

# Occupational Structure in Egypt in 1848-2006

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## 1. Introduction

This chapter documents the evolution of the occupational structure of the Egyptian economy over the last one and a half centuries from 1848 to 2006. While there is a voluminous literature on the history of the Egyptian economy during the nineteenth and twentieth centuries (Al-Gritli 1952; M. Fahmy 1954; Issawi 1967; Al-Hitta 1967; Mabro 1974; Mabro and Radwan 1976; Marsot 1984; Owen and Pamuk 1998; Ghazaleh 1999; Owen 2002), there are a number of distinguishing features of this chapter in comparison to the existing literature. First, it makes use of a novel data source, nationally representative individual-level samples (about 80,000 observations each) of the Egyptian population censuses of 1848 and 1868 that I recently digitized from the original census manuscripts at the National Archives of Egypt (Saleh 2013). Being the earliest population censuses in Egypt and one of the earliest in the Middle East, the census samples allow us for the first time to document the empirical facts about employment, labor force participation, and the occupational structure of the Egyptian male and female populations in pre-Colonial nineteenth-century Egypt, instead of relying on, mostly impressionistic, secondary historical sources. Second, the chapter covers a long period of time (about 160 years) that is examined systematically in a unified framework using the long series of the Egyptian population censuses, which is quite unusual for countries outside Western Europe and North America. Third, the chapter documents the structural shifts of the Egyptian economy from the viewpoint of the occupational outcomes of the Egyptian male and female employed (or with occupation) populations, rather than the sectoral shifts of the aggregate output. Finally, since the data include information on the pre-Colonial period, and extend until the beginning of the twenty-first

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century, they allow me to conjecture on the effects on the occupational structure of several structural changes in regimes and/or policies that include (a) a (pre-Colonial) first wave of state industrialization in 1816-1848 that focused on textiles and military manufactories, and that is considered to be one of the earliest state industrialization programs outside Europe, (b) a second wave of state industrialization in 1848-1882 that was partially characterized by “de-industrialization,” due to the closures of most state manufactories of the first wave, and the shift towards creating new state transportation and communications firms (e.g., railways, steam navigation, telegraph, tramways, Suez Canal), (c) British Occupation in 1882-1922 and the growth in the share of foreign capital in the economy, (d) the growth of the share of private Egyptian capital in 1922-1952 following Egypt’s nominal independence from Britain, (e) state industrialization in 1952-1967 (under Nasser) following the military coup of 1952, and (f) the shift towards a market economy and increased integration into the world economy in 1974-2006 (under Sadat and Mubarak) which followed the economic stagnation that resulted from the Arab-Israeli war period in 1967-1973. These shifts are presumably not confined to Egypt and may have implications for the trajectories of many developing countries throughout the world.

Before examining the main question of this chapter, the evolution of employment, labor force participation, and the occupational structure in 1848-2006, it is perhaps useful to start with documenting the long-term trends of key macroeconomic variables in order to have a better understanding of the long-term path of economic development in Egypt since the nineteenth century. Hence, I show in a series of figures the long-term trends of Egypt’s real GDP per capita, annual growth rates of real GDP per capita, (a proxy of) urbanization, and the share of Egypt’s top export commodity out of the total value of exports.

Figure I plots the real GDP per capita in 1990 PPP USD from 1886 to 2010. The figure indicates that real GDP per capita grew slightly between 1886 and 1904, but then remained relatively constant between 1905 and 1955. It then started to grow between 1956 and 1965, which corresponds to the post-1952 state industrialization episode. GDP per capita stagnated between

1966 and 1973, presumably because of the 1967 and the 1973 Arab-Israeli Wars, before it started to grow again starting from 1974, which corresponds to the shift to (some form of) the market economy by Sadat and Mubarak.

Figure II depicts the corresponding growth rate of real GDP per capita, smoothed using a five-year moving average. Throughout the whole period, there were episodes of booms followed by sharp busts, with growth rates frequently falling below zero for multiple years. These fluctuations make it difficult to precisely date the beginning of Modern Economic Growth (MEG) in Egypt, defined as sustaining an average growth rate of real GDP per capita of 1 percent or more per year over a long enough period of time so as to quadruple the level of real GDP per capita. It appears, however, that 1956 is a reasonable date because (a) the average growth rate per year in 1956-2010 was 2.8 percent, as opposed to 0.85 percent in 1886-1955, and (b) real GDP per capita quadrupled from 905 to 4267 PPP USD in 1956-2010 (it less than doubled from 477 to 885 PPP USD in 1886-1955). Periods of slowdown in growth (where the growth rate dropped below 1 percent) have continued to occur though since 1956, such as in 1966-1968 (due to the 1967 War) and 1988-1992 (due to a public debt crisis).

Figure III illustrates Egypt's urban population share over time. It employs two measures of urbanization. The first is the population share of Egypt's largest cities (Cairo, Alexandria, and Suez Canal cities) that is available for all population censuses from 1882 to 2006.<sup>2</sup> This measure should be thought of as a lower bound on the urban population share in Egypt since it does not include urban areas outside these cities.<sup>3</sup> The second measure includes all urban areas and is

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<sup>2</sup> It is not straightforward to calculate urbanization rate in Egypt from the digitized village/quarter-level tables of the population censuses in 1882-1996 and the 2006 population census sample, because the distinction between urban and rural areas according to the administrative division of the censuses is *not* based on population size and density. Instead, it classifies Egypt's provinces into (a) urban: Cairo, Alexandria, and the Suez Canal cities (the status of Rosetta and Damietta as urban provinces varies across censuses), (b) rural: all remaining provinces in the Nile Delta and Valley, and (c) border provinces: all provinces in Sinai and the Western and Eastern deserts. This classification is problematic for two reasons. First, it does not take into account that many administrative units outside the urban provinces are large enough to be considered urban. Second, although there were continuous changes in the definition of each administrative unit, there are no detailed maps of the administrative boundaries in the censuses, making it difficult to follow the evolution of administrative units (e.g., urban provinces) over time.

<sup>3</sup> Other administrative units that increased their population shares over the second half of the twentieth century include Giza and Shubra Al-Khayma in Cairo's metropolitan area, Damietta, and the provincial capitals.

available for 1986, 1996, and 2006. Comparing the two measures in 1986-2006 suggests that the first measure captures the *changes* in (and not the *levels* of) urban population share. As can be seen in the figure, there was steady urbanization between 1897 and 1976 with the population share of the largest cities doubling over the period from less than 10 percent to more than 22 percent of the population. Urban population share then declined slightly (to 20 percent) between 1976 and 1996, before it remained stable through 2006. The second measure confirms that urban population share first declined between 1986 and 1996 and then remained constant between 1996 and 2006. The finding that urbanization came to a halt after 1986 has been previously documented by other scholars in the field such as Wahba (2009).

On the whole, Figures I-III reveal two empirical facts. First, Egypt started to witness Modern Economic Growth (MEG), in the sense of long-term average annual growth rates of real GDP per capita of about 1+ percent, starting from 1956. Second, there was steady urbanization throughout the twentieth century although it came to a halt after 1986. The natural question then is: Did the Egyptian economy witness a corresponding “industrialization” in the sense of increasing the share of the secondary sector in the total output since 1956? Figure IV attempts to shed some light on this question. The figure reveals a striking, yet a somehow gloomy, fact about Egypt’s exports from 1842 to 2014. Basically, the top export commodity of Egypt was raw cotton for more than a century from around 1865 until 1975, only to be replaced by oil from 1976 until today. In fact, raw cotton’s share of the total value of exports remained around 80 percent of all Egypt’s exports until 1955. More important, despite the decline in cotton’s share between 1956 and 1975, the rise in oil prices in the 1970s drove Egypt to more reliance on oil exports that reached 80 percent of total exports in 1980. The oil share in exports started to decline though since the 1980s. This trend suggests that agriculture and mining, but not manufacturing, continued to play a large role in the economy until today.

## 2. Historical Background

Traditional historiography dates the beginning of the modern economic history of Egypt with Muhammad Ali Pasha's accession to power in 1805.<sup>4</sup> Ali, the autonomous Ottoman viceroy of Egypt in 1805-1848, embarked on one of the earliest state industrialization programs in the world which focused on textiles and military industries, within a broader set of state-led modernization policies that spanned education, military reforms, agriculture, and irrigation. To fund his ambitious projects, Ali monopolized internal and external trade, and centralized the tax system (Owen 2002, pp. 65-6). Nonetheless, the program failed to transform Egypt into an industrialized economy and most of the state manufactories closed down after Ali's reign. Traditional accounts for this failure center around two causes: (1) the Anglo-Turkish commercial convention (1838) that abolished state monopolies and reduced tariffs in the Ottoman Empire; this convention was imposed on Egypt (officially, an Ottoman province until 1914) following its defeat in the Egyptian-Ottoman War of 1839-1841, and (2) the London treaty of 1841 which limited the size of the Egyptian army, the *raison d'être* of the state manufactories (Owen 2002, pp. 75-6). Both treaties directly weakened Ali's state industrialization and agricultural monopolies programs. Owen, however, suggests quite convincingly that there were structural causes for the failure of the program such as the fading centralized power of the state starting from 1837, unqualified personnel, the fuel and power problems, and, perhaps most importantly, the failure to create an entrepreneurial class.

As Egypt became increasingly open to international trade after the dissolution of the state monopoly system, Ali's successors focused on transportation and communications in the second wave of state industrialization in 1848-1882. That wave was much smaller in size than the first wave and hence it can (partially) be characterized as a period of "de-industrialization," as most of Ali's state manufactories, especially in textiles, closed down. However, other state transportation

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<sup>4</sup> A more recent line of the historical literature challenges the view that Egypt was transformed from a backward country to a modern economy under Muhammad Ali (see for example, Gran (1979) and K. Fahmy (1997)).

and communication firms were established including railways (1853), telegraph (1854), steam navigation (1856 and 1863), tramways (1861), and, perhaps most remarkably, the Suez Canal (1869) (Al-Hitta 1967, pp. 215-91). The technology used in these firms was more capital-intensive than the one used in Ali's manufactories. Both internal and external debts were used to fund the second wave, and the increased debt (especially for the Suez Canal) eventually ended with the British Occupation in 1882. However, the second wave was perhaps more successful, and many of the transportation firms survived until today.

Although the two waves of the state industrialization program, which lasted from 1816 to 1882, failed to transform the Egyptian economy into an industrialized economy, they created state manufacturing, transportation, and communication firms that employed a significant share of the Egyptian employed male population, especially in Cairo and Alexandria, and formed the nucleus of an Egyptian urban working class. While the first wave is usually credited with being an attempt of industrializing an agricultural economy, the second wave is viewed as a shift from the secondary sector to the tertiary sector (in particular, transportation and communications) due to the closures of most of Ali's manufactories and the rise of the transportation firms. The emphasis on transportation was in fact part of a general trend in the Ottoman Empire towards more integration into the world economy, which was induced by the increased European influence in the region. For Egypt, the shift meant an increased emphasis on exporting raw long-staple cotton, which necessitated improving transport facilities. Notably, the shift towards reliance on the exportation of raw cotton started with the cotton boom that was caused by the American Civil war in 1861-1865 and persisted for over a century (see Figure IV).

Under the British Occupation of Egypt (1882-1922), the Egyptian economy became even more dependent on cotton exports and the share of foreign capital increased in all sectors of the economy. Following Egypt's (nominal) independence from Britain in 1922, Egypt witnessed in 1922-1952 a period in which the Egyptian private capital increased its share vis-à-vis foreign capital. However, the exportation of raw long-staple cotton continued to be the backbone of the

Egyptian economy since the Lancashire cotton famine in 1861-1864 until after the 1952 military coup that overthrew Ali's dynasty.

The country witnessed a second ambitious attempt at state industrialization in 1952-1967 following the 1952 military coup. The program focused on heavy industries and electrification via establishing the Aswan High Dam in 1960-1970, but it essentially came to an end with Egypt's defeat in the 1967 Arab-Israeli War. However, the program remains highly controversial in the literature and most of the debates surrounding it are ideologically biased, with little known about the facts of the program.

The following decades (1974-2006) witnessed a shift in Egypt's economic policy towards openness to the world economy and the adoption of a market economy. This was accompanied by the growth of the share of the services sector, relative stagnation in the share of the secondary sector, and increased withdrawal of the state from the economic realm.

### **3. Data Sources**

Despite the large historical literature on the topic, relatively little is known on the long-run empirical quantitative facts on the occupational shifts from the primary to the secondary and the tertiary sectors that the Egyptian economy witnessed throughout the entire period. In order to establish the empirical facts over such a long period of time, one needs to dig through various data sources, some of which are not digitized. The chapter attempts to fill this gap in the historical literature using several novel data sources: (a) individual-level population census samples from 1848 and 1868 that I recently digitized from the original manuscripts at the National Archives of Egypt (Saleh 2013), (b) national-level tables on the occupational structure in the published population census reports of 1897, 1907, and 1917, (c) village/quarter-level tables in the decennial published population census reports of 1927, 1937, 1947, 1960, 1976, 1986, and 1996 that were digitized by a French research center in Egypt, the *Centre d'Études et de Documentation Économiques, Juridiques et Sociales* (CEDEJ 2003), and (d) 10-percent individual-level

population census sample from 2006 that is available through the Integrated Public Use Microdata Series (IPUMS) by the Minnesota Population Center.

Charting the evolution of the employment rate, the labor force participation rate, and the occupational structure by gender at the national level in 1848-2006 requires creating consistent time series of these variables across population censuses. This proved to be a challenging task because of the changes across population censuses in the definition of the working-age population, the enumeration of employment and labor force (especially among females), and the occupational categories that are being reported. The 1848 and 1868 population census samples provide the most detailed occupational information at the individual level. The CEDEJ CD-ROM (CEDEJ 2003) digitized the village/quarter-level tables (the lowest administrative level in Egypt) of the published population census reports from 1882 to 1996, but did *not* digitize any variable that is only available at a higher administrative level, i.e. district, province, and national levels. Hence, because the census reports of 1927, 1937, 1947, 1960, 1976, 1986, and 1996 report the occupational structure at the village/quarter-level, this information is readily available in CEDEJ (2003). This raises four limitations though. One, the village/quarter-level tables in 1927-1996 report only “aggregate” categories of occupations whereas the more detailed occupational categories that are only reported at a higher administrative level are not digitized. Two, the earlier census reports of 1897, 1907, and 1917 (but not 1882) report the occupational structure at a higher administrative level only and thus these occupational tables are not digitized by CEDEJ (2003). Three, the most recent census report of 2006 is not included in CEDEJ (2003). Four, the occupational categories vary from one census to the other and there is no description provided in the village/quarter-level tables on the specific occupations that lie under each category in 1927-1996. I could not address the first concern given the sheer size of the detailed occupational tables in the census reports from 1927 to 1996. However, I addressed the second concern by digitizing the aggregate occupational categories in the national-level tables in 1897, 1907, and 1917. To address the third concern, I extracted the aggregate occupational categories at the national level



from the 2006 individual-level population census sample that was digitized by IPUMS.<sup>5</sup> Finally, to tackle the fourth concern, I resorted to the PSTI (primary, secondary, tertiary) classification of the occupational structure in order to build consistent series of the occupational structure over time. In the future, a more complete account of the evolution of the occupational structure in 1897-2006 will be constructed through (a) digitizing the detailed occupational tables in the published population census reports from 1897 to 1996, and (b) translating the occupational codes in the individual-level population census samples of 1986, 1996, and 2006 from the International Standard Classification of Occupations (ISCO) system to the PSTI classification.

In the two following sections, I document the evolution of employment, labor force participation, and the occupational structure of the employed population in 1848-2006.

#### **4. Employment and Labor Force Participation in 1848-2006**

In this section, I first summarize the measurement issues that arise in examining employment and labor force participation between 1848 and 2006. Second, I discuss the enumeration policies of employment in each population census. Third, I document the long-term trends of employment and labor force participation among each of males and females. Finally, I discuss if changes in enumeration policies of male and female employment across population censuses could possibly distort the evolution of the occupational structure in 1848-2006.

##### **4.1 Measurement Issues**

Before 1960, Egypt's population censuses did not use the modern definitions of the employed, the unemployed, the economically active, and the working-age population, which are required concepts for the computation of the employment rate (the employed population divided by the working-age population) and the labor force participation rate (the economically active population, employed plus unemployed, divided by the working-age population). Instead, the population censuses between 1848 and 1947 only distinguish between those "with occupation"

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<sup>5</sup> The 10-percent individual-level population census sample of 2006 provides information on occupations using the International Standard Classification of Occupations (ISCO) at the 3-digit level. I only digitized the national-level occupational structure at the 1-digit level.

and those “without occupation.” Under this classification, the “with occupation” group includes not only the currently employed individuals but also certain groups who are technically out of the labor force such as students and retired individuals who receive pensions. On the other hand, the “without occupation” group essentially includes three sub-groups, (a) economically inactive (out of labor force) individuals for other reasons such as being unable to work, unwilling to work, or not actively seeking employment, (b) the unemployed (those who are willing to work and are actively seeking employment but are currently unemployed), and (c) those with missing occupational titles. However, since 1960, the population censuses have included a section on “employment status” which distinguishes between the employed, the unemployed, and those who are out of the labor force, albeit with individuals whose employment status is missing.

A related measurement issue is that the definition of the working-age population varies from one population census to the other. In this context, the working-age population means those for whom any occupational information is recorded, i.e. information on occupational titles in 1848-1947 and employment status in 1960-2006. Specifically, the 1848 and 1868 population census manuscripts treat the entire population as of working age with infants (below 5) often listed as “without occupation.” While the 1897 census limits the working-age population to those who are 10 years old and above, the subsequent censuses of 1907, 1917, and 1927 define the working-age population as the entire population. After 1927, the working-age population is defined as those who are 5 years old and above in 1937 and 1947, 6 years old and above in 1960, 1976, 1986, and 2006, and 15 years old and above in 1996.

These measurement issues make it difficult to compare the employment rate across population censuses, and thus I had to make certain approximations in order to compute the employment rate before and after 1960. First, I computed the employment rate in 1848-1947 as the number of individuals “with occupation” divided by the working-age population. This essentially assumes that (a) individuals “with occupation” are equivalent to the “employed,” and (b) individuals with missing occupation titles in 1848-1947 are either unemployed or out of the

labor force. Second, I calculated the employment rate in 1960-2006 as the number of “employed” individuals divided by the working-age population. This assumes that (c) individuals with missing employment status in 1960-2006 are either unemployed or out of the labor force. Third, I measured the working-age population using the 15 years and above definition whenever possible, but I also reported various age definitions of the working-age population for comparison.

While these approximations are arguably justifiable since they produce estimates of employment rate that are close enough both before and after 1960, the assumptions on which my calculations are based may introduce biases in estimating employment. Assumption (a) treats students and retired personnel, who are enumerated as “with occupation” in 1848-1947, as “employed.” While I was able to exclude students and retired personnel from those “with occupation” in 1848 and 1868, where I have individual-level information, I was not able to make the same correction in 1897-1947. This likely overestimates the employment rate in 1897-1947 since these groups should be excluded as “out of the labor force,” and the magnitude of the over-estimation is likely growing over time due to the expansion in education and retirement. Assumption (b) treats individuals with missing occupational titles, who in principle could be employed, unemployed, or out of the labor force, as belonging to the two latter groups only. This likely understates the employment rate between 1848 and 1947, and the magnitude of the under-estimation is likely greater among females due to the presumable cultural bias against recording employment of women by the census administration. The magnitude of the under-estimation is also probably decreasing over time among both males and females due to improvements in enumeration of employment. Finally, assumption (c) is the least problematic since the number of individuals with missing employment status is relatively small in 1960-2006 (see Table I).

The estimation of the labor force participation rate raises even more challenging issues compared to the employment rate. Basically, while it is possible to calculate the labor force participation rate in 1960-2006 as the total number of employed and unemployed individuals divided by the working-age population (subject to assumption (c) above), it is not possible to

measure the labor force participation rate before 1960 since I do not observe the number of unemployed individuals in 1848-1947. That said, given the small difference that is observed between the labor force participation rate and the employment rate in 1960-2006 (see Table II), it is perhaps safe to think of the employment rate in 1848-1947 as a reasonable proxy for the labor force participation rate during that period, albeit subject to assumptions (a) and (b) that I used to measure the employment rate.

#### **4.2 Enumeration of Male and Female Employment**

I summarize the different employment categories that are used in each population census in Table I. Since I have individual-level population census samples in 1848 and 1868 with information on age and detailed occupational titles, it is possible to analyze employment in these censuses in more depth compared to the subsequent censuses from 1897 to 1947. To this end, I define the working-age population in 1848 and 1868 as those who are 15 years old and above in order to be consistent with the modern definition of the working-age population, but I also calculate the working-age population according to the definitions used in other censuses for the purpose of comparison. Because females in Cairo and Alexandria in 1848 and 1868 do not have their age recorded in numbers and are instead classified as either “adults” (Arabic: *kabira*) or “juveniles” (Arabic: *saghira*), I define the working-age female population in these two cities as “adult” females, thus assuming that “adult” females are 15+ years of age. This seems to be a reasonable assumption. For one, the Arabic words for “adults” and “juveniles” suggest that they mean post-puberty age and pre-puberty age respectively, an interpretation that is also supported by Alleaume and Fargues (1998). For another, the population share of females who are 15+ outside Cairo and Alexandria is in fact very close to the share of “adult” females in the two cities in each of 1848 and 1868 (it ranges between 57 and 62 percent).

Furthermore, since I am able to identify in 1848 and 1868 students in religious schools (*kuttabs*), modern schools, and higher religious institutions, as well as retired individuals who receive pensions from the state, I exclude those two groups (students and retired personnel) from

the population “with occupation” and I classify them instead as “out of labor force.” The purpose of this procedure is to be consistent with the modern definition of the labor force.

With these procedures in place, the population “with occupation” in 1848 and 1868 is equivalent to the “employed” working-age population with non-missing occupational titles, whereas the population “without occupation” includes unemployed individuals, students, retired personnel, and, most importantly, those with missing occupational titles.

Unfortunately, I do not have such level of detail in the village/quarter-level tables of the censuses between 1897 and 1947 and thus I am only able to distinguish between those “with occupation” and those “without occupation.” In these censuses, the former category includes students and retired personnel besides the “employed” individuals, whereas the latter category includes the unemployed, the out-of-labor-force, and those with missing occupational titles.

Starting from the 1960 population census, the employment status is recorded where a distinction is made between employed, unemployed, and out of the labor force populations (although there are individuals with missing employment status). Moreover, the censuses document the sub-groups that lie under the employed and out-of-labor-force groups. On the one hand, employed individuals include employers, self-employed, employees, unpaid family workers, and unpaid workers. On the other hand, out-of-labor-force individuals include individuals who are unable to work, individuals who are unwilling to work, and the latter group is broken down further starting from 1976 into students, retired personnel, seniors, housewives (for females), and those who are inactive for other (unspecified) reasons.

The previous discussion applies to the enumeration of employment of both the male and female populations. However, in contrast to males, enumerating employment of females was far less complete and varied widely from one census to the other because of ad hoc decisions made by the census administration. While the vast majority of females were recorded as “without occupation” (with a missing occupation title) from 1848 up to 1897, it appears that the census administration from 1907 to 1947 attempted to improve the enumeration of female employment,

especially in agriculture and (domestic) services, and the enumerated females were hence recorded as “with occupation.” While it is not possible to know exactly the enumeration decisions of the census takers in 1907-1947, they might have decided to classify females who resided in a household where the male household head is a farmer, as employed in agriculture. This is a common practice in many developing countries, which carries the risk of over-enumerating women in agriculture instead of under-enumerating them. Also, they might have attempted to better enumerate female domestic servants in households.

To the contrary, the more recent censuses of 1960, 1976, 1986, 1996, and 2006 treated the vast majority of females as economically inactive or out of the labor force, mostly as “unwilling to work,” specifically “housewives.”

As it turns out, understanding the policy changes in enumerating male and female employment across the population censuses is crucial to interpret the observed long-term trends of employment and labor force participation among each of males and females in 1848-2006; a task which I now turn to in the following sub-section.

### **4.3 Evolution of Employment and Labor Force Participation**

The long-term trends of employment and labor force participation are shown in Table II. Given the aforementioned differences in enumeration of male and female employment, I show the rates for each of males and females separately. In interpreting the figures in Table II, I focus on the employment and labor force participation rates calculated as percentages of the total population since the latter is available in all population censuses, but I also report both rates calculated as percentages of the other definitions of the working-age population for comparison.

#### *4.3.1 Male Employment and Labor Force Participation*

The long-term trends of male employment rate (and labor force participation rate) in panel (A) suggest that the rate increased between 1848 and 1897 from 43 percent to 64 percent. It then remained relatively stable between 1897 and 1947 (where it peaked in 1927 and 1937 at 71 and 76 percent respectively). The rate then decreased steadily from 63 percent in 1947 to 54

percent in 1960, and then down to 44 percent in 1986, before it remained stable between 1986 and 2006. Thus, all in all, it appears that there is an inverted-U shaped long-term trend where male employment first increased between 1848 and 1897, and then stabilized between 1897 and 1947, before it started to decline steadily from 1947 to 2006. In fact, the level of male employment in 2006 is similar to its level back in 1848.

How could one account for this trend? Is it driven by policy changes in enumeration of employment across different population censuses or rather by *real* changes in male employment? I would argue that the first possibility is the most likely explanation for (a) the rise in male employment between 1848 and 1897, (b) the stability in male employment in 1897-1947, and (c) its subsequent decline between 1947 and 1960. However, the continuous decline in male employment between 1960 and 2006 is probably due to real changes in employment. To begin with, the increase in male employment between 1848 and 1897 is possibly driven by improvements in enumerating employment during that period that reduced the share of males with missing occupational titles, and these improvements persisted through 1947.<sup>6</sup> Another reason for the persistence of relatively high male employment rates between 1897 and 1947 (and even their increase in 1927-1937) and the subsequent decline in male employment in 1947-1960 is the fact that students and retired personnel are treated as “with occupation” (i.e. “employed”) in 1897-1947 but not in 1848, 1868, or in 1960. Although this statistical artifact may have been small between 1897 and 1917 given the low student enrollment rates in that period, it is likely an important factor between 1927 and 1947 due to the expansion in education following Egypt’s nominal independence from Britain in 1922 and the resulting increase in student enrollment.

Finally, by contrast, one could attribute the declining trend in male employment in 1960-2006 to real changes in male employment. For one, the large expansion in mass education in Egypt starting from 1953 may have contributed to taking increasingly more males out of the

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<sup>6</sup> There is a slight decline in male employment between 1848 and 1868, because of the higher share of males with missing occupational titles in 1868. In other words, enumeration of male employment seems to have slightly deteriorated in 1868 compared to 1848.

labor force leading to an increase in the population share of students from 27 percent in 1976 to 30 percent in 2006. For another, the expansion in public sector employment due to the employment guarantee in the government and public sectors for university and high school graduates (that lasted from 1961-1964 to 1983) led to an increase in the population share of retired personnel from less than 1 percent in 1960 to 3 percent in 2006.<sup>7</sup>

#### *4.3.2 Female Employment and Labor Force Participation*

Moving on to the findings on females in panel (B), the results suggest that female employment (and hence labor force participation rate) was extremely low in 1848-2006, with two exceptional episodes: a large increase in female employment in 1917-1947 and a more modest rising trend in 1960-2006. On the whole though female employment rate in 2006 is only 9 percent compared to 2 percent in 1848. Faced by these numbers, it is perhaps tempting to conclude that Egyptian women achieved a very modest progress in their participation in the labor force over the last one and a half centuries. However, as with male employment, the extremely low levels of female employment and labor force participation in 1848-1907 and 1960-2006 and the apparent surge in their employment in 1917-1947 should not be taken at face value for they may not reflect the real levels of, and changes in, female employment over time, but rather changes in enumeration of female employment across censuses. For one thing, females worked in agriculture together with men in the nineteenth century since the vast majority of landholding farmers relied on household labor, which included females and children, and this phenomenon likely continued throughout the twentieth century (Tucker 1985). For another, females in cities might have worked in informal unskilled jobs.

Taking these historical facts into account, one should instead interpret the long-term trend of female employment in 1848-2006 as largely a result of enumeration policies. First, there was low enumeration of women's employment by the census administration in 1848-1897 and 1960-2006, in the sense of reporting the occupational titles of the vast majority of females as

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<sup>7</sup> The population shares of students and retired personnel were negligible in 1848 and 1868.



missing in 1848-1897 or as out of the labor force (housewives) in 1960-2006. This policy started to change in 1907, with a 2.5-times increase in the number of females “with occupation” between 1897 and 1907. However, the big increase in enumeration of female employment occurred in 1917-1947, as the census administration during that period increasingly enumerated female employment in agriculture and domestic services. However, there is considerable variation in enumeration of female employment in 1917-1947. The 1947 census reports the highest share of employed women, followed by the 1917 census, but both are much higher than the 1927 and 1937 censuses and the subsequent 1960 census. Second and relatedly, the census administration in 1848-1897 and 1960-2006 likely focused on reporting female wage employment in the formal labor market and ignored other types of employment. Given the relatively low access of women to the formal labor market and their resorting to the informal market either in agriculture or in low-skilled jobs in cities (such as domestic services) this may explain the low enumeration of female employment during those periods.

As with male employment, however, the slowly rising trend of female employment in 1960-2006 might reflect *real* changes. In particular, the state (gender-neutral) guarantee of formal employment in the government and public sectors for graduates of secondary schools and universities starting from 1961-1964; a policy that lasted until the 1983 graduates, is often credited for the rise in female formal employment during that period (Assaad 1997). This may account for the modest progress in female employment and labor force participation between 1960 and 2006.

#### **4.4 Are Enumeration Policies of Male and Female Employment Sector-Neutral?**

Because the changes in male and female employment, especially in 1848-1960, are arguably driven by changes in enumeration policies of employment rather than by real changes in participation, an important question that arises is whether the changes in enumeration policies in 1848-2006 could possibly distort the occupational distribution. In other words, were the enumeration policies of the census administration neutral across the primary, secondary, and

tertiary sectors, or did they exhibit certain biases across sectors? The answer to this question varies between males and females. For males, the changes in enumeration policies across censuses may create two problems for estimating the male occupational structure. The first problem is that while the under-enumeration of male employment in 1848 and the improvement in enumeration in 1897-1947 is most likely random across sectors, because these population censuses have (almost) complete enumeration of Egypt's population, the 1868 census suffers from two caveats: (a) many rural provinces and a few cities are missing in their entirety (Saleh 2013),<sup>8</sup> and (b) there is a higher percentage of males in (enumerated) rural provinces with missing occupational titles, compared to the 1848 census. These two issues might result in higher under-enumeration of male employment in the primary sector in 1868 compared to both 1848 and the subsequent censuses in 1897-1947. I correct for this problem by (a) assigning higher sampling weights to individuals in enumerated rural provinces in 1868, and (b) imputing missing occupational titles of individuals in enumerated rural provinces as "farmers" in both 1848 and 1868. The second problem that arises for enumeration of male employment is that the over-enumeration in 1897-1947 due to treating students and retired personnel as "with occupation" might result in higher over-enumeration of employment in the tertiary sector (under which students are presumably classified) during that period compared to 1848-1868 and 1960-2006.

Nonetheless, the changes in enumeration policies of female employment create more serious problems with respect to tracing the occupational distribution of employed females over time. First, almost all enumerated employed females in 1848-1897 work in low-status occupations in the tertiary sector such as domestic servants and slaves. Second, the policy change in enumeration of female employment starting from 1907, but most importantly in 1917-1947, resulted in more enumeration (possibly, over-enumeration) of females in the primary sector. Third, because most females who are waged workers, or are employed in the public sector that

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<sup>8</sup> Only 6 rural provinces (out of 14) have surviving registers in the 1868 population census.

expanded since 1961-1964, likely belong to the secondary and tertiary sectors, there is probably higher under-enumeration of female employment in the primary sector in 1976-2006.

## **5. Evolution of the Occupational Structure in 1848-2006**

How did the occupational structure of Egypt's employed labor force evolve between 1848 and 2006? In order to simplify the exposition, I classify the occupational categories in the Egyptian censuses into primary, secondary, and tertiary sectors following the PSTI classification. The specific occupational categories that lie under each sector vary from one census to the other, and are classified in this chapter in order to abide by the PSTI classification on the one hand, and to ensure consistency across population censuses on the other hand. Broadly speaking, the primary sector includes agriculture, animal breeding, fishing, and hunting; the secondary sector includes mining, manufacturing, and construction; the tertiary sector includes trade, professions and services, and transportation and communications.

In this section, I provide an overview of the evolution of the occupational structure across the three sectors among each of the male and female populations that are enumerated as "with occupation" in 1848-1947 or as "employed" in 1960-2006. I relegate the discussion of the causes of the observed occupational shifts; in particular, whether they are *real* sectoral shifts or are rather driven by changes in enumeration policies across censuses, to section 6.

### **5.1 Male Occupational Structure**

Panel (A) of Figure V shows the changes in the occupational structure for males between 1848 and 2006, where I divide the graph into four historical periods to simplify the exposition.

The pre-Colonial period in 1848-1882 witnessed a decline in the share of the primary sector from 71 percent in 1848 to 63 percent in 1868. This drop was absorbed in the tertiary sector whose share increased by 11 percentage points from 18 percent to 29 percent during that period, whereas the share of the secondary sector remained stable at 8 percent.<sup>9</sup> The pre-Colonial

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<sup>9</sup> Notice that the share of the sectorally unspecific occupations dropped from 3 to 1 percent between 1848 and 1868.

period (1848-1882) was hence characterized by (a) a decline in the primary sector share, (b) stability in the share of the secondary sector, and (c) “tertiarization” of the economy.

Under the British Occupation in 1882-1922, the share of the primary sector increased back from 63 percent in 1868 to 65 percent in 1897 and even further to 68 percent in 1907 before it dropped to 61 percent in 1917. These changes were again mapped in the tertiary sector, whose share first dropped from 29 percent in 1868 to 17 percent in 1897, before it increased to 22 percent in 1907 and 29 percent in 1917. By contrast, the share of the secondary sector remained relatively stable at 10 percent in 1897, 1907, and 1917 (compared to 8 percent in 1848 and 1868). However, noticing that the share of sectorally unspecific occupations was particularly high in 1897 (about 8 percent), and given the relative stability of the shares of the primary and secondary sectors between 1897 and 1907, it is reasonable to assume that most of the sectorally unspecific occupations in 1897 in fact belong to the tertiary sector, which would raise its share in 1897 to 25 percent. This leads us to characterize the British Occupation (1882-1922) period by (a) an increase in the share of the primary sector between 1868 and 1907 followed by a decrease in its share in 1907-1917, (b) stability in the share of the secondary sector, and (c) “de-tertiarization” between 1868 and 1907 followed by “tertiarization” in 1907-1917.

The Egyptian Kingdom period in 1922-1952 witnessed a relatively stable share of the primary sector in 1927, 1937, and 1947, compared to its value in 1917, rotating around 60-62 percent. Also, the share of the secondary sector remained stable around 9-10 percent in 1927 and 1937 before it increased to 13 percent in 1947. The “industrialization” in 1937-1947 was reflected in the tertiary sector, whose share remained stable in 1927 and 1937 (around 30-31 percent), compared to its value in 1917, before it dropped to 25 percent in 1947. This period can thus be summarized by (a) stability in the primary sector share, (b) stability in the share of the secondary sector in 1917-1937 followed by “industrialization” in 1937-1947, and (c) stability in the share of the tertiary sector in 1917-1937 followed by “de-tertiarization” in 1937-1947.

The Egyptian Republic period in 1952-2006 exhibited a continuous decline in the share of the primary sector from 62 percent in 1947 to 30 percent in 2006 (less than half of its value in 1947). This was accompanied by (a) stability in the share of the secondary sector in 1947-1960, followed by “industrialization” in 1960-1996, as the share of the secondary sector doubled from 12 percent to 25 percent in 1996, and stability in the secondary sector share in 1996-2006, and (b) “tertiarization” as the share of the tertiary sector increased from 25 percent in 1947 to 46 percent in 2006. Interestingly, in 1996, the share of the tertiary sector exceeded that of the primary sector for the first time in Egypt’s economic history.

To sum up, the occupational distribution of employed males from 1848 to 2006 witnessed multiple episodes: (1) “tertiarization” in 1848-1868, (2) “de-tertiarization” in 1868-1907, (3) “tertiarization” in 1907-1917, (4) stability in 1917-1937, (5) “industrialization” and “de-tertiarization” in 1937-1947, (6) “tertiarization” in 1947-1960, (7) “industrialization” and “tertiarization” in 1960-1996, and (8) “tertiarization” in 1996-2006. It is important to note here that, with the exception of the industrialization episode in 1937-1947, all the other male occupational shifts between 1848 and 1960 are due to fluctuations in the relative shares of the primary and tertiary sectors, whereas the share of the secondary sector remained stable. It is important to keep this fact in mind when discussing if the observed changes in male occupational structure are due to real sectoral shifts or changes in enumeration policies across population censuses. I discuss the causes of these shifts in section 6.

## **5.2 Female Occupational Structure**

Panel (B) of Figure V depicts the evolution of the occupational structure of the employed female labor force in 1848-2006. Given the changes in enumeration of female employment across population censuses that I discussed in section 4, the figures here should be interpreted simply as shifts in the sectoral composition of *enumerated* females who have at least one occupational title in 1848-1947 or who are treated as “employed” in 1960-2006. Enumerated females with occupational titles in 1848-1897 are overwhelmingly (about 78-96 percent) working in the tertiary

sector, mostly as domestic servants (and slaves in 1848 and 1868), whereas the share of enumerated females in the primary and secondary sectors during that period is almost negligible. Between 1907 and 1947, however, and as the census administration improved the enumeration of female employment in agriculture and (domestic) services (but not in the secondary sector), the share of the primary sector increased to 52-77 percent, the share of the tertiary sector remained high at 30-44 percent, whereas the share of the secondary sector remained very low (1-7 percent). In terms of absolute numbers, the number of enumerated females in agriculture increased from 0 in 1897 to 104,160 in 1907, but the highest enumeration levels of female employment in agriculture were achieved in 1947 (3,898,708) and 1917 (1,622,812), followed by 1937 (703,121) and 1927 (523,932). Similarly, the number of enumerated females in the tertiary sector (mostly, domestic services) increased significantly (starting from 1917) to reach 738,455 and 2,690,461 in 1917 and 1947 respectively (compared to 60,893 in 1907). By contrast, the number of enumerated females in the secondary sector did not witness significant increases.

The level of enumerating female employment dropped in 1960 census more in agriculture than in services. This is reflected in the decline of the share of the primary sector from 59 percent in 1947 to 46 percent in 1960 and the increase in the share of the tertiary sector from 40 to 49 percent between the two years. Enumeration of female employment remained unchanged in 1976, 1986, 1996, and 2006. During this period, the share of the primary sector continued to decrease to 23 percent in 1976, and then to 11 percent in 1986, before it remained stable in 1986-2006 at 10-11 percent. This decline was mirrored by a continuous rise in the share of the tertiary sector to 62 percent in 1976 and 77 percent in 1986, before it increased slowly to 78 percent in 1996 and 82 percent in 2006. The share of the secondary sector also increased from 1 percent in 1947 to 4 percent in 1960, and 15 percent in 1976, before it decreased again to 12 percent in 1986, 11 percent in 1996, and 7 percent in 2006.

## 6. Causes of Egypt's Occupational Shifts in 1848-2006

Do the occupational shifts among employed males and females that took place from 1848 to 2006, and were documented in the previous section, reflect real sectoral shifts or rather changes in enumeration of employment across population censuses? If they are real shifts, are they consistent with the changes in GDP per capita and urbanization as well as the macroeconomic policy changes that I documented in the beginning of this chapter? This section attempts to address these central questions. I start with discussing the causes of female occupational shifts since they are probably driven by changes in enumeration (at least until 1960), before I dedicate the rest of the section to understanding the causes of male occupational shifts.

### 6.1 Female Occupational Shifts

The under-enumeration of female employment in 1848-1897 and the subsequent improvement in enumeration in 1907-1947 suggests that the female occupational shift that is observed in 1907-1947 from the tertiary to the primary sector is an artifact of the improvement in enumeration of female employment in agriculture. Nevertheless, since the enumeration policy of female employment remained likely unchanged in 1960-2006, although it consistently under-enumerated the *levels* of female employment during that period, the documented sectoral changes in female employment during that period are likely attributable to real occupational shifts. In particular, the findings may reflect an occupational shift in 1960-2006 among employed female wageworkers from the primary sector to the tertiary and secondary sectors that in fact mirrors the occupational shift among employed males during the same period.

Because the changes in enumeration of female employment make it difficult to trace the real sectoral changes among employed females, I focus in the remaining part of this section on understanding the underlying causes of the occupational shifts among employed males from 1848 to 2006. However, disentangling the real sectoral shifts of employed females in Egypt from 1848 to 2006 and their causes over time is an important area for future research.

## 6.2 Male Occupational Shifts

To examine the causes of male occupational shifts more closely, I show in Tables III-VIII, the specific occupational categories for males that are classified under the primary, secondary, and tertiary sectors in each population census from 1848 to 2006. Below, I first discuss the measurement issues in the 1848 and 1868 individual-level population census samples in more depth since these samples provide the most detailed occupational titles. I then discuss the occupational shifts in 1848-2006 where I make use of the detailed occupational classification in each population census.

### *6.2.1 The 1848 and 1868 Population Census Samples*

The individual-level population census samples from 1848 and 1868 provide detailed occupational titles in Arabic. I coded the occupational titles following the 5-digit HISCO occupational coding scheme (Saleh 2015) but for the purpose of this chapter I translated the HISCO codes into the 2-digit PSTI classification. The results of this exercise are shown in Tables III and IV that show the PSTI classification of employed males in the census samples at the 1-digit and 2-digit levels respectively.

There are three issues that arise in the 1848 and 1868 population census samples. The first issue is the existence of a relatively large number of males with missing occupational titles as has been discussed in Table I. Those individuals are considered “without occupation” in Table I and hence should not be included in the occupational structure analysis. Importantly though, it turns out that males with missing occupational titles are over-represented in rural provinces. I thus conjecture that those are farmers whose occupational title is omitted by the census takers since they belong to the “default” occupational group in rural Egypt: farmers. This behavior on part of the census takers is actually reflected in the omission of the default group with respect to other fields such as omitting “Muslim” in the religion field, “Egyptian” in the nationality field, and “free” in the legal status field (i.e. free or slave). In other words, the census takers focused more on reporting the “anomalous” category rather than the default group. Based on this



conjecture, I imputed the occupational titles as “farmers” for males in working age (15+ years of age) who resided in rural Egypt and whose occupation is omitted.

Table III shows the 1-digit PSTI classification of males “with occupation” in the 1848 and 1868 population census samples for both the original sample and the sample with imputed occupational titles for working-age males in rural Egypt. As can be seen in the table, imputing occupations increases the share of the primary sector in 1848 from 62 to 71 percent and in 1868 from 46 to 63 percent. The estimates for the imputed sample are, I argue, more credible since they are closer to the share of the primary sector in the subsequent population censuses of 1897 and 1907 (65 and 68 percent respectively). Naturally, the imputation reduces the share of the secondary sector in each year from 11-12 percent to 8 percent and the share of the tertiary sector from 23 to 18 percent in 1848 and from 40 to 28 percent in 1868.<sup>10</sup>

The second issue is the existence of individuals with sectorally unspecific occupations. Those are individuals recorded as “with occupation” in Table I, but who have vague occupational titles such “laborer,” “worker,” “follower,” “servant (non-domestic),” “wage worker,” and “assistant,” from which it is not possible to infer the sector of employment. The laborer problem is quite prevalent in historical censuses, even in Western Europe and North America. Fortunately though, the share of those individuals in the Egyptian censuses is relatively small, compared to the aforementioned, and more prevalent, problem of individuals with missing occupational titles.

The third issue is that of by-employment. Although, to the best of my knowledge, little is known in the historical literature on by-employment in nineteenth-century Egypt, presumably because of the lack of data sources, the 1848 and 1868 samples contain examples for individuals, especially farmers, who have two (or more) occupational titles reported. For example, an individual could be recorded as both a farmer and a police guard, or as a farmer and a teacher in a religious school. I addressed this problem in the original HISCO coding of occupations by

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<sup>10</sup> The figures for 1848 and 1868 in Figure V are computed from the samples with imputed occupations.

choosing to code the first occupational title in Arabic. It also appears that the share of enumerated by-employment is small and is almost limited to rural Egypt.

### *6.2.2 Male Occupational Shifts in 1848-1868*

Having discussed the measurement issues in the 1848 and 1868 population census samples, I now turn to discussing the causes of the male occupational shift, specifically, the tertiarization, that is observed between 1848 and 1868 that I outlined in section 5. To understand which sectors are driving the tertiarization during this period, I focus on Tables III and IV which show the 1-digit and 2-digit PSTI classifications of males “with occupation” in 1848 and 1868, and hence allow identifying the industries that employed the largest population share within each sector. In both 1848 and 1868, the primary sector was almost entirely made up of agriculture. The top industries in the secondary sector in both 1848 and 1868 were textiles, building and construction, and food industries, although the share of textiles declined between the two years, due to the closures of most state textiles firms during this period (Saleh 2015). The top occupations in the tertiary sector in 1848 are professions, domestic service, local government service, sea (water) transport, dealers, commercial and administrative services, and armed forces. In 1868, the top occupations in the tertiary sector include, in addition to the previous occupations, small traders, sellers, and miscellaneous service industries.

Which occupations in the tertiary sector grew between 1848 and 1868? Table III shows that these were mainly sellers, services, and professions. A closer look at Table IV shows that the increase in the shares of professions, local government service, domestic service, armed forces, and small traders is what is driving the tertiarization during this period.

Table V gives a further look into the occupational shift as it allows us to understand which regions are driving the tertiarization. The table shows the occupational structure (using the imputed sample) in 1848 and 1868 by region. Following the standard division of Egypt, I classify the sample into three regions: (a) the urban provinces (Cairo, Alexandria, Rosetta, Damietta, Al-Arish, and Al-Qusayr), (b) the Nile Delta that extends from the north of Cairo to the

Mediterranean Sea, and (c) the Nile Valley that extends from the south of Cairo to Egypt's southern border with Sudan. The table reveals that the occupational structure in urban provinces remained quite unchanged between 1848 and 1868, with the tertiary sector employing the majority of the population at 61 percent, the secondary sector employing 36 percent, and the remaining 3-4 percent employed in the primary sector. The Nile Delta witnessed a little change as well between 1848 and 1868 with about 77-78 percent of the population employed in the primary sector, 3-5 percent in the secondary sector, and the rest in the tertiary sector, mostly as services and professions (teachers in religious schools, religious personnel, and police guards). The only region that witnessed a major shift in its occupational structure is the Nile Valley, where the share of the primary sector dropped from 77 percent in 1848 (almost the same value as in the Delta) to 60 percent in 1868, with a corresponding large increase in the share of the tertiary sector from 15 to 32 percent and stability in the share of the secondary sector (around 6-7 percent).

There are three possible reasons for the tertiarization of the economy of the Nile Valley in 1848-1868, all of which were of *temporary* nature and did *not* reflect a permanent occupational shift. First, the cotton boom that occurred due to the American Civil War in 1861-1865 caused a sudden increase in Egypt's cotton production that quadrupled over a few years. Since cotton cultivation in Egypt was almost entirely limited to the Delta, agriculture in the Valley may have deteriorated as a result either because many farmers emigrated from the Valley to the Delta, or because the government directed its resources to improving irrigation and agriculture in the Delta. Second, military conscription increased during this period due to Ismail's expansionary wars. Since farmers in the Valley were traditionally targeted for conscription, this policy pushed males in that region away from agriculture to becoming military personnel and police guards, thus contributing to the tertiarization of the economy. Equally important, males in the Valley may have shifted to non-farming occupations such as trade and professions in order to avoid military conscription that targeted farmers. Third, the construction of the Suez Canal from 1859 to 1869

relied on *corvée* labor that was mostly drawn from the Valley. Again, the coercion of labor in the Valley to work in the Suez Canal pushed its males away from agriculture.

### *6.2.3 Male Occupational Shifts in 1868-1917*

The period from 1868 to 1917 witnessed two shifts, de-tertiarization between 1868 and 1907 followed by tertiarization in 1907-1917. Table VI shows the detailed occupational structure under the British Occupation in the 1897, 1907, and 1917 censuses. Again, the primary sector is almost entirely made up of agriculture despite changes in the terminology used in each census. The largest industries in the secondary sector in 1897 are food products and textiles, while the village/quarter-level tables of the 1907 and 1917 censuses only report the occupational category of “manufacturing” without further details. The tertiary sector in 1897 employed the highest population shares in religious services, domestic services, trade, and transportation and communications. Perhaps similarly, the top occupations in the tertiary sector in 1907 and 1917 are commerce, professionals, transportation and communications, diverse services, and domestic services.

The aggregate categories that are reported under the tertiary sector in 1897 and 1907 do not permit constructing a full account of which sectors were driving the de-tertiarization between 1868 and 1907. However, there is a decrease in the share of services and professions such as the military (presumably due to decreasing the army size under the British Occupation). One may speculate that the temporary increase in the share of the tertiary sector between 1848 and 1868 was reversed in the subsequent period as its temporary causes ceased to exist, leading to a revival in the share of the primary sector.

The following tertiarization between 1907 and 1917 is also difficult to account for since it is mainly driven by an increase in the share of “diverse services.” I conjecture that the tertiarization in 1907-1917 is an artifact of the improvement in enumeration of male employment in informal services.

#### *6.2.4 Male Occupational Shifts in 1917-1947*

The period from 1917 to 1947 witnessed an episode of stability in 1917-1937 followed by industrialization and de-tertiarization in 1937-1947.

Table VII shows the evolution of the occupational structure following Egypt's nominal independence from Britain in 1922 using the censuses of 1927, 1937, and 1947. The relative share of each sector is stable in 1917, 1927, and 1937. However, given the level of aggregation of the occupational categories, it is not possible to identify the sectors that are driving the rise in the share of the secondary sector and the decline in the share of the tertiary sector between 1937 and 1947. It is possible, however, that this was a real occupational shift due to the growth of the Egyptian private sector in manufacturing during this period.

#### *6.2.5 Male Occupational Shifts in 1947-2006*

The period from 1947 to 2006 is divided into three episodes: tertiarization in 1947-1960, industrialization and tertiarization in 1960-1996, and tertiarization in 1996-2006. Table VIII documents the evolution of the occupational structure following the military coup in 1952 using the censuses of 1960, 1976, 1986, 1996, and 2006. Four findings are important to note here. One, tertiarization between 1947 and 1960 preceded the growth in the share of the secondary sector after 1960. Two, the observed increase in the share of the secondary sector in 1960-1996 is attributable to a rise in the share of the manufacturing sector in 1960-1976, and to the growth of the construction sector in 1976-1996. In fact, the manufacturing sector stagnated after 1976. Three, the rise in the share of the tertiary sector is largely attributable to the increase in the share of services and professions, such as financing, insurance, real estate, and business services, and in the shares of trade and transport and communications. Four, the growth of the secondary sector stagnated in 1996-2006 (manufacturing actually declined) while the share of the tertiary sector continued to increase.

### 6.2.6 *Summary*

So far, I documented the potential causes of male occupational shifts in Egypt from 1848 to 2006. This long period spans various episodes that have been documented historically: (a) the first wave of state industrialization under Muhammad Ali Pasha in 1816-1848 with its focus on manufacturing (textiles and military sectors), (b) the second wave of state industrialization under Muhammad Ali's successors in 1848-1882, with its shift from manufacturing to transportation and communication, and partial de-industrialization due to the closures of most of Ali's state manufactories, (c) the British Occupation in 1882-1922, with the increase in the share of foreign capital in the three sectors of the economy, (d) the rise of the share of Egyptian capital vis-à-vis foreign capital after Egypt's nominal independence in 1922-1952, (e) the third state industrialization wave under Nasser in 1952-1967 with its focus on manufacturing, and (e) the period of openness to trade and foreign investment in 1974-2006.

However, the male occupational shifts that have been documented so far provide a slightly different picture. With respect to state industrialization in 1816-1848 and (partial) de-industrialization in 1848-1882, the evidence from the population censuses does not allow us to assess the growth in the share of the secondary sector in 1816-1848 due to the lack of data before 1848. However, the 1848 census sample reveals that state manufactories in textiles, military, paper, printing, and other sectors recruited 8 percent of the adult (15+) employed male population in Cairo and Alexandria 1848. The data also allow us to examine the sectoral shift from 1848 to 1882. First, state manufactories and transportation and communication firms in 1868 recruited only 3 percent of the adult employed male population in Cairo and Alexandria, indicating that there was indeed a decline in employment in state manufactories (also, the share of textiles fell in 1848-1868), due to the closures of most of Ali's firms. However, the overall share of the secondary sector remained stable in 1848-1868, suggesting that there was no overall "de-industrialization" under Ali's successors. Second, while there is evidence for tertiarization in 1848-1868, it does not seem to be driven by the second wave of state industrialization and its

shift to transportation and communications. For one, the tertiarization between 1848 and 1868 did not take place in Cairo and Alexandria (where state transportation and communication firms were located), but in the Nile Valley. For another, the tertiarization in this region was likely due to temporary causes (and not real occupational shifts) such as the expansion of cotton cultivation in the Delta, the increased military conscription, and the recruitment of *corvée* labor for the construction of the Suez Canal (which is the only cause that is related to the state transportation firms). Overall, this suggests that the industrialization in 1816-1848 and the de-industrialization in 1848-1882 that has been suggested by the historical literature may *not* reflect aggregate shifts in the composition of the employed labor force from the primary to the secondary sector in 1816-1848 and then back to the primary sector in 1848-1882. Instead, since state manufactories recruited a small share of the population, they only caused a modest shift in the technology of production in the manufacturing sector (presumably observed in large cities only) from the artisanal workshop towards the factory system in 1816-1848 and then back to the artisanal workshop in 1848-1868, but without generating a steady immigration of the labor force from the primary to the secondary sector in the “industrialization” phase or an opposite emigration to the primary sector in the “de-industrialization” phase.

With respect to the growth in the share of foreign capital under the British Occupation in 1882-1922 and the subsequent growth in share of Egyptian capital in 1922-1952, the empirical evidence suggests two things. First, there was de-tertiarization from 1868 to 1907 as the temporary causes of the increase in the tertiary sector ceased to exist. Second, there was industrialization between 1937 and 1947, which might have been driven by the growth of the share of Egyptian capital in the economy.

Finally, with respect to state industrialization in 1952-1967 and the subsequent shift to openness to foreign trade and foreign investment in 1974-2006, the evidence indicates that (a) tertiarization in 1947-1960 preceded industrialization in 1960-1976, (b) industrialization in 1960-1976 was due to a growth in the share of manufacturing, (c) industrialization did not come to a

halt following the 1967 Arab-Israeli war but continued through 1996, but the growth of the share of the secondary sector shifted from manufacturing to construction, and (d) tertiarization continued from 1947 through 2006 although the share of the secondary sector stagnated in 1996-2006. Importantly, the period from 1947 to 2006 corresponds to the rise in real GDP per capita that started in 1956 and continued through 2010, albeit with episodes of stagnation in 1966-1973 and 1986-1993 (Figure I). Overall, this suggests that the occupational shift that Egypt witnessed in the second half of the twentieth century is mainly a shift from the primary sector towards the tertiary sector and the construction sector. The shift to manufacturing occurred for only a brief period between 1960 and 1976. But from 1976 to 1996, Egypt witnessed industrialization, in the sense of a continuous growth in the share of the secondary sector, but without the industrial revolution in the sense of growth in the share of manufacturing.

Furthermore, the growth of the construction and tertiary sectors in 1976-2006 indicates that Egypt's rapid growth in real GDP per capita during this period was mainly due to non-tradable sectors that are not subject to international competition (since only cotton and oil exports are internationally competitive as they dominate Egypt's exports since 1865). The experience of Egypt in this regard is similar to many developing countries where the growth in real GDP per capita was due to the growth the employment share of internationally non-competitive sectors.

## **7. Conclusion**

This chapter has documented the evolution of employment, labor force participation, and the occupational structure of the employed labor force in Egypt in the last one and half centuries from 1848 to 2006. The evidence suggests a slightly different narrative from the traditional historiography. First, there is no evidence for de-industrialization in 1848-1882 following the failure of Ali's state industrialization program in 1816-1848, but there was tertiarization in 1848-1868 that has little to do with the shift to transportation and communications under Ali's successors. Second, the growth of the share of foreign capital in 1882-1922 was associated with



de-tertiarization in 1868-1907, although it is not possible to infer if the latter shift was caused by foreign capital. Third, the growth of the share of Egyptian capital in 1922-1952 might have led to industrialization in 1937-1947. Fourth, state industrialization in 1952-1967 was first associated with tertiarization in 1947-1960 followed by industrialization (due to manufacturing) in 1960-1976. Fifth, although industrialization continued through 1996, it shifted to construction since 1976. Finally, although the secondary sector stagnated in 1996-2006, tertiarization continued through 2006.

The chapter opens at least three new areas of research. First, the analysis above focused on male occupational shifts since female occupational shifts especially in 1848-1960 are arguably artifacts of changes in enumeration policies of female employment across population censuses. In the future, one may be able to correct for female employment and occupational structure figures using the 1917 and 1947 population censuses that were the most complete in enumerating female employment (although they carry the risk of over-enumeration). Second, due to the limited digitization of the population censuses, the analysis relied on aggregate occupational categories in the population censuses from 1897 to 2006. A more complete analysis can be carried out if the detailed occupational tables in 1897-1996 are digitized and if the more detailed ISCO occupational codes in the individual-level samples of 1986, 1996, and 2006, are translated to the PSTI classification. Third, a closer analysis of the impact of certain policy changes that occurred during each historical episode on the occupational structure for males and females is a must in order to have a more complete understanding of Egypt's occupational shifts in 1848-2006.

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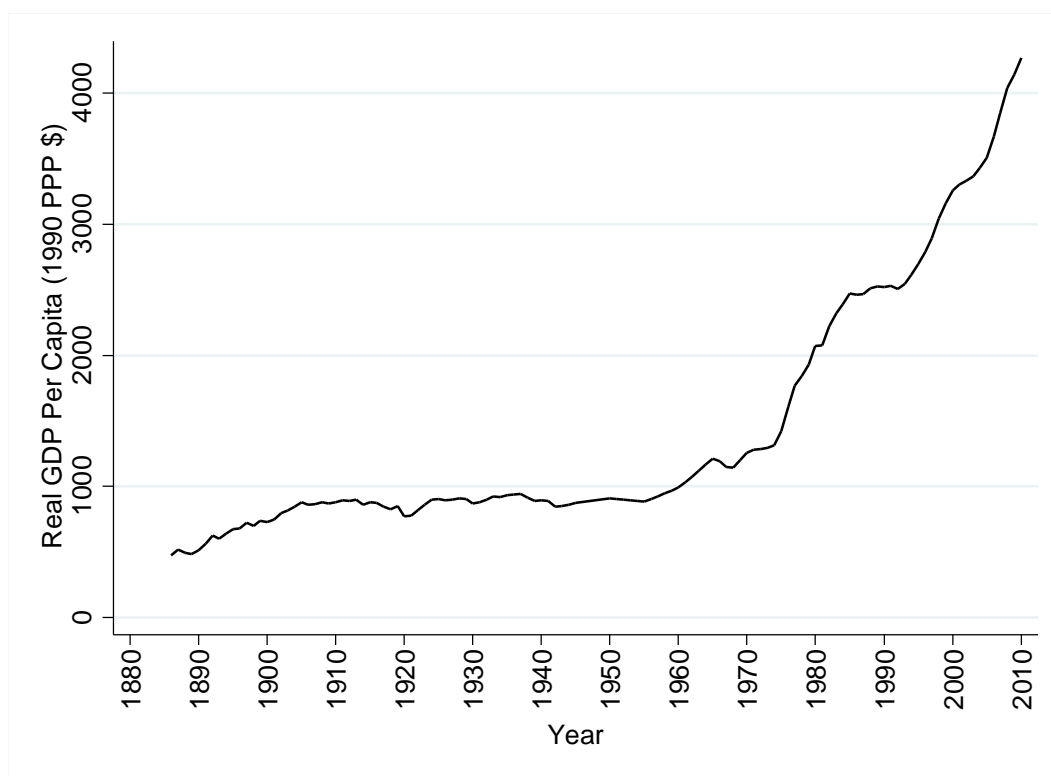
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**Figure I: Egypt's Real GDP Per Capita (1990 PPP \$)**



Sources:

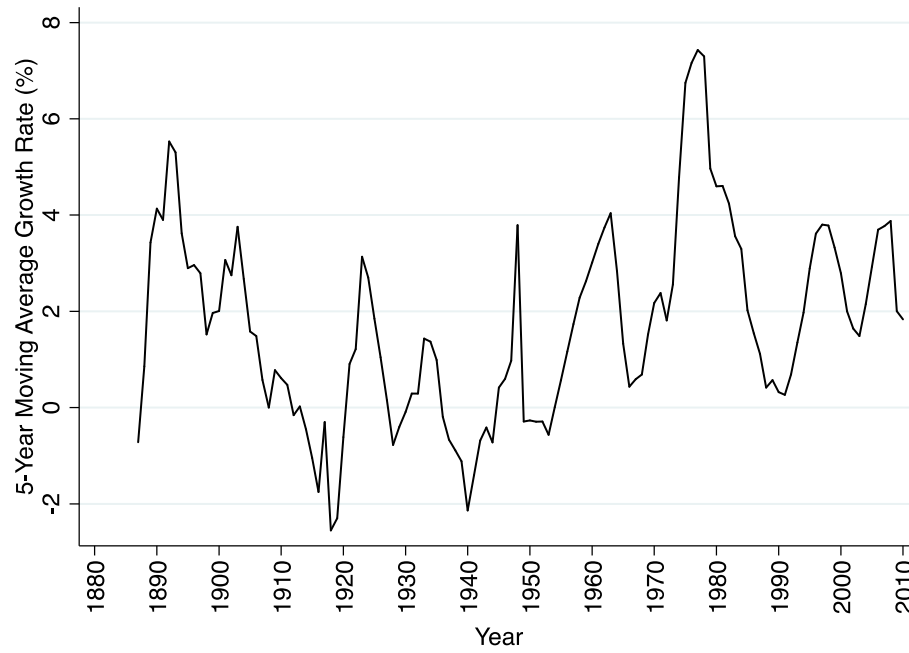
(1) 1886-1945: Yousef (2002).

(2) 1950-2010: Bolt and van Zanden (2013).

Notes: GDP per capita estimates in Yousef (2002) are in Egyptian Pounds (EGP, 1913 prices) while estimates in Bolt and van Zanden (2013) are in 1990 International GK USD (PPP \$). I transformed Yousef's estimates to PPP \$ using the exchange rate in 1913 (1 EGP = 99.78 PPP \$), since the GDP per capita in 1913 is reported in both series.

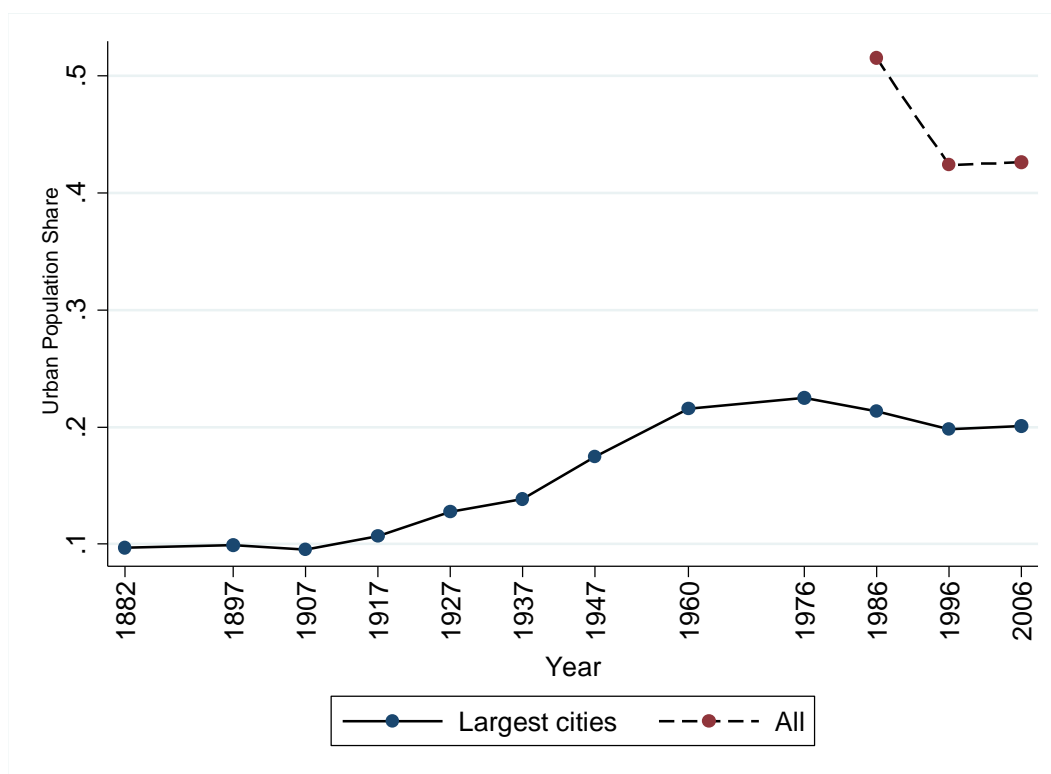
**Figure II: Growth Rate of Real GDP Per Capita in 1886-2010**

*(5-Year Moving Average)*



Sources: 1886-1945: Yousef (2002). 1950-2010: Bolt and van Zanden (2013). The annual growth rate of real GDP per capita is smoothed using a five-year moving average.

**Figure III: Population Share of Egypt's Largest Cities in 1882-2006**



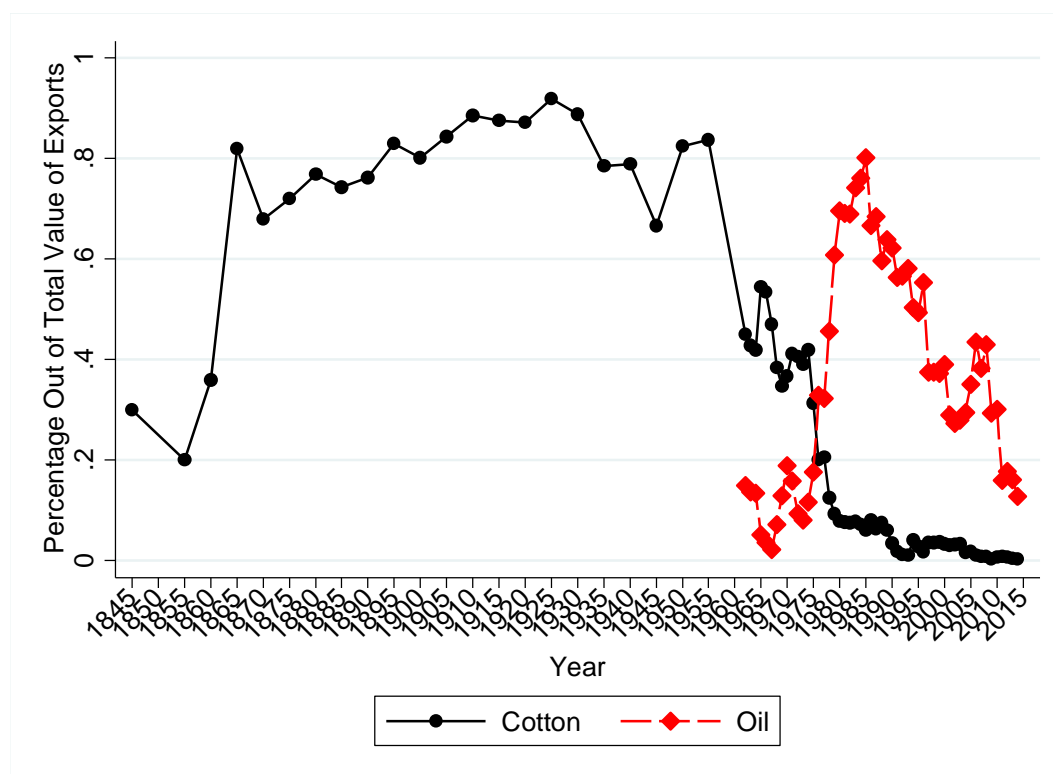
Sources:

(1) Population share of largest cities: 1882-1996: The village/quarter-level tables from the published population census reports of 1882, 1897, 1907, 1917, 1927, 1937, 1947, 1960, 1976, 1986, and 1996 that were digitized by CEDEJ (2003). 2006: The 10-percent individual-level population census sample of 2006 available on IPUMS-International.

(2) Share of all urban population in 1986, 1996, and 2006 is from the 10-percent individual-level population census samples of 1986, 1996, and 2006 that are available on IPUMS-International.

Notes: Largest cities include Cairo, Alexandria, and Suez Canal cities (Port Said, Suez, and Ismailiya). Each city is defined according to the administrative boundaries of each population census.

Figure IV: Egypt's Top Export Commodity in 1842-2014



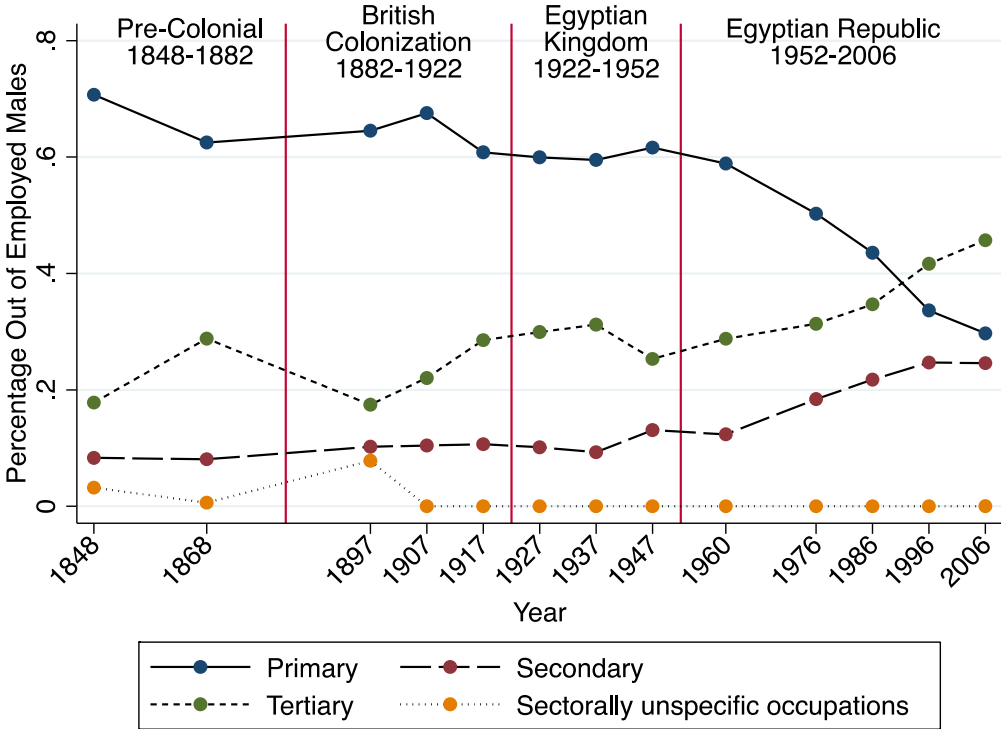
Sources:

- (1) 1842-1843: United Kingdom Parliamentary Papers Volume 24 (1849), *Tables of the Revenue, Population, and Commerce of the United Kingdom and Its Dependencies: Supplement to Part XIV, Statements Related to Foreign Countries Compiled from Official Returns*, London: W. Clowes and Sons, pp. 395-367.
- (2) 1855-1858: U.S. Department of State (1860), *Commercial Relations of the United States with Foreign Nations*, Washington D.C.: U.S Government Printing Office.
- (3) 1866-1876: U.S. Department of State (1876), *Commercial Relations of the United States with Foreign Nations*, Washington D.C.: U.S Government Printing Office.
- (4) 1878-1956: Issawi, Charles (1961), "Egypt since 1800: A Study in Lop-sided Development," *Journal of Economic History*, Vol. 21, No. 1, pp. 1-25.
- (5) 1962-2000: Feenstra, R. C., et al. (2005), "World Trade Flows, 1962–2000," National Bureau of Economic Research Working Paper No. 11040, Cambridge, MA: NBER.
- (6) 2000-2014: UN COMTRADE Database.

Notes: Cotton refers to raw cotton. Oil refers to (a) crude petroleum, (b) lubricating petroleum oils, and (c) liquified petroleum gases.

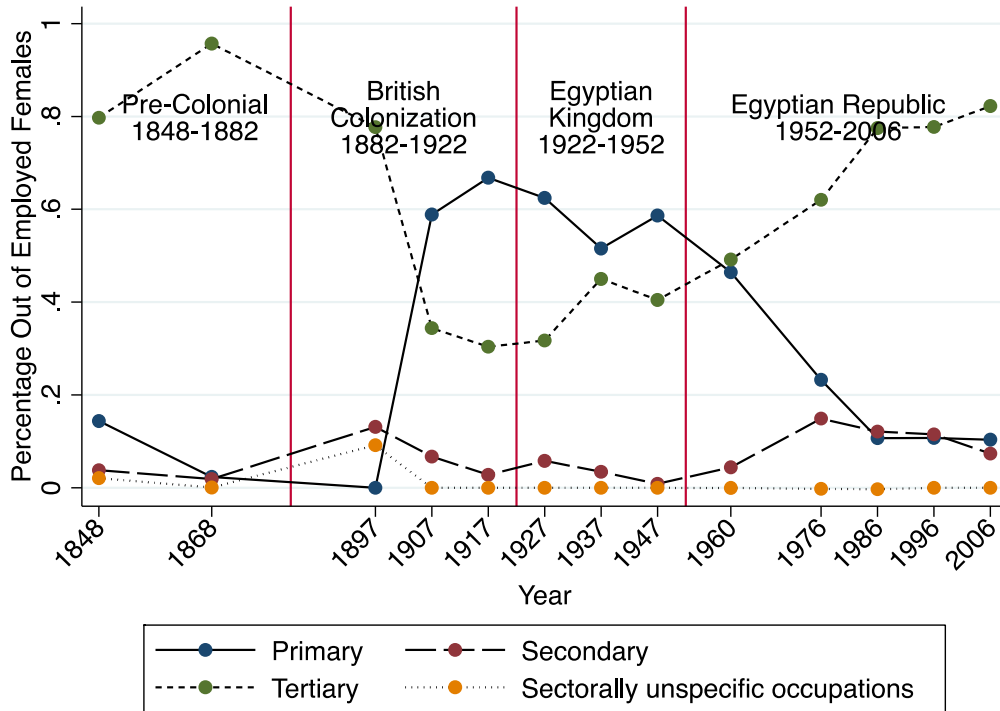
Figure V: Occupational Structure of the Employed Population in 1848-2006

(A) Males





## (B) Females



Sources:

- (1) 1848-1868: The individual-level population census samples of 1848 and 1868 (Saleh 2013).
- (2) 1897-1917: The national-level statistics on the occupational structure in the published population census reports of 1897, 1907, and 1917.
- (3) 1927-1996: The village/quarter-level tables from the published population census reports of 1927, 1937, 1947, 1960, 1976, 1986, and 1996 that were digitized by CEDEJ (2003).
- (4) 2006: The 10-percent individual-level population census sample of 2006 available on IPUMS-International.

Notes:

(1) In 1848, 1868, 1897, 1907, 1917, 1927, 1937, and 1947, the “employed” population is defined as those “with occupation” with a non-missing occupational title. In 1960, 1976, 1986, 1996, and 2006, the “employed” population is defined as those who are “employed” with non-missing employment status.

(2) The working-age population for whom the occupational title is defined differs from one population census to the other. I defined it in 1848 and 1868 in the case of males as those who are 15 years old and above. Because females in Cairo and Alexandria in these censuses have their age recorded in two categories, “juvenile” and “adult,” I defined the working-age female population in those two cities as “adult” females. In 1897, the working-age population is defined as the population that is 10 years old and above. In 1907, 1917, and 1927, it is defined as the entire population. In 1937 and 1947, it is defined as the population that is 5 years old and above. In 1960, 1976, 1986, and 2006, it is defined as the population that is 6 years old and above. In 1996, it is defined as the population that is 15 years old and above.

(3) The tertiary sector includes the following PSTI 1-digit categories: dealers, sellers, services and professions, and transport and communications. See Tables IV, VI, VII, and VIII for the occupational categories that are included under the primary, secondary, and tertiary sectors in each population census.

**Table I: Working-Age Population, Labor Force Participation, and Employment in 1848-2006**

**Panel (A): Males**

	1848	1868	1897	1907	1917	1927	1937	1947	1960	1976	1986	1996	2006
<b>With occupation ("Employed" in 1960- 2006):</b>	947129	1063304	3176778	3458494	3982588	5006587	6058412	5934607	7057409	9438710	10816043	13547789	16839050
<i>Employer</i>									564463	845826	501485	1060034	
<i>Self-employed</i>									1700567	1980173	3191527	3089906	
<i>Employee</i>									3506557	6048640	6806312	9012477	
<i>Unpaid family worker</i>									1264625	561420	316719	385372	
<i>Unpaid worker</i>									21197	2651			
<b>Without occupation:</b>	315701	480434	147398	2208580	2386929	2051486	868150	2175840	3522815	6028839	9256774	5921168	16120320
1. Unemployed									139149	557827	1073815	1002885	1394060
2. Out of LF:	3424	9965							3340569	5287286	8008537	4224978	13692520
<i>Unable to work</i>									181796	378380	130059	176712	125190
<i>Unwilling to work</i>									3158773	388693	308325	262149	
<i>Student</i>	3204	8140								4358290	6662388	2615730	9967180
<i>Retired</i>	220	1825								127853	383118	697405	1023590
<i>Senior</i>										34070	524647	472982	1122400
<i>Inactive, other reasons</i>													1454160
3. Missing occupation (missing "employment status" in 1960-2006)	312277	470469	147398	2208580	2386929	2051486	868150	2175840	10084	147191	1677	48240	914400
Population	2201527	2760345	4947850	5667074	6369517	7058073	7966675	9384417	13068012	18647289	24634027	30351390	37241980
Population 5+	1754608	2214830			5511092	6045287	6926562	8110447	10956360	16096446	20738771	26839614	33286190
Population 6+	1632538	2090628							10547211	15431014	19900072	25714370	32840030
Population 10+	1436077	1799661	3324176		4606077	5107854	5818683	6870381	8984433	13674633	17478330	22900493	29332160
Population 15+	1262830	1543738				4247371	4787734	5728340	7333012	11092654	14556753	18823892	25323990

**Panel (B): Females**

	1848	1868	1897	1907	1917	1927	1937	1947	1960	1976	1986	1996	2006
<b>With occupation ("Employed" in 1960- 2006):</b>	35834	41809	71171	176969	2429445	839078	1363836	6647251	585562	692392	1104887	2017506	3181330
<i>Employer</i>									11952	14117	12881	37047	
<i>Self-employed</i>									51577	50911	52292	105937	
<i>Employee</i>									343104	571193	993748	1813142	
<i>Unpaid family worker</i>									176299	55416	45966	61380	
<i>Unpaid worker</i>									2630	755			
<b>Without occupation:</b>	1355029	1601604	3118902	5443316	3919293	6280713	5485301	1621155	9937175	14191864	17882493	15639914	28238120
1. Unemployed									35791	292606	358154	515902	752140
2. Out of LF:	167	48							9894733	13873256	17467227	14997945	26620350
<i>Unable to work</i>									315490	666418	69382	95098	74410
<i>Unwilling to work</i>									9579243	0	27775	0	
<i>Student</i>	167	48								2600247	4744425	1810182	8856670
<i>Retired</i>	0	0								4238	0	105535	239170
<i>Senior</i>										13976	723041	484477	835760
<i>Housewife</i>										10588377	11902604	12502653	16528660
<i>Inactive, other reasons</i>													85680
3. Missing occupation (missing "employment status" in 1960-2006)	1354862	1601556	3118902	5443316	3919293	6280713	5485301	1621155	4024	2894	5823	70146	841750
Population	2221570	2503875	4786555	5620285	6348738	7119791	7954019	9570411	12916089	17978915	23473554	28961524	35582360
Population 5+ (rural only)	1621452	1996416			5452972	6062485	6849137	8268406	10894919	15481834	19756201	25618058	31813850
Population 6+ (rural only)	1519605	1891873							10520110	14861148	18936091	24565857	31395570
Population 10+ (rural only)	1371520	1656077	3190073		4555867	5140527	5748179	7041824	9067843	13221945	16695216	21930927	28110830
Population 15+	1390863	1643413				4421132	4870025	5970534	7540640	10898401	14056046	17601499	24395590

*Sources:* 1848-1868: the individual-level population census samples of 1848 and 1868 (Saleh 2013); 1897-1917: the national-level statistics on the occupational structure in the published population census reports of 1897, 1907, and 1917; 1927-1996: the digitized village/quarter-level data from the published population census reports of 1927, 1937, 1947, 1960, 1976, 1986, and 1996 (CEDEJ 2003); 2006: the 10-percent individual-level population census sample available on IPUMS-International.

*Notes:*

(1) In 1848-1947, the Egyptian population censuses collected information on the “occupational title.” Thus, individuals “with occupation” is equivalent to the “employed” with non-missing occupational titles, while individuals “without occupation” include the unemployed, those who are outside the labor force, and those with missing occupational titles. In 1960-2006, the censuses collected information on the “employment status” distinguishing between the employed, the unemployed, those who are outside the labor force, and those with missing employment status.

(2) The working-age population for whom the “occupational title” in 1848-1947 and the “employment status” in 1960-2006 are defined differs from one population census to the other. I defined it in 1848 and 1868 as those who are 15 years old and above. Because females in Cairo and Alexandria in the 1848 and 1868 censuses have their age recorded in two categories, “juvenile” and “adult,” I defined the working-age female population in those two cities as the “adult” females. In 1897, the working-age population is defined as the population that is 10 years old and above. In 1907, 1917, and 1927, it is defined as the entire population. In 1937 and 1947, it is defined as the population that is 5 years old and above. In 1960, 1976, 1986, and 2006 it is defined as the population that is 6 years old and above. In 1996, it is defined as the population that is 15 years old and above.

**Table II: Estimates of Employment and Labor Force Participation Rates in 1848-2006**

**Panel (A): Males**

	1848	1868	1897	1907	1917	1927	1937	1947	1960	1976	1986	1996	2006
<b>Employment rate out of:</b>													
Males (all)	0.43	0.39	0.64	0.61	0.63	0.71	0.76	0.63	0.54	0.51	0.44	0.45	0.45
Males (5+)	0.54	0.48			0.72	0.83	0.87	0.73	0.64	0.59	0.52	0.50	0.51
Males (6+)	0.58	0.51							0.67	0.61	0.54	0.53	0.51
Males (10+)	0.66	0.59	0.96		0.86	0.98	1.04	0.86	0.79	0.69	0.62	0.59	0.57
Males (15+)	0.75	0.69				1.18	1.27	1.04	0.96	0.85	0.74	0.72	0.66
<b>Labor force participation (LFPR) rate out of:</b>													
Males (all)									0.55	0.54	0.48	0.48	0.49
Males (5+)									0.66	0.62	0.57	0.54	0.55
Males (6+)									0.68	0.65	0.60	0.57	0.56
Males (10+)									0.80	0.73	0.68	0.64	0.62
Males (15+)									0.98	0.90	0.82	0.77	0.72

### Panel (B): Females

	1848	1868	1897	1907	1917	1927	1937	1947	1960	1976	1986	1996	2006
<b>Employment rate:</b>													
Females (all)	0.02	0.02	0.01	0.03	0.38	0.12	0.17	0.69	0.05	0.04	0.05	0.07	0.09
Females (5+)	0.02	0.02			0.45	0.14	0.20	0.80	0.05	0.04	0.06	0.08	0.10
Females (6+)	0.02	0.02							0.06	0.05	0.06	0.08	0.10
Females (10+)	0.03	0.03	0.02		0.53	0.16	0.24	0.94	0.06	0.05	0.07	0.09	0.11
Females (15+)	0.03	0.03				0.19	0.28	1.11	0.08	0.06	0.08	0.11	0.13
<b>Labor force participation (LFPR) rate out of:</b>													
Females (all)									0.05	0.04	0.05	0.07	0.09
Females (5+)									0.05	0.04	0.06	0.08	0.10
Females (6+)									0.06	0.05	0.06	0.08	0.10
Females (10+)									0.06	0.05	0.07	0.09	0.11
Females (15+)									0.08	0.06	0.08	0.11	0.13

*Sources:*

- (1) 1848-1868: The individual-level population census samples of 1848 and 1868 (Saleh 2013)
- (2) 1897-1917: The national-level statistics on the occupational structure in the published population census reports of 1897, 1907, and 1917
- (3) 1927-1996: The village/quarter-level data from the published population census reports of 1927, 1937, 1947, 1960, 1976, 1986, and 1996 that were digitized by CEDEJ (2003)
- (4) 2006: The 10-percent individual-level population census sample of 2006 available on IPUMS-International.

*Notes:*

- (1) Employment rate is computed in 1848-1947 as the population “with occupation” divided by the population size in the specified age group. In 1960-2006, it is computed as the “employed” population divided by the population size in the specified age group.
- (2) Labor force participation rate (LFPR) in 1960-2006 is defined as the population in the labor force divided by the population size in the specified age group. The labor force equals the sum of the employed and unemployed populations.

**Table III: Male Occupational Structure in Pre-Colonial Egypt - The Reigns of Muhammad Ali Pasha and Ismail Pasha (1848-1868)**

	Original Sample		Imputing males (15+) with missing occupational titles in rural provinces as “farmers”	
	1848 (%)	1868 (%)	1848 (%)	1868 (%)
PRIMARY	61.60	46.44	70.69	62.50
SECONDARY	10.91	11.53	8.31	8.08
TERTIARY dealers	1.76	2.25	1.34	1.58
TERTIARY sellers	2.17	4.53	1.65	3.18
TERTIARY services and professions	15.81	29.39	12.08	20.58
Transport and Communications	3.60	3.82	2.74	2.67
Sectorally unspecific occupations	4.16	2.03	3.18	1.42
<b>Total</b>	100.00	100.00	100.00	100.00

Source: The individual-level population census samples of 1848 and 1868 (Saleh 2013).

Notes: (1) The census samples are restricted in this table to males who are at least 15 years of age and who are recorded as “with occupation.” This restriction excludes males in working age who are out of labor force (students and retired personnel) and males with missing occupational titles. Occupations of males with missing occupational titles in rural provinces are imputed as “farmers” and are hence classified under the primary sector. Rural provinces are the provinces of the Nile Delta and the Nile Valley: Al-Daqahliya, Al-Sharqiya, Al-Qalyubiya, Al-Gharbiya, Al-Menoufiya, Al-Buhayra, Al-Giza, Bani Souayf, Al-Fayyum, Al-Minya, Asyut, Girga, Qena, and Isna.

(2) I originally coded the occupational titles of the 1848 and 1868 population census samples according to the 5-digit coding scheme of the Historical International Standard Classification of Occupations (HISCO). I translated the HISCO coding scheme to the 2-digit PST coding scheme for the purpose of this chapter.

(3) Personal sample weights are applied in calculating the proportions of each sector in each population census sample in order to account for the different sampling rates across provinces.

(4) See Table IV for more information on the detailed occupational titles that are included under the primary, secondary, and tertiary sectors in 1848 and 1868.

**Table IV: Male Occupational Structure in 1848 and 1868 - Detailed**

**(A) 1848**

PST (2 Digit)	Sector	Group	Proportion
11	PRIMARY	Agriculture	0.7043
13	PRIMARY	Forestry	0.0002
14	PRIMARY	Fishing	0.0024
20	SECONDARY		0.0057
21	SECONDARY	Food industries	0.0144
210	SECONDARY	Clothing	0.0024
215	SECONDARY	Footwear	0.0017
22	SECONDARY	Drink industries	0.0005
220	SECONDARY	Textiles	0.0225
225	SECONDARY	Wood industries	0.0044
23	SECONDARY	Tobacco industries	0.0012
230	SECONDARY	Industries using leather, bone etc.	0.0011
231	SECONDARY	Industries producing products from fibers	0.0001
235	SECONDARY	Furnishing	0.0000
240	SECONDARY	Paper industries	0.0000
241	SECONDARY	Printing	0.0004
245	SECONDARY	Earthenware, pottery manufacture	0.0032
246	SECONDARY	Glass industries	0.0003
250	SECONDARY	Precious metals and jewelry	0.0009
252	SECONDARY	Instrument making	0.0000
255	SECONDARY	Chemical, soap, adhesives, manufacture	0.0010
256	SECONDARY	Rubber, manufacture	0.0000
261	SECONDARY	Iron and steel manufacture and products	0.0027
262	SECONDARY	Non-ferrous metal manufacture and products	0.0010
265	SECONDARY	Machines and tools, making and operation	0.0004
271	SECONDARY	Boat and ship building	0.0010
276	SECONDARY	Stone and mineral processing industries	0.0009
280	SECONDARY	Building and construction	0.0150
281	SECONDARY	Public Works	0.0001
285	SECONDARY	Minor manufactures and trades	0.0021
30	TERTIARY dealers		0.0134
40	TERTIARY sellers		0.0069
42	TERTIARY sellers	Sellers of drink	0.0023
490	TERTIARY sellers	Small traders	0.0073
50	TERTIARY services and professions		0.0000
51	TERTIARY services and professions	Food, drink and accommodation services	0.0013
510	TERTIARY services and professions	Storage	0.0000
515	TERTIARY services and professions	Entertainment	0.0026
516	TERTIARY services and professions	Media	0.0000
520	TERTIARY services and professions	Miscellaneous service industries	0.0098
525	TERTIARY services and professions	Domestic service	0.0277



**Table IV (Cont.)**

530	TERTIARY services and professions	Financial services and professions	0.0037
531	TERTIARY services and professions	Commercial and administrative services	0.0117
535	TERTIARY services and professions	Professions	0.0317
536	TERTIARY services and professions	Professional support	0.0003
541	TERTIARY services and professions	Local government service	0.0204
542	TERTIARY services and professions	National government service	0.0005
550	TERTIARY services and professions	Armed forces	0.0110
560	TERTIARY services and professions	Owners, possessors of capital	0.0001
60	Transport and Communications		0.0001
61	Transport and Communications	Road transport (animal power)	0.0071
64	Transport and Communications	Sea transport	0.0179
65	Transport and Communications	Rail transport	0.0000
650	Transport and Communications	Communications	0.0023
900	Sectorally unspecific occupations		0.0318

**(B) 1868**

PST (2 Digit)	Sector	Group	Proportion
11	PRIMARY	Agriculture	0.6225
13	PRIMARY	Forestry	0.0003
14	PRIMARY	Fishing	0.0022
20	SECONDARY		0.0003
21	SECONDARY	Food industries	0.0139
210	SECONDARY	Clothing	0.0024
215	SECONDARY	Footwear	0.0018
22	SECONDARY	Drink industries	0.0005
220	SECONDARY	Textiles	0.0198
225	SECONDARY	Wood industries	0.0052
23	SECONDARY	Tobacco industries	0.0016
230	SECONDARY	Industries using leather, bone etc.	0.0010
231	SECONDARY	Industries producing products from fibers	0.0002
235	SECONDARY	Furnishing	0.0000
240	SECONDARY	Paper industries	0.0001
241	SECONDARY	Printing	0.0003
245	SECONDARY	Earthenware, pottery manufacture	0.0016
246	SECONDARY	Glass industries	0.0001
250	SECONDARY	Precious metals and jewelry	0.0016
252	SECONDARY	Instrument making	0.0001
255	SECONDARY	Chemical, soap, adhesives, manufacture	0.0003
256	SECONDARY	Rubber, manufacture	0.0000
261	SECONDARY	Iron and steel manufacture and products	0.0015
262	SECONDARY	Non-ferrous metal manufacture and products	0.0016
265	SECONDARY	Machines and tools, making and operation	0.0008

271	SECONDARY	Boat and ship building	0.0007
276	SECONDARY	Stone and mineral processing industries	0.0012
280	SECONDARY	Building and construction	0.0223
281	SECONDARY	Public Works	0.0001
285	SECONDARY	Minor manufactures and trades	0.0018
30	TERTIARY dealers		0.0158
40	TERTIARY sellers		0.0106
42	TERTIARY sellers	Sellers of drink	0.0021
490	TERTIARY sellers	Small traders	0.0191
50	TERTIARY services and professions		0.0000
51	TERTIARY services and professions	Food, drink and accommodation services	0.0008
510	TERTIARY services and professions	Storage	
515	TERTIARY services and professions	Entertainment	0.0016
516	TERTIARY services and professions	Media	0.0000
520	TERTIARY services and professions	Miscellaneous service industries	0.0119
525	TERTIARY services and professions	Domestic service	0.0390
530	TERTIARY services and professions	Financial services and professions	0.0034
531	TERTIARY services and professions	Commercial and administrative services	0.0065
535	TERTIARY services and professions	Professions	0.0458
536	TERTIARY services and professions	Professional support	0.0010
541	TERTIARY services and professions	Local government service	0.0551
542	TERTIARY services and professions	National government service	0.0006
550	TERTIARY services and professions	Armed forces	0.0402
560	TERTIARY services and professions	Owners, possessors of capital	0.0000
60	Transport and Communications		0.0002
61	Transport and Communications	Road transport (animal power)	0.0094
64	Transport and Communications	Sea transport	0.0163
65	Transport and Communications	Rail transport	0.0004
650	Transport and Communications	Communications	0.0005
900	Sectorally unspecific occupations		0.0142

Source: The individual-level population census samples of 1848 and 1868 (Saleh 2013).

Notes: (1) The census samples are restricted in this table to males who are at least 15 years of age and who are recorded as “with occupation.” This restriction excludes males in working age who are out of labor force (students and retired personnel) and males with missing occupational titles. Occupations of males with missing occupational titles in rural provinces are imputed as “farmers” and are hence classified under the “PRIMARY” sector. Rural provinces are the provinces of the Nile Delta and the Nile Valley: Al-Daqahliya, Al-Sharqiya, Al-Qalyubiya, Al-Gharbiya, Al-Menoufiya, Al-Buhayra, Al-Giza, Bani Souayf, Al-Fayyum, Al-Minya, Asyut, Girga, Qena, and Isna.

(2) I originally coded the occupational titles of the 1848 and 1868 population census samples according to the 5-digit coding scheme of the Historical International Standard Classification of Occupations (HISCO). I translated the HISCO coding scheme to the 2-digit PST coding scheme for the purpose of this chapter.

(3) Personal sample weights are applied in calculating the proportions of each sector in each population census sample in order to account for the different sampling rates across provinces.

**Table V: Male Occupational Structure by Region in 1848 and 1868**

	Urban Provinces		Nile Delta		Nile Valley	
	1848 (%)	1868 (%)	1848 (%)	1868 (%)	1848 (%)	1868 (%)
PRIMARY	3.48	3.57	77.84	76.58	77.39	59.68
SECONDARY	36.16	36.06	5.13	3.19	5.82	7.14
TERTIARY dealers	9.07	10.97	0.53	0.30	0.56	0.81
TERTIARY sellers	6.24	6.29	1.05	1.21	1.34	4.87
TERTIARY services and professions	27.32	25.61	11.01	17.81	9.87	22.79
Transport and Communications	7.52	10.39	1.67	0.26	2.96	3.76
Sectorally unspecific occupations	10.20	7.11	2.77	0.65	2.06	0.96
<b>Total</b>	100.00	100.00	100.00	100.00	100.00	100.00

Source: The individual-level population census samples of 1848 and 1868 (Saleh 2013).

Notes: (1) The census samples are restricted in this table to males who are at least 15 years of age and who are recorded as “with occupation.” This restriction excludes males in working age who are out of labor force (students and retired personnel) and males with missing occupational titles. Occupations of males with missing occupational titles in rural provinces are imputed as “farmers” and are hence classified under the “PRIMARY” sector. Rural provinces are the provinces of the Nile Delta and the Nile Valley: Al-Daqahliya, Al-Sharqiya, Al-Qalyubiya, Al-Gharbiya, Al-Menoufiya, Al-Buhayra, Al-Giza, Bani Souayf, Al-Fayyum, Al-Minya, Asyut, Girga, Qena, and Isna.

(2) I originally coded the occupational titles of the 1848 and 1868 population census samples according to the 5-digit coding scheme of the Historical International Standard Classification of Occupations (HISCO). I translated the HISCO coding scheme to the 2-digit PST coding scheme for the purpose of this chapter.

(3) Personal sample weights were applied in calculating the proportions of each sector in each population census sample in order to account for the different sampling rates across provinces.

(4) Urban provinces include Cairo, Alexandria, Rosetta, Al-Arish, Al-Qusayr, and Damietta. Provinces in the Nile Delta include Al-Daqahliya, Al-Sharqiya, Al-Qalyubiya, Al-Gharbiya, Al-Menoufiya, and Al-Buhayra. Provinces in the Nile Valley include Al-Giza, Bani Souayf, Al-Fayyum, Al-Minya, Asyut, Girga, Qena, and Isna.

**Table VI: Male Occupational Structure under the British Occupation  
(1897-1917)**

	1897 (%)	1907 (%)	1917 (%)
PRIMARY	64.52	67.54	60.81
• Agriculture	64.52		
• Agriculture and animal husbandry		65.29	
• Agriculture, animal husbandry, fishing, hunting, and animal grazing			60.81
• Fishing, hunting, and animal grazing		2.25	
SECONDARY	10.22	10.43	10.65
• Manufacturing		10.31	10.58
• Food products	3.27		
• Textiles (Cotton, string, silk, wool, cloth)	2.29		
• Wood	1.48		
• Stone, pottery, and construction	1.19		
• Iron and different metals	1.17		
• Leather (raw and manufactured)	0.52		
• Tobacco	0.29		
• Mining		0.12	0.07
TERTIARY dealers and sellers	2.85	4.44	6.08
• Trade	1.27		
• Diverse sellers	1.58		
• Commerce		4.44	6.08
TERTIARY services and professions	12.09	14.67	18.70
• Diverse services	2.13	2.88	9.35
• Education	1.43		
• Religious services	3.64		
• Professionals	0.19	3.92	3.27
• Military services	1.13	1.65	1.16
• Domestic servants	3.57	1.94	3.18
• Public administration		1.40	1.08
• Owners		2.87	0.67
Transport and Communications	2.51	2.92	3.76
• Transportation	1.11	2.92	3.76
• Navigation	1.40		
Sectorally unspecific occupations	7.81	0.00	0.00
• Diverse occupations	7.81		
<b>Total</b>	100.00	100.00	100.00

Sources: The national-level tables on the occupational structure in the published population census reports of 1897, 1907, and 1917.

Notes: (1) The working-age population is defined as the population that is 10 years and above in 1897. In 1907 and 1917, it is defined as the entire population.

(2) The occupational categories employed in the table are the categories used in the national-level tables on the occupational structure in the published population census reports.

**Table VII: Male Occupational Structure under *De Facto* British Occupation  
The Egyptian Kingdom (1927-1947)**

	1927 (%)	1937 (%)	1947 (%)
PRIMARY	59.95	59.51	61.61
• Agriculture	59.95		
• Farming, fishing, and hunting		59.51	
• Farming, fishing, animal breeding, and hunting			61.61
SECONDARY	10.13	9.29	13.08
• Manufacturing	10.13		
• Manufacturing, mining, and quarrying		9.29	
• Manufacturing and mining			11.19
• Constructions			1.89
TERTIARY dealers and sellers	8.29	6.60	9.17
• Commerce	8.29	6.60	9.17
TERTIARY services and professions	21.63	22.33	12.74
• Services			4.50
• Public administration and social services			8.24
• Other occupations	21.63	22.33	
Transport and Communications		2.28	3.40
• Transport		2.28	
• Transport and communications			3.40
Sectorally unspecific occupations	0.00	0.00	0.00
<b>Total</b>	100.00	100.00	100.00

Sources: The village/quarter-level tables from the published population census reports of 1927, 1937, and 1947 that were digitized by CEDEJ (2003).

Notes: (1) The working-age population is defined as the entire population in 1927. In 1937 and 1947, it is defined as the population that is 5 years and above.

(2) The occupational categories under each sector that are employed in the table are the categories used in the village/quarter tables as reported in CEDEJ (2003).

**Table VIII: Male Occupational Structure in Post-Colonial Egypt  
The Egyptian Republic (1960-2006)**

	1960	1976	1986	1996	2006
	(%)	(%)	(%)	(%)	(%)
<b>PRIMARY</b>	58.88	50.26	43.55	33.65	29.70
• Agriculture, hunting, and fishing	58.88	50.26	43.55	33.65	
• Agriculture, fishing, and forestry					29.70
<b>SECONDARY</b>	12.35	18.40	21.75	24.69	24.59
• Manufacturing	9.80	13.61	13.28	14.90	13.13
• Constructions	2.25	4.45	8.09	9.33	11.26
• Mining and quarrying	0.30	0.34	0.38	0.46	
• Mining					0.21
<b>TERTIARY dealers and sellers</b>	8.58	8.64	7.57	9.86	11.18
• Commerce	8.58				
• Commerce, restaurants, and hotels		8.64	7.57		
• Commerce and retail				9.86	
• Wholesale and retail trade					11.18
<b>TERTIARY services and professions</b>	16.53	17.74	21.23	25.32	25.64
• Services	16.01				
• Electricity, gas, and water	0.52	0.61	0.83	1.07	1.47
• Financing, insurance, real estate, and business services		0.76	1.85	3.62	
• Community, social, human, and domestic services		16.37	18.56	2.29	
• Hotels and restaurants				1.47	1.40
• Public administration and defense				8.82	5.72
• Education				6.62	6.49
• Health and social work				1.43	3.73
• Financial services and insurance					1.14
• Real estate and business services					2.30
• Private household services					0.31
• Other services					3.08
<b>Transport and Communications</b>	3.67	4.96	5.89	6.48	8.88
• Transport and storage	3.67				
• Transport, storage, and communications		4.96	5.89	6.48	
• Transport and communications					8.88
<b>Sectorally unspecific occupations</b>	0.00	0.00	0.00	0.00	0.01
• Other industry					0.01
<b>Total</b>	100.00	100.00	100.00	100.00	100.00

Sources: (1) 1960-1996: The village/quarter-level tables from the published population census reports of 1960, 1976, 1986, and 1996 that were digitized by CEDEJ (2003).

(2) 2006: The 10-percent individual-level population census sample of 2006 available on IPUMS-International.

Notes: (1) The working-age population is defined as the population that is 6 years and above in 1960, 1976, 1986, and 2006. In 1996, it is defined as the population that is 15 years and above.

(2) The occupational categories under each sector that are employed in the table are the categories used in the village/quarter tables as reported in CEDEJ (2003) for the period 1960-1996 and the categories reported in the IPUMS-International sample for 2006.