

# Public Mass Modern Education, Religion, and Human Capital in Twentieth-Century Egypt\*

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## Abstract

Public mass modern education was a major pillar of state-led development in the post-Colonial period. I examine the impact of Egypt's transformation in 1953 of traditional elementary schools (*kuttabs*) into modern primary schools on the Christian-Muslim educational and occupational differentials, which were in favor of Christians. The reform allowed *kuttabs*' graduates, where Muslim students were over-represented, access to higher stages of education that were previously confined to primary schools' graduates. Exploiting the variation in exposure to reform across cohorts and districts of birth among adult males in 1986, I find that the reform benefited Muslims but not Christians.

Keywords: public mass education; religious schools; Middle East; human capital; inequality

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## 1. Introduction

*What Europe is suffering from is the result of generalizing education among all levels of society... they have no chance of avoiding what happened [Europe's 1848 revolutions]. So if this is an example in front of us, our duty is simply to teach them how to read and write to a certain limit in order to encourage satisfactory work and not to spread education beyond that point.*

Muhammad Ali Pasha, Ottoman Viceroy of Egypt (1805-1848), in a private letter to his son, Ibrahim Pasha (Cochran 1986, p. 6)

*The poor go to heaven, but can't they have a share on Earth too? They are willing to give up a share in heaven in exchange for a share on Earth.*

Gamal Abdul-Nasser, President of Egypt (1956-1970) (Excerpt from a public speech)

Public mass modern education was a major pillar of the state-led development model that was widely adopted throughout the developing world in the post-Colonial period. This was usually advocated by governments not only on the grounds of human capital accumulation and economic growth, but also on egalitarian grounds with the objective of reducing human capital inequality. Achieving these objectives entailed a certain challenge, however: How to unify the dichotomous educational system that was often inherited from the Colonial Era with its two components, (a) the pre-Colonial traditional schools that served the masses but provided little opportunity for educational or occupational advancement and (b) the Colonial modern schools that served the elites and were the gateway of university education and white-collar jobs? The unification process was particularly important in ethnoreligiously diverse societies, where the Colonial educational system preserved, or even aggravated, intergroup human capital differentials, which were, at least partially, responsible for inter-group tensions.

But regardless of the governments' declared objectives of introducing public mass modern education, its factual impact on both human capital accumulation and inequality is controversial. First, on the human capital accumulation front, the historically different roles of the central government in the provision of mass education in Western Europe versus North America suggest that there is no unique optimal path to generate rapid accumulation of human capital (Ringer 1979; Goldin and Katz 2003 and 2009). The evidence from developing countries is also mixed. While state's expansion of the *quantity* of schools was shown to have positive impact on economic outcomes (Duflo 2001), the drop in the *quality*

of schools and the surge in the employment share of the public sector that often characterized public mass education programs may shed doubt over their positive effect (Pritchett 2001; Glewwe 2002; Hanushek and Woessmann 2007). In fact, one line of literature estimated the quality differences between public and private schools finding that they are in favor of the latter (Cox and Jimenez 1991; Kingdon 1996). Second, on the inequality front, the impact of public mass education on inequality, both overall and across groups, remains to be, to the best of my knowledge, an unresolved question. On the one hand, the literature on nationalism in political science emphasizes public mass education as a fundamental channel of state formation and nation-building (Weber 1976; Gellner 1983; Smith 2003). Apart from its impact on creating a common identity across heterogeneous ethno-religious groups, public mass education may mitigate inter-group human capital inequality which could potentially lead to inter-group conflicts. On the other hand, however, there is little empirical evidence on whether public mass education indeed mitigates human capital differences between groups.

This paper provides novel empirical evidence on the impact of introducing public mass education on inter-group human capital inequality from an understudied region, the Middle East, and from one of its largest countries, Egypt. Following a long medieval tradition, Christians in Egypt (6 percent of the population) had, on average, better educational and occupational attainment than Muslims (Tagher, 1998 [1951]; Courbage and Fargues, 1997; Saleh, 2015). In 1996 Egypt, 30 percent of adult active Muslim males aged 35 to 65 worked in white-collar jobs, compared to 43 percent among Christians.<sup>1</sup> After a military coup that overthrew the monarchy in 1952 and ended the *de facto* British Colonization in 1956, Egypt embarked on a pioneering state-led development program in the region. In 1953, as the final stroke in a century-long process of unifying the dichotomous traditional and modern educational systems, the government transformed traditional “elementary” (*awwaliya*) schools (*kuttabs*), which enrolled 70 percent of students in 1948/49, into public modern “primary” (*ibtida’iya*) schools (Boktor 1963, 27-28).<sup>2</sup> Prior to

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<sup>1</sup> Author’s calculations based on the individual-level 10 percent sample from the 1996 census. Sample is restricted to Egyptian active Muslim and Christian males aged 35 to 65 who are born in Egypt with non-missing values for age, province of birth, literacy, and occupation.

<sup>2</sup> Author’s calculation based on the 1948/49 schools census.

1953 modern primary schools were the sole route to secondary schools, university education, and white-collar jobs, whereas *kuttabs* qualified their graduates to only religious (Muslim or Christian) higher education institutes (Boktor 1936, p. 123; Harby and El-Azzawi 1960). Although the reform entailed partial improvement of equipment and facilities in *kuttabs* and the construction of new primary, preparatory, and secondary schools, these measures were limited in scope. Instead, the reform essentially meant the “re-labeling” of *kuttabs* as public modern primary schools and increasing class size in primary, preparatory, and secondary schools in order to absorb the surge in student enrollment. In addition to these policies, the government abolished tuition fees in public universities in 1961 and introduced in 1961-1964 an employment guarantee in the government and public sectors for graduates of secondary schools and universities, a policy that lasted until the 1983 graduates (Assaad 1997). As a result of these policies, the supply of modern schools (per 1,000 population aged 5 to 19) more than doubled from 0.44 in 1951/52 to 0.96 in 1959/60,<sup>3</sup> primary enrollment rose from 1 million students in 1952 to nearly 3.5 million in 1965–66, and preparatory and secondary enrollment expanded even faster, multiplying six fold and threefold respectively, from 1956 to 1961 (Richards 1992; Assaad 1997).

Conceptually, the 1953 reform reduced the cost of access to modern primary schools and thus to higher stages of education and white-collar jobs. This may have improved children’s educational and occupational attainment among those who would have otherwise chosen modern primary schools but were constrained by their limited supply, relative to *kuttabs*, in their districts of birth. The effects may vary by religious group, however, if there were inter-group differentials in enrollment in modern primary schools prior to 1953. Indeed, in 1948/49, Christian children who aged 5 to 19 years had higher student enrollment rates (49 percent) than Muslims (36 percent), with 71 percent of Christian students enrolled in modern, mostly private, schools, compared to only 25 percent among Muslim students most of whom enrolled in public schools.

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<sup>3</sup> Author’s calculations based on the schools censuses of 1951/52 and 1959/60 and the population censuses of 1947 and 1960. Modern schools include primary, preparatory, and secondary schools and universities.

I examine the impact of the 1953 reform on the educational and occupational attainment among each of Muslims and Christians, by matching two new data sources: (a) the individual-level 10-percent 1986 census sample that has information on religion, education, occupation, and year and district of birth (but has no information on income), and (b) the district-level 1951/52 schools census. I restrict the analysis to Egyptian Muslim and Christian males who were born in Egypt, and aged 0-19 years in 1953, with non-missing values on age, education, occupation, and district of birth. Following Duflo (2001), two factors determine the exposure of an adult male in 1986 to the 1953 reform: year of birth and intensity of the reform in district of birth, where I estimate the effect of the reform separately for each religious group. I measure reform intensity by the share of *kuttabs* out of the total number of *kuttabs* and modern schools, or alternatively, out of total male student enrollment, in district of birth in 1951/52, under the presumption that the higher the relative share of *kuttabs* in a district the more “intense” the 1953 transformation was. I focus on two outcomes: years of schooling and an indicator for white-collar jobs, where the experiment of interest compares (within each of Muslims and Christians) males who aged 0 to 5 years in 1953, and were thus poised to benefit from the reform, to those who were 11 to 15 years of age in 1953, and thus had just finished their primary or elementary schooling (4 years) by 1953.

Using the 1986, 1996, and 2006 pooled individual-level census samples and the decennial village/quarter-level 1897-1986 population censuses, I first document that the Christian-Muslim differences in educational and occupational attainment *fell* during the second half of the twentieth century. Exploiting the variation across cohorts and districts of birth in the intensity of the reform, I find that the 1953 reform had a positive impact on Muslims’ educational and occupational attainment, but had no statistically significant impact on Christians. However, the estimated impact of the reform on the Christian-Muslim *differences* with respect to these outcomes is imprecisely estimated and statistically insignificant. I argue that the observed improvement in Muslims’ educational and occupational attainment is indeed attributable to the 1953 reform although I cannot completely rule out the confounding effects of other policies that were undertaken during the same period.

The paper links two lines of literature: (a) the literature on the relationship between religion and economic outcomes (La Porta et al. 1997; Barro and McCleary 2003; Guiso et al. 2003; Borooah and Iyer 2005; Boppart et al. 2008; Becker and Woessmann 2009; Chaudhary and Rubin 2011), and (b) the literature on the impact of the construction of new schools (Duflo 2001) and the shift from traditional to modern schooling (Yuchtman 2010) on economic outcomes. The paper is, to the best of my knowledge, the first to link the two literatures by examining the impact of public mass modern education on inter-religious educational and occupational differentials. In this respect, the paper adds a policy perspective to the economics of religion literature by examining the role that public policies may play in mitigating inter-religious human capital inequality. The novelty of the research question stems from the relevance of the 1953 reform to the experiences of many developing countries in the post-Colonial Era in their attempts to unify the traditional and modern educational systems. Interestingly, the reform involved little improvement in quality of *kuttabs* and limited construction of new schools.

The paper also contributes to Egyptian history. It provides the first econometric analysis of Egypt's public mass education reform in 1953 (Harby and El-Azzawi 1960; Boktor 1963; Cochran 1986). The paper also presents the first quantitative evidence on the evolution of the Christian-Muslim socioeconomic differences as opposed to the historical qualitative literature (Tagher 1998 [1951], Courbage and Fargues 1997).

The rest of the paper is organized as follows: Section 2 provides a historical background on Egypt's educational system. Section 3 documents the Christian-Muslim differences in educational and occupational attainment over the twentieth century. I present the hypothesis in section 4. Section 5 describes the data. The empirical strategy and results are discussed in sections 6 and 7 respectively. I discuss alternative interpretations of the findings in section 8. Section 9 concludes.

## **2. Egypt's Educational System and the 1953 Reform**

Up to 1800, Egypt's educational system was composed of religious schools at both the elementary (*kuttabs*) and higher education levels. *Kuttabs* were segregated by religion and were funded

privately by each religious group's private pious endowments (*waqf*).<sup>4</sup> Modern schools were introduced to Egypt in the late eighteenth century, and existed parallel to religious schools until 1953, where they continued to serve a relatively small share of the population (enrolled 30 percent of students in 1948/49). The modern educational system started with "primary" (*ibtida'iya*) schools that led to secondary schools and universities, the gateway to white-collar occupations. These schools taught secular subjects (arithmetic, geometry, and science), and had qualified teachers and good equipment and facilities (Boktor 1936, p. 123-4).<sup>5</sup> There were three types of modern schools. First, there were public schools, which enrolled 59 percent of modern schools' students in 1948/49. Public modern schools were introduced to Egypt in 1816 under Muhammad Ali Pasha the autonomous Ottoman viceroy (1805-1848). Tuition fees were imposed on these schools in 1907 under the British Occupation (1882-1922) and remained in effect until 1944, where they were abolished at the primary level (Harby and El-Azzawi 1960, p. 33). Second, there were Egyptian private schools, which enrolled 32 percent of modern schools' students in 1948/49, and belonged to Egyptian Muslim, Coptic, Jewish, and other non-Muslim communities. Finally, there were foreign private schools, which enrolled 9 percent of modern schools' students in 1948/49, and belonged either to foreign Christian missionaries or foreign secular entities (Salama 1963, pp. 31-35).<sup>6</sup>

The parallel religious educational system started with *kuttabs*, which enrolled 70 percent of students in 1948/49. *Kuttabs* qualified their graduates to higher religious (Muslim or Christian) institutions, but *not* to secondary schools or universities. For over a century, the government attempted to unify the two systems by merging *kuttabs* and public modern primary schools. In 1916, *kuttabs* were

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<sup>4</sup> There were important quality differences between Muslim and Christian *kuttabs*. Whereas Muslim *kuttabs* taught only Arabic orthography and Quran, Christian *kuttabs* taught arithmetic and geometry in addition to orthography and religion (Heyworth-Dunne 1938, pp. 2-7, 85).

<sup>5</sup> Religion constituted 6 percent of the weekly periods in a public modern primary school in 1929. Subjects taught included: Religion, Arabic, English, Arithmetic and Geometry, Science and Hygiene, Geography and History, Drawing, and Physical Training (Boktor 1936, p. 124).

<sup>6</sup> Author's calculations based on the 1948/49 schools census. Public modern schools included schools under the Ministry of Education, Cairo University, Administration of Religious Institutes, *Waqf* Administration, and other governmental entities. Egyptian private modern schools included (1) Muslim schools under private Muslim *waqfs*, charity Muslim organizations, and other private Muslim entities, (2) Coptic schools under the Coptic Orthodox Church, charity Coptic organizations, and other private Coptic entities, (3) Jewish schools, (4) Armenian schools, and (5) other Egyptian non-Muslim schools. Foreign private modern schools included American, British, German, Italian, French, Greek, and other foreign schools.

transformed into tuition-free four-grade “elementary” (*awwaliya*) schools offering a modernized and standardized curriculum with presumably no segregation between Muslim and Christian students. Since then, *kuttabs* (now, elementary or *awwaliya* schools) became increasingly administered, or at least subsidized, by the state. By 1949, the curricula of public *kuttabs* and public modern primary schools were unified except for the foreign language requirement that started from the third grade in the latter. However, despite these measures, the separation of the two systems persisted, and *kuttabs*’ graduates were not admitted to secondary schools unless they transferred first to a modern primary school.

It was under Law 210 of 1953 that the government completely unified public *kuttabs* and public modern primary schools via omitting the foreign language requirement from the latter and allowing students in the now-unified primary schools to advance throughout their primary schooling (four years) even if they fail end-of-year examinations. The reform was accompanied by partial improvement of equipment and facilities in the transformed public *kuttabs* and the construction of new primary, preparatory, and secondary schools in order to absorb the increase in student enrollment. However, comparing the total number of *kuttabs* and modern schools in 1951/52 to that of modern schools in 1959/60 shows a very modest increase of 2.5 percent. This suggests that the increased enrollment in primary, preparatory, and secondary schools, was mostly absorbed via increasing class size. In addition, the government made education in public universities free of charge in 1961, and initiated, starting from 1961, an employment guarantee scheme in the government and public sectors to university graduates, which was then extended to graduates of secondary schools and formalized in Law 14 of 1964. This guarantee lasted until the 1983 graduates (Assaad 1997).

Figure I depicts Egypt’s supply of *kuttabs* and modern schools (the latter include primary, secondary, and higher-education schools) per 1,000 school-age population between 1906/07 and 1969/70, based on the triennial schools censuses. Between 1906/07 and 1951/52, the population-adjusted supply of *kuttabs* was about five times that of modern schools. While modern schools remained stable throughout the period, *kuttabs* witnessed a few fluctuations, especially in the 1920s, where they increased presumably

as a result of an expansion program after Egypt's (nominal) independence from Britain in 1922.<sup>7</sup> Nevertheless, the major structural break in Egypt's educational history came after 1951/52, as *kuttabs* were transformed into public modern primary schools causing a sharp increase in modern schools supply.

Figure II shows the sectoral composition of *kuttabs* and modern schools between 1906/07 and 1969/70. Public *kuttabs* that were administered by Ministry of Education or local provincial councils, whose share was negligible in 1906/07, increasingly substituted private *kuttabs* to reach 67 percent of all *kuttabs* in 1948/49 and then 100 percent in 1951/52. The latter development was perhaps a precursory measure of the 1953 reform. Similarly, within modern schools, the share of public schools increased between 1906/07 and 1951/52. Together, these trends indicate that the first half of the twentieth century witnessed increased state intervention in education via administering the traditionally private *kuttabs* and increasing public provision of modern schools.

### **3. Christian-Muslim Educational and Occupational Differentials in the Twentieth Century**

Although the existence of educational and occupational differentials between Christians and Muslims in Egypt, or, more generally, between native non-Muslim minorities and the Muslim majority in the Middle East at large, has been long noted qualitatively in the literature (Tagher 1998 [1951]; Issawi 1981), the quantitative evidence on the phenomenon and its evolution over time remains rather scanty. To the best of my knowledge, only Courbage and Fargues (1997) provided quantitative evidence on the magnitude of the inter-religious differentials in birth, death, and literacy rates in a number of countries in the region. In this section, I employ two data sources to document the evolution of the inter-religious educational and occupational differentials in Egypt throughout the twentieth century. First, I use the pooled 1986, 1996, and 2006 individual-level 10-percent population census samples to document the average educational and occupational attainment by cohort of birth among Christian and Muslim males who aged 30-60 years in each census. Second, I use the decennial village/quarter-level population censuses in 1897-1986, where I regress the average educational and occupational attainment at the

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<sup>7</sup> This was an implementation of the 1923 constitution that provided free and compulsory education for every child between 6 and 12 years.

village/quarter-level on the percentage of non-Muslims in the village/quarter allowing the coefficient of non-Muslims to vary across census years. This documentation allows me to identify the structural breaks in the long-term trends of the Christian-Muslim human capital differentials.

*A. Evidence from the Pooled 1986, 1996, and 2006 Individual-Level Population Census Samples*

The six panels of Figure III depict the average educational and occupational attainment by religion and cohort of birth and the corresponding Christian-Muslim differences. The graphs are based on the pooled 1986, 1996, and 2006 individual-level 10-percent population census samples, where the sample is restricted to Egyptian Christian and Muslim males who were born in Egypt and aged between 30 and 60 years in 1986, 1996, or 2006, with non-missing values on age, religion, province of birth, and education. I measure educational attainment by: (a) years of schooling which I assign according to the highest educational degree achieved (available in 1986 and 2006 only), and (b) literacy, which is a dummy variable that takes the value of one if the individual knows how to read and write. I measure occupational attainment by a dummy variable that takes the value of one if occupation is white-collar (defined for the working population only), which includes four major ISCO occupational groups: (1) legislators, senior officials, and managers, (2) professionals, (3) technicians and associate professionals, and (4) clerks. Because people do not remember their age, and given the lack of official birth records for older cohorts, the age distribution in the pooled 1986, 1996, and 2006 census sample exhibits *heaps* around multiples of five, a common problem in censuses from developing countries. To mitigate this problem, I construct 5-year-window cohorts of birth centered on heap years: 1926, 1931, and so on.

Panels (A1), (B1), and (C1) show that Christians in all cohorts have, on average, more years of schooling, higher literacy rate, and greater share of white-collar workers, than Muslims. Interestingly, although there was secular improvement across cohorts of birth in educational attainment (both years of schooling and literacy), occupational attainment, measured by the share of white-collar workers, *deteriorated* among both Christians and Muslims starting from the cohort born in 1964-1968. Although this seems surprising at first sight, it is actually consistent with Assaad's (2014) findings from the 2006 Egyptian Labor Market Survey. It may have resulted from the government's suspension, starting from the

cohort that graduated in 1983, of the employment guarantee in the government and public sector, which was presumably behind the observed improvement in occupational attainment up to the cohort born in 1959-1963. Panels (A2), (B2), and (C2) show the Christian-Muslim differences in the three outcomes along with the 95-percent confidence intervals. The differences in educational and occupational attainment declined beginning from the cohort born in 1949-1953 that presumably benefited from the 1953 reform, although there is an earlier convergence in literacy among the cohorts born in 1929-1943.

### *B. Evidence from the Village/Quarter-Level Population Censuses in 1897-1986*

Since the 1986, 1996, and 2006 individual-level census samples include only the *survivors* in these years, I also document the inter-religious educational and occupational differentials using the decennial villages/quarter-level population censuses in 1897-1986 that enumerated the entire population at the time of each census. The published census reports were digitized by the *Centre d'Etudes et de Documentation Economiques, Juridiques, et Sociales* (CEDEJ) and are available in *Century Census CD-ROM: Egypt 1882-1996*. I matched villages/quarters across censuses using the 1996 census mapping provided by CEDEJ, but I supplemented this mapping by matching names of villages/quarters that do not have a mapping in the 1996 census. This resulted in an unbalanced panel dataset at the village/quarter-level. There are a number of caveats in these censuses, however, and hence the results must be interpreted with caution: First, the data are aggregated at the village/quarter-level, the lowest administrative level in Egypt, but are not available at the individual-level. Second, the variables vary from one census to another on an arbitrary basis, thus limiting the control variables that could be included in the regression analysis. Third, educational and occupational outcomes are *not* broken down by religion.

I pool the decennial village/quarter-level censuses from all years and I estimate the following OLS regression:<sup>8</sup>

$$(1) y_{it} = \alpha_i + \beta_t + nonmuslimshare_{it}\gamma_t + X_{it}\delta_t + \varepsilon_{it}$$

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<sup>8</sup> I also estimated the regression without village/quarter fixed effects and I obtained similar results.

Where  $y_{it}$  is the outcome of interest in village/quarter  $i$  in census year  $t$ . There are two outcomes: the percentage of males who are able to read and write and the percentage of males who work in the non-agricultural sector. In order to ensure comparability across census years, I calculated both percentages out of the *total* male population including children.  $\alpha_i$  are village/quarter fixed effects, which capture the village/quarter-level time-invariant characteristics,  $\beta_t$  are census year fixed effects, which capture aggregate shocks that may have affected all villages/quarters in a given census year,  $nonmuslimshare_{it}$  is the percentage of non-Muslims in the village/quarter,  $X_{it}$  is a vector of village/quarter-level time-variant control variables, and  $\varepsilon_{it}$  is an error term. Control variables include (log) population, percentage of females, percentage of population under 10 years, percentage of population who are at least 60 years, and percentage of foreigners. In this specification, I allow the marginal effects of the percentage of non-Muslims (and of the control variables) to vary by census year.  $\gamma_t$  could be interpreted as an estimate of the *difference* between non-Muslims and Muslims in census year  $t$  with respect to the outcome of interest. Since I include village/quarter fixed effects, I exploit here the within-village/quarter variation in non-Muslims' population share in 1897-1986. However, because I do not observe the outcomes broken down by religion,  $\gamma_t$  should be interpreted with caution since there might be other omitted village/quarter-level time-varying characteristics that are correlated with both non-Muslims' population share and the educational and occupational outcomes.

The decennial estimates of  $\gamma_t$  for the two outcomes are shown in the two panels of Figure IV. Panel (A) suggests that the literacy gap between non-Muslims and Muslims, which was initially in favor of non-Muslims, dropped between 1937 and 1947, remained stable between 1947 and 1960, declined further between 1960 and 1976, and then remained stable between 1976 and 1986. A one-percentage point increase in non-Muslims' population share is correlated, on average, with an increase in the percentage of males who are able to read and write by 28 percentage points in 1897 but by only 12 percentage points in 1986. The trend of the inter-religious literacy gap is qualitatively robust to the inclusion of control variables. Panel (B) shows that the occupational gap that is in favor of non-Muslims

started to decline between 1960 and 1976. A one-percentage point increase in non-Muslims' population share is correlated, on average, with an increase in the percentage of males working in the non-agricultural sector by 26 percentage points in 1927 but by only 3 percentage points in 1986.

Overall, the estimated trends from the village/quarter-level censuses in 1897 to 1986 suggest that the inter-religious educational and occupational gaps declined between 1960 and 1976. This seems to be consistent with the trends across cohorts of birth of the inter-religious differences in average years of schooling, literacy rate, and percentage of white-collar workers, which were documented in Figure III, thus suggesting that the convergence in Christians' and Muslims' educational and occupational attainment started from the cohort born in 1949-53. Basically, the observed village/quarter-level decline in the inter-religious educational and occupational gaps between 1960 and 1976 could be attributed to the fact that most of the cohort born in 1949-53 had completed schooling and entered the labor market by 1976 (this cohort aged 23 to 28 years in 1976).

Finally, it should be noted that both the 1986-2006 individual-level census data and the 1897-1986 village/quarter-level census data demonstrate an earlier decline in the inter-religious literacy gap among the cohorts born between 1929 and 1943 or between the census years 1937 and 1947. One may speculate that the earlier decline was caused by the state's policies since Egypt's nominal independence in 1922 to expand on, improve the quality of, or increasingly provide public schooling (Figures I and II).<sup>9</sup>

#### **4. Hypothesis**

The transformation of *kuttabs* into public modern primary schools under the 1953 reform reduced the cost of access to modern primary schools and thus to higher stages of education and white-collar jobs. Hence, it should have increased the optimal parental investment in human capital (child's years of schooling), leading to better occupational attainment, among the supply-constrained parents. These are parents who would have otherwise chosen modern primary schools for their children, because they provided access to higher stages of education and/or white-collar jobs, but could not do so because of the

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<sup>9</sup> It is not possible to examine the impact of the expansion of *kuttabs* between 1921/22 and 1927/28 that is shown in Figure I using the 1986, 1996, and 2006 census samples because the birth cohorts that were poised to benefit from the expansion (presumably born in 1917-1923) are too old to be observed in 1986, 1996, or 2006.

limited supply of these schools relative to *kuttabs* in their districts of residence (equivalently, their children's districts of birth). Two notes are in order: First, The 1953 reform did *not* reduce the tuition cost of enrollment in public modern primary schools, which were in fact made free of charge, just like public *kuttabs*, since 1944. Second, the expected improvement in child's occupational attainment may be explained by two mechanisms, (a) a market mechanism, where the increase in human capital that results from the increase in years of schooling is translated into better occupational attainment or higher probability of working in a white-collar job, and (b) a non-market mechanism, where the 1964 employment guarantee in the government and public sectors for secondary schools and university graduates may have improved occupational attainment *regardless of* the actual human capital accumulation. Both mechanisms do not differ, at least in principle, across Christians and Muslims.

The effect of the reform may differ across Christians and Muslims if there were differences in enrollment in modern schools prior to 1953. First, Figure V shows that Christians had higher student enrollment rates than Muslims in 1907/08-1948/49, with a persistent gap throughout the period, albeit with a few fluctuations. Second, Figure VI shows the educational choices across *kuttabs* and modern schools (including, public, Egyptian private, and foreign private schools) among Christian and Muslim students. 96 percent of Christian students in 1907/08 were enrolled in modern schools (66 percent in foreign private schools, 25 percent in Egyptian private schools, and 5 percent in public schools), as opposed to only 24 percent among Muslim students (16 percent in Egyptian private schools, 5 percent in public schools, and 3 percent in foreign private schools). Although the share of *kuttabs* among Christian students increased steadily in 1907/08-1948/49, perhaps because of the increased enrollment of poorer Christian children, the majority of Christian students (71 percent) in 1948/49 resorted to modern schools. By contrast, the share of *kuttabs* among Muslim students remained stable at 75 percent in 1948/49 with only 25 percent enrolled in modern schools.

These *equilibrium* choices reflect both supply and demand for education. But why were Christian students more likely to enroll in modern schools to begin with? First, they were more likely to afford tuition fees in non-free modern schools. Second, Egyptian private modern schools, which enrolled 27

percent and 7 percent of Christian and Muslim students respectively in 1948/49, were more likely to be owned by non-Muslim communities. Figure VII shows that the Coptic Christian community (7 percent of the population in 1947) owned 37 percent of Egyptian private modern schools, compared to 46 percent owned by the Muslim community. This suggests that Christians were relatively more active than Muslims in providing private modern education to their children and hence relied relatively less on public schools.

## 5. Data

I examine the impact of the expansion of mass education in 1953 on the educational and occupational differences between Christians and Muslims using the 1986 individual-level 10-percent census sample, which, unlike the more recent 1996 and 2006 census samples, reports the *district* of birth.<sup>10</sup> I restrict the sample to Egyptian Christian and Muslim males who were born in Egypt between 1934 and 1953, and thus aged 0 to 19 years in 1953, with non-missing values for age, religion, district of birth, and education.<sup>11</sup> The census sample is then matched, on individual's district of birth, to the 1951/52 district-level schools census, which I digitized from the *Annuaire Statistique 1949-1950 et 1950-1951* (1953, pp. 260-71). There are two outcomes of interest in the 1986 census sample: (a) educational attainment, which I measure by years of schooling, and (b) occupational attainment, which I measure by a white-collar occupation dummy variable. In order to mitigate the concern of mean reversion in human capital across districts, I include, as controls, the health outcomes in an individual's district of birth in 1951/52, measured by (i) the number of cases of infectious diseases (total deaths and maladies) and (ii) the number of hospital beds per 1,000 population; I digitized both variables from the *Annuaire Statistique 1949-1950 et 1950-1951* (1953, pp. 144-77).

Table I shows the descriptive statistics for Muslims and Christians. Christians have, on average, more years of schooling and greater percentage of white-collar workers than Muslims. The average shares

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<sup>10</sup> The 1996 and 2006 individual-level census samples report the *province* of birth and not the *district* of birth. The small number of provinces (~ 20) is not sufficient for the regression analysis.

<sup>11</sup> There are originally 451,314 Egyptian Christian and Muslim males born in Egypt between 1934 and 1953 in the sample. Dropping those with missing age, religion, district of birth, or education (2.4 percent) results in a sample size of 440,569 observations. Merging the sample with the 1951/52 district-level schools census results in a final sample size of 426,801.

of *kuttabs* in district of birth in 1951/52, out of the total number of *kuttabs* and modern schools and of total male student enrollment, are lower among Christians than Muslims, indicating that modern schools were relatively more widespread in Christians' districts of birth. It seems, however, that there are no differences in health outcomes in district of birth in 1951/52 between Christians and Muslims.

## 6. Empirical Strategy

Does the expansion of mass modern education in 1953 explain part of the observed convergence in educational and occupational attainment between Christians and Muslims in Egypt in the mid-twentieth century? In order to identify the impact of the reform on each religious group, and following Duflo (2001), I exploit the variation across cohorts and districts of birth in exposure to the program. In particular, two variables determine an individual's exposure to the 1953 reform: year of birth and intensity of the 1953 reform in district of birth measured by the relative share of *kuttabs* in the provision of schooling on the onset of the reform. Specifically, I estimate the following OLS regression:

$$(2) y_{irjt} = (P_j T_i) \delta_1 + (C_i P_j T_i) \delta_2 + (X_j T_i) \delta_3 + (X_j C_i T_i) \delta_4 + \alpha_r + \beta_j + \gamma_t + \alpha_r * \beta_j + \alpha_r * \gamma_t + \varepsilon_{irjt}$$

Where  $y_{ijt}$  is the educational or occupational attainment of an individual  $i$  from religious group  $r$  (= Christian or Muslim) born in district  $j$  in year  $t$ .  $T_i$  is an indicator variable for being in the "young" or the "treated" cohort that was poised to benefit from the program.  $P_j$  is the intensity of the program in district of birth, which I measure by two alternative variables both of them observed in 1951/52: (i) the relative share of *kuttabs* out of the total number of *kuttabs* and modern schools and (ii) the relative share of *kuttabs* out of total male student enrollment (because the first measure does not take into account differences in size between *kuttabs* and modern schools).  $C_i$  is an indicator variable for being Christian.  $X_j$  is a vector of control variables that measure health outcomes in district of birth in 1951/52.

$\alpha_r$ ,  $\beta_j$ , and  $\gamma_t$  are vectors of fixed effects indicating an individual's religious group, district of birth, and year of birth respectively, which control for differences in educational or occupational attainment across religious groups, districts of birth, and years of birth. The interaction terms  $\alpha_r * \beta_j$  and  $\alpha_r * \gamma_t$  are introduced to control for the possibility that geographic or time differences in educational or

occupational attainment may vary by religious group. Standard errors are clustered at the district of birth level.  $\varepsilon_{irjt}$  is an error term.

Equation (2) is a straightforward extension of the difference-in-differences strategy in Duflo (2001). In this specification, the effect of the 1953 reform on Muslims is given by  $\delta_1$ , which captures the *differential* growth in educational or occupational attainment between Muslims from *high*-reform districts and their coreligionists from *low*-reform districts. Similarly, the effect of the reform on Christians is captured by  $\delta_1 + \delta_2$ , whereas  $\delta_2$  measures the effect of the reform on the Christian-Muslim difference in educational or occupational attainment. The identifying assumption of the effect of the 1953 reform on each religious group is that there are no district- and year-specific omitted variables ( $Z_{jt}$ ) that are correlated with both the intensity of the 1953 reform and the observed growth in educational or occupational attainment. The assumption is violated, for example, if there were other public programs that took place around the same period and might have driven (among each religious group) the differential growth in educational or occupational attainment across districts.

Two notes are in order: First, religion in the 1986 census is self-reported in four categories: Muslim, Christian, Jew, and other. Given the inheritability of religion and the (near) impossibility of conversion, I treat religion as an inherited demographic trait that is similar to race. In other words, the objective of my analysis is *not* to estimate the causal impact of religion on economic outcomes, but rather the effect of providing mass education on the accumulation of human capital among each religious group and if the effect varied across Christians and Muslims. Second, occupational attainment is defined for the working population only, but since I am interested in the impact of the 1953 reform on the Christian-Muslim *differences* in occupational attainment, the concern about self-selection of workers is mitigated so long as there are no differences in labor force participation between the two groups, a claim that is supported by the data.<sup>12</sup>

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<sup>12</sup> The employment rate among Christians is 93 percent versus 92 percent among Muslims.

I estimate three sets of regressions. I first estimate equation (2) on the “experiment of interest,” in which I compare the treated cohort, those who aged 0-5 years in 1953 ( $T=1$ ) and were hence poised to benefit from the reform because they were just about to enter primary schools or *kuttabs*, to the control cohort, those who aged 11-15 years in 1953 ( $T=0$ ) and were just too old to benefit from the program because they were past their primary or *kuttabs*’ schooling years (there were four years of primary/elementary schooling between 6 and 10 years of age). Second, I estimate a “placebo test,” in which I compare those who aged 11 to 15 years to those who aged 16 to 19 years in 1953. Since both cohorts were presumably too old to benefit from the reform, one expects to find no effect of the program there. Third, I re-estimate the regression where I include interactions of program intensity with a full set of cohort of birth indicators. Given age heaping in the sample, I construct four cohorts of birth centered on heap years, 1936, 1941, 1946, and 1951:

(3)  $y_{irjt}$

$$= \sum_{l=2}^4 (P_j d_{il}) \delta_{1l} + \sum_{l=2}^4 (C_i P_j d_{il}) \delta_{2l} + \sum_{l=2}^4 (X_j d_{il}) \delta_{3l} + \sum_{l=2}^4 (X_j C_i d_{il}) \delta_{4l} + \alpha_r + \beta_j + \gamma_t + \alpha_r * \beta_j + \alpha_r$$

\*  $\gamma_t + \varepsilon_{irjt}$

Where  $d_{il}$  is a dummy variable that indicates if an individual belongs to cohort  $l$ , with  $l = 1$  for the 1936 cohort (born in 1934-1937), which is the base cohort,  $l = 2$  for the 1941 cohort (born in 1938-1942),  $l = 3$  for the 1946 cohort (born in 1943-1947), and  $l = 4$  for the 1951 cohort (born in 1948-1953). In this specification,  $\delta_{14}$ ,  $(\delta_{14} - \delta_{12})$ , and  $(\delta_{14} - \delta_{13})$  capture the differential effects of the 1953 reform on the treated cohort of Muslims relative to its effects on each of the three older cohorts. The differential effects of the reform on the treated cohort of Christians relative to its effects on each of the three older cohorts are given by  $(\delta_{14} + \delta_{24})$ ,  $(\delta_{14} + \delta_{24}) - (\delta_{12} + \delta_{22})$ , and  $(\delta_{14} + \delta_{24}) - (\delta_{13} + \delta_{23})$  respectively. Finally,  $(\delta_{24} - \delta_{22})$ ,  $(\delta_{24} - \delta_{23})$ , and  $\delta_{24}$  measure the differential effects of the reform on the Christian-Muslim educational or occupational differential among the treated cohort relative to its effects on the differentials in each of the three older cohorts.

## 7. Results

The results of the three sets of regressions are shown in Tables II, III, and IV. In each table, panel (A) shows the results using the first measure of program intensity, district's relative share of *kuttabs* out of the total number of *kuttabs* and modern schools in 1951/52, whereas panel (B) shows the results using the second measure of the program intensity, the relative share of *kuttabs* out of total male student enrollment in 1951/52. I show the results on years of schooling for both the full sample and the workers' sample for comparison.

Table II shows the results on the experiment of interest. The 1953 reform had a positive impact on Muslims' educational and occupational attainment. Muslims born in high-program districts (high share of *kuttabs*) experienced, on average, *differentially* greater increases in years of schooling and in the probability of working in a white-collar job than their coreligionists from low-program districts. For example, Muslims from districts at the third quartile of *kuttabs*' share in 1951/52 (*kuttabs*' share  $\approx 0.92$ ) increased their years of schooling and their probability of working in a white-collar job differentially more than their coreligionists from districts at the first quartile (*kuttabs*' share  $\approx 0.54$ ) by 0.19 year and 4 percentage points respectively, on average. The effects on Muslims are robust to adding controls for district's health outcomes in 1951/52 (columns 4, 5, and 6), suggesting that the findings are not driven by mean reversion in human capital across districts.

By contrast, the 1953 reform had no statistically significant effect on Christians' years of schooling as  $\delta_1 + \delta_2$  is positive but not statistically different from zero (columns 1 and 4). Although the effect on Christians' probability of working in a white-collar job is positive and statistically significant in column 3, it is not robust to controlling for district's health outcomes in 1951/52 in column 6.

As to the impact of the reform on Christian-Muslim human capital inequality, although the estimated impacts of the 1953 reform on the Christian-Muslim *differences* in years of schooling and in the probability of working in a white-collar job are mostly negative (thus, suggesting that the reform may have caused convergence in human capital between the two groups), they are not precisely estimated and

are statistically insignificant. The results in panel (B), which uses the share of *kuttab*s out of total male student enrollment as a measure of the reform intensity, are qualitatively similar to those in panel (A).

Table III shows the results of the placebo test. As expected, I find no statistically significant effects of the program on Muslims or Christians in the cohort that aged 11-15 years in 1953 compared to the cohort that aged 16-19 years in 1953 in either panel (A) or (B). The only exception is that  $\delta_1 + \delta_2$  is positive and statistically significant at the 10-percent level in column 3 of panel (A). However, it loses its statistical significance in the corresponding regression in column 3 of panel (B). Overall, the table suggests that the improvements in Muslims' educational and occupational attainment that are observed in Table II are indeed driven by the 1953 reform since they are not found among the older cohort.

Table IV shows the results of estimating equation (3), where I include interactions of the program intensity with a full set of cohort of birth fixed effects. Overall, the results suggest that the observed growth in educational and occupational attainment among the "treated" cohort of Muslims (those who aged 0-5 years in 1953) is attributable to the 1953 reform. First, the effects of the program on Muslims in the two older cohorts, those who aged 6-10 and 11-15 years in 1953, are not statistically different from its effect on the base cohort, those who aged 16-19 years in 1953 ( $\delta_{12}$  and  $\delta_{13}$  are each insignificant). Second, the effect of the program on Muslims who aged 0-5 years in 1953 (the treated cohort) is positive and statistically different from its effects on each of the three older cohorts since  $\delta_{14}$ ,  $(\delta_{14} - \delta_{12})$ , and  $(\delta_{14} - \delta_{13})$  are each statistically different from zero. The previous results hold for both years of schooling and the probability of working in a white-collar job, with and without controls, and for both measures of the intensity of the program in panels (A) and (B). The only exception here is that  $\delta_{14}$  is insignificant in a few regressions suggesting that the effect of the program on the treated cohort is not statistically different from its effect on the oldest cohort. But this seems as a statistical power problem.

For Christians, however, the effect of the program on the treated cohort is in most cases not statistically different from its effects on each of the three older cohorts as  $(\delta_{14} + \delta_{24})$ ,  $(\delta_{14} + \delta_{24}) - (\delta_{12} + \delta_{22})$ , and  $(\delta_{14} + \delta_{24}) - (\delta_{13} + \delta_{23})$  are each statistically insignificant. As expected, all estimates

of the program's impact on the Christian-Muslim differences in educational and occupational attainment among the treated cohort are statistically insignificant as  $(\delta_{24} - \delta_{22})$ ,  $(\delta_{24} - \delta_{23})$ , and  $\delta_{24}$  are each not statistically different from zero.

The central findings of the paper could hence be summarized as follows. The expansion of public mass modern education, that occurred as a result of the transformation in 1953 of *kuttabs*, that were initially made all public in 1951/52, into public modern primary schools, improved Muslims' educational and occupational attainment in terms of years of schooling and the probability of having a white-collar job but had no statistically significant impact on Christians' outcomes. Although one would expect Muslims to have benefited from the 1953 reform *differentially* more than Christians in a statistical sense, the estimated impacts of the reform on the Christian-Muslim educational and occupational differences are all imprecisely estimated and statistically insignificant. This seems to be stemming from a statistical power problem (large standard errors) presumably because Christians are more concentrated in a relatively small number of districts.

I interpret the finding of statistically significant effects on Muslims but not on Christians as a result of the pre-1953 inter-religious differences in enrollment in modern schools that were in favor of Christians. In particular, since the vast majority (75 percent) of Muslim students were enrolled in *kuttabs* before the reform, it is the increase in the expected returns to enrollment in the transformed *kuttabs* via providing their graduates access to preparatory, secondary, and university education and white-collar jobs in the 1953 reform, that led to Muslims' increased demand for modern schooling and the consequent improvement in their educational and occupational attainment. For Christians, however, the effects of the reform are not statistically significant perhaps because most Christian students were already enrolled in modern schools prior to 1953. It must be emphasized though that the effects of the reform on Muslims are not statistically different from those on Christians, as the marginal effects of the reform on the Christian-Muslim educational and occupational differences are not precisely estimated.

## 8. Discussion

One natural concern regarding the interpretation of the results is that Egypt implemented in the post-1952 period a number of public policies within the model of state-led development and some of these might be driving the improvement in Muslims' human capital. First, the abolition of tuition fees in public universities starting from 1961 and the introduction of the guaranteed employment scheme in 1961-1964 may have improved Muslims' access to white-collar occupations. However, the two policies were at the national level and thus cannot explain the observed variation across districts of birth in the growth of Muslims' educational and occupational attainment. Second, one may suspect that there were public health programs at the time that could be driving the results. Although I was unable to find historical evidence on a national public health program during the period, I controlled for health outcomes in district of birth in 1951/52 and this did not affect the results. Third, one could argue that the electrification of rural Egypt, because of the construction of the Aswan Dam, might explain the findings. Yet, the dam was completed in 1970 by the time that the treated cohort had already finished schooling and so is unlikely to explain the improvement in educational attainment among this cohort. Finally, there were two earlier reforms in the educational system, (a) the abolition of tuition fees on public modern primary schools in 1944 and (b) the abolition of fees on public modern secondary schools in 1950. These reforms cannot explain the findings though because they affected older cohorts and not the treated cohort.

One may also be concerned about the measurement error in observing years of schooling. Basically, I only observe an individual's highest educational degree attained but I do not observe the actual years of schooling if the individual dropped out from school between any two degrees. I thus measured years of schooling via assigning a number of years to the highest educational degree achieved. In order to test if the results are robust to the measurement of years of schooling, I re-estimated equation (2) on the "experiment of interest" using alternative educational outcomes as the dependent variables. In particular, I constructed five dummy variables that take the value of one if the individual (1) is literate, (2) finished at least primary school, (3) finished at least preparatory school, (4) finished at least secondary school, and (5) finished at least university education. The results are shown in Table V. Overall the results

are qualitatively similar to those in Table II, except that the reform seems to have had a *negative* effect on the probability of having at least a university degree among each of Muslims and Christians. Although the result seems paradoxical, it may be because the 1964 employment guarantee that gave positions in the government and public sector to graduates of *both* universities and secondary schools may have provided incentives to finish secondary schooling but fewer incentives to complete university education.

## 9. Conclusion

Employing several new data sources from Egypt, one of the largest Middle Eastern countries, I examined the impact of the expansion of public mass modern education in 1953, which resulted from the transformation of traditional elementary schools (*kuttabs*) into public modern primary schools, on the long-standing Christian-Muslim educational and occupational differences, which were in favor of Christians. The results are mixed. I first documented that there was considerable convergence in educational and occupational attainment between the two groups starting from the mid-twentieth century. I then found that the 1953 reform had a positive and statistically significant impact on Muslims' educational and occupational attainment but had no statistically significant impact on Christians. Nevertheless, its impacts on the Christian-Muslim educational and occupational differentials are imprecisely measured and statistically insignificant. I interpret the findings as a result of the Christian-Muslim differences in students' schooling choices prior to 1953, where most Christian students were already enrolled in modern schools, whereas most Muslim students were enrolled in *kuttabs*.

The relative success of the 1953 reform in improving Muslims' human capital outcomes is remarkable from a historical perspective given the religion-neutral non-discriminatory nature of the reform. Indeed some reflection on the long-term history of the phenomenon may be helpful here in order to appreciate the impact of the reform. The Christian-Muslim socioeconomic gap in Egypt persisted since the Middle Ages and up to the early nineteenth century because of certain institutions, such as guilds and religious schools, which made occupations largely hereditary within each religious group. Although Egypt embarked on a state-led modernization program under Muhammad Ali Pasha (1805-1848) in which public modern schools were first introduced to Egypt, modern schooling remained limited to a tiny

Muslim elite, whereas the widespread religious schools (*kuttabs*) remained as the sole educational choice to the Muslim masses. Interestingly however a considerable share of Christian students shifted to modern schools starting from the mid-nineteenth century, way ahead of Muslims. Based on the newly digitized 1848 and 1868 Egyptian census samples (Saleh, 2013 and 2015), I find that in 1848, almost all Christian and Muslim students were enrolled in *kuttabs*. By 1868, however, 40 percent of Christian students enrolled in modern schools, all private, compared to only 4 percent among Muslim students, most of them were in public schools. By contrast, the more *populist* 1953 reform was relatively more successful in improving Muslims' human capital, because it transformed *kuttabs*, which did not qualify their graduates to secondary schools or university education, into upward mobility devices leading students up to white-collar jobs, hence making enrollment in the transformed *kuttabs* a much more attractive investment for the Muslim masses.

Despite this positive impact, it must be noted that the paper did not analyze the drop in quality of public modern education that presumably occurred because of the 1953 reform. In fact, the curriculum of public *kuttabs* was almost the same as public modern primary schools by 1949, and so the unification of the two systems only meant omitting the foreign language requirement from public modern primary schools, and allowing students to advance throughout their primary schooling years even if they fail end-of-year examinations. I would argue, however, that evaluating the 1953 reform should consider the relevant counterfactual which is the situation of the Muslim masses before 1953: Is it better to provide *some* schooling, regardless of its content, than nothing at all to the masses?

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**Table I: Summary Statistics**

	N	Mean	SD	Min	Max
<b>Muslims</b>					
Years of Schooling	397410	4.731	5.797	0.000	20
White-Collar Dummy	365229	0.250	0.433	0.000	1
<i>Kuttabs</i> per 1,000 children in 1951/52	397410	1.500	0.620	0.000	10.09
Schools per 1,000 children in 1951/52	397410	0.611	0.742	0.000	21.28
<i>Kuttabs</i> ' share in 1951/52	397410	0.758	0.225	0.000	1
% Male children in <i>kuttabs</i>	397410	0.302	0.119	0.000	1.808
% Male children in modern schools	397410	0.383	0.507	0.000	4.742
<i>Kuttabs</i> ' share in total male student enrollment	397410	0.603	0.260	0.000	1
Fatalities and maladies per 1,000 population	397410	4.335	5.441	0.000	58.39
Hospital beds per 1,000 population	397410	0.370	0.513	0.000	3.498
<b>Christians</b>					
Years of Schooling	29391	7.193	6.383	0.000	20
White-Collar Dummy	27291	0.432	0.495	0.000	1
<i>Kuttabs</i> per 1,000 children in 1951/52	29391	1.468	0.544	0.296	10.09
Schools per 1,000 children in 1951/52	29391	0.891	0.828	0.000	3.788
<i>Kuttabs</i> ' share in 1951/52	29391	0.670	0.244	0.143	1
% Male children in <i>kuttabs</i>	29391	0.291	0.101	0.073	1.808
% Male children in modern schools	29391	0.544	0.564	0.000	3.192
<i>Kuttabs</i> ' share in total male student enrollment	29391	0.512	0.279	0.078	1
Fatalities and maladies per 1,000 population	29391	4.763	5.242	0.000	50.80
Hospital beds per 1,000 population	29391	0.340	0.482	0.000	3.498
<b>Total</b>					
Years of Schooling	426801	4.901	5.872	0.000	20
White-Collar Dummy	392520	0.263	0.440	0.000	1
<i>Kuttabs</i> per 1,000 children in 1951/52	426801	1.498	0.615	0.000	10.09
Schools per 1,000 children in 1951/52	426801	0.630	0.752	0.000	21.28
<i>Kuttabs</i> ' share in 1951/52	426801	0.752	0.227	0.000	1
% Male children in <i>kuttabs</i>	426801	0.301	0.118	0.000	1.808
% Male children in modern schools	426801	0.394	0.513	0.000	4.742
<i>Kuttabs</i> ' share in total male student enrollment	426801	0.597	0.262	0.000	1
Fatalities and maladies per 1,000 population	426801	4.364	5.428	0.000	58.39
Hospital beds per 1,000 population	426801	0.368	0.511	0.000	3.498

**Table II: Impact of Program on Educational and Occupational Attainment by Religion:  
Experiment of Interest**

	<b>Panel A</b>					
	(1)	(2)	(3)	(4)	(5)	(6)
	Years of schooling - full sample	Years of schooling - workers' sample	White- collar dummy - workers' sample	Years of schooling - full sample	Years of schooling - workers' sample	White- collar dummy - workers' sample
<i>Kuttabs'</i> share in 1951/52 * Aged 0-5 in 1953 ( $\delta_1$ )	0.512*** (0.142)	0.596*** (0.149)	0.099*** (0.013)	0.366** (0.160)	0.517*** (0.173)	0.083*** (0.015)
Christian * <i>Kuttabs'</i> share in 1951/52 * Aged 0-5 in 1953 ( $\delta_2$ )	-0.136 (0.497)	0.197 (0.499)	-0.016 (0.042)	-0.599 (0.587)	-0.173 (0.595)	-0.043 (0.052)
Fatalities and maladies per 1,000 population * Aged 0-5 in 1953				-0.014** (0.006)	-0.010 (0.006)	-0.001** (0.001)
Christian * Fatalities and maladies per 1,000 population * Aged 0-5 in 1953				-0.037 (0.023)	-0.027 (0.023)	-0.002 (0.002)
Hospital beds per 1,000 population * Aged 0-5 in 1953				0.107* (0.058)	0.136* (0.070)	0.009 (0.005)
Christian * Hospital beds per 1,000 population * Aged 0-5 in 1953				-0.106 (0.226)	-0.165 (0.249)	-0.022 (0.019)
Christian	Yes	Yes	Yes	Yes	Yes	Yes
Christian * Year of birth FE?	Yes	Yes	Yes	Yes	Yes	Yes
Year of birth FE?	Yes	Yes	Yes	Yes	Yes	Yes
Christian * District of birth FE?	Yes	Yes	Yes	Yes	Yes	Yes
District of birth FE?	Yes	Yes	Yes	Yes	Yes	Yes
P-value ( $H_0: \delta_1 + \delta_2 = 0$ )	0.471	0.116	0.049	0.702	0.567	0.429
Number of Districts	151	151	151	151	151	151
Observations	256253	236986	236986	256253	236986	236986
Adjusted $R^2$	0.148	0.153	0.089	0.148	0.153	0.089
	<b>Panel B</b>					
<i>Kuttabs'</i> share in male student enrollment * Aged 0-5 in 1953 ( $\delta_1$ )	0.365*** (0.127)	0.432*** (0.135)	0.075*** (0.011)	0.228 (0.139)	0.337** (0.153)	0.058*** (0.013)
Christian * <i>Kuttabs'</i> share in student enrollment * Aged 0-5 in 1953 ( $\delta_2$ )	-0.089 (0.458)	0.280 (0.461)	-0.005 (0.039)	-0.390 (0.507)	0.048 (0.523)	-0.022 (0.044)
Fatalities and maladies per 1,000 population * Aged 0-5 in 1953				-0.017*** (0.006)	-0.014** (0.006)	-0.002*** (0.001)
Christian * Fatalities and maladies per 1,000 population * Aged 0-5 in 1953				-0.032 (0.022)	-0.022 (0.023)	-0.001 (0.002)
Hospital beds per 1,000 population * Aged 0-5 in 1953				0.104* (0.057)	0.132* (0.069)	0.008 (0.005)
Christian * Hospital beds per 1,000 population * Aged 0-5 in 1953				-0.108 (0.224)	-0.144 (0.248)	-0.021 (0.019)
Christian	Yes	Yes	Yes	Yes	Yes	Yes
Christian * Year of birth FE?	Yes	Yes	Yes	Yes	Yes	Yes
Year of birth FE?	Yes	Yes	Yes	Yes	Yes	Yes
Christian * District of birth FE?	Yes	Yes	Yes	Yes	Yes	Yes
District of birth FE?	Yes	Yes	Yes	Yes	Yes	Yes
P-value ( $H_0: \delta_1 + \delta_2 = 0$ )	0.563	0.125	0.074	0.758	0.461	0.406
Number of Districts	151	151	151	151	151	151
Observations	256253	236986	236986	256253	236986	236986
Adjusted $R^2$	0.148	0.153	0.089	0.148	0.153	0.089

Standard errors clustered at the district of birth level are in parentheses.  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

**Table III: Placebo Test of the Impact of the Program**

**Panel A**

	(1)	(2)	(3)	(4)	(5)	(6)
	Years of schooling - full sample	Years of schooling - workers' sample	White- collar dummy - workers' sample	Years of schooling - full sample	Years of schooling - workers' sample	White- collar dummy - workers' sample
<i>Kuttabs'</i> share in 1951/52 * Aged 11-15 in 1953 ( $\delta_1$ )	-0.114 (0.175)	-0.082 (0.184)	0.004 (0.017)	-0.084 (0.201)	-0.130 (0.211)	-0.007 (0.020)
Christian * <i>Kuttabs'</i> share in 1951/52 * Aged 11-15 in 1953 ( $\delta_2$ )	0.615 (0.563)	0.642 (0.590)	0.075* (0.044)	0.716 (0.796)	0.821 (0.810)	0.105* (0.060)
Fatalities and maladies per 1,000 population * Aged 11-15 in 1953				0.004 (0.008)	-0.002 (0.008)	-0.001 (0.001)
Christian * Fatalities and maladies per 1,000 population * Aged 11-15 in 1953				0.003 (0.031)	0.006 (0.031)	0.002 (0.002)
Hospital beds per 1,000 population * Aged 11-15 in 1953				-0.055 (0.071)	-0.068 (0.065)	-0.001 (0.005)
Christian * Hospital beds per 1,000 population * Aged 11-15 in 1953				0.396** (0.192)	0.537*** (0.184)	0.045*** (0.017)
Christian	Yes	Yes	Yes	Yes	Yes	Yes
Christian * Year of birth FE?	Yes	Yes	Yes	Yes	Yes	Yes
Year of birth FE?	Yes	Yes	Yes	Yes	Yes	Yes
Christian * District of birth FE?	Yes	Yes	Yes	Yes	Yes	Yes
District of birth FE?	Yes	Yes	Yes	Yes	Yes	Yes
P-value ( $H_0: \delta_1 + \delta_2 = 0$ )	0.346	0.313	0.065	0.387	0.352	0.073
Number of Districts	150	150	150	150	150	150
Observations	157414	142623	142623	157414	142623	142623
Adjusted $R^2$	0.163	0.173	0.115	0.163	0.173	0.115

**Panel B**

<i>Kuttabs'</i> share in male student enrollment * Aged 11-15 in 1953 ( $\delta_1$ )	-0.128 (0.147)	-0.114 (0.155)	-0.000 (0.014)	-0.115 (0.162)	-0.160 (0.169)	-0.009 (0.016)
Christian * <i>Kuttabs'</i> share in student enrollment * Aged 11-15 in 1953 ( $\delta_2$ )	0.230 (0.506)	0.267 (0.536)	0.046 (0.038)	0.234 (0.664)	0.351 (0.687)	0.065 (0.049)
Fatalities and maladies per 1,000 population * Aged 11-15 in 1953				0.003 (0.007)	-0.002 (0.007)	-0.001 (0.001)
Christian * Fatalities and maladies per 1,000 population * Aged 11-15 in 1953				-0.010 (0.030)	-0.007 (0.031)	0.001 (0.002)
Hospital beds per 1,000 population * Aged 11-15 in 1953				-0.058 (0.070)	-0.071 (0.064)	-0.002 (0.005)
Christian * Hospital beds per 1,000 population * Aged 11-15 in 1953				0.395** (0.196)	0.537*** (0.183)	0.047*** (0.016)
Christian	Yes	Yes	Yes	Yes	Yes	Yes
Christian * Year of birth FE?	Yes	Yes	Yes	Yes	Yes	Yes
Year of birth FE?	Yes	Yes	Yes	Yes	Yes	Yes
Christian * District of birth FE?	Yes	Yes	Yes	Yes	Yes	Yes
District of birth FE?	Yes	Yes	Yes	Yes	Yes	Yes
P-value ( $H_0: \delta_1 + \delta_2 = 0$ )	0.826	0.755	0.200	0.843	0.758	0.197
Number of Districts	150	150	150	150	150	150
Observations	157414	142623	142623	157414	142623	142623
Adjusted $R^2$	0.163	0.173	0.115	0.163	0.173	0.115

Standard errors clustered at the district of birth level are in parentheses.  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

**Table IV: Impact of Program by Religion and Cohort of Birth**  
**Panel A**

	(1)	(2)	(3)	(4)	(5)	(6)
	Years of schooling - All	Years of schooling - Workers	White- collar - Workers	Years of schooling - All	Years of schooling - Workers	White- collar - Workers
<i>Kuttabs'</i> share in 1951/52 * Aged 11-15 in 1953 ( $\delta_{12}$ )	-0.115 (0.176)	-0.087 (0.185)	0.003 (0.017)	-0.091 (0.202)	-0.139 (0.212)	-0.009 (0.020)
<i>Kuttabs'</i> share in 1951/52 * Aged 6-10 in 1953 ( $\delta_{13}$ )	-0.080 (0.221)	-0.017 (0.228)	0.038* (0.020)	-0.136 (0.274)	-0.073 (0.279)	0.012 (0.024)
<i>Kuttabs'</i> share in 1951/52 * Aged 0-5 in 1953 ( $\delta_{14}$ )	0.407** (0.184)	0.521*** (0.197)	0.102*** (0.019)	0.275 (0.214)	0.377 (0.233)	0.075*** (0.022)
Christian * <i>Kuttabs'</i> share in 1951/52 * Aged 11-15 in 1953 ( $\delta_{22}$ )	0.682 (0.559)	0.678 (0.584)	0.079* (0.044)	0.865 (0.802)	0.941 (0.810)	0.112* (0.060)
Christian * <i>Kuttabs'</i> share in 1951/52 * Aged 6-10 in 1953 ( $\delta_{23}$ )	0.981* (0.569)	0.954 (0.593)	0.086 (0.052)	1.053 (0.755)	1.227 (0.832)	0.128* (0.074)
Christian * <i>Kuttabs'</i> share in 1951/52 * Aged 0-5 in 1953 ( $\delta_{24}$ )	0.583 (0.677)	0.902 (0.584)	0.066 (0.046)	0.263 (0.874)	0.769 (0.758)	0.073 (0.063)
Fatalities and Maladies per 1,000 Population * Aged 11-15 in 1953				0.003 (0.008)	-0.002 (0.008)	-0.001 (0.001)
Fatalities and Maladies per 1,000 Population * Aged 6-10 in 1953				-0.004 (0.008)	-0.005 (0.008)	-0.002*** (0.001)
Fatalities and Maladies per 1,000 Population * Aged 0-5 in 1953				-0.011* (0.007)	-0.013* (0.007)	-0.002*** (0.001)
Christian * Fatalities and Maladies per 1,000 Population * Aged 11-15 in 1953				0.012 (0.031)	0.014 (0.031)	0.002 (0.002)
Christian * Fatalities and Maladies per 1,000 Population * Aged 6-10 in 1953				0.001 (0.028)	0.017 (0.029)	0.003 (0.003)
Christian * Fatalities and Maladies per 1,000 Population * Aged 0-5 in 1953				-0.029 (0.030)	-0.014 (0.026)	0.000 (0.002)
Beds per 1,000 Population * Aged 11-15 in 1953				-0.055 (0.071)	-0.068 (0.065)	-0.001 (0.005)
Beds per 1,000 Population * Aged 6-10 in 1953				-0.007 (0.072)	0.009 (0.069)	0.001 (0.006)
Beds per 1,000 Population * Aged 0-5 in 1953				0.050 (0.082)	0.066 (0.071)	0.008 (0.007)
Christian * Beds per 1,000 Population * Aged 11-15 in 1953				0.428** (0.197)	0.545*** (0.195)	0.043** (0.017)
Christian * Beds per 1,000 Population * Aged 6-10 in 1953				0.545* (0.291)	0.529** (0.266)	0.029 (0.020)
Christian * Beds per 1,000 Population * Aged 0-5 in 1953				0.336 (0.287)	0.387 (0.263)	0.022 (0.021)
Christian	Yes	Yes	Yes	Yes	Yes	Yes
Christian * Year of birth FE?	Yes	Yes	Yes	Yes	Yes	Yes
Year of birth FE?	Yes	Yes	Yes	Yes	Yes	Yes
Christian * District of birth FE?	Yes	Yes	Yes	Yes	Yes	Yes
District of birth FE?	Yes	Yes	Yes	Yes	Yes	Yes
$P(H_0: \delta_{14} - \delta_{12} = 0)$	0.000	0.000	0.000	0.021	0.003	0.000
$P(H_0: \delta_{14} - \delta_{13} = 0)$	0.001	0.001	0.000	0.013	0.009	0.000
$P(H_0: \delta_{14} + \delta_{24} = 0)$	0.148	0.016	0.001	0.530	0.117	0.025
$P(H_0: (\delta_{14} + \delta_{24}) - (\delta_{12} + \delta_{22}) = 0)$	0.420	0.102	0.040	0.700	0.573	0.396
$P(H_0: (\delta_{14} + \delta_{24}) - (\delta_{13} + \delta_{23}) = 0)$	0.846	0.276	0.202	0.477	0.987	0.845
$P(H_0: \delta_{24} - \delta_{22} = 0)$	0.844	0.659	0.760	0.313	0.778	0.465
$P(H_0: \delta_{24} - \delta_{23} = 0)$	0.368	0.904	0.604	0.118	0.362	0.206
Number of Districts	151	151	151	151	151	151

Observations	426801	392520	392520	426801	392520	392520
Adjusted $R^2$	0.154	0.160	0.095	0.154	0.160	0.095

**Panel B**

<i>Kuttabs'</i> share in male student enrollment * Aged 11-15 in 1953 ( $\delta_{12}$ )	-0.125 (0.148)	-0.115 (0.156)	-0.001 (0.014)	-0.115 (0.164)	-0.161 (0.170)	-0.010 (0.016)
<i>Kuttabs'</i> share in male student enrollment * Aged 6-10 in 1953 ( $\delta_{13}$ )	-0.134 (0.199)	-0.121 (0.204)	0.017 (0.017)	-0.189 (0.232)	-0.189 (0.235)	-0.006 (0.020)
<i>Kuttabs'</i> share in male student enrollment * Aged 0-5 in 1953 ( $\delta_{14}$ )	0.251 (0.165)	0.330* (0.178)	0.075*** (0.017)	0.116 (0.186)	0.179 (0.200)	0.049*** (0.018)
Christian * <i>Kuttabs'</i> share in enrollment * Aged 11-15 in 1953 ( $\delta_{22}$ )	0.261 (0.502)	0.279 (0.530)	0.048 (0.038)	0.313 (0.667)	0.414 (0.686)	0.068 (0.049)
Christian * <i>Kuttabs'</i> share in enrollment * Aged 6-10 in 1953 ( $\delta_{23}$ )	0.462 (0.536)	0.486 (0.590)	0.061 (0.050)	0.442 (0.667)	0.621 (0.771)	0.087 (0.067)
Christian * <i>Kuttabs'</i> share in enrollment * Aged 0-5 in 1953 ( $\delta_{24}$ )	0.196 (0.612)	0.580 (0.519)	0.046 (0.043)	-0.083 (0.740)	0.463 (0.649)	0.049 (0.056)
Fatalities and Maladies per 1,000 Population * Aged 11-15 in 1953				0.003 (0.008)	-0.003 (0.008)	-0.001 (0.001)
Fatalities and Maladies per 1,000 Population * Aged 6-10 in 1953				-0.005 (0.008)	-0.007 (0.008)	-0.002*** (0.001)
Fatalities and Maladies per 1,000 Population * Aged 0-5 in 1953				-0.015** (0.007)	-0.017** (0.007)	-0.003*** (0.001)
Christian * Fatalities and Maladies per 1,000 Population * Aged 11-15 in 1953				-0.004 (0.030)	-0.000 (0.031)	0.001 (0.002)
Christian * Fatalities and Maladies per 1,000 Population * Aged 6-10 in 1953				-0.016 (0.029)	-0.001 (0.030)	0.002 (0.003)
Christian * Fatalities and Maladies per 1,000 Population * Aged 0-5 in 1953				-0.039 (0.030)	-0.024 (0.026)	-0.000 (0.002)
Beds per 1,000 Population * Aged 11-15 in 1953				-0.058 (0.071)	-0.071 (0.064)	-0.001 (0.005)
Beds per 1,000 Population * Aged 6-10 in 1953				-0.012 (0.072)	0.001 (0.070)	0.000 (0.006)
Beds per 1,000 Population * Aged 0-5 in 1953				0.045 (0.082)	0.059 (0.072)	0.007 (0.007)
Christian * Beds per 1,000 Population * Aged 11-15 in 1953				0.430** (0.205)	0.550*** (0.198)	0.045*** (0.016)
Christian * Beds per 1,000 Population * Aged 6-10 in 1953				0.553* (0.298)	0.546** (0.268)	0.033 (0.020)
Christian * Beds per 1,000 Population * Aged 0-5 in 1953				0.336 (0.301)	0.413 (0.277)	0.026 (0.022)
Christian	Yes	Yes	Yes	Yes	Yes	Yes
Christian * Year of birth FE?	Yes	Yes	Yes	Yes	Yes	Yes
Year of birth FE?	Yes	Yes	Yes	Yes	Yes	Yes
Christian * District of birth FE?	Yes	Yes	Yes	Yes	Yes	Yes
District of birth FE?	Yes	Yes	Yes	Yes	Yes	Yes
$P(H_0: \delta_{14} - \delta_{12} = 0)$	0.003	0.001	0.000	0.093	0.025	0.000
$P(H_0: \delta_{14} - \delta_{13} = 0)$	0.007	0.002	0.000	0.038	0.016	0.000
$P(H_0: \delta_{14} + \delta_{24} = 0)$	0.472	0.086	0.009	0.964	0.308	0.088
$P(H_0: (\delta_{14} + \delta_{24}) - (\delta_{12} + \delta_{22}) = 0)$	0.520	0.112	0.061	0.755	0.462	0.369
$P(H_0: (\delta_{14} + \delta_{24}) - (\delta_{13} + \delta_{23}) = 0)$	0.784	0.207	0.162	0.643	0.669	0.637
$P(H_0: \delta_{24} - \delta_{22} = 0)$	0.890	0.522	0.963	0.445	0.926	0.683
$P(H_0: \delta_{24} - \delta_{23} = 0)$	0.523	0.824	0.651	0.252	0.750	0.311
Number of Districts	151	151	151	151	151	151
Observations	426801	392520	392520	426801	392520	392520
Adjusted $R^2$	0.154	0.160	0.095	0.154	0.160	0.095

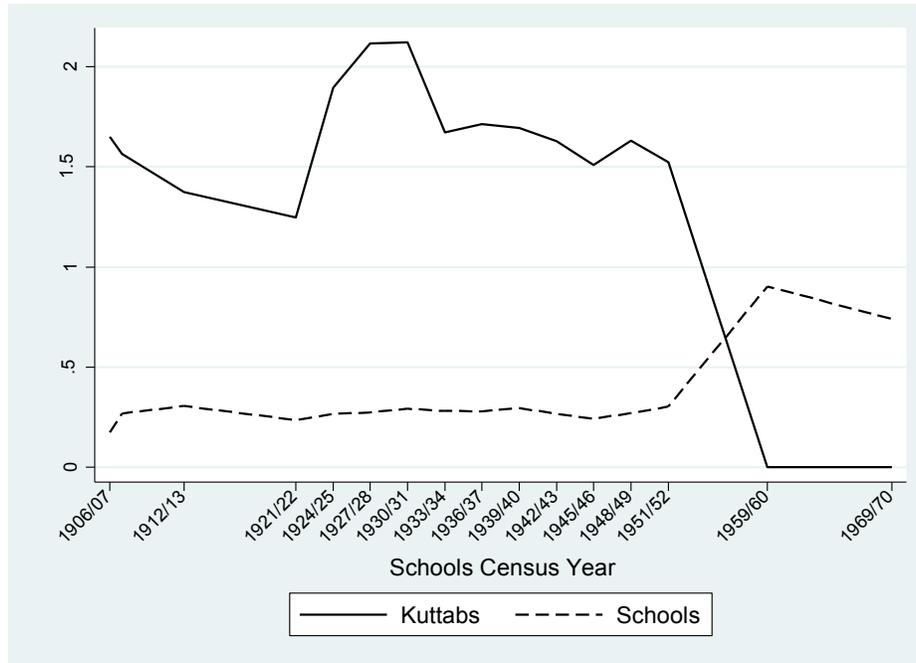
Standard errors clustered at the district of birth level are in parentheses.  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

**Table V: Impact of Program on Alternative Measures of Educational Attainment by Religion: Experiment of Interest**

	<b>Panel A</b>				
	(1)	(2)	(3)	(4)	(5)
	=1 if Literate	=1 if At least primary school	=1 if at least preparatory school	=1 if at least secondary school	=1 if at least university
<i>Kuttabs'</i> share in 1951/52 * Aged 0-5 in 1953 ( $\delta_1$ )	0.069 <sup>***</sup> (0.017)	0.040 <sup>***</sup> (0.014)	0.040 <sup>***</sup> (0.014)	0.026 (0.016)	-0.041 <sup>***</sup> (0.008)
Christian * <i>Kuttabs'</i> share in 1951/52 * Aged 0-5 in 1953 ( $\delta_2$ )	-0.017 (0.041)	0.021 (0.053)	0.002 (0.053)	-0.086 <sup>*</sup> (0.046)	-0.067 <sup>**</sup> (0.026)
Fatalities and maladies per 1,000 population * Aged 0-5 in 1953	-0.001 (0.001)	-0.001 <sup>**</sup> (0.000)	-0.001 <sup>**</sup> (0.000)	-0.001 (0.001)	-0.001 <sup>**</sup> (0.000)
Christian * Fatalities and maladies per 1,000 population * Aged 0-5 in 1953	-0.002 (0.001)	-0.001 (0.002)	-0.002 (0.002)	-0.004 <sup>**</sup> (0.002)	-0.002 (0.002)
Hospital beds per 1,000 population * Aged 0-5 in 1953	-0.001 (0.005)	0.007 (0.004)	0.009 <sup>*</sup> (0.005)	0.012 <sup>**</sup> (0.006)	0.005 (0.003)
Christian * Hospital beds per 1,000 population * Aged 0-5 in 1953	-0.001 (0.014)	-0.019 (0.021)	-0.016 (0.019)	-0.011 (0.017)	0.009 (0.017)
Christian	Yes	Yes	Yes	Yes	Yes
Christian * Year of birth FE?	Yes	Yes	Yes	Yes	Yes
Year of birth FE?	Yes	Yes	Yes	Yes	Yes
Christian * District of birth FE?	Yes	Yes	Yes	Yes	Yes
District of birth FE?	Yes	Yes	Yes	Yes	Yes
P-value ( $H_0: \delta_1 + \delta_2 = 0$ )	0.203	0.251	0.422	0.182	0.000
Number of Districts	151	151	151	151	151
Observations	256253	256253	256253	256253	256253
Adjusted $R^2$	0.129	0.133	0.125	0.108	0.055
<b>Panel B</b>					
<i>Kuttabs'</i> share in male student enrollment * Aged 0-5 in 1953 ( $\delta_1$ )	0.067 <sup>***</sup> (0.013)	0.039 <sup>***</sup> (0.011)	0.036 <sup>***</sup> (0.011)	0.014 (0.013)	-0.036 <sup>***</sup> (0.006)
Christian * <i>Kuttabs'</i> share in enrollment * Aged 0-5 in 1953 ( $\delta_2$ )	0.009 (0.033)	0.041 (0.041)	0.028 (0.040)	-0.063 (0.039)	-0.053 <sup>**</sup> (0.021)
Fatalities and maladies per 1,000 population * Aged 0-5 in 1953				-0.001 <sup>**</sup> (0.001)	-0.001 <sup>*</sup> (0.000)
Christian * Fatalities and maladies per 1,000 population * Aged 0-5 in 1953				-0.004 <sup>**</sup> (0.002)	-0.002 (0.002)
Hospital beds per 1,000 population * Aged 0-5 in 1953				0.011 <sup>**</sup> (0.005)	0.005 (0.003)
Christian * Hospital beds per 1,000 population * Aged 0-5 in 1953				-0.012 (0.017)	0.006 (0.016)
Christian	Yes	Yes	Yes	Yes	Yes
Christian * Year of birth FE?	Yes	Yes	Yes	Yes	Yes
Year of birth FE?	Yes	Yes	Yes	Yes	Yes
Christian * District of birth FE?	Yes	Yes	Yes	Yes	Yes
District of birth FE?	Yes	Yes	Yes	Yes	Yes
P-value ( $H_0: \delta_1 + \delta_2 = 0$ )	0.029	0.054	0.111	0.198	0.000
Number of Districts	151	151	151	151	151
Observations	256253	256253	256253	256253	256253
Adjusted $R^2$	0.129	0.132	0.125	0.108	0.055

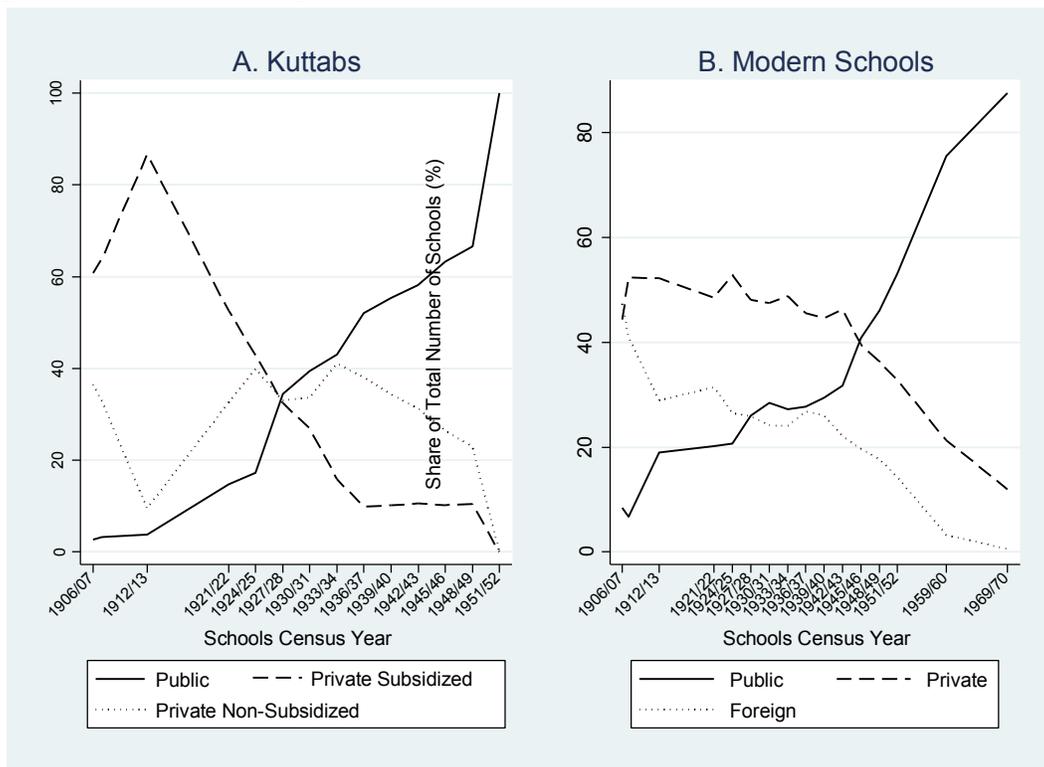
Standard errors clustered at the district of birth level are in parentheses. p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01

**Figure I. Egypt's Supplies of *Kuttabs* and Modern Schools per 1,000 Children in 1906-1970**

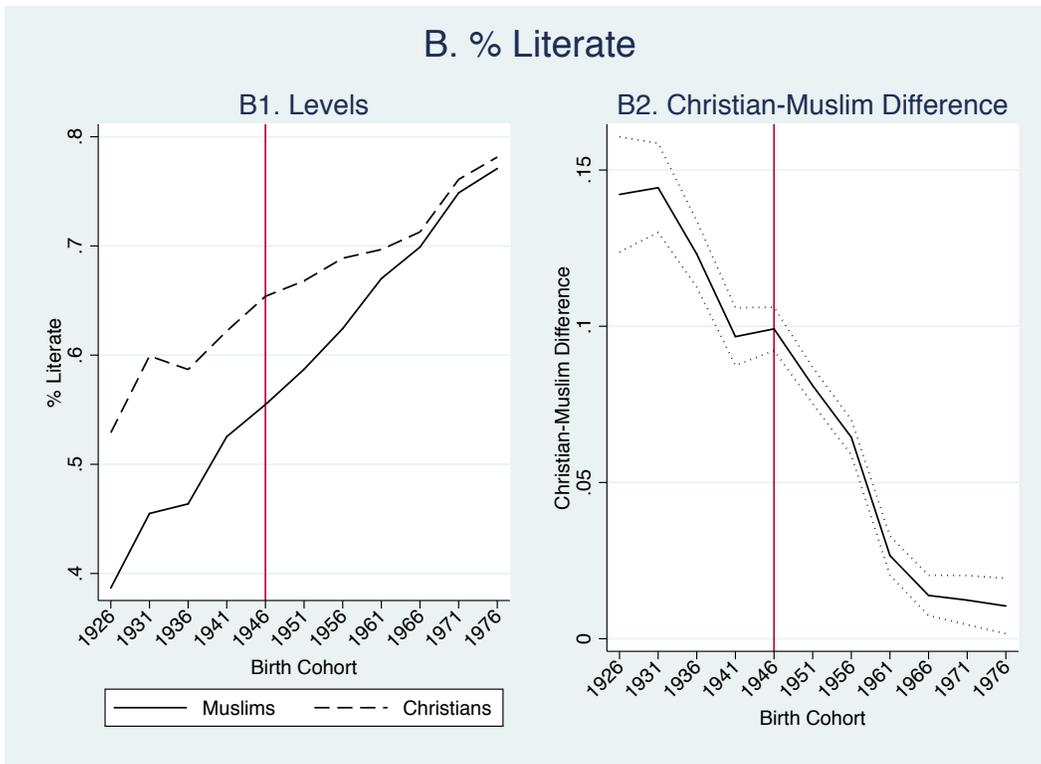
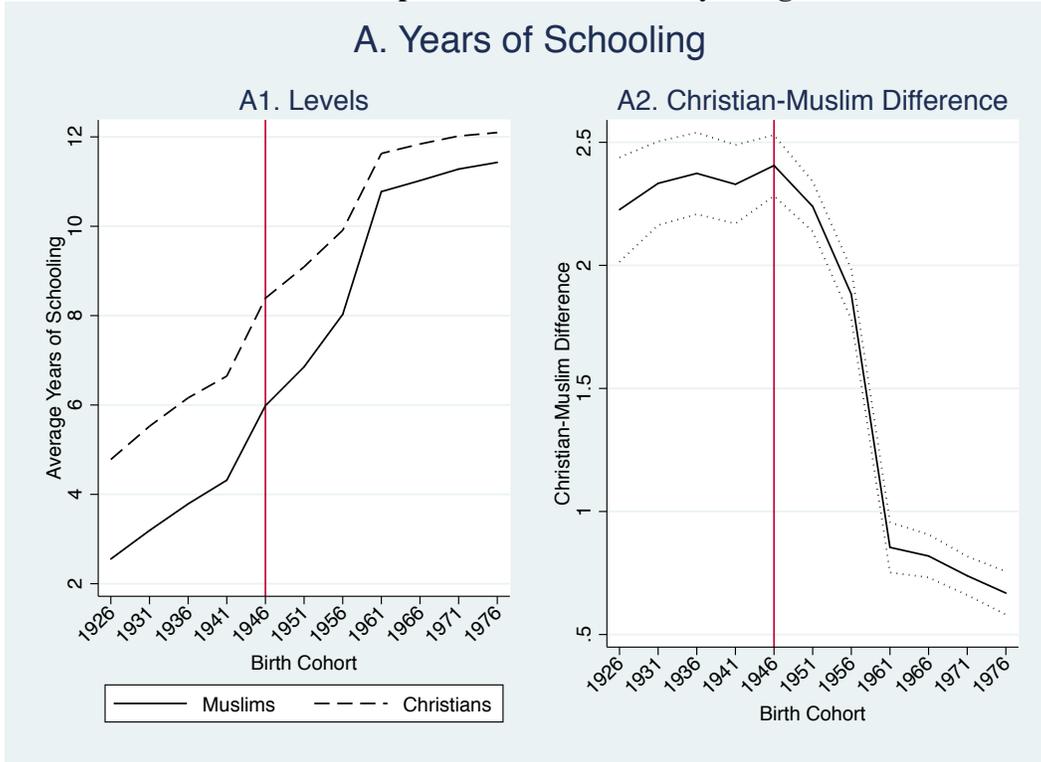


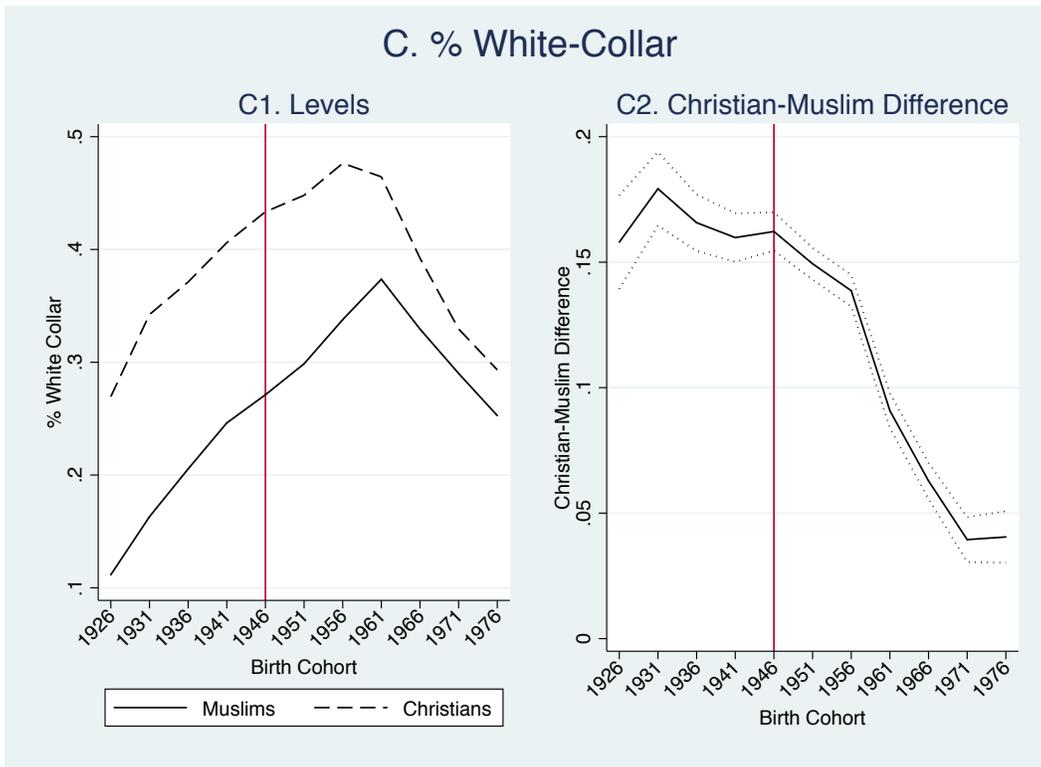
Numbers of *Kuttabs* and modern schools (the latter include primary, secondary, and higher education institutions) are obtained from the schools censuses in 1906/07 to 1969/70 and are adjusted by Egypt's school-age population that I obtained from the closest population census. *Kuttabs* are adjusted by the population aged from 5 to 14 years, whereas modern schools are adjusted by the population aged from 5 to 19 years. The only exception is in 1921/22 where I adjusted *Kuttabs* by the population aged 5 to 19 years, because I could not find information on the population aged 5-14 years in the 1917 population census.

**Figure II. Sectoral Composition of *Kuttabs* and Modern Schools in 1906/07-1951/52**



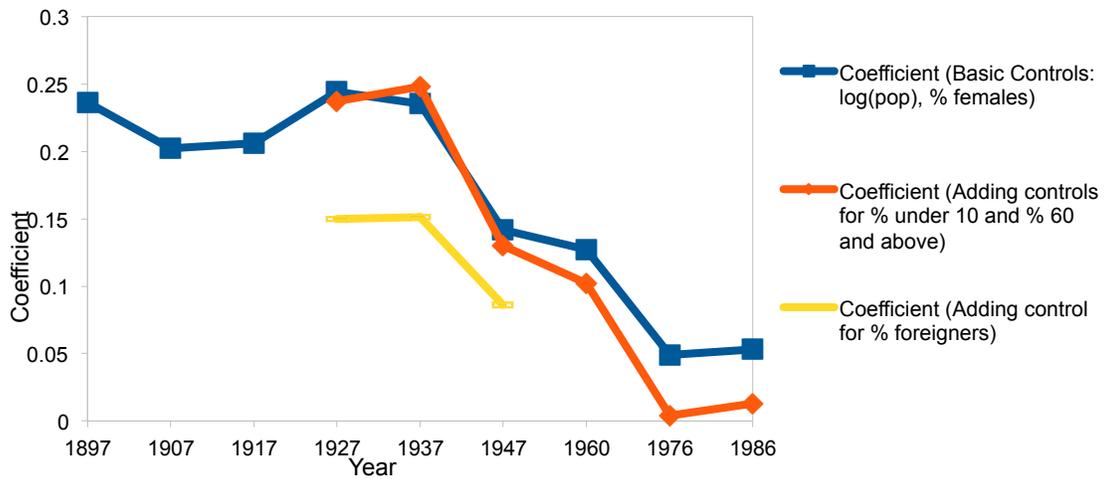
**Figure III. Educational and Occupational Attainment by Religion and Cohort of Birth**



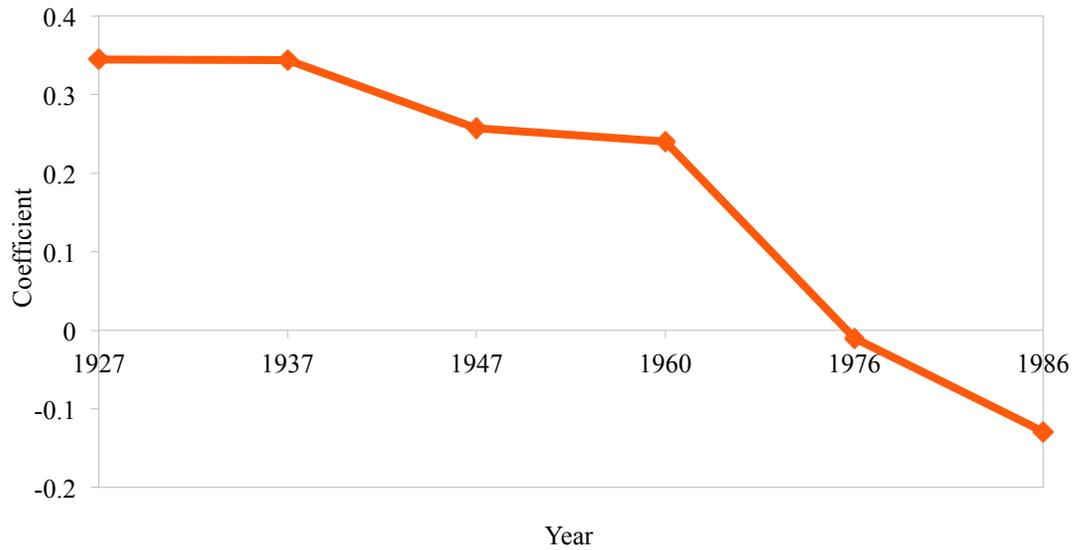


**Figure IV. Decennial Marginal Effects of Non-Muslims' Population Share on Mean Educational and Occupational Attainment at the Village/Quarter-Level in 1897-1986**

(A) Dependent Variable: Percentage of Males Who Are Able to Read and Write

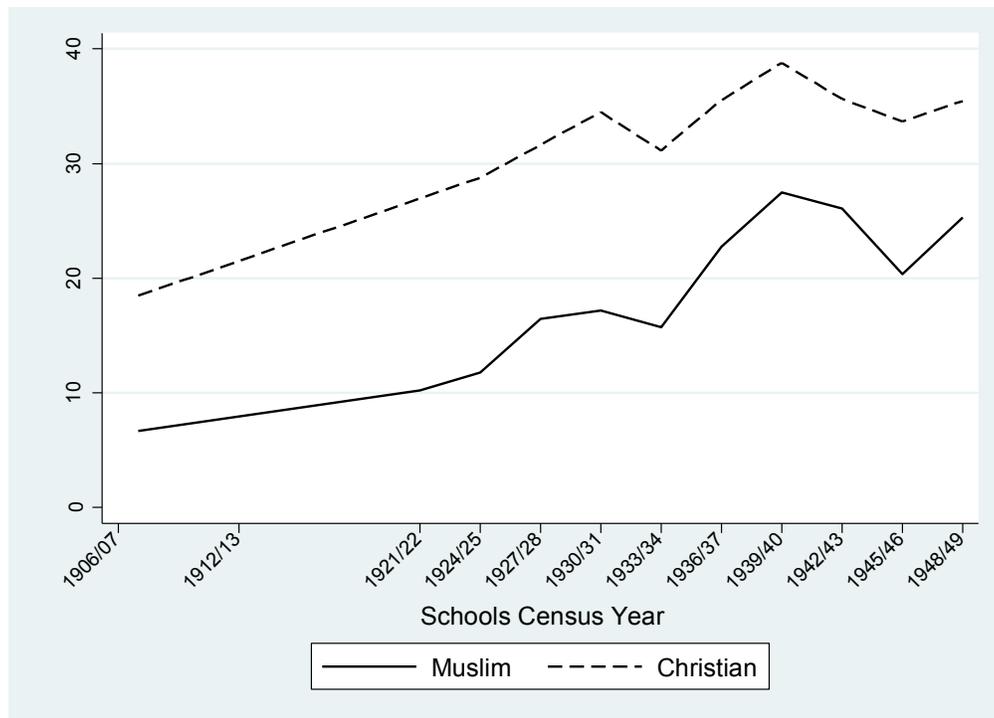


(B) Dependent Variable: Percentage of Males Working in the Non-Agricultural Sector



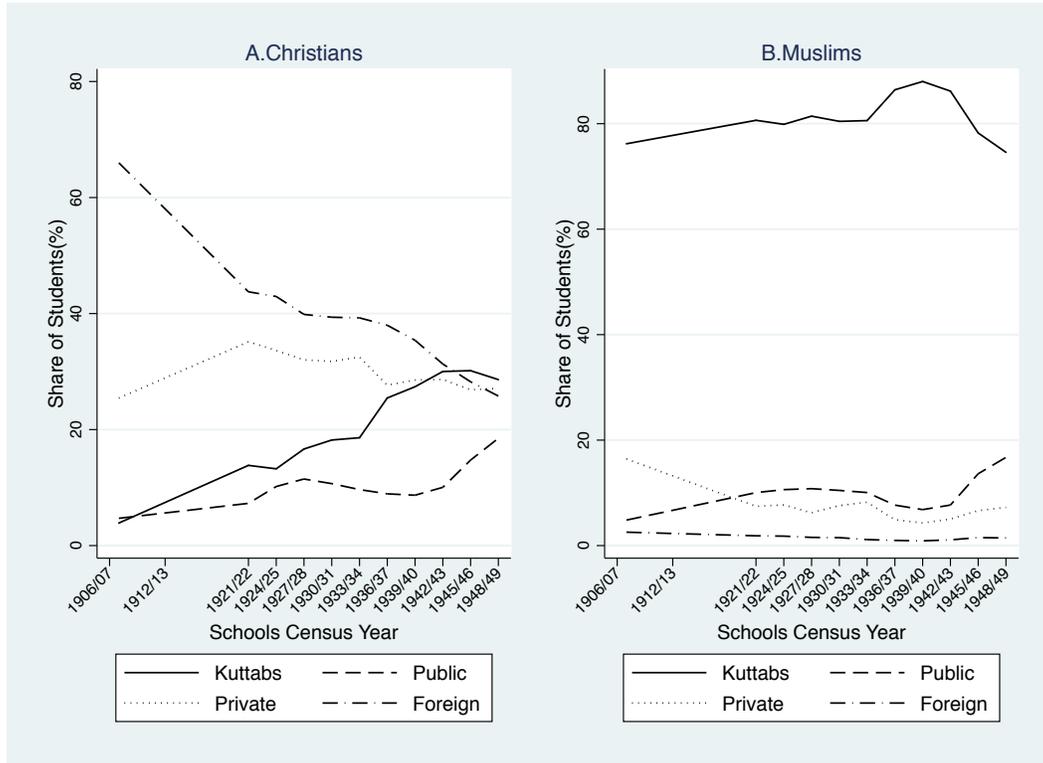
Panels (A) and (B) depict the decennial estimates of  $\gamma_t$  from equation (1). Control variables in panel (B) include: log (population), percentage of females, percentage of population aged below 10, and percentage of the population aged 60 and above.

**Figure V. Christian and Muslim Student Enrollment Rates in 1907/08-1948/49**



School-age population is the population aged from 5 to 19 years. Christian students in modern schools include both Copts and non-Coptic Christians, while those in *kuttabs* are only Copts (no information on non-Coptic Christian students in *kuttabs*). I computed Muslim and Christian school-age population from the closest population census by multiplying the population share of each religious group by the total school-age population.

**Figure VI. Educational Choices of Christian and Muslim Students in 1907/08-1948/49**



**Figure VII. Composition of Egyptian Private Modern Schools in 1906/07-1951/52**

