger cohorts than those who have turned 35 by 2005 is important to get a fuller understanding of fertility changes over the 1990s and early 2000s. Therefore, I next assess parity-specific changes by education groups for all women using parity progression ratios (PPRs). PPRs are 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 and refer to the proportion of women who had child j in the years preceding the index year and who had child $j+1$ in the index year. In order to calculate PPRs in the recent past and make use of all up-to-date data that is available, I use the “synthetic parity cohort” approach to

construct PPRs (Ní Brolcháin 1987; Hinde 1998). However, the more distant past is less accurately captured with the synthetic method since the parity cohorts become a more selected group—by only young women being able to enter the parity cohort—when the time period is many years before the interview. My primary interest is the change in PPRs over the 1990s and early 2000s, which is a relatively recent time period and minimizes the risk of selectivity through censoring. The time period under analysis is, therefore, 1990 to 2005. In this study, parity cohorts are observed for ten years.

The PPR is calculated as follows:

$$a_j = 1 - (1 - q_0) (1 - q_1) (1 - q_2) \dots (1 - q_{10})$$

where a_j is the period PPR and the numerator in the calculation of q_x is the number of women who had j birth in year x before the current year and had their $(j+1)$ birth in the current year. The denominator is the number of women who have already had their $(j+1)$ birth before the start of the current year, subtracted from the total number of women who had j birth in the x year before the current year (see Hinde 1998, 111-114).

Since most of the relevant changes in fertility behaviour appear to revolve around having a second (1-2 PPR) and third (2-3 PPR) child, these are the foci of this analysis. Fourth births would also have been interesting to analyse, considering that almost 8% of currently married women in Moldova and over 10% in Armenia have given birth to four or more children; however, this sample is too small for use in the following analysis.

Before discussing education-specific PPRs, overall trends for the two countries are displayed in Figure 6. To smooth yearly fluctuations and clarify trends in the two countries, 3-year moving averages are used, which means the 1990 and 2005 PPRs are not displayed. According to the PPRs for all women sampled, with sample weights applied, we see different patterns in 1-2 PPRs emerge for the two countries. In Armenia, the proportion of women who go on to have a second birth remained more or less constant over the 1990s and early 2000s, with only a minimal

decline. In Moldova, a more significant change occurred, in which 20% fewer women proceed to the second birth. Third parity progressions display a more similar trajectory for Armenia and Moldova. The initial PPRs in Armenia were more than 10% higher than in Moldova, but they converged with Moldova's PPRs in the first half of the 1990s. Moldova experienced most of its decline in the 2-3 PPRs from 1996-1999, after which the two countries converged again and the PPR trajectory became level in the most recent years.

Figure 6 about here.

While Figure 6 describes general changes, this study is mainly concerned with the differences in PPR decline by education groups.¹¹ For reasons of space these numerous figures are not displayed,¹² but the overall relative declines according to three year moving averages are summarised in Table 1. In Armenia, a notable exception to a general decline emerged; the share of women with only a secondary or lower education who had a second birth did not decrease as dramatically as other education groups, parities and their counterparts in Moldova. If the transition impacted all women similarly, we might expect changes to be similar across all subgroups; conversely, two patterns might emerge based on previous theoretical considerations. First, the increasing returns to education that likely accompanied market reform leads us to expect greater declines for higher educated women since they likely experienced an increase in opportunity costs. Alternatively, the opposite gradient in which the lowest educated women experience a greater decline might appear, due to a conflict of increased childbearing costs and low wages. The summary statistics in Table 1 show some evidence of these expectations.

¹¹ Similar to the last empirical analysis of changes in fertility patterns according to educational levels, an issue of sequencing exists. But as previously discussed, this issue is more problematic when discussing first births rather than higher parity births, as is the case here.

¹² These figures are available upon request.

Table 1 about here.

For the 1-2 parity progression ratio, opportunity costs appear to be driving the decline, although in Armenia the decline was relatively similar for women with specialised secondary and higher education. In Moldova, a clearer gradient emerges by education and women with higher education experienced a substantially greater decline than all others. The story appears more complicated for the 2-3 PPR and the declines much greater for all education groups. In both countries, an inverse U-shaped relationship appears in which both the lowest and highest educated women had the greatest decline in progression rates to the third birth. Once again, however, the highest educated women had the greatest decline of all. In Moldova, the disparity among educational groups, in terms of initial 2-3 PPRs, was significantly greater to begin with but by 2004 the span between PPRs by education was around 10 percentage points for both countries and parities except the 1-2 PPR in Armenia, which had a smaller disparity between the highest and lowest education groups. This discussion was based on relative changes in fertility decline, which render the initial PPR levels irrelevant in the comparison; if we look at absolute declines, the most obvious differences that emerge in fertility behaviour revolve around the third birth in Armenia and the second birth in Moldova and this mostly held true across education groups.

In summary of these descriptive analyses, on the basis of Figures 4-6 and Table 1, we now have ample evidence that the decline in Armenian TFR was driven by fewer third births than before the transition, while the decline in Moldovan TFR seems to be driven by fewer second births. Moreover, the decline in the number of children born to the 1956-1970 cohorts has evolved in a way that has not eradicated the educational gradient. We also now know that the highest educated women were the ones who most dramatically altered their fertility patterns, although women with lower educational levels also had significantly fewer third births. If the

scenarios based on stylized facts were justifiable, then both direct and opportunity cost mechanisms may have been working in tandem and these findings suggest that this was the case.

VI. Current Fertility Preferences

The previous analyses have given us detailed information about past fertility trends in Armenia and Moldova. Current fertility preferences and their desired timing are now analysed. These analyses allow the use of rich information available at the time of the interview and contribute to our knowledge of which factors are associated with the desire for further children.

VI.1 Method

Two different dependent variables will be analysed that relate to fertility intentions and the desired timing. The first analysis will identify determinants of the desire to have a second or third child (0=respondent does not want another child or has been sterilised, 1=respondent wants another child) for women who already have one or two children. The DHS questionnaire also allows for an “undecided” answer. The share of women in this sample (those who are living with a partner) that do not know if they want another child is too few (2.5% in Armenia and 2.8% in Moldova) to keep this as a separate category and use multinomial regressions. Therefore, these women were excluded from the analysis.¹³

The second dependent variable is the preferred timing of the next birth. Blake (1967) argued that analysing the timing of desired childbirth helps to qualify the preference. The strategy to use timing as a dependent variable along with preference for another child also mirrors the strategy of Philipov, Spéder and Billari (2006) in their analysis of fertility preferences in Bulgaria and Hungary. The present study follows their lead by confirming the importance of analysing factors that contribute to not only quantum but tempo. These

¹³ Sensitivity analyses, in which the undecided were placed with those who do not want another child, were conducted to make sure this decision did not alter the major findings.

intentions have been called “short-term fertility intentions” by Philipov (2009) in a recent Special Collection on fertility intentions; short-term intentions are considered more accurate than long-term intentions since it is much easier for respondents to predict circumstances in the near future than those in the distant future.

The question in the survey on which this variable is based was an open-ended question and responses were coded in years, as a non-numerical response, or as “don’t know”. Responses of “don’t know” (6% in Armenia and 7% in Moldova) were re-coded in this study as “later” (rather than “sooner”) since one implication for an intention of its timing is its seriousness and how likely it is to be carried out. Since “don’t know” is a less concrete response than one in the near future (three years or less), it is therefore classified as “later”.¹⁴ The sample for the timing model includes only women who indicate they would like to have another child. Rather than split the sample according to parity in this case, all women who desire another child are pooled together. How many children the woman has and when she had the last child are important covariates included in this model.¹⁵ This dependent variable takes the value of 1 if women prefer to have the child in the next three years or the value of 0 if they prefer to wait longer or don’t know when.

The independent variables cover demographic factors, personal characteristics of the respondent, characteristics of her partner and of her living conditions. The first individual characteristic is education level. Almost the same share of women reaches higher education in both countries: 20% in Moldova and 21% in Armenia. The major educational difference between the two countries, therefore, is the extent to which women take specialised secondary training in Armenia: 34% versus only 21% in Moldova. Armenian women appear then to have more occupation-specific skill development.

¹⁴ Non-numerical responses (3.5% in Armenia and 4% in Moldova) refer to answers such as “after we get married”. Since there is no unequivocal logic to placing these answers with “sooner” or “later”, they are coded as later and sensitivity analyses confirm that this small portion of respondents does not change the overall results if they are coded alternatively as sooner.

¹⁵ The time passed since the last birth is also included in the first model predicting desire for another child.

Employment status is measured in terms of working or not. The questions about employment are carefully crafted to ensure that the respondents offer information about any paid work that they do, even if they are not employed in the formal market.¹⁶ Ideally, the indicator would have three categories: not participating in the labour 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. Sixty-two percent of partnered mothers in Moldova are working whereas only 30% are in Armenia. To gain some insight into the characteristics of women who work and those who do not, the following figures show the distribution across household wealth ranking and across educational levels for all women who are in a union and have at least one child. The wealth indicator is based on asset accounting and a multi-step index calculation (Rutstein and Johnson 2004). Figure 7 shows that little difference in wealth exists among women who work in Armenia; only 8% more of the wealthiest women were working than the poorest. A tighter association between wealth and whether mothers are employed exists in Moldova; 18% more of the richest mothers were working than the poorest women. It seems that two incomes contribute to greater wealth in Moldova but not necessarily in Armenia, which strengthens the speculation that women's wages are less significant in Armenia. Low wages in Armenia, however, does not mean they are not fundamental to the household budget.

Figure 7 about here.

Figure 8 displays the distribution of educational attainment according to work status. If higher education endows women with more skills to be successful in the labour force or reflects

¹⁶ The questions from the survey are the following: "Aside from your own housework, have you done any work in the last seven days?" "As you know, some women take up jobs for which they are paid in cash or kind. Others sell things, have a small business or work on the family farm or in the family business. In the last seven days, have you done any of these things or any other work?"

their investment and commitment to a career, we would expect to see women working more as their educational level increases. This is the case in both countries.¹⁷ The gap between the lowest and highest educated working rates was virtually the same in both countries; however, the gap between working rates for secondary special and higher educated women was smaller for Moldovan women: 7% versus 13% in Armenia.

Figure 8 about here.

Months since last birth, age at first birth and the sex composition of the child/ren that the respondent already had are all included as control variables. Because the relationship between desire for another child and months since last birth is not likely to be linear, I also square this indicator. These indicators give us tools to control for demographic factors that should influence childbearing but are not relevant to the focus of this paper.

The independent variables representing household characteristics are whether the respondent lived in an urban/rural location or capital city, household size and wealth ranking. Household size averages 5.03 persons in Armenia and 3.96 persons in Moldova. The larger size in Armenia points to the possibility that Armenian households consist of extended family members. Indeed, only 70% of the household members interviewed in Armenia were comprised of the head, partner or children whereas 90% of household members were in Moldova. The wealth index value has been condensed from the previously displayed quintiles into terciles: poorest, middle and richest. The wealth indicator essentially attempts to identify whether the level of resources matters and, hence, whether a direct cost explanation to fertility preferences appears plausible. Type of settlement, as well as household size, are other household indicators that may control for potential cultural influences or reflect other aspects of resource levels.

¹⁷ An obvious positive relationship emerges for wealth and education as well, but these findings are not shown for reasons of space.

The final variables reflect the importance of the couple's perspective. First, although the education of the partner cannot be included in the model due to high collinearity with respondents' education (0.56 in Armenia and 0.54 in Moldova), it is possible to account for whether the partner has the same education, lower or higher. Interpreting this indicator is not straightforward, however. I also include partner's employment status. This indicator is coded similarly to respondents' work status (working vs. not working), but is less problematic than the indicator for women because non-participation of men in this age group would be rare, which means that "not working" is much more likely to imply unemployment rather than not participating in the labour market. Ten percent of Armenian partners are unemployed in this sample, as are 11% of Moldovan partners. This variable offers an additional dimension to assessing the impact of household resources, which may be more relevant to immediate economic conditions than asset wealth.

I further analyse the couple's circumstances by introducing a joint indicator of both the respondent's and the partner's employment status called "dual employment". The couple can either be both employed, only the partner employed, neither employed or only the respondent employed. Table 2 displays summary statistics for these categories. Couples in which neither partner is working are more common in Armenia, while couples in which only the respondent works appear more common in Moldova. In general, women seem to have more success in employment in Moldova, or they more often choose to stay in the labour market.¹⁸ This indicator aims to pick up particularly problematic household conditions, which may deepen our understanding of how crisis conditions impact fertility.

Table 2 about here.

¹⁸ Looking into the characteristics of these couples reveals little variation in wealth by joint employment status in Armenia, whereas significant differences in wealth exist in Moldova for those who are neither or both employed.

Besides being selected on motherhood, the sample includes only those respondents who are in a union at the time of the survey. Thirty-eight percent of the Armenian sample and 34% of the Moldovan sample are not living in a union. Mothers who were not in a union were highly likely to be “undecided” about wanting another child or were “waiting until married,” and were therefore excluded. This means that women who do not have a first or a second child are excluded, thus there is selection into the sample. Women have also selected themselves into the analysis of desired timing for the next birth, since they all prefer to have another child.

Despite the likelihood of selection bias, the rho (correlation of the residuals of the two equations used in the Heckman probit selection model) was consistently insignificant, even with different specifications of the selection equation. This means independence of the two equations cannot be rejected and that selection bias is not influencing the results. This is not unexpected for the sample of women with one child—analysed for preferences of a second child—as having at least one child remains mostly universal in the two countries. However, we would expect a selection process into the sample in which women have two children. This was not the case though and, in fact, could be a predictor of few statistically significant explanatory variables in the second birth preference model, since determinants of the desire to have a second or third child should appear as selection bias if the models are correctly specified. However, if desire for another child is just as influenced by current circumstances as by permanent characteristics of the respondent in these contexts, this lack of selectivity may not be surprising.

VI.2 Results

Table 3 displays results of logistic regression models in which second birth preferences were analysed for women with one child and third birth preferences were analysed for women with two children. In 2005, 24% of Armenian women and 40% of Moldovan women with one child

preferred not to have a second child. Eighty-five percent of women with two children in Armenia preferred not to have a third child, while 89% of Moldovan counterparts felt the same.

Age at first birth and months since the last birth were often statistically significant in the models. The older women were when they had their first child, the less likely they were to want another child. The sex of the child already born or the sex composition of the two children born appears to play a strong role in determining preference for a second or third child. In both countries, there is a preference for male children and this preference appears more pronounced in Armenia. However, in Armenia, if a woman has two male children, she is also more likely to want another child than if she had one female and one male child.

Surprisingly, an urban/capital city/rural difference in preference for another child—whether second or third—did not appear; however, this indicator played its expected role when timing was modelled. Household size also did not appear to be consistently related to the preference for another child. When more concrete measures of socioeconomic status and labour force situation were included in the model, education also did not have a statistically significant association with child preference. In contrast, the difference in educational attainment between the respondent and her partner was associated with the preference for another child. The association, however, operated in opposite ways in the two countries, albeit for different parities. In Armenia, having a partner that was more highly educated decreased the odds of wanting a second child, relative to having a partner with the same educational attainment. In Moldova, the same educational difference increased the odds of wanting a third child.

In regards to the key indicators, many expected results emerged. For second birth preference, whether the respondent is working or not is a significant predictor in both countries; working respondents have higher odds of wanting a second child than non-working women. The impact is stronger for Armenian women, who are twice as likely to want a second child if they are working, which is an important finding considering the low level of employment among

mothers in Armenia; however, this odds ratio is only weakly significant. Moldovan mothers who are working are 41% more likely to want a second child than their non-working counterparts. Whether the partner is working is also related to second birth preference in Moldova and has a stronger impact than respondents' own work status. Wealth appeared not to play a role in second birth preference. However, the results were generally in the expected direction; the richest households had the highest odds of wanting a second child. Similarly, Armenian women in the richest wealth ranking had 75% higher odds of wanting a third child than women in the poorest wealth ranking. Although a relationship in the same direction emerged in Moldova, the result was not statistically significant.

Table 3 about here.

Table 4 presents the results of a logistic regression in which the same characteristics are regressed on the likelihood of wanting the next child within three years. In this case, the reference category is “wanting to have a child later than three years,” so the outcomes are referred to as wanting a child soon if the odds ratios are more than one or later if they are less than one. Rural women are more likely to want the next child soon in Armenia, whereas women residing in Chisinau—the capital city of Moldova—are less likely to want the next child soon. A preference for male children again emerges in Armenia in which women are more likely to want the next child soon if they only have female children.

The only theoretically important variable that was statistically significant in the timing models appeared for the Armenian sample and was whether or not the respondent was working at the time of the survey. The odds ratio shows that for those respondents who want to have another child, it is the ones who are working who prefer to have it soon.

Table 4 about here.

Finally, couples' joint employment status was introduced into the models. In general, the findings are similar to those in models where each partner's employment status was considered independently. In reference to couples in which both partners are employed, the odds of wanting a second child were lower when only the partner was employed both in Armenia and Moldova. Similar to the previous results, this impact was much stronger in Armenia than in Moldova. However, in Moldova, the odds of preferring a second child were more than 60% lower when neither the respondent nor her partner was employed. For the third child preference, Armenian mothers with two children and an unemployed partner who were working were more than 80% less likely to want a third child than those who were part of a couple in which both were working. In regards to timing, the odds of wanting the next child soon were very low for mothers in couples in which only the partner worked or neither was employed in Armenia. A few unexpected and unexplainable results emerged in these models for Moldova, however. First, although only weakly significant, dual joblessness was associated with a higher third birth preference; second, dual joblessness was associated with much higher odds of wanting the next child soon.

Table 5 about here.

VII. Discussion

This study explored changes in recent fertility trends in Armenia and Moldova as well as current fertility preferences to contribute to research on changing fertility trends in transitional countries. Childlessness does not appear to be increasing in either country and the two child norm appears to be strong in both countries, although less so in Moldova; in 2005, 76% of mothers in Armenia

and 60% in Moldova preferred to have a second child. Women who completed their childbearing mostly before the transition from communism display an educational gradient in how many children they had, in which women with higher education had fewer children than women with secondary or less education. After the transition from communism began, fertility declined for women of all education levels. A consistently high decline in second and third parity births occurred for women with higher education, which indicates increased opportunity costs as a driver of fertility decline. Indeed, the decline in second parity progressions was also higher for specialised secondary educated women than those with secondary or less, which indicates a straightforward educational gradient in second parity progression decline. Because the decline in second parity progressions was most important to the fertility decline in Moldova, opportunity costs appear to be relevant to the fertility decline in Moldova during the 1990s and early 2000s, which was the initial expectation due to the general economic context there. Third parity progressions appear slightly more complicated because the loss for the lowest educated women was more similar to the highest educated women. This finding can be interpreted as evidence that both direct and indirect costs suppressed childbearing. Because third birth progressions rates declined the most dramatically in Armenia, the expectation that direct costs would play a more substantial role in the Armenian fertility decline was upheld. These interpretations are speculative, however, and more research on what educational attainment meant in terms of labour market outcomes in these contexts would be useful.

The second part of this study undertook the investigation of socioeconomic conditions that were associated with the desire to progress to second or third parity in 2005. Women who are working prefer to have a second child more than women who are not working in both countries and they prefer to have the next child within three years in Armenia. Employment status does not appear to be important for third birth preferences in either country. For Moldova, when the partner is working, respondents have higher odds of wanting a second child. Analysed from a

couple's perspective, dual joblessness appeared to deter childbearing, in terms of parity preferences in both Armenia and Moldova and timing preferences in Armenia. Moreover, being in the richest rather than poorest group of women is associated with wanting a third child in Armenia.

These findings yield little support for the idea that opportunity costs are a major factor in the current preferences for children in these two countries. In a social and cultural context in which women generally combined work and family, perhaps this is not a surprising finding—even in a context of declining pre-primary enrolment rates for children. In contrast, the findings related to employment status indicate that women prefer to have more children when they are contributing to household income, which may be evidence that dual-earnership is necessary to meet the direct costs of having another child. Incidences of dual joblessness and its impact on fertility preferences further demonstrate this. One result at least is unexpected. Given the very low value of wages in Armenia as well as descriptive evidence that working mothers are not likely to be much wealthier, employment status should be less important in Armenia than in Moldova to mothers' preference to have another child. However, the impact of employment status on second birth preference is larger in Armenia than Moldova and mothers' work status matters even to the timing preference in Armenia, but not Moldova.

Taken together, these results suggest two key conclusions. First, despite declining female labour force participation rates and despite lower rates in Armenia than Moldova, there is no evidence that a willing shift toward a breadwinner model has taken place. When women stay home or lose their job, they are less likely to desire a second child in societies that are characterised by a relatively high ideal number of children (2.6 in Armenia and 2.2 in Moldova). This may be a legacy of the Soviet work culture in which great emphasis was placed on female labour force participation or it may simply be that two incomes are needed to make ends meet in both of these countries. Therefore, despite the diverging destinies of the two countries

considered in this study, the determinants of fertility decline and current fertility preferences that were studied are similar in the two countries.

Second, there is some evidence that crisis conditions suppress the desire for more children and encourage the postponement of desired children. While this study was not able to model crisis conditions in the analyses of the past fertility decline, the finding that having a partner out of work, as well as not working oneself, particularly lowered the odds of wanting another child indicates that conditions generating high unemployment have an impact on fertility. The dual joblessness models were not entirely consistent, however, and some results in Moldova indicate the opposite scenario. These contrary findings are not all robust, however; the odds ratio for timing in Moldova loses its significance and becomes negative if the dependent variable is wanting the next child within two years and not three.¹⁹

The two findings that direct costs are important to fertility intentions in post-Soviet societies and that crisis conditions were influential as well are supported in the literature. Focusing on the case of Russia, for which the most in-depth research into determinants of fertility has been done and which underwent similar economic crises, Perelli-Harris (2006) found that being able to supplement one's income with informal work increased the likelihood that a mother wanted another child. Bühler (2004) also found that additional income or sustenance-generating activities were positively related to second births. Billingsley (2010a) found evidence that downward mobility was negatively related to second birth rates in Russia.

Finally, the absence of other potentially important determinants of fertility in this study highlights important areas of future research. The effect of educational differences in attainment between the respondent and partner, for example, is worth exploring. We might expect that women who are less educated than their partner, and hence have less earning power, have less control or bargaining power in the relationship; alternatively, if we assume that partners unite on

¹⁹ The only other substantive change involved in this different operationalization is that having a working partner becomes statistically significant and has a positive effect on timing in Moldova.

the basis of homophily or shared backgrounds, then having a lower education than one's partner may be a stronger indication of a low commitment to human capital than education on its own. As such, it may be that having lower control suppresses the desire for another child in Armenia, whereas a possibly weaker orientation to a career appears to be positively related to wanting another child in Moldova. Ideally, we would have more information to model the impact of gender equality or the degree of control women have over their lives.

In these contexts, it is also likely very important to capture migration flows of partners and family members since this might influence not only household income but whether there are two partners in the household to raise a child. To be representative of the entire population of these countries, migration is an important aspect to study. Other explanations might also be explored in the event of new survey data, including the importance of value and attitudinal changes and the state of work/family tensions brought about by the overhaul of the economic and social support systems in these countries. Nevertheless, this study offers knowledge and insight into recent fertility behaviour and current fertility preferences in two countries that are under-studied and provide insightful similarities and differences.

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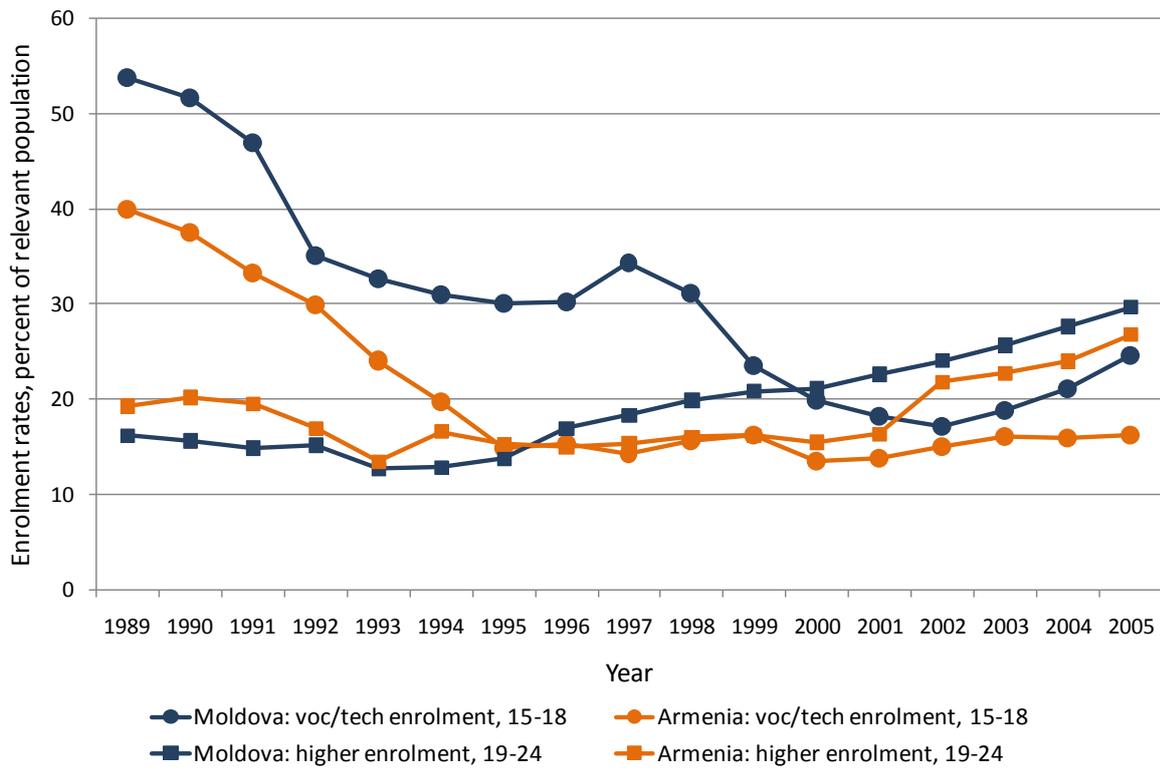
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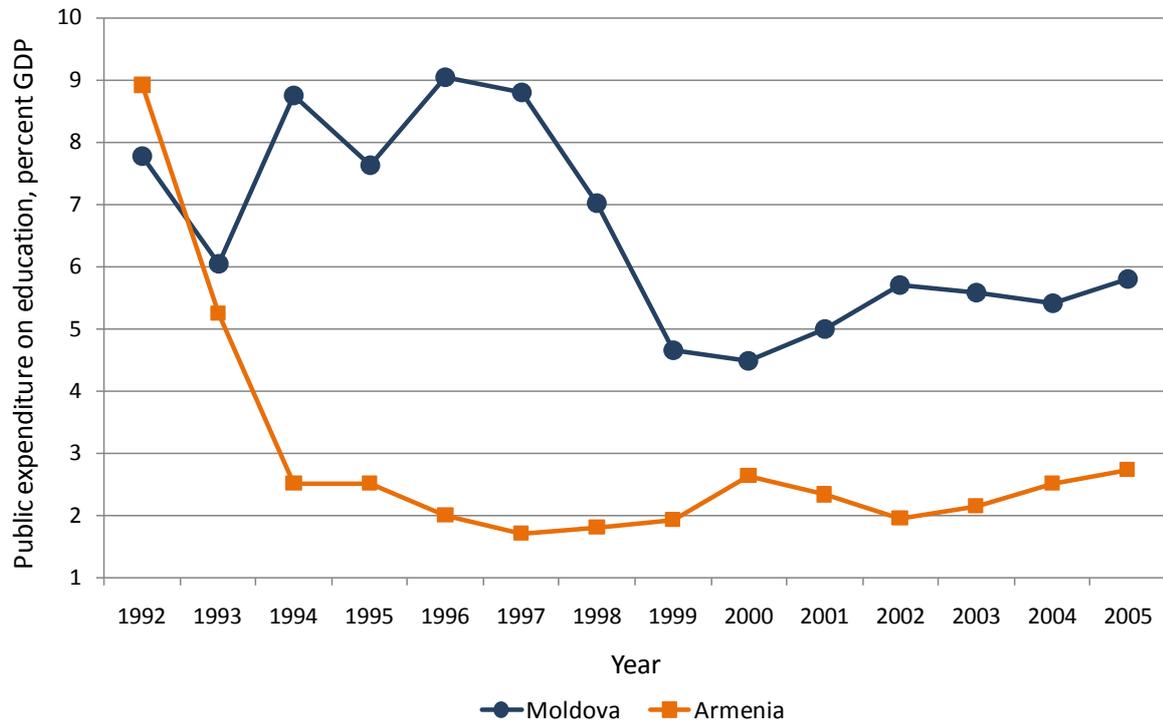
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Figure 1. Education enrolment rates in Armenia and Moldova, 1989-2005



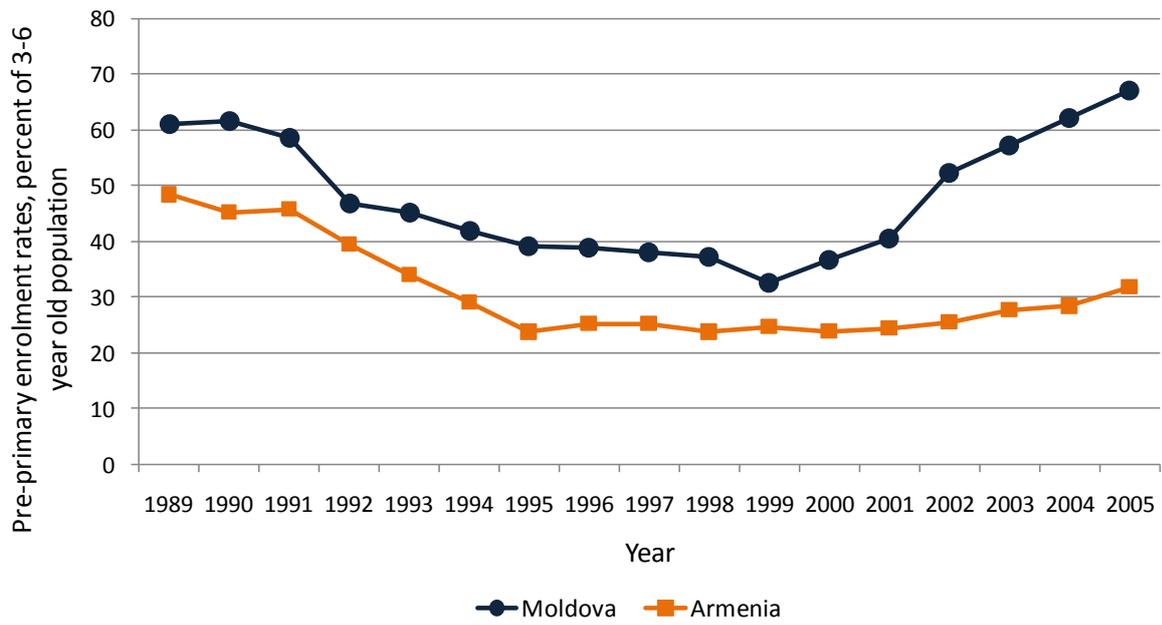
Source: Transmonee database

Figure 2. Public expenditure on education in Armenia and Moldova, 1992-2005



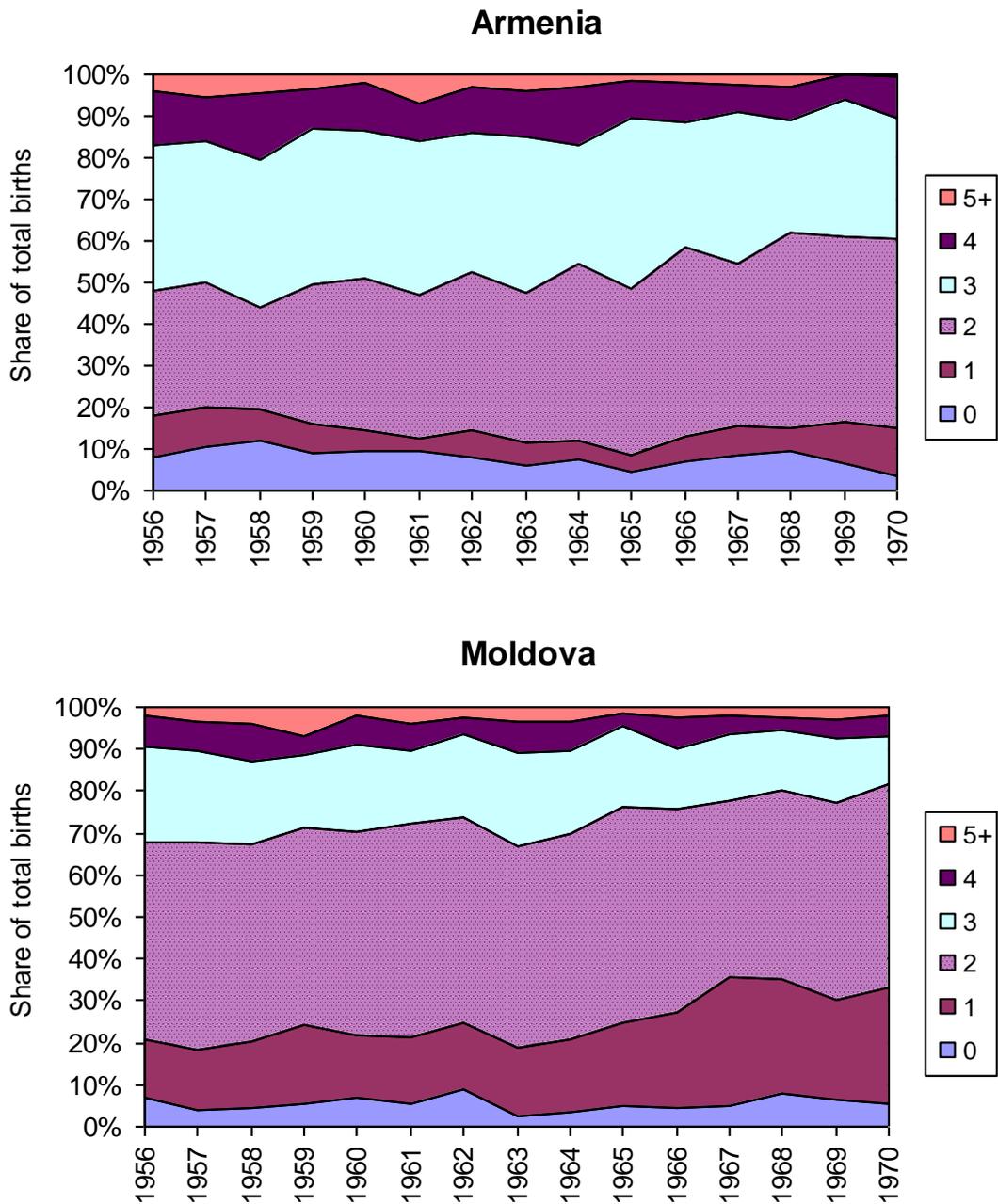
Source: Transmonee database

Figure 3. Pre-primary enrolment rates in Armenia and Moldova aged 3-6, 1989-2005



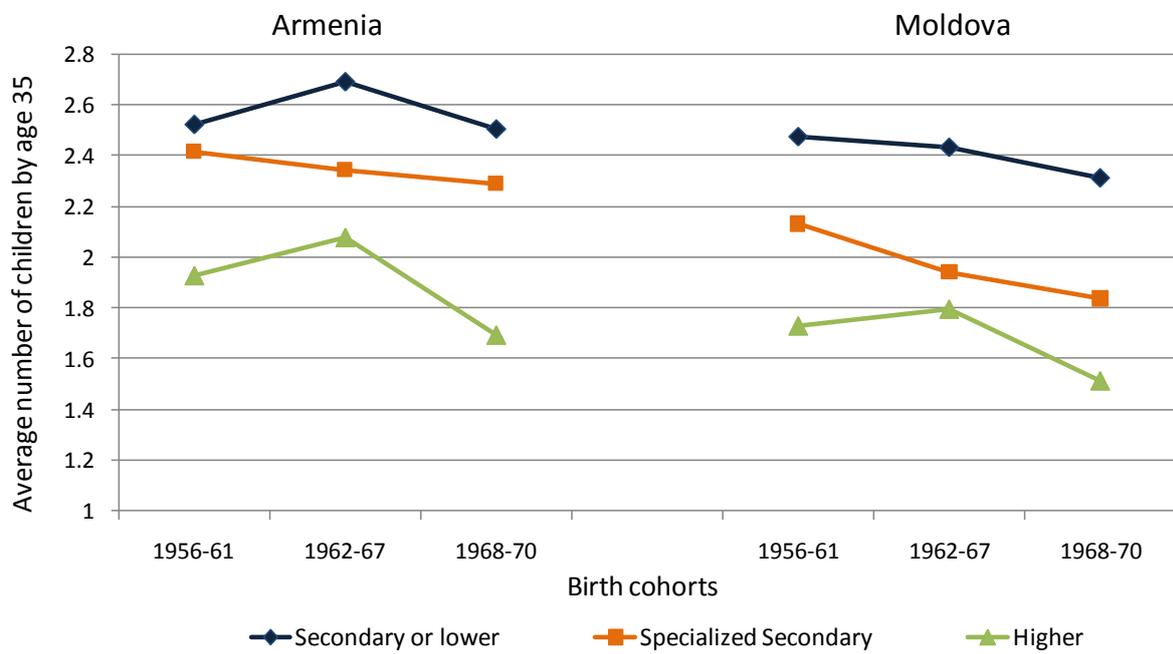
Source: Transmonee database

Figure 4. Parity shares of total births for women with almost completed fertility at aged 35, Cohorts 1956-1970



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

Figure 5. Average number of children ever born to women aged 35, cohorts 1956-1970, by education level



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

Figure 6. Period parity-progression ratios for second and third births, Armenia and Moldova, 3 year moving averages

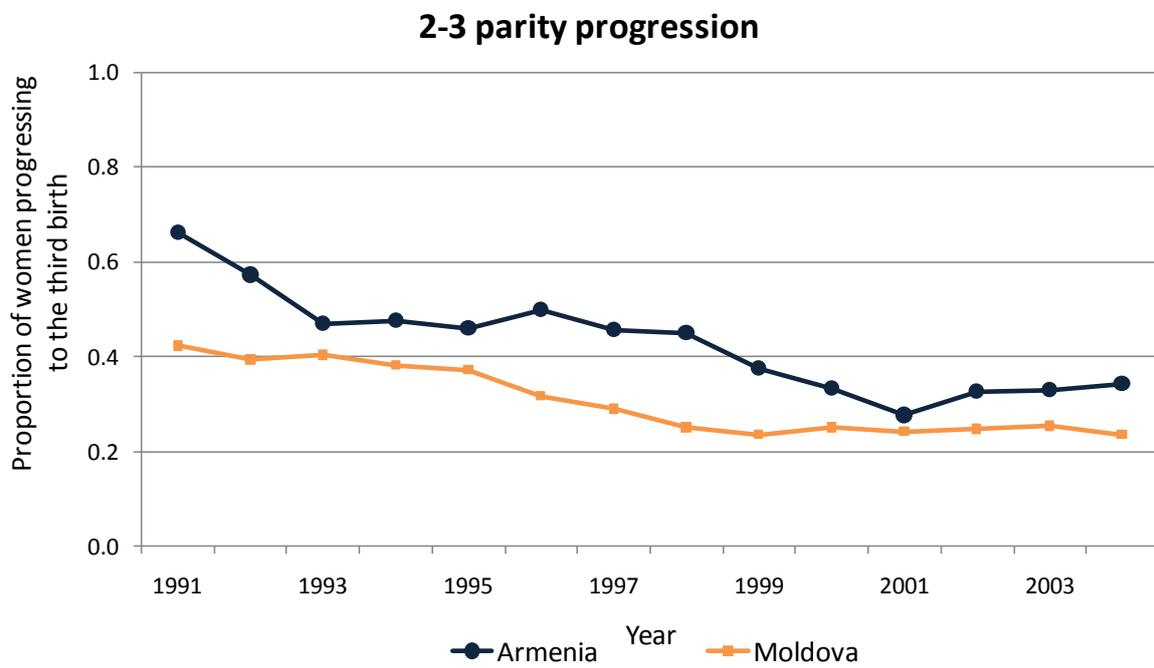
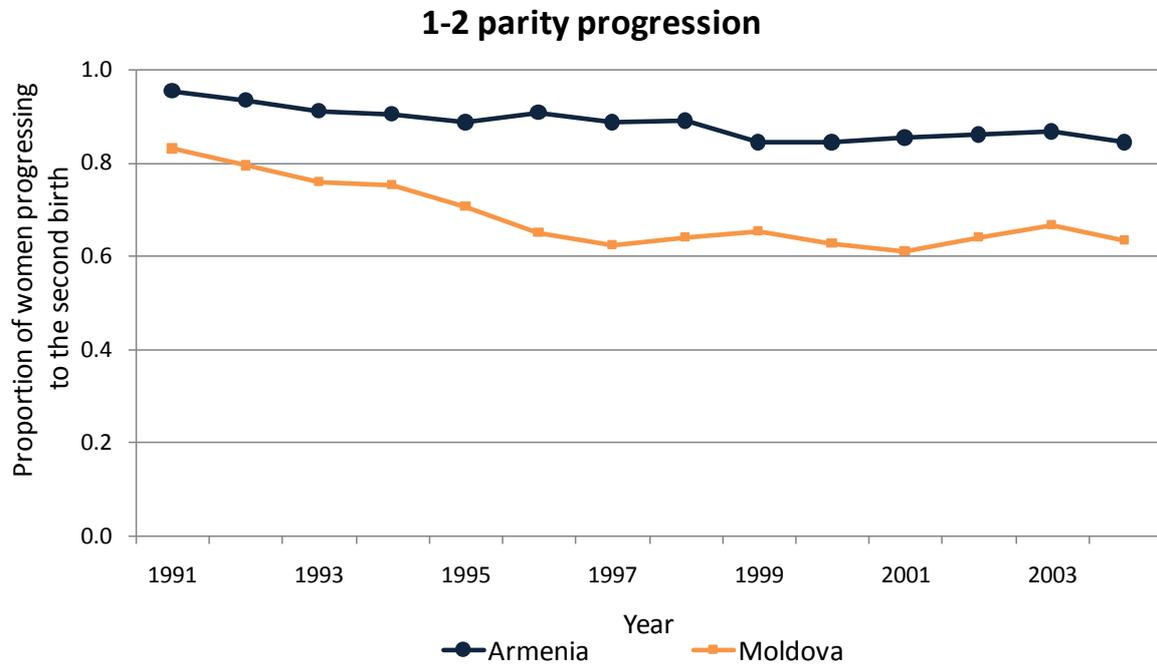
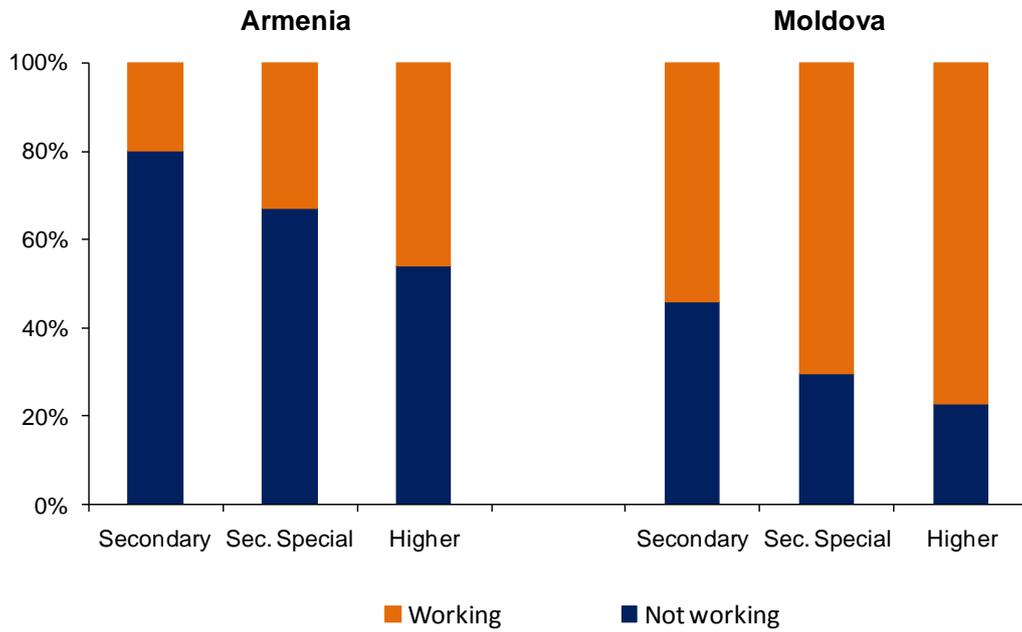
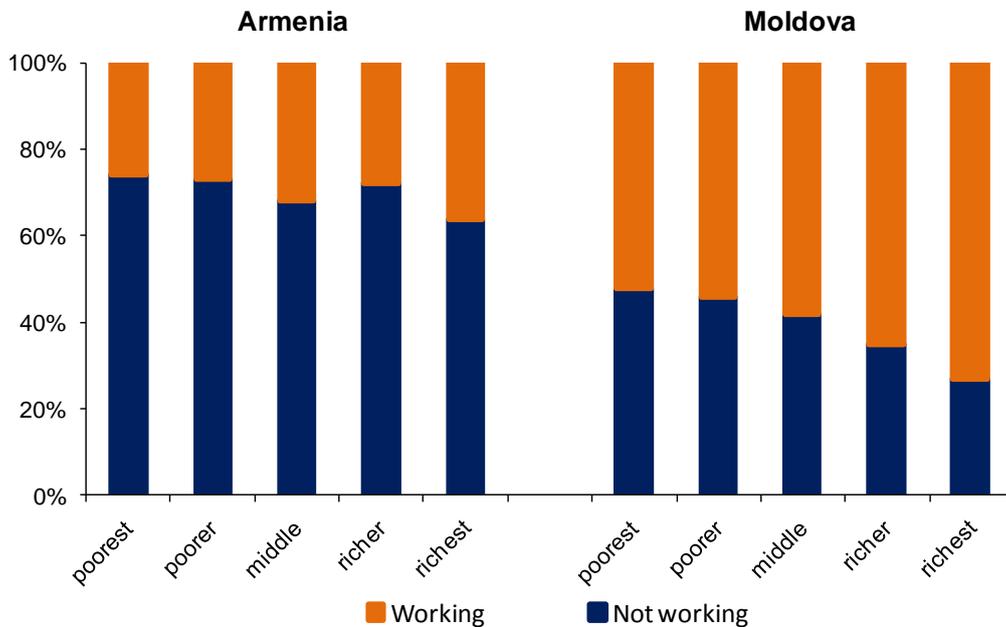


Figure 7. Share of women who are working and not working according to wealth rankings



Note: Sample includes women who are in a union and have at least one child.

Figure 8. Share of women who are working and not working according to educational level



Note: Sample includes women who are in a union and have at least one child.

Table 1. Summary of Relative Declines in Parity Progression Ratios from 1991-2004 (3-year moving averages) within education groups

Parity Progression	Secondary or less	Specialized secondary	Higher education
Armenia			
1-2	-0.04	-0.15	-0.17
2-3	-0.52	-0.33	-0.70
Moldova			
1-2	-0.18	-0.23	-0.36
2-3	-0.48	-0.40	-0.56

Table 2. Percent of mothers in couples with different joint employment circumstances

	Armenia	Moldova
Both working	28	57
Only P working	63	32
Both not working	7	5
Only R working	2	5
Total	100	100

Table 3. Logistic regression results for wanting another child

N of observations	Armenia				Moldova			
	2nd child		3rd child		2nd child		3rd child	
	Odds ratios	P> z						
	473		1603		1253		1840	
Months since last birth	0.98	0.07	1.00	0.53	0.99	0.03	1.01	0.02
Months since last birth. squared	0.99	0.33	0.99	0.00	0.99	0.00	0.99	0.00
Age at first birth	0.83	0.00	0.89	0.00	0.89	0.00	0.92	0.00
Urban	1		1		1		1	
Rural	0.81	0.62	1.08	0.71	1.08	0.71	1.10	0.66
Capital city	1.33	0.50	0.75	0.20	1.30	0.14	2.08	0.00
Household size	0.99	0.95	0.99	0.93	0.96	0.46	0.93	0.40
Sex composition of child/ren: both			1				1	
Male only	1		1.68	0.00	1		1.32	0.14
Female only	1.74	0.07	5.80	0.00	1.55	0.00	1.51	0.03
Secondary or less education	1		1		1		1	
Secondary Special education	1.17	0.70	1.37	0.14	0.98	0.93	0.92	0.73
Higher education	0.70	0.47	1.14	0.62	1.24	0.30	1.08	0.79
Education in relation to partner's: same	1		1		1		1	
Respondent less educated than partner	0.37	0.02	1.16	0.47	0.89	0.58	1.55	0.06
Partner less educated than respondent	0.54	0.13	1.10	0.67	0.83	0.36	1.06	0.82
Respondent is not working	1		1		1		1	
working	1.99	0.09	0.92	0.70	1.41	0.03	0.84	0.32
Partner is not working	1		1		1		1	
working	0.64	0.39	1.08	0.78	1.50	0.07	0.77	0.30
Poorest wealth ranking	1		1		1		1	
Middle wealth ranking	1.10	0.82	0.93	0.76	0.93	0.73	0.99	0.96
Richest wealth ranking	1.53	0.39	1.75	0.02	1.13	0.64	0.67	0.20

Notes: Samples include women currently in unions and who have one child in 2nd child preference models and two children in 3rd child preference models.

Table 4. Logistic regression results for wanting the next child within three years

N of observations	Armenia		Moldova	
	667		993	
	Odds ratios	P> z	Odds ratios	P> z
Months since last birth	1.01	0.02	1.03	0.00
Months since last birth. squared	0.99	0.04	0.99	0.00
Age at first birth	1.08	0.03	1.07	0.00
Urban	1		1	
Rural	1.75	0.03	1.18	0.45
Capital city	0.88	0.62	0.64	0.04
Household size	0.94	0.31	1.00	0.99
Children	0.83	0.31	0.51	0.00
Sex composition of	1		1	
Male only	1.42	0.22	0.84	0.54
Female only	2.22	0.00	0.66	0.15
Secondary or less	1		1	
Secondary Special	0.8	0.38	1.05	0.85
Higher education	0.76	0.36	0.80	0.33
Education in relation to Respondent less	1		1	
Partner less educated	1.16	0.55	1.45	0.11
	1.43	0.18	1.13	0.60
Respondent is not working	1		1	
	2.65	0.00	0.84	0.28
Partner is not working	1		1	
	1.24	0.43	0.77	0.30
Poorest wealth ranking	1		1	
Middle wealth ranking	0.97	0.91	1.13	0.57
Richest wealth ranking	0.90	0.71	1.51	0.14

Notes: Sample includes all women who have at least one child and are currently in a union.

Table 5. Logistic regression results for parity and timing preferences according to the joint employment status of the couple

Preferences by joint employment status				
	Armenia		Moldova	
Second child				
	Odds ratios	P> z	Odds ratios	P> z
Both working	1		1	
Only P working	0.37	0.02	0.75	0.08
Both not working	1.25	0.78	0.37	0.00
Only R working	0.30	0.19	0.92	0.79
Third child				
Both working	1		1	
Only P working	0.97	0.88	1.14	0.47
Both not working	1.19	0.62	1.73	0.08
Only R working	0.15	0.08	0.97	0.95
Within three years				
Both working	1		1	
Only P working	0.36	0.00	1.3	0.12
Both not working	0.30	0.00	1.14	0.68
Only R working	0.43	0.47	2.52	0.04

Notes: P = partner, R = respondent. All models control for educational attainment, months since last birth (and squared), age at first birth, household size, sex composition of children, urban/rural/capital city residence, difference between educational level of partner and respondent, and wealth.