Fertility and Education in Radical Islamic Sects
Evidence from Asia and Africa[*]

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Abstract

We investigate returns to education and fertility among members of Radical Islamic sects in Indonesia, Bangladesh, India, and Cote D'Ivoire. Fertility is significantly higher among families with members attending Islamic schools in all four countries. Returns to education are generally lower among these families, though that result is statistically significant in only two of the four samples. These findings are consistent with previous results for Ultra-Orthodox Jews in Israel and Christian Anabaptist sects in North America, suggesting a common pattern of behavior across sects of different religions. High fertility and low returns to schooling are broadly consistent with the predictions of a club-good model of religious sects.

1. Introduction

This paper looks at radical Islamic communities from an economic perspective. Iannaccone's (1992) economic theory of religious sects is fairly radical in itself, arguing that many behaviors of sect members which seem patently uneconomic, such as religious prohibitions and sacrifices, can be explained as rational choices of economic actors. That theory emphasizes the internal economies of communities which provide local public goods, such as mutual insurance, through collective action. The community functions as an economic club – an exclusive organization which provides a local public good to members. In a club sacrifices have an efficient role as signals of commitment which weed out free-riders in mutual insurance contracts. Prohibitions are effectively taxes on market activity. They induce substitution of members' time away from market activities to activities within the community that have positive externalities for other club members. The theory has strong testable implications that have been borne out in Iannaccone's studies of Christian sects (1992) and in Berman's (2000) subsequent work on the dominant Jewish sect, the Ultra-Orthodox.

Berman's (2000) extension of Iannaccone's theory predicts that members of religious sects should have high fertility because the effective tax on market activity lowers potential wages for women which in turn lowers fertility according to Becker's (1991) well known argument. That prediction is consistent with high fertility found in numerous studies of Christian Anabaptist sects and with both levels and changes in fertility among Ultra-Orthodox Jews (Berman, 2000). Another extension predicts that if religious education is used as a signal of commitment it should have low market returns. Those and other testable implications of the club approach are supported by the Israeli data on Ultra-Orthodox Jews.

This paper investigates every data source the authors could find on radical Islamic communities, following the practice of Berman and Klinov (1996) of identifying an individual as

1

a sect member if they or a family member attended an Islamic religious school[1]. That method produced four separate datasets with sufficient information to study returns to education and fertility, each in a different country: Indonesia, rural Bangladesh, rural parts of the Indian states of Uttar Pradesh and Bihar, and Cote D'Ivoire[2].

We find that fertility is significantly higher among graduates of Islamic schools in all four countries. Returns to education are generally lower among graduates of Islamic schools though that result is statistically significant in only two samples. In the other two samples returns are positive in one (Cote D'Ivoire) and negative in the other (the Indian states Uttar Pradesh and Bihar). These results as broadly consistent with the predictions of the club good approach, mimicking the findings of Berman (2000) for Jews and of Kraybill and Bowman (2001) (among others) on the fertility of Christian Anabaptist sects in North America.

The consistency of these findings across sects of different religions is striking. It indicates that a nondenominational economic model of religious communities may well be relevant for understanding the recent historical phenomenon of Radical Islam.

This paper is organized as follows: The next section provides background on Radical Islam and motivates the study of fertility and returns to schooling among sect members. Section 3 briefly reviews the club approach to radical religious groups, drawing out the implications for fertility and returns to education. Section 4 presents results for each of the four samples in turn, but first introduces the dataset by providing some background about Radical Islam in the that country. Section 5 discusses the broad implications of these results, and section 6 concludes.

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[1] We comment on the appropriateness of this classification system below.
[2] The choice of these countries was determined by the availability of data that contained the necessary information. The 1991 Pakistan Integrated Household Survey (PIHS) is another survey with such information. The results of the analysis of the PIHS data will be available in the next version of this paper.

2. Background

Radical Islam is a relatively recent religious innovation. Like Christian Anabaptist sects (such as the Hutterites, Mennonites and Pennsylvania Dutch) and the Jewish Ultra-Orthodox, Radical Islam is often described by historians as a reaction to the incursion of secular, market-driven, Western culture into traditional societies. Like those Christian and Jewish sects, the growth of Radical Islamic sects represents a paradox to economists. As markets increase the shadow value of time, price theory predicts the evolution of time-efficient forms of religious practice. Yet most religious sects that have evolved and flourished in recent history insist on increasingly *time-intensive* versions of practice (through prayer requirements, for example).

In the 20th century, in the face of urbanization, industrialization and attraction of a market-oriented culture, Muslim religious practice began to bifurcate towards secularism on the one hand and radicalism, Salafiyya and Wahhabism[3] on the other. Inspired by the ideas of Sayyid Qutb,[4] Salafiyya became very popular among Islamic radicals in the early 1980s (Amanat, 2001). Like Jewish Ultra-Orthodoxy and Christian Anabaptism, both Sunni and Shiite Radical Islam are more stringent than traditional religious practice. They regard secular influence as dangerous and corrupting. Salafiyya, for example, requires a true believer to "renounce the dark sacrilege of his secular surroundings" (Amanat, 2001). Historians, theologians, and political scientists view radical Islam as the "retrenchment" of a traditional culture defending itself against modern influences, including the incursion of markets. This argument, however, presents a *paradox* to economists. In the face of rising wage opportunities, which increase the shadow value of time,

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[3] Wahhabi movement, founded by Muhammad ibn Abd al-Wahab (1703–1791), is a puritan reform movement aimed at purifying the Sunni Islam (Columbia Encyclopedia, 2002). The central doctrine of Wahhabism is a particular interpretation of Sunni Islam known as Salafiyya, which urges a return to the way of "virtuous ancestors," i.e. to the form of Islam that existed before 950 A.D. (3d century of the Muslim era) (Amanat, 2001).

[4] A leader of the Muslim Brothers (a radical Islamic organization founded in Egypt in 1928 calling for a return to rigid orthodoxy, the overthrow of secular governments, and a restoration of the theocratic state) who was executed by the Nasser regime in 1966 (Amanat, 2001).

how could a radical religious sect, which demands an increasingly time-absorbing form of practice, survive? And why would it thrive?

The spread of radical Islam has the potential for large demographic effects through differential fertility patterns. Casual empiricism suggests that followers of radical Islamic groups have higher fertility than do adherents to traditional Islam or secular Islamic modernists. However, to our knowledge, aside from the Iranian case, the demographic role of radical Islam has not been investigated.[5] Economic demography may have insights to add here. Demographers tend to see fertility transition as an inevitable and irreversible phase of human development. Economics has the advantage of a theory (Becker 1960, 1991) that can predict fertility increases as well as declines as women's wages decline or increase respectively.

The best-known fertility transition reversal among a radical Islamic group is in post-revolutionary Iran. The 1979 revolution sharply reversed a trend decline in fertility dating back to the 1950s. The cohort aged 0-4 increased in size from 5.4 million in the 1976 census to 9.0 million in the 1986 census (Salehi-Isfahani and Tandon 1999). To be sure, more than a change in norms was at play. Pronatalist policy was not subtle; the legal age of marriage for girls was reduced from 18 to 9; contraceptive supplies were restricted; day-care centers were closed, women were discouraged from seeking employment; and wartime rationing favored large families. Yet norms were also changed and religious prohibitions enacted: public campaigns endorsed early marriage and traditional female roles; women's dress in public was restricted, as were women's leisure activities outside the home, such as television, movies, and restaurants (Salehi-Isfahani and Tandon, 1999). In fact, the Iranian revolutionary government eventually became so concerned by rising fertility that by 1990 almost all of these policies were reversed. Clinics started distributing contraceptives, and prohibitions on behavior were relaxed. This led to

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[5] For example, the massive five volumes produced by the "fundamentalism Project" edited by M.E. Marty and R.S. Appleby (University of Chicago Press 1991-1995) make no mention of differential fertility.

a decline in fertility rates. The 0-4 year-old cohort shrunk by almost a third (from 9.0 to 6.1 million) over the decade between the 1986 and 1996 censuses.[6]

In contrast, fertility transition reversal among Israeli Ultra-orthodox Jews has been more persistent. In the early 1980s that group had a total fertility rate of 6.3 children per woman, which rose to 7.6 children per woman by the mid-1990s (Berman 2000).

The Iranian and the Israeli Ultra-orthodox examples motivate a wider investigation of fertility among religious sects. The assumption of fertility transition is one of the cornerstones of development economics and of national and global population projections. Yet radical religious movements appear to be growing in numbers throughout the Islamic world.[7] That growth is commonly attributed to the spread of an attractive philosophy, but the possible influence of differential fertility rates deserves at least some attention. In the case of the Israeli Ultra-Orthodox, differential fertility rates are undoubtedly the largest source of their increasing population share. Throughout the Middle East and the Muslim world, rising population shares among religious radicals with high fertility rates could influence the political and economic stability of many secular nationalist regimes, because radical Islamists generally aspire to replace secular government with an Islamic state.

3. Theoretical Framework

First a definition. By a radical religious group, or sect, we mean a group that views secular society as threatening, and distances itself from secular society by means of prohibitions and/or sacrifices. Religious prohibitions are restrictions on behavior (for example, dietary restrictions, dress code, restrictions on sexual behavior etc.) Sacrifices are acts which are expensive or impossible to reverse, such as circumcision, blood-letting and other initiation rites.

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[6] The subsequent reversal suggests that some of the apparent fertility increase in the early 1980s may have been the result of shift forward in birth timing rather than an increase in lifetime fertility. See Salehi-Isfahani and Tandon (1999) for a discussion.
[7] Examples may exist in other religions as well.

The group usually demands high levels of commitment and high rates of participation. The rational choice framework for the study of religious sects, proposed by Iannaccone (1992) offers an explanation for these phenomena. The following is an outline of the model and of Berman's (2000) extension to explain fertility and the puzzle of low returns to religious schooling.

Group members derive utility from time spent in religious activities, R, and from secular goods, S. They also gain utility from group "quality," Q, the average amount of time that other members spend doing R, which is an externality for other members. Formally,

$$U_i = U(S_i, R_i, Q), \qquad U_1, U_2, U_3 > 0$$

for $i=1$ to N members, where $Q = \sum_{j \neq i} \frac{R_j}{N-1}$

and N is exogenous.

Perhaps the most important source of externalities to religious activity among radical Jewish and Muslim sects is the role of charity in providing mutual insurance. The Jewish Ultra-Orthodox, and the Muslim Brothers display remarkable donation of time and money to community charities, including educational institutions. These provide insurance to community members in the form of job search, spouse search, and transfers of food, clothing, medical services, and cash.[8] These activities would have been familiar to 19th century Americans, where the same public goods were often provided by religious organizations.[9]

Members maximize utility subject to time and budget constraints. Time, T, is split between religious activity, R, and work hours, H. Income is earned at wage rate w and entirely spent on consumption of the secular good S, at price p, so that the budget constraint is $pS=wH=w(T-R)$. Members underprovide R in a competitive equilibrium as they ignore the

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[8] These examples of externalities, particularly mutual insurance, are excludable, as they can be limited to club members. Excludability distinguishes club goods among social interaction models [Becker and Murphy 2000].
[9] This analysis stresses the importance of time-intensive activities for group quality and omits charitable donations from Q for simplicity.

external benefits of their religious activity as illustrated in Figure 1. The labor supply curve to the right indicates the competitive equilibrium choice of work hours, *H=T-R*, at the wage *w/p*. The curve to the left indicates the social welfare maximizing labor supply schedule that would be chosen by a
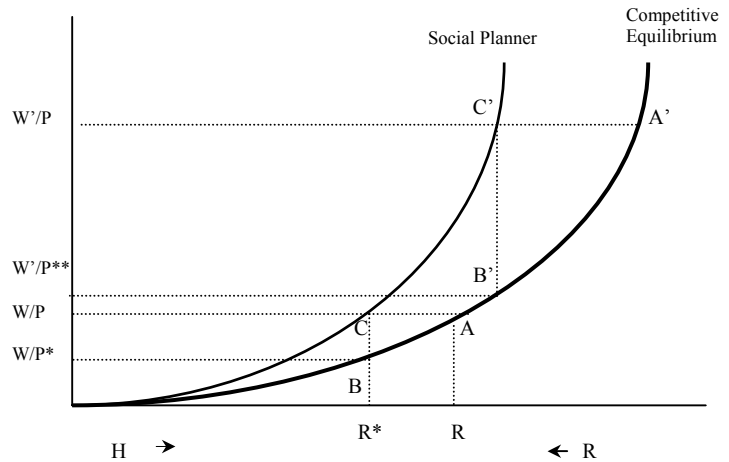

Figure 1: Efficient Prohibitions

social planner. She would dictate less work and more religious activity (at R^*). Welfare of group members can be improved by increasing the average level of activity, *R*, by either subsidizing *R* or by taxing its substitute, *S*. Religious groups often encourage *R* with eternal promises and the respect of one's peers. Yet *R* may be hard to subsidize as charitable acts are often unobservable. Consider the case where the community can literally control the price level faced by members by levying a tax. To achieve efficiency they would raise the price level by imposing the tax $p^* - p$, which induces a choice $R^* > R$.

Alternatively, the group could impose and enforce prohibitions on types of secular good consumption, thus inducing members to work less and spend more time at religious activities. Religious restrictions can be understood as extreme but enforceable forms of taxation on secular goods which can make all club members better off. Activities involving contact with the secular world are substitutes for group activities. Thus, prohibitions that limit these contacts induce members to spend more time in religious and other group activities that have positive externalities. Exclusion from access to insurance or other club services is a viable form of enforcement.

This logic provides a rationalization for many forms of religious prohibition (Iannaccone, 1992). For example, Sabbath restrictions induce members to spend time together on the Sabbath,

dietary restrictions decrease the ability of group members to socialize with nonmembers, and so forth. Distinctive clothing, celibacy and other prohibitions have similar effects.

Now consider the recent spread of radical Islam. Conventional microeconomic theory would view this as a puzzle: real wages rose over the 20th century yet people turn to an increasingly time-intensive version of religious practice. The logic of prohibitions as efficient taxes can explain that defensive "retrenchment" of a religious sect. As wages rise, so does the optimal tax rate. In Figure 1, an increase in the wage from w to w' implies an increase in the efficient tax from $\tau = p - p^*$ to $\tau' = p - p^{**}$, because of the convexity of the labor supply curve. In order to induce a given increase in R, larger taxes are necessary at higher wages as the income effect makes labor supply less responsive to changes in wages. Interpreting prohibitions as taxes, this mechanism can explain the puzzling expansion of radical Islam. Increases in the time-demands of religious practice could be an efficient mechanism for defending the quality of communities' mutual insurance services against the increasing shadow price of members' time.

3.1. *Implications for fertility*

This club good approach, with efficient prohibitions, can also explain why radical religious groups have had slow fertility transitions over the past century. Becker's [1960, 1991] fertility transition model argues that increased market wages increase the shadow price of children and thus decrease fertility (as parents substitute quantity for quality, investing more resources per child). Increased real wages have less effect on the fertility of women in the club because the wage increase is muted by increased prohibition. As in the analysis of increased stringency of religious practice above, the efficient consumption tax, $p - p^{**}$, is increasing in the real wage because of the convexity of the labor supply curve in Figure 1. Interpreting prohibitions as a tax, the increase in prohibitions caused by changes in the real wage could leave the value of a woman's time largely unchanged, muting the effect of increased (gross) wages on fertility.

A muted substitution effect can only explain why fertility decline among women in radical Islamic sects may be muted, despite an increase in real wages. The evidence presented in the next section corroborates this argument. However, the above framework also offers an explanation for the fact that fertility in the radical sects may actually increase, as it did for Ultra-Orthodox women in Israel (Berman, 2000). An intuitive explanation (for details see Berman, 2000) is that external transfers allow an efficient increase in prohibitions by easing an attrition constraint (N, the size of the sect, being now treated as endogenous). If a sect is concerned about attrition, its efficient level of prohibition will be influenced by the effect of prohibitions on club size. Attrition is a natural concern if it involves family members or if there are returns to scale in club activities, such as mutual insurance. Since transfers allow a club to augment the quality of its services, they also reduce the possibility of attrition. Relaxing an attrition constraint allows prohibitions to be made more onerous in order to induce increased substitution of religious activity for work hours. In that way increased transfers may have both a positive income effect on fertility and a positive substitution effect through increased prohibitions. Unavailability of appropriate data does not allow us to test the hypothesis of increased fertility at this stage, although there is evidence that radical Islamic sects in various countries used to receive significant external monetary transfers from Saudi Arabia in 1980s and 90s (see Amanat, 2001).

3.2. *Implications for schooling*

Berman (2000) argues that religious school attendance can be thought of as a sacrifice (similar to the irreversible acts such as circumcision, and other initiation rituals) that destroys value. As such, the religious schooling cannot then be explained as efficient prohibition with the logic of the above-described model, since such a sacrifice does not "tax" secular goods. The explanation he offers treats religious schooling as a type of initiation ritual which signals unobserved type. The latter argument, based on Iannaccone (1992), explains a sacrifice as a type

9

of economic signaling.[10] The unobserved heterogeneity is introduced by having high wage and low wage individuals, with high wage individuals choosing less religious activity as it is relatively more expensive for them. High wage (or equivalently low religious activity individuals) would like to join the sect with high average religious activity. Members of the sect with high religious activity, however, would rather not admit the high wage types, since the average level of religious activity will drop and the sect quality will deteriorate. The sect can solve this free-rider problem since the access to the positive externality of the sect religious activity is excludable. A costly initiation ritual, or sacrifice, will achieve the objective of preventing the high wage individuals from joining the sect, and, thus, to retain the sect's religious quality. The efficient sacrifice from the sect's perspective is the smallest sacrifice that will induce only low wage types to sacrifice. Such a sacrifice will reliably signal a high level of religious activity, and the sect will, therefore, accept into the group anyone who makes the sacrifice.

Religious school attendance, practiced by individuals with very low alternative labor market opportunities, is argued to be an efficient sacrifice that separates high from low wage types. A sect concerned about its average quality will accept only those who forgo years of secular education. A testable implication is low returns to religious education compared to a secular alternative. The following section investigates the evidence on both fertility and returns to schooling in radical Islamic communities.

4. Data and results

This project began with an extensive review of numerous datasets in search of suitable questions about religious education in countries with reasonably large Muslim populations. We found four samples[11], each in a different country, that had sufficient data about religious

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[10] For the details of the model of efficient sacrifice see Iannaccone (1992) and Berman (2000).
[11] The data from the Pakistan Integrated Household Survey 1991 have been made available to us recently. The results from the analysis of these data will be available in the subsequent version of this paper.

education, fertility, and earnings. The survey instruments used are sufficiently different to warrant a separate discussion of fertility and education for each.[12]

In all surveys, a subset of women was asked about detailed fertility history. Using this information, we could construct a measure of the number of living children.[13] This is primarily a measure of lifetime fertility and, therefore, captures the cumulative effect of life events over a long interval. A basic reduced-form model of fertility includes the respondent's religion (or when unavailable, the religion of the head of the household), age, and years of education. We use ordinary least squares to predict fertility by estimating the following equation:

$$(1) \qquad N_i = \alpha I_i + \mathbb{Z}_i' \beta + \varepsilon_i, \qquad i=1,..., \text{n}$$

where N_i denotes number of living children, I_i is an indicator of an affiliation with Islamic schooling (denoting one's own type of schooling in Indonesia and Bangladesh, and that of any household member in India and Cote D'Ivoire, see the following sections), $\mathbb{Z}_i$ is a vector of other individual and household characteristics, and ε_i is a residual.

For returns to education regressions we estimate the traditional Mincer (1958) earnings equation[14] of the form:

$$(2) \qquad \ln W_i = X_i' \gamma + v_i$$

where W_i denotes earnings (monthly for Indonesia and Bangladesh, daily for India, and hourly wage for Cote D'Ivoire[15]); X_i is a vector of individual characteristics that include years of schooling (for Indonesia and Bangladesh), an indicator for affiliation with an Islamic school (for

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[12] Indonesia and Bangladesh surveys are an exception, as both use very similar, although, not identical, set of questionnaires. Both surveys were coordinated by RAND.
[13] An alternative measure of fertility is "children ever born", which incorporates child mortality. Basu (1996) argues, however, that the number of living children is a more appropriate fertility measure to use when studying a *choice* to have children, since it takes into account both choice and circumstances of conception, and since the number of dead children is not a choice variable for parents.
[14] For an overview of the human capital earnings function the reader is referred to Card (1999) and Willis (1999).
[15] For Cote D'Ivoire we used imputed hourly effective wage rate since the information on hours of work per week was available.

11

India and Cote D'Ivoire), and years of potential job market experience; and v_i captures unobserved individual heterogeneity assumed to be uncorrelated with the regressors.[16]

4.1. Indonesia

4.1.1. *Background*

We first investigate Indonesia, home to the world's largest Muslim population -- approximately 170 million people (87 percent of total population) as of 1992 (LOC, 2003). The Islamic movements and associations in Indonesia and their involvement in politics have received considerable attention in the sociological and ethnographic literature. Ellen (1988) describes in detail the evolution of one of the most important Islamic organizations, Muhammadiyah. Originally founded in 1912 as a progressive Islamic organization willing to accommodate Western values and secularism in order to legitimize the new and desired lifestyles of its supporters, Muhammadiyah has become increasingly conservative over time. Ironically, its original secular predisposition led to the birth of a counter movement in 1926 – the more traditionalist Nahdatul Ulama (Union of Muslim Teachers). Both organizations have been active in charitable and educational works, including clinics, religious schools,[17] orphanages, hospitals, and youth groups. Nahdatul Ulama had gained more support among the rural population than has Muhammadiyah (Ellen, 1998).

The educational setup in Indonesia have two main components: the state secular system and the parallel Muslim system. The latter is comprised of two categories: state-regulated and private-unregulated.

The Islamic section of the Ministry of Religious Affairs was created following the proclamation of the Indonesian Republic in 1949. It supervises Islamic education provided by the

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[16] In all regressions, we correct the standard errors for the sampling designs (clustering and stratification). In addition, all the estimates in the paper are weighted using sampling weights (unless specified otherwise).
[17] Dhofier (1999) reports that in 1942, about 10 percent of religious Islamic schools on the islands of Java and Madura belonged to Muhammadiyah.

government-sponsored religious schools, *madrasas*. Although the curriculum of a madrasa focuses primarily on religious subjects, it was updated in the 1950s and most recently in the early 1990s to include some secular subjects with the aim of better preparing students for a modern life (Dhofier, 1999; LOC, 2003).

In contrast, Islamic boarding schools called *pesantren* in Java and *surau* in Sumatra (Johns, 1987) obtain funding mostly from contributions of local communities, and are completely outside of state supervision (McVey, 1983).[18] These are located predominantly in rural areas and headed by local Muslim scholars (LOC, 2003). Pesantren are usually attended by young people, and focus exclusively on the study of Quran, the Arabic language, the Sharia (Islamic legal code enforced among Muslims), and Muslim traditions and history (Dhofier, 1999; LOC, 2003). The curriculum at a pesantren is typically not organized as a progression of courses leading to graduation, and students can enter and leave pesantren at any time (LOC, 2003).

The split of Islamic education between madrasas and pesantren reflects, to some extent, an underlying tension between modernist and traditionalist Muslims in Indonesia. The traditionalists generally seek to enforce Sharia for all Muslims, oppose adoption of Western educational and organizational principles, and view urban madrasas as a force designed to undermine the authority of the local Muslim clerics in charge of pesantren.[19] Among Islamic schools, a madrasa is typically ranked below a pesantren (LOC, 2003).

4.1.2. *Data and results*

The data come from the 1993 Indonesian Family Life Survey (IFLS), which covers a sample of 7,224 households across 13 provinces, representing about 83% of the Indonesian population. The educational system is divided into primary, secondary, and tertiary. Primary education starts at the age of 7 and lasts 6 years. Secondary education consists of 3 years in junior high school and is followed by another 3 years of senior high school. Tertiary education in

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[18] Cited in Johns, 1987.
[19] Indonesia country study by the Federal Research Division, Library of Congress (2003)

the data includes undergraduate and graduate university education (usually consisting of 4 years for the equivalent of a Bachelor's degree, 2 subsequent years for the equivalent of a Master's, and an additional 3 years for the equivalent of a Doctorate). The indicator for Islamic schools describes attendance of an Islamic school (madrasa or pesantren) at any level.

Evidence of increased attendance of Islamic schools is evident in school choice patterns of women, as reported in Table 1. The Table reports that as of 1993, the proportion of women who did not attend school at all dropped from 31% among the 40-49 year old cohort to 13% among the 15-29 year old cohort. Remarkably, more than two thirds of the implied increase in the incidence of female school attendance between the 1960s and the 1990s can be attributed to increased attendance of Islamic schools (13 of 18 percentage points).

Table 3 reports estimates of equation (1), predicting number of living children. The equation includes an indicator of mother's Islamic school attendance. Since lifetime fertility increases with age, the equation includes a set of indicators for age categories. Years of education have a negative estimated coefficient, as is typical in this literature. The Islamic schooling coefficient is 0.17 and significant in Column 1, the sample which includes women aged 15-49. The comparison of results in columns 2, 3, and 4, for subsamples of successively older women, indicates that the fertility increment for women with Islamic education is successively higher for older women, peaking at 0.67 (0.265) additional children for women in the 40-49 year old cohort. This pattern is illustrated in Figure 2, which presents raw comparisons of lifetime fertility by age. Although the estimation does not discriminate between various causal paths, it can be argued that since the parents usually make schooling choice for children, high fertility women selecting into Islamic schools is unlikely.[20] On the other hand, an unobserved factor causing both fertility and school choice could explain this correlation.

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[20] Jeffrey and Basu (1996) argue that although the possibility that higher fertility prohibits longer-term schooling (i.e. the reverse causation) may exist in some societies (for example, in some African countries, pregnant girls are forced out of schools), it is not likely to be the case in South Asia. There, they argue,

Interpreted as a lifetime fertility effect or not, the estimated coefficient for the older cohort indicates lifetime fertility which is much higher (13% = 0.67 / 4.97) among women who attended Islamic schools. An ambiguity in these results is whether that large effect is particular to the older cohort or will express itself in younger cohorts as they grow older. This fertility pattern among older cohorts and this ambiguity will accompany results from the other countries as well.

Table 3 reports estimates of equation (2), a standard human capital rate of return regression.[21] The first column reports the standard specification, ignoring the distinction between secular and Islamic schools. The results are fairly typical: estimated returns to education are high at 11.3%, but not unusually so for a developing country; returns to experience are high and concave; males and urban residents command a wage premium.

The innovation in the second and third columns is the inclusion of a separate slope and intercept for Islamic schooling (with and without sample weights). The unweighted results in the third column are the most precise, reporting secular returns to education of 11.6% while returns to Islamic education are (almost) significantly lower (at the 10% level) by 2.2 percentage points.

4.2. India

4.2.1. *Background*

The second country we analyze is India. India's Muslim population of 125 million people is the second largest in the world and the largest minority in India at 12% of the population.[22]

According to Titus (1979), the origin of radical Islamic sects in India dates back to the early 19th century founding of the Wahhabi-type sect known as Tariqah-I-Muhammadiyah ("The Way of Muhammad") by Sayyid Ahmad. Tariqah-I-Muhammadiyah subsequently evolved into a larger organization called Ahl-I-Hadith ("People of Tradition"), which became large enough to

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school attendance and marriage are virtually mutually exclusive, and pregnancies outside marriage are very rare.
[21] The sample in the rate of return regressions is restricted to individuals for whom there are earnings data.
[22] The CIA World Factbook, 2000.

receive regular mention in the Census of India (Titus, 1979). This sect maintained theological schools (madrasas), published religious literature, and built mosques through its district organizations across India, particularly in the Punjab, north India, Bihar, and Bengal (Titus, 1979). In 1902, some members of Ahl-I-Hadith formed a somewhat more fundamentalist community, Ahl-I-Quran, basing their doctrine exclusively on the Quran, and excluding even the Prophetic Tradition as a source of law (Titus, 1979).

The most recent fundamentalist movement in India is Jamaat-I-Islami founded by Abu-l-Ala Mawdudi in 1941 in Lahore, Pakistan (Ahmad, 1969). This organization is usually credited with the revival of fundamentalist Islam not only in India, but also in Pakistan and Bangladesh (in both of which it is an active political party). Ahmad (1967) describes Jamaat-I-Islami as "the most dynamic and well-organized challenge modernist Islam has been facing in India" (as well as in Pakistan).

Our investigation is linked to a number of studies.[23] Shahabuddin and Wright (1987) in their qualitative study propose several conjectures for what they that perceive to be inferior schooling among India's Muslim community: poor availability of schools in Muslim neighborhoods; the neglect of Urdu, the mother tongue of most Muslims, particularly in the Hindi-speaking states; the imposition of Sanskrit, the sacred language of Hinduism, as the second language; the prescription of secular textbooks; and the celebration of Hindu religious rites in schools which Muslims find offensive.[24] They also report that religiously minded parents often

[23] There is a large literature about differences *between* Muslims and non-Muslims in India. To our knowledge, differential fertility and returns to education *among* Muslims themselves have not been widely investigated. The only exception we found is a study of Qaziwala village in Bijnor (a district in western Uttar Pradesh, India) by Jeffrey and Jeffrey (1996). They compare Sheikh women (the Sheikhs are Indian Muslims of Arab descent) in their sample (N=87) and find that women with positive years of schooling (which is exclusively Quranic) have higher fertility, measured as mean number of live born children, than women with no education (the difference is 1.9 children for the 1960-69 cohort).
[24] Shahabuddin and Wright (1987) point out that education may be closely related to the language issue, as there is a lack of job prospects for children educated in Urdu. Over the years, they argue, Urdu has become identified with the Muslim community (the Urdu speakers reside mainly in the Hindu-majority region of Uttar Pradesh and Bihar), although neither all persons who speak Urdu are Muslims nor all Indian Muslims speak Urdu. Shahabuddin and Wright observe that although from the point of view of participation in the

send their children to religious schools to receive religious instruction in *maktabs* (elementary level schools for religious education attached to mosques) and madrasas, which by itself, however, leaves the children unable to compete in the modern. These observations are somewhat supportive of a signaling argument for religious schooling. That argument can also claim at least some support from recent stories in the Indian press (Alam, 2002; Mukherjee, 2003[25]) about madrasas drastically modernizing their curricula in face of charges of intellectual stagnation and orthodoxy breeding raised against them in the Post-Taliban world. Talib (2001) offers interesting insights into the role of madrasas, arguing that "…the aim of madrasas is not to make a person adapt to a work culture, but to make him adept in the cultural and religious cosmos of Islam. This has a context in the Indian rural setup." In particular, Talib (2001) puts forward two main reasons for the existence of madrasas: 1) an average Muslim family may send one of their kids to a madrasa so that he can later help clarify religious and legal issues related to a Muslim's personal law that governs daily living; 2) madrasa education acts as protector of cultural and religious identity from the forces of modernization which some Muslims think will destroy their heritage. That second argument, with its echoes of xenophobia, is common also among many denominations of Ultra-Orthodox Jews and Christian Anabaptists.

Sikand (2001), however, writes that maktabs and madrasas remain the only source of education for children from poor families, because they do not charge fees and provide free boarding and lodging to their students. Madrasas in India do not receive state support, but rely instead on funds from farmers who annually donate about two percent of their income in cash or in kind (Talib, 2001). The claim that the cost of schooling in Islamic versus non-Islamic schools may be different certainly deserves further investigation. We leave it for our future research, and at this stage we caution the reader to interpret the results of the return to schooling regressions

economy, Urdu proficiency is not helpful, Muslim parents encourage their children to learn Urdu as a way to preserve their cultural identity.

[25] "Our students have to know about everything. Studying religious scriptures alone is not enough in today's world. So we have introduced modern education like computers," says the head of a madrasa in West Bengal in the interview to Mukherjee (2003).

keeping in mind the possibility of differences in costs. It's worth noting at this point, though, that in most of the regions in which we observe Islamic schooling, there are Muslims who have non-Islamic education.

Regarding fertility, Wright (1983) discusses at length the small but steady increase in the population share of India's Muslims. He points out that the generally negative position of Jamaat-I-Islami on birth control may be indicative of lower acceptance rates of family planning among Muslims. In addition, traditional customs like polygamy, widow remarriage, and possibly also easy divorce among Muslims (Hindus are prohibited from both) may affect lifetime fertility (Wright, 1983). Wright notes that although several Muslim scholars have demonstrated that the Quran, properly interpreted, is not incompatible with family planning, Muslims in India show rather strong resistance to state interference in the Sharia, and such interference is often considered to be an infringement on their rights as a minority. In addition, the orthodox Muslims usually oppose sterilization and regarded it as un-Islamic (Wright, 1983).

4.2.2. *Data & Results*

The data are from the Survey of Living Conditions in Uttar Pradesh and Bihar (SLCUP&B) that was carried out between December 1997 and March 1998 in south and eastern Uttar Pradesh and north and central Bihar.[26] Data were collected through household and village-level questionnaires in 120 villages drawn from a sample of 25 districts. A total of 2,250 households were interviewed during the course of the survey.

Uttar Pradesh and Bihar are India's most populous states with approximately 175 million and 110 million people, respectively, in 2001 (Shahabuddin, 2001). Uttar Pradesh and Bihar are also two states with unusually low literacy and high fertility, as shown in Figure 3. Uttar Pradesh has the largest Muslim population (24 million) in India, followed by West Bengal (16 million), and Bihar (12 million) according to the 1991 census (LOC, 2003). Uttar Pradesh also hosts the

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[26] The survey belongs to the series of Living Standards Measurement Study surveys administered by the World Bank.

18

Darul Ulum Deoband – a well-known religious and academic center in the Islamic world – the second largest after al-Azhar University in Egypt.[27]

The Indian education system is based upon 12 years of primary and secondary education, followed by university (LOC, 2003). In contrast to the IFLS, the SLCUP&B does not ask all respondents about religious schooling, but instead asks if there are children (aged 6-19) in the *household* that are attending or have attended religious schools. For households headed by a Muslim, presence of such children serves as our indicator that adult household members are affiliated with radical Islamic sects.

Table 6 suggests an increasing proportion over time of women in families with at least one member attending Islamic schools. The interpretation of this number, however, may potentially be very different from the one presented in Table 1 for Indonesia: in this case, the increase in the number of women may be indicative of higher fertility in such families, and not necessarily higher attendance of religious schools by the women themselves.

Table 8 reports estimates from regressions predicting the number of living children in equation (1), which includes an indicator of a child's Islamic school, along with an indicator for the presence of school age children in the household. The Islamic school coefficient, significant in the regressions for the higher age categories, suggests that the fertility of women with children attending Islamic schools is higher than that of women in households where children go to secular schools. The results in Column 1 indicate that women with children going to Islamic schools have about 0.7 more children than other women in 15-45 age-group[28]. This translates into about 30 percent higher fertility compared to the average number of surviving children, which is approximately 2.2. Figure 4 presents the unconditional estimates of fertility.

Perhaps easier to interpret are the results for older women, who are closer to completing lifetime fertility. Baseline fertility for 35-39 year old women (with no schooling in UP) is about 3

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[27] The schools website at http://www.darululoom-deoband.com/english/index.htm.
[28] The age grouping used for India has 45 as its upper limit since the fertility module of the survey was administered only to women in this age group.

children, to which Islamic schooling among family members adds a predicted 0.77 children, over and above the extra predicted 1.0 children due to being Muslim. In other words, among Muslim families affiliation with an Islamic school predicts about 19% (0.77/4.0) higher fertility.

As in the Indonesian case above, that finding comes with the caveat that the cohort and lifecycle period effects cannot be distinguished in a single cross-section.

The results from earnings regressions (Table 10) are inconclusive as to whether workers from households where children go to Islamic schools command lower returns to their education. Islamic schooling has a negative intercept and a positive slope for a net negative effect, but none of these estimates are statistically significant.

4.3. Bangladesh

4.3.1. *Background*

The third country we study is Bangladesh, the fourth largest Muslim country in the world, with 88 percent (130 million) of the population Muslim.[29]

Similar to the Indian case, the historical growth of orthodox movements in Islam in Bangladesh is associated with the ideas of the Wahhabi movement in Arabia, introduced by pilgrims to Mecca. Banu (1992) describes this phenomenon as a response to the loss of political power to the British and the increasing Hindu influence. Muslims in Bengal, as in rest of North India, started following orthodox Muslim teachers who interpreted the decline of Muslim power as a sign of religious degeneration, and called for the restoration of Muslim power. The first radical Islamic movement in Bangladesh was the Faraidi movement (1830-57) based on Wahhabi doctrines, which was followed by a more radical Indian-born Tariqah-I-Muhammadiya, described in the previous section (Banu, 1992). The strong organizational network of Tariqah-I-Muhammadiya, established throughout the whole of Bengal, is reported to recruit its members from primarily poor peasants and other rural lower classes (Banu, 1992).

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[29] CIA World Factbook, 2002.

The revival of the radical Islamic movements in present Bangladesh is generally thought to be associated primarily with orthodox Islamic groups operating in Pakistan, North India, and Bengal. One of these, Mawdudi's Jamaat-I-Islami is the largest Islamic party in Bangladesh (Islam, 2001). Banu (1992) argues that the madrasa[30] system of education is mostly responsible for keeping the orthodox revivalist movement alive in Bangladesh. Similar to madrasas in Indonesia and India, madrasas in Bangladesh avoid secular studies, focusing primarily on teaching of the Quran, the Hadith (the book of traditions of prophet Mohammad), Islamic jurisprudence, and Arabic language and literature, even though their syllabi had been slightly updated in the Pakistan (pre- 1971) and Bangladesh periods[31] to include fragments of natural and social sciences (Banu, 1992).

According to Babar (2002), there are currently two types of madrasa systems in Bangladesh – Aliya Madrasa and the Dars-i-Nizami systems. The Aliya madrasas are primarily run with government support and control and are regulated by the governmental Madrasa Education Board, established in 1978. Students prepare themselves for employment in government and private sector jobs like those in secular colleges or universities. In contrast, the Dars-i-Nizami or Deoband style madrasas are run without any form of government support, and depend on public charity and endowments (Babar, 2002). These schools are managed by a non-government education board (Qawmi Madrasa Board) in Dhaka, and the government reportedly has no control over these institutions (Babar, 2002). As mentioned by Babar, the curriculum of these madrasas, developed as early as the 19th century, concentrates solely on memorizing the Quran and the Hadith. Degrees granted by these madrasas are not recognized by the government: their graduates typically become imams in mosques or teachers at non-government madrasas.

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[30] A higher school for orthodox Islamic education in Bangladesh.
[31] Bangladesh declared independence from Pakistan in 1971.

Islam (2001) reports that Bangladesh has about 5766 madrasas and 58126 maktabs.[32].

These institutions exist even in remote villages and education in these schools is free (Babar, 2002).

Two studies of fertility in Bangladesh that mention religiosity are Cleland, Kamal, and Slogget (1996) and Banu (1992). The former study uses the 1989 Bangladesh Fertility Survey. Self-reported religiosity (measured by respondent's answers as to whether they think they observe religious customs more or less strictly than their neighbors) is added as a control variable in the analysis of contraceptive use. The authors, however, are not concerned with the effect of religiosity per se and do not report the corresponding coefficient estimates.

The study by Banu (1992) is more comprehensive and is based on an analysis of a private survey of 3461 rural and 2086 urban individuals.[33] Banu categorizes Muslim respondents according to their type of beliefs into modern, orthodox, and popular, and classifies respondents according to high, medium, or low levels of Islamic religious practice. She then investigates whether the differences in religious beliefs and levels of religious practice can be explained in terms of their social correlates.[34] She reports that while the fundamentalist Islamic organization Jamaat-I-Islami[35] usually expresses the most vigorous opposition to family planning on religious grounds, orthodox and modern Islamic beliefs are positively associated with acceptance of family planning. In addition, Banu (1992) does not find a significant association between any social

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[32] Maktabs in Bangladesh are elementary schools for religious education attached to mosques (Abecassis, 1990).

[33] The rural sample was collected from twenty villages from the four undisclosed regions of Bangladesh, and is a representative sample of the rural population of Bangladesh. The urban sample is collected from three areas of Dhaka (Banu, 1992).

[34] According to Banu (1992) *orthodox* Muslims rigidly adhere to the canonical laws of Islam and observe strictly the five religious injunctions. *Modernist* Muslims emphasize individual judgment in interpreting the Quran. Both modernist and orthodox Muslims make no compromise on Islam's monotheism, and reject any practice and belief suggesting polytheism as un-Islamic. The *popular* Muslims of Bangladesh, acknowledge (not formally but effectively) the sharing of the supernatural power of God by Hindu gods, local deities, and spirits. The classification by three levels of practice is based on a score that summarizes attitudes towards the five religious injunctions.

[35] Jamaat-I-Islami argues that the Quran declares sustenance to all creatures, and controlling population for fear of lack of food and shelter is a grievous sin in Islam since it expresses lack of faith in Allah. Those who argue that Islam accommodates birth control usually point out that none of the verses in the Quran forbid family planning. For further discussion see Banu (1992).

characteristics and the intensity of religious practice in rural settings. In the urban environment, however, she reports that higher income and education tend to be associated with low religious practice rather than with the high or medium levels of practice. Also, illiteracy, being a housewife and being female are all associated with high levels of religious practice.

4.3.2. *Data and results*

We use data from the Matlab Health and Socioeconomic Survey (MHSS), conducted in the Matlab region of rural Bangladesh in 1996. Matlab is located about 50 km southeast of Dhaka, the capital. The sample consists of 149 rural villages with an estimated population of 180,000 in the 1982 census. The survey consists of individual- and household-level information on 4,364 households clustered in 2,687 baris.[36] Approximately one-third of baris in the Surveillance area are randomly sampled.[37] Education is measured by the highest level of schooling attained. There are five grades of primary education, followed by five of lower secondary-level education and two of higher secondary education in a college or a polytechnic institute. After that, a student can enter universities. The indicator for Islamic schooling denotes whether the *last* school attended was Islamic: maktab or madrasa. Those who report a maktab education as their last are not asked about their level of schooling, because maktabs are usually not considered to provide systematic education, and attendance does not culminate in any sort of degree. Therefore, these respondents may report an Islamic education even though they have zero years of measured formal schooling.

Table 11 shows that attendance of Islamic schools by women in the 30-39 age group is almost twice as low as that of the adjacent age groups. According to Islam (2001), the post-1971 military rulers of Bangladesh aimed at gaining popularity by various expressions of Islamic sentiment. They made the study of the Quran and Arabic compulsory in secondary schools in

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[36] Bari is a residential compound that consists of several houses sharing a common yard (see MHSS 1996 documentation for details)

[37] For more information on the Matlab Surveillance population the reader is referred to Menken and Phillips (1990).

1972-75, and in all schools from the first to eighth grades in 1976-1981. One interpretation of Table 11, therefore, may be that these changes made traditional Muslim parents more comfortable with secular schools as an option for their daughters' education. Alternatively, with an increasing female education, as suggested by the numbers in Table 12, the last school attended by women in 30-39 age group was at levels higher than pre-school (that include maktabs), and there were much fewer Islamic schools at higher levels (madrasas) than maktabs.

Table 14 reports the results of fertility regressions. We find a pattern similar to that reported for Indonesia and India. The fertility of women with Islamic school education is lower than that of other women for younger age groups, but it becomes higher for older age groups. Results in Columns 3a and 3b suggest that women in the 35-44 age group with Islamic education have 0.59 more surviving children than other Muslim women. The estimates for the top age category show an even higher fertility differential of 0.99 children, which, however, is not precisely estimated due to the smaller sample size. Figure 5 shows the unconditional means of number of surviving children according to the type of education.

Table 15 reports summary statistics for the sample reporting earnings for which we can estimate a Mincer earnings equation. Average years of education are 1.7. Only 1.6% of this sample report Islamic school attendance. Eighty six percent of respondents are Muslim and 59.6% are male.

Table 16 reports estimates of equation (2). The first column reports the standard specification, which doesn't distinguish between secular and religious schooling. Estimated returns to education are high, at 8.4%, though not as high as those in Indonesia or in UP and Bihar. Returns to experience are high, as in the previous two samples. Muslims have much lower earnings than in the other two samples. The gender differential is even larger than that in rural Uttar Pradesh and Bihar.

Columns 2 and 3 of Table 16 report separate returns to years of Islamic schooling. Estimated returns to Islamic schooling are 7.2 or 7.3 percentage points lower than those to secular

24

schooling, making the level of return statistically indistinguishable from zero! The unweighted

estimate (in column 3) is precise enough to render the differential statistically significant. The

degree to which secular schooling dominates Islamic schooling in Bangladesh is the largest we

see in any of the countries sampled. It is about the same size as the estimated differential

experienced by Ultra-Orthodox Jews in Israel (Berman, 2000).

4.4. Cote D'Ivoire

4.4.1. *Background*

Muslims currently constitute 35-40% of the 16.8 million population of Cote-D'Ivoire.

Christians comprise 20-30% of the population, while indigenous religions (broadly described as

Animism) are practiced by 25-40%.[38, 39] Most Muslims in Cote D'Ivoire are Sunni, and the

Ahmadiya sect – a Shiite sect originating in nineteenth century India – is the only non-Sunni

order in the country.[40]

The origins of radical Islam in West Africa, including Cote D'Ivoire, date to the post

World War II period (Launay, 1992). Wahhabi puritan movements began in response to the

increasing influence of *marabouts* (traditional local Muslim leaders that acted as physicians and

mystics).[41] These reform movements, waged in the 1950s mostly by graduates of al-Azhar

University in Cairo and other Near Eastern schools, condemned Sufism (the ascetic and mystical

movements within Islam often intertwined with indigenous beliefs in Cote D'Ivoire)[42] and

marabouts as un-Islamic (Kaba, 2000). The Wahhabis began to establish their own religious

schools – madrasas – that stressed language instruction of Arabic and Islam instead of rote

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[38] CIA World Facts Book, 2002.
[39] LOC, 2003.
[40] Yacoob (1986) writes that Ahmadiya is one of the key organizations providing for the physical and social needs of the urban poor (especially the migrants) in Abidjan, the capital of Cote D'Ivoire. Ahmadis are observed to generally depend upon each other to carry out economic tasks and provide emotional support (Yacoob, 1986).
[41] LOC, 2003.
[42] LOC 2003.

memorization emphasized by the traditional Quranic schools (Launay, 1992). The new style of beards and Middle Eastern types of clothing, worn by Wahhabis instead of traditional West African gowns, were supposed to signal the wearer's adherence to a different interpretation of the Islamic doctrine and ethos (Kaba, 2000). However, despite the tension between the Sufi marabouts and the Wahhabis, Launay (1992) observes that many Muslims, including the anti-Wahhabi, viewed the rapidly expanding secular school system as undermining Islamic values.

The Ivorian education system is closely resembles the French system and is comprised of three stages: primary school has six grade levels, leading to a certificate of primary studies; secondary school has another seven (four lower and three upper), leading to a certificate or *baccalauréa*, and university education, available only in Abidjan, follows (LOC, 2003). The 1980 International Yearbook of Education,[43] (which describes the system of education in Cote D'Ivoire closest to the date of the survey we use) states that approximately 14 percent of primary schools and 29 percent of secondary schools were private in 1980. According to the same source, most of these were Catholic and were partially subsidized by government funding. In contrast, Quranic schools, common primarily in the north, were not supported by the government. Religious instruction was not permitted in government schools and some students attended both public and Quranic schools (LOC, 2003).

4.4.2. *Data and results*

Data are drawn from the Cote D'Ivoire Living Standards Survey (CILSS) which is a part of the World Bank's Living Standards Measurement Study series. This multipurpose survey of Ivorian households was undertaken over a period of four years from 1985 till 1988. Each year the sample included 1600 households. Sample design was a rotating panel with half of households revisited the following year, while the other half were replaced with new households. The school

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[43] International Yearbook of Education, 32, New York, 1980, as cited in the Library of Congress Country (LOC) Studies: Cote D'Ivoire, 2003.

26

type variable we use is available only in the 1986 and 1987 questionnaires, so analysis is based on the 1986 cross section appended by 800 new households from 1987.

Education is measured by the highest level of schooling attained. The indicator for Islamic schooling denotes whether a respondent belongs to a household with a Muslim head, and in which at least one member reports a private religious school as the last school attended. While we could have used one's own indicator of attendance at such schools, the extremely small number of such current or former students in the sample precludes precise estimation. (Only 2-4 women in the 15-49 age group report Islamic school attendance, depending on the sample used. See the description below.) Creating an indicator based on attendance in the household increases the number of women that have an "Islamic" indicator to 32 or 89 depending on the sample used.

The results in Table 19 combined with the unconditional estimates of fertility from Figure 6a do not provide any conclusive evidence as to differential fertility between women with an "Islamic school" indicator and those without. Figure 6a suggests that fertility of "Islamic" women in the 30-39 age group may be higher, but the multivariate estimates in Table 19 lack precision. It must be noted, however, that the questions about the number of living children were administered to only a random subset of all women who participated in the survey. This decreases the sample of women in 15-49 age group by about half.

We can draw a larger sample using as an alternative measure of fertility the number of children under age 30, which is asked of all respondents. (This is the closest to the number of living children measure that is possible to construct for all women in the sample). The results of fertility regressions using this larger sample of women (Table 21) indicate that "Islamic" women in 30-39 age group have about 1.3 more children, and the estimate is statistically significant. Figure 6b shows a pattern of fertility differentials similar to that in Figure 6a with the exception of women in the 40-49 age group. The number of women with an Islamic affiliation in the 40-49 age group in Figure 6a, is, however, only 6. Therefore, the difference between the estimates for these age groups may be due to sampling variance.

27

Table 23 presents estimates from the rate of return regressions. These show very high returns to education, at 17.4%, high returns to experience, a large predicted earnings penalty for Muslims and a very large predicted premium for males. Unfortunately, the sample is not very informative about the returns to Islamic schooling. Estimates are actually positive, but are smaller than their standard errors.

4.5. *Qualifications*

The rate of return results for all countries need qualification in two important respects. First, the Mincer (1958) model assumes that the only cost of schooling is foregone earnings during time spent in school. Therefore, the results from fertility regressions should not be interpreted as "true" rates of return to education, since we have not accounted explicitly for costs of education such as fees, costs of supplies etc. A valuable next step in this line of research would be to account for these costs explicitly since if these costs are different for various types of schools, as suggested by some observers cited above, then rates of return to various types of education must be adjusted for differences in costs.

Also, our primary focus is on monetary returns. Education, especially religious education, is designed to have nonpecuniary benefits. The latter are, however, difficult to measure in practice, and the results presented here in this paper should be interpreted subject to this caveat.

Finally, in our rate of return regressions we use only respondents who report schooling and positive earnings. Thus, an individual's labor force participation decision is not modeled. An alternative way to interpret these earnings functions is to view them as conditional hedonic earnings functions. Consequently, the coefficient on the indicator variable denoting Islamic school attendance would be interpreted as the implicit "market" price of having an "attribute" of Islamic school affiliation.

5. Discussion

Understanding the economics underlying differential fertility rates may have important policy implications. Consider the case of the Israeli Ultra-Orthodox: this group consolidates some political power which it uses to extract subsidies and other transfers from government. The subsidies are used to augment a pronatalist set of internal prohibitions. Thus, increased fertility implies an increased population share, which in turn increases political influence that is used to generate increased transfers from government. This self-reinforcing process is particularly relevant for a political-religious group in which strong religious affiliation generates a potent political force through the ability to deliver a block of votes or even through politically motivated violence. Thus, subsidies and transfers have implications for fertility, which may in turn affect the long-term political stability of countries from Indonesia to Morocco.

The political economy of mutual insurance clubs suggests how policy can circumvent this spiral toward Islamic revolution. Consider the Western European experience. In the aftermath of the devastating religious wars of the 17th century, and of England's disastrous experience with a Puritan state, Adam Smith and other liberals argued against state sanctioned religions and for equal treatment of churches by the state. The Americans and Western Europeans largely took that approach: a guaranteed freedom of religion coupled with a commitment that there be no discrimination along religious lines by the federal government. This effectively destroyed the incentive of religious groups to organize politically, since the rewards they could aspire to obtain from political power were intrinsically limited by the commitment to equal treatment.

A glance at currently successful democracies in the OECD is consistent with this argument. They have all avoided religious parties and the accompanying extraction of rents, while respecting the rights of religious groups. They either have strict rules forbidding public policy to discriminate along religious lines, like the First Amendment, or have generous social welfare systems as in much of Western Europe, or a combination of both. The social welfare systems are important, as state social welfare reduces the appeal of social welfare services

29

provided by a religious group, drying up the demand for mutual insurance. In contrast to the success of the Western democracies (since the 18th century) in avoiding religious antagonism, Middle Eastern and Asian democracies from Algeria to India remain subject to the destabilizing influence of religious-political parties.

6. Conclusion.

This paper tests two implications of the club model of radical sects using household surveys from Indonesia, India, Bangladesh and Cote D'Ivoire. The results indicate that fertility is higher and returns to education are generally lower among families that send children to Islamic schools. These findings are consistent with the literature on Ultra-Orthodox Jews in Israel documented in Berman (2000), and on Christian Anabaptist sects as described in Kraybill and Bowman (2001), suggesting a common pattern of behavior among religious sects of different religions.

While these common patterns are consistent with the predictions of the club-good model of religious sects they do not by themselves refute other possible explanations for high fertility and low returns to schooling. High fertility and poor school quality may well be typical of traditional societies, regardless of the intensity of religious practice. Yet, supporting evidence for the club model comes from other sources as well: it can rationalize prohibitions and sacrifices (Iannaccone 1992); it predicts that increased subsidies amplify radicalization (Berman 2000) increasing fertility and durations of attendance in religious seminaries; it can resolve the puzzle of increased time-intensive religiosity as market wages increase the alternative cost of time (see Section 3 above); and finally, the club model can explain why radical religious groups are so successful as militias (Berman 2003). The contribution of this paper is to show that the milder predictions of the club theory are consistent with the available data as well.

The available data on radical Islamic sects is sparse. Future efforts could productively focus on augmenting existing household surveys with questions about school type and other

30

indicators of religiosity, in order to increase the breadth and depth of our knowledge about the

internal economies of radical Islamic communities.

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Tables

Table 1. School attendance of women, Indonesia

Current Age	Islamic School	Other School	No School
15-29	17.6%	69.8%	12.6%
30-39	11.7%	69.9%	18.4%
40-49	7.3%	61.4%	31.3%
Total	12.7%	67.8%	19.6%

Notes: Islamic school indicator denotes one's own attendance of an Islamic school at any level
Source: Authors' calculations from IFLS 1993

Table 2. Summary statistics for variables entering fertility regressions (sample of mothers), Indonesia

	Mean	SD	Min	Max
Number of Surviving Children	2.446	0.043	0	14
Education (in years)	5.216	0.153	0	18
Attended Islamic School	0.128	0.012	0	1
Muslim	0.909	0.011	0	1
Age	31.652	0.189	15	49
Urban	0.354	0.029	0	1
age category 15-19	0.097	0.007	0	1
age category 20-24	0.126	0.006	0	1
age category 25-29	0.184	0.007	0	1
age category 30-34	0.197	0.007	0	1
age category 35-39	0.168	0.006	0	1
age category 40-44	0.143	0.006	0	1
age category 45-49	0.085	0.005	0	1
province1 (North Sumatra)	0.064	0.006	0	1
province2 (West Sumatra)	0.027	0.003	0	1
province3 (South Sumatra)	0.041	0.005	0	1
province4 (Lampung)	0.039	0.004	0	1
province5 (Dki Jakarta)	0.056	0.003	0	1
province6 (West Java)	0.222	0.014	0	1
province7 (Central Java)	0.191	0.014	0	1
province8 (Yogyakarta)	0.018	0.002	0	1
province9 (East Java)	0.230	0.013	0	1
province10 (Bali)	0.021	0.002	0	1
province11 (West Nusa Tenggara)	0.024	0.003	0	1
province12 (South Kalimantan)	0.019	0.002	0	1
province13 (South Sulawesi)	0.049	0.007	0	1
Number of Observations	5125			

Notes: Islamic school indicator denotes one's own attendance of an Islamic school at any level
Source: Authors' calculations from IFLS 1993

Table 3. Fertility by Mother's own Islamic school indicator, IFLS 1993, Indonesia
LHS Variable: Number of Surviving Children

	(1)	(2)	(3)	(4)
	Age 15-49	Age 15-29	Age 30-39	Age 40-49
Education (in years)	-0.050	-0.076	-0.038	-0.025
	(0.008)***	(0.007)***	(0.013)***	(0.022)
Attended Islamic School	0.166	0.013	0.209	0.667
	(0.073)**	(0.062)	(0.129)	(0.265)**
Muslim	0.124	0.030	0.436	0.009
	(0.108)	(0.102)	(0.158)***	(0.225)
Urban	-0.013	0.019	-0.186	0.204
	(0.080)	(0.059)	(0.115)	(0.201)
Constant	0.987	0.760	3.385	4.974
	(0.173)***	(0.126)***	(0.251)***	(0.343)***
age category 15-19	*reference*	*reference*		
age category 20-24	0.889	0.855		
	(0.055)***	(0.047)***		
age category 25-29	1.663	1.592		
	(0.061)***	(0.056)***		
age category 30-34	2.426		*reference*	
	(0.069)***			
age category 35-39	2.910		0.495	
	(0.095)***		(0.094)***	
age category 40-44	3.468			*reference*
	(0.113)***			
age category 45-49	3.767			0.298
	(0.157)***			(0.166)*
province1 (North Sumatra)	*reference*	*reference*	*reference*	*reference*
province2 (West Sumatra)	-0.356	-0.195	-0.496	-0.524
	(0.184)*	(0.148)	(0.232)**	(0.352)
province3 (South Sumatra)	0.010	0.135	0.007	-0.099
	(0.213)	(0.178)	(0.270)	(0.475)
province4 (Lampung)	-0.248	0.099	-0.690	-0.168
	(0.187)	(0.135)	(0.313)**	(0.328)
province5 (Dki Jakarta)	-0.599	-0.249	-0.533	-1.494
	(0.175)***	(0.134)*	(0.240)**	(0.373)***
province6 (West Java)	-0.529	-0.003	-0.788	-1.179
	(0.187)***	(0.137)	(0.260)***	(0.343)***
province7 (Central Java)	-0.695	-0.074	-1.045	-1.303
	(0.178)***	(0.126)	(0.235)***	(0.346)***
province8 (Yogyakarta)	-1.021	-0.399	-1.278	-1.847
	(0.165)***	(0.130)***	(0.257)***	(0.334)***
province9 (East Java)	-1.026	-0.143	-1.417	-2.075
	(0.164)***	(0.123)	(0.233)***	(0.327)***
province10 (Bali)	-0.660	-0.135	-0.809	-1.196
	(0.202)***	(0.132)	(0.272)***	(0.414)***
province11 West Nusa Tenggara	-0.204	0.032	-0.389	-0.010
	(0.177)	(0.141)	(0.233)*	(0.405)
province12 South Kalimantan	-0.614	-0.049	-1.021	-0.958
	(0.193)***	(0.137)	(0.291)***	(0.411)**
province13 South Sulawesi	-0.542	-0.091	-0.626	-1.262
	(0.229)**	(0.178)	(0.280)**	(0.461)***
Weights	x	x	x	x
Observations	5125	1812	2043	1270
R-squared	0.38	0.41	0.09	0.08

Notes: Robust standard errors in parentheses: * significant at 10%; ** significant at 5%; *** significant at 1%
Source: Authors' calculations from IFLS 1993

Table 4. Summary statistics for variables entering the rate of return regression, Indonesia

	Mean	SD	Min	Max
Log monthly earnings	4.414	0.040	0	11.408
Education (in years)	6.821	0.142	0	18
(of which) years of Islamic education	0.648	0.059	0	16
Attended Islamic School	0.138	0.011	0	1
Muslim	0.915	0.009	0	1
Experience	22.476	0.248	0	54
Male	0.658	0.010	0	1
Urban	0.414	0.032	0	1
province1 (North Sumatra)	0.065	0.006	0	1
province2 (West Sumatra)	0.028	0.003	0	1
province3 (South Sumatra)	0.039	0.005	0	1
province4 (Lampung)	0.038	0.005	0	1
province5 (Dki Jakarta)	0.064	0.004	0	1
province6 (West Java)	0.223	0.014	0	1
province7 (Central Java)	0.189	0.015	0	1
province8 (Yogyakarta)	0.023	0.003	0	1
province9 (East Java)	0.237	0.017	0	1
province10 (Bali)	0.027	0.003	0	1
province11 (West Nusa Tenggara)	0.019	0.002	0	1
province12 (South Kalimantan)	0.020	0.003	0	1
province13 (South Sulawesi)	0.029	0.004	0	1
Number of observations	4127			

Notes: a. Monthly earnings are reported in thousands, and 17 respondents report having 1000 rupiah per month.

b. Islamic school indicator denotes one's own attendance of an Islamic school at any level

Source: Authors' calculations from IFLS 1993

Table 5. Rate of return regressions, Indonesia
LHS Variable: Logarithm of monthly earnings

	(1)	(2)	(3)
Education (in years)	0.113	0.115	0.116
	(0.007)***	(0.007)***	(0.005)***
(of which) years of Islamic education		-0.015	-0.022
		(0.019)	(0.013)*
Attended Islamic School		-0.031	0.033
		(0.100)	(0.075)
Muslim	-0.043	-0.026	-0.066
	(0.090)	(0.090)	(0.060)
Experience	0.056	0.056	0.058
	(0.012)***	(0.012)***	(0.007)***
Experience^2	-0.001	-0.001	-0.001
	(0.000)***	(0.000)***	(0.000)***
Male	0.481	0.479	0.482
	(0.051)***	(0.051)***	(0.035)***
Urban	0.446	0.44	0.426
	(0.062)***	(0.062)***	(0.037)***
Constant	2.535	2.525	2.585
	(0.214)***	(0.214)***	(0.131)***
province1 (North Sumatra)	*reference*	*reference*	*reference*
province2 (West Sumatra)	0.024	0.032	0.022
	(0.154)	(0.152)	(0.088)
province3 (South Sumatra)	-0.217	-0.22	-0.138
	(0.200)	(0.201)	(0.104)
province4 (Lampung)	-0.373	-0.366	-0.408
	(0.154)**	(0.156)**	(0.111)***
province5 (Dki Jakarta)	0.363	0.365	0.351
	(0.112)***	(0.112)***	(0.071)***
province6 (West Java)	0.005	0.001	-0.043
	(0.121)	(0.121)	(0.072)
province7 (Central Java)	-0.146	-0.148	-0.194
	(0.128)	(0.128)	(0.083)**
province8 (Yogyakarta)	-0.287	-0.266	-0.29
	(0.133)**	(0.133)**	(0.088)***
province9 (East Java)	-0.114	-0.113	-0.161
	(0.124)	(0.125)	(0.074)**
province10 (Bali)	0.116	0.12	0.02
	(0.146)	(0.146)	(0.089)
province11 West Nusa Tenggara	-0.084	-0.085	-0.183
	(0.159)	(0.160)	(0.091)**
province12 South Kalimantan	0.092	0.089	0.015
	(0.161)	(0.160)	(0.094)
province13 South Sulawesi	-0.121	-0.128	-0.232
	(0.143)	(0.142)	(0.103)**
Weights	x	x	
Observations	4127	4127	4127
R-squared	0.26	0.26	0.28

Notes: a. Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

b. 766 individuals report attending Islamic school at any level. The sample includes all respondents who reported years and monthly earnings. Estimates are not corrected for the selection into labor force.

d. Experience is calculated as (age-schooling-6)

e. Islamic school indicator denotes one's own attendance of an Islamic school at any level

Source: Authors' calculations from IFLS 1993

Table 6. Percentage of women with a 6-19 year-old household member (self included) in Islamic school, India, rural UP & B

Current Age	With HH members in Islamic school	With HH members in any school
15-29	1.9%	76.5%
30-39	2.2%	91.4%
40-45	0.8%	92.3%

Source: Authors' calculations from SLCUP&B 1998

Table 7. Summary statistics for variables entering fertility regressions, India, rural UP&B

	Mean	SD	Min	Max
Number of Surviving Children	2.184	0.040	0	11
Education (in years)	2.120	0.159	0	18
Muslim head of household	0.116	0.023	0	1
Islamic school	0.019	0.008	0	1
Presence of 6-19 hh members	0.829	0.011	0	1
Bihar	0.552	0.011	0	1
Age	27.930	0.150	15	45
age category 15-19	0.192	0.008	0	1
age category 20-24	0.188	0.008	0	1
age category 25-29	0.194	0.008	0	1
age category 30-34	0.156	0.008	0	1
age category 35-39	0.129	0.007	0	1
age category 40-45	0.141	0.008	0	1
Number of observations	2948			

Notes: Islamic school is an indicator of a household with a Muslim household head, in which there is at least one member aged 6-19 who attends a religious school. It is used as a proxy for women's own religious schooling indicator.

Source: Authors' calculations from SLCUP&B 1998

Table 8. Fertility by household's Islamic indicator (see notes), India, rural UP&B

LHS Variable: Number of Surviving Children

	(1)	(2)	(3)
	Age 15-45	Age 15-34	Age 35-45
Education (in years)	-0.045	-0.039	-0.061
	(0.006)***	(0.006)***	(0.019)***
Muslim head of household	0.292	0.13	0.995
	(0.115)**	(0.114)	(0.213)***
Islamic school	0.695	0.732	0.765
	(0.201)***	(0.220)***	(0.428)*
Presence of 6-19 hh members	0.865	0.576	2.814
	(0.086)***	(0.078)***	(0.213)***
Uttar Pradesh	*reference*	*reference*	*reference*
Bihar	-0.085	-0.054	-0.151
	(0.055)	(0.055)	(0.139)
Constant	-0.519	-0.27	1.083
	(0.093)***	(0.083)***	(0.243)***
age category 15-19	*reference*	*reference*	
age category 20-24	1.064	0.992	
	(0.071)***	(0.067)***	
age category 25-29	2.247	2.194	
	(0.070)***	(0.069)***	
age category 30-34	3.061	3.059	
	(0.089)***	(0.090)***	
age category 35-39	3.458		*reference*
	(0.114)***		
age category 40-45	3.698		0.289
	(0.114)***		(0.143)**
Weights	x	x	x
Observations	2948	2170	778
R-squared	0.54	0.52	0.18

Notes: a. Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%
b. Islamic school is an indicator of a household with a Muslim household head, in which there is at least one member aged 6-19 who attends a religious school. It is used as a proxy for women's own religious schooling indicator.
Source: Authors' calculations from SLCUP&B 1998

Table 9. Summary statistics for variables entering rate of return regressions, India, rural UP&B

	Mean	SD	Min	Max
Log daily earnings	2.463	0.074	-2.499	6.345
Education (in years)	3.225	0.210	0	18
Education*Islamic school	0.054	0.032	0	12
Islamic school	0.026	0.015	0	1
Muslim head of household	0.108	0.028	0	1
Experience	24.974	0.423	0	74
Male	0.798	0.017	0	1
Bihar	0.489	0.023	0	1
Number of observations	1620			

Notes: Islamic school is an indicator of a household with a Muslim household head, in which there is a member aged between 6-19 years old who attends a religious school. It is used as a proxy for adults' religious schooling indicator.
Source: Authors' calculations from SLCUP&B 1998

Table 10. Rate of return regressions, India, rural UP&B

LHS Variable: Log daily earnings

	(1)	(2)	(3)
Education (in years)	0.122	0.122	0.122
	(0.008)***	(0.008)***	(0.008)***
Islamic school		-0.026	-0.051
		(0.206)	(0.229)
Education*Islamic school			0.012
			(0.048)
Muslim head of household	0.178	0.184	0.184
	(0.116)	(0.149)	(0.149)
Experience	0.062	0.062	0.062
	(0.010)***	(0.010)***	(0.010)***
Experience^2	-0.001	-0.001	-0.001
	(0.000)***	(0.000)***	(0.000)***
Male	1.724	1.724	1.724
	(0.105)***	(0.105)***	(0.105)***
Uttar Pradesh	*reference*	*reference*	*reference*
Bihar	0.151	0.151	0.151
	(0.082)*	(0.082)*	(0.082)*
Constant	-0.158	-0.158	-0.159
	(0.189)	(0.189)	(0.189)
Weights	x	x	x
Observations	1620	1620	1620
R-squared	0.45	0.45	0.45

Notes: a. Robust standard errors in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%
b. Experience is calculated as (Age-education-6).
c. Islamic school is an indicator of a household with a Muslim household head, in which there is a member aged between 6-19 years old who attends a religious school. It is used as a proxy for adults' religious schooling indicator. The sample includes all the respondents who reported years of schooling and annual earnings.

Source: Authors' calculations from SRLUP&B 1998

Table 11. Islamic school attendance of women, rural Bangladesh

Current Age	Islamic school
15-29	3.2%
30-39	1.7%
40-49	3.5%

Notes: Islamic school attendance indicates whether the most recent school was an Islamic school. It includes attendance of maktabs that are considered pre-school level educational institutions. Women with only maktab level education are assigned zero level of schooling according to MHSS 1996. In the analyzed sample of women, 81% of women report maktab as the most recently attended school.
Source: Authors' calculations from MHSS 1996

Table 12. School attendance of women, rural Bangladesh

Current Age	Positive Schooling
15-29	71.6%
30-39	46.5%
40-49	35.7%

Source: Authors' calculations from MHSS 1996

Table 13. Summary statistics for variables entering fertility regressions, rural Bangladesh

	Mean	SD	Min	Max
Number of Surviving Children	2.361	0.042	0	11
Education (in years)	3.311	0.092	0	14
Muslim	0.876	0.011	0	1
Attended Islamic School (including maktabs)	0.028	0.005	0	1
age	29.379	0.189	15	49
age category 15-19	0.224	0.012	0	1
age category 20-24	0.141	0.010	0	1
age category 25-29	0.156	0.009	0	1
age category 30-34	0.163	0.013	0	1
age category 35-39	0.133	0.007	0	1
age category 40-44	0.094	0.005	0	1
age category 45-49	0.091	0.007	0	1
Number of observations	4088			

Notes: Islamic school indicator denotes whether one's most recently attended school is Islamic.
Source: Authors' calculations from MHSS 1996

Table 14. Fertility by mother's own Islamic school indicator, rural Bangladesh

LHS Variable: Number of Surviving Children

	(1)	(2)	(3a)	(3b)	(4)
	Age 15-49	Age 15-34	Age 35-44	Age 35-44	Age 45-49
Education (in years)	-0.062	-0.07	-0.021	-0.021	0.086
	(0.007)***	(0.007)***	(0.018)	(0.014)	(0.044)*
Muslim	0.383	0.232	0.773	0.737	0.495
	(0.079)***	(0.084)***	(0.193)***	(0.125)***	(0.422)
Attended Islamic School (including maktabs)	-0.236	-0.522	0.521	0.589	0.989
	(0.211)	(0.213)**	(0.338)	(0.271)**	(0.620)
Constant	0.023	0.21	3.428	3.503	4.584
	(0.076)	(0.082)**	(0.188)***	(0.129)***	(0.325)***
age category 15-19	reference	reference			
age category 20-24	0.692	0.687			
	(0.056)***	(0.054)***			
age category 25-29	1.869	1.844			
	(0.079)***	(0.079)***			
age category 30-34	2.82	2.792			
	(0.099)***	(0.098)***			
age category 35-39	3.834				
	(0.072)***		reference	reference	
age category 40-44	4.398		0.546	0.597	
	(0.100)***		(0.121)***	(0.096)***	
age category 45-49	4.902		1.06	1.154	
	(0.160)***		(0.153)***	(0.101)***	
Weights	x	x	x		x
Observations	4088	2442	1646	1646	473
R-squared	0.71	0.66	0.1	0.1	0.02

Notes: a. Robust standard errors in parentheses: * significant at 10%; ** significant at 5%; *** significant at 1%
b. Islamic school indicator denotes whether one's most recently attended school is Islamic.

Source: Authors' calculations from MHSS 1996

Table 15. Summary statistics for variables entering rate of return regressions, rural Bangladesh

	Mean	SD	Min	Max
Log monthly earnings	5.932	0.051	-1.792	11.002
Education in years	1.726	0.086	0	16
(of which) years of Islamic education	0.061	0.019	0	12
Attended Islamic school (including maktabs)	0.012	0.003	0	1
Muslim	0.864	0.013	0	1
Experience	29.022	0.327	1	76
Male	0.596	0.013	0	1
Number of observations	4081			

Notes: Islamic school indicator denotes whether one's most recently attended school is Islamic.
Source: Authors' calculations from MHSS 1996

Table 16. Rate of return regressions, rural Bangladesh

LHS Variable: Log monthly earnings

	(1)	(2)	(3)
Education (in years)	0.084	0.089	0.097
	(0.009)***	(0.009)***	(0.007)***
(of which) years of Islamic education		-0.072	-0.073
		(0.062)	(0.034)**
Attended Islamic School (including maktabs)		-0.219	-0.122
		(0.411)	(0.271)
Muslim	-0.435	-0.426	-0.393
	(0.113)***	(0.113)***	(0.063)***
Experience	0.051	0.05	0.043
	(0.009)***	(0.009)***	(0.006)***
Experience^2	-0.001	-0.001	-0.001
	(0.000)***	(0.000)***	(0.000)***
Male	2.874	2.874	2.952
	(0.072)***	(0.072)***	(0.043)***
Constant	3.718	3.724	3.747
	(0.218)***	(0.217)***	(0.120)***
Weights	x	x	
Observations	4081	4081	4081
R-squared	0.59	0.59	0.62

Notes: a. Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%
b. 200 people report having attended Islamic schools, including maktabs. The sample includes all respondents who reported years of schooling and monthly earnings. The estimates are not corrected for selection into labor force.
c. Experience is calculated as (age-schooling-6)
Source: Authors' calculations from MHSS 1996

Table 17. Percentage of women with a household
member (self included) in Islamic school, Cote D'Ivoire

Current Age	Islamic
15	1.8%
30	2.4%
40	1.6%

Notes: Islamic is an indicator of a household with a Muslim
household head, in which there is any member whose last
school attended was a private religious school. It is used
as a proxy for adults' Islamic education.

Source: Authors' calculations from CILSS 1986-87

Table 18. Summary statistics for variables entering fertility regressions (fertility module sample), Cote D'Ivoire

	Mean	SD	Min	Max
Number of surviving children	2.846	0.062	0	15
Education (in years)	2.166	0.088	0	21
Muslim head of household	0.365	0.013	0	1
Islamic school	0.018	0.004	0	1
Urban	0.311	0.012	0	1
Age	28.864	0.240	15	49
age category 15-19	0.192	0.010	0	1
age category 20-24	0.193	0.010	0	1
age category 25-29	0.182	0.010	0	1
age category 30-34	0.143	0.009	0	1
age category 35-39	0.118	0.008	0	1
age category 40-44	0.095	0.008	0	1
age category 45-49	0.077	0.007	0	1
Year 1987	0.361	0.012	0	1
Number of observations	1785			

Notes: Islamic is an indicator of a household with a Muslim household head, in which there is any member whose last school
attended was a private religious school. It is used as a proxy for adults' Islamic education.

Source: Authors' calculations from CILSS 1986-87

Table 19. Fertility by a household member's Islamic school attendance (fertility module sample), Cote D'Ivoire.

LHS Variable: Number of Surviving Children

	(1)	(2)	(3)	(4)
	Age 15-49	Age 15-29	Age 30-39	Age 40-49
Education (in years)	-0.050	-0.058	-0.039	0.115
	(0.013)***	(0.012)***	(0.033)	(0.094)
Muslim head of household	0.100	0.075	0.379	-0.246
	(0.105)	(0.094)	(0.233)	(0.377)
Islamic school	0.375	-0.169	1.297	-0.632
	(0.589)	(0.318)	(0.962)	(1.470)
Urban	-0.077	-0.083	-0.089	0.019
	(0.128)	(0.104)	(0.315)	(0.546)
Constant	0.692	0.741	3.697	5.042
	(0.099)***	(0.096)***	(0.242)***	(0.304)***
age category 15-19	reference	reference		
age category 20-24	1.127	1.121		
	(0.090)***	(0.089)***		
age category 25-29	2.270	2.263		
	(0.099)***	(0.098)***		
age category 30-34	3.231		reference	
	(0.155)***			
age category 35-39	3.990		0.830	
	(0.174)***		(0.223)***	
age category 40-44	4.265			reference
	(0.243)***			
age category 45-49	4.109	0.000		-0.120
	(0.258)***	0.000		(0.347)
Year 1986	reference	reference	reference	reference
Year 1987	-0.118	-0.126	0.000	-0.173
	(0.114)	(0.103)	(0.245)	(0.415)
Weights	x	x	x	x
Observations	1785	1016	464	305
R-squared	0.43	0.37	0.06	0.01

Notes: a. Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

b. Islamic is an indicator of a household with a Muslim household head, in which there is any member whose last school attended was a private religious school. It is used as a proxy for adults' Islamic education. There are only 2 women in the 15-49 age group with last schooling being private religious given that the head of the household is Muslim. There are 32 women with a household member reporting attendance of a private religions school.

Source: Author's calculations from CILSS 1986-87

Table 20. Summary statistics for variables entering fertility regressions (full sample), Cote D'Ivoire

	Mean	SD	Min	Max
Number of children under 30	2.414	0.042	0	18
Education (in years)	2.290	0.062	0	21
Muslim head of household	0.352	0.008	0	1
Islamic school	0.020	0.003	0	1
Urban	0.312	0.008	0	1
Age	28.340	0.170	15	49
age category 15-19	0.234	0.007	0	1
age category 20-24	0.192	0.007	0	1
age category 25-29	0.161	0.006	0	1
age category 30-34	0.120	0.006	0	1
age category 35-39	0.113	0.006	0	1
age category 40-44	0.101	0.005	0	1
age category 45-49	0.078	0.005	0	1
Year 1987	0.338	0.008	0	1
Number of observations	4024			

Notes: Islamic is an indicator of a household with a Muslim household head, in which there is any member whose last school attended was a private religious school. It is used as a proxy for adults' Islamic education.

Source: Authors' calculations from CILSS 1986-87

Table 21. Fertility by a household member's Islamic school attendance (full sample), Cote D'Ivoire.

LHS Variable: Number of Children under 30

	(1)	(2)	(3)	(4)
	Age 15-49	Age 15-29	Age 30-39	Age 40-49
Education (in years)	-0.055	-0.055	-0.05	0.058
	(0.009)***	(0.007)***	(0.023)**	(0.065)
Muslim head of household	0.146	0.083	0.419	-0.033
	(0.073)**	(0.062)	(0.180)**	(0.250)
Islamic school	0.435	-0.138	1.339	0.808
	(0.254)*	(0.153)	(0.460)***	(0.921)
Urban	0.055	-0.119	0.127	0.496
	(0.085)	(0.066)*	(0.228)	(0.333)
Constant	0.399	0.54	3.239	4.25
	(0.059)***	(0.051)***	(0.169)***	(0.218)***
age category 15-19	*reference*	*reference*		
age category 20-24	1.044	1.039		
	(0.057)***	(0.056)***		
age category 25-29	2.076	2.068		
	(0.074)***	(0.074)***		
age category 30-34	3.077		*reference*	
	(0.111)***			
age category 35-39	3.852		0.830	
	(0.127)***		(0.223)***	
age category 40-44	3.988			*reference*
	(0.165)***			
age category 45-49	3.578			-0.120
	(0.173)***			(0.347)
Year 1986	*reference*	*reference*	*reference*	*reference*
Year 1987	0.12	-0.01	0.275	0.306
	(0.078)	(0.066)	(0.184)	(0.277)
Observations	4024	2379	937	708
R-squared	0.41	0.36	0.06	0.01

Notes: a. Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%
b. Islamic is an indicator of a household with a Muslim household head, in which there is any member whose last school attended was a private religious school. It is used as a proxy for adults' Islamic education. There are only 4 women in the 15-49 age group with last schooling being private religious given that the head of the household is Muslim. There are 89 women with a household member reporting attendance of a private religions school.
Source: Author's calculations from CILSS 1986-87

Table 22. Summary statistics for variables entering rate of return regressions, Cote D'Ivoire

	Mean	SD	Min	Max
Log of hourly wage	7.003	0.038	1.022	14.054
Education (in years)	2.494	0.081	0	21
Muslim head of household	0.365	0.009	0	1
Islamic school	0.021	0.003	0	1
Education*Islamic school	0.055	0.016	0	20
Male	0.625	0.009	0	1
Experience	33.994	0.312	3	88
Abidjan	0.131	0.008	0	1
Urban	0.290	0.009	0	1
Year 1987	0.347	0.009	0	1
Number of observation	3282			

Notes: Islamic school is an indicator of a household with a Muslim household head, in which there is any member whose last school attended, was a private religious school. It is used as a proxy for adults' Islamic education.

Source: Authors' calculations from CILSS 1986-1987

Table 23. Rate of return regressions, Cote D'Ivoire

LHS Variable: Log hourly wage

	(1)	(2)	(3)
Education (in years)	0.174	0.174	0.175
	(0.010)***	(0.010)***	(0.010)***
Muslim head of household	-0.523	-0.525	-0.523
	(0.072)***	(0.071)***	(0.071)***
Islamic school		0.027	0.105
		(0.380)	(0.285)
Education*Islamic school			-0.029
			(0.070)
Male	1.612	1.613	1.613
	(0.067)***	(0.068)***	(0.068)***
Experience	0.062	0.062	0.062
	(0.010)***	(0.010)***	(0.010)***
Experience^2	0.000	0.000	0.000
	(0.000)***	(0.000)***	(0.000)***
Abidjan	-0.091	-0.091	-0.087
	(0.132)	(0.131)	(0.128)
Urban	-0.842	-0.843	-0.846
	(0.093)***	(0.093)***	(0.093)***
Year 1986	*reference*		*reference*
Year 1987	-0.110	-0.110	-0.111
	(0.070)	(0.070)	(0.070)
Constant	4.553	4.554	4.550
	(0.203)***	(0.198)***	(0.196)***
Weights	x	x	x
Observations	3282	3282	3282
R-squared	0.37	0.37	0.37

Notes: a. Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%
b. Islamic school is an indicator of a household with a Muslim household head, in which there is any member whose last school attended, was a private religious school. It is used as a proxy for adults' Islamic education.
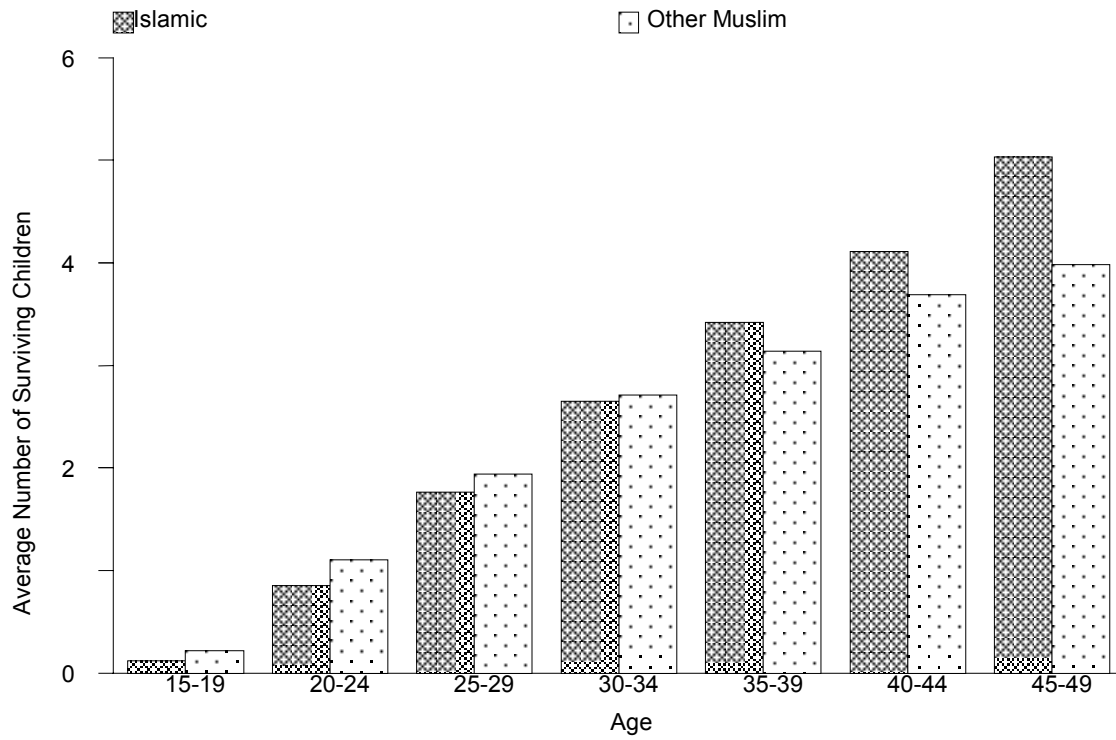c. The sample includes all respondents who reported years of schooling and weekly earnings along with number of hours of work. The estimates are not corrected for selection into labor force.

d. Experience is calculated as (age-schooling-6)
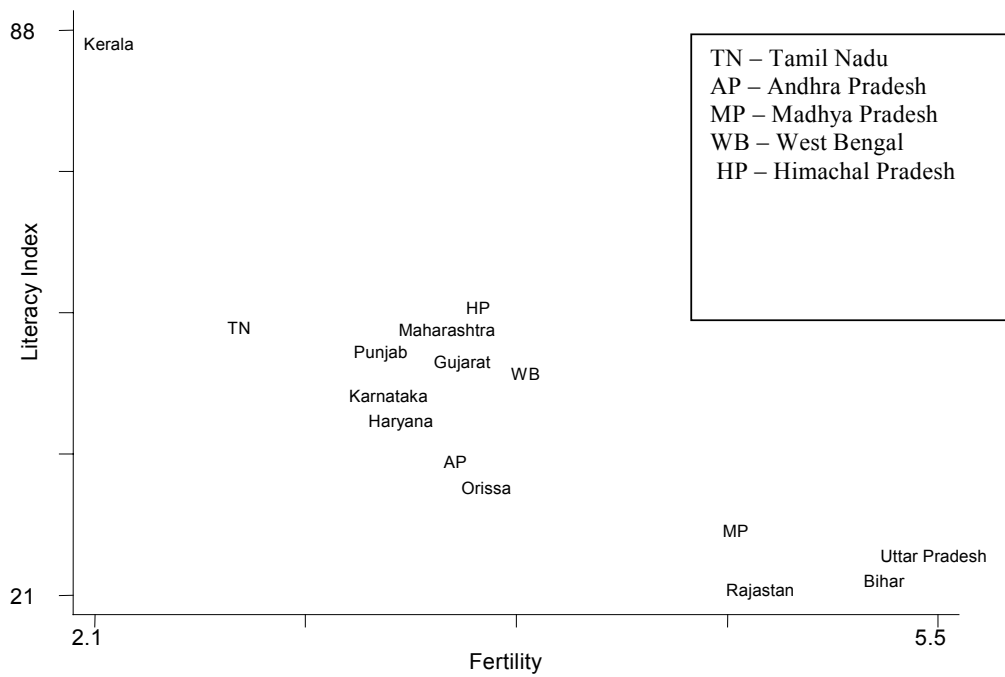
Source: Authors' calculations from MHSS 1996

Figures
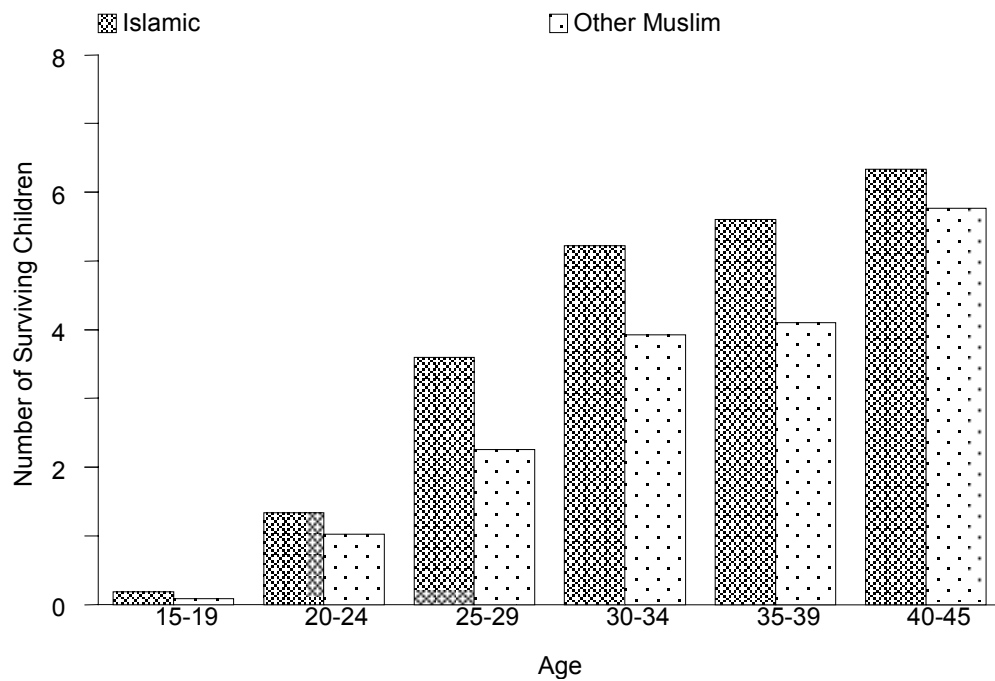
Figure 2. Fertility differentials, Indonesia

Source: IFLS 1993

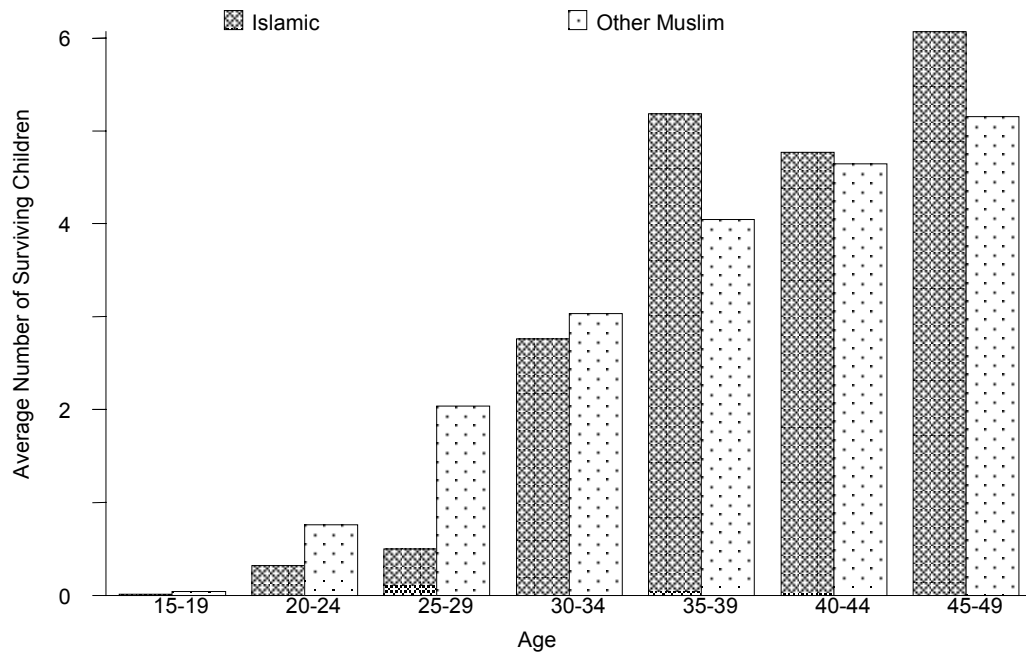**Figure 3.** Indian States by Level of Female Literacy Index and Total Fertility

Source: Cleland and Jejjebhoy, 1996

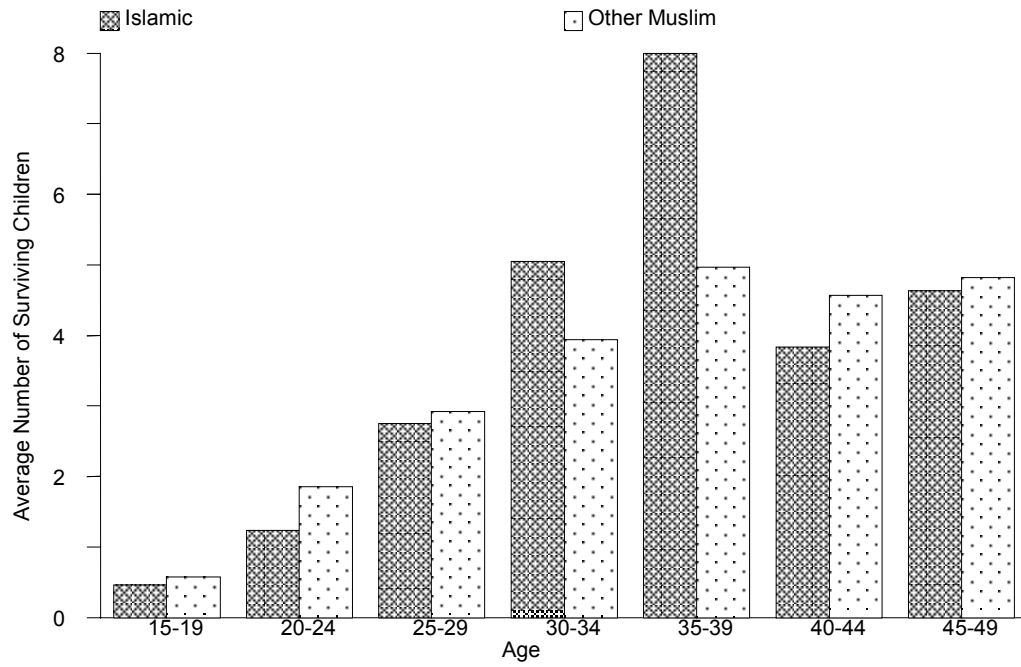**Figure 4.** Fertility differentials, India, rural UP&B

Source: SLCUP&B 1998

53

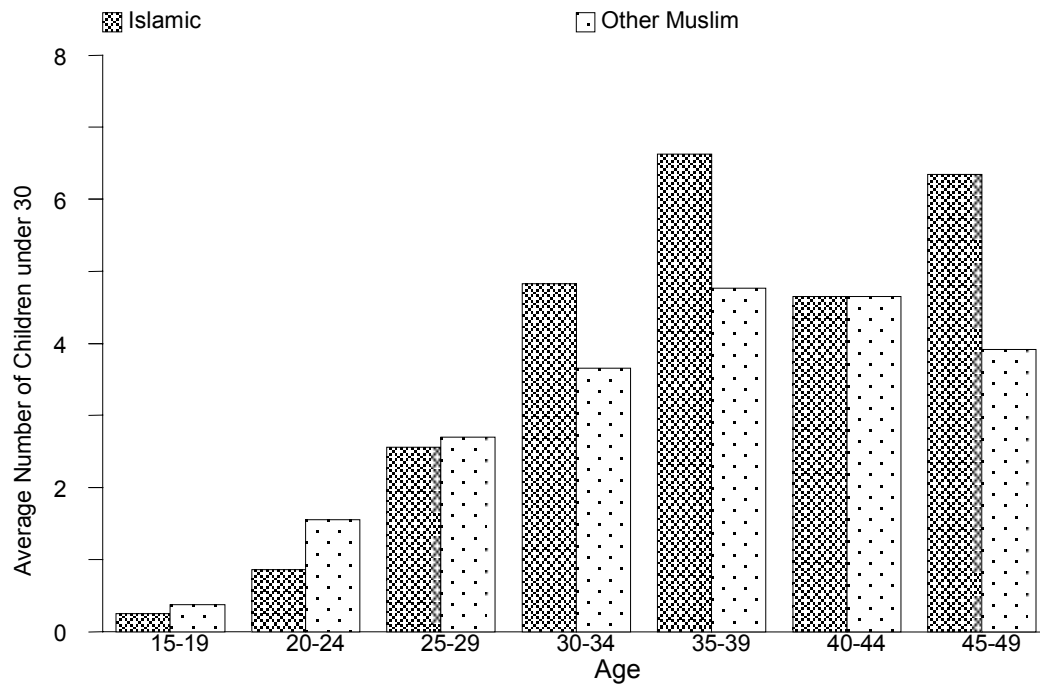**Figure 5.** Fertility differentials, rural Bangladesh

Source: MHSS 1996

Figure 6a. Fertility differentials (Average number of surviving children, fertility module sample), Cote D'Ivoire

Figure 6b. Fertility differentials (Average number of children under 30 years of age, full sample), Cote D'Ivoire