RELIGIOUS AFFILIATION AND FAMILY FORMATION IN POST-SOVIET CENTRAL ASIA

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Figure 1. Map of Central Asia

Executive Summary

The breakup of the former Soviet Union and independence in the Central Asian states created a natural experiment on the impact of market reform on economic, social, and political development. It also created a natural experiment on the impact of religious freedom on social and economic behavior. Under the Soviet system, religion was not openly practiced, and within schools atheism was the philosophical slant of the curriculum. Today religion is openly practiced in all countries but with restrictions. An interesting and policy relevant question is whether the open practice of religion has motivated change within the family. In this paper we explore one broad dimension of behavior – family formation – and try to determine whether the influence of religion on marital status, fertility, and contraceptive use has evolved over time in the region.

INTRODUCTION

The five countries of Central Asia – Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan – comprise the largest primarily Islamic region of the former Soviet Union. (Figure 1) Following independence from Moscow in the early 1990s, these countries opened their markets to global competition but pursued different paths for the development of their economies and human rights. Turkmenistan's natural gas sector provided a large amount of foreign exchange, but the social policies pursued by an egocentric dictator, President for Life Niyazov, led to repressive social policies that set the country apart from the others in its overall development. The death of President Niyazov in 2006 led to a change in government (President Bertimuhammadow), and some positive social changes have been implemented. However, it is too early in the regime to determine how open the country will become and the development path that it will follow.

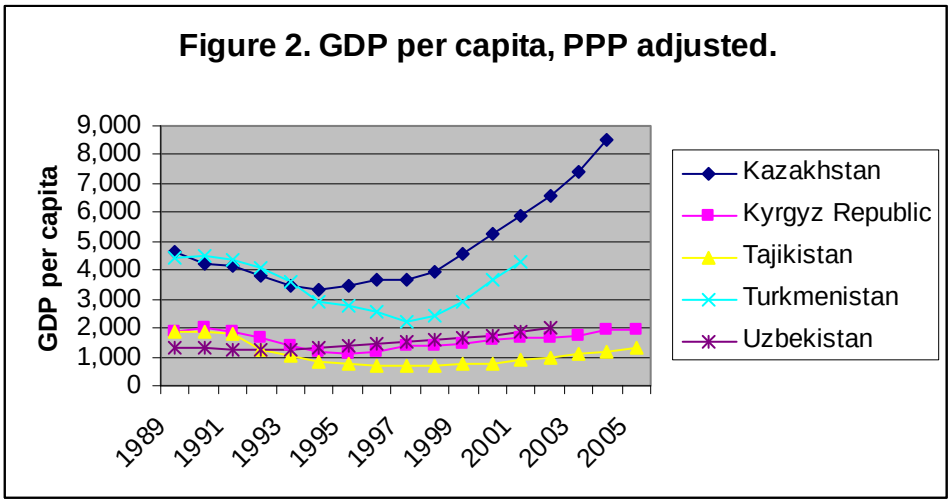
Tajikistan was immediately embroiled upon independence in a civil war based on rivalry for political power. The war ended in the late 1990s, but Tajikistan was far behind the other countries in its post-Soviet development. It needed to focus on recovery from the war and political stability, and the beginning of its adjustment to global market conditions was 6-7 years behind that of the other countries in the region. President Rahmon was last elected in 1999, and his party is firmly in control of the government.

Uzbekistan was a slow reformer and approached development more gradually than Kazakhstan or the Kyrgyz Republic. State enterprises were not closed at the same rate as in the other countries, and the country did not suffer the immediate and often harsh disruption to household income stability. Although the country initially pursued openness towards the press, religion, and opposition to the ruling elite, President Karimov's regime became one of the most

repressive in the region in the late 1990s and pursued harsh policies towards vocal opposition often expressed in mosques.

The most open of the five countries and one of the poorest was the Kyrgyz Republic. It is still the most tolerant country towards freedom of the press and speech, but depends on the support of Western donors such as the United States and the European Union for economic survival. The non-violent "Tulip" revolution in 2005 threw out the corrupt government of President Akaev and replaced it with the current elected government of President Bakiyev who is thought to be as corrupt as the former president. However, the economy is open to foreign business, and it has experimented with new, innovative social policies to redress the large wealth inequality within the country.

The largest and wealthiest country in Central Asia is Kazakhstan. With its large reserves of oil and natural gas, it has become a major player in the international oil market and has enough foreign exchange to pursue the most advanced social policies in the region. It has been innovative in the development of the state pension system, although this has not been without criticism or corruption. It has recently focused on education as one of the keys to long run economic development. The Bolashak program, for example, sends hundreds of students to the West for college and post-graduate training. The press is relatively free in Kazakhstan, but the government is controlled by the Nazarbayev family, and corruption in government, education, and other sectors has been a significant problem. Because of its wealth, the poor are well-off for the region, and Kazakhstan has become a net importer of immigrant (legal and illegal) labor from other countries in Central Asia. Figure 2 below illustrates the divergence in economic well-being since 1989 between Kazakhstan and the other countries of Central Asia.



Source: UNICEF-IRC, TransMonee database, 2007.

In addition to the economic transition experienced after the collapse of the USSR, an important social transformation in the region was the freedom to openly practice one's religion. Under the Soviet Union, the open practice of Islam, Orthodox, or other organized religions was replaced with the religion of "forced socialism." Following independence, however, all countries in the region passed legislation that guaranteed the freedom of religion. Over time these freedoms have eroded in every country, but the variation in the restrictions over religious freedom is large. Appendix Table A.1 presents a timeline of the developments in religious freedom beginning in the early 1990s through 2007.

Events in blue indicate expansion of religious freedom; events in red indicate repression of religious freedom. Between 1991 and 1996, all countries declared themselves to be secular states or promised religious freedom for all. However, freedoms were constrained in the region beginning in 1997. Turkmenistan declared that all religions were banned except state controlled Sunni Islam and Russian Orthodox. All religious groups were required to register with the state in 1997 in the Kyrgyz Republic, 1998 in Uzbekistan, and 2002 in Kazakhstan. Restrictions were placed on discussion of religion in schools in Uzbekistan in 1998, Kyrgyzstan in 2000, and Kazakhstan and Tajikistan in 2005. All countries imposed limits on religious demonstrations and

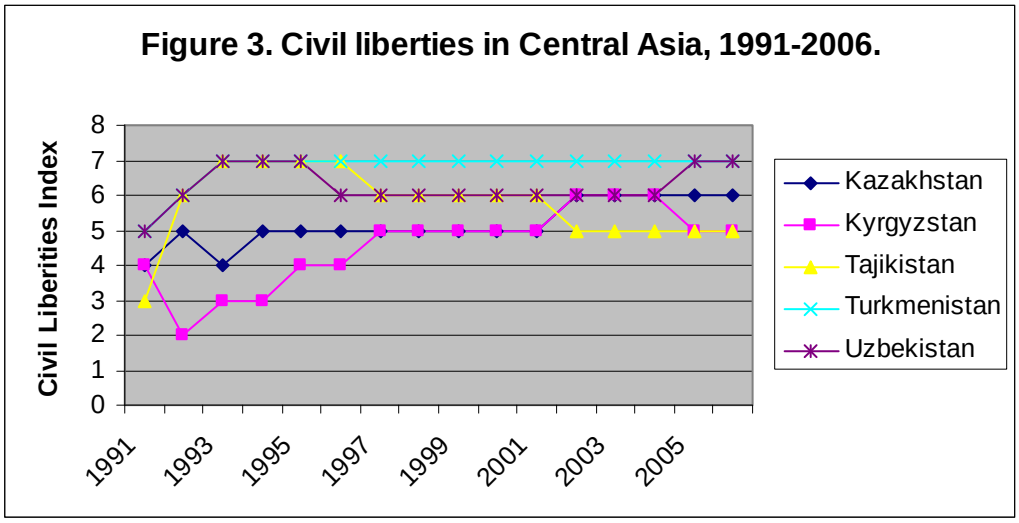
public religious speech.

The restrictions on religious freedom began in the late 1990s in reaction to disturbances in the poor agricultural region of the Ferghana Valley in the Kyrgyz Republic, Tajikistan, and Uzbekistan. Violent confrontation with government forces primarily in Uzbekistan and the Kyrgyz Republic led to a crackdown on religious freedom in an attempt to minimize the influence of Islamic extremists among the poor. Missionary activities from other religious organizations such as Jehovah's Witness, Hare Krishna, and Baptists were perceived as threats to the social order and were severely restricted. Uzbekistan banned Jehovah's Witness from the country in 2007. Kazakhstan proposed amendments to its Religion Law that would ban religious training that affected the physical or moral health of children, and the proposed new Religion Law of 2007 would ban religious literature from organizations with less than 50 members. In 2001, Kyrgyzstan increased the monitoring of religious schools and mosques, and in 2003 issued a decree to increase the monitoring of religious extremism including the collection of data on religious organizations and extremist groups. In 1999 in Tajikistan, the state was declared secular but ruled that religious political parties could be formed. The draft religion law of 2006 banned political activity of religious organizations and forbade children less than eight years of age from attending religious schools. The draft law is up for debate this year.

The changes in religious and political freedom in the region from 1989-2007 are summarized in Figure 3 and Table 1. Figure 3 plots the distribution of the Freedom House civil liberties index; the higher the index number, the fewer the civil liberties in the country. Table 1 presents cross-sectional information on religious freedom in 2003 from the ARDA[1] International Religious Freedom database; it includes data on 26 indicators of religious freedom as well as the

[1] Association of Religion Data Archive

state religion index of Grim and Finke (2006) and indices of civil liberties, freedom of the press, political rights, and economic freedom. The red highlights indicate the least free countries on each dimension in the table. The Grim and Finke index categorizes countries as atheist, secular, religious, or specific religious.



Source: Freedom House, 2007.

Kazakhstan is classified as a secular state on the Grim and Finke index; all the other countries are classified as specific religion states (Islam and/or Orthodox). On almost all of the other dimensions, the freest countries in the region are Kazakhstan and the Kyrgyz Republic; the most repressive are Turkmenistan and Uzbekistan. Historically, the religious practice of the nomadic Kyrgyz and Kazakhs was individualized; this independence from central religious authority in a community is still evident today and is in contrast to Islamic practice in the rural areas of Uzbekistan and Turkmenistan.

Table 1. Religious freedom in Central Asia, 2003

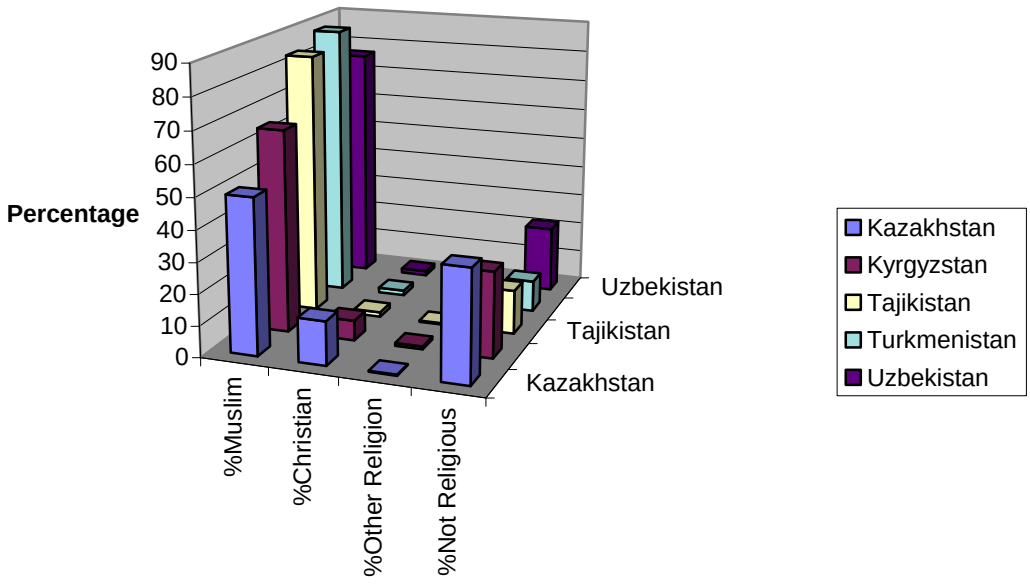
VARIABLE	Kazakhstan	Kyrgyzstan	Tajikistan	Turkmenistan	Uzbekistan
Religious Freedom Scale, FH,1(high)-7	4	4		**7**	**6**
State religion?	Secular	Specific	Specific	Specific	Specific
Freedom of Press,FH,1(high)-97	75	71	74	**96**	**85**
Political Rights,1(most)-7	6	6	6	**7**	**7**
Civil Liberties,1(most)-7	5	5	5	**7**	**6**
Economic Freedom,1(most)-5	3.66	3.29	4	**4.36**	**4.1**
Govt. Regulates Religion,0(low)-10	6.389	4.722	4.722	**6.944**	**8.611**
Govt Interferes Worship	Some	some	some	no	**severe**
Govt Respect Freedom Religion	No	Yes but	Yes but	No	No
Missionaries Allowed	Limits	Limits	Yes	**No**	**No**
Proselytizing limited	Yes,all	No	Yes,all	Yes,all	Yes,all
Govt. Favors Religion,0(no)-10	1.167	2.500	0.000	**7.333**	**6.833**
Govt. Subsidize Religion	some excl	some excl	no	**one relig**	**one set**
Govt Funding Religion,0(no)-12	1	0	0	**6**	**2**
Govt Fund Religious Schools	No	no	no	**yes,some**	**yes,some**
Govt Fund Religious Media	No	no	no	**yes,some**	no
Social Regulation Religion,0(no)-12	0.000	3.500	1.167	**3.833**	**8.667**
Social Attitudes Non-Trad.Religion	Open	**negative, regional**	discriminatory	discriminatory	**hostile**
Attitudes Towards conversions	No Problem	negative	0	negative	negative
Estab. Religion Shut Out New	No	no	no	no	**yes**
Social Religious Movements	None	flashes	flashes	**national**	**regional**
Constitution	**laws enforced**	yes	yes	yes	yes
Freedom of Religion in Constitution	yes	yes	yes	yes	yes
Amicable relations among religions	yes	yes	yes but	**no**	yes but
Change in status religious freedom	positive	no	no	**negative**	no

Hassles if not in dominant religion	no	no	no	**yes**	no
Govt promotes interfaith understanding	yes	yes	**no**		**no**
Govt requires religions to register	no	yes	yes	yes	yes
Religious literature/broadcasting restricted	no	literature	no	**literature and broadcasting**	**literature and broadcasting**
Religious prisoners or detainees	limited	numerous	numerous	numerous	numerous
Discrimination on basis of religion	some	some	some	some	**all**
Govt bureau supervises religion	non-coercive	non-coercive	coercive	coercive	coercive
Govt harrasses religions	isolated	isolated	isolated	**yes**	**yes**
Activities promote toleranced	yes	yes	no	no	no
Social movements w/ religious agenda	no	no	**yes**	no	**inactive**
Tensions related to religion	no	yes	yes	yes	yes
Organized interfaith dialog	no	yes	no	no	no
Vandalism towards religious property	no	no	**yes**	no	no
Regulation of religion,0(none)-5	2	3	3	**5**	**4**

Source: ARDA International Religious Freedom database, 2003.

Although religious freedom has moderated in each country in Central Asia since 1991, the open practice of religion is still a right throughout the region. This is a significant departure from the Soviet period. The dominant religion in the region is Sunni Islam practiced among the regional ethnic groups of Kazakhs, Kyrgyz, Uzbeks, Tajiks and Turkmen. Religion and ethnicity are closely intertwined in their impact on individual and community behavior. There are significant populations of Slavs and Europeans and other Asian ethnicities such as Mongols, Koreans, Dungan, and Uighurs; most of these were forced to immigrate to the region during the Stalinist period or moved from Western China for work. The Slavs – Russians, Ukrainians, Belorussians – are classified into two main groups based on their religious preferences: Russian Orthodox and atheists. Figure 4 illustrates the breakdown in religious preference in the five Central Asian republics in 2003.

Figure 4. Distribution of religion in Central Asia.



Source: ARDA International Religious Freedom database, 2003.

Most residents of Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan are classified as Moslem – 65 percent in Kyrgyzstan, 76 percent in Uzbekistan, 84 percent in Tajikistan, and 88 percent in Turkmenistan. The lowest representation of Moslems is in Kazakhstan with 50 percent. Orthodox representation is highest in Kazakhstan and Kyrgyzstan – 14 percent and 6 percent respectively. In the other countries, less than two percent are classified as Christian. In each country, there is a larger percentage of non-religious residents than Christians, and the percentage is highest in Kazakhstan (38 percent), Kyrgyzstan (27 percent) and Uzbekistan (21 percent).

The breakup of the former Soviet Union and independence in the Central Asian states created a natural experiment on the impact of market reform on economic, social, and political development. It also created a natural experiment on the impact of religious freedom on social and economic behavior. Under the Soviet system, religion was not openly practiced, and within schools atheism was the philosophical slant of the curriculum.[2] Today religion is openly practiced in all countries but with restrictions. An interesting and policy relevant question is whether the open practice of religion has motivated change within the family. In this paper we explore one broad dimension of behavior – family formation – and try to determine whether the influence of religion on marital status, fertility, and contraceptive use has evolved over time in the region. There are many other ways in which religion can impact household well-being including support of the elderly, income inequality, and education. These areas will be explored in future research.

[2] Atheist hour was part of the events of the typical school day throughout the Soviet Union, including Central Asia.

MARRIAGE AND CHILDBEARING IN CENTRAL ASIA AFTER ECONOMIC TRANSITION

In recent years, several forces have converged to alter the costs and incentives of marriage and childbearing in Central Asia. These include institutional changes relevant to marriage and parenthood, economic insecurity in the wake of transition, and the resurgence of traditionalism. These factors potentially impact Muslim women in the region differently than their Christian or non-religious counterparts.

Beginning in the 1920s, Soviet policies aimed at broadening women's roles in the home, society, and economy. Policymakers promoted education for women, encouraged their full participation in the labor force, and discouraged or outlawed "archaic" and "degrading" practices (Khalid 2007). The latter included cultural customs prevalent in Central Asia and associated with Islam that effectively treated women as "slaves and chattels", such as the common practice of marrying off women at very young ages, arranged marriages, bride payments (called *kalym)*, polygamy, and the veiling and/or seclusion of women (Khalid 2007). In addition to dismantling many of these practices, the Soviets also established civil marriage, eased restrictions on women requesting divorce, promoted women's freedom of movement and land ownership, and increased access to abortion (Ishkanian 2003).

Although progress in broadening women's roles was slower in Central Asia than the rest of the Soviet Union, by the 1990s, women there were much more likely to be working or attending school than in other nearby Muslim countries. These gains in women's economic participation, however, were not accompanied by real changes in women's social status (Khalid 2007). One obstacle to the "emancipation" process was the pronatalist agenda pursued by Soviet leaders. For example, governments established

generous maternity pay programs, created nearly (or completely) free childcare, and frequently recognized and rewarded women for having large families (Ishkanian 2003; Khalid 2007). Furthermore, although abortions were widely available and often free of charge, other safer, more convenient forms of contraception were unavailable. Although official policy promoted equality for women along several dimensions, high fertility rates and slow social progress reinforced women's roles as caregivers and homemakers and – at times – added work expectations outside of the home to their existing roles within the home (Ishkanian 2003).

Scholars noted that even the few gains women did experience during the Soviet period eroded following economic transition. For example, social programs and day care facilities that facilitated women's employment outside the home collapsed. Women also experienced disproportionate increases in unemployment, poverty, and insecurity in the years following transition and have far less of a presence in the upper levels of government and industry (Bauer et al. 1997). Moreover, inadequate pension support and health care further expanded the traditional role of women in providing care in the home for elderly family members (Bauer et al. 1997). The declining availability of economic opportunities outside the home potentially increases women's reliance upon male relatives, increases their incentives to conform to traditional roles of homemaking and childrearing, and lowers the opportunity cost of bearing children (McQuillan 2004).

Surging forces of traditionalism have also altered the costs associated with marriage and childbearing. In the years following transition, many local government leaders called for a return to "traditional" family values. Despite the rhetoric, these values are decidedly patriarchal in nature. The policy agenda that resulted reversed the few

economic and social gains made for women during Soviet rule. In Kazakhstan, Kyrgyzstan, and Uzbekistan, for example, observers describe widespread efforts to make it difficult for women to initiate divorce and to re-establish (de-jure or de-facto) polygamy (Khalid 2007). Although arranged marriage was prohibited during the Soviet period, and *kalym* or dowry payments were improper by extension, the incidence of reported arranged marriages and use of bride payments increased in the years following transition (Bauer et al. 1997). Taken together, the rising incidence of (reported) arranged marriages, observance of previously outlawed customs such as the circumcision of newborns, festivities surrounding these events, and the associated expenses of these activities increased the incentives to delay marriage or even engage in illegal practices such as bride kidnapping (Poliakov 1992; Bauer et al. 1997).[3]

Despite these setbacks, the years since transition have also been characterized by an increased focus on family planning and wider availability of contraception. In particular, public education campaigns conducted by NGOs and government initiatives to establish women's health/family planning facilities have resulted in increased usage of modern contraception such as the pill and IUDs (e.g., see ADB 1997).

As described above, the rapid institutional, economic, and social changes occurring in the wake of transition greatly altered the costs and benefits of marriage and childbearing. These forces potentially impacted Muslims, Orthodox Christians, and non-religious individuals in very different ways. The following section gives a brief outline of

[3] In 1997, a *kalym* often cost the groom's family between $1,000-5,000, the dowry approximately the same, the wedding ceremony approximately $3,000, and customary gifts and clothing amounting to even more. These costs would likely have deterred/delayed a significant proportion of weddings and are believed to motivate bride kidnapping - the practice of seizing a potential wife to convince her to marry without payment of the bride price (Poliakov 1992; ABD 1997).

the conceptual framework that links religion to fertility decisions and describes the nature of Islam and Orthodoxy in the Central Asian context.

The Role of Religion in Fertility Choices

Sharp differences in fertility patterns and contraceptive use across religious groups received a great deal of attention in the social science literature. Early studies suggested that differences in reproductive behavior could be fully explained by the socioeconomic characteristics of ethnic and regional groups (e.g., Goldscheider 1971). Although these characteristics prove to be important determinants of fertility outcomes, differences in fertility rates and completed fertility remain even after controlling for income, poverty status, and various other social and economic characteristics. Explanations for these remaining differences (e.g., Knodel et al. 1999; McQuillan 2004) include the direct impact of religious beliefs on reproductive behavior, the influence of religious values on broader social norms, and the potential for socioeconomic transition to alter the relationship between religion and fertility.[4]

Of most relevance to the current study is the idea that specific aspects of religion directly and indirectly influence attitudes and reproductive behavior. This might be the case if theology takes a particular stance on issues of sexual behavior (within and outside marriage), use of contraception, or the morality of abortion. For example, the strong Catholic prohibition on contraceptive use, coupled with a view that marital debt (sexual fulfillment) was to be honored in the spousal relationship, is associated with shorter birth

[4] Also, see Goldscheider (1971) and Knodel (1988) – both of which examine the possible link between minority status of religious groups and their fertility outcomes – and McQuillan (2004), which examines the importance religious institutions in the reproductive outcomes of followers.

intervals and higher completed fertility among Catholic populations (Knodel 1988; McQuillan 1999, 2004). In addition, religious doctrine may also influence proximate determinates of fertility such as the age at first marriage or the entry into subsequent marriages following the death or divorce of a partner.

Religion potentially affects fertility outcomes by influencing broader social norms such as the role of the family in society, the ideal family size, and the social roles of women (McQuillan 2004). For example, Muslims and Mormons both view the family as the central unit of the religious community, and unmarried individuals are expected to marry and raise children (McQuillan 2004; Karim 2005). While Mormons have no restrictions on the use of contraception, they still espouse pronatalist values in the course of practicing their faith (McQuillan 2004).[5] Religion may also influence the roles deemed appropriate for women in society and, thus indirectly, affect fertility. For example, conservative religious values may place constraints on women's autonomy or discourage participation in the labor market, which both effectively alter the opportunity costs and benefits of childbearing (e.g., Heaton and Cornwall 1989; Jejeebhoy 1995; Lehrer 1995).

Although the connections described above seem plausible in many circumstances, it is clear that the actual practices of followers frequently diverge from a religion's stated doctrine. This disconnect prompted the development of the "interaction hypothesis", which allows for changes in the connection between religious beliefs and reproductive behavior over time in response to socioeconomic transition (Chamie 1981; Knodel 1999).

[5] Mormons believe that the "plan of salvation can only be accomplished when all worthy spirits who have yet to be born come to experience life on earth" and see it as their duty to help this come to pass (McQuillan 2004).

For example, Catholics, despite the Church's prohibition on birth control, exhibited patterns of contraceptive use and fertility similar to their non-Catholic counterparts by the 1960s in the United States (Jones and Karim 2005).

Islam, Eastern Orthodoxy, and Fertility

Although Islam is typically associated with high levels of fertility there is little in the Qu'ran or Haddith (sayings of the Prophet) that suggests Islam is necessarily incompatible with low fertility.[6] Instead, it is important to recognize that teachings of Islam vary substantially over place and time, given the views of local religious leaders and the changing social, economic, and political reality. Islamic law emphasizes the centrality of marriage and family, prohibits permanent celibacy, and discourages divorce. There is little to suggest, however, that the sexual relationship in a marriage is solely for the purpose of procreation.

Although some religious leaders interpret the law in different ways, no explicit prohibition on birth control exists in the Qu'ran. In fact, there are several circumstances when the use of birth control might seem appropriate. For example, Muslims are discouraged from marrying or having children beyond the amount they can support and educate well. Moreover, if limiting or spacing children is necessary to preserve the health of the mother or other family members, this practice would likely be justified as well. Finally, the use of lactational amenorrhea to control family size is implicitly encouraged since new mothers are instructed to breastfeed their children for the first two years of life:

[6] This section draws heavily on Karim (2005) and Jones and Karim (2005).

Mothers are to suckle their children for two whole years; that is for those who wish to complete their suckling (Sura, 2; 233).

Schools of thought vary substantially in their views on the morality of abortion. The Qu'ran delineates the progression of a human fetus into four stages (up to 40 days, 40 to 80 days, 80 to 120 days, and beyond 120 days when the spirit is said to enter the body). All Islamic interpretations agree that abortion after 120 days is prohibited. Several schools of thought argue that abortion is not acceptable during any stage of development, others permit abortion through the first 40 days, and the *Hanafi* school of thought – most closely followed by Muslims in Central Asia – is the most permissive allowing abortion up until the final stage (120 days).

Islamic teachings address not only breastfeeding and birth control, but also other proximate determinants of fertility. For example, although the Qu'ran does not specify a minimum age for marriage, several references describe the importance of waiting until both parties are old enough to exhibit sound judgment and offer willing consent. The *Hanafis* suggest that this age would be around eighteen for boys and seventeen for girls.

Eastern Orthodoxy and Fertility

Both Islam and Eastern Orthodox Christianity prohibit sexual relationships outside the context of marriage. Orthodox teachings de-emphasize the importance of marriage for believers, however, and recommend marriage primarily for individuals who would be lured into "fornication" if they were to remain single (I Cor. 7:2; Zaphiris 1974). Like Islam, however, Eastern Orthodoxy admits reasons for sex within marriage that extend beyond the need for procreation. Although Islamic teachings on this matter center on nurturing the relationship between husband and wife, Christian teachings

emphasize the need for wives and husbands to help one another avoid sexual temptation (e.g., forbidding them to withhold intercourse from one another except in a temporary times of devotion to prayer) (I Cor. 7:4-5; Zaphiris 1974; Karim 2005).

Orthodox teachings are largely silent on the matter of contraception, but theologians have long discussed the issue. While the Orthodox Church discouraged or banned artificial contraception until the 1930s, recent discourses have been more open to contraceptive use that is consistent with practicing Orthodox Christianity. For example, although the Orthodox Church views marriage absent children (or intent to have children) as sinful behavior, religious scholars have pointed out that these views are not inconsistent with the use of contraceptives to space or limit births (Zaphiris 1974).

Unlike Islam, Orthodox Christian leaders have near consensus regarding the morality of abortion. Scriptures that describe God as creating each human's "…inmost being; knitting *him* together in his mother's womb" influence and reinforce the Church's view that life belongs only to God, and abortion of a fetus is essentially murder (Ps. 139:13; Zaphiris 1974)

Rise of Traditionalism and Conservative Islam

Despite communist efforts in Central Asia to obliterate religious practices and – indeed – all "backward" thinking under Soviet rule, evidence suggests that observance of religious ritual remained widespread. Islam, however, became more than religious theology and observances; it became deeply intertwined with ethnic identity and local cultural tradition. For example, Islamic feasts to celebrate life events, circumcision of newborn boys, and specific ideas about marriage and family began to be viewed as "local, Eastern, and Muslim", while many local festivals and holidays that had no

connection to Islam began to be associated with Muslims. No longer only a religious distinction, being Muslim took on social significance as a means to bind individuals together (even those who did not embrace Islam) and as a way to differentiate themselves from others in their society (Khalid 2007).

By 1988, local officials had ceased their organized efforts to suppress religious activity and a revival of Islam ensued. Many Muslims resumed public prayer rituals, embarked on pilgrimages to Mecca, and constructed (and re-opened) mosques throughout the region (Khalid 2007). Despite these visible changes, Khalid 2007 writes:

> *The Islamic revival in post-Soviet Central Asia shows little sign of affecting everyday life. There is little concern about observing the basic prohibitions of Islam against alcohol and even pork. The rhythms of everyday life remain secular in a way that is inconceivable even in other secular Muslim countries (p. 121).*

"Islamic social and family norms historically have been less influential among Kazakhs than among neighboring traditionally agricultural groups, such as Uzbeks and Tajiks" (Sitnianski, 1994 and Tishkov 1994 cited in Agadjanian and Qian 1997).

RELIGION AND ATTITUDES

The discussion above suggests that there are significant differences in attitudes towards the family among households that practice Islam or Orthodox and households that do not practice religion. To investigate these attitudes we examine descriptive data from the Kyrgyzstan 2003 World Values Survey. No other Central Asian countries have been in the World Values Surveys to date.

The Kyrgyzstan sample was a random selection of 1043 individuals aged 18 and older; each respondent was given a face-to-face interview. Within the sample, 74 percent describe themselves as religious and only 2.6 percent define themselves as atheists.

Among the religious respondents 74 percent are Muslim and 7.5 percent are Orthodox. Among Asians[7], almost all are Muslim (97 percent); among Europeans 79 percent are Orthodox and 9 percent are Protestant. Muslims (51 percent) are more likely to pray everyday than Orthodox (46 percent), and Muslims are more likely to attend religious services regularly. These statistics suggest that Asians and Muslims specifically are more religious in their practice than Europeans and Christians.

Table 2 presents a comparison of attitudes towards marriage, children, and the role of women by religious practice. The table reveals significant differences in the attitudes of the average respondent across the three religion categories, and not always in the expected direction. On average, Muslims want more children than Orthodox or non-religious respondents. The modal response for Muslims is 4, twice the model response for either Orthodox or non-religious. There are also significant differences in the desired family structure. Muslims and Orthodox (over 90 percent) are more likely to feel that a woman needs children to be fulfilled than the non-religious (83 percent). Muslims (76 percent) are also more likely to disapprove of women raising children alone than other persons (42 percent) and less likely to feel that working mothers can have warm and secure relationships with their children. Muslims are more likely to feel than a man has more right to a job than Orthodox or the non-religious. The differences in attitudes towards homosexuality are also quite different across groups. Eighty-six percent of Muslims think that homosexuality is never acceptable, while only 57 percent of Orthodox and 68 percent of the non-religious have this attitude.

[7] Specific ethnic classification was unavailable for Asians or Europeans. Asians include Kyrgyz, Kazakhs, Tajiks, Turkmen, and Uzbeks. Europeans include Russians, Ukrainians, Belorussians, and Germans.

Table 2. Religion and Attitudes towards Marriage, Children, and the Role of Women

	Not Religious	Muslim	Orthodox
Ideal Number of Children	2.94	3.71	2.78
Disapprove of a woman as a single parent	42.6	75.8	41.6
Woman needs children to be fulfilled	82.6	94	91
Working woman can have warm relationship with children	86.4	82.4	84.7
Husband and wife should both contribute to family income (%)	79.4	75	70.7
Men have more right to job than women (%)	38.2	54	28.2
Divorce never acceptable	22.2	53.9	14.3
Average divorce score*	4.87	2.8	5.47
Abortion never acceptable.	41.6	64.2	32.1
Average abortion score*	3.68	2.21	4.12
Homosexuality never acceptable	67.8	86.4	56.6
Average homosexuality* score	2.43	1.49	2.83

*Score ranges from 1 for never acceptable to 10 for always acceptable.

Differences in attitudes towards abortion and divorce are also striking across groups. Muslims are more strongly opposed to both abortion and divorce than other persons, but Orthodox have more liberal attitudes towards both events than the nonreligious.

Table 3 presents a comparison of attitudes towards life by religious preference. We look at happiness, life satisfaction, respect for parents, and the state of one's health (subjective assessment). We also include measures of toleration towards corruption and trust. On the first four measures, Muslims report the most positive responses. Eighty-eight percent of Muslims are very or quite happy in comparison to 64 percent of Orthodox and 76 percent of the non-religious. Muslims have higher life satisfaction

(score of 6.76 in comparison to 5.4-5.7), are more likely to feel that their health is good (67 percent in comparison to 31 percent for Orthodox and 51 percent for non-religious), and feel that you should always respect and love your parents. They are more likely to view bribery as unacceptable than the Orthodox, but they are more likely to feel that most people cannot be trusted ("can't be too careful").

Table 3. Religion and life satisfaction

	Not Religious	Muslim	Orthodox
Very or quite happy	75.9	88.5	63.6
Average life satisfaction score*	5.7	6.76.	5.38
Modal life satisfaction score	6	8	5
Health good or very good	51	66.9	30.8
Always respect and love parents	90.0	94.8	91
Trust others: can't be too careful	81.3	85.1	74.4
Accepting a bribe is never acceptable (%)	75.7	73.1	64.3

*Score ranges from 1=dissatisfied to 10=satisfied.

From this attitudinal information, we expect to find more a more traditional household structure among Muslims than either Orthodox or non-religious households. They are more likely to believe that children need to be raised by both parents, that women should stay in the home to care for the family rather than work, and to reject divorce. We also expect to find larger families in Muslim households and, given the attitude towards parents, more extended family arrangements. In general, Muslims are the most satisfied with their lives, and this attitude spills over to the perceptions they have of their own health. They are also more connected to their faith as evidenced through their religious practice and the importance they place on religion in their lives.

Orthodox households in many ways are the least traditional. They are the most tolerant of deviations from the traditional norm as evidenced by their most liberal attitudes towards homosexuality, abortion, and divorce. They are the least likely to disapprove of single parent households or to feel than men have more right to a job than women. However, the Orthodox in general are the least satisfied with their lives, their

evaluation of their own health is the most negative, and their reported happiness is well below that of Muslims or the non-religious. They are significantly less likely to actively participate in their religion than Muslims.

These statistics are descriptive and are not conditioned on any other characteristics of households and communities that may influence the attitudes of the respondents in the sample. However, they do suggest that religion may play an important role in family formation decisions and the cohesiveness of families and communities. In the next section, we examine data from Demographic and Health Surveys for three different Central Asian countries at various points in time to see whether the attitudinal preferences reported in the World Values Survey for Kyrgyzstan are reflected in the actual structure of families.

MODEL

We explore the connection between religious affiliation and family formation in Central Asia. The discussion above suggests that Islam and Orthodox religions differ in their approaches to family planning and family formation. Both of these religions promote marriage as the only means to generate children. However, religious practice in Central Asia has grown within a historically secular political and social environment, and the influence of religion on behavior is continuously evolving in the region. We expect older cohorts of adults to be less affected by religious doctrine in their social and family interactions than younger cohorts.

We examine the impact of religion on marriage, contraceptive knowledge and choice, and fertility. Y_{ijt} is the demographic outcome for individual i in country j at time t. We hypothesize that Y is affected by wealth, family background, education, and ethnic

and religious affiliation. We expect to find that wealth (W_{ijt}) increases the use of modern contraception and abortion, reduces the age at marriage, and increases fertility if children are normal goods. Education (S_{ijt}) increases the value of a woman's time and the opportunity cost of marriage and children; education also increases knowledge of contraception and the efficiency of its use. We expect to find that the use of modern contraception and age at marriage are higher but the probability of marriage and fertility are lower among the most educated women.

Childhood determines many of the preferences that adult women have towards marriage and family. We expect to find that women who live in urban environments (R_{ijt}) are more likely to use contraception and have smaller families than women from villages; we also expect to find that urban women are less likely to marry and that they marry later than other women. Living in an urban environment as a child raises the opportunity cost of marriage and family and lowers the access costs of contraception and health care. Finally, we expect to observe large differences in behavior by ethnicity (E_{ijt}) and/or religion (R_{ijt}). The regression model is given in (1) below,

$$Y_{ijt} = \alpha + W_{ijt}\beta_w + S_{ijt}\beta_s + U_{ijt}\beta_u + E_{ijt}\beta_e + R_{ijt}\beta_r + \nu_j + \nu_t + \varepsilon_{ijt} \quad (1)$$

where ν_j is a set of country fixed effects, ν_t is a set of year fixed effects, and ε_{ijt} is individual specific random error. β_k are regression coefficients.

DATA AND VARIABLES

The data are obtained from five Demographic and Health Surveys (DHS) from Central Asia: Kazakhstan, 1995 and 1999; Kyrgyz Republic, 1997; Uzbekistan, 1996 and

2002. The respondent in each survey is a woman aged 15-49. The sample sizes for our analyses are as follows:

Kyrgyz Republic	3803;
Kazakhstan, 1995	3651;
Kazakhstan, 1999	4537;
Uzbekistan, 1996	4374; and
Uzbekistan, 2002	5007.

We examine the influence of religion on 10 demographic outcome variables. These include the following:

(1) Knowledge of the ovulatory cycle, or when in the cycle a woman is most likely to become pregnant (1=yes, 0=no);

(2) Knowledge of modern contraception (1=yes, 0=no);

(3) Use of modern contraception (1=yes, 0=no);

(4) Ever terminate a pregnancy (1=yes, 0=no);

(5) Abortion ratio (number of abortions/number of pregnancies) among women with at least one pregnancy;

(6) Probability of premarital sex (1=had premarital sex, 0=did not have premarital sex);

(7) Probability of never marrying (1=never married, 0=married, widowed, or divorced);

(8) Age at marriage;

(9) Number of children ever born; and

(10) Interval in months between marriage and first live birth.

We also explored sex preference in births and deaths and found no impact of religion or any of the other explanatory variables on either outcome. We exclude these

models from the text. The explanatory variables are as follows:

(1) Wealth index derived using principal components from indicators of housing quality and ownership of consumer durables;

(2) Two education dummy variables (special secondary education and higher education, relative to completed primary or general secondary education);

(3) Two childhood residence dummy variables (urban and town relative to village);

(4) Three ethnicity dummy variables (Russian, European, Russian-speaking Central Asian relative to non-Russian speaking Kazakhs, Kyrgyz, and Uzbeks);

(5) Six age group dummy variables; and

(6) Two religion variables (Christian -- primarily Orthodox -- and Not Religious relative to Islam).

We only have information on religious affiliation; we have no information on religious commitment or religious beliefs and practice. Religious affiliation among non-Slavic Central Asians is closely linked with ethnicity. We also differentiate between Russified ethnic Central Asians and others. We expect to find the Russian-speaking Kazakhs, Kyrgyz, and Uzbeks to be more similar in their demographic behavior to Russians and other Slavic ethnicities than other native Central Asians. We expect a higher percentage of not religious among Russified Kazakhs, Kyrgyz, and Uzbeks than among non-Russian speaking Central Asians.

We first estimate our demographic outcome models with regression. For the dummy variable outcomes, we estimate a linear probability model with heteroskedasticity corrected standard errors. We estimate a second version of the models with instrumental variables estimation and instrument for religious affiliation. The instruments are created

from a first stage multinomial logit model of religion choice. The explanatory variables are: ethnicity, age, residence in childhood, residence in adulthood, characteristics of the current head of household (gender and age), education, wealth, and access to information (ownership of radio or TV, subscription to a newspaper). We hypothesize that with more information, she is more likely to declare a religious affiliation.

The results of our first stage analysis are given in Appendix Tables A.2a and A.2b. The religion outcomes are Christian or Not Religious relative to Muslim. Several interesting results are evident in these tables. First, over time there is a decline in the proportion of Central Asian women declaring themselves Not Religious in Uzbekistan but an increase in Kazakhstan. Second, wealthier households in all countries are more likely to be Christian or Not Religious than Muslim. Women with better access to information are less likely to be Christian or Not Religious. Third, urban residence is associated with a higher probability of Christian affiliation relative to Muslim except in Uzbekistan. Fourth, Russians and Russified Kazakhs are more likely to be Not Religious than other Central Asians, and Russians and Europeans are more likely to be Christian. Finally, education and head characteristics are weakly related to religious affiliation. Overall, the most important determinants of religion in Central Asia are ethnicity and wealth.

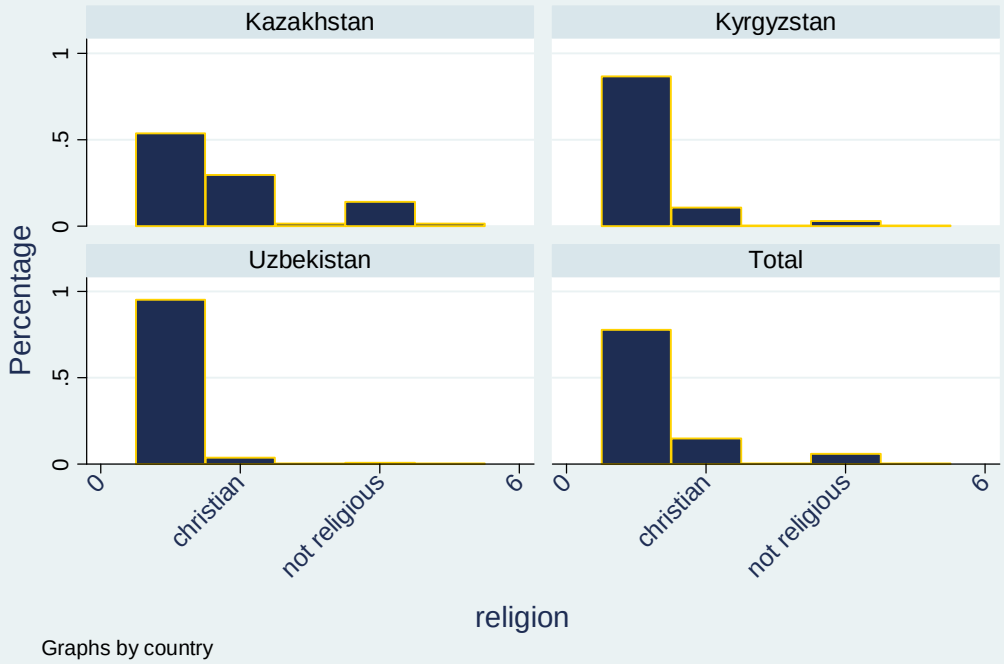
From the multinomial logit model of religious affiliation, we predict the probability of being Christian, Muslim, or Not Religious for each woman. We estimate separate models by country and year and predict these probabilities separately for each survey. These predicted values serve as instruments for religious affiliation in our demographic models. We also include squared predicted values as additional

instruments. We estimate our models with two stage least squares and with the generalized method of moments. We test for the validity of our instruments using GMM. We report the results of our IV estimation in Tables 2a-2e (menstrual cycle, knowledge of contraception, use of modern contraception, pregnancy termination, and abortion ratio), 3a-3c (premarital sex, never married, age at marriage) and 4a-4c (children ever born, age at first birth, length of first birth interval). Summary statistics for the variables included in our models are presented in Appendix Table 3 by country.

RESULTS

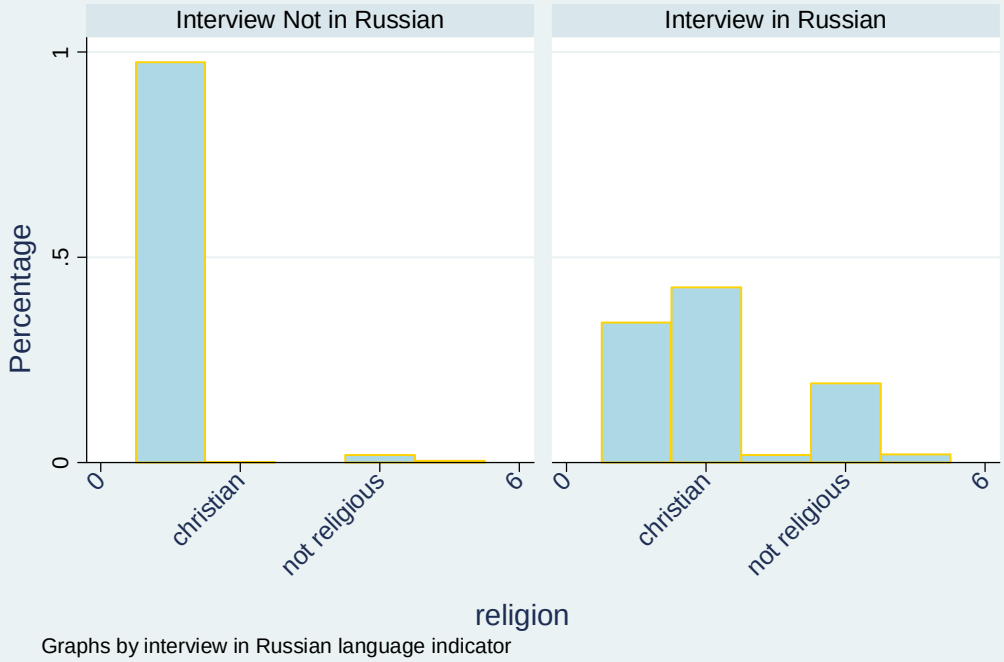
Figure 5a below presents a picture of the distribution of religious affiliation in the DHS data. The proportions in these graphs were weighted to represent population based proportions. The distributions are similar to the distributions reported for 2003 in the ARDA database and the 2003 Kyrgyzstan World Values Survey. The dominant religion is Islam, and the greatest diversity in religious affiliation is found in Kazakhstan. Figure 5b presents the distributions for Kazakhstan in 1995 and 1999, and Figure 5c presents the distributions for Uzbekistan in 1996 and 2002. There is no significant change in religious affiliation over time in Uzbekistan, but in Kazakhstan there was a significant decline in Christian affiliation and increases in Islam and no religious affiliation. Part of the decline in Christian affiliation is due to the large outmigration of Russians from Kazakhstan after the breakup of the Soviet Union.

Figure 5a. Religion in Central Asia



Graphs by country

Figure 5b. Religion in Kazakhstan in 1995 and 1999



Graphs by interview in Russian language indicator

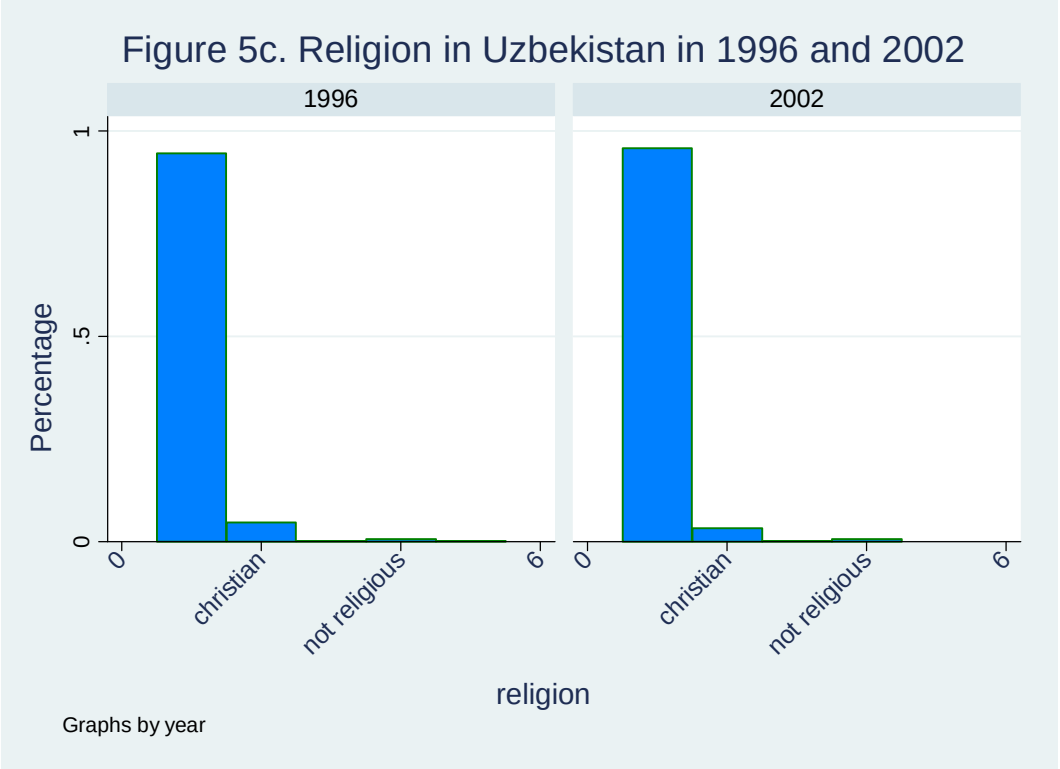


Figure 5c. Religion in Uzbekistan in 1996 and 2002
1996
2002
Percentage
0
.5
1
0
christian
not religious
6
religion
Graphs by year

Figures 6a-6d present the distributions of religious affiliation by ethnicity.

Figure 6a shows the distributions for Kazakhs –Russian speaking and non-Russian speaking– for 1995 and 1999 combined. Islam is the dominant religion, but there is a larger proportion with no religious affiliation among Russian-speaking Kazakhs than among other Kazakhs. Figures 6b for Kyrgyz and 6c for Uzbeks indicate that almost all persons in these ethnic groups are Muslims.

Figure 6a. Religion among Kazakhs by Russian language interview

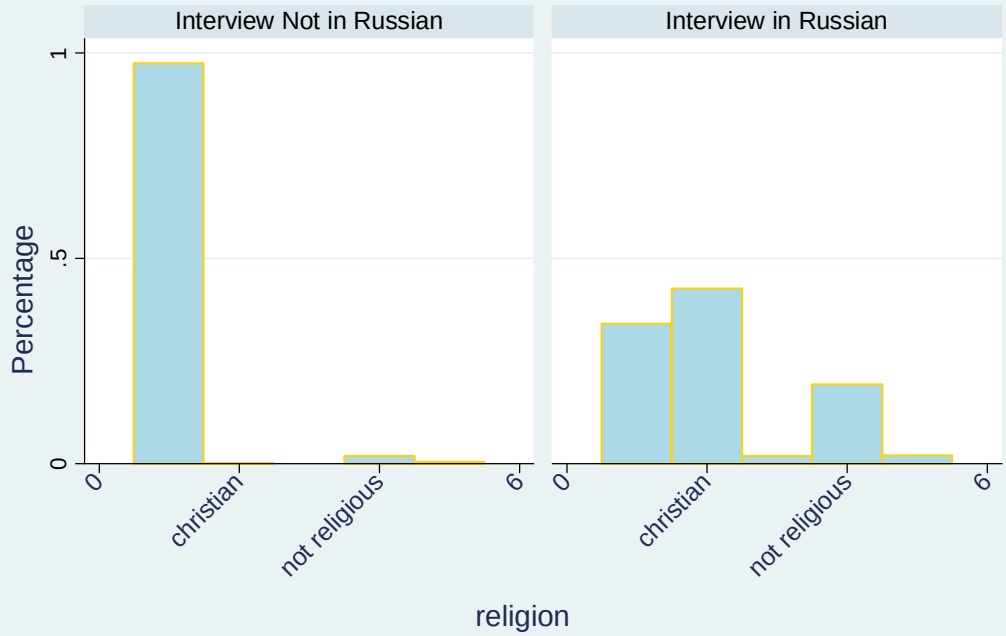


Figure 6b. Religion among Kyrgyz

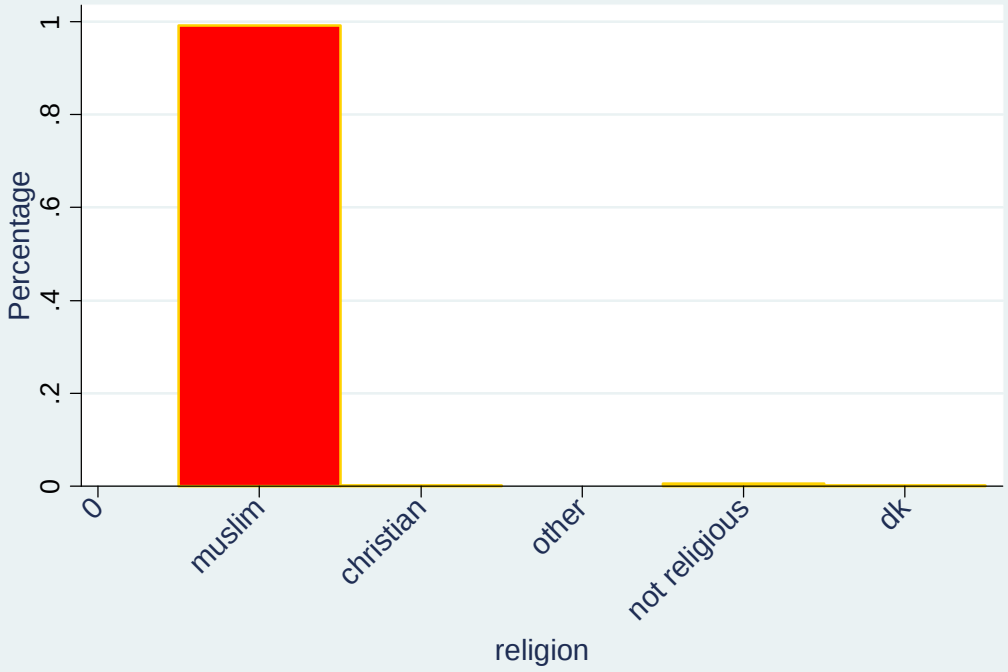


Figure 6c. Religion among Uzbeks

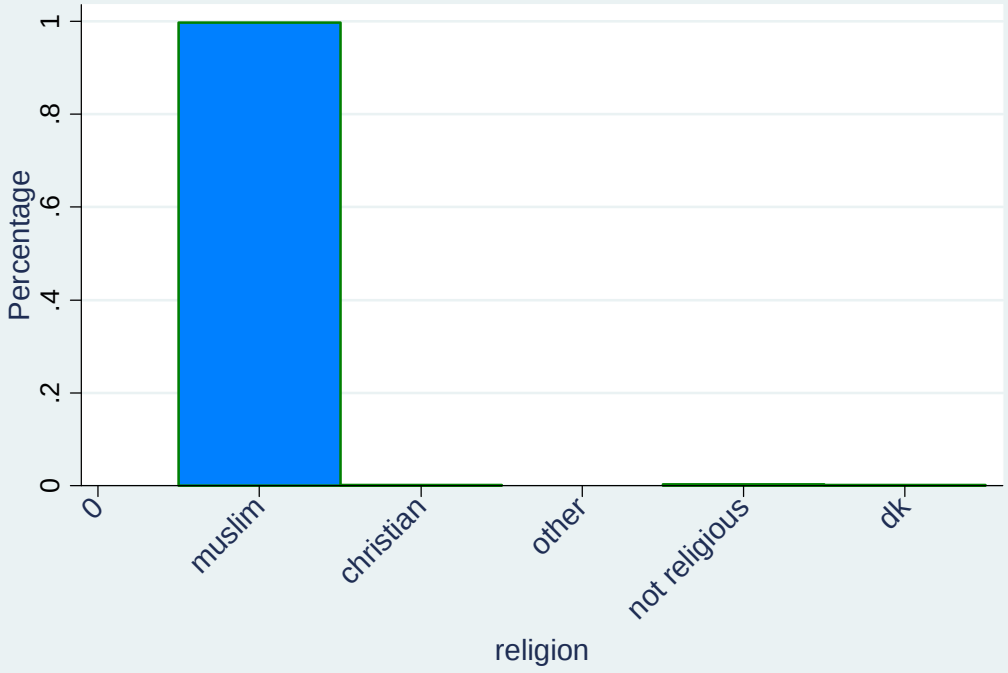
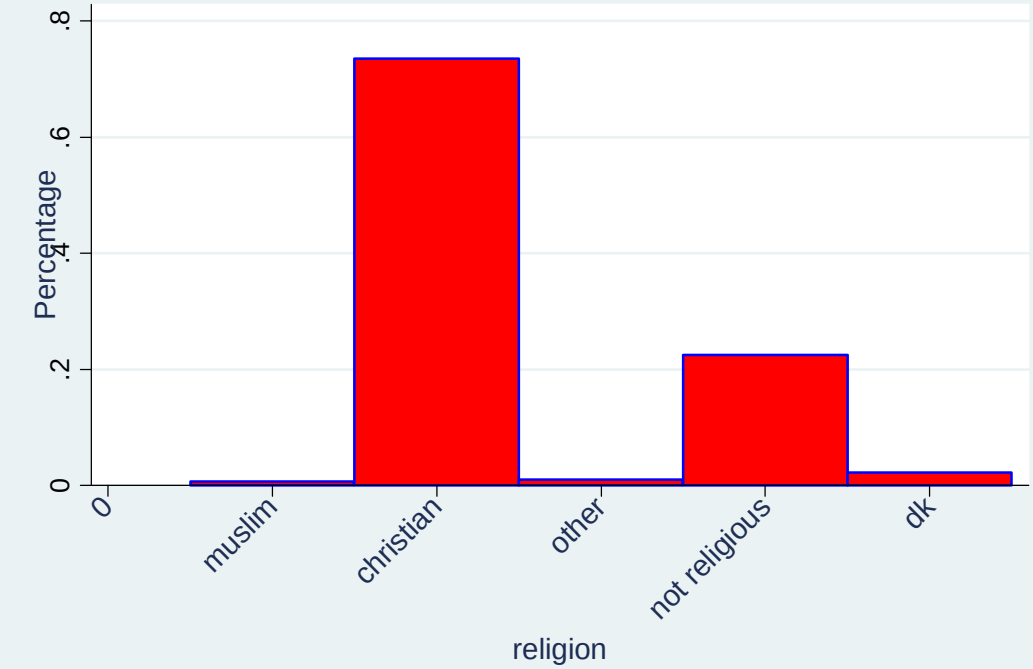


Figure 6d presents the distribution of religious affiliation for Russians and other Slavic ethnicities. The dominant religious affiliation is Christian (primarily Orthodox), but a large fraction of the population of Slavic Central Asians report no religion. Altogether, Figures 6a-6d demonstrate the close connection between religion and ethnicity. They also demonstrate that the more Russified women are the most likely to report no religious affiliation. Almost all non-Russian speaking Kyrgyz and Uzbeks are Muslim.

FIgure 6d. Religion among Russians and other Slavic ethnic groupgs



The results in Tables 4a-4e indicate some influence of religion on contraceptive knowledge and choice. Christians and those with no religious affiliation are more likely to have knowledge of the ovulatory cycle and modern contraception, to use modern contraception, and to have had at least one abortion. The strongest effects of religion on

contraception are consistently in Kazakhstan where religious diversity is the greatest. Only with abortion do we find strong positive effects of Christian affiliation relative to Islam in all three countries. This is an interesting result because abortion is believed to be morally unacceptable in standard Orthodox doctrine but is generally acceptable among Moslems if performed early in the pregnancy. There are no significant direct effects of ethnicity on contraception once we control for religion.

Over time in Kazakhstan and Uzbekistan, there is some indication that differences in contraceptive behavior among the three religious groups narrowed in both countries. We estimated separate yearly models for Kazakhstan and Uzbekistan which are available from the authors. By 2002, there were no differences in knowledge or use of contraception or abortion based on religious affiliation. In 1996, Christians were more likely to choose abortion or modern contraception; by 2002 the Christian premium evaporated. In Kazakhstan in 1995, Christians were more likely to choose abortion than Muslims, and they had greater knowledge of how to use their menstrual cycle to prevent pregnancies; by 1999 on both dimensions, Christians and Muslims were more similar. The largest changes occurred in the comparison between those with no religious affiliation and Muslims. By 1999 the non-religious were more likely to use abortion than Muslims, but the differences in their knowledge and use of modern contraception declined by over 50 percent.

Table 4a. Linear probability model of knowledge of menstrual cycle

Variable	cycleall	cycleky	cyclekz	cycleuz
Religion:				
Not religious	0.057	0.396*	0.084	-1.026
Christian	0.150***	-0.079	0.154***	0.107
Ethnicity:				
Russian	0.039	0.144	0.037	0.134
European	-0.021	0.070	-0.026	
Central Asia				
Russian Lang	0.042***	0.040	0.049***	0.004
Survey:				
Kz 1995	-0.030**			
Kz 1999	0.069***		0.097***	
Uz 1996	-0.082***			
Age:				
20-24	0.102***	0.103***	0.137***	0.064***
25-29	0.178***	0.153***	0.238***	0.110***
30-34	0.187***	0.182***	0.239***	0.121***
35-39	0.184***	0.208***	0.232***	0.085***
40-44	0.202***	0.254***	0.232***	0.119***
45-49	0.181***	0.184***	0.220***	0.158***
Education:				
Special sec	0.097***	0.094***	0.102***	0.097***
Higher ed	0.191***	0.174***	0.186***	0.223***
Residence in childhood:				
Large city	0.038***	0.054*	0.036*	0.039**
Town	0.014	-0.005	0.022	0.008
Wealth	0.046***	0.023**	0.058***	0.046***
Intercept	0.009	-0.003	-0.064***	-0.017*

* p<0.05; ** p<0.01; *** p<0.001

Table 4b. Linear probability model of knowledge of modern contraception

Variable	kmodall	kmodky	kmodkz	kmoduz
Religion:				
Not religious	0.056**	-0.014	0.059***	-0.295
Christian	-0.008	0.014	0.011	-0.007
Ethnicity:				
Russian	0.010*	-0.002	0.001	0.044*
European	0.009	0.010	-0.004	
Central Asia				
Russian lang	0.009*	0.010	0.016***	0.011
Survey:				
Kz 1995	-0.019***			
Kz 1999	-0.011**		0.007*	
Uz 1996	-0.060***			
Uz 2002	-0.053***			0.011
Age:				
20-24	0.151***	0.101***	0.054***	0.227***
25-29	0.175***	0.099***	0.060***	0.275***
30-34	0.178***	0.105***	0.061***	0.280***
35-39	0.175***	0.106***	0.056***	0.281***
40-44	0.170***	0.102***	0.058***	0.269***
45-49	0.163***	0.105***	0.049***	0.264***
Education:				
Special sec	0.015***	0.019***	0.016***	0.029***
Higher ed	0.015***	0.021***	0.014***	0.018**
Residence in childhood:				
Large city	0.022***	0.006	0.010**	0.024**
Town	0.004	0.005	-0.001	0.003
Wealth	0.013***	0.009**	0.007**	0.022***
Intercept	0.823***	0.881***	0.900***	0.685***

* p<0.05; ** p<0.01; *** p<0.001

Table 4c. Linear probability model of the use of modern contraception

Variable	All	Kyrgyzstan	Kazakhstan	Uzbekistan
Religion:				
Not religious	0.478***	0.050	0.287***	-0.035
Christian	0.033	0.028	0.082*	0.213*
Ethnicity:				
Russian	0.018	0.076	0.012	-0.115
European	0.001	0.166	0.032	
Central Asia				
Russian lang	0.010	0.012	0.019	-0.051
Survey:				
Kz 1995	-0.095***			
Kz 1999	-0.057***		0.042***	
Uz 1996	-0.065***			
Uz 2002	0.043***			0.103***
Age:				
20-24	0.369***	0.390***	0.340***	0.378***
25-29	0.676***	0.659***	0.626***	0.714***
30-34	0.764***	0.776***	0.714***	0.789***
35-39	0.777***	0.798***	0.702***	0.818***
40-44	0.752***	0.778***	0.693***	0.783***
45-49	0.646***	0.715***	0.566***	0.682***
Education:				
Special sec	0.014	0.032*	0.034**	0.002
Higher ed	-0.025**	-0.026	0.018	-0.042***
Residence in childhood:				
Large city	0.004	0.014	0.030*	-0.025*
Town	-0.000	0.027	0.016	-0.008
Wealth	0.013***	0.014	0.023***	0.010
Intercept	0.046***	0.033**	-0.023*	-0.021**

* p<0.05; ** p<0.01; *** p<0.001

Table 4d. Linear probability model of pregnancy termination

Variable	All	Kyrgyzstan	Kazakhstan	Uzbekistan
Religion:				
Not religious	0.282***	0.259	0.210**	-0.312
Christian	0.234***	0.257***	0.294***	0.316**
Ethnicity:				
Russian	-0.044*	-0.130*	-0.019	-0.153
European	0.009	-0.093	0.040	
Central Asia				
Russian lang	0.048***	0.041	0.083***	0.057
Survey:				
Kz 1995	-0.067***			
Kz 1999	-0.085***		-0.019*	
Uz 1996	-0.144***			
Uz 2002	-0.178***			-0.040***
Age:				
20-24	0.124***	0.163***	0.179***	0.075***
25-29	0.300***	0.392***	0.411***	0.193***
30-34	0.440***	0.540***	0.560***	0.312***
35-39	0.514***	0.621***	0.606***	0.404***
40-44	0.537***	0.695***	0.653***	0.385***
45-49	0.553***	0.709***	0.656***	0.412***
Education:				
Special sec	0.051***	0.042*	0.028**	0.049***
Higher ed	-0.007	-0.001	-0.050***	0.027*
Residence in childhood:				
Large city	0.003	-0.024	-0.013	0.038**
Town	0.004	0.035	0.017	0.003
Wealth	0.031***	0.025**	0.027***	0.032***
Intercept	0.072***	0.005	-0.081***	0.004

* p<0.05; ** p<0.01; *** p<0.001

Table 4e. Regression model of the abortion ratio

Variable	All	Kyrgyzstan	Kazakhstan	Uzbekistan
Religion:				
Not religious	0.229***	0.382**	0.117*	0.263
Christian	0.283***	0.341***	0.308***	0.448***
Ethnicity:				
Russian	-0.023	-0.098	-0.002	-0.224**
European	0.026	-0.004	0.061	
Central Asia				
Russian lang	0.089***	0.093***	0.099***	0.091***
Survey:				
Kz 1995	-0.017*			
Kz 1999	-0.026***		-0.006	
Uz 1996	-0.061***			
Uz 2002	-0.048***			0.011*
Age:				
20-24	0.054***	0.044	0.063	0.042***
25-29	0.087***	0.085**	0.105**	0.065***
30-34	0.120***	0.118***	0.147***	0.089***
35-39	0.136***	0.127***	0.156***	0.114***
40-44	0.141***	0.133***	0.173***	0.103***
45-49	0.148***	0.144***	0.182***	0.108***
Education:				
Special sec	0.016***	0.033***	0.002	0.020**
Higher ed	0.009	0.021	-0.002	0.021***
Residence in childhood:				
Large city	0.019***	-0.002	0.014	0.024***
Town	0.007	0.047	0.003	0.011
Wealth	0.031***	0.038***	0.040***	0.017***
Intercept	0.015	0.014	-0.022	-0.025***

* p<0.05; ** p<0.01; *** p<0.001

Tables 5a-5c present results from estimation of models of premarital sex, never married, and age at marriage. Premarital sex is most common among the not religious in Kazakhstan and among Christians in Uzbekistan. Over time, however, these differences narrowed so that by 2002 there were no religious differences in premarital sex in Uzbekistan. The differences in the probability of marriage by religion were small on average and dissipated by 2002.

However, there were significant differences among religious groups in the age at marriage in Kazakhstan and Uzbekistan, but the patterns were not the same. In Kazakhstan, Muslim women married on average later than Christian women or women with no religious preference, and over time the differences narrowed by 2 years between those with no religious affiliation and Muslim women but increased by a year between Muslim and Christian women. In Uzbekistan, Christian women married later than other women, but this difference had disappeared by 2002.

Tables 6a-6c illustrate the differences in marital fertility patterns by religious affiliation. On average Christian women had 1-2 fewer children than other women in all three countries, but the differences shrank over time. By 2002 in Uzbekistan there were no differences among religious and non-religious women in the number of children that they bore, and the differences were much smaller in Kazakhstan by 1999. However, consistent with their earlier age at marriage, non-religious women were younger when they had their first birth than other women in Kazakhstan, but there were no differences in the length of time between marriage and birth. In Uzbekistan, Christian women were considerably older than other women when they had their first birth, and the interval between marriage and birth was about nine months on average in 1996. By 2002 there

were no significant differences in the first birth interval.

Table 5a. Linear probability model of premarital sex

Variable	All	Kyrgyzstan	Kazakhstan	Uzbekistan
Religion:				
Not religious	0.461***	0.045	0.288***	0.057
Christian	0.105**	0.220**	0.143***	0.309**
Ethnicity:				
Russian	0.054*	0.022	0.048	-0.142
European	-0.096*	-0.078	-0.050	
Central Asia				
Russian lang	0.076***	0.041	0.086***	0.033
Survey:				
Kz 1995	0.053***			
Kz 1999	0.103***		0.056***	
Uz 1996	-0.030***			
Uz 2002	-0.008			0.016***
Age:				
20-24	-0.088***	-0.018	-0.156***	0.003
25-29	-0.119***	-0.021	-0.243***	-0.002
30-34	-0.130***	-0.044	-0.274***	0.003
35-39	-0.148***	-0.042	-0.320***	0.000
40-44	-0.160***	-0.042	-0.342***	0.002
45-49	-0.184***	-0.065*	-0.369***	-0.012
Education:				
Special sec	-0.000	0.029**	0.010	-0.006
Higher ed	0.023***	0.034*	0.070***	-0.003
Residence in childhood:				
Large city	0.030***	-0.013	0.072***	0.001
Town	0.008	0.053	0.015	0.008
Wealth	0.002	0.000	0.015*	0.000
Intercept	0.143***	0.051*	0.314***	0.005

* p<0.05; ** p<0.01; *** p<0.001

Table 5b. Linear probability model of never married

Variable	All	Kyrgyzstan	Kazakhstan	Uzbekistan
Religion:				
Not religious	-0.171***	0.103	-0.158**	0.494
Christian	0.023	0.054	-0.005	0.134
Ethnicity:				
Russian	-0.028	-0.103*	-0.021	-0.157
European	-0.024	-0.142	-0.008	
Central Asia				
Russian lang	0.031***	0.040	0.025*	0.030
Survey:				
Kz 1995	0.046***			
Kz 1999	0.079***		0.032***	
Uz 1996	-0.000			
Uz 2002	0.013*			0.023***
Age:				
20-24	-0.596***	-0.660***	-0.514***	-0.629***
25-29	-0.823***	-0.824***	-0.781***	-0.852***
30-34	-0.868***	-0.840***	-0.845***	-0.895***
35-39	-0.879***	-0.860***	-0.863***	-0.890***
40-44	-0.887***	-0.860***	-0.871***	-0.902***
45-49	-0.881***	-0.850***	-0.859***	-0.897***
Education:				
Special sec	0.008	0.003	-0.000	0.030***
Higher ed	0.068***	0.056***	0.086***	0.048***
Residence in childhood:				
Large city	0.007	0.012	0.018	-0.005
Town	0.011	-0.003	0.010	0.011
Wealth	0.008***	0.013*	0.012**	0.002
Intercept	0.863***	0.861***	0.883***	0.875***

* p<0.05; ** p<0.01; *** p<0.001

Table 5c. Regression model of age at marriage

Variable	All	Kyrgyzstan	Kazakhstan	Uzbekistan
Religion:				
Not religious	-4.097***	-1.122	-1.939**	2.162
Christian	0.218	-0.607	-0.945**	2.735**
Ethnicity:				
Russian	0.070	0.774	0.090	-2.255**
European	0.624	1.877*	0.101	
Central Asian				
Russian lang	0.482***	0.586*	0.229*	0.807**
Survey:				
Kz 1995	0.643***			
Kz 1999	0.826***		0.116	
Uz 1996	-0.106			
Uz 2002	-0.274***			0.003
Age:				
20-24	1.522***	1.422***	1.564***	1.421***
25-29	2.384***	2.474***	2.724***	2.025***
30-34	2.929***	3.026***	3.310***	2.594***
35-39	3.193***	3.364***	3.875***	2.644***
40-44	3.185***	2.847***	3.988***	2.646***
45-49	3.081***	2.713***	3.918***	2.531***
Education:				
Special sec	0.976***	1.049***	1.014***	0.992***
Higher ed	2.163***	2.540***	2.404***	1.741***
Residence in childhood:				
Large city	-0.014	-0.080	-0.050	0.182
Town	-0.038	0.036	-0.142	0.079
Wealth	0.032	0.084	0.030	-0.067
Intercept	16.711***	16.567***	16.971***	16.835***

* p<0.05; ** p<0.01; *** p<0.001

Table 6a. Regression of the number of children ever born

Variable	All	Kyrgygstan	Kazakhstan	Uzbekistan
Religion:				
Not religious	1.324***	-0.528	0.897***	-5.236*
Christian	-1.796***	-1.836***	-1.385***	-2.032***
Ethnicity:				
Russian	0.220*	0.421	0.017	0.881*
European	-0.076	0.635	-0.138	
Central Asia				
Russian lang	-0.567***	-0.534***	-0.530***	-0.503***
Survey:				
Kz 1995	-0.134***			
Kz 1999	-0.366***		-0.197***	
Uz 1996	0.059			
Uz 2002	-0.123***			-0.234***
Age:				
20-24	0.900***	1.121***	0.772***	0.934***
25-29	1.966***	2.144***	1.669***	2.115***
30-34	2.770***	2.993***	2.288***	3.050***
35-39	3.461***	3.858***	2.848***	3.761***
40-44	3.922***	4.430***	3.172***	4.397***
45-49	4.216***	5.034***	3.362***	4.699***
Education:				
Special sec	-0.349***	-0.431***	-0.300***	-0.305***
Higher ed	-0.665***	-0.818***	-0.706***	-0.543***
Residence in childhood:				
Large city	-0.122***	-0.217***	0.016	-0.289***
Town	-0.130***	-0.166	-0.081	-0.176***
Wealth	-0.182***	-0.209***	-0.206***	-0.084***
Intercept	0.485***	0.324***	0.681***	0.436***

p<0.05; ** p<0.01; *** p<0.001

Table 6b. Age at first birth

Variable	All	Kyrgyzstan	Kazakhstan	Uzbekistan
Religion:				
Not religious	-3.517***	0.731	-2.201***	3.445
Christian	0.148	-0.313	-0.937**	4.036***
Ethnicity:				
Russian	0.036	0.451	0.103	-3.546***
European	0.509	1.539	0.202	
Central Asian				
Russian lang	0.513***	0.467	0.227	0.574
Survey:				
Kz 1995	0.489***			
Kz 1999	0.610***		0.046	
Uz 1996	-0.067			
Uz 2002	-0.329***			-0.100
Age:				
20-24	1.646***	1.372***	1.449***	1.727***
25-29	2.713***	2.644***	2.785***	2.537***
30-34	3.442***	3.276***	3.544***	3.339***
35-39	3.783***	3.673***	4.151***	3.491***
40-44	3.787***	3.329***	4.252***	3.448***
45-49	3.900***	3.158***	4.472***	3.577***
Education:				
Special sec	0.853***	0.940***	0.978***	0.813***
Higher ed	2.126***	2.568***	2.518***	1.598***
Residence in childhood:				
Large city	0.094	0.013	0.115	0.146
Town	0.007	0.116	-0.021	0.078
Wealth	0.029	0.020	0.070	-0.090*
Intercept	17.485***	17.491***	17.842***	17.530***

* p<0.05; ** p<0.01; *** p<0.001

Table 6c. Length of first birth interval

Variable	All	Kyrgyzstan	Kazakhstan	Uzbekistan
Religion:				
Not religious	-0.111	15.816	-2.521	2.952
Christian	3.218*	2.954	1.604	9.122*
Ethnicity:				
Russian	-0.304	-0.667	0.566	-6.306
European	-0.458	-5.677	0.034	
Central Asia				
Russian lang	0.589	0.395	0.465	-0.354
Survey:				
Kz 1995	-1.067*			
Kz 1999	-2.144***		-1.089*	
Uz 1996	1.580***			
Uz 2002	-0.418			-2.129***
Age:				
20-24	0.599	-1.860	0.356	1.860**
25-29	2.081***	-0.342	1.134	3.391***
30-34	3.425***	0.364	2.272*	5.380***
35-39	3.936***	1.195	2.789*	5.724***
40-44	4.408***	2.124	3.172**	6.189***
45-49	6.509***	2.675	4.551***	8.997***
Education:				
Special sec	-1.511***	-1.233*	-0.819	-2.135***
Higher ed	-0.441	-0.099	-0.169	-1.030
Residence in childhood:				
Large city	1.012**	0.304	1.665*	0.134
Town	-0.050	-1.236	0.472	-0.261
Wealth	-0.044	-0.810*	0.468	-0.205
Intercept	13.465***	15.371***	13.387***	13.919***

p<0.05; ** p<0.01; *** p<0.001

CONCLUSION

Table 7 below summarizes the differences we measured in demographic outcomes in Kazakhstan, Kyrgyzstan, and Uzbekistan between 1995 and 2002. In Uzbekistan, 1996 was a transition year; religious freedom was the law, the state was secular, and religious participation increased; by 2002 many restrictions had been placed on religious participation and practice. We find on all demographic indicators a narrowing of the initial differences in demographic behavior by religion in Uzbekistan between 1996 and 2002 so that by 2002 there were no discernable effects of religious affiliation on these outcomes except for age at marriage. Even for age at marriage, the difference between the age at marriage of non-religious women and other women narrowed.

In Kazakhstan we also observed significant change in the impact of religion on demographic outcomes between 1995 and 1999, but the patterns were different than in Uzbekistan. On many dimensions the differences narrowed over time, but in some cases the patterns reversed. In both years Muslim women were less likely to use modern contraception or abortion or engage in premarital sex. However, by 1999 they married later than other women, were older when they had their first child, and had fewer births. Residents of Kyrgyzstan were similar in background to residents of Kazakhstan, but the religious differences in the demographic outcomes in Kyrgyzstan for 1997 before the implementation of restrictions on religious practice were in some respects more similar to Uzbekistan than Kazakhstan. In 1997 Muslim women had the least knowledge about birth control and were the least likely to use abortion or engage in premarital sex; this pattern was also evident in Kazakhstan and Uzbekistan. There were no differences in age at marriage or first birth as in Uzbekistan, but Muslim women in Kyrgyzstan had more

children as in Kazakhstan and shorter birth intervals than Christians. Their fertility behavior and attitudes towards abortion wee consistent with the attitudinal patterns expressed in 2003 in the World Values Survey.

On many dimensions of demographic behavior – contraceptive knowledge and use – differences between Muslim, Christian, and non-religious women were evident and followed consistent patterns in all countries. On other dimensions, religion influenced marriage and fertility behavior in unique ways within countries. Religion has been an important influence on demographic behavior, but it has been tempered by the time and the location of the household. Continuing restriction of religious custom and practice in all countries of Central Asia in the long run may alter demographic behavior, but the most significant causes of demographic change over the transition period reflect the changing economic status of the household and widening inequality in wealth and education. The educated and the wealthy tend to delay marriage, use contraception and abortion more regularly, delay births, and to have smaller families than poorer or less educated households. These trends in wealth and education are as important to explaining demographic differences across and within countries as cultural and religious traditions in Central Asia.

Table 7. Summary of demographic differences

	Kyrgyzstan, 1997	Kazakhstan, 1995	Kazakhstan, 1999	Uzbekistan, 1996	Uzbekistan, 2002
Cycle	NR > (CH = M)	CH > (NR = M)	CH > (NR = M)	NR = CH = M	Not available
Knowledge: contraception	CH > (NR = M)	NR > CH > M	NR = CH = M	(CH = M) > NR	NR = CH = M
Use: modern contraception	NR = CH = M	NR > (CH = M)	(NR = CH) > M	NR = CH = M	NR = CH = M
Terminate pregnancy	NR > CH > M	CH > (NR = M)	NR > CH > M	NR = CH = M	NR = CH = M
Abortion ratio	NR > CH > M	CH > (NR = M)	CH > NR > M	CH > (NR = M)	NR = CH = M
Premarital sex	CH > (NR = M)	NR > (CH = M)	(NR = CH) > M	CH > (NR = M)	NR = CH = M
Never married	NR = CH = M	NR < (CH = M)	NR < (CH = M)	NR = CH = M	NR = CH = M
Age at marriage	NR = CH = M	NR < (CH = M)	NR < CH < M	CH > NR > M	NR < (CH = M)
Children ever born	CH < (NR = M)	CH < M < NR	CH < (NR = M)	NR < CH < M	NR = CH = M
Age at first birth	NR = CH = M	NR < (CH = M)	NR < CH < M	CH > (NR = M)	NR = CH = M
1st birth interval	NR > (CH = M)	NR = CH = M	NR = CH = M	CH > NR > M	NR = CH = M

Appendix Table A.1. Religious freedom timeline for Central Asia, 1991-2007

	Kazakhstan	Kyrgyzstan	Tajikistan	Turkmenistan	Uzbekistan
1991	**Independence**	**Independence**	**Independence**	**independence**	**independence**
1992			**Civil War begins:** Islamic parties/democratic forces vs neo-Communist rule	1.Caps visits to Mecca on Hajj; govt transport only 2.Constitution declares TK a secular state and guarantees freedom of religion	Constitution promises freedom of religion; freedom of expression may be limited by the state
1993		Constitution guarantees freedom of religion	Civil War		
1994			1.Civil war 2.Constitution declares TJ a secular & democratic state		
1995	Constitution declares KZ a secular state; religious org. must register, at least 10 adherents		Civil War	Requires 500 adherents to register as legal religious org.	
1996		1.State Commission on Religious Affairs to promote tolerance **2.Consitution amended to give President more power**	Civil War		
1997		1.All religious groups (each congregation) must register with commission 2.Catholic Mission 3.Special units control activities of Wahhabis and other sects	**Agreement on Peace and National Reconciliation: End of Civil War**	New religion law bans all relig. groups except state-controlled Sunni Muslim Board & Russian Orthodox	

	Kazakhstan	Kyrgyzstan	Tajikistan	Turkmenistan	Uzbekistan
1999	**1.President reelected with no opposition** 2.Govt. raid on a religious meeting 3.Commission to develop policies to combat religious extremism		Constitution states that state is secular and religious parties can be formed	**People's Council eliminates term limits for the President**	1.Arrests of members of groups thought to promote Islamic extremism
2000	**1.Economic Security Strategy thru 2010** 2.More border security following incursions by Islamic extremists into KR and UZ 3.New Mufti of Natl. Muslim Org., govt selection maybe 4.Recalls students studying at relig. insti. in Islamic countries w/o mutual recognition diplomas	Detentions for distributing extremist literature		1.Religious leader arrested 2.Unregistered mosque and religious school destroyed	1.Union of Baptists denied summer camp
2001		1.In Jalal-Abad, court tries Muslims who converted to Christianity 2.New Religion Law: registration, tight control over religious activities 3.Increased monitoring of mosques & religious schools **4.Joins SCO: fight ethnic & religious militancy; economic cooperation**	1.Loudspeakers banned from mosques in Dushanbe	1.Bans printing of religious text other than Rukhnama (President is author) 2.Imported Bibles & Korans scrutinized	

	Kazakhstan	Kyrgyzstan	Tajikistan	Turkmenistan	Uzbekistan
2003	Ministry of Education bans visits to religious asso. and confessions by school children	1.State Muftiate grants Islamic Institute univ. status; develops std. curriculum for other institutes 2.Supreme Court bans four political org. for religious extremist activities **3.Voting irregularities** 4.Mosques closed in Jalal-Abad 5.Decree to combat religious extremism (database, information, prevention) **6.President granted lifelong immunity from prosecution**	1. Closed 152 mosques in N. TJ **2.Constitution changed to allow President to stay 17 more years**	1.Most religious activity banned 2.Criminal penalties for illegal religious activity 3.Restricts exit visas	1.Restricts activities of international faith-based NGOs 2.Bans websites offering information on religious developments in UZ
2004		1.Islamic Institute oversees all Islamic schools 2.Special board to review religious literature, but not activated	1.Jehovah's Witness has trouble registering new place of worship.	1.Rescinds exit visas from 2003 2. 7 mosques destroyed, no new ones built 3.some small religious groups allowed to register (foreign policy) 4.Gegenshi of Religious Affairs appoints all imams 5.Decriminalizes some religious activity, reduces registration requirements	Wearing of hijab (headscarf) in public banned in s. UZ

	Kazakhstan	Kyrgyzstan	Tajikistan	Turkmenistan	Uzbekistan
2005	1.Circular to teachers to watch children who were exposed to religious & political extremism 2.Anti-extremism law in effect: designate org.,ban activities, criminalize 3.First apolitical religious org. banned 4.Amendments to religious law: annual registration of missionaries; religious training cannot affect child's phys or moral health; can refuse org. with teaching components	**President Akayev overthrown and flees the country.**	1.Government issues textbooks of history of Islam 2.Girls cannot wear hijab in public education institution	1.Imams forced to hang list of members over door to mosque; only those on the list can enter. 2.Imams told to not read Koran, only Rukhnama 3.Stops construction of Orthodox cathedral	1.Denied permission to Russian Orthodox Church to bring relics into UZ **2. Andijan: troops fire on suspected extremists, 180+ killed** 3.Last legal Protestant church closed in Karakalpakstan; all Protestant org. banned 4.Police hunt down religious literature 5.Increase fines for violations of religious laws
2006	1.Hare Krishna evicted from Karashi		1.Draft law to replace old religion law: ban political activity by relig. org.; forbid children <8 from studying religion;incr. adherents needed to register relig. org. 2.Demolish only synagogue in Dushanbe 3.New religion bill put on hold	1.Meetings disrupted for Hare Krishna, Baptists, others 2.Last Armenian Apostolic Church destroyed 3.Russian Baptist deported w/o family 4.Only 188 allowed on Hajj **5.President Niyazov dies**	**1.US State Dept.: concerns about human rights violations** 2.1000 copy limit in UZ on any relig. book 3.Increased fine for illegal printing/storing relig. lit. & criminalized produce lit. promoting religious hatred 3.Religious school closed in Tashkent

	Kazakhstan	Kyrgyzstan	Tajikistan	Turkmenistan	Uzbekistan
2007 (January-August)	1.Draft of new Religion Law: unreg. relig. activity banned; no lit. from relig.org. with <50 members or having open worship or charity 2.State Program of Patriotic Education: how not to fall under influence of religious sects		New draft religious law up for debate:	1.Official newspaper declares it is every Muslim's duty to go on the Hajj 2.Resumes practice of jailing religious conscientious objectors.	1.Prominent Russian language religious news website banned. 2.Local govts. order Imams to speak out against extremism (including those who practice Islam outside of govt. control) 3. Last Jehovah's Witness group told activities were illegal.

Source: Freedom House and various new reports.

Appendix Table A.2a. Multinomial logit models of religious identity: Christian

Variable	All	All	Kyrgyzstan	Kazakhstan	Uzbekistan
Ethnicity:					
Slavic	7.858***	8.389***	9.080***	7.259***	8.880***
European	8.477***	9.311***	8.483***	24.874***	
Central Asia:					
speak Russ.	-1.052***	-0.129	-0.010	-1.413***	0.539
Survey:					
Kz 1995	1.221***				
Kz 1999	1.136***			-0.024	
Uz 1996	-0.358				
Uz 2002	-1.205***				-0.874**
Age:					
20-24	0.171	0.082	-0.154	0.284	-0.047
25-29	0.117	0.075	-0.339	0.289	-0.206
30-34	-0.016	0.000	-0.937	0.087	0.313
35-39	0.215	0.289	0.200	0.284	0.126
40-44	0.222	0.358	-0.097	0.179	0.884
45-49	0.376	0.562**	0.008	0.483*	0.094
Education:					
Special sec.	0.323**	0.556***	0.345	0.295*	-0.005
Higher ed	0.023	0.039	0.308	-0.030	-0.289
Residence, childhood:					
Large city	0.864***	0.657***	1.346***	0.714***	0.948
Town	0.340	0.034	0.848	0.265	0.319
Residence, adult:					
Large city	0.575***	0.457**	1.091*	0.452*	0.661
Town	0.229	0.242	0.350	0.247	0.505
Years reside	0.004	-0.005	-0.002	0.004	0.010
Household:					
Male head	-0.351***	-0.429***	0.306	-0.391**	-0.357
Age head	-0.006	-0.011**	0.019	-0.008	-0.015
Phone	-0.389**	-0.369*	-1.845***	-0.196	-0.470
Tv	-0.469***	-0.531***	-0.703*	-0.360**	-0.600

```
       Radio |  -0.633*      -0.705**     -1.071       -0.480       -0.377
      Wealth |   0.817***     0.828***     1.414***     0.640***     1.247***
   Intercept |  -3.754***    -3.124***    -5.049***    -2.369***    -4.647***
-------------+------------------------------------------------------------------
* p<0.05; ** p<0.01; *** p<0.001
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Appendix Table A.2b. Multinomial logit models of religious identity: not religious

Variable	All	All	Kyrgyzstan	Kazakhstan	Uzbekistan
Ethnicity:					
Slavic	6.480***	7.177***	6.665***	6.490***	5.784***
European	7.595***	8.628***	6.352***	24.590	
Central Asia speak Russ.	0.151	1.331***	-0.711	0.439***	0.980*
Survey:					
Kz 1995	1.185***				
Kz 1999	1.346***			0.301**	
Uz 1996	-1.300***				
Uz 2002	-2.419***				-0.960**
Age:					
20-24	0.066	-0.035	-0.386	0.154	0.169
25-29	0.072	0.033	-0.299	0.190	-0.155
30-34	-0.230	-0.220	-1.004*	-0.148	0.192
35-39	-0.268	-0.193	-0.241	-0.214	-0.172
40-44	-0.108	0.030	-0.334	-0.154	0.120
45-49	-0.028	0.159	-0.411	0.067	0.272
Education:					
Special sec	0.278*	0.522***	0.164	0.250	0.409
Higher ed	0.338**	0.324**	0.390	0.283	0.352
Residence, childhood:					
Large city	0.583***	0.308**	1.597***	0.390**	0.847
Town	0.277	-0.087	0.976	0.172	0.362
Residence, adult:					
Large city	0.070	-0.044	1.836***	-0.330	0.451
Town	0.170	0.129	-0.259	0.167	0.846
Years reside	0.009*	0.001	-0.008	0.007	0.021
Household:					
Male head	-0.106	-0.150	0.456	-0.134	-0.552
Age head	-0.010**	-0.016***	-0.001	-0.009*	-0.014
Phone	-0.147	-0.143	-0.893*	-0.074	0.030
TV	-0.346**	-0.481***	-0.637*	-0.176	-0.674

```
      Radio |  -0.105       -0.181       -0.488        0.120       -1.416*
      Wealth |   0.634***     0.668***     1.047**      0.509***     0.706
   Intercept |  -3.809***    -3.224***    -4.458***    -3.034***    -4.020***
-------------+------------------------------------------------------------------
* p<0.05; ** p<0.01; *** p<0.001
```

Appendix Table A.3. Summary statistics, population weighted

Country	variable	mean	sd	min	max
Kazakhstan					
Religion:					
	Muslim	0.537	0.499	0.000	1.000
	Christian	0.295	0.456	0.000	1.000
	Not religious	0.139	0.346	0.000	1.000
Ethnicity:					
	Russian	0.322	0.467	0.000	1.000
	European	0.034	0.180	0.000	1.000
	Other regional	0.038	0.192	0.000	1.000
	Kazakh	0.500	0.500	0.000	1.000
	Kyrgyz	0.000	0.000	0.000	0.000
	Uzbek	0.005	0.070	0.000	1.000
	Russian speaking	0.241	0.428	0.000	1.000
Survey:					
	Kz 1995	0.440	0.496	0.000	1.000
	Kz 1999	0.560	0.496	0.000	1.000
	Uz 1996	0.000	0.000	0.000	0.000
	Uz 2002	0.000	0.000	0.000	0.000
	Kyrgyzstan	0.000	0.000	0.000	0.000
Age variables:					
	Current age	30.957	9.891	15.000	49.000
	15-19	0.170	0.376	0.000	1.000
	20-24	0.144	0.351	0.000	1.000
	25-29	0.142	0.349	0.000	1.000
	30-34	0.147	0.354	0.000	1.000
	35-39	0.153	0.360	0.000	1.000
	40-44	0.142	0.349	0.000	1.000
	45-49	0.102	0.303	0.000	1.000
Education:					
	Primary/secondary	0.386	0.487	0.000	1.000
	Special secondary	0.423	0.494	0.000	1.000
	Higher education	0.191	0.393	0.000	1.000
Residence in childhood:					
	Large city	0.273	0.446	0.000	1.000
	Town	0.126	0.332	0.000	1.000
	Village	0.601	0.490	0.000	1.000
Residence as adult:					
	Large city	0.198	0.398	0.000	1.000
	Town	0.362	0.481	0.000	1.000
	Village	0.440	0.496	0.000	1.000
Years current residence		19.921	12.949	0.000	49.000
Household variables:					
	Male head	0.710	0.454	0.000	1.000
	Age head	43.970	12.426	16.000	98.000
	Phone	0.401	0.490	0.000	1.000
	TV	0.479	0.500	0.000	1.000
	Radio	0.929	0.257	0.000	1.000
	Wealth	0.079	0.950	-2.467	1.521
Demographic outcomes:					
Knowledge of:					
	Menstrual cycle	0.339	0.474	0.000	1.000

Modern contraception	0.981	0.135	0.000	1.000
Contraception:				
Use modern contraception	0.616	0.486	0.000	1.000
Ever end a pregnancy	0.474	0.499	0.000	1.000
Number of abortions	1.136	2.170	0.000	40.000
Abortion ratio	0.270	0.285	0.000	1.000
Marriage and fertility:				
Had sex before marriage	0.238	0.426	0.000	1.000
Age at 1st intercourse	20.165	3.153	11.000	39.000
Age at marriage	20.587	3.237	10.000	41.000
Never married	0.245	0.430	0.000	1.000
Age at first birth	21.758	3.394	12.000	44.000
Children ever born	1.787	1.734	0.000	13.000
Sex ratio of births	0.509	0.365	0.000	1.000
Currently pregnant	0.033	0.178	0.000	1.000
Months to 1st birth	15.656	15.388	0.000	226.000

Kyrgyzstan

Religion:				
Muslim	0.863	0.343	0.000	1.000
Christian	0.107	0.309	0.000	1.000
Not religious	0.028	0.164	0.000	1.000
Ethnicity:				
Russian	0.107	0.309	0.000	1.000
European	0.006	0.076	0.000	1.000
Other regional	0.039	0.193	0.000	1.000
Kazakh	0.018	0.131	0.000	1.000
Kyrgyz	0.619	0.486	0.000	1.000
Uzbek	0.180	0.384	0.000	1.000
Russian speaking	0.046	0.209	0.000	1.000
Survey:				
Kz 1995	0.000	0.000	0.000	0.000
Kz 1999	0.000	0.000	0.000	0.000
Uz 1996	0.000	0.000	0.000	0.000
Uz 2002	0.000	0.000	0.000	0.000
Kyrgyzstan	1.000	0.000	1.000	1.000
Age:				
Current age	29.678	9.670	15.000	49.000
15-19	0.193	0.395	0.000	1.000
20-24	0.169	0.374	0.000	1.000
25-29	0.138	0.345	0.000	1.000
30-34	0.164	0.370	0.000	1.000
35-39	0.150	0.358	0.000	1.000
40-44	0.107	0.309	0.000	1.000
45-49	0.080	0.271	0.000	1.000
Education:				
Primary/secondary	0.534	0.499	0.000	1.000
Special secondary	0.299	0.458	0.000	1.000
Higher education	0.167	0.373	0.000	1.000
Residence in childhood:				
Large city	0.216	0.412	0.000	1.000
Town	0.041	0.198	0.000	1.000
Village	0.743	0.437	0.000	1.000
Residence in adulthood:				

Large city	0.135	0.341	0.000	1.000
Town	0.200	0.400	0.000	1.000
Village	0.665	0.472	0.000	1.000
Years current residence	15.229	11.744	0.000	49.000
Household variables:				
Male head	0.764	0.425	0.000	1.000
Age of head	45.902	13.541	16.000	96.000
Phone	0.276	0.447	0.000	1.000
TV	0.433	0.496	0.000	1.000
Radio	0.867	0.339	0.000	1.000
Wealth	-0.440	0.977	-2.467	1.521
Demographic outcomes:				
Knowledge of:				
Menstrual cycle	0.190	0.392	0.000	1.000
Modern contraception	0.971	0.169	0.000	1.000
Contraception:				
Use modern contraception	0.583	0.493	0.000	1.000
Ever end a pregnancy	0.416	0.493	0.000	1.000
Number of abortions	0.708	1.543	0.000	25.000
Abortion ratio	0.160	0.229	0.000	1.000
Marriage and fertility:				
Had sex before marriage	0.065	0.246	0.000	1.000
Age at 1st intercourse	19.820	2.722	14.000	38.000
Age at marriage	19.893	2.824	14.000	38.000
Never married	0.215	0.411	0.000	1.000
Age at first birth	21.207	2.945	14.000	40.000
Children ever born	2.351	2.216	0.000	13.000
Sex ratio of birth	0.520	0.332	0.000	1.000
Currently pregnant	0.057	0.233	0.000	1.000
Months to first birth	16.621	15.032	0.000	192.000

Uzbekistan

Religion:				
Muslim	0.952	0.213	0.000	1.000
Christian	0.039	0.194	0.000	1.000
Not religious	0.007	0.082	0.000	1.000
Ethnicity:				
Russian	0.034	0.181	0.000	1.000
European	0.000	0.000	0.000	0.000
Other regional	0.073	0.260	0.000	1.000
Kazakh	0.030	0.172	0.000	1.000
Kyrgyz	0.000	0.000	0.000	0.000
Uzbek	0.854	0.353	0.000	1.000
Russian speaking	0.020	0.142	0.000	1.000
Survey:				
Kz 1995	0.000	0.000	0.000	0.000
Kz 1999	0.000	0.000	0.000	0.000
Uz 1996	0.447	0.497	0.000	1.000
Uz 2002	0.553	0.497	0.000	1.000
Kyrgyzstan	0.000	0.000	0.000	0.000
Age:				
Current age	28.978	9.712	15.000	49.000
15-19	0.210	0.407	0.000	1.000
20-24	0.188	0.390	0.000	1.000

25-29	0.154	0.361	0.000	1.000
30-34	0.137	0.344	0.000	1.000
35-39	0.126	0.332	0.000	1.000
40-44	0.107	0.309	0.000	1.000
45-49	0.078	0.268	0.000	1.000
Education:				
Primary/secondary	0.623	0.485	0.000	1.000
Special secondary	0.156	0.363	0.000	1.000
Higher education	0.219	0.414	0.000	1.000
Residence in childhood:				
Large city	0.211	0.408	0.000	1.000
Town	0.151	0.358	0.000	1.000
Village	0.638	0.481	0.000	1.000
Residence in adulthood:				
Large city	0.139	0.346	0.000	1.000
Town	0.253	0.435	0.000	1.000
Village	0.608	0.488	0.000	1.000
Years current residence	22.346	12.168	0.000	49.000
Household variables:				
Male head	0.822	0.383	0.000	1.000
Age of head	48.146	13.906	16.000	97.000
Phone	0.295	0.456	0.000	1.000
TV	0.500	0.500	0.000	1.000
Radio	0.922	0.268	0.000	1.000
Wealth	-0.277	0.917	-2.467	1.521
Demographic outcomes:				
Knowledge of:				
Menstrual cycle	0.103	0.304	0.000	1.000
Modern contraception	0.899	0.302	0.000	1.000
Contraception:				
Use modern contraception	0.544	0.498	0.000	1.000
Ever terminate pregnancy	0.216	0.411	0.000	1.000
Number of abortions	0.370	1.043	0.000	19.000
Abortion ratio	0.093	0.177	0.000	1.000
Marriage and fertility:				
Had sex before marriage	0.024	0.152	0.000	1.000
Age 1st intercourse	19.715	2.676	10.000	39.000
Age at marriage	19.729	2.703	11.000	39.000
Never married	0.255	0.436	0.000	1.000
Age at first birth	21.068	2.847	12.000	41.000
Children ever born	2.207	2.120	0.000	14.000
Sex ratio of births	0.520	0.324	0.000	1.000
Currently pregnant	0.054	0.227	0.000	1.000
Months to first birth	17.402	16.724	0.000	283.000

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