

Cotton Boom, De-industrialisation and re-industrialisation in the Middle East.

Contrasting Experience in Egypt and western Anatolia 1850-1914

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Abstract

This paper undertakes an investigation of the process of decline and rebirth of textile manufacturing in two Middle Eastern regions, Egypt and western Anatolia during the first wave of globalisation (1850-1914). Through the application of the “Dutch Disease” model we explore the linkages between terms of trade and industrialisation. These are further related to the evolution of price transmission between domestic and global raw cotton markets. We find that different levels of market integration have contributed to diverging trajectories in industrial development in the two regions: while in Egypt the process of de-industrialisation was not reversed, in western Anatolia weaker international price transmission and domestic policy interventions facilitated the creation of a nascent domestic textile industry.

I

The first wave of globalisation (1850-1914) generated a series of considerable transformations in the international web of trade and investments. Together with stronger international commodity market integration, another major feature of the so-called ‘long nineteenth century’ was the worldwide decline of manufacturing based on pre-industrial handicraft technology.¹ Hand-made goods were replaced by machine-made ones to an unprecedented degree: this phenomenon, which generated a dramatic change in the structure

¹ The term long nineteenth century is often used by historians to refer to the period between the French Revolution (1789) and the First World War (1914).

of global commerce and in the international division of labour, has been described as the ‘Great Specialisation’.² Thus, the process of rapid industrialisation on the Continent and in the British offshoots led to a marked distinction between industrialized and non-industrialized economies. The former became the main producers and exporters of manufactures, while the latter specialized in production and export of primary commodities, importing finished goods.

Like everywhere else in the so-called periphery, the Middle East’s manufacturing output declined in the face of superior European productivity advances in factory commodity production.³ From Anatolia to Greater Syria, from Iraq to Egypt, a process of de-industrialisation took place in common with most regions outside the core industrialising countries of Europe.⁴

The pattern, timing and magnitude of these changes varied widely, both globally and within the Middle East, which was then part of the Ottoman Empire.⁵ Moreover, this initial process of de-industrialisation did not always proceed in a monotonic manner. It slowed down in many areas of the periphery between the end of the nineteenth and the beginning of the twentieth century. In some cases it was reversed, supplanted by a new stage of re-industrialisation.

² See Findlay and O’Rourke, *Power and plenty*, p. 426.

³ We use the term periphery as a synonym for the developing world, thus representing the non-industrialized economies of the nineteenth century.

⁴ We use Clingingsmith and Williamson definition of de-industrialization (‘Deindustrialization in India’, p 210), considering it as ‘the movement of labor out of manufacturing and in to agriculture, either measured in absolute numbers (weak de-industrialization), or as a share of total employment (strong de-industrialization)’.

⁵ In the nineteenth century the Ottoman Empire covered most of the Balkans, part of Greece, Macedonia, Albania, Bulgaria, Romania (until mid-century), Turkey, Syria, Lebanon, Jordan, Palestine, Iraq, Egypt (until 1882), Tunisia, Libya and part of Saudi Arabia.

In this paper we analyse the development of a specific manufacturing sector, the textile industry, which had two sub-components: spinning and weaving, with the former representing an intermediate input of the latter. Specifically, we focus on two Middle Eastern regions: Egypt and western Anatolia. Our study shows that the textile industries in these two areas experienced quite contrasting developments towards the end of the nineteenth century, after undergoing a collapse of their handicraft textile industries at the beginning. In Egypt, which was at the ‘periphery’ of the Ottoman Empire, the extent of the demise of the domestic textile sector proved to be ‘permanent’: by the end of this period, Egypt had almost no domestic textile industry and was exporting practically all of its raw cotton to foreign markets, primarily those in Britain. In contrast, in western Anatolia, which was located at the ‘core’ of the Empire, after an initial lengthy phase of decline a process of re-industrialisation began to take place, particularly in the spinning sector. This raises some interesting questions.

Which elements were decisive in shaping such diverse trajectories of industrialisation? Were they domestic factors, linked to trade policy, level of technological development and different infrastructure? Or were they primarily external shocks, related to terms of trade movements? To what extent were these differences connected with the British colonisation of Egypt? How do these developments in the Middle East compare with developments elsewhere in the periphery?

These issues continue to animate scholarly research, with recent contributions by J. G. Williamson and colleagues that emphasize the importance of international developments transmitted through terms of trade shocks to the national economies (see Williamson, ‘Globalisation and the great divergence’; Dobado, Gomez and Williamson, ‘Mexican exceptionalism’; Clingensmith and Williamson, ‘Deindustrialization in India’; Pamuk and Williamson, ‘Ottoman de-industrialization’).

In this paper we approach the process of de-industrialisation and re-industrialisation in the Middle East by outlining the theoretical framework that underpins such recent research, building on the Corden and Neary model of de-industrialisation and Dutch Disease economics.⁶ We extend the current debate by drawing attention on the factors that facilitated the process of re-industrialisation in western Anatolia, but not in Egypt. While other studies, including Pamuk and Williamson ('Ottoman de-industrialization'), have investigated the issue of de-industrialisation in the Middle East, the worthwhile contribution of this paper stems from its focus on the causes which led to the rise of factories. To this purpose, we highlight the significance of understanding the linkages between industrialisation and the process of commodity market integration.

Specifically, we interpret the process of price transmission between the Middle East and the global raw cotton markets in relation to the changes in the western Anatolian and Egyptian textile industries. Through this perspective, we place the Middle Eastern experience within the wider debate about de-industrialisation and re-industrialisation of the periphery during the first wave of globalisation.

In section II we examine the process of decline and rebirth of the Middle Eastern textile industry during the nineteenth and early twentieth centuries, reflecting upon similarities and differences with other areas of the periphery. The analytical framework used to study the process of de-industrialisation and re-industrialisation in the Middle East is depicted in sections III and IV; in section V we explore the linkages between terms of trade, market integration and industrialisation. Section VI concludes.

⁶ Corden and Neary, 'Booming sector and de-industrialisation'.

II

In the Middle East, as in other areas of the developing world, the intensification of trade linkages with the global economy, particularly with Europe, led on the one hand to the expansion of marketable crops and to specialisation in primary commodities, while on the other it resulted in the sharp decline of traditional manufacturing activities. Since the first decades of the nineteenth century, European factories penetrated Middle Eastern markets, exporting cheap industrial commodities which competed with local goods. It was during the years of the mid-Victorian boom (1840-70) in particular that Middle Eastern handicrafts declined.

The Middle Eastern textile industry shared some similarities with that of India, which was the major cloth supplier internationally in the pre-industrial revolution period.⁷ Both India and the Middle East as a region were self-sufficient in cotton textiles until the late eighteenth and early nineteenth Centuries, but the former had a much larger export market: Indian cloth was widely sold internationally, while Middle Eastern cloth was predominantly used within the region and there was virtually no export of cotton cloth to Western Europe.⁸

⁷ India was primarily a cloth exporter but it also exported yarn, especially to the Ottoman Empire and Iran. For example in 1785 one million French livres of cotton yarn were imported in Istanbul from India (Parthasarathi, *Europe*, p. 118). See also Inalcik, 'British cotton goods', p. 376.

⁸ Anatolian cotton cloth exports to the Northern Countries (from the Danube to the Caucasus) were considerable until the late eighteenth century and continued even after the Russian invasion of the northern Black Sea region (1783). The Serez-Selanik and Thessaly regions continued exporting cotton cloth and yarn to central Europe (especially Germany and Austria) until the second half of the eighteenth century. The situation changed dramatically at the turn of the eighteenth century, when Anatolian exports were superseded by British cottons (Inalcik, *Middle East*, pp. 274, 300).

On the other hand, both regions exported considerable amounts of raw cotton.⁹ In terms of its dimensions of production and trade, the cotton industry had a long history in the Middle East and played a fundamental role for a number of its regions. According to Inalcik it ‘constituted the most important sector of the Turkish economy after grains’ (*Middle East*, p. 264). Ottoman craftsmen supplied cloth for most of the domestic market until the eighteenth century, competing with (and imitating) their Indian counterparts.¹⁰ They produced particular weaves, prints, colours and styles, often blending cotton thread with silk, to satisfy specific consumers’ demands. However, it is important to outline that the size of the Middle Eastern textile industry was much smaller than the Indian one which, between 1650 and 1750, emerged as the dominant global cotton producer and exporter (Inalcik, *Middle East*, p. 275).¹¹

The industrial and transport revolutions had significant consequences for both Indian and Middle Eastern raw cotton, yarn and cloth markets. Exports of the raw fibre dropped with the availability of cheaper and higher quality American cotton.¹² Indian yarn and textile exports fell dramatically. Domestic textile production declined in both regions, outcompeted by British imports.

⁹ Egypt was not a major exporter of the cotton until the 1820s. Before that it was an important consumer of the raw fibre, imported from Syria and other areas of the Ottoman Empire.

¹⁰ Ottoman imitations of Indian goods covered a vast spectrum of items, from the twills and light cottons of the subcontinent to the colourful calico and chintzes of Gujarat and Masulipatnam (Parthasarathi, *Europe*, p. 124).

¹¹ On the different impact in the Ottoman Empire and in Britain of the Indian dominance in cotton production in the eighteenth century see Parthasarathi, *Europe*, pp. 115-147.

¹² Both in India and in the Middle East raw cotton exports were resumed at the height of the American Civil War, but the export surge died out when the conflict was over. Only in Egypt did cotton production and exports expand at a significant level in the post-war period.

Between the last two decades of the nineteenth century and the beginning of the twentieth century the process of de-industrialisation slowed down in most of the periphery, and some areas like China, India, Japan and some parts of Latin America started a significant re-industrialisation (Williamson, 'Globalisation and the great divergence').

This was also the case within the Middle East, but the focus of many studies on the de-industrialisation process in the Middle East has tended to distract attention from the fact that some regions, like western Anatolia, also experienced an incipient and slow process of re-industrialisation, particularly in the textile sector, though others, like Egypt, remained producers and exporters of primary commodities.

In recent years there has been a renewed interest in the issue of the diffusion of industrialisation. In particular, some authors have emphasized the importance of the 'non-Western path' of industrialisation (see, among others, Pomeranz, *The great divergence*; Sugihara, 'Labour-intensive industrialisation'; Quataert, 'Proto-industrialisation') which occurred at different paces and according to different patterns. After the first 'Western' experience of Britain, Continental Europe and the US, a second route to industrialisation occurred in the non-European world which involved the use of imported machinery and exploitation of the abundance of cheap labour.

By the late nineteenth century, Japanese and Indian spinning and weaving sectors (mainly the spinning sector in India) saw the replacement of handicrafts by mechanized production. The effective transplantation of a mechanized factory system in the late 1880s led to a process of structural change in the economy and marked the beginning of Japanese industrialisation.

The quicker adoption of cotton spinning technology in Japan than in India is cited as one of the major factors that explain its success (Sugihara, 'Labour-intensive industrialisation');

Otsuka, Ranis and Saxonhouse, *Comparative technology choice*). Technology improvements, such as modifications in mule spinning in 1884 and the adoption of ring spinning in 1887-9, occurred at a very fast pace in Japan, while India (and the Middle East) lagged behind.

In western Anatolia, the first mechanized textile factories were established by the state in the 1830s, but they ‘suffered from great inefficiencies, including lack of fuel and metallic raw materials and the total absence of skilled labour’ (Issawi, *Middle East and North Africa*, p. 154). After this first short experience, the cotton factories were established in two different circumstances. The first phase occurred during 1870s-1880s, at the time of the price depression, which saw the emergence of spinning mills. Depressed agricultural prices provided an incentive for the establishment of Ottoman mills, located near raw cotton supplies.¹³ The second cluster of factories (mainly spinning but also a few weaving mills) was established after 1896, when agricultural prices were rising.

At the beginning of the twentieth century Ottoman mills provided around 13 per cent of all mechanically spun yarn used within the Empire; within a decade, their share had reached about one quarter of the total (Quataert, *Ottoman reform*, p. 94). By 1914 in the area covering present Turkey there were 82,000 spindles, 787 looms and 3,000 workers (Issawi, *Turkey*, p. 310).

The majority of the available data on mechanised Ottoman yarn and cloth production are aggregate statistics. Under such constraints it is possible to calculate only a rough estimate of western Anatolia’s contribution to total Ottoman textile output. Economic historians agree that the vast majority of Ottoman mills were located just in a few areas: the Izmir region,

¹³ Quataert (*Ottoman reform*) indicates that at the time of the price depression it was harder to obtain foreign loans to finance imports. This encouraged local production of consumer goods and facilitated the rise of mechanised mills.

Adana, Salonica and to a lesser extent Istanbul (Quataert, *Ottoman Reform*, p. 94; Issawi, *Middle East and North Africa*, p. 155, Pamuk, *Ottoman Empire*, p.127).

Donald Quataert (*Ottoman reform*) provides one of the most accurate accounts of the growth of mechanised mills in western Anatolia, located both in Izmir and in the rest of the region (see Table 1). While two Izmir mills combined had 28,000 active spindles in 1912, no data is available on other western Anatolian mills' production or employment.¹⁴ However, Quataert reports that they were able to carve out a portion of the market, successfully competing with British, Belgian, Italian and Indian yarn producers.

[Table 1]

Several mechanical weaving mills for both cotton and wool cloth opened in Izmir just before World War I: the 'Société Ottomane de manufacture de coton de Smyrne' employed 400 workers in 1911. At the same time the Cousinery spinning mill was expanded to include weaving operations (Quataert, *Ottoman reform*, p. 90). These coexisted with a considerable number of hand-looms, which reinvigorated the vitality of western Anatolian textile sector (see Table 2). Weaving was carried out both for subsistence and for the market, organised through home workshops or through putting-out networks.

[Table 2]

In Egypt, after a short period of industrialisation during the government of Muhammad Ali in the 1820s, the attempts to establish mechanized textile industries failed. Two cotton mills were set up in 1899: the first with 20,000 spindles was forced to liquidate as it was not

¹⁴ In the Adana region spinning mills operated 40,000 active spindles at the eve of World War I, but they had stronger ups and downs-export of cotton. The European part of the Ottoman Empire (mainly Salonica and the Macedonian interior) had the strongest concentration of mills with around 70,000 spindles in 1909 (Quataert, *Ottoman reform*).

profitable, and shut down in 1907; the second, the Anglo-Egyptian Weaving & Co. with 22,000 spindles and 400 looms, experienced serious financial difficulties in 1907 and did not recover in the following years (Owen, *Cotton* , p. 223-4).

Egyptian textiles artisans managed to survive to the penetration of cheap European imports only in the countryside. According to 1872 census there were only 685 weavers in Cairo and Alexandria (Chalcraft, *Striking Cabbies*, p.56), while outside the two major cities, employment was much higher, reaching almost 17,000 workers (see Table 3).¹⁵

[Table 3]

In the next section we consider recent approaches to the analysis of reasons for the different industrial development paths within the periphery and their applicability to understanding the divergent experiences between Egypt and western Anatolia.

III

Recent work by J. G. Williamson and colleagues on the broad issue of de-industrialisation draws on the theoretical model based on the so-called Dutch Disease framework, first proposed by Corden and Neary ('Booming sector and de-industrialisation').¹⁶ This model provides a systematic analysis of aspects of structural change in an open economy when impacted by an exogenous shock that affects a particular tradable

¹⁵ On the other hand, another sector of textile production resisted and expanded at the end of the nineteenth – beginning of the twentieth century: garment manufacturing, whereby imported cloth and yarn were used as primary inputs. Tailors, seamstresses, shirt and dress makers increased in number both in absolute terms (the number of tailors rose from 9,000 to 29,000, according to the censuses of 1897 and of 1917; Chalcraft, *Striking cabbies*, p.113) and relative terms (relative to spinning and weaving).

¹⁶ Corden ('Dutch disease economics') provides a review and consolidation of some further extensions to that model.

sector. It has been widely used in the literature as a framework to analyse both current and historical developments.¹⁷

This approach highlights the importance of international terms of trade changes associated with the Industrial Revolution that may have penalized Middle Eastern import-competing sectors (i.e. textile handicrafts) through ‘Dutch disease’ effects that pulled labour and other resources out of textile manufacturing and into the agricultural sector, thus prompting a process of de-industrialisation.¹⁸

After presenting the main features of the Corden-Neary ‘core’ model and the variant proposed by Pamuk and Williamson, we will relate its theoretical implications to the response of the Middle Eastern textile industry during the nineteenth century.¹⁹

The model

We briefly outline here the main features of Corden and Neary’s core model (‘Dutch disease economics’), denoting the ‘traditional’ export sector as the raw cotton sector, to provide the basis for discussing the impact of three key variables of interest: terms of trade

¹⁷ See Goderis and Malone, ‘Natural resource booms’; Dobado, Gomez and Williamson, ‘Mexican exceptionalism’; Ross, ‘Mineral rich states’; Sachs and Warner, ‘Curse of natural resources’; Matsuyama, ‘Agricultural productivity’.

¹⁸ The term was coined to describe the de-industrialisation experience of the Netherlands after its discovery of natural gas reserves in the North Sea in the late 1950s. The exploitation of this new resource led to an appreciation of the exchange rate and an improvement in the balance of trade but had an adverse impact on domestic tradeable industries and, in particular, reduced the competitiveness of Dutch manufacturing.

¹⁹ Pamuk and Williamson, ‘Ottoman de-industrialization’.

movements, technological change, and industry protection policies, on the industrialisation process in the Middle East.²⁰ We then discuss some variations to the core model.

Consider a small open economy that produces and consumes two tradable commodities, raw cotton and manufactures, at exogenously given world prices and a non-traded commodity, ‘services’, the price of which is determined in domestic markets.

Raw cotton, X_C , is an exportable that is produced with a technology using labour (L) and a specific factor, land (T):

$$X_C = X_C(L_C, T_C) \quad (1)$$

Manufactures, X_M , is an importable produced using labour and a specific factor, capital (K):

$$X_M = X_M(L_M, K_M) \quad (2)$$

The non-tradable commodity, services (X_S) is produced using labour and a specific factor, ‘services capital’, K_S :

$$X_S = X_S(L_S, K_S) \quad (3)$$

The model assumes:

- There are no distortions in commodity or factor markets, so prices are flexible and markets clear to ensure full employment.
- Terms of trade are exogenously given.
- Labour is perfectly mobile across all sectors.

²⁰ The formal Corden-Neary model uses proportionate changes in variables to analyse the comparative static outcomes of various shocks. The discussion below aims only to present the intuition behind some of the key features and results of the model, as the formal model is easily accessible.

In equilibrium:

1. There is full employment, so $L = L_C + L_M + L_S$.
2. Profit maximisation by firms implies that (money) wages are equated to marginal (value) products in each industry:

$$w_C = VMPL_C = P_C * MPL_C \quad (4)$$

$$w_M = VMPL_M = P_M * MPL_M \quad (5)$$

$$w_S = VMPL_S = P_S * MPL_S \quad (6)$$

where

w_i = (money) wage in industry i (C, M and S)

MPL_i = marginal product of labour in industry i

$VMPL_i$ = value marginal product of labour in industry i

3. Because labour is homogeneous and perfectly mobile between industries, wages must be equalized between the three industries. Hence:

$$w_C = w_M = w_S \quad (7)$$

The equilibrium in the economy is illustrated in Figure 1. The horizontal axis $O_B O_T$ depicts the total labour supply: the amount of labour employed in the non-tradable and in the two tradable sectors is measured by the distance from O_B and from O_T , respectively. L_T stands for the total demand for labour in the tradable sectors, obtained by laterally adding L_M , labour demand in manufacturing and L_C , labour demand in the raw cotton sector. Full-employment equilibrium occurs at A, where L_T intersects L_S , with an initial wage rate of w_0 .

[Figure 1]

Let us now assume that the country specializes in the production and export of cotton and imports manufactures. In what follows we will analyse the impact of a series of changes in

the economy: a) an improvement in terms of trade, b) technological change and c) the introduction of a tariff in the manufacturing sector.

a) Improvement in terms of trade

Terms of trade will be considered as the ratio of average export prices to average import prices. An improvement in terms of trade can be caused by a higher price increase in exports than in imports and/or by a stronger price decline in imports than in exports. Both scenarios will lead to de-industrialisation, which is considered as the movement of labour out of manufacturing into the cotton industry.

If the country imports manufactures and exports cotton, a rise in the world price of cotton, at an unchanged world price for manufactures, will lead to an improvement in terms of trade. This will have two main impacts on the economy, a *resource movement effect* and a *spending effect*, which affect both total output and returns to factors of production.

The resource movement effect occurs as higher cotton prices (hence improved terms of trade) raise the marginal product of labour in the cotton industry, allowing it to offer a higher wage and attract labour from other sectors. This leads to a movement of labour out of both manufacturing and services (which contract) into the cotton sector (which expands). Wages also rise in the manufacturing and the service industries. Higher labour demand in the cotton sector causes the composite labour demand schedule L_T to shift upwards to L_T^1 , reaching a new equilibrium at B where wages are higher (w_1). Employment in services declines from $O_S S$ to $O_S S^1$. Employment in textiles drops from $O_T M$ to $O_T M^1$ (Figure 1).

Standard trade theory tells us that a terms of trade improvement will enhance the real income of the country. This leads to higher spending on both services and manufacturing.

If we focus solely on the impact of a spending increase, non-tradables will experience a price rise, caused by higher demand, leading to a real appreciation, where the real exchange rate is defined as the relative price of non-tradables to tradables. The services labour demand schedule shifts upwards to a position such as L_S^1 and at the new equilibrium C wages are higher (w_2).

The combination of the resource movement and the spending effect has ambiguous effects on the non-tradable sector: while the resource pull from the export sector tends to lower its total output, the spending effect acts in the opposite direction, allowing services to compete for labour with the cotton sector. No conjecture can be made as to which effect will prevail without further information, as this will depend on the nature of supply functions, demand elasticity for services, etc.

As the country is 'small', with no market power in world markets, the higher demand for manufactures does not lead to a higher price for manufactures. Hence the increased demand for manufactures is met by an increase in imports at unchanged prices. Employment in manufacturing must consequently drop (to $O_T M^2$ in Figure 1) as the sector faces higher wages. Thus, the manufacturing sector will be unambiguously negatively affected through the resource movement effect, and its total output will decline: this process has been labelled *direct de-industrialisation*. Moreover, we have seen that the labour demand schedule of services is shifted upwards by the rise in their price, thus driving wages even higher. As a consequence, employment and output in manufacturing drop further, leading to what has been referred to as *indirect de-industrialisation* resulting from the spending effect.

b) Technological change

Let us assume that some level of Hicks-neutral technological change occurs in the domestic raw cotton sector. We can think of it as a productivity improvement and/or as an improvement in the quality of the fibre.

Technological improvement raises the marginal product of labour and hence shifts the labour demand schedule upwards and generates a wage rise.

This will have a similar effect to a terms of trade improvement on total output, national income and returns to factors in the cotton industry. Its impact on the service sector will be ambiguous, as it could either expand or contract. On the other hand, the manufacturing sector would be again negatively affected, owing to lower employment and output levels (through both indirect and direct de-industrialisation), and, consequently, to a decrease in the returns to capital, its specific factor.

c) The introduction of a tariff in the manufacturing sector

The introduction of tariff protection in the manufacturing sector has the effect of increasing the domestic price of manufactures by the amount of the tariff, thus enhancing the relative price of import-competing industries *vis a vis* the export sector.

The induced rise in manufacturing price will generate an increase in the labour demand schedule in manufactures, thus raising the wage rate. Resources will be diverted from the cotton and services sectors into manufacturing.

At the same time, the imposition of a price distortion through the tariff will have a welfare-reducing effect on national income in a 'small' country. The fall in national income will have negative effects on the non-tradable sector: the demand for services will fall, leading to a price drop and a depreciation of the real exchange rate. Thus, the overall impact of a protectionist policy for manufacturing – often used to counteract the adverse effects of an

export boom – will have a negative impact on the export industry as well as on the non-tradable sector.

d) Extensions to the core model

Pamuk and Williamson's recent paper on Ottoman de-industrialisation is based on a modified Dutch Disease model, a 'neo-Ricardian model', which incorporates a Lewis-type labour market with a fixed real wage based on food.²¹ This had been utilized earlier by Dobado, Gomez and Williamson to analyse de-industrialisation in Mexico between 1750 and 1857.²²

It is obvious that applying a conventional, relatively simple economic model such as the Dutch Disease model to the analysis of economic changes of underdeveloped economies during the nineteenth century, at a time when they were just beginning to engage in commercial crop cultivation, raises important methodological questions.²³ In particular it is important to ensure that the model captures at least the major structural features of the economies and that its underlying assumptions are plausible (or that model predictions are robust to substantial deviations) if insights of the model are to have credibility. But before discussing these assumptions and their plausibility, we will outline briefly the main implications of this model for the analysis of de-industrialisation forces.

Pamuk and Williamson present a formal three-sector model where the assumption of a flexible wage in the standard Corden-Neary model is replaced with a real wage that is fixed

²¹ Pamuk and Williamson, 'Ottoman de-industrialization'.

²² Dobado, Gomez and Williamson, 'Mexican exceptionalism'.

²³ Boldizzoni, *Poverty of Clio*, presents a strong methodological critique of economic history research which applies mainstream economic models to historical situations without adequate appreciation of (and research into) the specific social, cultural and institutional context.

in food units (with food as the non-tradable good) but where the assumption of a competitive, integrated economy-wide labour market is maintained.²⁴

This assumption of an economy-wide fixed real wage creates a link between food sector productivity and the two tradable sectors, including the textile manufacturing sector. It also implies that de-industrialisation (a contraction of the textile sector) can occur if the own (product) wage in textiles increases – which can happen for a number of reasons, such as a fall in textile price, a rise in domestic food price or a rise in prices of the exportable. They show that in an integrated labour market with a single economy-wide wage, differences in the rate of product wages in the textile and export sectors can generate relative de-industrialisation.²⁵ In particular, an increase in food prices or an improvement in terms of trade brought about by increased world prices of export commodities will tend to encourage de-industrialisation. A decrease in textile employment is defined as ‘strong de-industrialization’, while a decline in the share of textile workers in total employment is defined as ‘weak-de-industrialisation’.

In what follows we review some of the model’s main assumptions and discuss their plausibility. These assumptions include: perfectly competitive factor and product markets; an integrated labour market with a fixed real wage (in terms of food); and perfect pass-through of international prices to domestic prices.

Consider the assumption of perfectly competitive and integrated labour market, implying perfect inter-sectoral labour mobility. In a footnote (footnote 76), Dobado, Gomez and Williamson (2008) assert that the assumption of competition and perfectly integrated labour markets is not critical to model predictions, but no formal proof of this proposition or

²⁴ Pamuk and Williamson, ‘Ottoman de-industrialization’

²⁵ See also Clingingsmith and Williamson, ‘Deindustrialization in India’.

simulation results to support this assertion are provided.²⁶ In the absence of powerful trade unions and relatively large numbers of employers, the assumption of competitive labour market is probably reasonable. But the degree of labour mobility is likely to have changed over time. Before the introduction of machinery, workers were probably able to move between different agricultural and some handicraft industries with relative ease. This was likely to be the case with the textile industry, as many farmers possessed skills in hand-spinning and weaving (Pamuk, *Ottoman Empire*). Nevertheless, with the mechanisation of textile production (from the 1890s), it is arguable that the labour markets were likely to be segmented to some extent as the skills required to operate textile machines were not easily acquired by new entrants to the industry from other sectors.

Let us now turn to the assumption of integrated commodity markets. The analytical discussion of domestic adjustments involving de-industrialisation that centres on terms of trade rests critically on an implicit assumption that external (world) price changes are transmitted fully, or at least in large part, to the domestic markets. Unless domestic prices change in line with international price movements, the industry or sectoral adjustments implied by the models will not occur.

Further, in the absence of a tight link between domestic and international prices, the impact of some developments in the raw cotton sector could have quite different effects because of the input-output linkage between industries. Technological improvements in cotton cultivation, for example, may not necessarily strengthen de-industrialisation forces if they lead to a reduction in the raw fibre's domestic price, thereby reducing costs in the textile industry. Higher domestic supplies can lower domestic prices, either because the country is not 'small' or because domestic and international prices are not strongly linked. Increased domestic cotton supply may then not only have the effect of increasing exports, generating

²⁶ Dobado, Gomez and Williamson, 'Mexican exceptionalism'.

de-industrialisation forces, but may lower the domestic price of yarn and encourage textile manufacturing.

Another important assumption of the model is that all sectors produce final consumption goods using primary factors of production and it ignores important input-output linkages between the raw cotton industry (the ‘booming industry’) and the textile industry (the industry which contracts under Dutch Disease pressures and generates de-industrialisation). These two industries not only compete for resources – as assumed in the simple three-sector model – but they are also linked through an input-output linkage: the industrially transformed product of the raw cotton industry, cotton yarn, is an essential input into the textile industry.

IV

We first describe the behaviour of our three main variables (terms of trade, technological change, tariff protection) in Egypt and western Anatolia. Then, on the basis of the trends described, we discuss the implications of the Corden-Neary model based approach adopted by Pamuk and Williamson for industrialisation (Pamuk and Williamson, ‘Ottoman de-industrialization’).

Terms of trade: In analysing Ottoman terms of trade movements, it is important to take into account the differences in the commodity composition of exports between western Anatolia and Egypt. Western Anatolia had a diversified export basket of tobacco, raisins, figs, mohair, raw silk, raw cotton, wheat and barley. This level of diversification remained relatively unchanged throughout the nineteenth century, and the share of a single commodity rarely exceeded 12 per cent of the total (Pamuk, ‘Anatolia and Egypt’, p. 41). In Egypt exports were dominated by cotton, which accounted for more than one-third of exports in the 1840s-1850s, more than 80 per cent in the 1880s and over 90 per cent at the turn of the century (Pamuk and Williamson, ‘Ottoman de-industrialization’, Appendix 2). On the other hand, the commodity

composition of imports was similar in the two regions and comprised manufactured goods and intermediate inputs.

The first decades of the century, specifically, from 1820 to the mid-1850s, were characterised by an improvement in both western Anatolian and Egyptian terms of trade, caused primarily by the rapid decline in the price of cotton goods and the slower decline of other manufactures, which constituted their main imports (see Figure 2). The following decade, between the mid-1850s and 1865, represented a phase of uninterrupted decline in the Ottoman terms of trade, followed by an improvement between 1865 and 1871.²⁷ On the other hand, in Egypt the terms of trade continued improving till the late 1860s owing to the predominant position occupied by cotton in the country's composition of exports. The fall in cotton prices after the American Civil War was compensated for by the increase in value of cotton seed, wheat and beans after 1865.²⁸ The last decades of the century (from 1871 to 1896) coincide with the so called price depression and marked a deterioration in the terms of trade of both Egypt and the Ottoman Empire, owing to the faster decline in primary commodity prices compared to manufactures. This trend was reversed from the mid-1890s when increased demand for foodstuffs and raw materials from industrialised countries led to a faster rise in prices of primary commodities than of manufactures; this generated an

²⁷ Pamuk (*Ottoman Empire*, p. 49) attributes the worsening in terms of trade between mid-1850s and 1865 to the higher share of cotton manufactures imports than the share of Ottoman raw cotton exports, while he ascribes the improvement that followed, between 1865 and 1871, to the return of prices of textiles to their normal level after the cotton famine brought about by the American Civil War.

²⁸ According to Owen (*Cotton*, p. 179): *evidence would suggest that Egypt showed small improvements (in terms of trade) during the twenty-five years 1854 to 1879. That this was due almost entirely to cotton is yet another illustration of the way this one crop had now come to play a role of central importance in the Egyptian economy.*

improvement of both Egyptian and Ottoman terms of trade, with the former's rising at a faster pace.

[Figure 2]

In their analysis of the relationship between terms of trade movements and industrialisation in the Ottoman Empire, Pamuk and Williamson ('Ottoman de-industrialization') identify a positive correlation between an improvement in Ottoman terms of trade and de-industrialisation, which mirrored a pattern found in other areas of the periphery.²⁹ But this process was not uniform within different Middle Eastern regions: a comparison between Egypt and the rest of the Empire shows that Egypt's terms of trade rose much faster, thus suggesting the possibility of a stronger de-industrialisation impact.

Technological change: The degree of technological change in the raw cotton, cotton yarn and cloth industries between Egypt and Anatolia was dissimilar.

Raw cotton:

In Egypt the introduction in 1820 of long staple, which was superior in quality to the previously cultivated short staple cotton strains, represented a major technological improvement. Moreover, higher levels of government investment in agricultural and irrigation schemes led to an advance in agricultural productivity and to an increase in cotton yields (Owen, *Cotton*). After the British occupation of Egypt in 1882 the colonial

²⁹ Clingensmith and Williamson, 'Deindustrialization in India' analyse the linkages between increasing terms of trade and de-industrialisation, drawing on the Indian experience. Indian terms of trade improved in the period between 1810-1860 when most of India's domestic textile market was lost to Britain. On the other hand, after 1860, when the terms of trade no longer moved in India's favour, the process of de-industrialisation slowed down and was eventually reversed.

administration directed most domestic investments towards large-scale irrigation projects, further contributing to higher productivity levels.

Supply increases through better technology did not reduce domestic raw cotton prices in Egypt, as international markets set the domestic price and increased supplies were exported.³⁰ So technological progress in the raw cotton industry did not reduce input costs in the textile sector, while higher exports generated the standard de-industrialisation effects through spending and resource-pull factors.

According to the available literature, technology and agricultural productivity in western Anatolia do not appear to have undergone significant changes during the nineteenth century. The considerable expansion in production and exports of cotton and other primary commodities was, in fact, achieved through an extension of the areas under cultivation owing to the availability of marginal lands, and not through technological change (see Pamuk, ‘Anatolia and Egypt’; Mihci and Mihci, ‘Ottoman raw cotton’; Issawi, *Turkey, Middle East, Fertile Crescent*).

Yarn and cloth:

Hand-spinning and hand-weaving were the most widely used techniques for textile production in both Egypt and western Anatolia during the nineteenth century.

In the 1880s western Anatolia saw the establishment of a series of spinning mills around Izmir (the main western Anatolian port), using imported machinery. A limited number of power looms was imported, too (Quataert, *Ottoman reform*). This process of mechanisation

³⁰ See Yousef, ‘Egyptian cotton policy’; Pamuk, ‘Anatolia and Egypt’; Owen, *Cotton*; Issawi *Middle East*; Herschlag, *Middle East*.

did not involve Egypt. Thus, technological improvement in spinning and, to a minor extent in weaving, took place in western Anatolia only, in the late 1880s and 1890s.

Trade policy: In the Ottoman-ruled Middle East an 8 per cent tariff was imposed on all imports in 1862; this rose to 11 per cent in 1907 and 15 per cent in 1914, but it did not affect Egypt, which since 1882 had been incorporated in the British Empire.

Thus, in western Anatolia, belonging to the politically-independent Ottoman Empire, higher import duties and the gradual abolition of internal custom duties paved the way for a steady rise in the level of protection for its domestic industries, including textile manufacturing. On the other hand, since becoming a British colony Egypt had operated under a regime of almost perfect free trade. As in the rest of the British Empire, the colonial administration implemented a non-protectionist trade policy through the imposition of zero nominal tariffs.

We can summarize the main trends as follows: Egypt experienced a considerable terms of trade improvement and underwent a process of technological change in raw cotton production. Moreover, its textile industry did not get any protection from import restrictions due to Egypt's incorporation in the British Empire. Western Anatolia also experienced a terms of trade improvement in the first half of the nineteenth and at the beginning of the twentieth century (though this was weaker than in Egypt). It experienced no major technological improvement in raw cotton cultivation, but technological advancement occurred in yarn and cloth production. Over time, import tariffs on manufactures increased.

In these circumstances, the expectation based on the theoretical model would be that there would be de-industrialisation forces in both regions but that they would be stronger in Egypt and would tend to weaken over time in western Anatolia. In fact, this is indeed what happened: in both Middle Eastern regions textiles production declined. This suggests that the

overall direction of structural changes in these economies is consistent with explanations based on the Pamuk and Williamson model.

Nevertheless the model is not able to capture the motives that prompted the emergence of mechanised production in western Anatolia. Why did the latter re-industrialise, at a time when primary commodity prices and real wages were rising and terms of trade improving? The next section addresses this question, focusing on two fundamental factors: the extent of market integration and the nature of the labour market.

V

Previous econometric analysis showed that the linkages between the domestic and global cotton markets were (a) stronger in general in Egypt and (b) tended to weaken over time in western Anatolia.³¹ In Egypt's case, the dominant role of cotton in its exports and its strong linkage with international prices meant that international terms of trade effects would have been reflected closely in domestic relative price changes. Hence, it seems reasonable to conclude that the findings on price transmission strengthen the case for accepting the relevance of the model's propositions.

But the case is different in western Anatolia, where price transmission and integration with international markets were both more variable over time and generally weaker. We will now examine the western Anatolian experience in somewhat greater detail.

As discussed in Panza, 'Ottoman Empire', the process of integration between western Anatolia and global raw cotton markets during the nineteenth century (1845-1914) took place in three phases. Initially (1845-1861), the linkages between the domestic and the world

³¹ Panza, 'Ottoman Empire'.

markets were quite weak.³² External terms of trade were rising, led by an increase in export prices and by declining import prices. This was, in fact, an era of strong de-industrialisation.

The second phase (1862-1895) marks the beginning of a process of strong integration between the domestic and the global market at the time of the so-called cotton famine caused by the outbreak of the American Civil War (1861-65).³³ During this time terms of trade declined, led by a slower decrease in import than export prices, including world cotton prices.

Figure 3 shows the decline in the relative price of raw in western Anatolia, i.e. the ratio of raw cotton prices (P_c) to textiles prices (P_t). The dramatic increase in the early 1860s reflects the impact of the American Civil War, when both raw cotton and textiles prices surged, but the former rose much more.

[Figure 3]

This was a period where the model predictions were likely to have greater relevance, as international price movements would have been better reflected in domestic prices, thereby generating domestic structural adjustments. This was indeed the case: this period was marked

³² The absence of market integration was related to high trade costs associated with trade policy (12 per cent export duty on cotton) and transportation costs. These were reduced in 1862 thanks to the lowering of the export tax to 1 per cent, the modernisation of the Izmir harbour and the improvement in infrastructure. Between 1845 and 1861 domestic factors played a stronger role in cotton price determination, compared to global dynamics. During this time a large portion of the raw material was hand-spun and -woven and utilized domestically: in 1851, when total Anatolian production amounted to 30,000 bales, 12,000-15,000 were exported and the rest supplied the domestic market (Issawi, Turkey, p. 234).

³³ These results are in line with the views of other economic historians, who claim that cotton revived as a crucial export commodity during the height of the American Civil War, as demonstrated by the outstanding increase in volume and value of exports. See, among others, Kurmuş, 'Cotton Famine' and Kasaba, 'Ottoman Empire'.

by a process of *slower de-industrialisation*, beginning in the 1880s.³⁴ Domestically-produced cotton yarn started to meet more of the domestic demand, thus slowing down the rapid growth of imports from Europe.

After the 1880s both domestic weaving and spinning expanded, spurred on by lower input prices. Initially, the weaving sector experienced a stronger revival. According to Pamuk, *Ottoman Empire*, the rise in weaving employment and output was led by two factors: increased purchases of imported yarn, the price of which was declining; and the shift in consumption patterns from woollen to cotton textiles.

The higher demand for yarn was initially satisfied by European imports despite the decline in relative raw cotton prices. This can be explained by the fact that the quality and durability of factory-made yarn was higher than that of hand-spun yarn.

Then the combination of these two factors, i.e. declining input prices (raw cotton) and the increased demand for yarn, provided the impetus for the mechanisation of the spinning industry. Its expansion began in the late 1880s/1890s, when the first factories producing yarn were established in Izmir and surrounding areas.

The development of a mechanized spinning industry continued to strengthen during the first decade of the twentieth century, despite the fact that during these years the terms of trade started improving, albeit slowly. This appears to contradict the prediction of the model, according to which a rise in terms of trade (in a country where the composition of exports is dominated by primary commodities) will generate de-industrialisation forces. However, if weak transmission of international prices to the domestic economy was not confined to the raw cotton sector, it is possible that the international price changes —and terms of trade

³⁴ Pamuk and Williamson, 'Ottoman de-industrialization', p. 168.

effects— were only very weakly reflected in internal prices, thereby further weakening the de-industrialisation forces.

In addition to weaker de-industrialisation forces from international markets, Pamuk and Williamson suggest that improvement in the level of internal economic integration and stronger consumer preferences may have also played an important role in the revival of Ottoman textiles manufacturing.³⁵ Lower internal trade costs achieved through policy (through the gradual abolition of internal duties) and better transport (through railroad expansion in the countryside) encouraged integration between the interior and the coastal regions. Consumers had strong preferences for Ottoman cloth styles and patterns and, although Western manufacturers tried to imitate them, they had only limited success (Pamuk, *Ottoman Empire*; Pamuk and Williamson, ‘Ottoman de-industrialization’).

Two additional factors help to explain the process of industrial revival in textiles production: (1) the introduction of improved technology in textiles manufacturing; (2) a decrease in raw cotton prices.

The use of spinning and weaving machines increased the productivity of the yarn and cloth industries. Higher productivity and profitability led to an expansion in the textiles sector, drawing resources out of the other sectors of the economy. Moreover, we observe that domestic cotton prices started declining from 1903, while world cotton prices were rising. Such a decrease in input costs may have further encouraged re-industrialisation.

These developments were partly responsible for the observed changes in textile product wages during this period. Product wages in the textile industry, computed by deflating

³⁵ Pamuk and Williamson, ‘Ottoman de-industrialization’.

nominal wages of skilled workers by textiles prices, show a downward trend between 1896 and 1908 (see Table 4).

[Table 4]

The decline in textile product wages is in contrast with the available evidence from real wage trends in other sectors of the economy. After being fairly stable during the nineteenth century, real wages started to increase quite rapidly from the 1890s onwards for both skilled and unskilled workers (see: Özmucur and Pamuk, ‘Real wages’; Pamuk and Williamson, ‘Ottoman de-industrialization’). This suggests that the assumption of perfect inter-sectoral labour mobility may have been violated and that labour markets were likely to be segmented after the development of mechanized spinning.

Moreover, trade policies would have also helped. As the average level of tariff protection was raised in 1907, this may have further stimulated domestic textile manufacturing at the expense of foreign imports. Some of the literature indicates that the rise in import duties gave an incentive for factory-building (see, for example, Quataert, ‘*Ottoman reform*’; İnalçik and Quataert, *Economic and social history*).

VI

Our analysis has built on the existing literature which uses the Dutch Disease framework to understand the mechanisms that led to the demise of the Middle Eastern textiles industry.

Developments in yarn and cloth production in Egypt and western Anatolia were influenced by the nature of price transmission between the international and the domestic raw cotton markets. The closer linkages between the domestic and the global markets in Egypt meant that external terms of trade were more strongly reflected in the domestic relative price changes. In contrast, weaker linkages with the world market in western Anatolia probably

weakened the overall terms of trade-related de-industrialisation forces and facilitated the rebirth of textiles manufacturing.

In Egypt, the absence of a process of industrialisation seems attributable to the interaction of a series of interconnected dynamics, consistent with the propositions of Pamuk and Williamson ('Ottoman de-industrialization'): the strong integration between domestic and international raw cotton markets, booming terms of trade, the complete specialisation in raw cotton production for export and the lack of tariff protection for textiles manufactures. On the other hand, in western Anatolia, after a period of manufacturing decline re-industrialisation was aided, initially, by a terms of trade worsening between the 1860s and 1890s. After the 1890s, the expansion of cotton mills continued despite rising terms of trade – whose domestic impact was muted by weak price transmission and was sustained by technological advances in spinning, cheaper domestic raw cotton, improved internal market integration, consumer biases towards Ottoman textiles, and more protectionist trade policies.

To conclude, our investigation into the relationship between market integration and industrialisation complements the insights gained from theoretical models of de-industrialisation and helps to fill out the picture of the different trajectories followed by the Egyptian and western Anatolian cotton industries. More nationalist government policies, strong consumer preferences and structural factors led to a revival of the textile manufacturing sector in western Anatolia and weakened the price transmission between domestic and international raw cotton markets. In contrast, the free trade policies and absence of support for a domestic manufacturing industry in British-controlled Egypt produced strong integration between domestic and international markets in raw cotton and discouraged the emergence of a textile manufacturing industry.

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Tables and Figures

Table 1: Mechanised spinning mills in western Anatolia and Istanbul.

Place	Owner	Year	Output in million kg	N. Spindles
Istanbul	Eastfarre	1888	1.1 (1890) 2.2 (1901)	9,000
Istanbul	Yedikule	1890		
Manisa		1890s		
Aydin		1890s		
Nazilli		1890s		
Izmir	(Cousiney et fils)	1892	1 (1901) ³⁶ 1.1 (1905) Output increased by 20-40% (1912)	8,000
Izmir		1912		28,000 (both Izmir mills)
Manisa	British owned	1910		
Manisa	Muslim owned	1910		

Sources: Quataert, *Ottoman reform*; Kurmus, 'British capital', p.182

Table 2: Cloth production in western Anatolia

Place	Year	Output in pieces	Value million piastres	Hand-Looms
Aydin province (total)	1890s			10,000
Izmir province (total)	1890s			10,000
Izmir	1900	1.5 million <i>alaca</i> plus other textiles	9.5	5000-7000 Singer machines
Denizli	1900	69,000		190
Kadıköy	1900	321,000		784
	Mid- 1900s	300,000 <i>alaca</i> plus other textiles		
Buldan	1900	40,000 <i>alaca</i> 1.5 million handkerchiefs		1,500
Manisa	mid- 1890s	150,000 <i>alaca</i> ; 60,000 shirting; 50,000 hand towels; 40,000 sofa and mattress covers; 1,000 pairs of socks	2.6	
Mardin	1880s			500
	1893			600

Sources: Quataert, *Ottoman Reform*; Inalcik and Quataert, *Economic and social history*.

³⁶ Exported 307,000 kg

Table 3: Hand-weaving employment in Egypt.

Location	Year	Employed
Cairo	1868	2,703
Outside Cairo and Alexandria	1872	16,997
Cairo and Alexandria	1872	685

Sources: Chalcraft, *Striking Cabbies* and Beinun, *Workers and Peasants*.

Table 4: Product wages of skilled textiles workers, 1896-1908.

Year	Product wages in textiles units
1896	1.47
1897	1.51
1900	1.36
1901	1.42
1902	1.37
1904	1.36
1905	1.34
1906	1.28
1908	1.32

Sources: Wages of skilled workers: Pamuk, 'Price revolution'; Textiles prices: Pamuk, *Ottoman Empire*.

Figure 1: Equilibrium in a three-sector economy

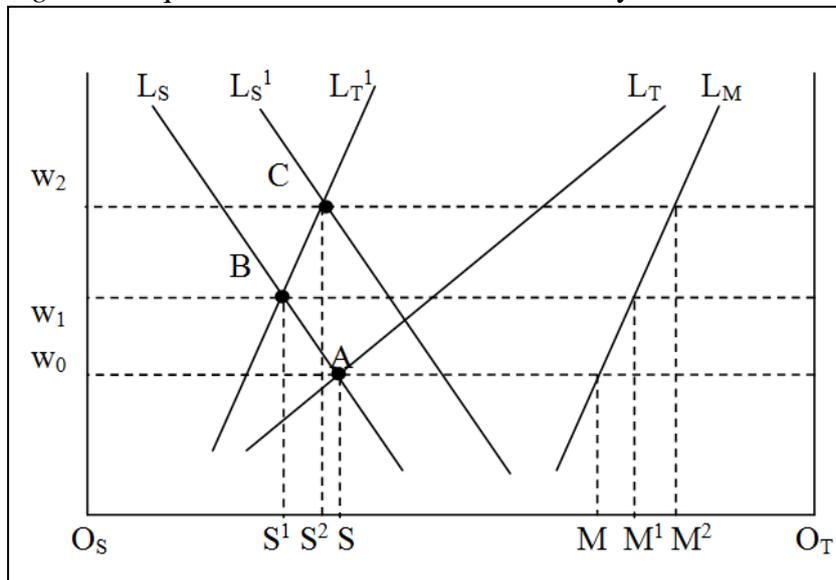
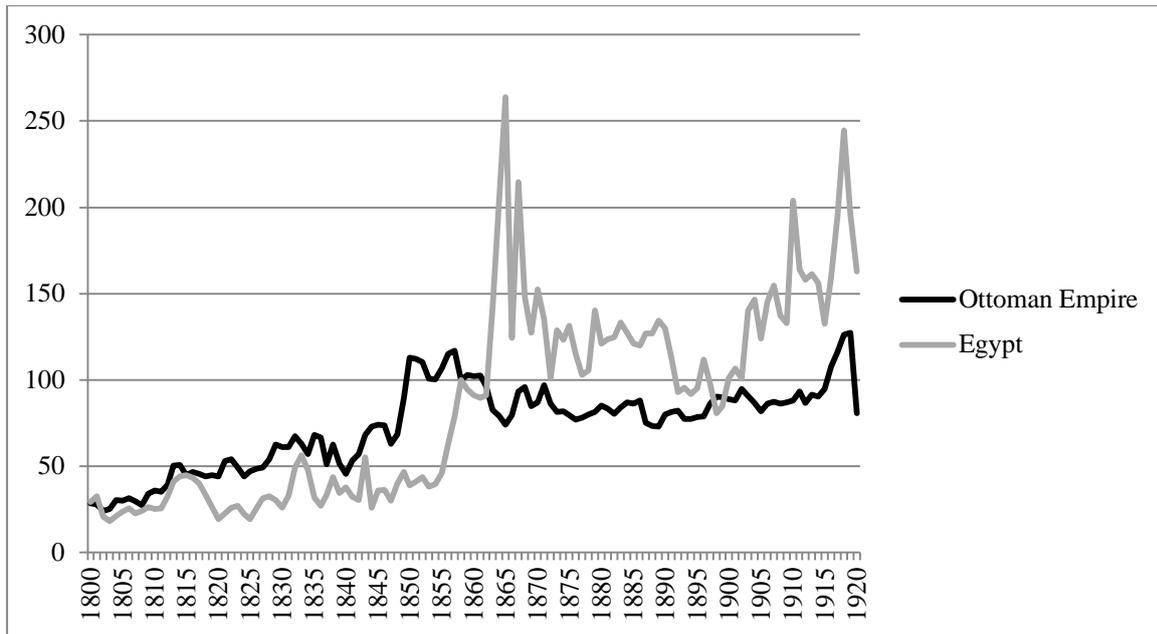
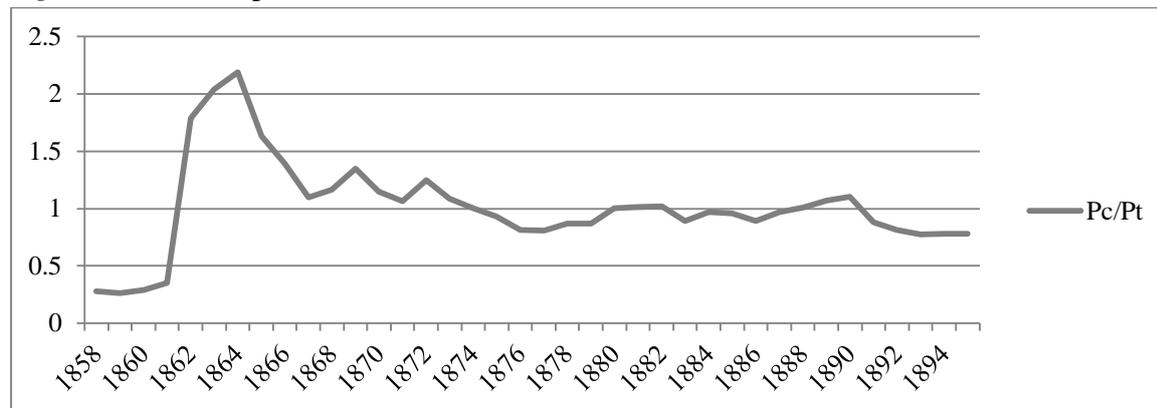


Figure 2: Terms of trade in the Ottoman Empire and Egypt, 1800-1920.



Source: Pamuk and Williamson 'Ottoman de-industrialization'.

Figure 3: Relative price of raw cotton in Izmir, western Anatolia, 1858-1895.



Sources: Pc= Raw cotton prices, 1858-1861: Owen, *Middle East*; 1862-76: Kasaba, *Ottoman Empire*; 1877-1896: Quataert, *Ottoman reform*. Pt= Textiles prices: Pamuk, *Ottoman Empire*.