On the Road to Heaven:
Poll tax, Religion, and Human Capital in Medieval and Modern Egypt

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Abstract

In the Middle East, non-Muslims are, on average, better off than the Muslim majority. I trace the origins of the phenomenon in Egypt to the imposition of the poll tax on non-Muslims upon the Islamic Conquest of the then-Coptic Christian Egypt in 640. The tax, which remained until 1855, led to the conversion of poor Copts to Islam to avoid paying the tax, and to the shrinking of Copts to a better off minority. Using new data sources that I digitized, including the 1848 and 1868 census manuscripts, I provide empirical evidence to support the hypothesis. I find that the spatial variation in poll tax enforcement and tax elasticity of conversion, measured by four historical factors, predicts the variation in the Coptic population share in the 19th century, which is, in turn, inversely related to the magnitude of the Coptic-Muslim gap, as predicted by the hypothesis. The four factors are: (i) the 8th and 9th centuries tax revolts, (ii) the Arab immigration waves to Egypt in the 7th to 9th centuries, (iii) the Coptic churches and monasteries in the 12th and 15th centuries, and (iv) the route of the Holy Family in Egypt. I draw on a wide range of qualitative evidence to support these findings.

Keywords: Islamic poll tax; Copts, Islamic Conquest; Conversion; Middle East
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I. Introduction

"*Scribes in the Levant and Egypt are Christians*."

Al-Muqaddasi, Muslim historian and geographer, 10th century[1]

In 1996 Egyptian Christians (Copts) were a small and successful minority, comprising 6 percent of the Egyptian population. The percent of adult active men working in a white-collar occupation stood at 41 percent for Copts compared to 30 percent for Egyptian Muslims.[2] The occupational gap was even higher in the 19th century, prior to the 20th century expansion of schooling, which reduced the literacy gap, and prior to out-migration of high-skilled Copts beginning in the 1960s (Saleh 2011c).[3] New data from Egypt's censuses of 1848 and 1868 reveal that among adult active men 48 percent of Copts worked in white-collar occupations (mostly as scribes), whereas only 16 percent of Muslims worked in white-collar occupations (Saleh 2011a).[4] The relative success of small non-Muslim minorities has been observed throughout the Middle East, both in the present day and in the past (Courbage and Fargues 1997, pp. 174-209).

Why did the Coptic-Muslim human capital gap in Egypt emerge?[5] I hypothesize that the poll tax (*jizya*) on non-Muslims that was imposed upon the Islamic Conquest of the then-Coptic Christian Egypt in 640 AD, and remained in effect until 1855, led to the conversion of poor Copts to Islam to avoid paying the tax, and to the shrinking of Copts

[1] Al-Muqaddasi (1877), *The Best of Compositions in the Knowledge of Regions*, p. 183.
[2] Based on the author's calculations from the 1996 10 percent census sample published on IPUMS-International. Sample is restricted to males who are at least 25 years old.
[3] Based on the author's calculations from the 1848 and 1868 digitized census samples (See Saleh 2011a and b for more details about the data source). Sample is restricted to males who are at least 15 years old.
[4] The educational gap was also higher. In 1848 Cairo, 51 percent of Coptic male children of 5-14 years of age were enrolled in Coptic *kuttabs* (elementary religious schools), which taught arithmetic and geometry besides Arabic orthography (Heyworth-Dunne 1938, p. 85). Muslim *kuttabs*, focusing solely on memorizing Quran, enrolled only 34 percent.
[5] I focus on the Coptic-Muslim gap since Copts constituted 94 percent of non-Muslims in 1848/68. Other non-Muslim minorities include Jews (1 percent) and non-Coptic Christians (5 percent), such as *Ruum* (Ottoman Greeks), Armenians, Greeks (from the independent Greek state), and Levantines. These groups have better economic outcomes than both Copts and Muslims. Unlike Copts, they are urban groups.

into a better off minority. A testable prediction of the hypothesis is that areas where the tax was more strictly enforced or where conversion was more responsive to the tax (i.e. with higher tax elasticity of conversion) witnessed larger conversions to Islam among poor Copts. These areas should thus have both a *lower* Coptic population share and a *wider* Coptic-Muslim gap. Controls on internal migration and guilds, by limiting both geographic and occupational mobility, explain the persistence of the gap and its spatial pattern over the centuries.

I show that four historical factors predict the variation in Coptic population share, which is, in turn, inversely related to the size of the gap. These factors are: (1) the 8th and 9th centuries tax revolts that were ignited by stricter tax enforcement, (2) the Arab (Muslim) immigration waves to Egypt in the 7th to 9th centuries that Islamized the local elites in the receiving districts. Local elites were responsible for tax collection, and, depending on their religion, exercised more (or less) lenience towards Coptic taxpayers, (3) the Coptic churches and monasteries in the 12th and 15th centuries, which provided aid to poor Copts, and (4) the route of the Holy Family in their biblical flight to Egypt. While tax revolts and Arab immigration capture the variation in tax enforcement, Coptic institutions and the route of the Holy Family measure the variation in the attachment to Christianity or the tax elasticity of conversion. Coptic institutions also have a direct effect on the extent of conversion through relaxing the budget constraint for poor taxpayers. I draw on a wide range of qualitative evidence to support these findings.

I test the hypothesis using the earliest comprehensive microdata source from Egypt, two national individual-level samples of the 1848 and 1868 Egyptian censuses that I digitized from the original manuscripts. I also make use of the village/urban quarter-level

1897 census data, which have the full population enumeration. Historical evidence, however, suggests that the gap emerged by the 12th century. I choose the 19th century censuses rather than the most recent ones because the earlier data provide a snapshot of the Egyptian population *before* the expansion of education, urbanization, and Coptic out-migration that may have altered the gap and its spatial pattern during the 20th century. I also created datasets on medieval Coptic tax revolts, post-Conquest Arab immigration waves, medieval Coptic churches and monasteries, and the route of the Holy Family's journey in Egypt, using various historical sources.[6]

My explanation of the Coptic-Muslim gap differs from that of other scholars. I discuss here four alternative explanations, and I examine the rest in subsection VI.3. First, a tradition in Middle Eastern economic history (e.g. Issawi 1981; Kuran 2004) postulated that the better economic outcomes of non-Muslim minorities did not exist before the 19th century. It has thus been suggested that non-Muslims' privilege was due to the rise of modern European influence in the Middle East that favored local non-Muslims (Issawi 1981), or to their adoption of European legal structures (Kuran 2004). Nonetheless, a large body of evidence suggests that Copts' quasi-monopoly of white-collar occupations, which accounts for the bulk of the gap in the 1848/68 censuses, emerged by the 12th century (See subsection VI.1). Second, one may argue following Kuznets (1960) that Copts, as a minority, attempted to preserve their religious identity by specializing in administrative occupations in which they had built a tradition. Although this may seem appealing in explaining the persistence of Coptic monopoly of administrative jobs once

[6] I use Morimoto (1981) and Mikhail (2004) for the information on the 8th and 9th centuries tax revolts, Al-Barry (1992) for the dataset on Arab immigration waves, the medieval sources Abul-Makarim (1999) and Al-Maqrizi (2002) for Coptic churches and monasteries in the 12th and 15th centuries, and Anba-Bishoy (1999) and Gabra (2001) for the sites visited by the Holy Family during their biblical flight to Egypt.

Copts became a minority, it does not explain how Copts, who initially constituted almost the entire population, made the occupational transition. Third, the white-collar bias of the Jewish occupational distribution is often explained by the fact that Jews were banned from specific occupations such as farming (Abrahams 1896, pp. 211-50). But Copts were not banned from farming and, unlike Jews, were not an "urban" population. In 1848/68, 33 percent of adult active male Copts were farmers.[7] Finally, Botticinni and Eckstein (2005) argued that the literacy requirement under Judaism led, via positive selection, to the Jewish higher human capital. Yet, no literacy requirement existed under Coptic Christianity, and illiteracy among adult male Copts in 1986 was as high as 34 percent.

The paper contributes to the economics literature on the lasting impact of institutional changes on economic outcomes (e.g. Acemoglu, Johnson, and Robinson 2001; Acemoglu et al. forthcoming). I show in this paper that the Islamic Conquest of Egypt that established the poll tax institution in 640 AD created *unintentionally* religious human capital differentials that persisted for over a millennium. It is also related to the literature on the impact of religion on economic outcomes (Botticinni and Eckstein 2002 and 2005; Barro and McCleary 2003 and 2005; Becker and Woessmann 2009; Boppart et al. 2008; Boorooah and Iyer 2005; Chaudhary and Rubin 2009). I provide a new explanation for the correlation between religion and economic outcomes based on the historical self-selection into the religion, which is caused by irreligious factors (poll tax). Finally, the effect of the poll tax on the conversion of Copts to Islam and the monopoly of Copts over administrative jobs in medieval and modern Egypt are both old topics in the historical

[7] The fact that, in 1848-68, Copts were excluded from top state positions in the military, the police, the judiciary, and the *ulama*, which were all high-status jobs, does not explain the *positive* Coptic-Muslim gap. The opposite scenario, banning Muslims from specific "Coptic" occupations (such as making, selling, or serving alcohol) also existed. Yet, the share of these occupations is too limited and their status is not high.

tradition (On poll tax and conversion: e.g. John of Nikiu 1916; Severus 1907; Dennett 1950; Morimoto 1981. On Coptic scribes: e.g. Al-Maqrizi 2002; Al-Muqqadasi 1877; Tagher 1998; Sheikho 1987; Samir 1996; Amer 2000). Yet, this paper is, to the best of my knowledge, the first to argue that the poll tax led to *selected* conversion of Copts to Islam (rather than *systematic* conversion), and that that, in turn, generated the human capital gap. My key point here is shifting the attention from identifying the reason(s) behind the Islamization of Egypt *per se*, a vast topic in the historical literature that generated fierce debates, into identifying the reason(s) behind the emergence of the Coptic-Muslim human capital gap. This gap is rarely emphasized in the historical literature although the Coptic dominance of administrative occupations is rarely disputed. The new data sources that I collected in support of the hypothesis may thus shed a new light on both the Coptic-Muslim gap and the historical process of Islamization of Egypt.

The rest of the paper is organized as follows. Section II provides historical background on the Christianization and Islamization of Egypt. I discuss the data in section III. Section IV and V introduce the empirical analysis and the results. I discuss the mechanisms through which the hypothesis operates in section VI. Finally, section VII concludes.

II. Historical Background: Christianization and Islamization of Egypt

Christianity has a long history in Egypt, reaching back to the 1st century, and the Church of Alexandria was a major theological center since the 2nd century (Bowman 1989, pp. 191-202; Roberts 1979, pp. 1-26).[8,9] Both the translation of biblical texts into

[8] According to Coptic traditions, Egypt knew Christianity through the biblical flight of the Holy Family to Egypt, and then through Saint Mark, the author of the Gospel of Mark, who is believed to have established the Church of Alexandria (Atiya 2005, pp. 29-37). Apart from this tradition, both Bowman (1989, p. 191) and Roberts (1979, p. 1) suggest that the presence of a large Hellenized Jewish community in Alexandria may have encouraged the choice of Egypt by early Christian preachers as their first station in the propagation of Christianity after Palestine.

Coptic in the 3rd century and Constantine's Edict of Toleration in 331 accelerated the Christianization of Egypt. Thus, by the end of the 4th century, incidents of persecution of pagans by the now dominant Christians were documented,[10] and the last pocket of paganism was Christianized in the mid-6th century (Bowman 1989, p. 192). The Church of Alexandria, followed by the Coptic (Egyptian) masses, separated from the (ruling) Byzantine Church on the grounds of a theological debate at the Council of Chalcedon in 451 (Atiya 2005, pp. 71-6; Tagher 1998, pp. 1-7).[11] Greeks and Hellenized Egyptians remained loyal to the Byzantine Church forming a competing church, the Melkite Church of Alexandria.[12] Condemned as "heretics," Copts suffered persecution under the Byzantines until the Islamic Conquest (Bowman 1989, p. 198; Atiya 2005, pp. 87-99), which created animosity between Copts and Melkites throughout the Middle Ages.

Hence, when Muslims conquered Egypt in 640, Copts constituted almost all the population, with Melkites and Jews forming two small minorities (Tagher 1998, p. 4; Lane-Poole 1969, p. 2; Wilfong 1998).[13] Over the centuries, Egypt was gradually Islamized, and Copts (Egyptian anti-Chalcedonian Christians) fell to 6 percent of the population in 1848. Two historical processes account for the Islamization of Egypt:

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[9] The first evidence on Christianization comes from the 3rd century: a document evidencing the persecution of Egyptian Christians. Decius, the Roman emperor, ordered that every individual had to declare that he was not a practicing Christian, and the evidence is one of these declarations (Bowman 1989, p. 191).

[10] This includes the murder of the Greek Neo-Platonist philosopher Hypatia by a Christian mob in 415 (Bowman 1989, p. 207). Interestingly, paganism survived longer among the Hellenized elite.

[11] The "Great Schism" that separated the Byzantine and Roman Churches occurred later, in 1054. The Chalcedonian theological controversy was on the nature of the Christ. The Coptic Church of Alexandria rejected the Chalcedonian decree and advocated for the "Monophysite" doctrine, i.e. that the Christ has a single inseparable nature. The Melkite Church, a pro-Chalcedonian Church, believed in the two natures (divine and human) of the Christ (Atiya 2005, 87-9), and it later followed the Greek Orthodox Church.

[12] According to Atiya (2005, pp. 21-2, 88), the word "Melkite" originated from the Syriac word for "King," and was the name used by Copts to describe their opponents as followers of the Byzantine Emperor or "King." The word "Copt," on the other hand, originated from the Greek word for Egypt.

[13] There were other minor Christian factions in Egypt that were later assimilated into the Coptic or Melkite Churches. These included Melitians, Arians, Manicheans, Eutychians, Acephali, Barsanuphians, and Julianists (See Mikhail 2004, p. 46 for more details).

Conversion of Copts to Islam and Arab (Muslim) immigration to Egypt. Demographic evidence in Russell (1958) suggests that the size of Arab immigration cannot, by itself, account for Islamization,[14] although inter-marriage between Arab immigrants and Copts may have acted as a "multiplier" of the base immigration effect.[15] Importantly, there was no significant Coptic emigration from Egypt, or "replacement" of Copts by Arab immigrants. Copts, because of their anti-Chalcedonian denomination that differed from both Eastern and Western Churches, were a highly isolated and immobile group that was first "discovered" by Europeans in the 15th century (Hamilton 2006, pp. 1-5). Large-scale Coptic emigration from Egypt only started in the 1960s.

In the absence of statistics, Wilfong (1998) points out that it is not possible to identify the point at which Copts became a minority. An old historical tradition (e.g. Al-Maqrizi 2002; Lane-Poole 1969; Dennett 1950; Mikhail 2004) argued that Islamization (i.e. Copts declining to a minority) took place in the early period (640-1250) especially after the suppression of the 8th and 9th centuries tax revolts. A more recent tradition (e.g. Wiet 1927; Little 1976; El-Leithy 2005; Werthmuller 2010) argued that the "deathblow" to Christianity only occurred in the Mamluk period (1250-1517) as various pressures by the state triggered a wave of mass conversion to Islam among Copts. A third school attempted to use quantitative methods. Bulliet (1979) used lineages of a sample of prominent individuals in medieval narratives to identify the point at which an individual's ancestors converted to Islam and thus adopted an Arabic name. He found that

[14] The population of the Arab peninsula in 600 AD is estimated at around 1 million, while the population of Egypt was around 2.7 millions (Russell 1958, p. 89). Thus, had the entire Arab population migrated to Egypt, it would not have sufficed, by itself, to account for the almost complete Islamization of the country.
[15] Fertility and mortality differentials between Arabs and Copts in medieval Egypt are also a possibility. Muslims in 20th century Egypt had higher crude birth and death rates than Christians (Courbage and Fargues 1997, pp. 199-200).

conversions peaked in the 9th century.[16] Courbage and Fargues (1997), following Russell (1958), used a time series of total poll tax receipts (from medieval narratives) to estimate the number of non-Muslim taxpayers assuming a fixed nominal tax per capita over time (which is consistent with the historical tradition). They found a sharp decline in the receipts before 800, thus suggesting that Copts became a minority by then.

III. Data

The empirical analysis is based on two national samples (80,000 observations each) of the 1848 and 1868 Egyptian censuses that I digitized from the original manuscripts at the National Archives of Egypt and two additional oversamples of non-Muslims in Cairo in each year (4,000 observations each) (Saleh 2011a and b). These censuses are the earliest microdata source on the Coptic-Muslim occupational gap in Egypt, since they contain information on religion and occupation. I pooled the samples and restricted the analysis to Muslim and Coptic adult active males who are at least 15 years old in 1848 (or 1868). I also use the village/urban quarter- level 1897 census data, which have the full enumeration, to measure the population and the Coptic population share in each geographic unit (Saleh 2011c). In the absence of income in the 1848/68 dataset, I define the religious economic gap in terms of the *Social Status Index* (henceforth, SSI), a measure of occupational attainment assigning values from 1 to 12 for each occupational title, with 12 being the highest social status.[17] Table (1) shows that Copts have higher mean SSI than Muslims, and this is confirmed by figure (1), which shows that the Coptic SSI distribution is more skewed to the right. Table (1) also shows that the religious distribution at both the national and regional levels and the regional distribution of Copts

[16] This is, however, subject to an obvious caveat: the representativeness of the biographies' sample.
[17] See the data appendix in Saleh (2011a) for details on the SSI construction.

are similar across 1848/68 and 1897, thus suggesting their stability over the second half of the 19th century, and confirming the national representativeness of the 1848/68 sample.

I drew on various sources to measure three historical factors employed in the empirical analysis: Medieval Arab immigration to Egypt, Coptic churches and monasteries, and the route of the Holy Family.[18] First, I constructed an index at the 1897 district-level that takes the value of one if the district had received *any* Arab immigration wave in the 7th to 9th centuries. The information is based on Al-Barry (1992), who, in turn, draws on Arabic medieval narratives. The author traces, for almost all the immigrating tribes, their destination in Egypt mostly at the *kura*-level, the administrative division that existed in 640-1036. Drawing on Ramzi (1994) and Tousson (1926), I matched the *kuras* to the 1897 districts, based on the location of the chef-lieu of each *kura*.

Second, I measured the number of churches and monasteries in the Middle Ages at the 1897 urban district- and rural village- level, drawing on two medieval sources: (1) Abul-Makarim (1999) provides a comprehensive list of Christian religious establishments, Coptic, Melkite, and Armenian, that existed in Egypt at the end of the 12th century. (2) Al-Maqrizi (2002) includes a less comprehensive list of churches and monasteries (both Coptic and Melkite) in the 15th century. Both lists are organized on a geographic basis at the urban street- and rural village-levels.

Finally, as a proxy for the local attachment to Christianity, I constructed an index at the 1897 urban district- and rural village- level that takes the value of one if the geographic unit had been visited by the Holy Family during their biblical flight to Egypt, using the information in Anba-Bishoy (1999) and Gabra (2001). The route of the Holy

[18] See Table (4) for the data on the first historical factor: tax revolts in the 8th and 9th centuries. See the data appendix for more details on the measurement of the other three historical factors.

Family in Egypt was recorded according to ancient and medieval Coptic local traditions, which preserved the "miraculous" sites that were touched by the Holy Family (e.g. hand and footprints of the child Jesus, trees that were believed to have sheltered Mary, and wells that were believed to be "created" by Jesus).

Table (2) shows the descriptive statistics for these datasets. 17 percent of Arab immigration waves were temporary (*Irtiba'*) and were thus excluded from the sample.[19] 66 percent of the permanent Arab immigration waves were from Qahtan tribes in Southern Arab Peninsula, and about half of the waves were destined to urban Egypt. More than 90 percent of churches and monasteries in the 12th and 15th centuries were Coptic. The percentage of churches and monasteries that were demolished shortly before the time of the medieval chronicle is particularly large in the 15th century (43 percent), because of the so-called "Churches' Event" under which Muslim masses burned a large number of churches nationwide (Al-Maqrizi 2002, pp. 1066-76). Interestingly, the regional distribution of the 15th century Coptic churches and monasteries that survived resembles the Coptic regional distribution in 1897 with the largest Coptic concentration being in the Nile Valley [Table (1)]. The majority (57 percent) of the sites visited by the Holy Family are located in the Nile Valley too.

IV. Empirical Analysis: Coptic Population Share and the Coptic-Muslim Gap

A testable prediction of the hypothesis that the poll tax institution led to selected Islamization and thus to the emergence of the religious economic gap is that areas where the tax was more enforced, or where the demand for Islam was more responsive to the tax incentive, witnessed larger conversions to Islam among poor Copts. Under geographic

[19] *Irtiba'* comes from the Arabic word for "spring," and it refers to the post-Conquest tradition that Arab tribes were moving in the spring season to any Egyptian village of their choice for grazing their animals. Egyptians (Copts) were required to provide them with food and shelter (Al-Barry 1992, pp. 56-60).

and occupational immobility, these areas should have lower Coptic population share and wider Coptic-Muslim gap in the 19th century. I start the analysis by examining the validity of the second part of this prediction: Do areas with lower Coptic population share have larger religious economic gap in the 19th century? Using the 1848 and 1868 pooled individual-level samples I estimate the following linear regression:

$$(1)\ SSI_{ijk} = \alpha + \beta_k + \gamma Copt_{ijk} + \delta CoptShare_{jk} + \phi(Copt_{ijk} \times CoptShare_{jk}) + \mu lpop_{jk} + \varepsilon$$

Where the SSI of an individual *i* residing in area *j* in greater area *k* depends on the following regressors: *Copt*, a dummy variable for being Coptic Christian, *CoptShare*, the percentage of Copts in the area of residence *j* in the 1897 census, and the interaction of the two terms.[20] The regression also controls for *lpop*, the logarithm of the population of the area *j* in 1897, and greater area *k* fixed effects. The area *j* is defined at four levels (from smallest to largest geographic division): (1) district in urban provinces and village in rural provinces, (2) district, (3) province, and (4) region. The greater area *k* is defined as the level higher than *j*: (1) urban province and rural district, (2) province, and (3) region. If *j* is defined at the region-level, no fixed effects are included in the regression. Although, the dependent variable of interest is the difference between the average Coptic and Muslim SSIs in a geographic unit, I conduct the analysis at the individual-level because of the data limitation. Since the 1848/68 individual-level samples are only representative at the province-level in rural Egypt (Saleh 2011b), I cannot compute the Coptic-Muslim SSI gap at the rural village- or even rural district- levels.[21]

[20] I use the 1897 census for data on population and Coptic population share because the village-level data of that census include the full enumeration. The 1848 and 1868 census datasets are individual-level samples.

[21] I also conducted the analysis using the village/urban quarter- level 1897 census data with the outcome of interest being the percentage of males who are able to read and write (literacy rate). The 1897 data, however, do not provide religion-specific literacy rates. I estimated the following regression by region: $literacyrate = \alpha + \beta Coptshare + \gamma lpop + \varepsilon$. Similar to my findings in the 1848/68 individual-

The results are shown in table (3). Regardless of the unit of geography at which *CoptShare* and *lpop* are measured, a Copt has greater SSI than a Muslim by more than one standard deviation (~ 2 points). An increase in the Coptic population share in the area of residence has a positive but insignificant impact on the SSI for Muslims, thus implying no significant spillover effects on Muslims from residing in areas with higher Coptic concentration. Most importantly, I find that the coefficient on the interaction term is negative and statistically significant in all regressions: The Coptic-Muslim SSI gap in an area with high Coptic population share is smaller than in areas with low Coptic population share. For example, the estimated Coptic-Muslim SSI gap in Middle Nile Valley, the region with the highest Coptic population share (19 percent), is 0.41. But the gap increases to 2.137 in the Nile Delta, where Copts constitute only 2 percent of the population. This lends support to the second part of the hypothesis: Areas where Copts are relatively more concentrated tend to have lower Coptic-Muslim economic gap. I now turn to examine the first part of the hypothesis: What are the historical origins of the Coptic spatial distribution (variation in Coptic population share) in Egypt?

V. Empirical Analysis: Historical Origins of the Coptic Spatial Distribution

V.1. Islamic Poll Tax Institution: Historical Background

My hypothesis that the Islamic poll tax institution led to the "selected" conversion of poor Copts to Islam and thus to the emergence of the Coptic-Muslim gap builds on a long-standing historiography. Historians have long emphasized the impact of the poll tax on the "systematic" conversion of Copts to Islam. The earliest evidence comes from the 7th century Coptic chronicle of John of Nikiu (1916, p. 201) who stated that "*(Arabs)*

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level census samples, I found that the magnitude of β is highest in the Nile Delta, which has the lowest Coptic population share, and lowest in the Middle Nile Valley, with the highest Coptic population share.

increased the taxes… And now many of the Egyptians who had been false Christians denied the holy orthodox faith and lifegiving baptism, and embraced the religion of the Moslem, the enemies of God." The 9th century Coptic chronicle of Severus (1910, pp. 116-7) described that, in the early 8th century, "*(Arabs) proclaimed that all those, who would give up their own religion and become Muslims, should be exempted from the poll tax… By means of this procedure Satan did much harm to many people who gave up their religion… and they amount to twenty-four thousand persons*." Modern historiography attempted to reconcile these medieval narratives with the emerging wealth of Arabic papyri evidence (e.g. Wellhausen 1927; Becker 1903; Dennett 1950; Morimoto 1981).

In this subsection, I address several aspects of the poll tax historiography that are central to my hypothesis, before turning to the empirical evidence. These aspects are: (1) The tax on non-Muslims was imposed at the individual-level, (2) The tax burden was higher at lower levels of income, (3) The poor were not exempt from the poll tax, (4) Muslim converts were exempt from the poll tax, and (5) The real poll tax amount did not have a trend over the Middle Ages. In what follows, I will discuss each of these points.

Was the tax on non-Muslims indeed a *poll* tax imposed at the individual-level? From 750 onwards, Islamic rulers and jurists distinguished between the poll tax (*jizya*), imposed on non-Muslims on the *individual* basis, and the land tax (*kharaj*), imposed on land, regardless of the landholder's religion, on the *territorial* basis (e.g. Abu-Youssef 1979, pp. 122-4). Historians, however, disagreed as to whether this distinction existed in the early period (640-750).[22]

[22] The year 750 signifies the accession of the Abbasids to power. Wellhausen (1927, pp. 477-82) and Becker (1903, pp. 81-112) argued that the tax in 640-750 was, following the Byzantine system, a fixed tribute imposed at the village-level, with no distinction made between land and poll taxes. The distinction emerged later on with the fiscal reforms of Umar II in 720. Dennett (1950, pp. 62-103) argued, to the

Was the poll tax burden (as a percentage of income) greater at lower income levels? In 640-750, the annual poll tax was, according to Arabic medieval narratives, a fixed amount of 2 dinars per person, but the papyri tax documents suggest that this amount was only an average (Ibn-Abdel-Hakam 1974, pp. 64-6; Morimoto 1981, pp. 66-91).[23] Under the Abbasids (750-969), the Fatimids (969-1171), and the Ottomans (1517-1855), the Sunni Hanafi and the Shiite Ismaili schools of Islamic jurisprudence both dictated that the poll tax is imposed on adult males according to three income brackets: 1 dinar on manual workers, 2 dinars on the middle-income, and 4 dinars on the rich (Hanafi: Abu-Youssef 1979, pp. 122-4; Ismaili: Al-Qadi Al-Nu'man 1963, pp. 379-381). Yet, under the Ayyubids (1171-1250) and the Mamluks (1250-1517), the dominant Sunni Shafi'i School stressed that the poll tax is fixed (Al-Shafi'i 2001, pp. 423-30), although the authorities often adhered to the three-brackets system (Mahmoud 2009a; pp. 32-7).[24] Over the whole period 750-1855, the actual tax assessment was often arbitrary and subject to the assessor's discretion although it was generally in line with the theory (Morimoto 1981, pp. 175-81; Ismail 1998, pp. 164-7; Mahmoud 2009a, pp. 147-81). At any rate, the limited variation in the poll tax amount under both the three-brackets and the fixed tax systems meant that the tax burden was larger at lower levels of income. To examine this argument, I used Ashtor (1969) to obtain occupation-based wages in medieval Egypt, and I classified each occupation into one of the three poll tax brackets based on the criteria

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contrary, that the distinction existed since the Conquest, and that the poll tax was assessed at the individual-level from the outset. Morimoto (1981, pp. 53-144) suggested that the individual principle was applied from the beginning to estimate each village's tribute but only imperfectly and that the poll tax became fully institutionalized with the fiscal reforms of the first half of the 8th century.

[23] Morimoto interprets the individual variation in the poll tax amount in the papyri in 640-750 as reflecting variation in income. However, it is impossible, based on the information in the tax documents, to confirm or reject this claim.

[24] The Sunni Hanbali and Maliki Schools do not specify income brackets but they both assert that the poll tax should be assessed according to the individual's economic means (Hanbali: Abul-Fadl Saleh 1999, p. 344; Maliki: Malik 1985, pp. 278-80; Al-Baji 1999, pp. 275-9).

mentioned in Abu-Youssef (1979, p. 122). Figure (2) shows the scatter plot of wages and poll tax burden under the three-brackets system in 660-1517. The tax burden is quite high at lower income levels but falls as income increases, thus suggesting that the financial incentive to convert to Islam was stronger for low-income Coptic taxpayers.

Were the poor exempt from the poll tax? While the Sunni Hanafi, Hanbali, and Maliki schools all stated that those living on charity (or are without occupation) are exempt from the poll tax, both the Shiite Ismaili and the Sunni Shafi'i schools did not grant such exemption. Noticeably, even under the exemption views, any *active* adult male is considered non-poor and is *not* exempt from the poll tax. Moreover, using evidence from the Cairo Geniza on destitute Jews who paid the poll tax, Goitein (1963) and Alshech (2003) argued that the Ayyubids applied the stringent Shafi'i non-exemption viewpoint.

Were Muslim converts exempt from the poll tax? With the institutionalization of the poll tax from 750 onwards, Islamic jurists agreed that when a non-Muslim converts to Islam, he becomes exempt from the poll tax starting from the following fiscal year (e.g. Abu-Youssef 1979, p. 122). The period 640-750, however, contains examples for collecting the poll tax even after conversion to Islam (Morimoto 1981, pp. 66-91).

Did the *real* poll tax amount have a specific trend over the Middle Ages because of inflation/deflation? I constructed a time series for the purchasing power (in kilograms of wheat) of the nominal poll tax for the lowest income bracket (1 dinar) over the period 706-1450, using Ashtor (1969, pp. 454-5) [Figure (3)]. The figure shows that the real poll tax fluctuated over time but that there is no trend in the series.

Having examined the central aspects of poll tax historiography, I turn in subsections (V.2-V.5) to the empirical evidence on the origins of the 19th century Coptic spatial

distribution. I introduce four historical factors: (i) Tax revolts in the 8th and 9th centuries and (ii) Arab immigration in the 7th to 9th centuries, as measures of poll tax enforcement, and (iii) Coptic churches and monasteries in the 12th and 15th centuries and (iv) the route of the Holy Family, as measures of the tax elasticity of conversion.

V.2. 8th and 9th Centuries Tax Revolts

Over the period 726-866, a number of anti-government revolts erupted throughout Egypt, because of higher taxation (poll and land taxes) and stricter tax enforcement (Morimoto 1981, pp. 145-72; Mikhail 2004, pp. 195-211).[25] Table (4) shows the sequence of these revolts by year, region, reasons, and parties revolting. Early revolts were led by "disenfranchised Coptic rural elites," who used to dominate tax collection in 640-750, against the immigrant Arab elites' increased control of the fiscal administration (Sijpesteijn 2009). Also, noticeably, the first revolt coincided with the earliest attempts at institutionalizing poll and land taxes in 720. Later revolts involved both Copts and Arabs, who both protested against the government's attempts at centralizing tax collection. The regional variation of these revolts may thus proxy for poll tax enforcement, which, in turn, may explain the variation in the Coptic population share in the 19th century. The tax revolts evidence is suggestive, however, since the variation is only at the region-level. Out of the 15 revolts, 13 took place in the Nile Delta, which has the lowest Coptic population share (2 percent) in 1897. Only one of the two revolts that occurred in the Nile Valley, the region with the highest Coptic population share in 1897 (12 percent), was a pure tax revolt.[26] Perhaps because of its proximity to the capital, and its consequent receipt of larger Arab immigration waves, the Nile Delta witnessed, on average, stricter

[25] Sijpesteijn (2009) mentions an early tax revolt that took place in Upper Egypt in 697.
[26] The information on tax revolts does not allow me to break down the Nile Valley into its three regions (North, Middle, and South).

tax enforcement than the Nile Valley (as reflected in the tax revolts), and thus larger conversions among poor Copts to Islam.[27]

V.3. 7th – 9th Centuries Arab Immigration Waves

I examine the three remaining historical factors that predict the variation in the Coptic population share in the 19th century through estimating the following linear regression(s):

$$(2) Coptshare_{jk} = \alpha + \beta_k + \gamma Historigin_{jk} + \mu lpop_{jk} + \varepsilon$$

Where *Coptshare* is the percentage of Copts in an area *j* in greater area *k* in 1897. *Historigin* is the historical origin of interest {7th to 9th centuries Arab immigration dummy, Number of Coptic churches and/or monasteries in the 12th and 15th centuries, Visited by the Holy Family dummy}. β_k is greater area *k* fixed effects. An area *j* is defined at (i) the district-level for Arab immigration, and at (ii) the urban district- and rural village- level for the other two origins. A greater area *k* is defined at the province-level in (i) and at the urban province- and rural district- level in (ii). The results are shown in table (5). Each historical origin is entered in a separate regression. In subsection V.6, I examine the interactions between these factors. I show the results with and without fixed effects in order to understand the source of variation in the factor of interest.

Local elites, village headmen, and large landholders played a crucial role in the poll tax system throughout the institution's history in Egypt.[28] In the early period (640-750), Arabs kept the Byzantine system, which relied on the Coptic elites in tax assessment and collection, mostly intact. Coptic village headmen assessed the individual tax amounts,

[27] Besides the stricter tax enforcement mechanism, the violent suppression of the tax revolts by the authorities may have demoralized the Coptic population in the Nile Delta and caused their mass conversion to Islam. This mechanism was first mentioned by Al-Maqrizi (2002), and is also found in Lane-Poole (1969), Dennett (1950), and Mikhail (2004).

[28] Under both the Byzantine and Islamic rule, rural land in Egypt was owned by the state, which gave usufruct right to private landholders to farm the land in exchange for land-tax, which was technically considered a "rent." Only in the late Fatimid period (969-1171), private landownership emerged as rulers gave away pieces of land to individuals for reclamation.

which were then aggregated to estimate the village's tribute (Bagnall 1996, p. 318; Morimoto 1981, pp. 66-91; Frantz-Murphy 1999). State attempts at centralizing the tax system started in 720, and strengthened with the accession of the Abbasids to power in 750. In response to the tax revolts, the government resorted to the decentralized tax-farming system (Sijpesteijn 2009), which remained in effect, in various forms, until the 19th century (Cuno 1992, pp. 17-32). Under this system, the government contracted out (through auctions) the tax collection of each geographic unit to private individuals, who then collected the taxes from the individual taxpayers (Morimoto 1981, pp. 231-3). Under the Ayyubids and the Mamluks (1171-1517), tax-farming took the form of the *Iqta'* system, whereby a military elite was granted large landholdings and control over local tax collection. However, the village headmen and local elites remained dominant as the "men on the spot" in the tax collection process whether they operated under a central government, a military elite, or an urban tax-farmer (Cuno 1992, p. 85).

Arab immigration to Egypt was mostly temporary in the 7th century, but permanent settlement increased in the 8th and 9th centuries. Arab settlers formed a rural elite with large landholdings, which altered the religious composition of the elites in the districts they migrated to, and facilitated the "Arabization" of the fiscal administration (Sijpesteijn 2009). In 833, Arabs lost their position as a military aristocracy to Turks with the stoppage of their state pensions (Morimoto 1981, p. 167), and Arab immigration to Egypt dropped after the 9th century as a result. I argue that in the districts that received Arab immigrants over the 7th to 9th centuries the poll tax was perhaps more strictly enforced on Copts, leading to larger conversions among poor Copts to Islam. By contrast, the districts where Arabs did not migrate to and Coptic elites remained in power may have witnessed

lower tax enforcement because of the possible collusion between Coptic elites and Coptic taxpayers. Arguably, these districts had lower conversions among poor Copts to Islam.

I examine this possibility in the first row of table (5), which shows the impact of the 7^{th} – 9^{th} centuries Arab immigration wave dummy on the Coptic population share (at the district-level) in 1897. Consistent with the argument above, I find that the coefficient is negative and statistically significant, when no province fixed effects are included. When I control for the latter, however, the coefficient becomes insignificant, suggesting that the variation in Arab immigration is *between*, rather than *within*, provinces. While this coefficient embodies a direct impact of the *Muslim* Arab immigration on a district's Coptic share, both demographic and historical evidence on the size of Arab immigration confirm that the effect is mostly indirect through the conversion of Copts to Islam.

V.4. Coptic Churches and Monasteries in the 12^{th} and 15^{th} Centuries

With the rise of Christianity in Egypt in the 4^{th} and 5^{th} centuries, Coptic churches and monasteries played a central role in providing financial and physical aid to the Coptic population. In the Byzantine period, Bagnall (1996, p. 316) describes how priests in the 4^{th} century assumed the new leadership in villages, and Bowman (1989, pp. 117, 129-30) points out that monasteries provided economic aid and shelter to farmers. After the Arab Conquest, Coptic churches and monasteries continued to assume the same role. Their large landholdings were leased out to Coptic farmers for cultivation (Richter 2009). Papyri evidence preserved loan documents (both with and without interest) provided by Coptic institutions, or by individual monks and clergymen, to Coptic laymen for the purpose of tax payment (poll or land tax), as well as in exchange for future services provided by the debtor to the institution (Markiewicz 2009). Morimoto (1981, p. 118)

provided evidence on Coptic taxpayers who took refuge in the monasteries and pretended to be monks in order to avoid paying the poll tax.[29] This seems consistent with the evidence from Cairo Geniza on the support provided by Jewish institutions to the Jewish community for poll tax payment in the Ayyubid period.

Based on this evidence, I predict that the larger the number of Coptic churches and monasteries in a geographic unit in the Middle Ages (12th and 15th centuries), the greater is its Coptic population share in 1897. The mechanism is that these geographic units enjoyed larger support for poor Coptic taxpayers by Coptic institutions and thus witnessed less conversion among poor Copts since the demand for Islam was less responsive to the poll tax over there. I expect that the impact of monasteries is likely to be stronger than churches because the former were richer and possessed large landholdings in their geographic units. The results are shown in rows 2-7 in table (5). Notice that I am excluding the geographic units that were named after a Coptic monastery in 1897 and that were thus mostly inhabited by the monastic population. The estimates when I control for greater area *k* fixed effects are often different in magnitude from those without fixed effects indicating that the source of variation could be between or within the greater areas. I find that there is generally a positive and statistically significant impact of the number of Coptic churches and monasteries in an area in the 12th century (and 15th century) on its Coptic population share in 1897, but that the effects in the 15th century are stronger. Also, the effect of monasteries is stronger than that of churches in the 12th century but not in the 15th century, as predicted by the historical evidence.

[29] Monks were exempt from the poll tax, although some rulers in 640-750 taxed them. To control the monastic population, each monk was branded on his left hand with an iron bracelet identifying his name and the monastery he belonged to (Morimoto 1981, p. 118).

Two endogeneity concerns are important to discuss here. There is a concern about the "selected" building of new Coptic institutions by the 12th and 15th centuries, because of survival of Copts in an area. Fortunately, historical evidence suggests that these Coptic institutions were mostly pre-Islamic, since building new churches and monasteries was generally restricted under Islamic rule. The other concern here, which is perhaps more challenging, is the "selected" demolition of Coptic institutions because of Islamization prior to the 12th and 15th centuries. Indeed, one may interpret the results on churches as suggesting that Islamization took place by the 12th century and was further strengthened in the 12th to 15th centuries (Section VI.1). However, the possible demolition of Coptic institutions is mainly a concern for churches but not for monasteries, which were more likely to survive because of their larger size and wealth. It is the Coptic monasteries that played the larger role historically in providing aid to poor Coptic taxpayers.

V.5. The Flight of the Holy Family to Egypt

Ancient and medieval Coptic local traditions preserved the route of the biblical flight of the Holy Family to Egypt and the "miraculous" sites that they touched or created. I argue that the geographic units that lie on this route may have been more attached to Christianity, either because of these traditions or as reflected in "inventing" these local traditions. The poll tax may have thus been less effective in converting poor Copts in these units, and so they are likely to have higher Coptic population share in 1897. I examine this possibility in the last row in table (5). As expected I find that the coefficient on the route of the Holy Family dummy is positive and statistically significant.

The historical factors (Coptic tax revolts, Arab immigration waves, Coptic churches and monasteries, and the route of the Holy Family) thus *individually* predict the variation

in the Coptic population share in the 19th century, which is inversely related to the size of the Coptic-Muslim gap. I now investigate the interactions between the last three factors.

V.6. Interactions Between the Historical Origins

Table (6) shows the estimation results of equation (2), without fixed effects, when the three historical origins are entered simultaneously, by aggregating the Coptic churches and monasteries and the route of the Holy Family dummy to the district-level. All three factors (Arab immigration, Coptic monasteries, and the route of the Holy Family) retain their expected signs and are statistically significant, although the latter two factors have smaller coefficients than in table (5), presumably because of high multicollinearity. Coptic churches are significant in the 15th century, but not in the 12th century (when no fixed effects are included), as in table (5).

In table (7), I examine the inter-correlation between the historical factors in more depth. I estimate the determinants of the spatial distribution of Coptic institutions in the 12th and 15th centuries, in order to understand its relationship with the earlier historical origins: Arab immigration and the route of the Holy Family. It appears that the latter factor, as a measure of attachment to Christianity, explains the spatial distribution of Coptic churches (but not monasteries) in the 12th and 15th centuries.

I now turn to examining the mechanisms through which the impact of the poll tax institution, that existed over the period 640-1855, persisted until the 19th century.

VI. Understanding the Mechanisms

VI.1. When Did the Coptic-Muslim Gap Emerge?

Was the Coptic-Muslim human capital gap born in the 19th century? Before the Conquest, the Coptic majority was, on average, worse off than Melkites (Greeks and

Hellenized Egyptians) and Jews. First, Copts were mostly rural, while Jews and Melkites lived in urban centers. In the 12th century, only 2 percent of Christian institutions were Melkite, and 89 percent of them were in the Nile Delta and urban centers.[30] Second, since Greek was the language of the Byzantine administration, Melkites, who spoke only Greek (Mikhail 2004, p. 133), had a privilege in white-collar jobs. On the contrary, Copts worked mostly in farming, although, perhaps notably, there was a bilingual Coptic elite, that knew both Greek and Coptic, was well-educated, and worked in the bureaucracy.[31]

Coptic dominance over administrative occupations before the 19th century is well documented in the historical literature and medieval narratives (e.g. Tagher 1998; Sheikho 1987; Amer 2000; Samir 1996; Al-Muqaddasi 1877; Al-Maqrizi 2002). Upon the Conquest, Arabs left the bureaucracy in the hands of the local Christian population (Butler 1996, p. 465). By the end of the 7th century, Copts, favored by the new Arab rulers, increasingly replaced Melkites in the bureaucracy, both because of the animosity between Arabs and Melkites (Byzantines), and the increasing Melkite emigration from Egypt after the Conquest (Lane-Poole 1969, p. 26; Mikhail 2004, pp. 105-6). Coptic administrative dominance reached its height in the Fatimid period (969-1171), the so-called "Golden Age of Non-Muslims," where Copts, along with Melkites, Jews, and Armenians, became the highest officials, and not only the bureaucratic machine. In the

[30] The statistics are based on my calculations from the dataset on churches and monasteries in the 12th century that I constructed from Abul-Makarim (1991). The urban centers are Cairo, Alexandria, and the deserted city of Tinnis in Northern Delta. This evidence is consistent with Mikhail (2004, p. 134), who points out that there is no literary or documentary evidence on Melkite presence in the Nile Valley in the post-Conquest period. Their pre-Conquest situation was not different. In the early 7th century, there were only 7 Melkite churches in Egypt (Mikhail 2004, p. 48).

[31] On the existence of a bilingual Coptic elite in the Byzantine period, it suffices to mention the biographies of prominent Copts who learned Greek in order to have access to governmental jobs, and the large portion of the Coptic literature and theology (Coptic here is defined in ethno-religious terms) that was composed in Greek (Mikhail 2004, pp. 135-48). It was this elite that deliberately created the Coptic script in the third century to express the Egyptian phonetics with Greek alphabets. See Bagnall (1996, pp. 230-65).

Ayyubid and Mamluk period (1171-1517), the attempts to replace Coptic clerks with Muslims were not successful, and they continued to control administration under the Ottomans (1517-1914).[32] It suffices here to draw parallels between Al-Muaqqadasi's statement, "*Scribes in the Levant and Egypt are Christians*," written circa 1000 AD, and Lord Cromer's, the British Consul of Egypt (1883-1908), statement, "*When the English took Egyptian affairs in hand, the accountants in the employment of the Egyptian government were almost exclusively Copts*," that was made a millennium later.[33] Moreover, the papyri provide additional evidence on the persistence of the phenomenon since the early Middle Ages. Using Maghawri's (2000) *Titles and Names of Crafts and Jobs in the Light of Arabic Papyri*, which traces each occupation in the Arabic papyri, I find that administrative occupations such as "*Gahbaz* or Tax Collector," "*Katib* or Scribe," and "*Gistal* or Secretary," are mainly connected with Coptic names.

Having established the persistence of the Coptic administrative monopoly before the 19th century, several questions arise: First, did this monopoly reflect an "occupational gap" against the growing Egyptian Muslim majority or did Egyptian Muslims dominate other white-collar jobs that declined, for some reason, before the 19th century? Muslims traditionally dominated four "white-collar" occupations: the military, the judiciary, the police, and the *ulama* (Muslim clergy). As the 19th century is known in Egyptian history as a period of unprecedented military expansion and modernization, there is no reason to believe that the relative size of these Muslim white-collar occupations was smaller than before. Moreover, starting from Al-Mu'tasim's reign (833-42), officers' ranks in the

[32] Tagher (1998, p. 142) described the "persistence" of the phenomenon as follows: "*The condition of the Copt did not change during the six centuries preceding (the 19th century)… His work, tax collecting, was the basis of his existence and his only hope to accumulate wealth*" (Italics mine).
[33] The statements are from Al-Muqqadasi (1877, p. 183) and Tagher (1998, p. 213).

regular army became controlled by Turks, i.e. non-Egyptian Muslims (Morimoto 1981, p. 160). The hostile attitude that Muslims expressed towards the dominance of non-Muslims over the administration in the Middle Ages perhaps indicates that this dominance was not compensated for by other Muslim white-collar venues.[34] In addition, evidence from Ashtor (1969) suggests that wages of governmental officials exceeded, on average, those of artisans and laborers, and thus this occupational gap reflected an income gap.

Second, when did this occupational gap emerge? The timing of the emergence of the gap is, to an extent, related to the timing of Copts becoming a minority (i.e. less than 50 percent of the population). My finding that the spatial distribution of Coptic churches in the 12th and 15th centuries predicts the 19th century Coptic spatial distribution provides suggestive evidence on this point. It may be safe to claim that the 19th century geographic pattern of Islamization was determined by the 12th century, but was strengthened between the 12th and the 15th centuries. Historical evidence suggests that Coptic regional distribution (their relative concentration in the Nile Valley rather than the Nile Delta) predates the 12th century. A liturgical Coptic text from the 8th to 10th centuries mentioned that, "*the remaining (Copts) in Upper Egypt (Nile Valley) who know the Coptic language and speak it are mocked and insulted*."[35] This evidence along with my findings lend support to the two existing historical viewpoints on Islamization of Egypt: Islamization

[34] Examples for this hostile attitude include the verse by the tenth century Muslim poet, Al-Hassan Ibn-Bishr Al-Dimashqi, in which he mocks three top Christian officials in Egypt at the time, "*Convert to Christianity for Christianity is the true religion! This is evidenced by our era! Believe in three who achieved lordliness and glory! Do not believe in others who are idle! The Father is Jacob the minister, Aziz is the Son, and the Holy Spirit is Fadl*," quoted in Sheikho (1987, p. 20). Other examples in Tagher (1998, p. 36) include the medieval books that sought a "theoretical" basis in Islamic jurisprudence for prohibiting non-Muslims from working in the Muslim government. These include the 14th century books by Ibn-Al-Naqqash, *Reprehensibility of Hiring Ahl-Al-Dhimma (Christians and Jews)*, and Ibn-Al-Durayhim's *The Right Way to Explain the Ugliness of Hiring the People of the Book (Christians and Jews)*.

[35] This text is the apocalypse of Samuel, Bishop of the Monastery of Qalamun (Ziadeh 1915-17). The document is undated, but it is suggested that it dates from the 8th to 10th centuries (Papaconstantinou 2007).

took place before the 12th century but received a "push" in the Mamluk period (1250-1517). Thus, the Coptic-Muslim gap likely emerged before the 12th century, and widened over time with continued selected conversion to Islam.

Finally, what occurred to Jews and Melkites, who were, in the pre-Conquest period, better off than Copts? Conceptually, these groups were perhaps less affected by the poll tax not only because of their ex ante better economic position but also because of their smaller size that facilitated solidarity in poll tax payment as evidenced by the Cairo Geniza (Alshech 2003). Interestingly, in 1848, there seem to be no changes in the size or in the relative economic status of these groups: They remained two small minorities that are better off than *both* Copts and Muslims.[36]

VI.2. Why Did the Gap Persist?

Medieval institutions in Egypt were gap-preserving as they limited occupational and geographic mobility. The hereditary transmission of occupations was the norm in the pre-modern period. Tagher (1998, pp. 212-3) and Samir (1996) described the barriers to entry set up by Coptic scribes in order to maintain their monopoly of administrative jobs. They insisted on using the more difficult fraction system (rather than decimals) in accounting. In the words of Lord Cromer, the Coptic accounting system was "archaic," and they resisted all attempts at reform or simplification of the system.[37] Its "secrets" were transferred from one generation to another, as Coptic children accompanied their fathers to governmental offices to learn.

[36] While it is correct to assume that 19th century Copts are the descendants of the pre-Conquest Coptic population, since Copts were an isolated and highly immobile group throughout the whole period, it is more difficult to make this claim for Jews and Melkites (Orthodox Ruum). The two latter groups in Egypt received large immigration waves from Spain and other parts of the Islamic world.

[37] The system was also corrupt. Copts manipulated the measurement rod (*qasaba*) used in calculating the acreage for land-tax assessment.

Geographic mobility was also constrained and led to the persistence of the spatial distribution of Copts and the Coptic-Muslim gap over the centuries. The central government in Egypt controlled the movement of individuals since antiquity. Morimoto (1981) mentions the problem of fugitives, who fled their villages to avoid paying the poll and land taxes in the 7^{th} – 10^{th} centuries, and the state's efforts to control their movement. Mahmoud (2009a, pp .159-60) and Cuno (1992, pp. 121-4) make similar observations for Ottoman and 19^{th} century Egypt.

VI.3. Other Historical Explanations for the Coptic-Muslim Gap

In this subsection, I examine other possible explanations of the conversion of Copts to Islam and the emergence of the Coptic-Muslim economic gap. These include forced conversion, land tax, access to governmental jobs, Islamic alms, and Islamic inheritance laws. In what follows I discuss briefly each of these points.

One possible explanation of the phenomenon is that forced conversion, as a result of state persecution, may have led to the conversion of Copts to Islam. Also, if poor Copts were more likely to suffer from persecution and thus to convert, it may also explain the Coptic-Muslim gap. Historical evidence suggests, however, that forced conversion cannot explain Islamization in the period 640-1250, where it occurred in two limited episodes under Al-Muttawakil (847-61) and Al-Hakim (996-1021), and that it only became common in the Mamluk period (1250-1517). Since the evidence in this paper suggests that Islamization and the Coptic-Muslim gap emerged by the 12^{th} century, it is perhaps safe to rule out forced conversion in explaining the gap. At most, forced conversion in the 12^{th} to 15^{th} centuries may have given the phenomenon a further "push."

Another explanation is that the land tax (*kharaj*) may have acted as another financial incentive for Copts to convert to Islam. However, in Islamic jurisprudence, land tax is *not* different across Muslims and non-Muslims, for it is assessed on the territorial basis regardless of the religion of the landholder. In the early period (640-750) though, the land tax was lower for Muslims, and so may have provided an additional incentive to convert.

One may also argue that the conversion of Copts to Islam occurred because of the desire to access high governmental jobs, which were preserved for Muslims. However, this incentive could have operated only among the Coptic elite, as is attested to in the historical literature, and thus does not explain the *positive* Coptic-Muslim gap.

One counterargument against the poll tax hypothesis is that Muslims were subject to other financial obligations such as the alms (*zakat*), which may have counterbalanced the poll tax incentive to convert. However, poor Muslims were not only exempt from the alms, but also recipients of them. Thus, the alms may have been an additional financial incentive for a poor Copt to convert to Islam.

Finally, one may argue that large Coptic landholders may have preferred to remain Christian in order to avoid the Islamic inheritance laws that would fragment their landholdings among their heirs. However, historical and quantitative evidence suggest that the bulk of the Coptic-Muslim gap is not because of the existence of a large Coptic landholding elite, that would be affected by the Islamic inheritance system, but because of the large Coptic bureaucracy who earned their living from governmental wages.

VII. Conclusion

Using both quantitative and qualitative evidence I traced the origins of the superior economic status of non-Muslim minorities in Egypt to the Islamic Conquest and the

subsequent imposition of the poll tax in 640. This tax, which remained in place until 1855, led to the conversion of poor Copts to Islam to avoid paying the tax, and the shrinking of Copts to a better off minority. Internal migration controls and guilds, which reduced geographic and occupational mobility, perpetuated the socioeconomic gap between non-Muslims and Muslims. My quantitative work showed that historical spatial variation in the enforcement of the poll tax, as proxied by 8th and 9th centuries tax revolts and by the Arab immigration waves in the 7th to 9th centuries, and in attachment to Christianity, as proxied by Coptic churches and monasteries in the 12th and 15th centuries and the route of the Holy Family, explains 19th century variation in the Coptic population share. The Coptic population share is, in turn, inversely related to the magnitude of the Coptic-Muslim gap.

The paper contributes to the current economics of religion literature (e.g. Botticinni and Eckstein 2002 and 2005), providing one of the first examples of the role of historical self-selection into religion. It also contributes to the ongoing historical literature on the Islamization of Egypt and the Middle East (e.g. Mikhail 2004; El-Leithy 2005). The new data sources that I digitized on Coptic churches allowed me to present suggestive evidence that Islamization of Egypt took place before the 12th century and that the Mamluk period (1250-1517), with the state's pressure on non-Muslims, gave Islamization a further and strong push.

The paper raises new, and perhaps more challenging, questions: Did the Islamic poll tax institution that operated in other countries in the Middle East, and the European parts of the Ottoman Empire, produce similar religious human capital gaps? Can the religious human capital gaps that are observed in Lebanon and Syria for example be explained

similarly? Why did Christianity survive in Egypt, Lebanon, Syria, and Iraq, but was completely wiped out from North Africa? Can this be explained by cross-country variation in the Islamic poll tax institution or is it due to other factors? There are new data sources that may shed light on at least some of these questions: The tax registers (*Tahrir Defterleri*) from 16th century Ottoman Syria, Palestine, and Transjordan (Hütteroth and Abdulfattah 1977) include information on poll tax amount and religious composition at the village-level. The recently discovered 1528 cadastral survey from Ottoman Egypt described in Mahmoud (2009b) may include similar information. When combined with the digitized samples of the 1848/68 Egyptian censuses, and the non-digitized Ottoman individual-level censuses from Lebanon, Syria, and Palestine in 1881-92 (Karpat 1978), these sources can perhaps deepen our understanding of the historical process of Islamization of the Middle East.

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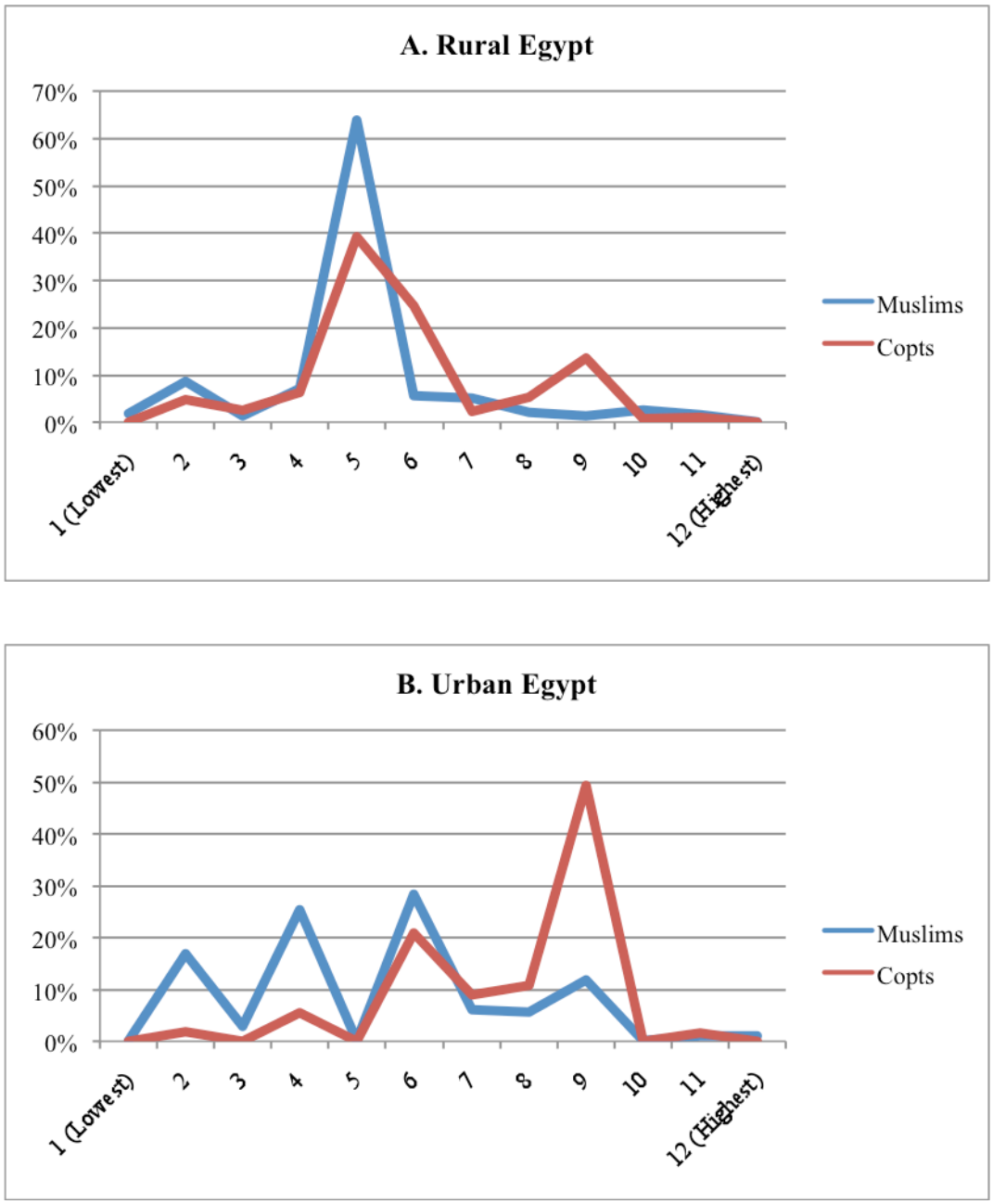
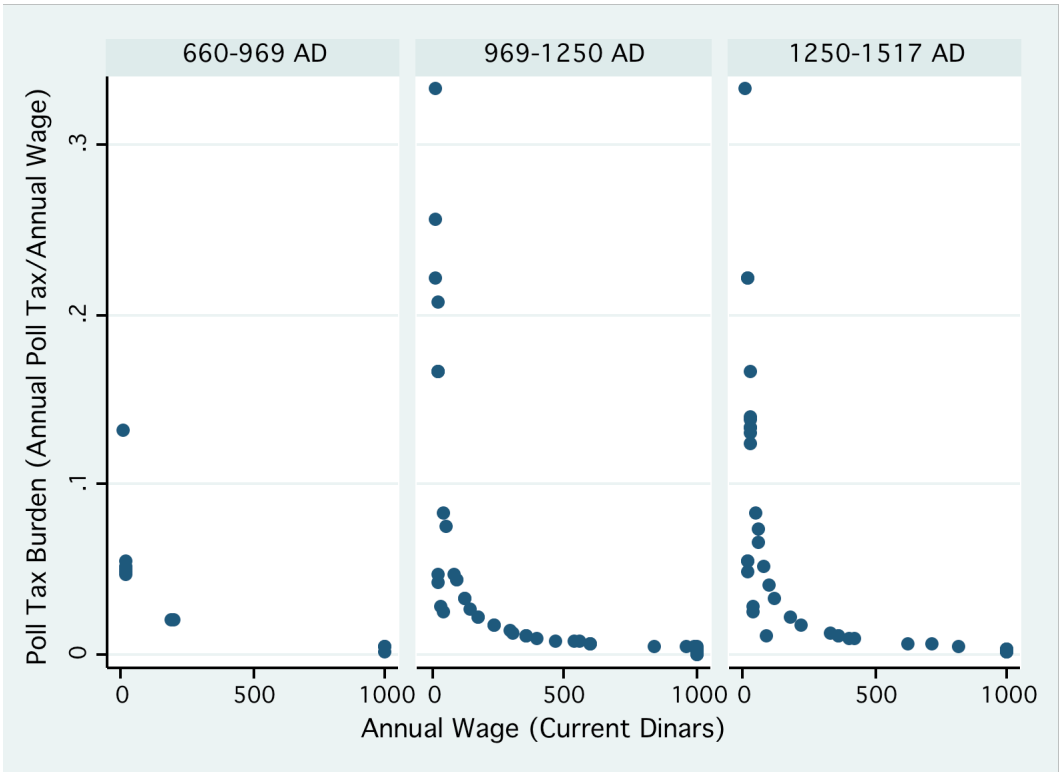
Figure (1): Social Status Index Distribution by Religious Group in Rural and Urban Egypt (1848 and 1868 Pooled Individual-Level Digitized Samples)

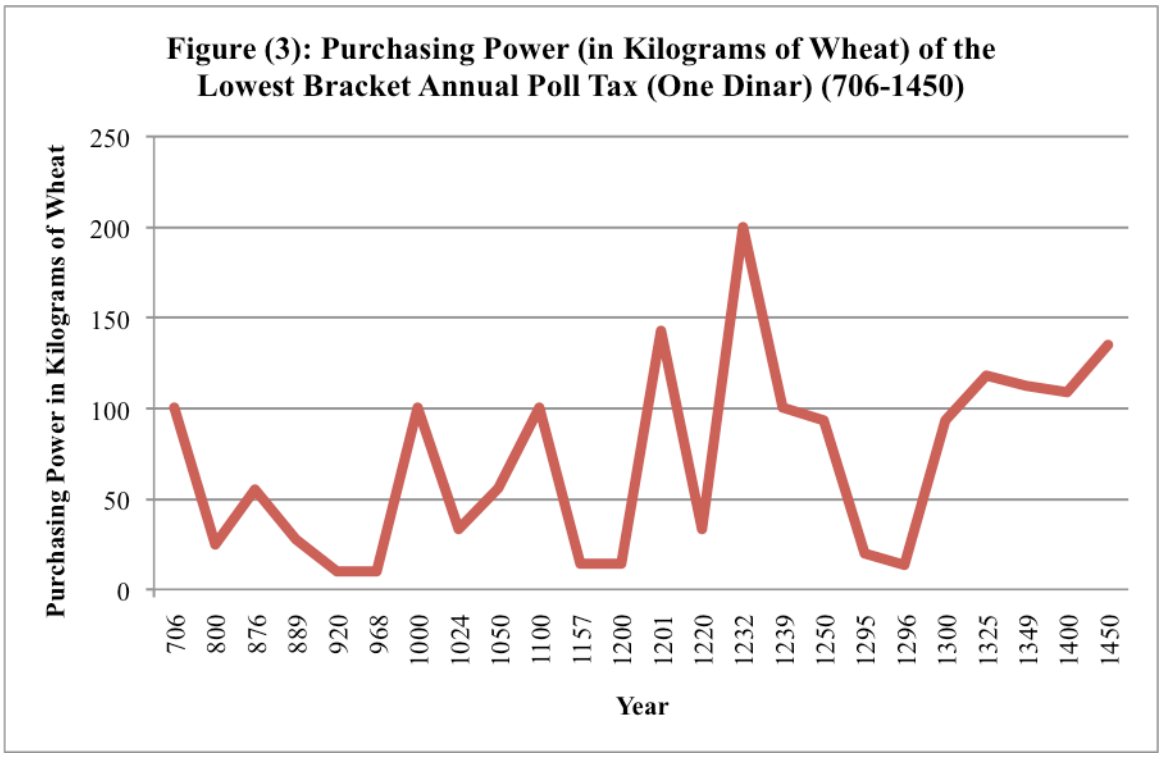


The figures are based on the pooled individual-level digitized samples from the 1848 and 1868 Egyptian censuses. See Saleh (2011a) for the construction of SSI and the definition of each value.

Figure (2): Wages and Poll Tax Burden in Medieval Egypt



The figure is based on Ashtor (1969). Each point represents an occupational title. The annual wage of an occupational title in each time period is the average annual wage across the observations mentioned in Ashtor (1969) practicing the occupation in the specified time period. Each occupational title is classified into one of the three poll tax brackets according to Abu-Youssef (1979, pp. 122-4), in order to assign the annual poll tax amount. The poll tax burden is defined as the quotient of the annual poll tax amount over the annual wage in current dinars.



The figure is based on the information on prices in Ashtor (1969).

Table (1): Descriptive Statistics: Individual-Level 1848 and 1868 Census Samples and 1897 Village-Level Full Census

	1848/68	1897
Social Status Index: Mean (Standard Deviation) (Min = 1, Max = 12)		
Urban Provinces		
Muslims (N = 22,700)	5.40 (2.40)	-
Copts (N = 827)	7.69 (1.79)	-
Rural Provinces		
Muslims (N = 11,642)	5.05 (1.72)	-
Copts (N = 916)	5.83 (1.85)	-
National Religious Distribution		
% Muslims	91%	92%
% Copts	6%	6%
% Other Non-Muslims	1%	2%
% Unspecified Religion	2%	0%
% Copts (Out of the Region's Population) by Region		
Urban Provinces	3%	3%
Nile Delta	2%	2%
Northern Nile Valley	4%	5%
Middle Nile Valley	18%	19%
Southern Nile Valley	3%	6%
Regional Distribution of Copts		
Urban Provinces	9%	6%
Nile Delta	13%	15%
Northern Nile Valley	10%	8%
Middle Nile Valley	65%	62%
Southern Nile Valley	3%	10%

Statistics in the first column are computed from the 1848 and 1868 pooled individual-level census sample which is restricted to adult active males who are at least 15 years old in 1848/68. The oversample of non-Muslims in Cairo is not used in the descriptive statistics but is used in the regressions in table (3). Sampling weights are used to account for the different sampling rates across provinces. Statistics in the second column are computed from the 1897 village-level full census. See Saleh (2011a) for details on the non-Muslims' oversample and the construction of the Social Status Index, Saleh (2011b) for details on the sampling methodology, and Saleh (2011c) for details on the 1897 census data.

Table (2): Descriptive Statistics: Medieval Arab Immigration Waves and Churches and Monasteries of Egypt

1. 7th - 9th Centuries Arab Immigration Waves	
Number of Arab immigration waves	296
% in unknown destination (excluded from sample)	1%
% in temporary non-settlement migration (*Irtiba'*) (excluded from sample)	17%
Origin of Arab Migration Waves in the Sample (N = 244)	
% Adnan tribes immigration waves (from North Arab Peninsula)	31%
% Qahtan tribes immigration waves (from South Arab Peninsula)	66%
Destination of Arab Migration Waves in the Sample (N = 244)	
% in Urban Provinces	49%
% in Lower Egypt	25%
% in Upper Egypt	26%
% 1897-Districts that received at least one Arab immigration wave in the 7th- 9th centuries	42%
2. 12th Century Churches and Monasteries	
Number of churches	1,118
Number of monasteries	136
% in deserted or unknown village (excluded from sample)	9%
% Recently Demolished by the 12th century (excluded from sample)	3%
Denomination of Institutions in the Sample (N = 1,110)	
% Coptic	96%
Spatial Distribution of Coptic Churches and Monasteries in the Sample (N = 1,062)	
% in Urban Provinces	13%
% in Lower Egypt	42%
% in Upper Egypt	45%
% 1897-Villages that existed before 1477, are not Coptic monasteries in 1897, and had at least one Coptic church/monastery in the 12th century	15%
3. 15th Century Churches and Monasteries	
Number of churches	201
Number of monasteries	87
% in deserted or unknown village (excluded from sample)	11%
% Recently Demolished by the 15th century (excluded from sample)	43%
Denomination of Institutions in the Sample (N = 154)	
% Coptic	93%
Spatial Distribution of Coptic Churches and Monasteries in the Sample (N = 145)	
% in Urban Provinces	21%
% in Lower Egypt	10%
% in Upper Egypt	69%
% 1897-Villages that existed before 1477, are not Coptic monasteries in 1897, and had at least one Coptic church/monastery in the 15th century	3%
4. Route of the Holy Family	
Number of sites visited by the Holy Family	38
% in deserted or unknown village (excluded from sample)	3%
Spatial Distribution of the Sites in the Sample (N = 37)	
% in Urban Provinces	11%
% in Lower Egypt	32%
% in Upper Egypt	57%
% 1897-Villages that existed before 1477, are not Coptic monasteries in 1897, and are believed to have been visited by the Holy Family	1%

Source: Digitized samples are described in section III in the paper.

Table (3): Coptic Population Share and Coptic-Muslim Economic Gap in 19th Century Egypt

(Linear Individual-Level Regression- Dependent Variable: Social Status Index- Pooled Individual-Level 1848 and 1868 Census Samples)

	(1) Area = Urban District and Rural Village	(2) Area = District	(3) Area = Province	(4) Area = Region
Coptic Christian	2.030***	2.143***	2.363***	2.437***
	(0.109)	(0.164)	(0.161)	(0.168)
% Copts in the Area (1897)	0.555	0.564	6.580	0.009
	(0.383)	(0.910)	(6.143)	(0.533)
Coptic Christian × % Copts in the Area (1897)	-2.661***	-3.693***	-9.172***	-11.141***
	(0.618)	(1.249)	(1.225)	(1.332)
Log(population) (1897)	-0.215**	-0.334**	0.180	0.170**
	(0.087)	(0.152)	(0.136)	(0.074)
# Individual Observations	36,570	33,747	37,462	37,462
Unit of Geography	Urban District + Rural Village	District	Province	Region
# Geographic Units	871	68	19	5
Fixed Effects	Urban Province + Rural District	Province	Region	No
Adjusted R-Squared	0.073	0.074	0.068	0.062

Each column represents a separate linear regression where the percentage of Copts is measured at a different geographic level in each. Column 1 represents the smallest geographic level and column 4 represents the largest. Robust standard errors clustered at the urban district/village- level are in parentheses. Social Status Index takes the values 1 through 12. Sample is restricted to Muslim and Coptic adult active males who are at least 15 years old in 1848/68. Numbers of observations, villages, and urban and rural districts vary across regressions because of the varying quality of matching between the 1848/68 units and the 1897 units. * indicates significance at the 10% level, ** indicates significance at the 5% level, and *** indicates significance at the 1% level.

Table (4): Coptic Regional Variation in 19th Century Egypt and Tax Revolts in the 8th and 9th Centuries

Year	Location	Reason	Parties Revolting
726	Nile Delta	Tightening state control over the tax system	Copts
740	Nile Valley	Higher tax enforcement, collecting poll tax from fugitives, higher tax rate, uniform regardless of wealth	Copts
750	Nile Delta	Heavy taxation and general suffering	Copts, Arabs also revolted to overthrow the Umayyads
753	Nile Delta	Reorganizing the tax system under the Abbasids and heavy taxation	Copts
768	Nile Delta	Al-Mansour's fiscal institutions	Copts
783	Nile Valley	Political revolt, proclaiming leadership over Upper Egypt, in essence tax resistance	Arabs (Umayyad descendants), Copts joined the troops
784	Nile Delta	Increase in taxes to be equal to that of Copts and corruption in collection	Arabs
794	Nile Delta	Increase in taxes	Arabs
802	Nile Delta	Strict tax enforcement	Arabs
806	Nile Delta	Strict tax enforcement	Arabs
807	Nile Delta	Strict tax enforcement, heavy taxes	Copts led by Arab landlords
818	Nile Delta	High taxes (part of the civil war under Al-Amin and Al-Ma'moon)	Copts and Arabs
829	Nile Delta	High taxes and strict tax enforcement (part of the civil war under Al-Amin and Al-Ma'moon)	Arabs then both Arabs and Copts
866	Nile Delta	Taxes	Arabs and Copts
866	Nile Delta	High Taxes and fiscal reforms by Ibn-Al-Muddabir	Arabs and Copts against the new Turkish elites

References: Morimoto (1981, pp. 145-72) and Mikhail (2004, pp. 195-211)

Table (5): Historical Origins of Coptic Spatial Distribution in 19th Century Egypt
(Linear Regressions: Dependent Variable: Percentage of Copts in 1897 Census)

Historical Factor (Regressor of Interest)	Without Fixed Effects	With Fixed Effects	Level of Analysis	Level of Fixed Effects	N
(1) 7th - 9th Centuries Arab Immigration Wave Dummy	-0.030*** (0.013) (0.144)	0.005 (0.012) (0.593)	District	Province	126
(2) Number of Coptic Churches and Monasteries in the 12th Century (Total)	0.001 (0.001) (0.027)	0.001* (0.001) (0.425)	Urban District + Rural Village	Urban Province + Rural District	2,113
(3) Number of Coptic Churches in the 12th Century	0.001 (0.001) (0.026)	0.002* (0.001) (0.425)	Urban District + Rural Village	Urban Province + Rural District	2,113
(4) Number of Coptic Monasteries in the 12th Century	0.013** (0.005) (0.029)	0.005 (0.004) (0.424)	Urban District + Rural Village	Urban Province + Rural District	2,113
(5) Number of Coptic Churches and Monasteries in the 15th Century (Total)	0.034*** (0.004) (0.066)	0.024*** (0.003) (0.442)	Urban District + Rural Village	Urban Province + Rural District	2,113
(6) Number of Coptic Churches in the 15th Century	0.045*** (0.004) (0.072)	0.031*** (0.004) (0.444)	Urban District + Rural Village	Urban Province + Rural District	2,113
(7) Number of Coptic Monasteries in the 15th Century	0.023*** (0.008) (0.030)	0.019*** (0.007) (0.426)	Urban District + Rural Village	Urban Province + Rural District	2,113
(8) Visited by the Holy Family Dummy	0.060*** (0.017) (0.031)	0.020 (0.014) (0.425)	Urban District + Rural Village	Urban Province + Rural District	2,113

(i) Coefficient (Standard Error) (Adjusted R-Squared) are reported in the second and third columns.
(ii) Each cell comes from a separate linear regression. All regressions control for the logarithm of population in 1897 at the specified level of analysis. In rows 2-8, rural villages are restricted to the pre-1477 villages according to Ramzi (1994) and Ibn-Al-Gay'an (1898) in order to have a map of rural Egypt that resembles rural Egypt's map in the Middle Ages. Also, in rows 2-8, villages formed mostly of Coptic monasteries (defined as villages named after Coptic monasteries) are excluded. These two restrictions resulted in dropping 43% of the 1897-villages. * indicates significance at the 10% level, ** indicates significance at the 5% level, and *** indicates significance at the 1% level.

Table (6): Interactions Between the Historical Origins

District-Level Linear Regression- Dependent Variable: Coptic Population Share in 1897

	(1)	(2)	(3)	(4)
Arab Immigration (640-900)	-0.038***	-0.040***	-0.031**	-0.036***
	(0.013)	(0.013)	(0.012)	(0.013)
Coptic Churches (1200)	-0.000	-	-	-
	(0.001)			
Coptic Monasteries (1200)	-	0.007**	-	-
		(0.003)		
Coptic Churches (1500)	-	-	0.013***	-
			(0.003)	
Coptic Monasteries (1500)	-	-	-	0.011**
				(0.005)
Visited by the Holy Family	0.041**	0.035**	0.016	0.036**
	(0.016)	(0.015)	(0.015)	(0.015)
Adjusted R^2	0.176	0.210	0.298	0.265
N	126	126	126	126

I control for log (population) in 1897 in each regression. * indicates significance at the 10% level, ** indicates significance at the 5% level, and *** indicates significance at the 1% level.

Table (7): Determinants of the Spatial Distribution of Medieval Coptic Institutions

District-Level Linear Regression- Dependent Variable Indicated on Top of Each Column

	(1) Coptic Churches (1200)	(2) Coptic Monasteries (1200)	(3) Coptic Churches (1500)	(4) Coptic Monasteries (1500)
Arab Immigration (640-900)	0.091	0.220	-0.607	-0.190
	(2.211)	(0.427)	(0.407)	(0.240)
Visited by the Holy Family	6.226**	0.400	1.718***	0.192
	(2.577)	(0.497)	(0.475)	(0.280)
Adjusted R^2	0.167	0.054	0.129	-0.007
N	126	126	126	126

I control for log (population) in 1897 in each regression. * indicates significance at the 10% level, ** indicates significance at the 5% level, and *** indicates significance at the 1% level.

Data Appendix

1. Arab Immigration Waves to Egypt in the 7th to 9th Centuries: The information is based on Al-Barry's (1992) *Arab Tribes in Egypt in the First Three Islamic Centuries*, which, in turn, draws on Arabic medieval narratives. The author traces, for almost all the immigrating tribes, their destination in Egypt mostly at the *kura*-level, the administrative division that existed in 640-1036. In a few cases, the destination of the Arab tribe is recorded at the village- or medieval province-levels. In the first case, I matched the destination to the district that the village belongs to in the 1897 census. In the second case, I matched the destination to the 1897-districts that comprise the medieval province. Drawing on Ramzi's (1994) *Geographic Dictionary of Egypt* and Tousson's (1926) *La Géographie de l'Egypte à l'Epoque Arabe*, I matched the *kuras* to the 1897-districts, based on the location of the chef-lieu of each *kura*. No information on the borders of the *kuras* survived. Fortunately, the average surface area of the *kura* was comparable to that of the 1897 district (*markaz*). The number of *kuras* in the Nile Delta and Valley in the 7th to 9th centuries (76) (Ramzi 1994, p. 31) was almost the same as the number of rural districts in 1897 (81). Egypt's inhabited area, the Nile Delta and Valley, has hardly changed since ancient times.

2. Coptic Churches and Monasteries in the 12th and 15th Centuries: I draw on two medieval sources: (1) Abul-Makarim's (1999) *Churches and Monasteries of Egypt* provides a comprehensive list of the Christian religious establishments, Coptic, Melkite, and Armenian, that existed in Egypt at the end of the 12th century. There are two versions of this book. The first is *The Churches and Monasteries of Egypt and Some Neighboring Countries* that was edited by Evetts and was first published in an English translation from

the original Arabic manuscript in 1895 where it was attributed *wrongly* to Abu-Saleh the Armenian. This early version included only the institutions in Nile Valley. Fortunately, in the 1990s, Anba-Samuel published a two-volumes version of the book in both Arabic and English. The first volume included the missing part about Nile Delta, while the second volume was a re-publication of Evetts' edition on Nile Valley. The book is now believed to belong to the 12th century Coptic chronicler Abul-Makarim.

(2) Al-Maqrizi's (2002) *Lessons in Examining Plans and Monuments* includes a less comprehensive list of churches and monasteries (both Coptic and Melkite) in the 15th century. Both lists are organized on a geographic basis at the urban street- and rural village-levels. I matched the locations in both sources to the 1897-urban districts and rural villages based on the streets' and villages' names that hardly changed over time, and the information provided by the books' editors in identifying the streets and/or villages. In this matching procedure, I excluded the churches and monasteries in "extinct" medieval locations that were deserted by 1897 based on Ramzi (1994). I then used Ramzi (1994) and the 1477 medieval source, Ibn-Al-Gay'an's (1898) *Names of Egyptian Villages*, to exclude, from the 1897 rural villages list, the "post-1477" villages that emerged after the Ottoman Conquest (1517) (43 percent), and thus to construct a modified list of the 1897 villages that reflects the map of medieval rural Egypt.[38] In addition, I excluded the villages that were named after Coptic monasteries in 1897 since the vast majority of the inhabitants of these villages in 1897 are the monastic population.

[38] Ibn-Al-Gay'an's 1477-list is based on *Al-Rok Al-Nassery*, the computation of Egypt's area that was carried out under the Mamluk sultan Al-Nasser Muhammad Ibn-Qalawun in 1315. However, Ibn-al-Gay'an updated the original list to 1477 and thus his list includes the villages that emerged between 1315 and 1477. An improvement over this 1477-village list is possible through using the *first* comprehensive village list in Egypt that was produced in *Al-Rok Al-Hussamy*, under Hussam-Al-Din Lajeen in 1298, and that was, preserved *without updates* in a contemporary manuscript called *Tuhfat Al-Irshad* that presumably exists in some library in Egypt (Ramzi 1994, pp. 18-21). I was not able, however, to find this 1298 manuscript.