

From Kuttabs to Schools:
Educational Modernization, Religion, and
Human Capital in Twentieth Century Egypt

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Abstract

I examine the impact of the transformation of elementary religious schools (*kuttab*s) into modern primary schools in 1953-56 on the educational and occupational differentials between religious groups in Egypt. Before the reform, non-Muslims enjoyed better educational and occupational outcomes than the Muslim majority and, unlike Muslims, were almost all enrolled in modern schools. Using several new data sources, the individual-level census sample from 1996, the official schooling reports from 1907 to 1969, and the village/urban quarter-level census data from 1897 to 1986, I find that the inter-religious educational and occupational gaps both declined in the second half of the twentieth century. The educational reform seems to explain the reduction in the occupational gap, but cannot explain the decline of the educational gap.

Keywords: educational modernization; religious schools; Middle Eastern economic history; human capital; modern schools

JEL Classification: N35; I25

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1. Introduction

The poor go to heaven... But could not they have a share on Earth too? They are willing to give up a share in heaven in exchange for a share on Earth.

Nasser, President of Egypt (1956-70)

The model of state-led development was widely adopted throughout the developing world in the post-WWII period, and education was usually the major pillar of this model. Following a military coup that overthrew the monarchy in 1952, Egypt embarked on one of the leading programs of this sort in the Middle East. In 1953-56, and to complete a long process of modernizing religious education that started in the late nineteenth century, the state transformed all elementary religious schools (*kuttab*s), which were the major providers of education until that year (enrolling 67 percent of all students in 1948/49),¹ into modern primary schools (Boktor 1963, pp. 27-8). Prior to 1953, there were two parallel educational systems in the country. Under the religious system, the *kuttab*s qualified a student, at most, to religious higher education, whereas under the modern system, a graduate of a modern primary school was qualified to higher educational stages leading up to university education and white-collar occupations (Boktor 1936, p. 123; Harby and El-Azzawi 1960). As a result of the 1953-56 unification of the two systems, the national supply of modern schools (per 1,000 children aged 5 to

¹ Author's calculation based on the 1948/49 official schooling report. Students include both males and females in all pre- higher educational stages. In 1948/49, overall student enrollment in both *kuttab*s and modern schools (out of children aged 5 to 14) reached 22 percent. See section 3 for more details on the data sources.

14) tripled from 0.4 in 1948/49 to 1.3 in 1959/60, and the percent of students enrolled in modern schools (out of children aged 5 to 14) quintupled from 8 to 41 percent.²

Does educational modernization mitigate long-standing human capital inequalities? Following a long medieval tradition, non-Muslim minorities in Egypt (and the Middle East at large) enjoyed, on average, better educational and occupational outcomes than the Muslim majority (Tagher 1998, Courbage and Fargues 1997, Issawi 1981, Krämer 1989). For example, in 1996 Egypt, 30 percent of adult active Egyptian Muslim males aged 35 to 65 worked in white-collar occupations, compared to 43 percent among Egyptian Christians.³ The empirical literature suggests that the expansion of (modern) schooling may cause abrupt changes in the educational and occupational distributions of a given population (e.g. Duflo 2001; Yuchtman 2010). This effect, however, may vary by group, thus altering the inherent inter-group socioeconomic differences, depending on the a priori inter-group differentials in the access to modern schooling. In particular, prior to the 1953-56 reform, almost all non-Muslim students were enrolled in modern schools (mostly private, both foreign and native), whereas *kuttabs* remained the main educational route for Muslims until the mid-twentieth century. For example, in 1907/08, the shift to modern schooling was almost complete for non-Muslim students: 93 percent of Coptic (Egyptian Christian) students, and 100 percent of Jewish students, were enrolled in

² Author's calculations based on the official schooling reports of 1948/49 and 1959/60 and the village/urban quarter- level censuses of 1947 and 1960. Modern schools include primary, preparatory, and secondary schools. Statistics include both males and female students. The occupational gap was even higher in the nineteenth century (See chapter 2).

³ 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.

modern schools, compared to only 24 percent among Muslims.^{4,5} Moreover, perhaps because of both financial and cultural constraints, the access of Muslims to modern schools was mostly through public schools.

This chapter examines the impact of the expansion of modern schooling in Egypt, measured between 1948/49 and 1959/60, on the educational and occupational differences between religious groups. The analysis draws on a number of new data sources: individual-level 10 percent sample from the 1996 census, available on IPUMS International, and official decennial schooling reports in 1907/08 to 1969/70 that I digitized. The chapter also documents the evolution of the educational and occupational differences between religious groups over the course of the twentieth century using (a) cohort analysis in the 1996 census sample, and (b) regression analysis in the village/urban quarter-level census data in 1897-1986, that are used for the first time in the literature.

I first find that the inter-religious educational and occupational gaps both declined in the second half of the twentieth century. I then turn to examine the impact of the expansion of modern schooling in 1948-59 on these differentials using the 1996 sample. In order to identify the effect of the program, I exploit the variation across cohorts and provinces of birth in the expansion of modern schools in 1948-59, and I allow the impact of the expansion to vary by religious group. I find that the expansion of modern schools

⁴ Author's calculations based on the 1907/08 official schooling report. School enrollment out of children aged 5 to 19 years old stood at 7 percent for Muslims, 13 percent for Copts, and 55 percent for Jews. Interestingly, 81 percent of Jewish students and 46 percent of Coptic students were enrolled in foreign private schools, compared to less than 3 percent among Muslim students.

⁵ Non-Muslims' shift to modern schooling started in the mid-nineteenth century. In 1848 Egypt, almost all non-Muslim students were enrolled in *kuttabs* compared to 2 percent among Muslim students who were enrolled in public modern schools. In 1868, 40 percent of non-Muslim students were enrolled in modern schools (all private schools, both foreign and native), compared to only 4 percent among Muslim students (92 percent of whom were in public schools) (Saleh 2011).

in 1948-59 explains the observed reduction in the Christian-Muslim occupational gap, but it does not seem to explain the decline of the educational gap (its effect on the educational gap is negative but statistically insignificant). I argue that the success of the 1953-56 program is due to its provision of an upward mobility route, modern primary schools, that was made accessible to the Muslim masses for the first time since the introduction of modern education in the first half of the nineteenth century.

The chapter links two lines of literature. First, there is a growing body of literature on the relationship between religion and economic outcomes (e.g. Barro and McCleary 2003 and 2005, Guiso et al. 2003, La Porta et al. 1997, Becker and Woessmann 2009, Boppart et al. 2008, Boorooah and Iyer 2005, Chaudhary and Rubin 2009). Second, there is a literature on the impact of the expansion of schooling (Duflo 2001) and the shift from traditional to modern schooling (Yuchtman 2010) on economic outcomes. The chapter is, to the best of my knowledge, the first research paper to combine the two literatures by examining the impact of the expansion of modern schooling on inter-religious educational and occupational differentials. In this regard, the chapter adds a policy perspective to the economics of religion literature by examining the role that public policies may play in mitigating socioeconomic differences between religious groups. This is particularly important in the Middle East, where religious identity is the main source of segmentation and division in the society.

The chapter also provides the first rigorous econometric analysis of the Egyptian educational modernization program in 1953-56, which was a major component of the highly controversial state-led modernization program under Nasser (1952-70). This program is highly debated in the qualitative historical literature (e.g. Boktor 1963; Harby

and El-Azzawi 1960; Cochran 1986). The chapter also presents, to the best of my knowledge, the first documentation in the literature of the evolution of the socioeconomic differences between religious groups over the twentieth century. Previous literature on the phenomenon has been limited to qualitative analysis (e.g. Tagher 1998, Courbage and Fargues 1997, Issawi 1981, Krämer 1989). Perhaps more importantly, the chapter is the first to examine the impact of the 1953-56 educational modernization on these differentials, a question that received less attention in the literature.

The rest of this chapter is organized as follows: Section 2 provides a historical background on the expansion of modern schooling in Egypt. Section 3 discusses the data sources. Section 4 documents the evolution of the educational and occupational differentials across religious groups over the twentieth century. The empirical strategy and the results are described in section 5. Finally, section 6 concludes.

2. Historical Background: Expansion of Modern Schooling

Modern schooling was introduced to Egypt in the first half of the nineteenth century, and co-existed along with traditional religious schooling until 1953. In the first half of the twentieth century, the modern schooling ladder started with primary schools that led a student up to secondary schools and university education, which were the gateway to prestigious white-collar occupations. Modern schools offered a diverse and largely secular curriculum, highly qualified teachers, and good equipments and facilities (Boktor 1936, p. 123-4).⁶ There were three types of modern schools: (i) Public schools (59 percent of modern schools' total enrollment in 1948/49): These were first introduced in

⁶ Religion constituted only 6 percent of the weekly periods in a public 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).

the first half of the nineteenth century. Fees were imposed on these schools in 1907, but were later abolished in 1944 at the primary level (Harby and El-Azzawi 1960). (ii) Native private schools (32 percent of modern schools' enrollment in 1948/49): These belonged to the Egyptian Muslim, Christian, and Jewish communities, and were first introduced in the second half of the nineteenth century. (iii) Foreign private schools (9 percent of modern schools' enrollment in 1948/49): These belonged to either European missionaries or to secular European entities and were first introduced in the late eighteenth century (Salama 1963, pp. 31-5).⁷

On the other side, the parallel religious education ladder started with elementary religious schools (*kuttab*s), which did not qualify their graduates to any further education, except at higher religious institutions. *Kuttab*s were segregated by religious group, and were traditionally funded by each group's religious endowments (*Waqf*) before the government started to subsidize them. Historically, *kuttab*s did not have a standardized curriculum, but there were important differences between religious groups: Muslim *kuttab*s focused primarily on learning Arabic orthography and memorizing Quran, a task that was typically completed in 2-3 years (Heyworth-Dunne 1938, pp. 2-7), whereas non-Muslim *kuttab*s taught arithmetic and geometry in addition to orthography and religion (Heyworth-Dunne 1938, p. 85).⁸ In 1916-53, however, the state made significant steps in order to modernize the *kuttab*s. In 1916, the *kuttab*s were transformed into four-grade

⁷ Author's calculations based on the 1948/49 official schooling report. Public schools include schools under the Ministry of Education, Cairo University, Administration of Religious Institutes, *Waqf* Administration, and Other governmental entities. Native private schools include: (1) Muslim schools: Under private Muslim *waqfs*, charity Muslim organizations, and other private Muslim entities, (2) Coptic schools: Under Coptic Orthodox Church, charity Coptic organizations, and other private Coptic entities, (3) Jewish schools, (4) Armenian schools, and (5) Other native non-Muslim schools. Foreign private schools include American, British, German, Italian, French, Greek, and other foreign schools.

⁸ See section 2.2.

elementary schools, provided free of charge, with a modernized curriculum.⁹ Moreover, in 1949, the curricula of elementary schools (*kuttab*s) and public primary schools were completely unified except for the foreign language requirement (that started from the third grade in modern primary schools).

Despite these measures, the separation of the two schooling systems persisted, and graduates of elementary schools were not allowed promotion to higher educational levels.¹⁰ It was only in 1953 that the government fully unified elementary and public primary schools by omitting the foreign language requirement from the latter, and improving the equipments and facilities in the elementary schools. Moreover, in 1956, the years of instruction in the now-unified primary schools were increased from 4 to 6 years (Boktor 1963, pp. 27-8), and the rules of unification were fully codified.

3. Data

I employ three new data sources in order to examine the impact of the expansion of modern schooling in 1953-56 on the educational and occupational differences between religious groups, and to document the evolution of these differences in the twentieth century. These sources are:¹¹

1. The 1996 Individual-Level 10 percent Census Sample: This data source is available from IPUMS International. In documenting the evolution of the inter-religious educational differential, I focus on Egyptian Muslim and Christian males aged 25 to 65

⁹ In 1948/49, elementary schools (*kuttab*s) were either public (60 percent of elementary schools' supply; 75 percent of elementary schools' enrollment) or private. Public elementary schools included schools under the Ministry of Education (11 percent; 20 percent) and provincial councils (49 percent; 55 percent). Private elementary schools were either subsidized (10 percent; 14 percent) or unsubsidized (30 percent; 11 percent) (Author's calculations based on the 1948/49 official schooling report).

¹⁰ These measures include the aforementioned abolition of fees on public primary schools in 1944.

¹¹ See Appendix D for more details on the data sources.

years who are born in Egypt with non-missing values for age, province of birth, and literacy. The sample is further restricted to those aged 3 to 7 in 1953 (treatment group), and those aged 13 to 18 in 1953 (control group), when evaluating the impact of the 1953-56 program. When examining the occupational differential, I restrict the sample further to *active* males with non-missing occupation. Table 3 shows the descriptive statistics.

2. National Official Schooling Reports (1907/08-1969/70): I digitized information on the local supply of schools (both *kuttab*s and modern) from the official schooling reports of 1907/08 to 1969/70. I then matched the province-level *change* in the supply of modern schools (per 1,000 children aged 5 to 14) that took place between 1948/49 and 1959/60 to the province of birth of the individuals in the 1996 sample. Figure 1 shows the evolution of the national supply of *kuttab*s (elementary schools) and modern schools (non-elementary schools at all pre-higher educational levels) per 1,000 individuals over the period 1907/08 to 1969/70. The figure clearly illustrates the sharp rise in the supply of modern schools between 1948/49 and 1959/60 as a result of the transformation of *kuttab*s into modern primary schools. It is also important to notice the rise in the supply of *kuttab*s (elementary schools) between 1921/22 and 1927/28. This earlier expansion was an application of the 1923 constitution that provided free and compulsory elementary education for every child between 6 and 12 years.

3. Village/Urban Quarter- Level Census Data (1897-1986): The data come from the published census reports of the decennial censuses: 1897, 1907, 1917, 1927, 1937, 1947, 1960, 1976, and 1986. Table 2 shows the summary statistics for the key variables of interest by year. The average percentage of non-Muslims across villages/urban quarters went down slightly from 7 percent in 1897 to 5 percent in 1986. The vast majority of

non-Muslims are Christians who are, in turn, mostly Copts (Egyptian Christians). The average percentage of Jews went down substantially starting from 1960, in the aftermath of the Arab-Israeli conflict, as most Jews emigrated from Egypt. The average percentage of males who are able to read and write increased gradually over the century but did not reach universal literacy. There is also a gradual rise in the average percentage of males who work in the non-agricultural sector.

4. Inter-Religious Socioeconomic Differentials in 1897-1986

In this section, I document the evolution of the inter-religious educational and occupational differentials using the 1996 individual-level census data and the village/urban quarter- level data (1897-1986). This documentation is important because it allows us to identify the points of structural change in the trend of the differentials.

4.1. Evidence from the 1996 Individual-Level 10 percent Census Sample

Figures 2 and 3 illustrate the evolution of the inter-religious educational and occupational gaps across birth cohorts using the 1996 census sample. Figure 2 depicts mean literacy by religious group across cohorts of birth for males born in 1931 to 1971, i.e. those aged 25 to 65 in 1996. Since there is high age heaping in the dataset around values of 0 and 5, I aggregated birth cohorts into ranges of five years.¹² The figure suggests that there is positive inter-religious literacy gap in favor of Christians at all birth cohorts. However, there is considerable convergence of Muslim and Christian literacy rates starting from the cohort born around 1951 (i.e. born in 1949-53). The gap continues to decline at the younger cohorts. Figure 3 suggests a similar pattern for the Christian-Muslim occupational gap. The figure depicts the percent working in white-collar

¹² For example, the cohort born in 1936 includes those recorded as born in 1934 to 1938. I chose the five years range such that it has the peak years (e.g. 1931, 36, 41, etc) in the middle of the range.

occupations by religious group across cohorts of birth for males born in 1931 to 1961, i.e. males aged 35 to 65 years in 1996. Similar to the educational gap, the occupational gap is positive in favor of Christians throughout all birth cohorts, but there is considerable convergence starting from the cohort born around 1951. Based on both pieces of evidence, I hypothesize that the expansion of modern schooling in 1953-56, which benefited the cohort born in 1947-51 onwards, might be the underlying cause that could explain this convergence pattern.

4.2. Evidence from the Village/Urban Quarter- Level Census Data (1897-1986)

Since the 1996 census sample includes only the survivors from that year, I also document the evolution of the inter-religious socioeconomic differentials using the actual population censuses that were carried out throughout the twentieth century, and that include the entire population at the time of the census. There are a number of caveats in using these censuses, however, and the results should be interpreted with caution. One caveat is that the data are aggregated at the village/urban quarter- level, the lowest administrative level in Egypt, and are not available at the individual-level (See subsection 2.1).¹³ Besides, the variables included in the censuses vary from one census to another on an ad hoc basis, and are not broken down by religious group. This limits the number of variables which can be added as controls.

I pool the village/urban quarter- level data from all census years and run the following OLS regression (1):

¹³ An individual-level 10 percent sample is available from the 1986 census only. However, the sample is not nationally representative, since many census records were lost on a non-random basis.

$$y_{it} = \alpha_i + \beta_t + nmuslimshare_{it}\gamma + \sum_{t=2}^9 (nmuslimshare_{it} \times T_t)\delta_t + Controls_{it}\zeta \\ + \sum_{t=2}^9 (Controls_{it} \times T_t)\eta_t + \varepsilon_{it}$$

Where: y_{it} is the outcome of interest for village/urban quarter i in the census year t , where $t = 1 \dots 9$ (there are nine censuses from 1897 to 1986). α_i is village/urban quarter fixed effects. β_t is a census years fixed effect. $nmuslimshare_{it}$ is the percentage of non-Muslims in village/urban quarter i in census year t . T_t is census year dummies (1897 census is the base year). $Controls_{it}$ is a set of control variables in village/urban quarter i in census year t . ε_{it} is the error term. Outcomes of interest are (a) the percentage of males who are able to read and write and (b) the percentage of males who are working in the non-agricultural sector. In order to ensure comparability across the census years, I calculate both percentages out of the total male population including children. Controls include log (population), percentage of females, percentage of population under 10 years, percentage of population 60 years and above, and percentage of foreigners. In this specification, the marginal effect of the non-Muslims' population share on the outcome of interest in a given census year is captured by $\gamma + \delta_t$, which is also an estimate of the differential between non-Muslims and Muslims with respect to that outcome.

The results are shown in figures 4 and 5. These figures show the estimated $\gamma + \delta_t$ by census year, i.e. the estimated educational and occupational differences between non-Muslims and Muslims in 1897 (or 1927) to 1986. Figure 4 suggests that the literacy gap between non-Muslims and Muslims, which is in favor of non-Muslims throughout the whole period 1897-1986, first dropped between 1937 and 1947, and then declined further between 1960 and 1976. A one percentage point increase in the non-Muslims' population

share is correlated, on average, with an increase in the percentage of literate males by 28 percentage points in 1897, but by only 12 percentage points in 1986. The evolution of the inter-religious literacy gap is qualitatively robust to the addition of controls for age distribution and percentage of foreigners in the village/urban quarter. Figure 5 also shows that the positive occupational gap in favor of non-Muslims started to decline between 1960 and 1976. A one percentage point increase in the 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 1897, but by only 3 percentage points in 1986.

Overall, the observed trends from the village/urban quarter census data in 1897 to 1986 suggest a decline in both the inter-religious educational and occupational gaps between 1960 and 1976. This seems to be consistent with the trend of the gaps across cohorts of birth in the 1996 census, which suggests a decline in the gaps starting from the cohort born in 1948-53 onwards (See subsection 4.1). In particular, it may be the case that the observed decline in the inter-religious socioeconomics gaps between 1960 and 1976 is because a larger share of the cohort born in 1948-53 had completed schooling and entered the labor force by 1976 (they aged 23 to 28 years old in 1976). However, the village/urban quarter census data show, in addition to that, an earlier decline in the inter-religious literacy gap between 1937 and 1947. This phenomenon is perhaps not possible to examine using the 1996 sample since the birth cohorts that are driving the phenomenon are perhaps too old to be observed in 1996. One may speculate that the decline in the literacy gap in 1937 to 1947 is caused by the expansion of the supply of elementary schools (*kuttab*s) in 1921/22 to 1927/28 (Figure 1) that aimed at eradicating illiteracy.

5. Empirical Strategy and Results

Can the educational modernization of 1953-56 explain the observed convergence in the educational and occupational gaps between Christians and Muslims in Egypt that is observed around the mid-twentieth century? I identify the effect of the program using the 1996 census sample by exploiting the variation across cohorts and provinces of birth in the expansion of the supply of modern schools, and I allow this effect to vary by religious group. In order to achieve this objective, I match the 1996 individual-level census sample to the expansion of the supply of modern schools (per 1,000 children aged 5 to 14), measured between 1948/49 and 1959/60, in each individual's province of birth. Because of data limitations in the 1948/49 report, modern schools are defined as all non-elementary schools, and so it combines primary, preparatory, and secondary schools. However, since the sharp rise in the number of modern schools in 1959/60 is mostly stemming from transforming all elementary schools of 1948/49 into modern primary schools (figure 1), the effect of the expansion of modern schools should be interpreted as effect of the expansion of modern *primary* schools in particular. I restrict the sample to two groups: (a) males aged 3 to 7 in 1953 (treatment group), i.e. the cohort that was exposed to the expansion program during their entire primary school years, and (b) males aged 13 to 18 in 1953 (control group), i.e. the cohort that had left primary school by the time the program started. Consider the following specification (2):

$$y_{ik} = \beta_{1k} + \beta_2 Young_i + \beta_3 Christian_i + \beta_4 (Christian_i \times Young_i) \\ + \beta_5 (Schools_k \times Young_i) + \beta_6 (Christian_i \times Schools_k \times Young_i) + \varepsilon_{ik}$$

Where: y_{ik} is the outcome of interest for an individual i born in province k . β_{1k} is a province of birth fixed effect. $Young$ T_t is a dummy for being in the treatment cohort who

was poised to benefit from the expansion, i.e. aged 3 to 7 in 1953. $Schools_{school_d}$ is the change in the supply of modern schools (per 1,000 children aged 5 to 14) in the province of birth between 1948/49 and 1959/60. ε_{ik} is the error term. Outcomes of interest are (a) literacy dummy and (b) white-collar occupation dummy. In this specification, β_5 captures the base effect of the expansion of schools on Muslims, while β_6 captures the effect of the program on the Christian-Muslim difference with respect to the outcome of interest.

The results are presented in table 3. The first column shows the results from the literacy dummy regression. In the absence of the program, and within the older cohort, a Christian has a higher probability than a Muslim of being literate by 14 percentage points. The Christian-Muslim literacy gap is not significantly lower within the younger cohort in the absence of the program (i.e. no evidence for mean reversion in younger cohorts). Also, in the absence of the program, a Muslim born in the younger cohort has a higher probability of being literate by 8 percentage points, compared to a Muslim born in the older cohort (i.e. there is a baseline positive cohort effect on literacy). More importantly, within the younger cohort, the program increases the probability of being literate for a Muslim by 3 percentage points. The effect of the program on the Christian-Muslim literacy gap within the younger cohort is negative (~ 2 percentage points), as expected, but is statistically insignificant.

The second column shows the results from the white-collar occupation dummy regression. Similar to the result on literacy, in the absence of the program, an old Christian has a higher probability than a Muslim of being in a white-collar job by 14 percentage points. Yet, the Christian-Muslim occupational gap within the younger cohort is significantly higher by 10 percentage points in the absence of the program. And there

does not seem to be any cohort effect for Muslims in the absence of the program. With the introduction of the program, the probability of a young Muslim being in a white-collar job increases by 7 percentage points (compared to a young Muslim with no access to the program). Finally, the effect of the program on the Christian-Muslim occupational gap within the younger cohort is negative (~ 7 percentage points), as expected, and is statistically significant.

Overall, it appears that the expansion of modern schooling in 1948-59 improved the educational and occupational outcomes of both Muslims and Christians. It also led to the reduction of the occupational gap between the two groups. Its effect on the educational gap is also negative but is statistically insignificant.

6. Conclusion

Employing several new data sources from Egypt, one of the largest Middle Eastern countries, I examined the impact of an educational modernization program in 1953-56 that transformed all elementary religious schools (*kuttab*s) into modern primary schools on the long-standing educational and occupational differences between religious groups, which were traditionally in favor of non-Muslims. The trends of these differences over the course of the twentieth century, that are being documented in this chapter for the first time in the literature, suggest that there was considerable convergence in both the educational and occupational gaps in the second half of the twentieth century. Overall, I find that the increase in the supply of modern schools (per 1,000 children aged 5 to 14) between 1948/49 and 1959/60, that resulted from the aforementioned transformation of the *kuttab*s, explains the reduction of the occupational gap between Christians and Muslims, but does not explain the decline of the educational gap.

When put into perspective, the success of the 1953-56 program in reducing the inter-religious occupational gap is remarkable. The socioeconomic gaps between religious groups in Egypt (with non-Muslims having better outcomes, on average, than the Muslim majority) have persisted since the Middle Ages because of the rigid labor market institutions (e.g. guilds and religious schools) that made occupations largely hereditary within each religious group. The Egyptian state-led modernization program of the nineteenth century failed to reduce the gaps because it did not focus on providing education and other upward mobility routes (e.g. job training and military training) to the Muslim masses. Thus, it ended up preserving the long-standing gaps.

So why was the educational modernization of 1953-56 relatively successful? I argue that it was because it turned the existing elementary schools into an upward mobility route, provided free of charge, towards white-collar jobs, thus making schooling a much more attractive investment for the Muslim masses. It is important to notice here that the transformation of the *kuttab*s into primary schools did *not* necessarily entail an improvement in the quality of education (the curriculum of the *kuttab*s was already converging to that of modern primary schools in 1916-49), but it did involve a tremendous increase in the expected returns to education and a decrease in its cost (free and proximate schools). Unlike the older *kuttab*s that did not lead the student to any further educational (and thus occupational) advancement, the newly transformed primary schools led the student to a promising career, perhaps ending up in one of the few prestigious universities and in white-collar occupations. This made the transformed primary schools a much more attractive option to the Muslim masses, thus increasing

their school enrollment, and improving their educational and occupational outcomes to match those of Christians for the first time in centuries.

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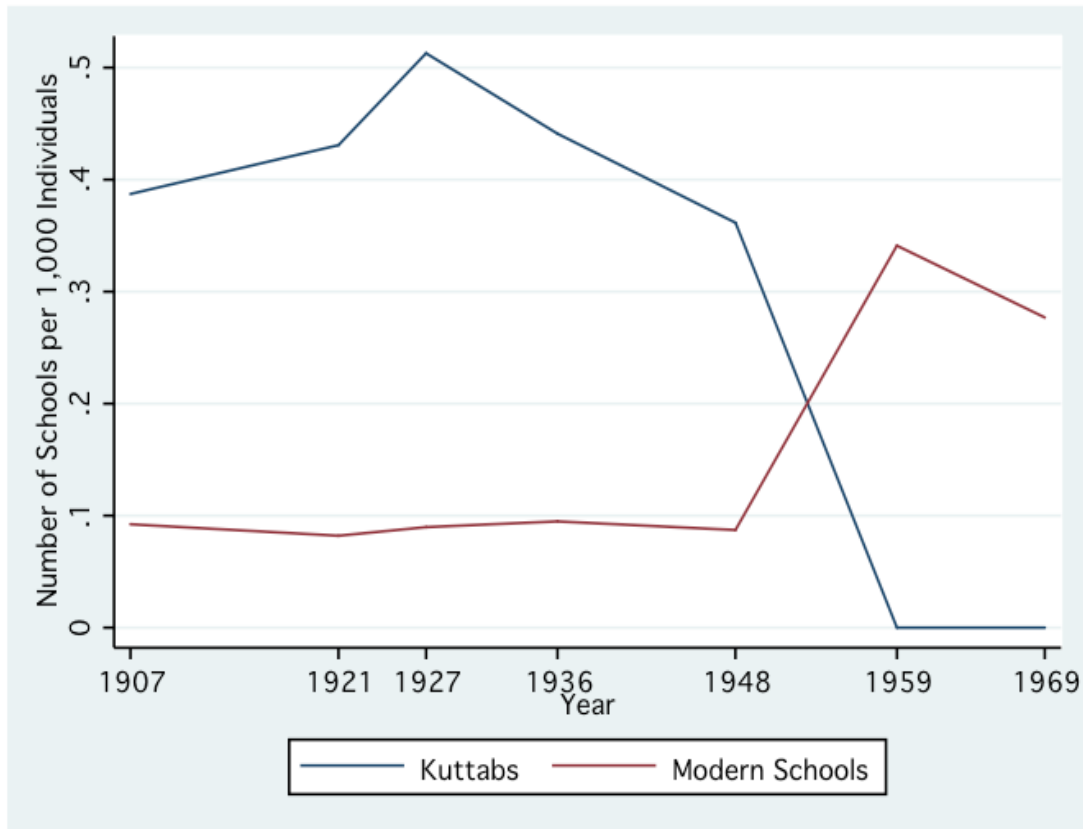
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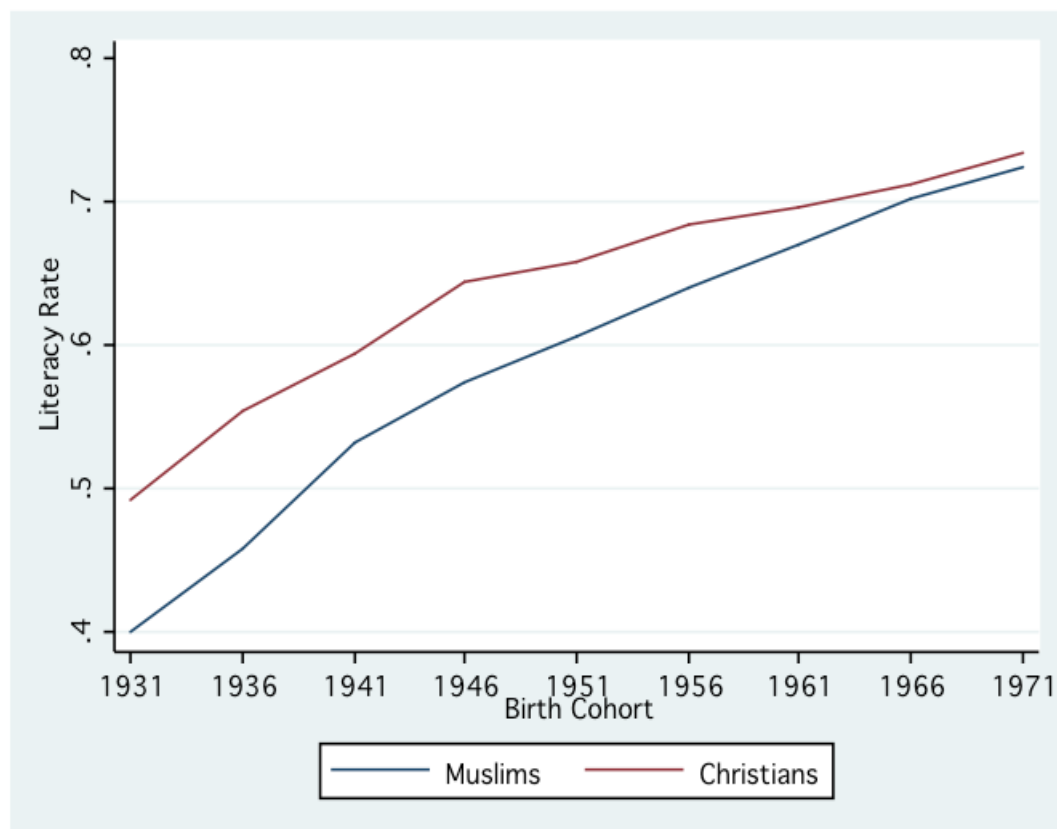
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Figure 1: National Supply of *kuttab*s and Modern Schools in 1907/08 to 1969/70



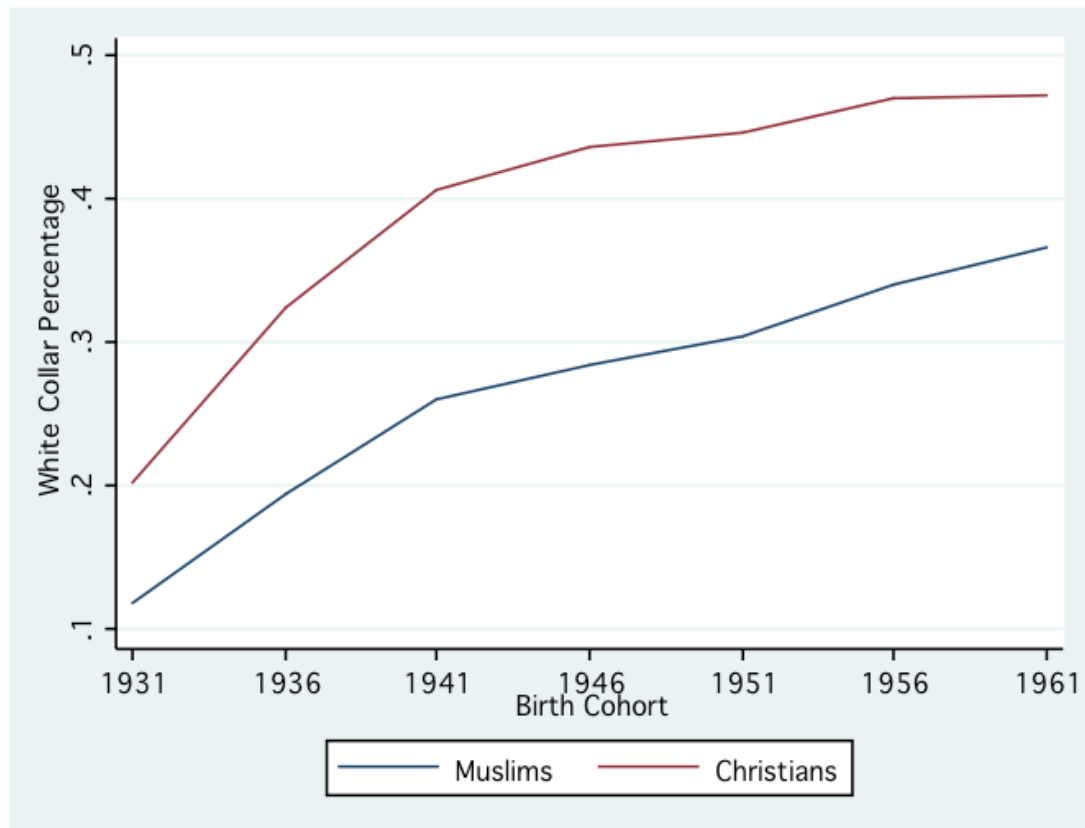
The graph is based on the official schooling reports of 1907/08, 1921/22, 1927/28, 1936/37, 1948/49, 1959/60, and 1969/70. Starting from 1921/22, *kuttab*s are defined as the four-grade elementary schools (that were started in 1916), while modern schools are defined as non-elementary schools (at all pre- higher education levels: primary, preparatory, and secondary). Information on population is obtained from the closest population censuses of 1907, 1917, 1927, 1937, 1947, 1960, and 1976.

Figure 2: Percentage of Literate Muslims and Christians across Birth Cohorts (1931-71)



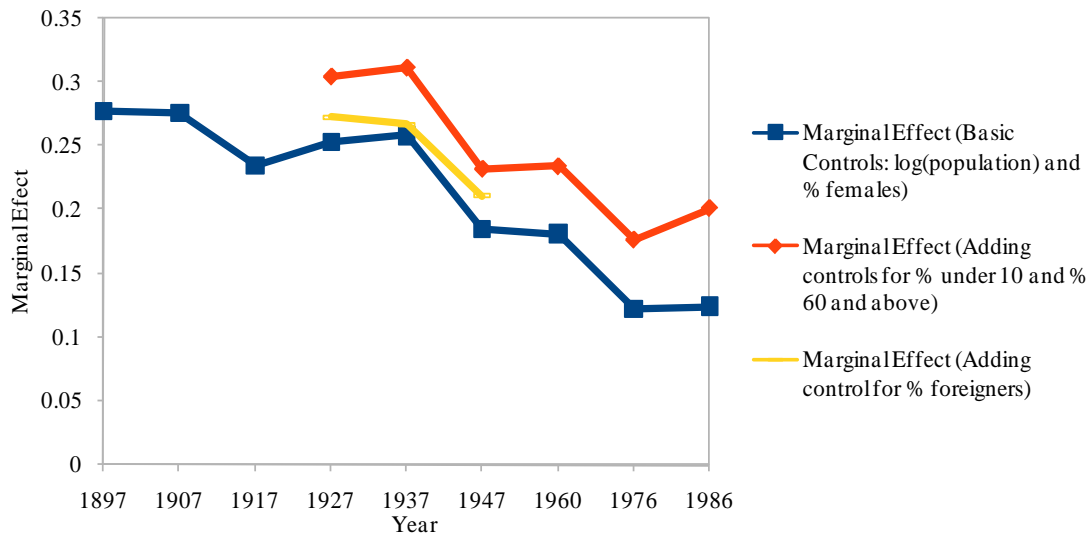
Graph is based on the 1996 10-percent individual-level census sample available at IPUMS-International. Sample is restricted to Egyptian Muslim and Christian males, 25-65 years of age, who are born in Egypt with non-missing values for age, province of birth, and literacy.

Figure 3: Percentage of Muslims and Christians Working in White-Collar Occupations across Birth Cohorts (1931-61)



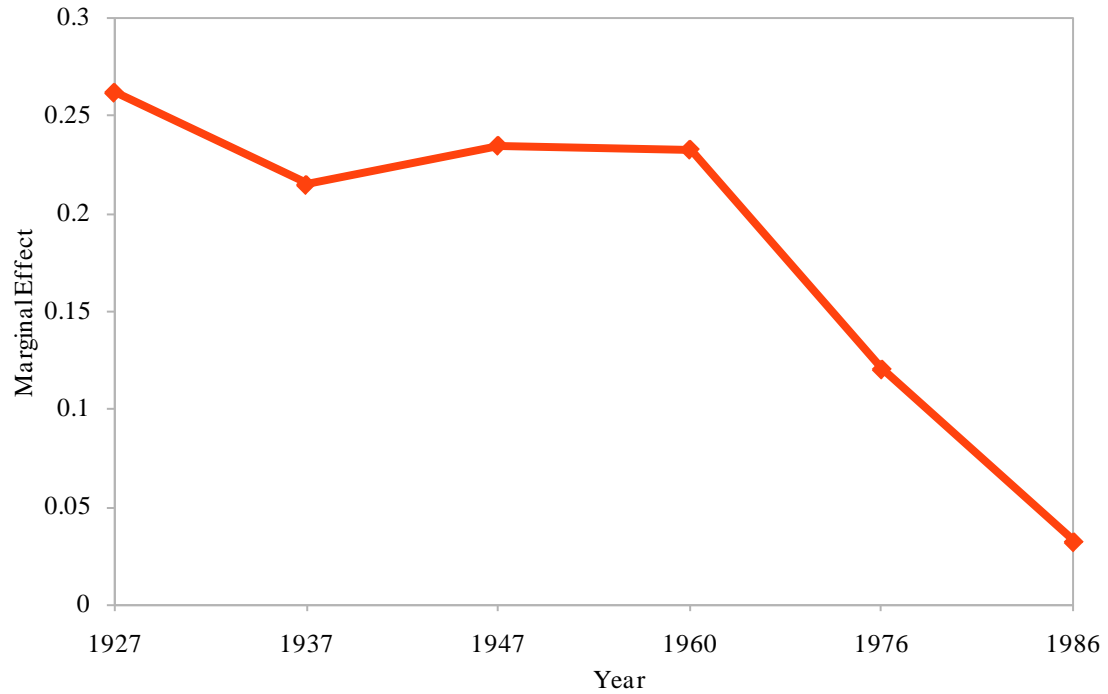
Graph is based on the 1996 10-percent individual-level census sample available at IPUMS-International. Sample is restricted to Egyptian Muslim and Christian males, 35-65 years of age, who are born in Egypt with non-missing values for age, province of birth, literacy, and occupation. White-collar occupations include four major occupational groups (1) legislators, senior officials, and managers, (2) professionals, (3) Technicians and associate professionals, and (4) clerks.

Figure 4: Marginal Effect of Non-Muslims' Population Share on the Percentage of Males Who Are Able to Read and Write
(Village/Urban Quarter- Level Census Data 1897-1986)



Graph depicts the estimated $\gamma + \delta_t$ from equation (1) for each census year, with the outcome of interest defined as the percentage of males who are able to read and write. Each line comes from a different regression with an additional number of control variables. Village/urban quarter- level fixed effects are included in the regression. See Data Appendix for details on the matching process of villages/urban quarters across the census years from 1897 to 1986.

Figure 5: Marginal Effect of Non-Muslims' Population Share on the Percentage of Males Working in the Non-Agricultural Sector
(Village/Urban Quarter- Level Data 1927-1986)



Graph depicts the estimated $\gamma + \delta_t$ from equation (1) for each census year, with the outcome of interest defined as the percentage of males working in the non-agricultural sector. Control variables include: log (population), percentage of females, percentage of population aged below 10, and percentage of the population aged 60 and above. Village/urban quarter- level fixed effects are included in the regression. See Appendix D for details on the matching process of villages/urban quarters across the census years from 1897 to 1986.

Table 1: Descriptive Statistics: Individual-Level 1996 10-percent Census Sample

Variable	Mean	N
% Christian	6.37	1,079,109
% Literate	63.19	1,079,109
% Working in white-collar occupations (Out of active males aged 35 to 65 with non-missing occupation)	30.93	761,657
Mean number of new modern schools added between 1948/49 and 1959/60 in the province of birth (per 1,000 children aged 5 to 14) (Individual-level mean)	1.07	1,079,109
Mean number of new modern schools added between 1948/49 and 1959/60 in the province of birth (per 1,000 children aged 5 to 14) (Province-level mean)	1.17	18

Sample is restricted to Egyptian Muslim and Christian males aged 25 to 65 years inside Egypt with non-missing values for age, province of birth, and literacy. White-collar occupations include four major occupational groups (1) legislators, senior officials, and managers, (2) professionals, (3) Technicians and associate professionals, and (4) clerks.

Table 2: Descriptive Statistics across Years: Village/Urban Quarter-Level Census Data (1897-1986)

Variable	1897	1907	1917	1927	1937	1947	1960	1976	1986
% Non-Muslims	0.07 (0.16)	0.07 (0.15)	0.07 (0.15)	0.07 (0.15)	0.07 (0.14)	0.06 (0.14)	0.06 (0.13)	0.05 (0.12)	0.05 (0.12)
% Christians	0.07 (0.16)	0.07 (0.14)	0.07 (0.14)			0.06 (0.13)	0.06 (0.13)	0.05 (0.12)	0.05 (0.12)
% Coptic Christians	0.06 (0.14)	0.06 (0.13)		0.06 (0.13)	0.06 (0.13)				
% Non-Coptic Christians	0.01 (0.07)	0.01 (0.06)							
% Jews	0.00 (0.02)	0.00 (0.03)	0.00 (0.03)				0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
% Males Able to Read and Write	0.08 (0.08)	0.08 (0.07)	0.11 (0.09)	0.17 (0.11)	0.21 (0.13)	0.24 (0.13)	0.24 (0.12)	0.35 (0.15)	0.40 (0.13)
% Males in Non-Agriculture Sector				0.30 (0.26)	0.31 (0.25)	0.34 (0.26)	0.27 (0.28)	0.33 (0.29)	0.42 (0.26)
% Foreigners	0.01 (0.07)			0.01 (0.06)	0.01 (0.05)	0.00 (0.03)			
% Population Under 5				0.14 (0.02)	0.13 (0.03)	0.13 (0.02)	0.16 (0.02)	0.14 (0.03)	0.16 (0.03)
% Population Under 10				0.27 (0.03)	0.27 (0.04)	0.26 (0.03)	0.30 (0.03)	0.28 (0.04)	0.29 (0.05)
% Population 60 and Above				0.07 (0.02)	0.06 (0.02)	0.06 (0.02)	0.07 (0.02)	0.07 (0.02)	0.06 (0.02)
N	4,044	3,828	3,839	3,903	4,200	4,342	4,682	4,791	4,910

Means are calculated across villages/urban provinces in each year. Border provinces are excluded. Standard deviation is between parentheses.

Table 3: Impact of the Expansion of Modern Schools in 1948-59 on the Christian-Muslim Educational and Occupational Gaps

(Evidence from the Individual- Level 1996 Census Sample)
(Linear Probability Model: OLS)

	Dependent Variable: Literacy Index	Dependent Variable: White- Collar Index
Christian	0.136*** (0.005)	0.141*** (0.006)
Young	0.083*** (0.008)	-0.002 (0.009)
Christian × Young	-0.001 (0.025)	0.098*** (0.029)
Expansion of Modern Schools × Young	0.030*** (0.008)	0.067*** (0.008)
Expansion of Modern Schools × Christian × Young	-0.021 (0.023)	-0.068*** (0.026)
Province of Birth Fixed Effects?	Yes	Yes
Adjusted R- Squared	0.085	0.067
N	244,227	187,520

Robust standard errors are in parentheses. In both regressions, the sample is restricted to Egyptian Muslim and Christian males born in Egypt in 1946 to 1950 and in 1931 to 1940 with non-missing values for province of birth, age, and literacy. In the white-collar dummy regression, the sample is restricted further to active males with non-missing occupation.

Data Appendix

1. The 1996 Individual- Level 10 percent Census Sample: I matched every individual in the restricted dataset (individuals aged 3 to 7 and 13 to 18 in 1953) to the change in the supply of modern schools (per 1,000 children aged 5 to 14) in 1948-59 in his province of birth. The change in the supply of modern schools is measured at the 1960 population census provinces level. I thus used the CEDEJ mapping of the 1960 provinces to the 1996 population census provinces in order to do the matching.

2. National Official Schooling Reports (1907/08-69/70): I collected information on the supply of schools (both *kuttabs* and modern) from the official schooling reports in 1907-69. These reports were irregular in the period (1906/07-1914/15), and then became triennial in the period (1921/22-1948/49). After the 1952 military coup, they were re-instated starting from 1955/56, and became annual since then. There is considerable variation in the level of detail of these reports across the years. In the earliest reports from 1906/07 to 1914/15, the reports give detailed data at the school level for modern schools, yet information on *kuttabs* is very approximate and is at the province-level. In the reports from 1921/22 to 1948/49, the reports give information on the number of elementary schools (*kuttabs*) and modern (non-elementary) schools at the district-level (which is higher than the village/urban quarter- level but lower than the province- level). They also give detailed information on the supply of each type of elementary and modern schools at the district- or province- levels. Finally, the post-1952 reports provide information on the number of modern schools (broken down by level of education) at the province-level. I digitized the information on schools in the reports of 1907/08, 1921/22, 1927/28,

1936/37, 1948/49, 1959/60, and 1969/70. Figure 3 shows the basic trends of the supply of modern and elementary schools.

3. Village/Urban Quarter- Level Census Data (1897-1986): These data are at the lowest administrative level in Egypt, the rural village or urban quarter, which is roughly equivalent to a zip code in the U.S. The data come from the published census reports of the decennial censuses: 1897, 1907, 1917, 1927, 1937, 1947, 1960, 1976, and 1986. They were digitized by *Centre d'Etudes et de Documentation Economiques, Juridiques, et Sociales* (CEDEJ) in Cairo, Egypt and made publicly available on a CD-ROM.

The variables collected differed from one year to another on an ad hoc basis, but they always included information on religious distribution, literacy, and economic activity (starting from 1927) at the village/urban quarter- level.¹⁴ Table D.1 shows the summary statistics by region, excluding the scarcely populated border provinces, across the two years 1897 and 1986. The average percentage of non- Muslims (across villages/urban quarters) is the highest in Middle Upper Egypt, where they are mostly Coptic Christians. Urban provinces have the second highest share, followed by Southern Upper Egypt, Northern Upper Egypt, and finally Lower Egypt. There is a slight decline in the shares of non-Muslims in almost all regions over the century, but the decline is much sharper in the urban provinces perhaps due to the massive emigration of foreigners and non-Coptic Christians in the 1950s and 1960s. As for male literacy, one can see that the urban provinces have the highest average male literacy rate, followed by Lower Egypt, Northern Upper Egypt, Middle Upper Egypt, and then Southern Upper Egypt. A similar regional pattern exists for the occupational distribution measures, with the exception of Southern Upper Egypt, which seems to have a

¹⁴ I checked all the censuses for internal consistency before employing them in my analysis and minor data cleaning was involved.

relatively high percentage of males working in the non-agricultural sector, on average, perhaps because of the large tourism industry in this region.

I employ the village/quarter- level census data as a pooled dataset as well as a panel dataset. For the purpose of building a panel, which follows the same geographical unit (village or urban quarter) over the twentieth century, I started by using the matching to the 1996 census geographical codes that was already available in the CEDEJ dataset. This matching assigned to every unit the geographical code from the 1996 census if the unit exists under the same name in 1996. For the units that do not have a match in the 1996 census, I made an extensive manual revision by attempting to match every unit of these across the years in which it appears with exactly the *same* name (in the same or neighboring province) following a general rule: I assigned for the geographical unit the code from the *latest* census in which it appeared as a “single” geographical unit. Three situations arose: First, if a geographical unit has been divided at some point during the century, I collapsed the emerging subsequent sub-units into the older single unit and assigned to them the code of that unit in the older year. This situation appeared mainly for the provincial capital cities, which were always treated as one “village” in the earlier censuses, but were then “promoted” into “districts” and were further subdivided into urban quarters. It also appeared for the Suez Canal cities, which were treated as single units in the early twentieth century but were then promoted into districts, and even later on into provinces. Second, if one or more geographical units have been united into one unit at some point, I collapsed the earlier units into this subsequent later single unit. This situation was rarer in practice. Third, if a geographical unit disappeared or emerged at some point, and which does not fall under the two scenarios above, I assigned to it the geographical code of the latest census in which it appears.

Although the matching procedure might seem complicated, it was straightforward in practice. About 97 percent of the villages/urban quarters in all years had an exact mapping in 1996 census. The manual revision procedure that I explained above thus focused on the unmatched units, which were about 3 percent of the total number of units. The quality of the 1996 census mapping increases in later censuses (from 94 percent in 1897 to 99 percent in 1986). Also, the quality of matching in rural provinces (98 percent) is much higher than in urban ones (87 percent). The quality of matching is particularly low (about 67 percent) in urban provinces in the early years (1897 and 1917). Nevertheless, modifications to the 1996 mapping to correct for the aforementioned three situations were necessary in order to obtain consistent mapping for all units. All these manual modifications are documented in the STATA do-file and dataset.

**Table A.1: Descriptive Statistics across Regions: Village/Urban
Quarter- Level Census Data (1897-1986)**

Variable	1897				
	Urban Provinces	Lower Egypt	Northern Upper Egypt	Middle Upper Egypt	Southern Upper Egypt
% Non-Muslims	0.147	0.028	0.049	0.183	0.040
% Christians	0.132	0.028	0.049	0.183	0.040
% Coptic Christians	0.027	0.027	0.049	0.182	0.040
% Non-Coptic Christians	0.105	0.001	0.000	0.000	0.001
% Jews	0.014	0.000	0.000	0.000	0.000
% Males Able to Read and Write	0.195	0.076	0.054	0.047	0.040
% Males in Non-Agriculture (1927)*	0.839	0.240	0.273	0.199	0.267
% Foreigners	0.098	0.001	0.000	0.000	0.001
N	432	2,184	462	738	228
Variable	1986				
	Urban Provinces	Lower Egypt	Northern Upper Egypt	Middle Upper Egypt	Southern Upper Egypt
% Non-Muslims	0.061	0.014	0.033	0.157	0.043
% Christians	0.057	0.014	0.032	0.157	0.043
% Jews	0.000	0.000	0.000	0.000	0.000
% Males Able to Read and Write	0.554	0.423	0.335	0.317	0.380
% Males in Non-Agriculture	0.840	0.393	0.378	0.270	0.457
N	547	2,539	610	908	306

Means are calculated across villages/urban quarters in each year/region.

* In 1927, N is as follows: Urban Provinces (384), Lower Egypt (2067), Northern Upper Egypt (483), Middle Upper Egypt (749), and Southern Upper Egypt (220).