# Shanghai's Trade, China's Growth: Continuity, Recovery, and Change since the Opium War[1]

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**Abstract**

In this paper, we provide an analysis of China's trade performance from the 1840s to the present. Based on a new historical benchmark we argue that China's recent gains are not exclusively due to the reforms since 1978. Rather, foreign economic activity can be understood by developments that were set in motion in the 19th century. Our focus is on Shanghai, the world's largest port. Shanghai began direct trade relations with Western nations starting in 1843. In tracking the levels and growth rates of the city's net and gross imports and exports over more than a century, we find that Shanghai's level of bilateral trade today is by no means high given Shanghai's 19th century experience. We also show in a gravity equation framework that the trade relationship estimated from historical data accounts quite well for China's trade today. In addition, the foreign presence in China in terms of direct investments and residents stimulated trade. Finally we show that the foreign presence during the treaty port era has a legacy for China today, by raising its trade.

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## 1. Introduction

China is today the largest exporter in the world, and one of the top three importers.[5] Its trade has increased by almost 18% per year on average in the last couple of decades, a performance that is routinely described as "astonishing" and "breathtaking".[6] China's rapid trade growth has implications not only for production, incomes and current accounts in developed and developing countries, but more directly, on the welfare of her own population. The correlation between trade openness and income can be seen in simple scatterplots. Figure 1 shows a highly suggestive positive correlation between openness and GDP per capita in China (R-squared: 0.95). The pattern is by no means universally applicable for all countries in the world, but it does point to the importance of studying the determinants of trade patterns in the case of China.

A second observation that there is quite a lot of variation in the growth of trade across countries, but China's trade pattern in the postwar period in particular stands out both in comparison to other Asian countries as well as more advanced countries of today. Figure 2 shows that unlike Japan and the countries of Western Europe, China's relative growth in openness in the Post World War II period was highly irregular and characterized by strong breaks in trend up until the 1980s. Figure 3 shows that in comparison to other Asian countries that have experienced strong growth, China's recent history of trade openness was slower in the initial decades. While catch-up has started relatively recently, it has proceeded quite fast.

Forecasts of China's economic prospects typically focus on the reforms since the year 1978, when China opened to world trade after the Maoist period of economic planning (Perkins 2007, Lin 2011). We push the quantitative knowledge frontier back in time by 150 years. This paper shows that while some features of China's recent performance are truly extraordinary, others are not and some features of China's current trade performance can be traced to pre-1978 origins.

[5] Data from United Nations COMTRADE and the National Bureau of Statistics of China.
[6] "China's average trade growth measured in constant US dollar between 1990 and 2010 was an astonishing 17.6%", Lin (2011), and "[T]he pace of China's integration into world trade has been nothing short of breathtaking", di Giovanni, Levchenko, and Zhang (2011).

The focus of this paper is on both the volume and composition of trade, as well as the role of foreign direct investment (FDI), mainly from Western countries and Japan, in the past and today. The well-known gravity equation of trade is employed as the basis for the analysis. First, we estimate a benchmark trade relationship with historical data, and show that when this relationship is projected into the modern period it fits the actual trade of China quite well. Second, we demonstrate that China's trade during the treaty port era (the years 1843 to 1941) was strongly affected by the foreign presence in terms of firms and residents. Moreover, the FDI during the 1920s has an impact on trade today even if we account for today's FDI in China. The main message of the paper is that China's trade performance today is not hard to explain when placed into the context of China's own history—the 19th century trade opening—and when compared to the experiences of other countries—the general trend towards openness since World War II.

Shanghai, the city with the largest port in the world, is a good starting point for understanding China's recent trade dynamics.[7] In the mid-19th century, under the demands of British military threats, Shanghai granted access to merchants from Western countries seeking wider markets in China. The city quickly gained importance for China as its center of foreign trade, the recipient of the lion's share of FDI into China, and generally it served as the link between China and the world. We also focus on Shanghai because historical data for all of China's individual treaty ports is not yet available. However, we have information for China as a whole so we can analyze the trade of China without Shanghai for comparison.

We introduce a historical benchmark for China's recent growth performance by quantifying international economic activity in Shanghai from the late 19th century onwards. During the early planned economy regime, Shanghai was among the regions hardest hit by the highly restrictive economic policies. At the same time, in the years after the 1978 reforms Shanghai has recovered. This attests to the resilience of the Shanghai economy and suggests that temporary policies are unlikely to overcome regional fundamentals that are reinforced by foreign trade. A complementary interpretation is

[7] This is the case by total tonnage of cargo volume since the year 2005; see www.aapa-ports.org.

that the institutional basis of Shanghai's strong position that it attained during the treaty port era was not fully wiped out during the years under the command and control economy. We track the levels and growth rates of the city's net and gross imports and exports over more than a century, finding that Shanghai's level of bilateral trade today is by no means high given Shanghai's 19th century experience. We also show in a gravity-of-trade-equation framework that the trade relationship estimated from historical data accounts quite well for China's trade today.

Today Shanghai serves as a hub between the rest of China and the rest of the world, as well as a catalyst for Chinese regional and national economic development. In some ways, it is a historical role Shanghai has taken anew. Our analysis sheds light on the sources of this persistence. The finding that the foreign presence in China during the 19th and early 20th century stimulated trade suggests that the role of trade goes beyond access to new goods, because foreign trade often comes bundled with other influences that have the potential to bring change. In particular, FDI during the treaty port era matters for China still today, even conditional on any effect of today's FDI in China.

Finally, we address the question whether a busy port (like Shanghai) might matter for an entire country (such as China). We show below that China's share in world GDP between the years 1870 and 2010 is more strongly correlated with Shanghai's trade openness than with China's as a whole. There is thus evidence for the hypothesis that the developments in a major port might have affected the country overall.

In building our historical benchmark we employ new data originally collected by the Chinese Maritime Customs service (CMCS), the Western-led organization that ran China's customs system from the years 1854 to 1948.[8] Descriptive analysis immediately shows a great deal of continuity over time. For example, the value of trade per capita in China during the treaty port era was comparable to its level as recently as in the year 2000. In addition, the fraction of Shanghai's exports that are produced elsewhere in China—that is, re-exports through Shanghai—was about 60% both during the treaty port era and over the last twenty years. The CMCS also compiled information on FDI, the

[8] Additional details on China's 19th century opening based on CMCS sources are reported in Keller, Li, and Shiue (2011a, b).

foreign population in China, and many other economic aspects during the treaty port era in China.

This paper contributes to the existing literature that attempts to understand China's current economic growth (Rawski 1999, Sachs and Woo 2000). While high growth today is in part due to improved factor allocation *post* reforms (Hsieh and Klenow 2009, Song, Storesletten, and Zilibotti 2011), it remains difficult to judge how sudden growth bursts will carry over into long-run increases in living standards. We present a comprehensive comparison between the 19th century opening and the post-1978 opening of China, not only in terms of Shanghai's trade but also FDI as well as international migration. This makes plain how a forecast of future trade growth that takes as the starting point the year 1978 would vastly overestimate China's future trade performance. The current rates of growth may reflect a recovery to an underlying "natural" level of globalization, but it is not itself a good indicator of that level.[9] Our analysis of the post-World War II era shows that China followed the same steps as other countries, with perhaps a 30 year (in the case of Western Europe) or less than 10 year (in the case of the East Asian tigers, see Figure 3) delay.

By providing a detailed quantitative picture of China since around 1850 we complement what is known about openness during this period for Europe, North America, and other parts of the world (Findlay and O'Rourke 2007, O'Rourke and Williamson 1999). The analysis employing the gravity equation of trade follows the tradition of Tinbergen (1962) and many others, though we are not aware of other studies that have transplanted gravity estimates through history to compare trade relationships over time.

Our result that foreign presence in terms of firms and residents stimulates trade is consistent with the trade-enhancing role of information flows, as emphasized by Rauch and Trindade (2002) and others. For historical trade relations this has rarely been shown, and to the best of our knowledge we are the first to show evidence for informational spillovers, from the foreign presence of one country to the trade with another country.

[9] This paper is not the first to take a longer view on China's recent economic reforms. Keller and Shiue (2007) have noted that the degree of regional market integration in the 18th century is highly correlated with today's income per capita across provinces.

The economic legacy of colonialism has been studied by Acemoglu, Johnson, and Robinson (2001), while Jia (2012) considers the specific case of Chinese treaty ports and finds that in the late 20th century former treaty ports had higher rates of growth than areas that were not treaty ports.[10] The impact of colonialism for trade is analyzed by Head, Mayer, and Ries (2010). While the presence of Western countries in China during the treaty port era might not have been colonialism in the sense of that literature, a more important distinction is that our analysis identifies a particular channel, namely FDI, which is responsible for the legacy effects.

The remainder of the paper is as follows. The next section provides a historical background on Shanghai's position in China's trade since the 19th century. Data sources are given in section 3, with additional information provided in the appendix. All empirical results are presented in section 4, where we begin with a descriptive analysis of trade, FDI, and foreign resident patterns before moving to a gravity equation framework to compare past with today's trade; we also test for legacy and other effects from the foreign presence in China during the 19th and early 20th century. A concluding discussion is presented in section 5.

## 2. Shanghai and the Foreign Trade of China

This section summarizes the role of Shanghai within the broader context of China's foreign trade since the 16th century. We will see that its special role today has emerged from the city's unique geographical position together with foreign trade interests of other countries during the 19th century. This section describes the main features while we turn to the quantitative analysis below.

At the conclusion of the Opium Wars, Shanghai was opened to Western trade as stipulated in the Treaty of Nanjing on November 17, 1843. Before this time, Shanghai was overshadowed by nearby administrative capital cities such as Suzhou, Hangzhou, and Nanjing, and foreign trade was subject to restrictions and bans. As a result, China's

[10] Jia (2012) suggests that human capital accumulation and the adoption of social norms may be behind this finding.

foreign trade on the whole since the mid-15th century was fairly restrictive. Shanghai's foreign trade consisted mainly of interactions with non-Western areas—especially Korea, Japan and the Nanyang (traders from Southeast Asia, the Arab Peninsula, Africa, and India). Western goods, if they arrived in Shanghai, had to come by way of Guangzhou, since by a decree of 1760, Guangzhou was the only Chinese port open to Western traders.

Shanghai was one of a handful of Chinese ports selected by Western countries to be opened in the 1840s. The location was attractive because of its geographical position at the mouth of the Yangzi River, with potential access to seafaring routes as well as the traffic on the Yangzi River.[11] This location of the city had long been considered promising, for example by the British East India Company, which suggested already in the year 1756 that a new factory—that is, a trading post—ought to be opened in Shanghai.

Within weeks of the official opening of Shanghai in 1843, no less than 11 foreign firms had begun operating in the city (CMCS 2001, v.159, 36), in anticipation of the profits to be had from doing business in Shanghai. The Governor of Hong Kong and Chief Superintendent of Trade, Sir John Davis, reported in 1844 that Shanghai was the most promising of the newly opened Chinese ports and possessed all the elements of commercial success (CMCS 2001, v.159, 37). In fact, Shanghai's trade growth was initially disappointing and limited by the fact that foreign ships were not permitted to go further along the Yangzi River to tap into the trunk lines of the inland traffic, which was where the source of China's markets lay. The forced opening of further ports inland on the Yangzi in the early 1860s partially improved Western traders' access to internal markets. The city's multiple advantages for serving as a bridge to the Western world was notable to contemporaries. In the words of a Christian missionary: "if China is ever to be opened, if the spirit of exclusiveness is ever to be effectually broken down, that process will begin

[11] The Yangzi is about 6,300 kilometers and the third-longest river in the world. It starts in the Tibetan plains and flows towards Chongqing (Sichuan province), from where it flows another 2,400 kilometers before emptying into the East China Sea at Shanghai. On the booming domestic trade of the Yangzi River Valley, see Pomeranz and Topik (2005), p. 63.

here. The rays will diverge from Shanghai".[12] In 1869, a newspaper, the *North-China Herald*, would write:

> *"The heart of foreign trade is Shanghai, and the outports mere blood vessels."* (June 2, 1869; CMCS 2001, v.159, 79).[13]

The size and the structure of Shanghai's foreign trade, summarized in section 4 below, generally supports this claim. We now turn briefly to the institutional structure in which this trade took place, which is important in its own right.

The British were officially permitted, in 1848, to establish a foreign settlement in Shanghai. Separating the foreign population from the Chinese city was a solution the Chinese government preferred over having the foreigners reside in the city itself. British consuls and foreign merchants, on their part, also realized that the city lacked the means to secure their goods. A section of waste land less than a mile from the city and close to anchorage points in the harbor was selected for the building of foreign residences and warehouses. Outwardly, there were some similarities between the foreign settlement policy of the treaty port era and the practice from 1760 to 1842 when European traders were cordoned off in an enclave and forced to reside within a specified location outside of the city of Guangzhou. During the treaty port era, however, foreigners came to have a much more active role in the wider economy than in earlier times, establishing hundreds of firms, banks, and shipyards, among other things.

In addition to the right to trade, the British (and later other Western nations) proclaimed other rights, including the right to own land and buildings (Willoughby 1920). There they were able to build roads, factories, and housing all according to their own preferences.[14] Moreover, by the right of extraterritoriality, foreigners were subject not to local laws but the laws governing their own lands. Although the Chinese were not permitted to own property in the foreign settlement, they could and increasingly did rent property in the foreign settlements.

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[12] Davis (1852). Christian missionaries were spread between Hong Kong, Fuzhou, Xiamen, and Shanghai.
[13] By outports the writer means the other ports in China's treaty port system; see below.
[14] The American Settlement was established in 1863, forming with the British area the "International Settlement". The French Settlement was independent of the International Settlement.

In the area of trade, the key organization created by Western countries was the Imperial Maritime Customs service (after 1911, the Chinese Maritime Customs service, or CMCS). It was formed in the year 1854 by Western consuls because rebel forces of the Triad Society that merged later with the Taiping Rebellion put the official Qing customs house out of action (Murphey 1977, 198). The Qing government had established customs stations along the south coast to organize the collection of tariffs on both Chinese and foreign trade in the late 17th century, and by 1730 Shanghai had taken over from Suzhou as the main customs station of Jiangsu province.[15] During the years 1853 and 1854 however these customs duties went unpaid.

The CMCS took charge of the collection of tariffs and duties on foreign trade, and it also oversaw the increase in the number of the Chinese ports open to foreign trade, or "treaty ports" (see Map 1 for their locations).[16] While the service was formally under the Chinese Foreign Service it was *de facto* led by Western (initially mostly British) individuals. Nevertheless, the CMCS's long-time leader, Robert Hart, stressed that each member of the CMCS was "a paid agent of the Chinese government for the performance of specified work".[17] The CMCS produced its flagship publication, the annual *Report on Trade* with detailed figures on the trade at each treaty port from the year 1859 to the year 1948.

Although there are no complete records of China's foreign trade at the time of the Treaty of Nanjing (1842), we have information on the trade of individual countries with China before and after 1842. In Figure 4 we show the value of China's imports from Britain between 1828 and 1860. Two points stand out. First, there was an increase in trade after 1842, immediately following the opening of additional ports (including Shanghai). This however was reversed in the early 1850s. The second instance of trade

[15] Notably, the imperial edict designated Shanghai a "superior" customs station for foreign commerce, an indication that Qing officials also recognized that Shanghai had potential to be profitable for trade.
[16] For more on the CMCS and the foreign presence in China, see Bickers (2006), van de Ven (2006), and Brunero (2006), as well as Keller, Li, and Shiue (2011a).
[17] Circular No. 8 , June 21, 1864, by Robert Hart, "The Customs Service, the spirit that ought to animate it, the policy that ought to guide it, the duties it ought to perform; general considerations and special rules" in Documents illustrative of the Origin, Development, and Activities of the Chinese Customs Service, vol. 1 p. 36-47. Murphey (1977) claims that the CMCS "stood out among foreign groups in China as freer of special interest, exploitative behavior, or blind arrogance toward things Chinese", p.198.

growth, starting around 1854, is more substantial. The most plausible explanation for this is the start of the operation of the Western-led Chinese Maritime Customs service in the year 1854.

While the level of China's foreign trade in the 1860s was several times its level in the 1830s, the growth of China's foreign trade in the initial decades of the treaty port era was not particularly high. As Figure 5 shows, only after the year 1885—a period of general commercial expansion and the absence of wars in the U.S. and Europe—does one see additional and sustained growth in China's foreign trade. Also notice that China typically ran a trade deficit versus the rest of the world during this period.

Table 1 presents the shares for China and five other countries in foreign trade, starting with the year 1870. In that year, China's share of world exports was 2.78%. This value was considerably larger than that of Japan, which opened just about that time to foreign trade. At the same time, China's share in world trade was much smaller than India's, which traded relatively more as part of the British Empire. The high shares for the three Western countries, among them the United Kingdom with almost a quarter of world exports, were mainly due to the fact that these countries had already begun their process of industrialization. In Table 1 on the right, one notes that in the year 2008 China is the world's largest exporter with close to 10% of world exports, followed by Germany and the U.S.

Table 2 shows how the countries compared in terms of GDP over time. Note that China's share in world GDP in 1870 was around 17%, very similar to its share in the year 2008. India's GDP share has evolved in a similar but less pronounced U-shaped pattern. The share of the U.S. in world GDP peaked around the year 1950, around the same time China's share reached its low point of about 4.5%. Japan's share in world GDP peaked around the year 1990, at 8.5% according to Table 2.

A juncture for China came in the year 1941 in form of the full-scale Japanese occupation. This year marks the end of the treaty port era. The occupation was the final phase of Japan's colonization attempt of China that reached back to the First Sino-Japanese War (1894-95), intermittent warfare (1931-37) and full-scale invasion by Japan

in 1937. Japan was the one country that together with Britain had the most substantial interests in China during the 19th and early 20th centuries. Like Britain, Japan was interested in the potential market of China. However, while British interests in China were spread between Shanghai and Hong Kong, Japanese business interests were based primarily in Shanghai. In addition, Japan had territorial designs on China, specifically in occupying Manchuria and Shandong.

In the years before, the 1911 revolution had ended the Qing Dynasty. The Republican period from 1912-1937 brought a temporary period of industrial expansion and prosperity, as the industrialization of the 1920s was centered in Shanghai (Bergere 2009). One of the foremost aims of the Nationalist Party (the *Guomindang*) was to take back China's national sovereignty from foreign countries, and in fact China did regain tariff autonomy between 1929 and 1934. The Nationalist regime, however, also acted in ways that were detrimental to private industries and by 1937, war with Japan, government corruption, labor strikes, and the rise of the Communist Party of China (CPC) had turned the tide in terms of China's domestic politics. The Japanese invasion was repelled in the context of Japan's loss in World War II, while domestically the CPC emerged victorious over the Nationalists when the civil war ended in 1949.

The evolution of trade for the period from 1949 until now can be broadly divided into the years before and after the market reforms of 1978 (Lardy 2002, Branstetter and Lardy 2008). Prior to this time, all of trade was held under central government control through state-owned Foreign Trade Companies. Shanghai's trade, like that of any other area in China, was procured from provinces according to central plans. Shanghai was also required to remit large amounts of resources in order to support investments in the interior regions to reduce regional inequalities and make the interior regions more economically self-reliant.

China re-established its relationships with Western countries soon after the first stage of Cultural Revolution (1966 to 1971), which triggered a period of trade growth, in

particular of imports.[18] During the 1970s, more and more regions of China were given permission to export directly to foreign countries. This affected the share of Shanghai's *gross* exports relative to China's total, not unlike to what had happened during the treaty port era with the opening of additional treaty ports.

The liberalization of China's foreign trade and investment regime followed on the 1978 decision of the CPC to reform.[19] While Shanghai was not in the first batch of Special Economic Zones of the year 1980—they were all located in Guangdong and Fujian provinces—it was one of the 14 Coastal Port Cities in the year 1984. FDI, which was closed during the early reign of the CPC, was once again welcomed as part of China's reforms, even though there remain *de facto* rules and requirements, e.g., to transfer technology, that effectively limit FDI into China. As a Coastal Port City, the goal for Shanghai was to attract capital investments and technology transfers from foreign countries, as well as to help spur growth of the region, by means of tax and profit incentives. Finally, a major step towards China's international economic liberalization was taken when China joined the World Trade Organization in the year 2001. Given this general outline, in the following we take a closer quantitative look at the role of Shanghai's trade for China as a whole. Figure 6 shows the development of exports in China and Shanghai between the years 1870 and the most recent year for which data are available, 2009.[20] The figure shows that China's and Shanghai's exports have evolved similarly over this period of nearly one and a half centuries. We choose the year 1870 as our initial year in part because by that time the treaty port of Shanghai had been established for more than two decades, so that the observed growth of trade is not mainly a start-up phenomenon. Even though the years 1932 to 1952 are omitted from the analysis because of unavailability of comparable data, we know that foreign trade severely contracted

[18] Shanghai's annual import growth between 1970 and 1975 was three times the annual growth during the years 1957 to 1970 (Tian 1996, p. 19).
[19] The measures included the decentralization of the right to import and export to local areas, the loosening of controls on foreign exchange, and the use of tariffs, quotas and licenses in place of planned economy controls on imports and exports. See Lardy (2002).
[20] Shown in Figure 6 is (the log of) China's (respectively, Shanghai's) exports of locally produced goods to foreign countries; other trade flows will be discussed below.

during this period, essentially extending the downward trend that is visible in the figure from 1925 onwards.[21]

Figure 7 shows the analogous developments for imports over the period of 1870 to 2009. Also here, there is a broad congruence in how foreign imports of China and Shanghai have changed over time. The figures also illustrate the relatively fast growth in exports in the 1950s, mainly due to trade with the Soviet Union, which is not present for imports. Second, while during the period from 1960 to 1980 China's growth in exports and imports was comparable to that of the treaty port era, after 1980, the growth of trade has accelerated. During the treaty port era, China's exports grew annually at about 1.9% per year, faster than Shanghai's exports which grew at a rate of 1.1% per year (Figure 6). China's exports surpassed the level of exports projected with the treaty port era trend by the year 1975, whereas Shanghai's exports already in 1960 were well above what would have been expected based on the treaty port trend. This is consistent with the idea that Shanghai was particularly important for achieving China's export goals in the early post-World War II period. Shanghai's imports during the treaty port grew noticeably faster than China's imports (3.6% versus 2.3%, see Figure 7). Third, projecting Shanghai's level of imports from the treaty port era shows that its level was actually surpassed only around the year 2000. This is in part due to Shanghai's especially low levels of imports in the early years of communist rule that was noted above.

Today Shanghai accounts for almost 15% of China's imports and exports. The fact that a city with about 1% of China's population accounts for close to 15% of China's foreign trade is in itself quite remarkable. However, during the treaty port era Shanghai accounted for roughly half of China's foreign trade between the years 1870 and 1930. On average, the import share of Shanghai was about 55% while its export share was around 45%. In contrast to Figures 6 and 7, these numbers are *gross* in the sense that they include re-exports. As such, they measure the activity at the port of Shanghai. On the export side, they include goods shipped through Shanghai that were produced elsewhere

[21] Major factors included the Great Depression, Japan's invasion of China, World War II, and the restrictive stance on foreign trade put in place by China's government.

in China, while on the import side they include foreign goods that were sent from Shanghai onwards to other Chinese regions.

Figure 8 shows how Shanghai's import and export shares have changed over time. The import share falls from above 70% in 1870 to around 40% in 1910 before climbing back to over 50% by the year 1930. On the export side, Shanghai's share was highest in the early years, about 50% from 1895 to 1915, and then falling to around 35% by the year 1930. The share of Shanghai in China's exports falling in part because of the expansion of the treaty port system. The number of ports open to foreign trade increased over time.

To understand the role that Shanghai played for China's trade, it is useful to examine this trade in more detail. First, we consider the exports of Shanghai that are destined to foreign countries; these trade flows are typically called foreign exports. While a small portion of these exports were produced in foreign countries—during the treaty port era mostly in Japan—the large majority of Shanghai's exports were produced in China (for example, in a typical year such as 1888, Shanghai re-exported foreign goods with a total value of about 1.9 million *Haiguan Liang* at the same time when Shanghai's exports of Chinese produced goods was about 72.1 million *Haiguan Liang*; CMCS 2001, Vol. 14, 235, 241).[22] Among these China-produced goods destined for foreign markets, one part is produced in Shanghai while another is produced outside of Shanghai (but still in China). For the latter set of goods, Shanghai serves as the transshipment point, and from the point of view of Shanghai this trade is a re-export. In contrast, the former goods are exports in the typical sense of the word—produced in Shanghai and shipped from there to foreign countries.[23]

A natural question is the importance of these re-exports compared with exports of goods produced in Shanghai. There is consistent information to examine this question both during the early treaty port era (years 1870 to 1925) as well as for twenty recent years, 1990 to 2009. During the treaty port era the re-exports share in Shanghai's total

[22] *Haiguan Liang* is the currency adopted by the CMCS; it is also sometimes referred to as *Haekwan Taels*.
[23] Produced in Shanghai here means in the greater Shanghai area. The exact location of production is unknown to us, but for the good to be counted as export rather than re-export, the location must be closer to the port of Shanghai than to any other open port.

foreign exports was, with 58%, more than half, as shown in Figure 9 on the left. Interestingly, the share of re-exports in Shanghai's foreign exports between the years 1990 and 2009 is almost exactly the same (56%), as shown on the right in Figure 9. This continuity is striking. While this trade shares some similarities with entrepôt trade, it is clear from this that vast changes in the nature of the traded goods, the general economic conditions in Shanghai, China, and overseas, the number of open ports, and also political factors do not need to affect the extent to which a particular port specializes in re-exporting goods for other regions. Thus, in both trade liberalizations, although some 100 years apart, Shanghai's indirect contribution in form of exporting non-local Chinese goods was larger than Shanghai's direct contribution by exporting locally produced goods.

We conclude this overview with three observations. First, China is now relatively accessible to foreign trade. In the year 2005, its average statutory tariff was 8.9%, not far from the maximum of 5% that China was permitted to charge during the treaty port era. Second, starting from 1999, foreign firms in China are given more leeway in ownership. This recent policy actually corresponds to the policy during the treaty port era, when foreigners could establish wholly foreign-owned enterprises in China. Third, China's regime today privileges firms engaged in foreign trade and investment relative to firms that do not. Differential treatment of firms, depending on whether it was engaged in foreign markets, might be seen as a vestige of the treaty port era, when goods destined for export or foreign goods imported into China were in effect given preferential treatment relative to domestic trade. During the treaty port era, preference was given through the relatively efficient and consistent CMC policy towards foreign goods (and Chinese goods destined for foreign markets), and, through the payment of one relatively low duty on foreign goods, which should serve to increase the incentives to trade. It thus appears that China's trade and FDI policies today are in some major ways similar to those that China had to follow under pressure from Treaty Powers in the mid-19$^{th}$ century.

Before we turn to the empirical analysis, the following section briefly discusses the data.

## 3. Data

The major source of information regarding trade of Shanghai and of China during the treaty port era is the reports produced by the Chinese Maritime Customs service (CMCS for short). We rely on the 170-volume compilation of the annual *Returns to Trade* and other Chinese Maritime Customs documents, cited as CMCS (2001). The source covers the years 1859 to 1948 and contains information on (1) China's exports and imports and (2) Shanghai's exports and re-exports of Chinese goods, as well as imports and re-exports of foreign goods. All trade flows except re-exports of foreign goods are available by foreign partner country. By China's foreign trade we mean the trade in the CMCS statistics; this excludes Hong Kong and the small amount of foreign trade that was not recorded by the CMCS, see Keller, Li, and Shiue (2011b) for a discussion.

Trade figures for the treaty port era are given in current values, typically *Haiguan Liang*, but later also in (customs) dollar and gold denominated currency. We have converted all values into U.S. dollars using exchanges rates given in CMCS (2001) and Hsiao (1974). The current U.S. dollar values are converted into constant 2006 U.S. dollars by linking two series on U.S. inflation available from the NBER Macro History database and the Bureau of Labor Statistics (see Appendix). These conversion factors into 2006 U.S. dollars are also applied to the values on trade during the modern period, which are given in 100 million current U.S. dollars. The remaining data sources are given in the Appendix.

In the following section we present the results of this paper.

## 4. Empirical Analysis

We begin by describing the basic patterns of foreign trade, FDI, and foreign residents to China and, in particular, Shanghai since the mid-19$^{th}$ century. This is followed by a gravity estimation of Shanghai's trade during the treaty port era, which is used to compare the historic trade pattern with that of Shanghai today. We will then proceed to examine the role of the foreign presence in China in affecting the volume of its trade during the treaty port era, and conclude by examining the legacy of past FDI and foreign residents in China for its trade today.

## 4.1 Descriptive Statistics

The composition of Shanghai's gross imports is shown in Figure 10. On the left panel we see the five largest individual sources of imports during 1870 to 1900, while on the right the same information is given for the years 1990 to 2009. It is clear that during the late 19th century, Shanghai imported mostly from Britain and its colonies; 37% of Shanghai's imports came from Britain proper, 27% from India and 16% from Hong Kong, making for a total of 80% from possessions of the British Empire.[24] Other significant sources of imports were the U.S. and Japan. Note that foreign trade at the time was highly concentrated in the sense that all countries outside the top five import-sources of Shanghai at the time accounted only for 8% of its imports. This degree of concentration is related to the relatively high degree of income inequality across countries at the time—only 100 years after the first country had begun its industrialization—which meant that only relatively few countries had the technological capacity as well as the resources to engage in large-scale foreign trade.

The corresponding results for the years 1990 to 2009 are shown in Figure 10 on the right side. Not only Britain but also its former colonies are absent in this figure, which strongly suggests that Britain's late 19th century role in Shanghai had been driven to some extent by its early industrialization and successful empire-building. Some continuity is preserved through the major roles of Japan (21%) and the U.S. (12%), which in the 19th century were ranked 4th and 5th, respectively. Other major sources of imports in Shanghai today include, with Taiwan and the Republic of Korea, two of the so-called "Asian Tigers" of the 1980s. Note that Shanghai's imports are now much less concentrated than in the treaty port era, with the top-five countries accounting for 62% versus 92% earlier.

For Shanghai's exports, the largest market during the late 19th century was Continental Europe, with 45% (see Figure 11, left side). Britain accounted for 24% of Shanghai's exports, followed by the U.S. and Japan with 12% and 10%, respectively.

[24] Shanghai's imports from Hong Kong for the most part come from other foreign countries for which Hong Kong serves as an intervening port, similar to Rotterdam, Antwerp, and Genoa at the time. With a population of around a third of a million in the year 1900, Hong Kong's principal industry was sugar refining, and there was also some cotton yarn production (CMCS 2001, vol. 43, 51). Compared with China as a whole, Hong Kong plays a smaller role for Shanghai's imports; this is due to the fact that Hong Kong and Shanghai were alternative entry ways for imports to China. See also Table 1 in Keller, Li, and Shiue (2011a).

These economies held more than 90% of Shanghai's exports during the years 1870 to 1900. In the recent past, the U.S. and Japan have each accounted for 21% of Shanghai's exports, followed by Hong Kong with 13% (Figure 11, right side). Among the European countries, Germany now receives about 4% of Shanghai's exports, whereas Britain and France are not in the top-five Shanghai export destinations anymore (each receives about 2% of Shanghai's exports). As in the case of imports, non-top five exporters account for about 38% of Shanghai's trade, indicating that the set of countries with which Shanghai trades has become much larger over time. In sum, the composition of Shanghai's trade, both historically and today, captures a number of aspects including market size and geographic location, with the latter becoming more important over time. This will prove to be useful for our gravity analysis below.

We now turn to FDI as another indicator of international economic integration. A distinguishing feature between the current era of globalization and the wave towards more economic integration before World War I is the much smaller extent to which firms in the earlier period operated multi-country production networks. Setting aside the commission agents of merchants and banks, which were around in the Middle Ages, multinational production in manufacturing can be found not much earlier than the middle of the 19th century, with substantial investments found only towards the end of the century.[25] In China, initially much of the foreign-owned activity was linked to the foreign presence in trade, such as retailers and wholesalers, banking to finance the trade, insurance to cover risk in the trade, and shipyards to repair ships. From there it spread into other sectors of the economy. Generally, FDI into China in the 19th and early 20th century was mostly in import and export trade, domestic trade, other transportation (railroads), and banking. Manufacturing and mining became important especially after 1895 when the Treaty of Shimonoseki established the legal right to establish manufacturing firms in China (Hou 1965, Ch. 3, Feuerwerker 1976, Ch. V).

[25] Among the earliest investors known were several British who invested in Naples in the 1840's, as well as the American Haviland producing fine China in France in 1842. The German Siemens company was established in 1847 and in the early 1850's had a plant in Russia, and a plant in Britain by 1857; see Kindleberger (1985).

There was much heterogeneity in the nature and scope of foreign firms operating in China.[26] In the area of trade, they included large firms such as Jardine, Matheson and Company from Britain, which from its head office in Hong Kong and branches in every major port controlled its foreign trade operations, but had also activities such as the 41 Yangzi steamers of the Indo-China Steam Navigation Company (a subsidiary), the large Shanghai and Hongkew Wharf Company, the Ewo Cotton Mill, and a silk filature in Shanghai. At the other end of the spectrum was the modest retail store Schlachterei W. Fütterer, butcher to the German community in Shanghai. Also today FDI activity in Shanghai varies substantially in both scale and sector.

During the treaty port era, the number of foreign firms in Shanghai was 152 for the year 1872, which increased to 1,741 by the year 1921 (annual growth rate of about 5%). Figure 12, on the left, shows the largest five source countries of where these firms originated. Japan was the largest source, accounting for 35%, followed by Britain with 30%. Other major sources were other Treaty Powers, the U.S., Germany, and France. Other countries accounted for 13% of the number of foreign firms in Shanghai.

Examining the composition of FDI in Shanghai with recent data shows that while Japan's importance has remained, the U.S. has gained relatively while Britain's importance has declined (see Figure 12, right side). Interestingly, the share of FDI by non-top five sources has roughly remained constant between the historical period and today (13% versus 11%, respectively). Taking this as the measure of the concentration of international economic activity in Shanghai, the degree of concentration of FDI has remained largely unchanged while in contrast that of trade has fallen over time.

We also look at the movement of people as another measure of foreign economic integration. The relationship between international migration and other aspects of economic integration is multi-faceted. Research has emphasized that international labor movements might be complementary to trade in that migration prepares the ground for international trade relations (Poole 2010, Cristea 2011). It could be that merchants

[26] On the following, see Feuerwerker (1976, pp.80-81); Feuerwerker (1976) also notes that this heterogeneity and other issues that need to be kept in mind when employing the data on foreign firms from the CMCS, pp.16-18.

follow their goods or meet their buyers. Alternatively, migration might substitute for trade because it relocates factors of production that otherwise might have been traded embodied in goods (Heckscher 1919, Ohlin 1933). Migration may also benefit the international flow of ideas and innovation (Hovhannisyan and Keller 2012). Moreover, the motives for migration might be different during the treaty port era compared to today. In addition, international migration may or may not be associated with the operation of multinational firms, a topic that will be discussed in the next section.

There is information on the number of foreign residents for two time periods, the years 1872 to 1921, and the years 2000 to 2009. During the roughly five decades between 1872 and 1921, the great majority of foreigners in Shanghai were nationals of the Treaty Powers. The largest groups were Japanese (29%) and British (28%), respectively, followed by 10% U.S. American, 7% German, and 4% French (see Figure 13, left side). During these treaty port era years, about 22% of foreign residents came from countries outside the top-five origins.[27]

A somewhat different picture emerges for the period from 2000 to 2009 (Figure 13, right side). First, the distribution of foreign residents in Shanghai has become more dispersed, with almost half coming from countries not ranking in the top-five origins. Second, while Japan, the U.S., and France are again among the top-five sources, Britain and Germany are replaced by two more geographically proximate countries, Singapore and South Korea. This suggests that the 19th century pattern was more affected by income and less by geography than the early 21st century pattern.

In addition to the composition, it is useful to get an idea of the level and growth in the number of foreign residents. The total number of foreign residents in Shanghai in the year 1872 was 2,074, of which 319 were U.S. American. For comparison, in San Francisco there were 73,719 foreign-born people in the year 1870, out of which 11,729 were from China.[28] Thus the number of Chinese in a major U.S. city in the late 19th century was about 35 times the number of U.S. Americans in Shanghai, the most international Chinese city

[27] Russia became a major source of foreign residents especially in the Northern Chinese cities.
[28] Data from *Ninth Census of the United States*, Statistics of Population, Table VIII.

(outside of Hong Kong). The main reason for this difference in the level of migrants was presumably wage differences due to the U.S. becoming a major industrialized country. Also, in the year 1921, the number of foreign residents in Shanghai was 31,893.[29] This amounts to an annual average growth rate of 5.6%, which is faster than Shanghai's imports from foreign countries (3.6%, see above).

In the following we turn to the regression analysis.

## 4.2 Regression Analysis

### 4.2.1 Gravity and Shanghai's Trade, Then and Now

We use the gravity equation of trade to examine Shanghai's bilateral trade with foreign countries, both during the treaty port era and in recent years. The use of the gravity equation is compelling for two reasons. First, the gravity equation is a good benchmark for trade. Not only is the gravity equation highly successful in explaining bilateral trade in a statistical sense (with $R^2$'s upwards of 0.70 the norm), it is also well-known that many micro-founded trade models imply the gravity equation.[30] Second, the gravity equation allows us to directly investigate whether Shanghai's bilateral trade patterns during the treaty port era were unusual. The fact that trade treaties were imposed upon China may give rise to doubts as to whether a model of trade based on voluntary exchange can fit the data.

The gravity equation of trade is, in its simplest form,

$$TRADE_{ij} = \frac{GDP_i^{\alpha} GDP_j^{\beta}}{DIST_{ij}^{\gamma}}, \quad (1)$$

[29] Thus, the stock of foreign residents in Shanghai, which accounted for about a third of all foreign residents in China, increased by about 28,000 over roughly 50 years in Shanghai. For comparison, the flow of immigrants to the U.S. in a typical year between 1870 and 1910 was about 500,000 (U.S. Senate document, Table 2).

[30] See Anderson (2010) for a recent review of the gravity literature, and Tinbergen (1962) for the original formulation.

where $i$ and $j$ are two trading economies, $TRADE$ is either bilateral exports or imports, $GDP$ is gross domestic product, and $DIST$ is shipping distance. In its usual log regression form, the equation is

$$(2) \qquad lnTRADE_{ij} = \alpha lnGDP_i + \beta lnGDP_j - \gamma lnDIST_{ij} + X'_{ij}\delta + \epsilon_{ij},$$

where $X$ refers to a set of control variables, and $\varepsilon$ is a regression error. The expected signs of coefficients are $\hat{\alpha} > 0$, $\hat{\beta} > 0$, and $-\hat{\gamma} < 0$.

Economy $i$ denotes a particular trade partner of Shanghai, and economy $j$ is Shanghai. Our gravity regression also has a time dimension: a pair of trade partners presents itself multiple times over years. We have data on years 1869 to 1904 (the historical sample) and 1953 to 2009 (the modern sample). To reduce problems arising from autocorrelation, we use five-year averages of the data. Since data on Shanghai's GDP for much of our sample period are unavailable, we use population instead. Population is the most natural replacement because GDP and population are interchangeable in measuring the size of an economy in many theories that provide micro-foundations for the gravity equation. In the following analysis, we also conduct robustness checks using year fixed effects instead of population.

The following countries and regions are Shanghai's trade partners: Continental Europe, Egypt, Hong Kong, Japan, the Philippines, Singapore, Thailand, and the U.S.[31] Among those, Hong Kong and Singapore were major entrepôts, with unusually voluminous inflows and outflows of goods that are transshipments rather than goods locally consumed or manufactured. To control for these peculiarities, we include an indicator variable specifically for Hong Kong and Singapore.

We first run the gravity regression using data on the treaty port era. Results are reported in columns 1 and 2 of Table 3. There are positive coefficients on the GDP of

[31] Trade here is net not gross trade of Shanghai because data including re-exports become available only after 1990, which would reduce our "modern" sample. Britain is excluded because its status as transshipment point in Europe during the treaty port era was eroding over time, which is not easily captured in the gravity framework. Also, we include Continental Europe because for trade before the year 1905, the CMCS publications do not distinguish many individual European countries. Most trade with Continental Europe was with France, Italy, and Germany.

trade partners and negative coefficients on shipping distance, while the population variable does not enter significantly. Notably, the coefficients of GDP and distance are both around one, a finding that is in line with results reported in studies using a wide range of data sources.[32] This provides additional evidence for the generality of the gravity equation considering that our treaty port sample years were more than a century ago and the era was initiated by China's defeat in the Opium War. Columns 3 and 4 use year fixed effects instead of Shanghai's population. In these two columns, the coefficients of trade partner's GDP and distance are very similar to those in columns 1 and 2.

Next, we run gravity regressions using the same set of countries but with modern data. Here, "modern" refers to the era starting after 1949, when the CPC took control of mainland China and established a new government.[33] The new government abolished all the trade treaties with Western powers. What interests us is the connection between the historical and modern gravity regressions.

To ensure comparability between historical and modern-time gravity regressions, we use, as before, five-year averages, Shanghai's population in place of its GDP, and the entrepôt indicator variable. Columns 5 to 8 in Table 3 report the results. Just as for the historical period, we alternately use population (columns 5 and 6) and year fixed effects (columns 7 and 8). The modern gravity regression results differ from the historical ones in a number of ways. First, the GDP of trade partners now has coefficients smaller in magnitude, in part because Western countries in the sample become less dominant than in the treaty port era. In other words, China currently trades with a more diversified set of countries than it did in the past (recall Figures 10 and 11).[34]

Second, Shanghai's population in the modern gravity regression has a positive and significant coefficient, consistent with results in the literature. Third, the coefficient of distance becomes smaller in absolute value, which is different from the common belief that the effect of distance on trade remains stable over time (e.g., Leamer and Levinsohn

[32] See Chaney (2011) for a review of gravity equation coefficient estimates.
[33] Data on the years 1949-1952 are unavailable, such that our modern time analysis actually starts in 1953.
[34] This effect is actually underestimated in Table 3, because only Shanghai's trade partners in the treaty port era are included in the regression.

1995). Fourth, the entrepôt dummy has a much smaller coefficient. Singapore and Hong Kong underwent rapid industrialization after World War II, and they became independent from Britain in 1963 and 1997, respectively. Such changes have likely reduced the transshipments through these entrepôts.[35] Finally, note that the gravity regression for the treaty port sample has an $R^2$ around 0.85 in columns 1 and 2, whereas for the modern period the $R^2$ in columns 5 and 6 is lower, around 0.70. Thus, income and distance variation across countries determines the volume of Shanghai's bilateral trade. Not only is this relationship just as expected, but it is even stronger in the historical than in the modern sample.

The modern time is a six-decade period, during which Shanghai, China, and the world changed in dramatic ways. In particular, in 1978, China began its transition to a market economy; in 1984, Shanghai was designated by China's central government as a Coastal Port City which was given flexible regulations, business-friendly policies, and trade-promotion measures (see section 2). To account for these structural changes, we specifically examine the post-1978 and post-1984 periods in Table 4. Several of the aforementioned changes to the gravity regression become more pronounced in Table 4. Notably, population now has a sizable coefficient, which may be due to slow population growth following the nationwide enforcement of the one-child policy,[36] as well as the contemporaneous rapid trade growth.

We are interested in how well history predicts modern trade patterns. To this end, we now employ modern country characteristics in terms of GDP together with the coefficients of the historical gravity equation (columns 1 and 2 in Table 3), and then compare these projected bilateral patterns with the actual trade of Shanghai today. The comparison will demonstrate how far modern trade patterns deviate from historical ones.

The results are reported in Figure 14. The upper and lower rows of the figure correspond to exports and imports, respectively. Diagonals in all the graphs of Figure 14 denote 45-degree lines, any point on which refers to a perfect match between projected

[35] Also, from the 1990s on Chinese goods produced in regions far from Hong Kong are less re-exported via Hong Kong than before (Feenstra and Hanson 2004).
[36] The average annual growth rate of Shanghai's population between 1984 and 2009 is about 0.6%.

(horizontal axis) and actual (vertical axis) trade volumes. Column 1 of Figure 14 shows projected export and import patterns in 1904, the latest year with available historical bilateral trade data. This column serves as a benchmark because, by construction, the predicted trade is close to the actual trade (the only difference is that the predicted trade uses data from 1869 to 1904, which is compared to the data of 1904). Column 2 of Figure 14 does the projection and comparison using data on the year 1974, 70 years after 1904. The projected exports are similar to the actual volume, while the projected imports are higher than the actual volume. This contrast is most likely politically driven by the Cultural Revolution and state planning.

Column 3 of Figure 14 does the projection and comparison using data on the year 2004, 30 years after 1974, and three years after China's accession into the World Trade Organization in 2001. Now, the projected exports are slightly lower than the actual volume, while the projected imports are quite close to the actual volume. Exceptions are Singapore and Hong Kong, which are as discussed above, economies with fading roles as entrepôts. Column 4 uses data on 2009, the latest year with available bilateral trade data, when the pattern shown in column 3 becomes clearer still. Projected exports further deviate from the actual volume, while projected imports are close to the actual volume. In sum, the cross-sectional pattern of Shanghai's trade during the treaty port era as pinned down by a gravity equation fits quite well the recent past.

Shanghai was the most important port of China during the treaty port era. A natural question arises: to what extent was Shanghai's bilateral trade with foreign countries representative of China's bilateral trade at that time? We next apply the gravity equation (2) using data on other treaty ports. Since our interest is in Shanghai's representativeness, we consider all other treaty ports as a whole (i.e., the rest of China). This is computed as China's total trade volume minus Shanghai's volume. Columns 1 and 2 in Table 5 correspond to columns 1 and 2 in Table 3, but use data on the rest of China. The findings from these two columns are very similar to those from Shanghai's data; namely, positive coefficient of foreign GDP, negative coefficient of distance, and insignificant coefficient of population. Columns 3 and 4 in Table 5 apply the gravity regression to modern trade data on the rest of China and obtain similar results as in columns 5 and 6 in

Table 3.[37] Lastly, in Figure 15, we predict modern trade of the rest of China using the gravity regression estimated in Table 3. The predicted patterns and deviations from the actual trade show a close resemblance with those in Figure 14.[38]

To conclude, we find that the bilateral trade between Shanghai and foreign countries follows the gravity equation during both the treaty port era and the modern era. The gravity equation in trade is typically derived for models of market economies based on voluntary exchange, whereas our finding indicates that it applies also in a time when colonial trade and regular trade intertwined. Moreover, Shanghai's modern bilateral trade largely follows its historical pattern, a level of persistence that may be unexpected in light of the changes in the institutional and economic context in which this trade takes place. The remainder of this section will seek for possible linkages between China's historical and modern trade, and we start with the role of FDI and foreign residents in promoting trade during the treaty port era.

### 4.2.2 Do FDI and Foreign Residents affect Trade?

The relationship between the trade and the FDI that two countries have is a perennial research topic. According to some recent work trade and FDI are jointly determined (Keller and Yeaple 2012). If so, once the fundamental determinants of trade are specified one does not expect any influence from FDI on trade, because it is already accounted for. Other research suggests that FDI has an independent effect on trade, for example because it generates new information about foreign demand or supply. In that case FDI might affect a country's trade beyond what the country's fundamental determinants of trade would say.

We will examine the question whether FDI affects trade in the gravity equation framework. The trade-creating force of economic size and the trade-reducing force of distance are fundamental forces affecting trade in a large class of models because they capture the influence of income and trade costs, respectively. To the extent that bilateral

[37] We have also experimented with year fixed effects as in Tables 3 and 4, arriving at similar findings.
[38] China's modern trade data are from the CEPII Gravity Database, which does not cover the year 2009; therefore, unlike Figure 14, Figure 15 does not have a column for 2009.

trade is affected by factors other than size and distance, for example bilateral FDI or foreign residents, following the large gravity literature (Rauch and Trindade 2002 in particular), these factors can be interpreted as reducing trade costs. Thus, we now ask whether exports and imports during the treaty port era are affected by the number of foreign firms and the number of foreign residents in China.

In the following analysis we shift the focus from Shanghai to China as a whole and the years 1905 to 1925 for data availability reasons; Table 6 shows the results.[39] In the first column we present the simple gravity results for exports. Distance and Foreign GDP have the expected significant signs whereas the point estimate of China's GDP is positive but less precisely estimated. In column 2, the number of foreign firms that a trade partner had in China during these years is added to the regression. This new explanatory variable reduces the size of the distance coefficient (in absolute value), which is a consequence of the strong negative correlation between distance and the number of foreign firms. This is an interesting finding in its own right, because it says that the gravity finding for FDI today of Keller and Yeaple (2012) and others extends also to FDI into China during the treaty port era.

The estimate on foreign firms is positive at 0.4 and highly significant. One interpretation of these results on distance and foreign firms is that the trade cost effect in a narrow sense is about -0.84 (as in column 2), not -1.5 (as in column 1). Beyond this the effect of trade costs on bilateral exports depends on whether or not the foreign country has located its firms in China. In that case, trade costs are substantially lower than if none of the country's firms are located in China.

If alternatively the number of foreign residents from the partner country is included, that variable is also positive, at about 0.3 (see column 3 of Table 6), and the size of the distance variable changes similar to column 2. This is not surprising given that the correlation of foreign firms and foreign residents in this data is 0.94; as we noted above, a large fraction of the foreign residents would have been the employees of foreign firms and

[39] The CMCS started to report aggregate bilateral trade for a larger number of foreign countries starting in the year 1905. Moreover, for all treaty ports together ("China") we have information on FDI and foreign residents annually during this period, not only twice (1911 and 1921); employed is data every five years.

their families. The relationship of bilateral exports with either foreign firms or foreign residents remains largely unchanged when time fixed effects are introduced (see columns 4 and 5). According to these results, it is *not* the case that the fundamental factors size and distance fully account for the bilateral exports of China during the treaty port era. Instead our findings are consistent with FDI and foreign migrants providing information that lowers the costs of trading with China.

What is the order of magnitude of this effect? To answer this question we report standardized (or, beta) regression coefficients that can be directly compared across variables in columns 2 and 3 in parentheses. The beta coefficients on foreign firms and foreign residents are about 0.24 while it is around 0.52 for foreign GDP. From these figures, on average a 10% increase in the foreign presence of a country in China raised China's exports to that country by almost as much as a 5% increase in the foreign country's GDP. Other research has shown that GDP changes typically account for most changes in trade volumes (Baier and Bergstrand 2001), so the foreign firm and resident estimates of column 2 and 3 imply economically large effects. It is also worth noting that the beta coefficients of foreign residents and firms are almost twice as large as the beta coefficient on distance.

We have also included foreign firms and foreign residents in the regression together. Given the high correlation between the two variables one should not expect major insights of this regression except to see which variable is the stronger predictor of trade. Interestingly, this turns out to be foreign residents (see column 6 of Table 6). If the estimated trade effects would mainly pick up that many foreign firms during this era were directly engaged in (or tightly linked to) foreign trade, one would expect that foreign firms captures that better than foreign residents. Thus we do not simply appear to pick up a mechanical effect.

In the following we push the analysis of the impact of foreign presence on trade costs further by incorporating what we call spillover effects. The idea is that while the number of Danish residents in China during the treaty port era affected the volume of China's exports to Denmark, it may at the same time also have influenced the size of

China's trade with Norway, given the many similarities between Denmark and Norway. For example, any information on the taste of Danes that Danish residents in China impart to local traders and producers should help the latter to sell their goods in Norway as well.

As a first step to analyzing these issues we adopt a very simple specification in which we define the spillover variable on the basis of geography. In particular, the variable *Other Foreign Firms* is defined as the sum of firms located in China from a particular continent, where American, Asian, and European countries are represented in the sample (three, one, and twelve in number, respectively). Analogously, we define the variable *Other Foreign Residents*.

Results of employing these spillover variables are given in Table 6 on the right side. Firms from other countries in the same continent positively affect bilateral trade, see column 7. This effect is somewhat smaller than the own country effect but still sizable (the beta coefficients are 0.15 for other, compared to 0.20 for own country firms). Similar findings are obtained using the foreign resident spillover variable in column 8. Note that these spillover results are robust to including a full set of time fixed effects (see columns 9 and 10) although the significance is somewhat lower.

In sum we have shown that China's exports during the treaty port era are positively and economically strongly affected by foreign presence in terms of firms and residents. While the impact of foreign presence of the own country is strongest, also foreign presence from the same continent has a sizable spillover effect on China's bilateral exports. These results are consistent with substantial trade-cost lowering informational flows from foreigners to Chinese producers and traders.

In the following we show results for China's imports during the same period (Table 7). The structure of Table 7 is identical to the exports Table 6. While column 1 shows the basic gravity result with GDPs and distance, we see also that both foreign firms and foreign residents lead to higher Chinese imports from the countries that are the origin of the foreign presence (from columns 2 and 3).

An interesting question is the precise nature of these foreign presence effects. While on the export side it is plausible to think of information flows from foreigners to Chinese agents, on the import side the foreign presence impact may be best viewed as demonstration effects from the consumption patterns of foreigners in China. In particular, the relation of foreign presence with imports cannot simply pick up the purchases of foreign residents from home because sizes are held constant in the estimation by the inclusion of China's and the foreign country's GDP.

Quantitatively, we find the foreign presence effect on imports to be somewhat larger relative to foreign GDP than on exports (note the beta coefficients in column 2 and 3 of Table 7, compared to with those in Table 6). As before, the results are robust to the inclusion of a full set of time fixed effects instead of China's GDP (see columns 4 and 5). It is also again the case that the number of foreign residents is a stronger predictor of trade than foreign firms: if both foreign presence variables are included, while the coefficient on foreign residents is not significant at standard levels it is much larger than that on foreign firms.

Finally, there is an important difference between exports and imports with respect to spillovers from other countries' firms and residents. Such spillovers do not exist for imports, as shown in columns 7 to 10 of Table 7, suggesting perhaps that the consumption information flows surrounding imports are more country-specific than those on the production and export side.

To sum up, we find significant foreign presence effects also on the import side. Quantitatively compared to either distance or foreign GDP, the foreign presence effects on the import side are found to be larger than on the export side. At the same time, there is no evidence for spillover effects from other countries' firms or residents on the import side, in contrast to the export side.

### 4.2.3 The Legacy of the Foreign Presence on Shanghai's Trade Today

The previous section suggests that the foreign presence in China during the treaty port era might have reduced bilateral trade costs from China to other countries. In this section, we assess formally whether the foreign presence during the late 19th and early 20th century in China might cast a shadow even today. Specifically we ask whether the foreign presence during the treaty port era influences Shanghai's trade today. If so, this legacy effect might also explain to some extent that a simple linear trend from the treaty port era does in some cases quite a good job in predicting Shanghai's bilateral trade today, as shown in Figures 6 and 7 above.

We begin by examining the long-run impact of foreign residents in Shanghai on Shanghai's exports today (see Table 8). Data availability determines that the sample period are the years 2000 to 2009. First, note from column 1 that the basic gravity relationship during this period holds. Including foreign residents in the year 1921 into the regression yields a positive coefficient for that variable, while the distance coefficient appears to fall in absolute value (column 2). When we consider not only the year 1921 but the decade 1911-21 or even the fifty years from 1872 to 1921, the impact from past foreign residents on today's exports becomes weaker and less precisely estimated (columns 3 and 4). This finding suggests that the recent past matters more for Shanghai's trade today than the more distant past.

Given that we estimate a stronger legacy effect for the more recent past, a natural question is whether foreign residents in the past matters for trade once we account for today's foreign residents. As columns 5 and 6 show, when we include today's foreign residents in Shanghai the influence of past foreign residents on trade today vanishes. The correlation between past foreign residents and today's foreign residents is 0.56, which is positive but far from one. Nevertheless, to the extent that there is a legacy from past foreign residents on Shanghai's exports today it exists because past resident patterns lead to similar resident patterns today. We do not find a legacy from foreign residents in Shanghai during the treaty port era that is independent of Shanghai's foreign residents today. Another interesting result is the size of the impact of today's foreign residents on Shanghai's exports implied by the Table 8 estimates. With a beta coefficient of 0.674 it is large--larger in fact than the sum of Shanghai's and the foreign country's GDP.

We now turn to the impact of past FDI on Shanghai's exports, see Table 9 for the results. The period here is from 1986 to 2009, which is chosen because then we have information on modern-day FDI in Shanghai for a sufficiently large set of countries. In column 1 we show the basic gravity results with GDPs and distance, which complement the results from section 4.2.1 above. It is useful to compare the results of column 1 in Table 9 with those for China and the early 20th century (see Table 6). First of all, historically, the distance coefficient was larger in absolute value (-1.4 to -0.8, compared to -0.5 now). This is consistent with declining trade costs. Further, the importance of foreign and Chinese GDP has been reversed over time: historically the coefficient on foreign GDP was around 1.5 whereas it is now around 0.5, while the coefficient on China's GDP was insignificantly different from zero whereas Shanghai's GDP now carries a coefficient of around 1.5. This may be indicative of the relative income dynamics of China versus other countries during this period when China's growth rate was higher than elsewhere.

In column 2 we introduce a measure of FDI in Shanghai in the year 1921. The coefficient is positive and significant, indicating that today's exports are increasing in the size of a country's FDI in Shanghai in the early 20th century. This is consistent with a legacy effect. The year 1921 is the last year for which we have detailed FDI data during the treaty port era. We also show results from employing broader measures of FDI in the following two columns of Table 9: for the years 1911 to 1921 in column 3 and for the years 1872 to 1921 in column 4. The estimated legacy effect shrinks as we go further into the past (which is here best seen from the smaller $R^2$ and lower significance of the FDI variable). It is plausible that whatever effect past FDI has on today's trade, the more recent past (here, the early 20th century) captures this influence better than the relatively distant past (here, the late 19th century). These findings parallel those on the influence of past foreign residents on Shanghai's exports today.

As it turns out, here the similarities end between the foreign resident and FDI effects from the past on today's exports. Including today's FDI in Shanghai in the regression gives a positive coefficient, consistent with a role of FDI that reduces bilateral trade costs and is therefore increasing trade. At the same time, the coefficient on the FDI in 1921 variable is also positive. Thus we conclude that past FDI affects today's trade not

only by inducing persistence in FDI, as in the case of foreign residents, but because past FDI has put processes in motion that affect Shanghai's exports today and which are unrelated to today's FDI activity.[40]

One concern is that the positive coefficient on FDI in 1921 is due to some omitted variable causing a spurious correlation. To address these concerns we have added a large number of standard gravity variables, such as contiguity, trade agreement membership, and others. The two variables that are most highly significant in the case of Shanghai from 1986 to 2009 are Common Language and Time Zone Differences. Results on these regressions are shown in columns 7 and 8 of Table 9. FDI from countries where the same language is spoken is strongly and positively correlated with Shanghai's exports, see column 7. The inclusion of Common Language reduces the size of the FDI in 1921 coefficient, although it remains significantly positive at standard levels. In contrast, there is no increasing-trade effect anymore from today's FDI once Common Language is added to the regression. Further, Shanghai's exports are declining in the number of time zones that have to be covered (see column 8), indicating that time differences act as a powerful barrier to trade. The FDI legacy effect is estimated smaller in size but still significant at a 10% level.

Also of interest are the relative magnitudes of the FDI legacy effects. Employing the standardized coefficients reported in parentheses in column 5 for these comparisons, we see that the quantitative importance of *FDI in 1921* is comparable to distance, and about half that of FDI in Shanghai today. Using time fixed effects reduces the size of the past FDI coefficient while it increases the influence of FDI today (see column 6). Nevertheless, these results attest to an economically substantial role for past FDI in affecting Shanghai's exports today. We have also asked whether there are any legacy effects from foreign presence on Shanghai's imports, finding that there is much less evidence than in the case of exports (results are given in the Appendix, Table A).

[40] The correlation of past FDI with today's FDI in Shanghai is 0.4, compared to 0.56 in the case of foreign residents.

The results can be summarized as follows. First, contemporaneously both FDI and foreign residents affect positively the volume of trade. This is true for both exports and imports, and it is the case both in the recent past (Tables 8, 9, and A in the Appendix) and during the treaty port era (Tables 6 and 7). Second, the contemporaneous effect of foreign residents is stronger than that of FDI, both now and during the treaty port era. Third, from one era to another, both past foreign residents and past FDI have a positive effect on today's exports, while neither has an impact on today's imports. Among the influences on today's exports, past FDI has an independent legacy in the sense that it does not only affect today's exports through today's FDI.

The empirical results in this paper have covered aspects of both the city of Shanghai and China as a whole. It is therefore important to return to the relationship between Shanghai's openness and the economic performance of China as a whole. To be sure, a city of about 250,000 people can hardly be expected to determine the fate of a vast country with about 350 million inhabitants (both values for the year 1870). At the same time, it is worth asking whether Shanghai's openness and China's growth might be related. In Figure 16, we show evidence on this question.

Figure 16 shows China's share of world GDP between the years 1870 and 2009. Today, China has about 17% of world GDP, similar to the year 1870, and the low point was around the 1960s with about 4.5% of world GDP. We ask whether this U-shaped pattern is related to openness, either in Shanghai or of China as a whole. There are three openness measures shown in Figure 16, one for Shanghai (trade per capita) and two for China (trade per capita and trade over GDP), all in logs. Interestingly, Shanghai's openness has a correlation of 0.88 with China's share in world GDP, far higher than the correlation with China's openness (which is 0.19 [0.38] for trade over GDP [trade per capita]). All openness measures track more or less the rise after 1970, however only Shanghai's openness falls with the initial decline in China's share in world GDP.[41] We conclude that while China's

[41] Shanghai's openness has fallen in the early years because China's foreign trade was shifting to other open ports. Also, the rising population of Shanghai outpaced the increase of foreign trade at Shanghai, where the higher population may be seen in part as an outcome of more foreign trade.

long-run growth performance is driven by a number of factors, this is evidence that not only China's but specifically Shanghai's openness has played a role in it.

We now turn to some concluding observations.

## 5. Conclusions

Recent observers have routinely characterized China's growth in trade and income with superlatives, so much so that it would be easy to believe that China has entered a new period in the history of its trade. In this paper, we attempt to see which part is hyperbole and which is not, using historical benchmarks that extend back to the treaty port era, which we define as the period from 1843 to 1941. Since Shanghai is currently the largest port in the world, and the most important port in China, we use this city as a lens with which to better understand China's trade.

We find that, first, there is evidence of historical continuity in some important dimensions. The level of openness in Shanghai at the turn of the 21st century was roughly the same as what it was at the end of the 19th century. Moreover, Shanghai not only receives a large share of provincial re-exports, but this share in recent years is comparable to the share of the late 19th century when it was established as an open port under the control of Western powers. Specifically, the share of re-exports in Shanghai's foreign exports between the years 1990 and 2009 is almost exactly the same, at 56%. This is true even though quite evidently many events have occurred in China, Shanghai, and the world in the intervening years between the Opium Wars and today.

Implied by the continuity is an underlying tendency towards recovery. China's trade was severely suppressed during the early planned economy years relative to historic trends. The depression of foreign trade in the communist period, however, appears to have had no long-term impact. Shanghai has to a large extent reverted back to its historical role in channeling the foreign trade of China. The implication of this is that it would be wrong to believe that recent trends could continue indefinitely, or that recent gains are mainly due to the reforms since 1978. In fact, Shanghai's imports from Britain today are quite close to what a naïve forecast using trends from the treaty port era would

give. Our gravity regressions, in which we plug modern country characteristics into the historical gravity relationship and then compare the projected bilateral trade pattern with the actual pattern also show that today's trade patterns are not far off the mark from what might be expected based on historical patterns.

Some of the continuities may be policy induced. There are certainly similarities in trade and FDI policy between the treaty port era and China's current trade liberalization regime. Today, as well as in the 19th century, low tariffs are enforced, preferential treatment is given to foreign firms, and foreign firms can wholly own businesses in China. The difference is that these policies were imposed upon China in the 19th century by foreigners, while in the recent era of reform, it is the Chinese government that has implemented policies such as the Special Economic Zones, which are oriented towards foreign markets—strikingly, virtually all of these modern zones selected by the Chinese government were former treaty ports or in areas closely neighboring former treaty ports.[42]

Despite similarities in policy, we suspect, nevertheless, that other factors besides policy, such as geography and the accumulation of experience play a part too in explaining why China has been able to return so swiftly to a market-economy after three decades of central planning. China's inherent comparative advantage historically was in its large labor pool, and this may still the case even as China' assembles and exports electronics and information technology products. Future research will allow us to use the quantitative information in the CMC records to further investigate the commodity composition of trade in order to provide a clearer view on this.

Second, there are several notable changes in trade patterns between the 19th century and the performance of Shanghai during the last decade. The most evident differences are Shanghai's import and export composition. Whereas British and Japanese interests in Shanghai were predominate a century ago, Shanghai's trade today has normalized in the sense that much of its trade is with geographically proximate places. We do find that growth in trade has reached extraordinary levels, but only since the year

[42] We may include Hong Kong in this list, although it is technically a former colony.

2000. At the same time, the greater Shanghai area has become, perhaps as a result of its success in trade, a very large urban metropolis with over 20 million permanent residents. Another change, related to the context of the 19th century is that Shanghai's trade, FDI, and foreign residency is now spread among a larger set of countries than what was the case during the 19th century. The volume of trade and FDI has shifted in favor of geographically proximate countries. Shanghai also retains a larger share of foreign imports than it did in the mid-19th century, a reflection of the fact that there are more ports of entry for foreign goods into China today.

Finally, our regional approach to trade seems to make sense in the case of China. The growth of Shanghai raises questions about the dynamic implications of re-exporting on Shanghai and the Yangzi Delta region. Examining foreign trade at the sub-national level may usefully identify the relationship between foreign trade and domestic trade, and, permit a better understanding of the sources of trade and growth. Shanghai and the wider Yangzi Delta area have served as central locations for China's domestic trade long before the arrival of Western gunboats. Given the important relation between international and domestic trade, Shanghai's accession today in the international arena would appear to crucially depend on its access to the domestic networks within China, which in this paper we capture with the re-exports variable. Other ports in China, also opened under Western force, did not attain the same level of trade and modernization because they had more limited access to domestic networks than did Shanghai. Guangzhou, for example, although already trading with Europe for a century longer than Shanghai, had primary access only to a southern network of domestic trade.

For a large country like China, where not all regions are equally trading internationally, an aggregate analysis of trade may not make as much sense as asking where the trading cities are. The importance of looking at localization in trade is emphasized in our quantitative measures related to growth. Shanghai's trade, for instance, seems to capture better the relationship between trade and growth in China than an overall measure of China's trade. The correlation between Shanghai's trade openness and China's share in world GDP over a century and a half is 0.88 while the correlation between China's openness and China's share in world GDP over the same

period is only 0.19 to 0.38, depending on the measure. The key role that Shanghai has in China's trade suggests that a better understanding of trends in China's trade requires examining persistence in the patterns of within-country trade. There may be persistence despite the fact that transport costs, production, goods, and China's main trading partners have all changed over time. Our finding of this striking persistence in Shanghai's trade highlights such empirical patterns must be a plausible outcome in any theoretical framework that integrates domestic trade within the international trading system.

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## Data Appendix

The data on trade during the years 1859 to 1949 comes from CMCS (2001), various volumes. One particularly noteworthy aspect of the data collected by the CMCS is that it captures re-exports with great detail. This has been a frequent source of misunderstanding, and some observers have erroneously concluded that the CMCS statistics massively overstate the actual trade that took place. For example, Murphey (1977) argues that by tracing the same goods as they are imported in Shanghai, then re-exported from Shanghai (to Tientsin), then imported by Tientsin (from Shanghai), and finally exported from Tientsin to some location of final demand, the CMCS data would create a "statistical illusion" by "quadruple counting"; he then concludes that "the recorded figures probably inflated the real import and export of goods by close to 100 percent", pp. 213-214. In fact, there is neither double-counting nor quadruple-counting in the CMCS trade data.

Information on Shanghai's trade in the communist period from 1949 onwards comes primarily from the Shanghai Statistical Yearbooks, cited as Shanghai YB (2010), which we have accessed via *China Data Online* (http://chinadataonline.org/ ). Parallel to the data available for the treaty port era, these yearbooks contain information on the foreign trade of firms located in Shanghai proper (denoted local trade). This covers the years 1953 to 2009 for exports and 1955 to 2009 for imports. They also have data on the total trade through the Shanghai customs for the years 1990 to 2009 (denoted customs trade). This contains foreign trade activity of firms located in Shanghai as well as firms located elsewhere in China. We compute re-exports as customs trade minus local trade.[43] Trade data for China as a whole comes from China Statistical Yearbooks and *China Compendium of Statistics 1949-2008*, compiled by Department of Comprehensive Statistics, National Bureau of Statistics of China. These figures include trade using any mode of transportation (including air). All values in current U.S. dollars are converted to constant $ U.S. 2006 by constructing a long-run U.S. price index from using Series m04051, for 1860 to 1939, from the NBER Macro History Database, http://www.nber.org/macrohistory/, and the U.S. Consumer Price Index from the Bureau of Labor Statistics, for the years 1913 to 2009.

The figures on trade of major countries other than China and on world trade comes from Maddison (2001), the Groningen Growth and Development Centre of the University of Groningen (www.ggdc.net), as well as the World Bank's Development Indicators database. Information on the number of residents by various foreign countries is available for the years 1872, 1891, 1901, 1911, and 1921 (sources: CMC 1873, as well as CMC 2001, various volumes). The figures include men, women, and children, where it is reasonable to believe the large majority were men. The figures do not include temporary residents, such as seamen staying in the city between the arrival and departure of their ship. During the modern period, foreign resident data is based on information on visa requirements, and it is available in Shanghai YB (2010).

Data on the number of firms from various foreign countries in Shanghai for the period 1872 to 1921 is available from the same sources as the foreign resident data. In the

[43] Customs trade also includes relatively small amounts of trade in form of foreign aid and gifts.

early years, foreign firms mainly engaged in importing and exporting, whereas especially after the turn of the 20th century they increasingly undertook manufacturing activities as well. For the modern period, we do not have counts of foreign firms in Shanghai by foreign country, so we estimate the number of foreign firms in Shanghai for a given foreign country by allocating the total number of foreign firms in proportion to the value of foreign capital absorbed, which is available by foreign country for the years 1995 to 2009. Both data series come from the Shanghai Statistical Yearbooks. In the regressions, the modern FDI measure is the contracted foreign capital Shanghai receives from each foreign country; this is available since the year 1986 (source: Shanghai Statistical Yearbooks).

Data on the Chinese population of Shanghai during the treaty port era comes from CMC (2001) and Mitchell (1998). For the post 1949 period it comes from the Shanghai Statistical Yearbooks (Shanghai YB 2010). GDP of foreign countries is from the online database of the Groningen Growth and Development Centre (GGDC, http://www.ggdc.net ), University of Groningen. The GGDC database reports all GDP data consistently using the 1990 International Geary-Khamis dollars. Historical GDP, if unavailable for a particular year, is estimated using data on the years 1870 and 1913. GDP of these two years are available for all countries in our sample. To estimate data for missing years, we compute the growth rate of a given country's GDP during this 43-year period and project its GDP for years using this growth rate. Distance between countries is available from the website www.searates.com. The website provides distance of ocean shipping in nautical miles between Shanghai and the major ports in the countries included in the analysis below.

## The Influence of past foreign presence on Shanghai's Imports today

The results, analogously to Table 8 and 9 in the text, are shown in Table A. It turns out that neither past FDI nor past foreign residents in Shanghai have a significantly positive effect on Shanghai's imports today, see columns 1 and 3. In contrast, today's FDI as well as today's foreign residents do have a positive effect on Shanghai's imports, see columns 2 and 4. This may be due to the fact that Shanghai's import pattern has changed drastically since the early 20th century, as noted above, away from far-away early-developing countries to more near-by countries. Further, we note that the size of the foreign resident effect appears to be larger, as judged by the beta coefficients.

**Map 1: Chinese Maritime Customs Stations**




**Note:** from Lyons (1973)

**Table 1: China's Share of World Merchandise Exports in Comparison, 1870 to 2009**

(In percent)

| | 1870 | 1913 | 1929 | 1950 | 1960 | 1970 | 1980 | 1990 | 2000 | 2009 |
|---|---|---|---|---|---|---|---|---|---|---|
| **China** | 2.78 | 1.98 | 2.50 | 2.14 | 2.08 | 0.76 | 0.92 | 1.79 | 3.86 | 9.62 |
| **Germany** | 13.43 | 17.98 | 14.03 | 4.46 | 9.23 | 11.27 | 9.77 | 12.12 | 8.55 | 9.02 |
| **United Kingdom** | 24.31 | 18.52 | 12.80 | 10.00 | 8.58 | 6.40 | 5.58 | 5.33 | 4.42 | 2.82 |
| **United States** | 4.96 | 9.04 | 12.15 | 14.58 | 16.66 | 14.24 | 11.43 | 11.33 | 12.11 | 8.45 |
| **India** | 6.88 | 4.46 | 3.28 | 1.86 | 1.08 | 0.67 | 0.44 | 0.52 | 0.66 | 1.30 |
| **Japan** | 0.10 | 0.79 | 1.74 | 1.20 | 3.28 | 6.36 | 6.61 | 8.28 | 7.42 | 4.65 |

**Note**: Sources are League of Nations Yearbooks, various years, and World Development Indicators database, World Bank.

**Table 2: China's Share of World GDP in Comparison, 1870 to 2008**

(In percent)

| | 1870 | 1913 | 1929 | 1950 | 1960 | 1970 | 1980 | 1990 | 2000 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|
| **China** | 17.10 | 8.83 | 7.05 | 4.59 | 5.24 | 4.63 | 5.20 | 7.83 | 11.77 | 17.48 |
| **Germany** | 6.50 | 8.68 | 6.74 | 4.97 | 6.62 | 6.12 | 5.52 | 4.66 | 4.24 | 3.36 |
| **United Kingdom** | 9.03 | 8.22 | 6.46 | 6.52 | 5.37 | 4.35 | 3.64 | 3.48 | 3.30 | 2.84 |
| **United States** | 8.87 | 18.93 | 21.68 | 27.29 | 24.27 | 22.39 | 21.12 | 21.39 | 21.89 | 18.61 |
| **India** | 12.15 | 7.47 | 6.23 | 4.16 | 3.88 | 3.41 | 3.18 | 4.05 | 5.18 | 6.70 |
| **Japan** | 2.29 | 2.62 | 3.29 | 3.02 | 4.45 | 7.36 | 7.83 | 8.55 | 7.16 | 5.70 |

**Note**: Figures are derived from Maddison's estimates, www.ggdc.net

**Table 3. Gravity Equations for Historical and Modern Trade of Shanghai**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| **Dep variable** | **Exports** | **Imports** | **Exports** | **Imports** | **Exports** | **Imports** | **Exports** | **Imports** |
| **Foreign GDP** | 1.504 | 1.722 | 1.497 | 1.717 | 0.945 | 1.197 | 0.898 | 1.053 |
| | [<.001] | [<.001] | [<.001] | [<.001] | [<.001] | [<.001] | [<.001] | [<.001] |
| **Shanghai population** | -0.565 | -0.308 | | | 1.575 | 3.686 | | |
| | [0.159] | [0.462] | | | [<.001] | [0.051] | | |
| **Distance** | -0.755 | -1.944 | -0.741 | -1.925 | -0.471 | -0.856 | -0.457 | -0.750 |
| | [<.001] | [<.001] | [<.001] | [<.001] | [<.001] | [<.001] | [<.001] | [<.001] |
| **Entrepôt Y/N** | 7.771 | 9.725 | 7.746 | 9.704 | 3.580 | 2.464 | 3.396 | 2.065 |
| | [<.001] | [<.001] | [<.001] | [<.001] | [<.001] | [0.053] | [<.001] | [<.001] |
| **Time Fixed Effects** | No | No | Yes | Yes | No | No | Yes | Yes |
| **Observations** | 58 | 54 | 58 | 54 | 69 | 52 | 69 | 52 |
| **R-squared** | 0.808 | 0.886 | 0.821 | 0.892 | 0.761 | 0.624 | 0.873 | 0.911 |

**Note**: Dependent variable is bilateral exports and imports of Shanghai. All variables in logarithms. Sources: CMCS (2001), various volumes, except Foreign GDP which is from www.ggdc.net, and Distance, which is by sea, from www.portworld.com. For details on the sources, see Section 3 and the Appendix. Bootstrapped p-values clustered at the country level are given in brackets.

**Table 4. Gravity Equations for Modern Trade, Different periods**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | The post-1978 period | | | | The post-1984 period | | | |
| **Dep variable:** | **Exports** | **Imports** | **Exports** | **Imports** | **Exports** | **Imports** | **Exports** | **Imports** |
| **Foreign GDP** | 1.030 [<.001] | 1.141 [<.001] | 1.008 [<.001] | 1.095 [<.001] | 1.161 [<.001] | 1.125 [<.001] | 1.161 [<.001] | 1.082 [<.001] |
| **Shanghai population** | 5.273 [0.019] | 21.530 [<.001] | | | 23.475 [<.001] | 28.432 [<.001] | | |
| **Distance** | -0.526 [0.001] | -0.740 [<.001] | -0.523 [<.001] | -0.721 [<.001] | -0.621 [<.001] | -0.570 [0.004] | -0.621 [<.001] | -0.558 [0.010] |
| **Entrepôt Y/N** | 3.172 [<.001] | 2.229 [0.005] | 3.113 [<.001] | 2.069 [0.005] | 3.208 [<.001] | 2.299 [0.006] | 3.207 [<.001] | 2.140 [0.040] |
| **Time fixed effects** | No | No | Yes | Yes | No | No | Yes | Yes |
| **Observations** | 49 | 39 | 49 | 39 | 35 | 29 | 35 | 29 |
| **R-squared** | 0.829 | 0.851 | 0.929 | 0.881 | 0.962 | 0.788 | 0.974 | 0.836 |

**Note**: Dependent variable is bilateral exports and imports of Shanghai. All variables in logarithms. Sources: CMCS (2001), various volumes, except Foreign GDP which is from www.ggdc.net, and Distance, which is by sea, from www.portworld.com. For details on the sources, see Section 3 and the Appendix. Bootstrapped p-values clustered at the country level are given in brackets.

**Table 5. Gravity Equations for Historical and Modern Trade for China with the Exception of Shanghai**

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | The historical period | | The modern period | |
| **Dep variable:** | **Exports** | **Imports** | **Exports** | **Imports** |
| **Foreign GDP** | 1.405<br>[<.001] | 1.647<br>[<.001] | 0.995<br>[<.001] | 1.100<br>[<.001] |
| **Population** | -6.043<br>[0.125] | 0.323<br>[0.939] | 3.712<br>[<.001] | 5.418<br>[<.001] |
| **Distance** | -1.625<br>[<.001] | -2.293<br>[<.001] | -0.679<br>[<.001] | -0.877<br>[<.001] |
| **Entrepôt dummy** | 7.973<br>[<.001] | 10.086<br>[<.001] | 3.240<br>[<.001] | 2.575<br>[<.001] |
| **Observations** | 44 | 43 | 60 | 44 |
| **R-squared** | 0.850 | 0.696 | 0.871 | 0.897 |

**Note**: Dependent variable is bilateral exports and imports of the rest of China (China's total value minus Shanghai's value). Sources: CMCS (2001), various volumes, except China's total value is from the CEPII gravity dataset http://www.cepii.fr/anglaisgraph/bdd/gravity.asp, Foreign GDP which is from www.ggdc.net, and Distance, which is by sea, from www.portworld.com. For details on the sources, see Section 3 and the Appendix. Bootstrapped p-values clustered at the country level are given in brackets.

**Table 6. China's Bilateral Exports, Foreign Firms and Foreign Residents in China, 1905 – 1925**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Distance** | -1.498<br>[<.001] | -0.841<br>[0.051]<br>(-0.134) | -0.866<br>[0.013]<br>(-0.138) | -0.841<br>[0.022] | -0.902<br>[0.002] | -0.881<br>[0.050] | -1.623<br>[0.005]<br>(-0.260) | -1.657<br>[0.001]<br>(-0.265) | -1.526<br>[0.001] | -1.590<br>[0.002] |
| **Foreign GDP** | 1.857<br>[<.001] | 1.518<br>[<.001]<br>(0.513) | 1.587<br>[<.001]<br>(0.537) | 1.502<br>[<.001] | 1.590<br>[<.001] | 1.599<br>[<.001] | 1.682<br>[<.001]<br>(0.569) | 1.703<br>[<.001]<br>(0.576) | 1.645<br>[<.001] | 1.691<br>[<.001] |
| **China GDP** | 1.402<br>[0.676] | 1.275<br>[0.698]<br>(0.019) | 1.743<br>[0.579]<br>(0.026) | | | 1.785<br>[0.585] | 0.129<br>[0.972]<br>(0.002) | 0.844<br>[0.809]<br>(0.013) | | |
| **Foreign Firms of Trade Partner** | | 0.402<br>[0.011]<br>(0.236) | | 0.409<br>[0.009] | | -0.039<br>[0.941] | 0.342<br>[0.039]<br>(0.200) | | 0.357<br>[0.023] | |
| **Foreign Residents of Trade Partner** | | | 0.316<br>[0.001]<br>(0.235) | | 0.302<br>[0.001] | 0.340<br>[0.332] | | 0.294<br>[0.003]<br>(0.219) | | 0.284<br>[0.002] |
| **Other Foreign Firms** | | | | | | | 0.237<br>[0.033]<br>(0.150) | | 0.207<br>[0.053] | |
| **Other Foreign Residents** | | | | | | | | 0.179<br>[0.027]<br>(0.151) | | 0.155<br>[0.097] |
| **Time Fixed Effects** | No | No | No | Yes | Yes | No | No | No | Yes | Yes |
| **R-squared** | 0.546 | 0.568 | 0.575 | 0.612 | 0.616 | 0.575 | 0.574 | 0.580 | 0.617 | 0.620 |
| **No. of observations** | 79 | 76 | 76 | 76 | 76 | 76 | 76 | 76 | 76 | 76 |

**Note**: Dependent variable is China's bilateral exports. Foreign firms of trade partner is the number of firms the trade partner has located in China, foreign residents of trade partner is the number of residents the trade partner has living in China. Other foreign firms (residents) are firms (residents) of the same continent as the trade partner (excluding the trade partner). All variables in logarithms. Sources: CMCS (2001), various volumes, except Foreign GDP which is from www.ggdc.net, and Distance, which is by sea, from www.portworld.com. For details on the sources, see Section 3 and the Appendix. Bootstrapped p-values clustered at the country level are given in brackets. Standardized beta coefficients are reported in parentheses (beta).

**Table 7: China's Bilateral Imports, Foreign Firms and Foreign Residents in China, 1905 – 1925**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Distance** | -1.654<br>[<.001] | -0.397<br>[0.216]<br>(-0.056) | -0.495<br>[0.138]<br>(-0.070) | -0.449<br>[0.149] | -0.559<br>[0.077] | -0.467<br>[0.140] | -0.353<br>[0.496] | -0.257<br>[0.609] | -0.290<br>[0.600] | -0.181<br>[0.728] |
| **Foreign GDP** | 1.741<br>[<.001] | 1.106<br>[<.001]<br>(0.340) | 1.261<br>[<.001]<br>(0.387) | 1.129<br>[<.001] | 1.283<br>[<.001] | 1.238<br>[<.001] | 1.097<br>[<.001] | 1.228<br>[<.001] | 1.099<br>[<.001] | 1.231<br>[<.001] |
| **China GDP** | 1.168<br>[0.812] | 1.436<br>[0.780]<br>(0.019) | 2.400<br>[0.667]<br>(0.033) | | | 2.338<br>[0.652] | 1.497<br>[0.771] | 2.653<br>[0.631] | | |
| **Foreign Firms of Trade Partner** | | 0.778<br>[<.001]<br>(0.402) | | 0.745<br>[<.001] | | 0.075<br>[0.899] | 0.781<br>[<.001] | | 0.754<br>[<.001] | |
| **Foreign Residents of Trade Partner** | | | 0.583<br>[<.001]<br>(0.386) | | 0.551<br>[<.001] | 0.536<br>[0.219] | | 0.588<br>[<.001] | | 0.559<br>[<.001] |
| **Other Foreign Firms** | | | | | | | -0.013<br>[0.917] | | -0.049<br>[0.728] | |
| **Other Foreign Residents** | | | | | | | | -0.054<br>[0.538] | | -0.086<br>[0.355] |
| **Time Fixed Effects** | No | No | No | Yes | Yes | No | No | No | Yes | Yes |
| **R-squared** | 0.416 | 0.483 | 0.497 | 0.509 | 0.520 | 0.497 | 0.483 | 0.497 | 0.509 | 0.520 |
| **No. of observations** | 83 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 |

**Note**: Dependent variable is China's bilateral imports. Foreign firms of trade partner is the number of firms the trade partner has located in China, foreign residents of trade partner is the number of residents the trade partner has living in China. Other foreign firms (residents) are firms (residents) of the same continent as the trade partner (excluding the trade partner). All variables in logarithms. Sources: CMCS (2001), various volumes, except Foreign GDP which is from www.ggdc.net, and Distance, which is by sea, in nautical miles, from www.portworld.com. For details on the sources, see Section 3 and the Appendix. Bootstrapped p-values clustered at the country level are given in brackets [p-value]. Standardized beta coefficients are reported in parentheses (beta).

**Table 8. The Legacy of Shanghai's Foreign Residents during the Treaty Port Era for Shanghai's Exports Today**

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| **Distance** | -0.367<br>[<.001] | -0.273<br>[<.001] | -0.310<br>[<.001] | -0.335<br>[<.001] | 0.230<br>[0.051]<br>(0.166) | 0.252<br>[0.035] |
| **Foreign GDP** | 0.582<br>[<.001] | 0.511<br>[<.001] | 0.541<br>[<.001] | 0.555<br>[<.001] | 0.279<br>[<.001]<br>(0.336) | 0.268<br>[<.001] |
| **Shanghai GDP** | 2.133<br>[<.001] | 2.152<br>[<.001] | 2.144<br>[<.001] | 2.140<br>[<.001] | 0.618<br>[0.132]<br>(0.159) | |
| **Foreign Residents in Year 1921** | | 0.027<br>[<.001] | | | 0.006<br>[0.469]<br>(0.031) | 0.006<br>[0.457] |
| **Foreign Residents in Years 1911 to 1921** | | | 0.016<br>[0.008] | | | |
| **Foreign Residents in Years 1872 to 1921** | | | | 0.023<br>[0.089] | | |
| **Foreign Residents Today** | | | | | 0.833<br>[<.001]<br>(0.674) | 0.871<br>[<.001] |
| **R-squared** | 0.784 | 0.792 | 0.787 | 0.785 | 0.885 | 0.894 |
| **No. of observations** | 90 | 90 | 90 | 90 | 86 | 86 |

**Note**: Dependent variable is Shanghai's bilateral exports; sample period is the years 2000 to 2009. Foreign Residents is measured as the number of foreigners from a particular trade partner living in Shanghai in various years. All variables, except Foreign Residents, are in logarithms. Sources: Foreign Residents during the treaty port era: CMCS (2001), various volumes, and CMCS (1873). Shanghai's exports, GDP, and foreign residents from Shanghai Statistical Yearbooks, Foreign GDP from www.ggdc.net; Distance and other gravity variables from CEPII gravity dataset. For details on the sources, see Section 3 and the Appendix. Column 6 includes time fixed effects (coefficients not shown). Bootstrapped p-values clustered at the country level are given in brackets. Standardized (beta) coefficients shown in parentheses in column 5.

**Table 9: The Legacy of Shanghai's Foreign Direct Investment during the Treaty Port Era for Shanghai's Exports Today**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| **Distance** | -0.464<br>[<.001] | -0.279<br>[<.001] | -0.358<br>[<.001] | -0.438<br>[<.001] | -0.251<br>[<.001]<br>(-0.130) | -0.293<br>[<.001] | -0.399<br>[<.001] | 0.037<br>[0.578] |
| **Foreign GDP** | 0.596<br>[<.001] | 0.463<br>[<.001] | 0.501<br>[<.001] | 0.564<br>[<.001] | 0.409<br>[<.001]<br>(0.394) | 0.401<br>[<.001] | 0.751<br>[<.001] | 0.589<br>[<.001] |
| **Shanghai GDP** | 1.471<br>[<.001] | 1.520<br>[<.001] | 1.506<br>[<.001] | 1.482<br>[<.001] | 1.358<br>[<.001]<br>(0.579) | | 1.409<br>[<.001] | 1.333<br>[<.001] |
| **FDI in Year 1921** | | 0.089<br>[<.001] | | | 0.059<br>[<.001]<br>(0.123) | 0.033<br>[0.020] | 0.023<br>[0.003] | 0.018<br>[0.071] |
| **FDI in Years 1911 to 1921** | | | 0.113<br>[<.001] | | | | | |
| **FDI in Years 1872 to 1921** | | | | 0.079<br>[0.053] | | | | |
| **FDI Today** | | | | | 0.184<br>[<.001]<br>(0.228) | 0.264<br>[<.001] | 0.034<br>[0.335] | 0.159<br>[<.001] |
| **Common Language** | | | | | | | 1.613<br>[<.001] | |
| **Time Zone Differences** | | | | | | | | -0.109<br>[<.001] |
| **R-squared** | 0.808 | 0.822 | 0.815 | 0.809 | 0.854 | 0.910 | 0.901 | 0.876 |
| **No. of observations** | 205 | 205 | 205 | 205 | 198 | 198 | 198 | 198 |

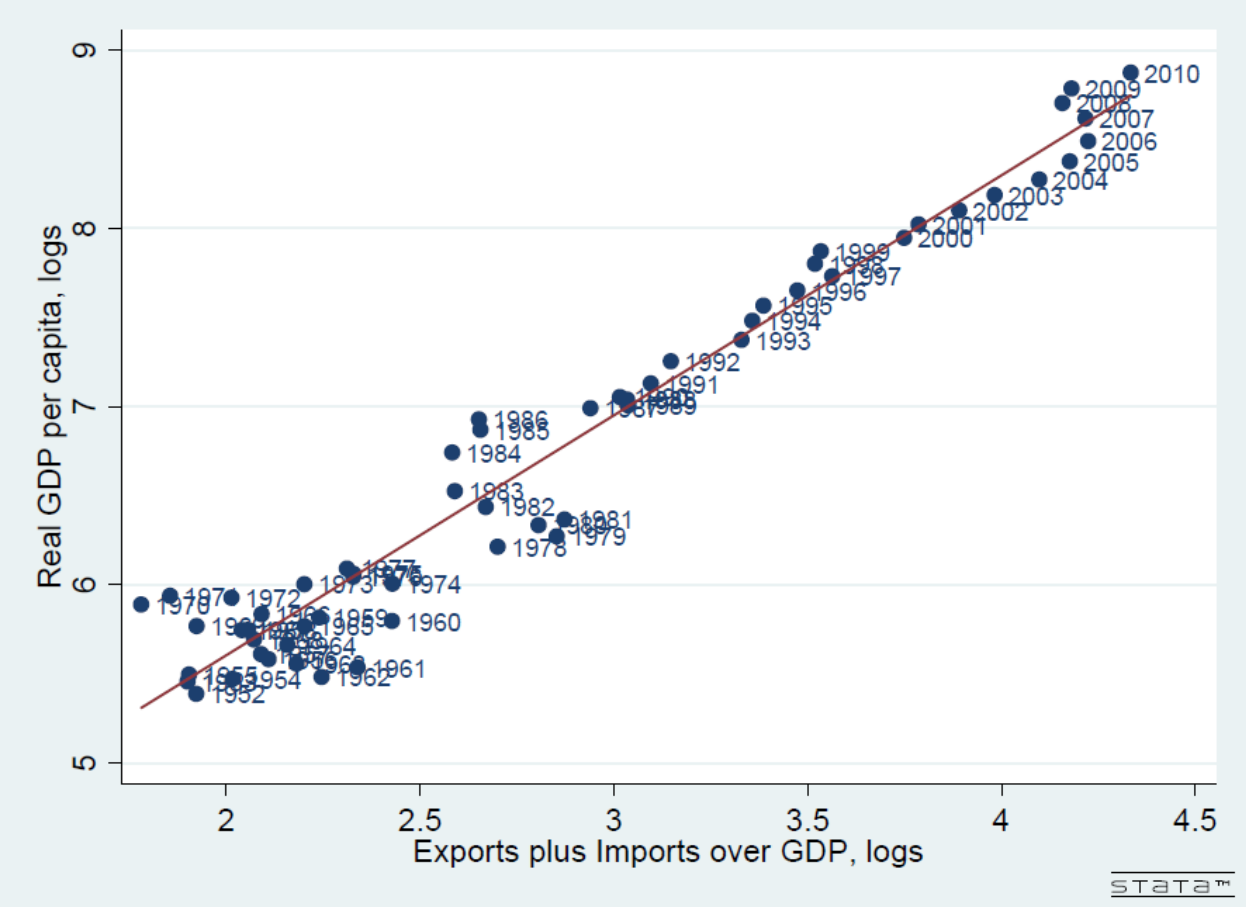
**Note**: Dependent variable is Shanghai's bilateral exports; sample period covers the years 1986 to 2009. FDI during the treaty port era is measured as the number of firms a particular trade partner has located in Shanghai during the Treaty Port Era; FDI Today is measured as the contracted foreign capital of Shanghai from foreign investing country. Common Language is a 0/1 variable; Time Zone Differences is the absolute value of the number of time zones between Shanghai and the trade partner. All variables, except FDI during the treaty port era, Common Language, and Time Zone Differences, are in logarithms. Sources: FDI Treaty Port Era: CMCS (2001), various volumes, and CMCS (1873). Shanghai's exports, GDP, and FDI during the modern period from Shanghai Statistical Yearbooks; Foreign GDP from www.ggdc.net; Distance, Common Language, and Time Zone Differences from the CEPII gravity dataset. For details on the sources, see Section 3 and the Appendix. Column 6 includes time fixed effects (coefficients not shown). Bootstrapped p-values clustered at the country level are given in brackets. Standardized (beta) coefficients shown in parentheses in column 5.

**Table A: Shanghai's Bilateral Imports Today and the Legacy of Shanghai's Foreign Firms and Residents during the Treaty Port Era**

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| **Distance** | -0.802<br>[<.001] | -0.776<br>[<.001]<br>(-0.328) | -0.793<br>[<.001] | -0.390<br>[0.001]<br>(-0.289) |
| **Foreign GDP** | 0.612<br>[<.001] | 0.590<br>[<.001]<br>(0.465) | 0.548<br>[<.001] | 0.357<br>[<.001]<br>(0.440) |
| **Shanghai GDP** | 1.973<br>[<.001] | 1.807<br>[<.001]<br>(0.630) | 1.423<br>[<.001] | 0.232<br>[0.517]<br>(0.061) |
| **FDI in Year 1921** | -0.004<br>[0.772] | -0.027<br>[0.028]<br>(-0.045) | | |
| **Foreign Residents in Year 1921** | | | -0.012<br>[0.030] | -0.029<br>[<.001]<br>(-0.144) |
| **FDI Today** | | 0.121<br>[0.001]<br>(0.122) | | |
| **Foreign Residents Today** | | | | 0.679<br>[<.001]<br>(0.563) |
| **R-squared** | 0.808 | 0.813 | 0.745 | 0.800 |
| **No. of observations** | 205 | 198 | 90 | 86 |

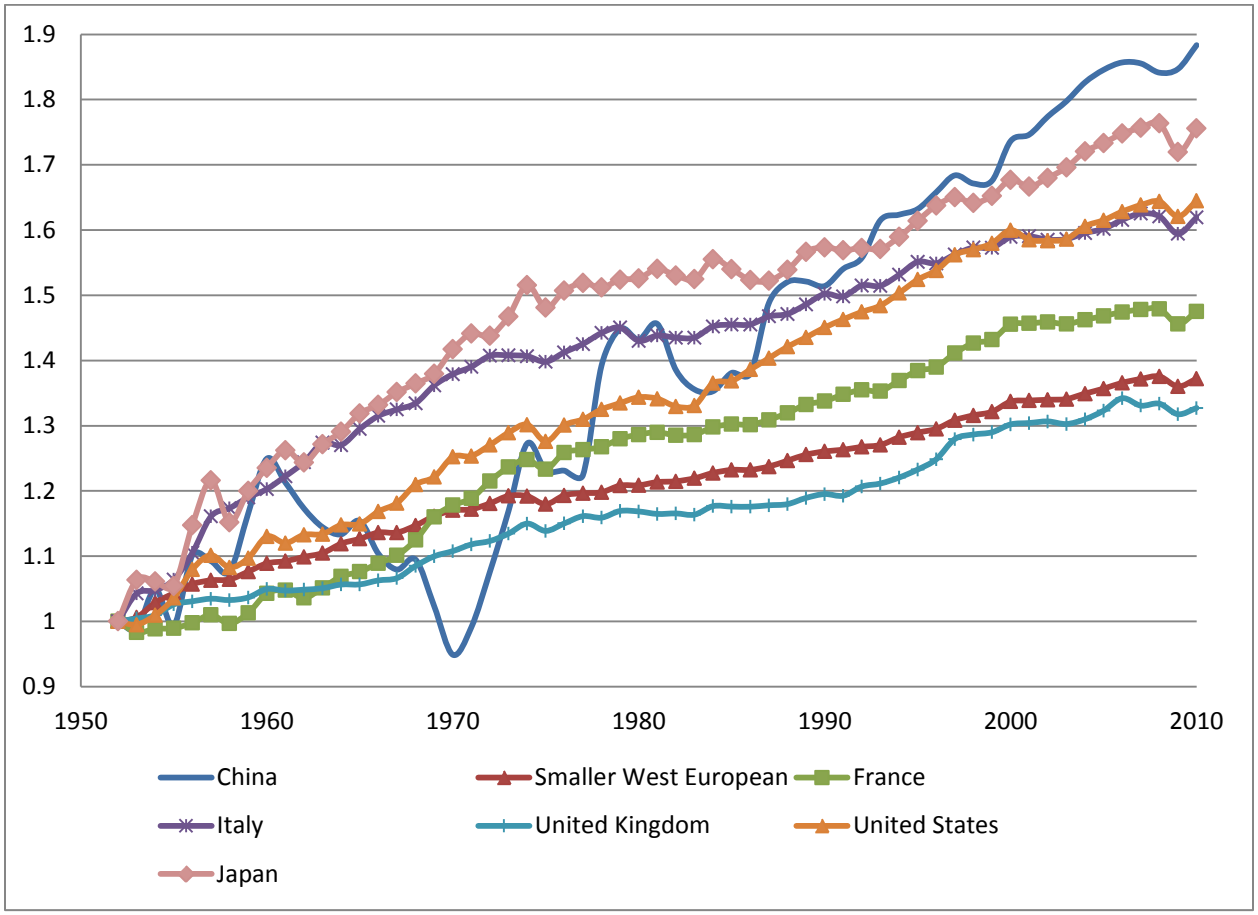
**Note**: Dependent variable is Shanghai's bilateral imports; sample years cover 1986 to 2009 in columns (1) and (2), and years 2000 to 2009 in columns (3) and (4). See Tables 8 and 9 for variable definitions and sources. Bootstrapped p-values clustered at the country level are given in brackets. Standardized (beta) coefficients shown in parentheses in columns 2 and 4.

**Figure 1: The Correlation of Trade Openness and Income per Capita in Post- World War II China**



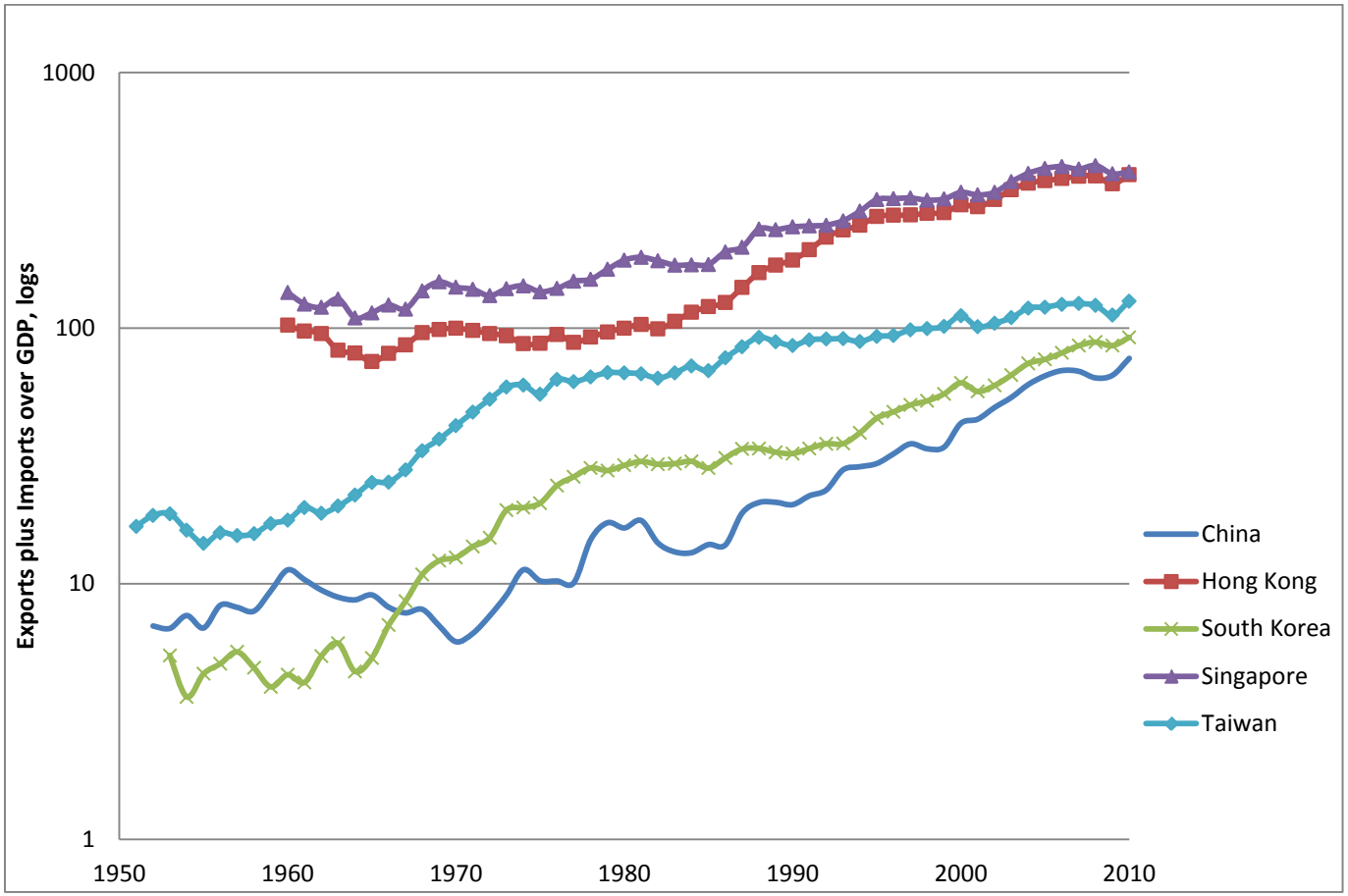

**Note**: Data from Penn World Tables, version 7.1

**Figure 2: The Relative Growth of Openness in the Post World War II Era (1952 = 1)**



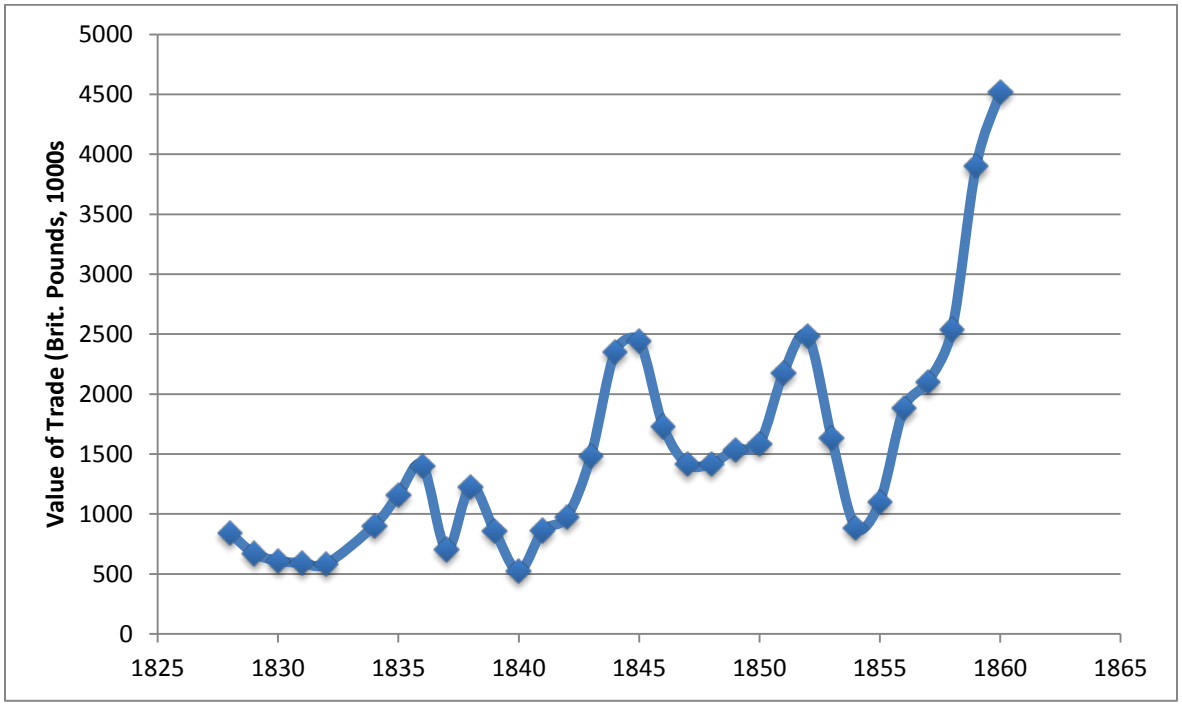

**Note**: Openness defined as exports plus imports over GDP, from Penn World Tables, version 7.1. For each country, the percentage annual rate of growth in openness is computed, and then linked to the level of 1 in the year 1952. Smaller West European are Austria, Belgium, Denmark, Finland, the Netherlands, Norway, Portugal, Sweden, and Switzerland.

**Figure 3: The Growth of Openness in Asia Since World War II**



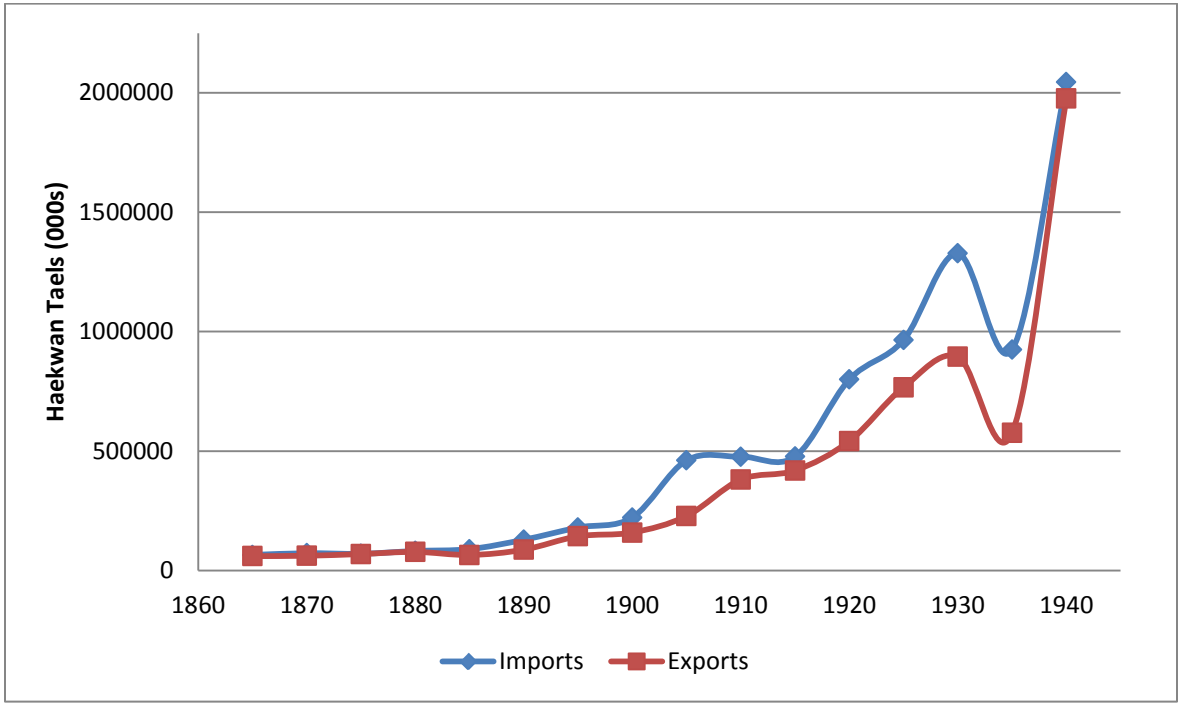

**Note**: Data from Penn World Tables, version 7.1

**Figure 4: China's Imports from Great Britain, 1828 to 1860**



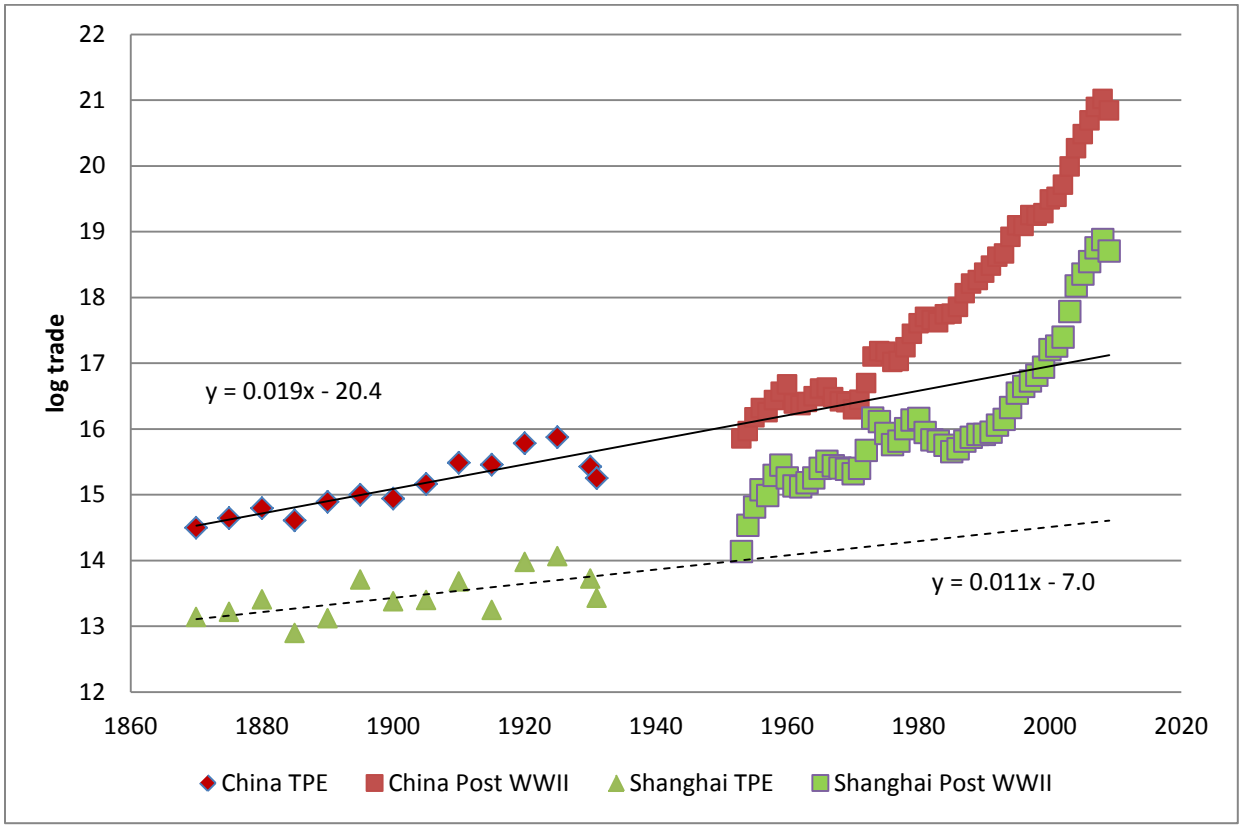

**Note**: Data from British Parliamentary Papers.

**Figure 5: China's Foreign Trade, 1865 to 1940**



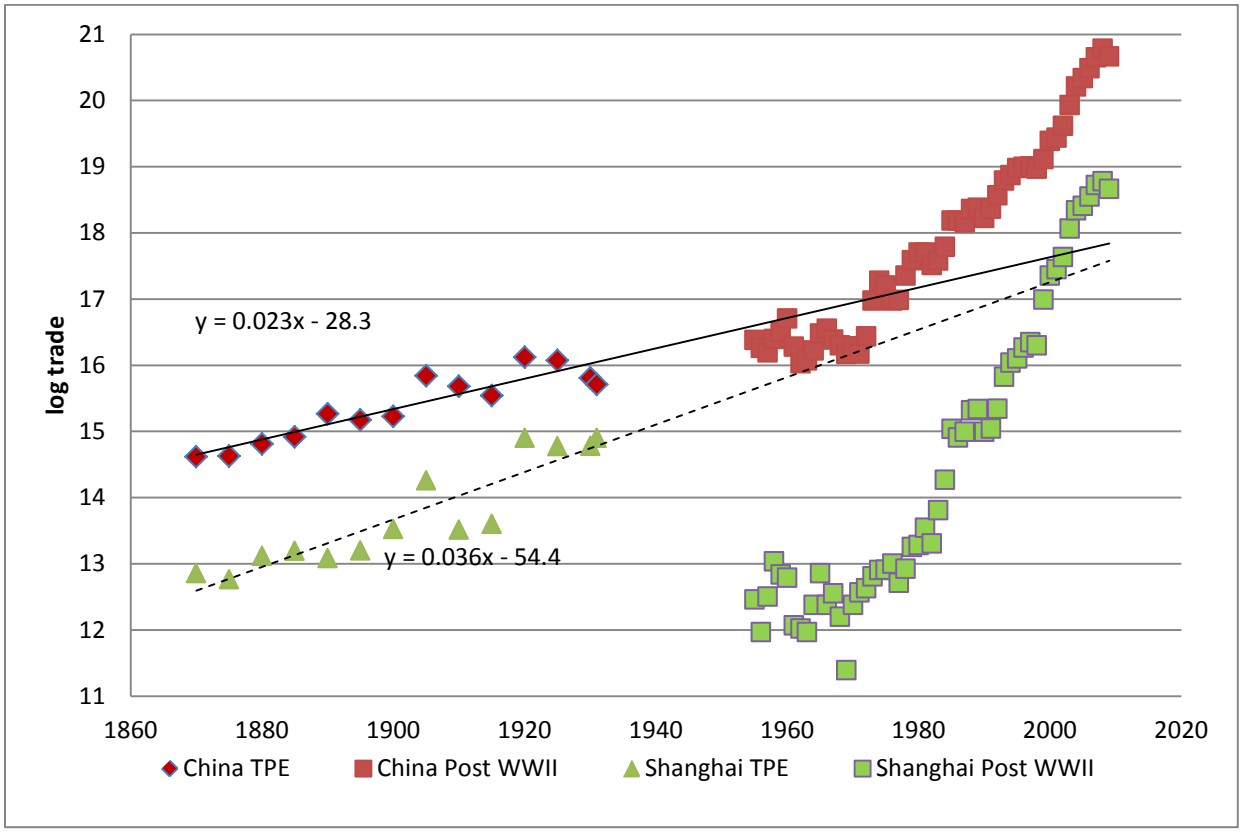

**Note**: Data from CMCS (2001), various years.

**Figure 6: Exports of Shanghai and China**



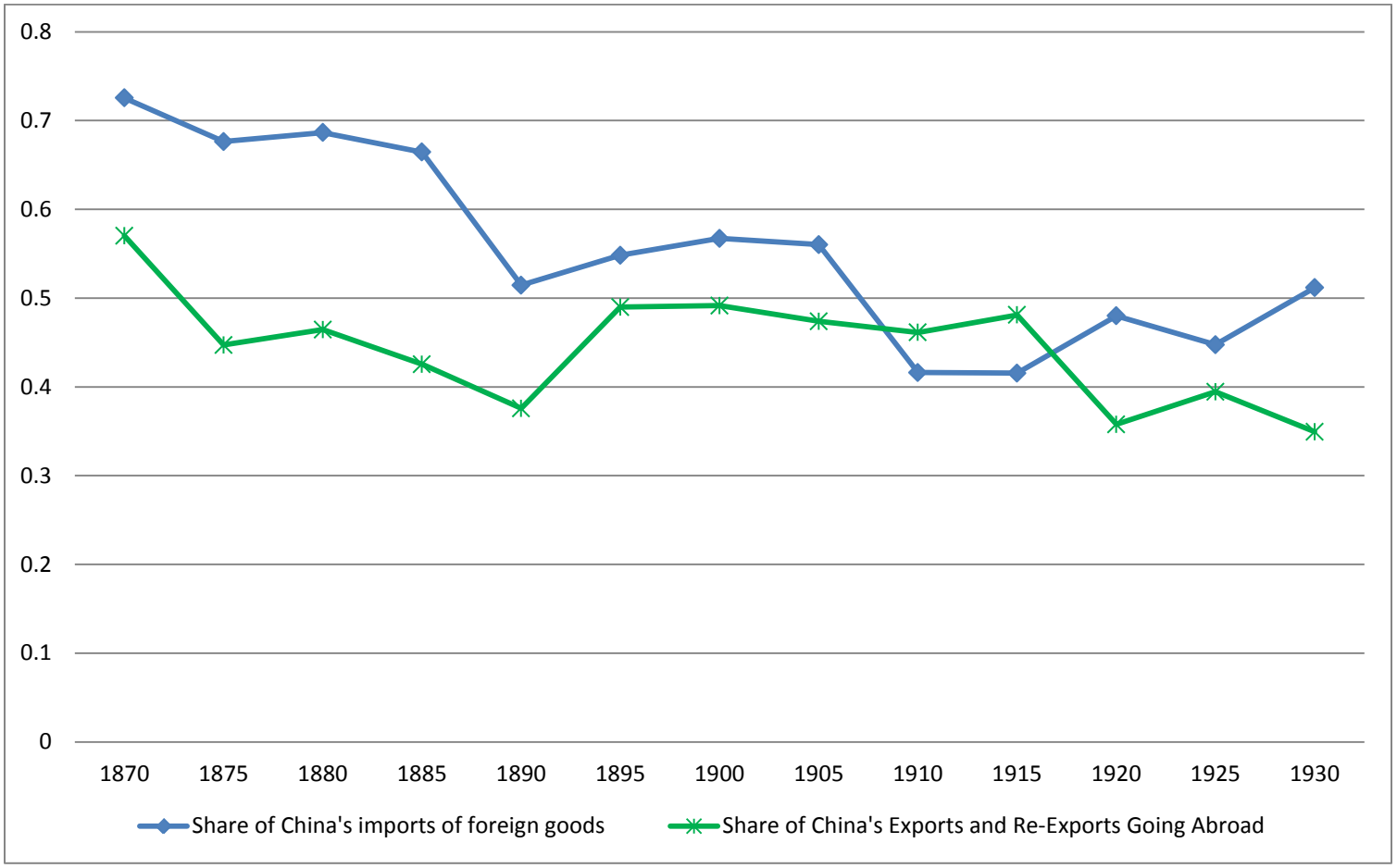

**Note**: TPE stands for treaty port era. Data before 1940 comes from CMCS (2001), various volumes. Information on Shanghai after World War II (WWII) from Shanghai Statistical Yearbooks, various volumes, and for China post WWII from World Development Indicators, the World Bank.

**Figure 7: Imports of Shanghai and China**




**Note**: TPE stands for treaty port era. Data before 1940 comes from CMCS (2001), various volumes. Information on Shanghai after World War II (WWII) from Shanghai Statistical Yearbooks, various volumes, and for China post WWII from World Development Indicators, the World Bank.

**Figure 8: Shanghai's Share in China's Trade including Re-Exports, 1870 to 1930**




**Note**: Both measures give information on *gross* trade, that is, part of Shanghai's imports of foreign goods were re-exported to other Chinese regions, and part of Shanghai's exports were produced not in Shanghai itself. Data from CMCS (2001), various volumes.

**Figure 9: Shanghai's Foreign Exports: Breakdown into Local Production and Re-exports By Time Period**




**Note**: Data from CMCS (2001), various volumes.

**Figure 10. Composition of Shanghai's Imports: Treaty Port Era versus Today**

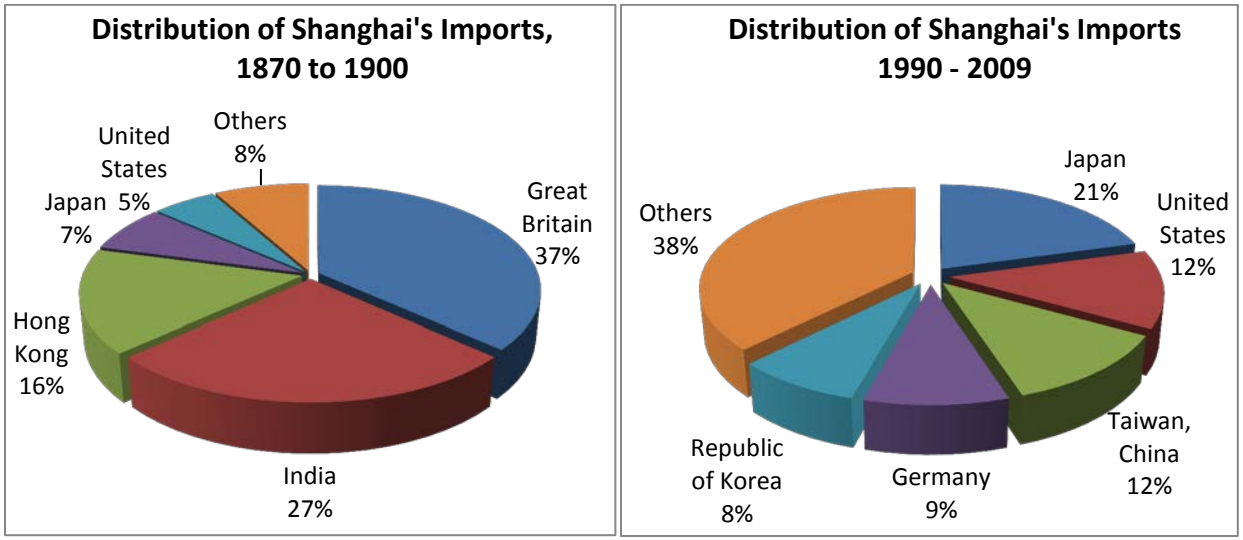



**Figure 11. Composition of Shanghai's Exports: Treaty Port Era versus Today**

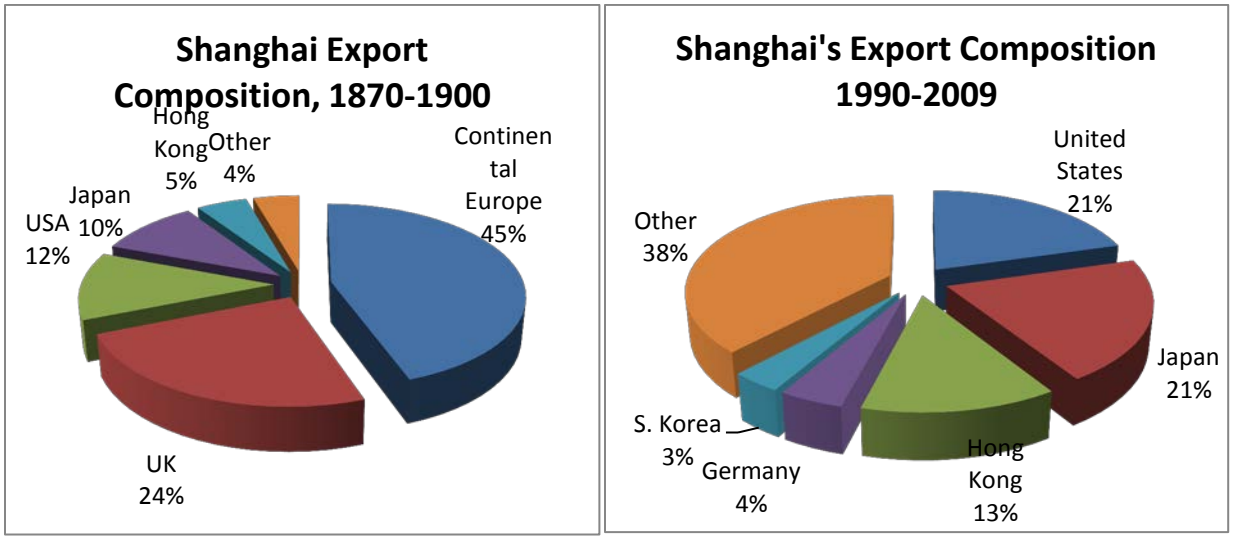
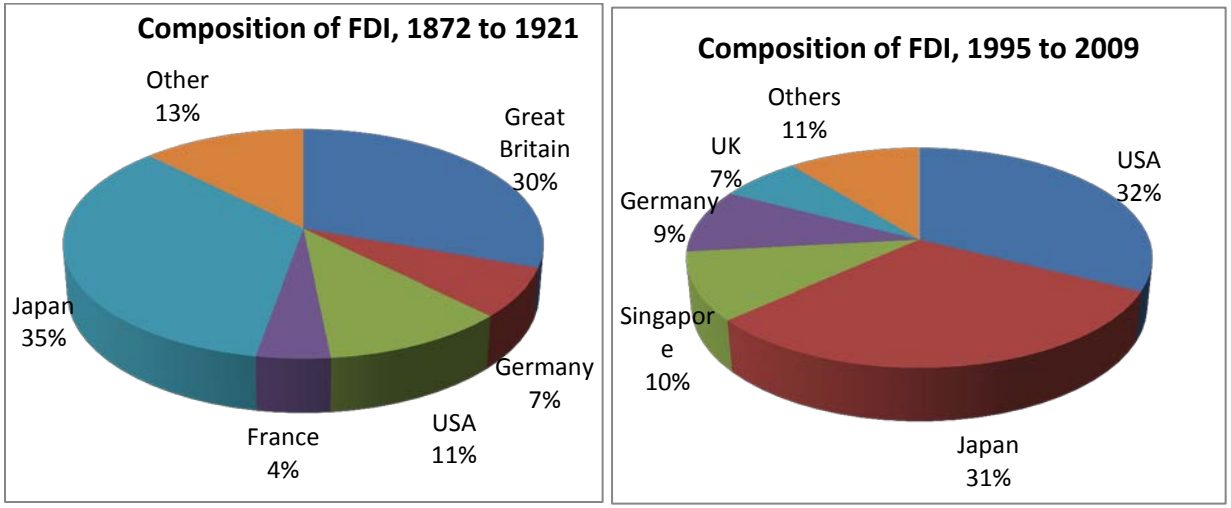
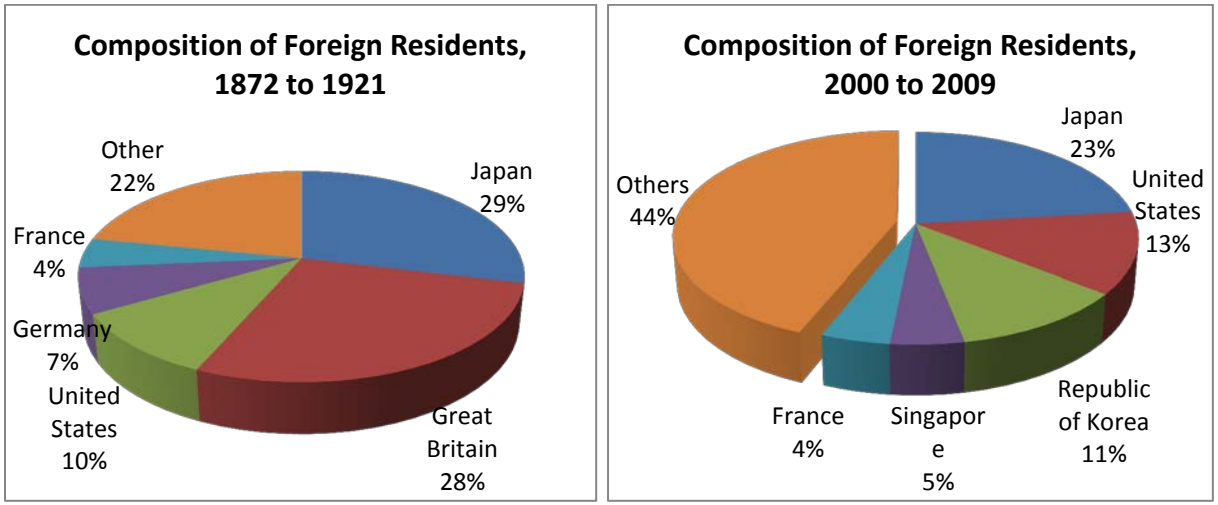


**Figure 12. Composition of Foreign Direct Investment in Shanghai: Treaty Port Era versus Today**



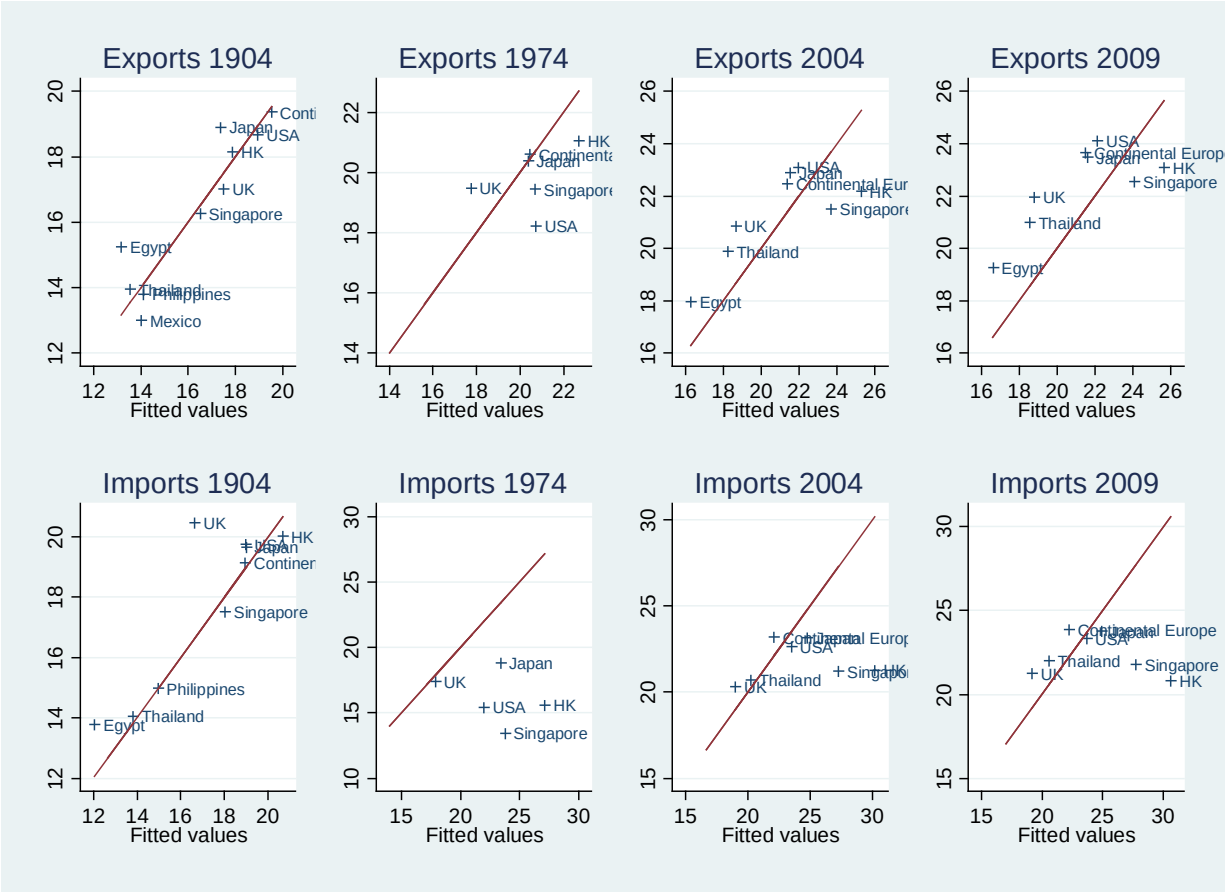

**Note:** For period 1872 to 1921, the shares are for the number of foreign firms (source: CMCS 1873, CMCS 2001, various volumes). For the period 1995 to 2009, the shares are derived from foreign capital absorbed (source: Shanghai Statistical Yearbook, various years). Modern period excludes FDI from Hong Kong, Taiwan, and Macao.

**Figure 13. Composition of Foreign Residents in Shanghai: Treaty Port Era versus Today**



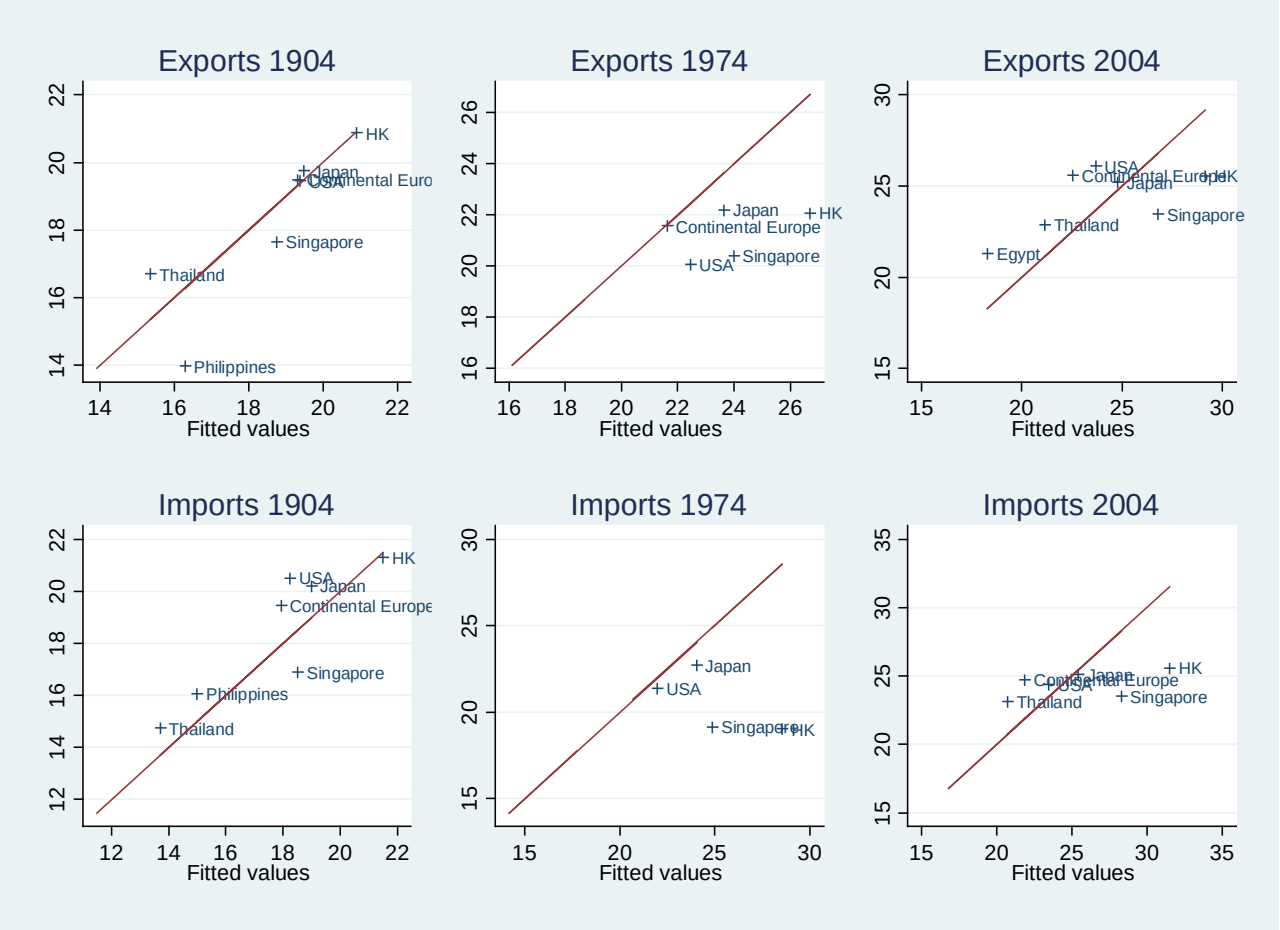

**Note:** Figures for 1872 to 1921 from CMCS (1873), CMCS (2001), various volumes. For years 2000 to 2009, data comes from the Shanghai Statistical Yearbook, various years.

**Figure 14. Projected and Actual Bilateral Trade Patterns for Shanghai**



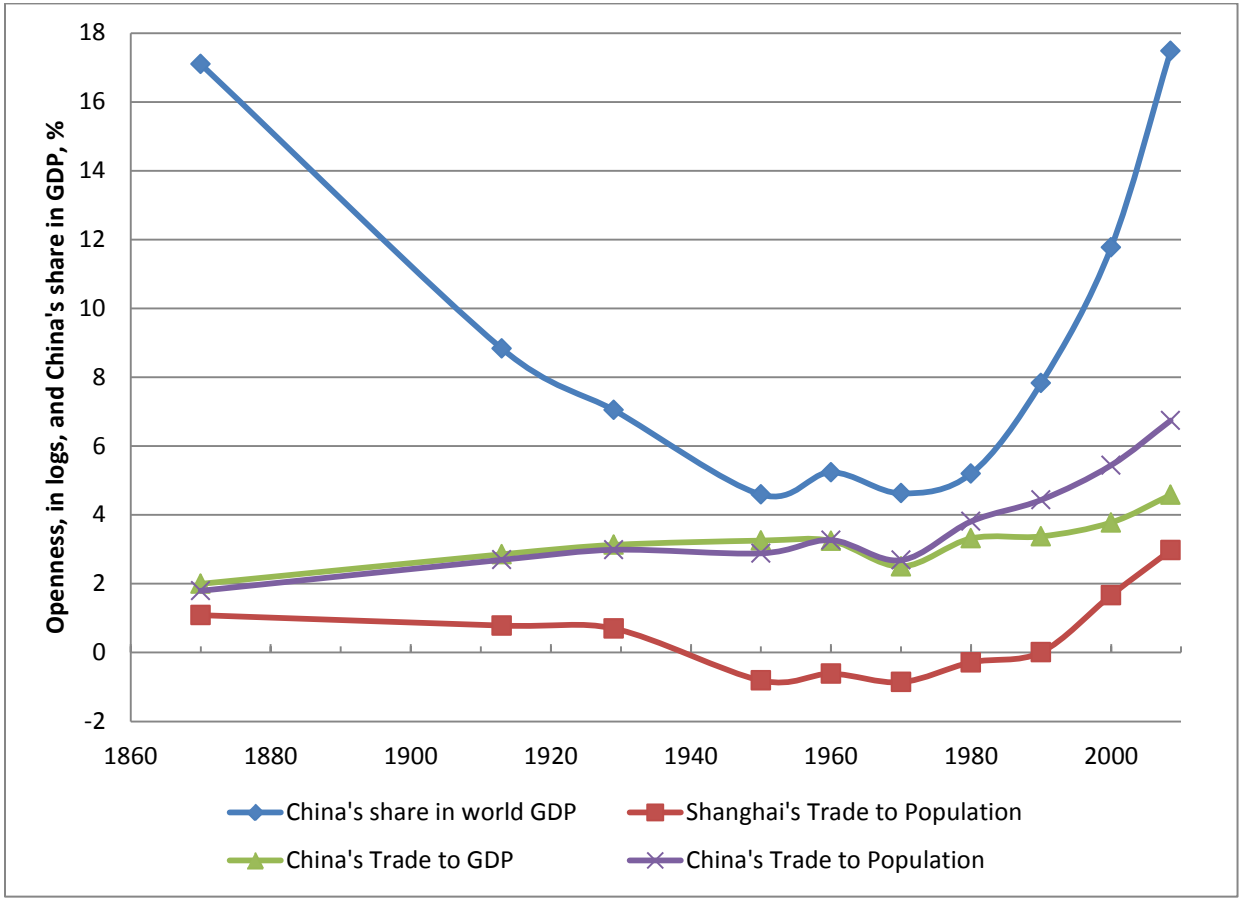

**Note**: On the horizontal axis is the predicted value of trade using values on the independent variables in years 1904, 1974, 2004, and 2009, respectively, together with the gravity regression coefficients for the historical period (1869 to 1904). On the vertical axis the actual value of trade for the same years is given. Trade data from CMCS (2001) and Shanghai Statistical Yearbooks, various volumes; for sources on other variables, see Section 3.

**Figure 15. Projected and Actual Bilateral Trade Patterns, China with the Exception of Shanghai**




**Note**: On the horizontal axis is the predicted value of trade using values on the independent variables in years 1904, 1974, and 2004, respectively, together with the gravity regression coefficients for the historical period (1869 to 1904). On the vertical axis the actual value of trade for the same years is given. Trade data from CMCS (2001) and Shanghai Statistical Yearbooks, various volumes; for sources on other variables, see Section 3.

**Figure 16. Explaining China's Share in World GDP: Shanghai's Openness or China's Openness?**




**Note:** GDP data from www.ggdc.net; China's population before 1940 from this source as well. China's and Shanghai's trade before 1940 from CMCS (2001), various volumes; trade data after 1940 from Shanghai Statistical Yearbook, various volumes, for Shanghai, and from World Development Indicators (WDI), The World Bank, for China. WDI is also the source for China's post WWII population. Shanghai population before 1940 from CMCS (2001), various volumes, and after 1940 from Shanghai Statistical Yearbook, various volumes.