

NBER WORKING PAPER SERIES

CHINA'S FOREIGN TRADE AND INVESTMENT, 1800 - 1950

Wolfgang Keller  
Carol H. Shiue

Working Paper 27558  
<http://www.nber.org/papers/w27558>

NATIONAL BUREAU OF ECONOMIC RESEARCH  
1050 Massachusetts Avenue  
Cambridge, MA 02138  
July 2020

Support from the National Science Foundation (Grants SES 0453040 and SES 1124426) is gratefully acknowledged. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

NBER working papers are circulated for discussion and comment purposes. They have not been peer-reviewed or been subject to the review by the NBER Board of Directors that accompanies official NBER publications.

© 2020 by Wolfgang Keller and Carol H. Shiue. All rights reserved. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission provided that full credit, including © notice, is given to the source.

China's Foreign Trade and Investment, 1800 - 1950  
Wolfgang Keller and Carol H. Shiue  
NBER Working Paper No. 27558  
July 2020  
JEL No. F1,F2,N15,O1

### **ABSTRACT**

The First Opium War (1840-42) was a watershed in the history of China. In its aftermath Britain and other countries forced open new ports to foreign trade through international treaties. Chinese institutions of trade were abolished and re-organized under Western management, Western legal institutions were introduced in China in form of courts and legal practices, and foreigners in China were tried according to the laws of their country of origin (extraterritoriality). To better understand the implications of these changes during the Treaty Port Era (1842-1943), we begin by discussing the attitudes towards foreign trade before 1840 for both China and the West. Drawing on information from the foreign-led Chinese Maritime Customs organization, we provide a synopsis of China's foreign trade and investment both in terms of patterns and volumes. The paper highlights the link between foreign and domestic trade as well as the important role of new, previously not traded goods for welfare. Employing several outcome measures, we show that Western influence generated significant benefits to China's economy, and the results suggest that the geographic scope of these benefits reached into areas far beyond the treaty ports.

Wolfgang Keller  
Department of Economics  
University of Colorado, Boulder  
Boulder, CO 80309-0256  
and NBER  
Wolfgang.Keller@colorado.edu

Carol H. Shiue  
Department of Economics  
University of Colorado at Boulder  
Boulder, CO 80309  
and NBER  
carol.shiue@colorado.edu

# China's Foreign Trade and Investment, 1800 - 1950\*

Wolfgang Keller<sup>†</sup> and Carol H. Shiue<sup>‡</sup>

July 15, 2020

## 1 Introduction

In the 18th century, the Qing Dynasty (1644-1911) was the dominant power within Asia. Its political system and institutions of state-building were founded on structures inherited from previous Chinese dynasties, as well as on the social and cultural codes of interaction among polities across Central Eurasia, East Asia, and Southeast Asia. China's international trade was oriented towards intra-Asian maritime commerce. Only one port was open to Western traders. In the decades leading up to the First Opium War of 1839 to 1842, China's foreign trade policy towards Sino-Western trade became increasingly at odds with British ambitions in Asia. The tensions stemmed from abiding differences in the political economy of not just two nations, but two empires. The overseas ambitions of the British empire took on a forceful new impetus with the British Industrial Revolution, and over the 19th century, technological improvements in transport powered a renewed effort by the West to expand global trade.

The Opium War of 1839 to 1842 was the turning point that effectively suspended Qing control over its foreign trade policy. Foreign, in particular Western nations, took greater control over key economic and political institutions. After 1842, Chinese ports that had previously been closed to Western traders were forced open to trade and investment. In these so-called

---

\*Prepared as Chapter 11 of the Cambridge Economic History of China, D. Ma and R. von Glahn (eds.), Vol. 2. Part 2, forthcoming. Kyle Butts, Jacob Howard, Peiyuan Li, William Ridley, and Javier Andres Santiago provided excellent research assistance. Support from the National Science Foundation (Grants SES 0453040 and SES 1124426) is gratefully acknowledged.

<sup>†</sup>University of Colorado Boulder, NBER, CEPR, and CESifo.

<sup>‡</sup>University of Colorado Boulder, CEPR, and CESifo.

“treaty ports”, tariffs on foreign imports into China were fixed at a low rate. Beyond trade, consular offices and foreign courts were established in China, exempting foreign nationals who were residing in China from the jurisdiction of Chinese law. The implications of the semi-colonial treaty port system for China—including questions about the western impact on China’s economic development, nation-building, technology transfer, and policy-making internationally—have been of perennial interest.<sup>1</sup> What has been less emphasized in the literature is that what we know about China’s foreign trade increased dramatically during this period. Before the 1800’s, the quality of archival data on the quantities, prices, and types of goods in China’s foreign trade, although substantial, is on the whole variable. After the mid-19th century, there was a sea change in what was systematically recorded about China’s imports and exports. The reason was not China’s new interest in foreign trade nor an improved statistical capacity due to a rising level of China’s economic development, but rather, to Western interests in China. The records thus reflect this aspect of history.

This chapter discusses China’s foreign openness from 1800 to 1950 from the point of view of new sources of information on foreign trade and investment that became available because of Western influence in China. The quantitative information on China that was collected in the 19th and 20th centuries had to do with the fact that the *Chinese Maritime Customs* (CMC) Service helped to revolutionize the system of foreign trade in China by introducing a consistent set of rules. The records are complex, yet of high quality.<sup>2</sup> In fact, the CMC data gives more detail than is found even in modern day international trade data as it captures re-exports with great detail, allowing gross trade to be distinguished from net trade flows.<sup>3</sup>

In order to understand the opening of China in the 19th century, Section 2 discusses the historical background of trade before 1840, and the motivations and attitude towards trade at the time. In Section 3, we consider the history of the CMC and the development of the organization during the the Treaty Port Era (1842–1943). Drawing both on recent work and original quantitative research, we summarize some of the findings based on the CMC data.<sup>4</sup>

---

<sup>1</sup>A number of historical overviews have been written by 19th century observers. Mayers, Dennys, and King (1867) is a compilation by British consular officers about treaty ports and companies in China and Japan. Another comprehensive treatment by a customs official in China is Hosea Ballou Morse (1910). See also Chong Su See (1919), Jiang (1938), Greenberg (1951), Feuerwerker (1976, 1980) for additional analysis. Recent historical treatments of the era can be found in Downs (2014); Bickers and Jackson (2016); Reinhardt (2018).

<sup>2</sup>Murphey (1977) stated, “the recorded figures probably inflated the real import and export of goods by close to 100 percent” (pp. 213–214), erroneously concluding the data was unreliable due to double-counting of what was traded. In actuality, a high degree of internal consistency and accuracy allows us to reconstruct real imports and exports at the port level.

<sup>3</sup>See Keller, Li, and Shiue (2013), Data Appendix, for a discussion of data quality of the CMC trade data.

<sup>4</sup>In particular, see Keller, Li, and Shiue (2011, 2012, 2013), Keller, Santiago, and Shiue (2017), and Keller and Shiue (2020).

We present China’s foreign trade at the aggregate level, as well as its composition by foreign country.

Beyond the resource gains that arise from commodity trade, trade also affects development by transferring knowledge with respect to new products, institutional environments, and different legal systems.<sup>5</sup> Section 4 briefly outlines the evolution of foreign-owned firms in China and aggregate levels of foreign direct investment, which also became both more systematically recorded during this period.

Since foreign trade often requires shipments from points of local production to ports of export, a high degree of domestic market integration between regions where goods—such as silk, tea, or porcelain—are produced, and the ports where the goods are ultimately destined for export—would have been important for the flow of exports. Domestic markets in 18th century China were populated by many buyers and sellers and were relatively efficient.<sup>6</sup> But how did foreign trade affect the domestic economy? Section 5 quantifies the effect of foreign trade in China from two key perspectives: the size and distribution of its welfare effects and the geographic scope of foreign influence on domestic capital markets.

Finally, in Section 6, we show how commodity level trade statistics can be used to obtain a more granular view on trade, in particular, on the role of the extensive margin, that is, goods that newly enter foreign trade. As there were important revisions to the manner in which China’s foreign trade data was collected throughout the period, we discuss new methodologies that can be implemented to address changes in the definition of new goods. A number of broader lessons are discussed in the concluding Section 7.

## 2 China’s Foreign Trade Before 1839 and the Opium Wars

To understand foreign trade in China prior to the Opium Wars, it is essential to consider the motivations and the preoccupations of both the Qing Dynasty (1644-1911) and of Western traders in the period leading up to the 19th century.<sup>7</sup> In particular, even though Chinese

---

<sup>5</sup>See Keller, Lampe, and Shiue (2020) for a survey on real trade and factor flows in the 18th and 19th centuries from the viewpoint of global trade.

<sup>6</sup>Shiue (2002); Shiue and Keller (2007).

<sup>7</sup>Secondary accounts on the nature of the conflicts of the Opium Wars: Waley (1963), Chang (1964), Hsü (1970), Beeching (1975), Su (1997), Wakeman (1997), Fay (1998), Brook and Wakabayashi (2000), Spence (2003), Lutz (2008), Lovell (2015).

merchants had been conducting trade over long distances with numerous foreign countries, China didn't have one foreign policy, but multiple policies that depended on the region in question. In addition, these policies changed over time.

It is important to note that China's borders were always porous to foreign traders. Early on, in the Western Han (206 BCE-9CE), China's push into Central Asia was instrumental in supporting the caravan trade on the famous Silk Road. In the Tang-Song transition (755 to 1127) the Yangtze<sup>8</sup> River valley emerged at the center of China's economy, and with it more urbanization, expanded domestic markets.<sup>9</sup> Significantly, China's cross-border commodity exchange permanently shifted away from the Silk Road, and towards maritime trade at the turn of the 10th century, by which time regions in Arabia and Persia, Java, Brunei, India, Japan, the Korean peninsula, and tribes of the Philippine archipelago were trading with China.<sup>10</sup> Intra-Asian maritime trade was active especially in the South China Sea. Over approximately 900-1300, triggered by the outward looking policies of the Song and Yuan, an increase in maritime trade occurred based on the export of pepper, safflower, and spices from Southeast Asia to China, in exchange for ceramics and metals.<sup>11</sup> Over Central Eurasia, nomadic Kazakhs and Mongolian tribes traded horses and furs in exchange for Chinese tea, cloth, and silks, and grain.<sup>12</sup>

Despite the presence of merchant-organized foreign trade with other nations, for much of China's history, from the point of view of the state, foreign trade was tied to foreign diplomacy. These terms were formalized in the framework of the tribute system (*chaogong tizhi* 朝贡体制). Notably, the tributary system encompassed different kinds of foreign relations. Prior to the Opium Wars, the Qing state organized the management of foreign relations into separate offices: the Court of Colonial Affairs (*lifanyuan* 理藩院), which dealt with Inner Asian regions including Mongolia, Russia, and Tibet; and the Board of Rites (*libu* 禮部), which handled court religious ceremonies but also the relations with Sinified tributaries. The tributaries retained their own sovereignty, but their rulers accepted the emperor of China as the nominal political and cultural hegemony, and they were rewarded for loyalty.<sup>13</sup> The

---

<sup>8</sup>Romanization of names of locations and treaty ports in this paper will follow that used by the CMC in the 19th and 20th centuries. *Pinyin* will be used in other cases.

<sup>9</sup>Miyakawa (1955); see also chapter in von Glahn (2016), p 208-217.

<sup>10</sup>So and Su (2000), p. 35.

<sup>11</sup>See Wade (2009) and Reid (1990a, 1990b). Reid (1990b) argues that these trades continued until the mid-17th century when the expansion of the Dutch East India Company into the region effectively ended the maritime trade boom.

<sup>12</sup>See Perdue (2005) for accounts related to the private trade and cooperative official exchange of Central Eurasia, p. 400-402, 575.

<sup>13</sup>Korea, for example, was considered a loyal tributary state, and thus Ming troops were sent in 1590's to help Korea fight off the Japanese. Other close tributaries included: Vietnam, Siam, Laos, Burma,

Qing also recognized arms-length relationships with non-tributary states, depending on the circumstances.<sup>14</sup>

Tributary trade—in which states ritually presented China with gifts, and often received gifts of even greater value in return—had been used as a means for China to maintain and to expand relationships with neighboring polities.<sup>15</sup> According to Fairbank (1942, 1969) and Fairbank and Teng (1941), the tribute system governed the entire foreign relations world order of China’s empire up to the 19th century, and this narrow mindset precluded the possibility of free trade and nation-state diplomacy based on terms of mutual equality.<sup>16</sup>

Recent research by numerous scholars has expanded on the interpretation of Fairbank and his co-authors in major ways. In particular, the importance of tributary trade has been shown to have weakened significantly over time. The Ming emperors were the last to prohibit maritime trade in favor of tributary trade, and even they didn’t succeed fully to enforce it when the Portuguese occupied Macau and established a private trade center there in the mid-16th century after they realized they could profit by shipping silk to Japan. The Qing further departed from the traditional tributary system when, in 1684, the Qing emperor, Kangxi, opened all coastal ports to private trade and established customs stations to collect taxes.<sup>17</sup> Moreover, although Ming and Qing emperors used maritime trade bans (*haijin* 海禁), compared to Ming emperors, Qing rulers were generally more relaxed about market-based exchange even if trade bans were imposed for strategic purposes.<sup>18</sup>

Because of the precedents set up during Kangxi’s reign (1661-1722), however, by the 18th century what we see is that although the tributary *system* was still in place, and provided a way for polities to promote diplomatic relations, tributary *trade* ran parallel to commercial

---

Cambodia, Liuqiu (Ryukyu), Luzon and Java, and the Central Asian peoples such as the Kazakhs, Kirghiz, and Badakhshanis. In 1754, Qianlong refers to Java as “already within the compass of Our enlightened government”, Elliot (2009), p. 126.

<sup>14</sup>For example, the Portuguese did not accept the emperor of China as the nominal authority but were allowed them to settle in Macau.

<sup>15</sup>Stability on the frontiers in Central Asia could have meant a net gain from the perspective of China’s rulers if that reduced the chance of military encounters; see Perdue (2005), p. 402-03.

<sup>16</sup>Fairbank and Teng (1941), citing Tsiang Tingfu, p. 140: “[in the 11th and 12th centuries], the neo-Confucian philosophy worked, which began to dominate China, worked out a dogma in regard to international relations, to hold sway in China right to the middle of the nineteenth century...That dogma asserts that national security could only be found in isolation and stipulates that whoever wished to enter into relations with China must do so as China’s vassal, acknowledging the supremacy of the Chinese emperor and obeying his commands, thus ruling out all possibility of international intercourse on terms of equality.”

<sup>17</sup>Rowe 2009, p.136.

<sup>18</sup>The Qing imposed a maritime ban that lasted 21 years (between 1656 to 1684) in order to squeeze the Zheng empire—a powerful merchant organization that was loyal to the Ming Dynasty.

trade, and was frequently of secondary importance to private trade.<sup>19</sup> It was from this new environment that the Sino-Western trade that first emerged out of demand for Chinese luxury goods—tea, silk, porcelain, furniture, art, and lacquers—continued to operate over the 18th century. It was also a time when Chinese merchants sailed to Nagasaki regularly to trade with Japanese merchants and entrepreneurs, and private Japanese traders plied the Chinese coastal trade.<sup>20</sup> Moreover, private maritime trade was well-established among Asian traders in the South China Sea, and these trades resulted in organized private enterprise and a Chinese diaspora that sent amounts of remittances back home.<sup>21</sup>

One consequence of the pervasiveness of these global trading networks was that silver from overseas surged into China and was exchanged for Chinese goods.<sup>22</sup> In the 17th century, China imported around 115 tons of silver annually, approximately half of which came from mines in Japan, and the other half from the Americas.<sup>23</sup> Whether this extensive global trade is the cause or the outcome of the divergence in living standards between China and Europe has been the subject of long-standing debates.<sup>24</sup> What seems clear, however, is that accumulating qualitative and quantitative evidence overturns the conclusions of the older literature by Fairbanks and others who saw China as an isolationist state before the West “opened” its markets.

Here, it is furthermore worth noting that the Qing—in particular the Qianlong emperor (1711-1799)—went much further than the preceding Ming state in terms of territorial expansion and empire building. A combination of diplomacy and military aggression, including foreign trade policy, had made it possible for the Qing to achieve a high level of political, economic, and civilizational hegemony.<sup>25</sup> At the same time, it could not be claimed that the

---

<sup>19</sup>Rowe (2009, p. 136) concludes tributary trade was “nil”; whereas Hamashita (2013, Ch. 2) depicts tributary trade as being intertwined with commercial trade.

<sup>20</sup>Since the 1970’s, historians have challenged the “national seclusion” view of Japan, documenting the continuous arrival of foreign trading vessels in Japan from the 17th through the 19th centuries. See Figure 1.2 in Peng (2019); Hamashita (2013) presents a regional maritime history based on networks of trade that cut across national borders.

<sup>21</sup>Hamashita (2013), Ch. 3-6; Zhao (2013), Ch. 6.

<sup>22</sup>Chuang (1969); Hamashita (2013, Ch. 4).

<sup>23</sup>See von Glahn 2016, p. 309; von Glahn (2007) documents how foreign coins could be found circulating alongside domestic currencies, or, as the dominating means of payment.

<sup>24</sup>Offering a contrasting point of view to Wallerstein’s treatment of Asia as a semi-peripheral area relative to the European core before the mid-19th century, Frank (1998) argues that a global economy in 1400-1900 centered on Asia. Jones (1981) and Pomeranz (2000) offer competing explanations and points of emphasis, with the latter arguing that it was the relaxing of ecological constraints in Europe brought about by access to New World resources that laid the foundations for the Great Divergence between China and Europe. Also see Findlay and O’Rourke (2007), who focus on the role of empire and the global connections established through trade.

<sup>25</sup>Wade (2005) links the Zheng He voyages to aggressive attempts to dominate trade routes in the Middle East and East Asia, and suggests the voyages constitutes maritime proto-colonialism.



Chinese state had no challengers.<sup>26</sup> Quite the opposite, the Qing state had no challengers of equal stature in Asia because it had successfully eliminated the threats from neighboring regions, as well as the domestic rebellions from within. The military campaigns by the Qing state over Central Asia, for example, nearly obliterated the Dzungar (Zunghar) population of 600,000.<sup>27</sup> At its maximal extent around the year 1780, the total territories of the Qing Dynasty were about double the extent governed by the Ming. It was the second largest Chinese empire, surpassed only by the Mongol Empire of Kublai Khan.

Within China, three key ports directed the trade coming from the West: Macau, Canton (now Guangzhou), and Hong Kong. Starting from the year 1684, and for more than 150 years after, the Qing managed Sino-Western trade through a merchant guild, or “Co-Hong” (公行). These merchants were appointed by the state to manage the European trade. The official superintendent of maritime customs, known as the “Hoppo”, collected duties on foreign trade through the Hong merchants. These revenues were sent directly to the imperial household. After 1757, and until 1842, all Western trade had to be conducted from Canton. The Canton System allowed British, Dutch, French, Austrians, Swedish, Spanish, Americans, and other traders to carry out trades with a member of the Hong merchants. In practice, this meant traders were required to live in special quarters, in buildings called “factories”. The factories were located outside of the city along Canton Harbor and included space for warehouses and offices.

Although Qing emperors personally gained revenues from the Sino-West trade, they did not seek to expand trade or diplomatic relations beyond the Canton System. This may seem irrational, but it might be remembered that the early and mid-Qing rulers sat at the apex of dynastic influence within Asia, and it was a largely successful position that had been achieved by incorporating foreign trade as a lever of power within a very different set of institutional constraints. Both national security and economic gain likely entered into Qing calculations of how it handled Western traders. Rulers were concerned about the increasing encroachment of foreigners and their activities on domestic interests. Thus, appointed Co-Hong merchants were responsible not only for the payment of transit dues of foreign traders, but also for the good behavior of foreign crews, in addition to managing the actual trade. Furthermore, Qing regulations limited foreign merchants from having personal or diplomatic channels of

---

<sup>26</sup>Referencing what he felt to be his top ten military achievements during his reign, Qianlong wrote: “The ten instances of military merit include the two pacifications of the Dzungars, the quelling of the Muslim tribes, the two annihilations of the Jinchuan [rebels], the restoring of peace to Taiwan, and the subjugations of Burma and Vietnam; adding the recent twin capitulations of the Gurkhas makes ten in all. Why is there any need to include those three trivial rebellions in the inner provinces?” Elliot (2009), p. 89.

<sup>27</sup>About 90% of the Dzungars were killed, died, or were taken captive; Elliot (2009), p. 94. Qianlong targeted young and strong men for massacre in order to destroy them as a people; Perdue (2005), p. 283.

communication with Qing government officials. Outside of the four-month trading season, foreigners had to relocate away from Canton and to Macau.

From the British perspective, the Canton System was unsatisfactory. Western traders who came to China often represented companies or syndicates that were funded by wealthy landowners and entrepreneurs in an industrializing Europe, or from the United States. They wanted more interaction and more representation. These organizations were in some cases powerful enough to influence government politics at home.<sup>28</sup> One prominent example of the close connection between merchants' interests and their political activity is the British East India Company (BEIC), which operated from 1600 until 1834. The BEIC was a trading monopoly that competed with the nationally chartered Dutch East India Company (Vereenigde Oost-Indische Compagnie, VOC) in Asia. The expansion of foreign trade into Asia was a central aim of the British government and the BEIC.

One example that compellingly illustrates the different motivations of Britain and China was Lord Macartney's mission to China. In 1792, Macartney was commissioned by Henry Dundas (who was president of the board of BEIC, and a member of Britain's home ministry) to speak to the Qing court on behalf of British interests. Specifically, Macartney was instructed to relay to China's emperor "the mutual benefit to be derived from trade between the two Nations".<sup>29</sup> He was also to bring some products in order to "excite at Peking a taste for many articles of English workmanship hitherto unknown there ... [and] turn the balance of the China trade considerably in favour of Great Britain".<sup>30</sup> As imported opium was already a growing point of discord, Macartney was also instructed that should the subject of opium should come up, and "if it should be made a positive requisition or any article of any proposed commercial treaty, that none of that drug should be sent by us to China, you must accede to it, rather than risk any essential benefit by contending for a liberty in this respect".<sup>31</sup>

On September 14, 1793, Macartney arrived in the court of Qianlong, who was over 80 years old at the time, with numerous gifts, most of which were European luxury items, such as German planetariums and clocks by Vulliamy. From Qianlong's written reply to King George III, we know that Macartney successfully transmitted to the Qing court Britain's requests, which Qianlong understood well. They were: 1) to have more ports in China to be open for purposes of trade, 2) to be able to establish a repository at the capital in Peking, 3) to have a island where merchants can reside and goods can be warehoused, 4) to be able to have a

---

<sup>28</sup>Brenner (2003) examines the relationship between English commerce and the political activities of overseas traders in the 17th century.

<sup>29</sup>Chen et al. (2014), 6.1 "Lord Macartney's Commission from Henry Dundas, 1792".

<sup>30</sup>As quoted from Morse, *The Chronicles*, vol. 2. p. 215. Cited in Berg (2006).

<sup>31</sup>Chen et al. (2014), 6.1 "Lord Macartney's Commission from Henry Dundas. 1792".

place inside the city of Canton where foreign merchants may reside, 5) to have reduced duties on merchandise, 6) to have reduced tariffs on ships, 7) to gain the full liberty to disseminate European religions to Chinese subjects.<sup>32</sup> Judging from the tone of Qianlong’s long reply to Macartney’s entreaties, he did not view Britain as more than a presumptuous far away state that had overstepped proper boundaries of civilized relations.

A common interpretation of Qianlong’s dismissal of Macartney’s requests is that it encapsulates “the Chinese policy of superior indifference to Western things”.<sup>33</sup> Yet a closer reading of the events shows that Qianlong was interested in foreign objects, and perhaps even prized them, as he already possessed in his residence exactly the kinds of mechanical devices that Macartney had brought with him on his journey to China.<sup>34</sup> Apparently, unbeknown to Macartney, similar luxury objects had arrived in Beijing through existing channels of trade. Macartney later wrote in his journal that on his tour of Qianlong’s pavilion, he saw “stupendous vases of jasper and agate; with the finest porcelain and japan,<sup>35</sup> and with every kind of European toys and sing-songs; with spheres, orreries, clocks and musical automatons of such exquisite workmanship, and in such profusion, that our present must shrink from the comparison and hide their diminished heads”.<sup>36</sup>

The Macartney mission did not fundamentally alter the way Sino-Western trade was conducted. Unlike their European counterparts, Chinese merchants had neither the explicit military backing of the state, nor, at least for the most part, the means to wage war against the state.<sup>37</sup> Instead, Chinese merchants typically tried to acquire official or semi-official roles within the state. Thus, many well-off merchants in China sought to gain greater influence in the government by purchasing degrees or investing in the education of their sons so that someone in the clan could gain the ear of an official, or better, be anointed into officialdom themselves.<sup>38</sup>

---

<sup>32</sup>Chen et al. (2014), p. 90-93.

<sup>33</sup>Landes (2006), p. 18.

<sup>34</sup>“On the court’s side, questions concerning Macartney’s pronouncements about the British gifts still lingered. As if to address this issue directly, the embassy was taken to buildings filled with intricate European clocks and mechanical devices...The point being made that the things Macartney had brought were in no way unique to his king’s domain”; cited from Hevia (1995), p. 179.

<sup>35</sup>Objects made with a dark lacquer.

<sup>36</sup>Cited in Hevia (1995), p. 176. See also Berg (2006).

<sup>37</sup>There were exceptions. One of the most successful merchant organizations was the Zheng family. Their annual profits from maritime trades were least one-third that of the Dutch VOC; see Appendix 3 in Hang (2015). In 1661, Zheng Chenggong (also known by Koxinga), successfully laid siege to the Dutch fort, Zeelandia, located in Taiwan. There, he established the Zheng family’s base of operations as a separate state named Ming Eastern Capital (*Dongdu Mingjing* 東都明京), in open defiance of the Qing.

<sup>38</sup>These official positions were frequently the most rewarding from socio-economic point of view; see Shiue (2017) for further discussion and references.

All the while, British and other western traders felt slighted as they sought to engage with China in the new diplomatic language of equal nation-states and negotiated benefits, while Qing emperors still considered the arrival of Western traders on China's shores to be nothing more significant than the understandable desire of foreigners to partake of the benefits of China's civilization and the blessings of the emperor. British, American, and European merchants chafed under the restrictions of Qing policies, but not so much as to be willing to give up their share of the profits from the Canton trade.

The differences in the political economy in the two empires, and how each conceptualized domestic and foreign relations, seem to be especially striking in the years leading up to the Opium War.<sup>39</sup> Because of the successful spread of the British Industrial Revolution, our modern system of foreign trade and diplomacy aligns with that of the European system, but it might be remembered that Europe had itself only not that long ago—sometime between the Treaty of Westphalia (1646-1648), the revolutionary decade of 1787 to 1799 in France, and the Congress of Vienna (1814-1815)—settled on the nation-state framework as a formal system of international relations among sovereign states.<sup>40</sup> Before that, customs, personal relationships, and family alliances through marriage tended to play a larger role in foreign diplomatic negotiations in Europe too.

The good that tipped the trade balance was opium.<sup>41</sup> In 1773, 140,000 pounds of it was imported into China from India; by the early 1820s, this number had grown ten-fold.<sup>42</sup> Opium was illegal and yet openly smuggled, bought and sold on the watch of Qing merchants and officials alike. In the 1830's, 20-30 percent of government officials consumed opium, and the Daoguang Emperor (reign 1820-50) was himself an addict.<sup>43</sup> At first considered a foreign luxury good and a symbol of privilege and hospitality, opium became widely used throughout Chinese society.<sup>44</sup> Early debates in the Qing court about the appropriate response to opium imports considered both legalization and taxation of the drug, as well as strict prohibition, to reduce the economic and social costs.<sup>45</sup> Eventually, opium imports became a scapegoat

---

<sup>39</sup>The similarities and differences in the economy and political system of China and Europe are further analyzed in detail in Wong (1997), Pomeranz (2000), Wong and Rosenthal (2011). Also Chapter 16 of Mokyr (2016).

<sup>40</sup>Kang (2010) and Hamashita (2013) contrasts Europe's "Westphalian system" with East Asia's formal hierarchy in international relations.

<sup>41</sup>See Dikötter, Laamann, and Xun (2002) on perspectives on the history of the consumption of opium; also, Su (1997).

<sup>42</sup>Spence (1992), p. 233-235.

<sup>43</sup>Perdue, (2011): [https://visualizingcultures.mit.edu/opium\\_wars\\_01/ow1\\_essay01.html](https://visualizingcultures.mit.edu/opium_wars_01/ow1_essay01.html)

<sup>44</sup>Qi (1959), p. 59.

<sup>45</sup>See the arguments from proponents legalization and taxation, as well as prohibition in Slade (1839), pp. 1-140.

for the failures of the government, social unrest, and the economic decline that characterizes the last third of the Qing Dynasty.<sup>46</sup>

Another important issue in the run-up to the Opium War was that from the start of Sino-Western trade, European traders sought access to Chinese markets not only to buy Chinese goods, but also to sell their own wares in what was they imagined to be an immense market. The problem, however, was not simply market access, but a lack of products that ordinary consumers in China could afford. As late as the 1830s, traders of one of the dominating trading houses at the time, Jardine Matheson, reported that the Chinese native *nankeen* cotton cloth (named for Nanjing) was superior in quality and cost compared to Manchester cotton goods.<sup>47</sup>

Thus, even though cotton was one of the core industries that was revolutionized by the British industrial revolution, it would still be some time before machine produced textiles could compete with the low costs of labor production in China. By contrast, as industrialization spread from Britain to northwest Europe and its offshoots, wealthier classes in urban centers may have been better able to afford foreign imports and Chinese luxury goods.<sup>48</sup> Not only did tea drinking become fashionable, but consumers were fascinated with chinoiserie and other Chinese decorative goods. Chinese craftsmen and manufacturers, for their part, also eagerly catered to custom-designed products for foreign markets.

In 1839, Qing Commissioner Lin Zexu was sent by Emperor Daoguang to end the opium problem through prohibition. Lin took the moral high ground on the matter of opium, eventually destroying a large cargo of opium when his entreaties to cease the opium trade failed.<sup>49</sup> In response, British traders declared property damage and quickly resorted to military action. It was the new technology of the steam engine outfitted on British boats, however, that determined the outcome of the Opium Wars. Finally, European grievances about the restrictive conditions of the Canton System could be forcefully expressed in the form of the

---

<sup>46</sup>Wang (2012) identifies periods of historical revisionism related to the politics of how the Opium Wars have been interpreted by Chinese leaders more recently.

<sup>47</sup>Greenberg (1951), p. 2.

<sup>48</sup>Average wage of urban residents in major cities of Western Europe like London were likely trending higher than it was for counterparts in Beijing or even Suzhou (Allen et al. 2007). Additional research is needed before we can be sure, but to the extent that average wages are correlated with incomes of the wealthier classes within each region, the trends may be similar.

<sup>49</sup>Lin's communication to Charles Elliot, the British Superintendent of Trade in March of 1839: "While our Celestial Court has in humble submission to it ten thousand (i.e. all) regions, and the heaven-like goodness of the great Emperor overshadows all, the nation aforesaid (Britain) and the Americans have, by their trade at Canton during many years, enjoyed, of all those in subjection, the largest measure of favors;" "but that they have brought opium—that pervading poison—to this land: thus profiting themselves by the injury of others..." Great Br. Foreign Office (1840), p. 268-269.

steamships that could deftly steer into the shallow harbor waters of Canton. British military forces took Canton, moved up the coast and along the Yangtze River, captured Shanghai, and eventually reached the Grand Canal, in effect threatening Peking itself.

China quickly surrendered, agreeing to sign the Treaty of Nanjing (1842), which stipulated that an indemnity had to be paid as compensation to Britain; in addition, Hong Kong was ceded to Britain. Beyond the initial four treaty ports (Xiamen, Fuzhou, Ningbo, and Shanghai), additional ports were later opened to foreign trade. Trade duties were limited to 5 percent ad valorem or less on all goods. Moreover, foreign nationals were given the right to reside and own property in designated treaty ports. In addition, foreigners in China would be subject to the legal jurisdiction of their own country rather than to Chinese laws.

The issue of the legality of opium in China was hardly worth even a mention in the Treaty of Nanjing. Indeed, the coup d'état was not about making the opium trade legal in China. The real prize was about market access and the entry of foreign businesses into China's economy. This sentiment was voiced by the British Plenipotentiary Sir Henry Pottinger, who announced after Britain's victory over China in the First Opium War (1840–42) that China's potential for trade was so vast "that all the mills of Lancashire could not make stocking stuff sufficient for one of its provinces".<sup>50</sup> His overly ambitious forecast was slow to come to fruition, however.

Initially, the Qing court did not see the Treaty of Nanjing as the resolution of a grand showdown, but rather as a small concession made in order to smooth over a conflict that could eventually be redressed in China's favor. For Britain, however, signed treaties between nations, compelled or not, was all that mattered in the new era defined by contractual agreements between nation-states. In 1844, the United States and France concluded similar treaties with China, the Treaty of Wanghia and Treaty of Whampoa, respectively. China's reluctance to enforce the terms of the earlier treaties led to the Second Opium War (1856-1860), and further treaty ratifications and most-favored-nation clauses that allowed all foreign powers operating in China to seek the same concessions. The various treaties thus gradually opened China to international markets and ushered in an age of ever-increasing commerce with the rest of the world until 1949, when Mao Zedong came to power.

---

<sup>50</sup>CMC (2001a), Fifth Issue, vol. 1, p. 39.

### 3 China's Foreign Trade During the Treaty Port Era (1842-1943)

The Treaty of Nanjing (1842) put into motion a significant transformation of China's trade environment. It was followed by the Treaty of Tianjin (1858), which opened yet more treaty ports, and it also laid the foundation for foreign trade policies in China in essential ways. The most important of the clauses of the Treaty of Tianjin established a system under which trade duties would be collected under a consistent system across treaty ports. In principle, this implied that foreign goods would be taxed only once upon entry into China and thereafter be exempt from further duties even if the goods were transported further inland. Among other rights granted to foreign traders and residents, foreign vessels were permitted on the Yangtze River and foreign merchants could also employ Chinese ships to carry their goods. The British were officially permitted, in 1848, to establish a foreign settlement in Shanghai. During the Treaty Port Era, foreigners came to have a much more active role in the wider economy than in earlier times, which included the ownership of hundreds of firms and businesses, such as banks and shipyards.

#### 3.1 The Chinese Maritime Customs and its Records

While the Treaty of Nanjing did away with several existing elements of China's foreign trade system, the Chinese Customs authority initially retained its oversight of the processing of foreign trade. However, the erosion of the central government's authority after the Opium War and the government's lasting preoccupation with the suppression of domestic uprisings (in particular the Taiping Rebellion of 1844 to 60), meant that foreign trade revenue collection fell primarily in the hands of provincial and local authorities. These local officials were ill-equipped to handle the larger volume of trade coming in, and foreign trade was not subject to a consistent set of rules. Rather, the payment of trade taxes was a matter of bargaining power, and the system was rife with corruption.<sup>51</sup>

The *Chinese Maritime Customs* (CMC) was founded in 1854 by the foreign consuls in Shanghai to collect maritime trade taxes that had been going unpaid due to the inability of Chinese officials to collect them during the Taiping Rebellion. Although the CMC was nominally

---

<sup>51</sup>Tax collection was poor even in major ports such as Shanghai. The British Consul of Shanghai estimated in one year that the loss of tariff revenue in Shanghai was at least 25 percent, and complained that "two or three sleepy menials at \$5 or \$6 a month" were the sole means existing for the collection of duty, with which he was bound by the Treaty of Nanjing to cooperate; CMC (2001a), Fifth Issue, vol. 1, p. 81.

under the jurisdiction of China's Foreign Office (the *Zongli yamen*, 總理衙門), which was newly established in 1861, in practice it operated under the management of foreign powers. In the beginning, its staff were mostly British. Later, nationals from other Western countries joined. The top CMC position and director of its operations was the Inspector General, who worked side by side with his Chinese counterpart, called the Superintendent of Customs, who oversaw the collection of trade taxes from the so-called native trade, that is, from Chinese-owned junks.

Early opposition to the CMC arose largely from foreign consuls who feared that the CMC would usurp some of their powers. Foreign merchants were also initially opposed to the CMC because now they had to deal with customs formalities that before were left in their entirety to Chinese middlemen and clerks. Within only a couple of years, however, foreign traders and entrepreneurs had come to prefer the consistent and predictable customs treatment by the new CMC system, and over time foreign merchants were generally in favor of the foreign inspectorship system—this smoothed the frictions between consuls and CMC officials.

Although the Chinese central government resented the loss of sovereignty that came with the Treaty of Nanjing and customs operations by the CMC, the introduction of the CMC also substantially increased the net tariff revenues it received.<sup>52</sup> Local Chinese government officials likely experienced a net decline in benefits as the CMC reduced their ability to withhold revenues from the central government and strike deals for personal enrichment. Moreover, smugglers, pirates, and adventurers saw their prospects of gain diminished with the arrival of the CMC, especially because over time the CMC extended its responsibilities to include anti-smuggling operations. Later, the CMC also expanded its involvement into postal administration, coastal policing, harbor and waterway management, and weather reporting.

From the point of view of the Treaty Powers, the establishment of the CMC not only broadened their political influence in China but also ensured that China would have the means to pay the indemnities imposed on it after the First and Second Opium Wars. The information generated by this system was so credible that China was able to put the tariff revenue down as collateral against which it could borrow from abroad at relatively low rates or interest. A further motive, arguably the most important, was that the Treaty Powers wanted to support the expansion of commercial exchange between China and their own economies, which necessitated a more open and consistent Chinese system.

---

<sup>52</sup>Robert Hart, the Inspector General of the CMC from 1863 to 1911 and one of the most influential individuals in the history of the Service, estimated that under the native customs system the costs of tariff collection were larger than the customs system's revenues, while under the CMC at Shanghai these costs were only around 2 percent of the revenues. CMC (2001a), Fifth Issue, vol. 1, p. 81.



**Figure 1:** Chinese Maritime Customs Stations and Treaty Ports



Source: CMC customs stations given in Lyons (1973), Treaty ports (TP) with entries in the *Returns to Trade* of 1910.

The CMC’s jurisdiction extended to “foreign-type” vessels, in particular steamships, whether owned by foreigners or by Chinese, and to junks chartered by foreigners. In addition to calculating tax revenues that were due, the CMC was responsible for the examination of cargo, the prevention of smuggling, and the assessment of treaty tariffs on exports, imports, and coastal trade. The nominal tariff was fixed to yield a rate of approximately five percent ad valorem, however, over time the effective rate was often lower, around three percent or less, due to price increases.

The number of treaty ports and Customs houses expanded until there were over 40 by the year 1907. Figure 1 displays the location of CMC stations that were established over the organization’s existence.<sup>53</sup> The CMC did not establish customs stations in all ports, but focused on the ports that were important for foreign trade. Generally, the more important

<sup>53</sup>The map gives on the list of treaty ports given in the CMC *Returns to Trade* of 1910. There were 92 treaty ports by 1917, but many were self-opened ports.

ports were opened relatively early, which means that even in the 1860s the CMC covered 80 to 90 percent of all foreign trade. With the opening of the CMC customs station in Kowloon in the year 1886, virtually all of China's foreign trade was covered.<sup>54</sup>

The CMC's statistical records on trade are contained primarily in the *Returns of Trade*, with additional statistics and more descriptive accounts available in the *Trade Reports* and *Special Collections*. From the start of the CMC in 1859 to its end in 1948, records on trade were entered at least on an annual interval. There is some daily information (e.g. for Shanghai) during some periods. Previous studies have given overviews of the institutional features of the CMC organization and have provided broad outlines of some of the contents of the CMC trade data.<sup>55</sup>

The most notable aspect of the CMC's trade records is that they capture trade flows that are difficult or impossible to obtain even in modern-day advanced economies. Most data on international trade take the country as the unit of observation. By contrast, the CMC recorded information not only by country, but by port. That is, the unit of observation is not country-to-country trade, but rather country to port-of-entry trade, where the port is treated independently as if it were a country. In this case, the port is the customs area. This allows for analyses that consider international trade flows at the intra-national level because the data effectively integrate domestic trade with international trade. This unique perspective on the movement of goods had much to do with the political circumstances at the time, when the treaty ports of China were treated as enclaves over which certain foreign countries had trading rights.

In order to assess trade duties in this elaborate system, the CMC's staff recorded the quantity and value of the goods carried. For example, in 1881, one can find over 20 different categories of Cotton Goods being imported (from Velvets and Velveteens to Turkey Red Cloths), at least 10 different varieties of Woolen Goods, and some 70 different Sundries that included Window Glass, Alpaca Umbrellas, Needles, and Dried Clams. From 1875 until around 1933, values were reported in terms of silver, also known as the Customs tael (or *haiguan liang* 海關兩). Rates of exchange between the Customs tael and the local currency existed for each port and were also reported by the CMC.<sup>56</sup>

---

<sup>54</sup>Kowloon was important for trade with Hong Kong, being located opposite of Hong Kong Island.

<sup>55</sup>Lyons (1973) outlines the contents of the CMC data and also paints a detailed portrait of the tea trade at several Chinese ports. On the institutional history of the CMC, see Hsiao (1974), Van de Ven (2004), Brunero (2004), and Bickers (2008). Nield (2015) gives details on many locations.

<sup>56</sup>Between 1875 and 1933, there were more variations. Currency units for value included the Spanish dollar, the British pound, local currency, Gold units, Gold Dollar, and the Chinese dollar.

Some qualifications should be noted. First, the CMC improved its record-keeping over time, so that it was not until 1867 that relatively uniform methods of accounting were put in place. Second, the statistics do not refer to the entirety of China's trade, but only to the trade through treaty ports, and of this trade, only that part of it that was carried on foreign vessels or on Chinese ships of the foreign type (that is, steamers). At the same time, the foreign-flag vessels not only included ships, but also those transports traveling overland to Russia. Further, from the year 1901 on, the CMC also took over the operation of Native Customs stations within 25 kilometers of open ports and began to collect data on trade going through these stations as well. The records on flows of those Chinese-produced goods were published in separate tables.

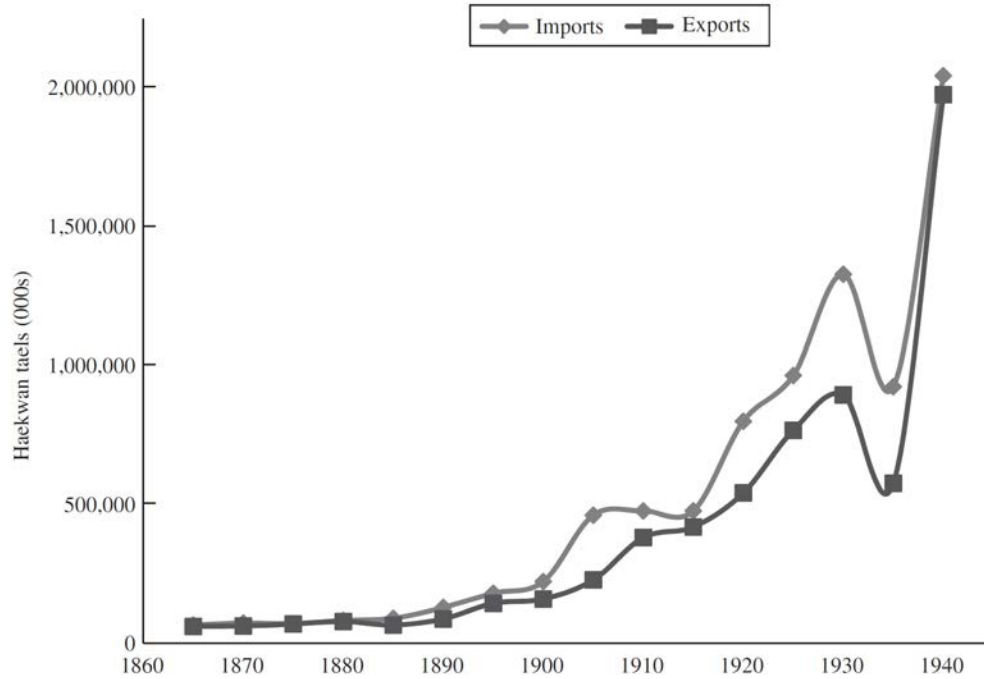
The trade statistics are broadly consistent, both internally to other numbers reported by the CMC and with foreign partner trade records where the data is considered to be of high quality. With the decline of 'junk' shipping, the coverage of foreign trade in the CMC data by the year 1904 was essentially one hundred percent. At the same time, the CMC data collection system underwent a number of changes, in part due to changing international practice, and in part due to structural economic changes. This is to be expected over a long period of close to one hundred years—1859 to 1948. We will return to this below in our discussion of China's commodity-level trade.

## **3.2 China's Overall Foreign Trade**

In this section, we summarize China's overall foreign trade. This provides a benchmark for the more disaggregated analysis below. All data are taken from the annual CMC reports (CMC 2001a). Figure 2 shows the evolution of China's aggregate foreign commodity trade. It is clear from the figure that trade expansion in China's trade remained relatively stagnant from 1865 to 1885. However, overall trade growth averaged 3.5 percent per year for imports and 2.7 percent for exports over the period 1865 to 1900.

Two things are apparent. First, for the period shown China was more likely to have a trade deficit than a trade surplus in its commodity trade, the difference to be covered by bullion or international debt. Second, the volume of China's overall foreign trade is relatively stable before the year 1885. Afterwards, the evolution of China's trade is reasonably well-characterized by a linear growth trend of about 5 percent per year.

**Figure 2:** China's Foreign Trade, 1865 to 1940



*Notes:* Reported are nominal values of *haiguan taels*, the currency adopted by the CMC. No adjustments have been made for territorial changes, for example Manchuria, which became part of Japan in 1931. Shown in the graph are total imports; a fraction between 1 and 5 percent of these were re-exported from China to other countries.

### 3.3 Country Composition

Turning to the composition of China's foreign trade across countries, we analyze the 19th and 20th centuries separately because several major changes took place over this period. Table 1 shows China's main trade partners in both imports and exports between the years 1865 and 1900.

The role of Hong Kong in intermediating China's trade through re-exports (entrepôt trade) is well known. Only a small fraction of China's imports from Hong Kong are produced in Hong Kong, and analogously, only a small part of Chinese exports to Hong Kong are consumed in Hong Kong. Table 1 quantifies this for the 19th century, with around 40 percent of China's imports originating in Hong Kong, and nearly 30 percent of its exports destined for Hong Kong. Because the ultimate origin and destination of China's trade via Hong Kong is not known for all years, the following analysis nets out trade through Hong Kong.<sup>57</sup>

<sup>57</sup>A quantitative analysis of Hong Kong's role as entrepôt is in Keller, Li, and Shiue (2011).

**Table 1:** Average Trade Shares, 1865 to 1900

<b>Imports</b>	<b>%</b>	<b>Exports</b>	<b>%</b>
Great Britain	24.82	Hong Kong	26.94
Hong Kong	41.36	Great Britain	31.65
British India	18.23	Continental Europe	11.86
Japan	5.80	United States	11.07
United States	2.65	Russia	5.82
Continental Europe	2.31	Japan	4.93
Other countries	4.84	Other countries	7.73

**Table 2:** Major Sources of Chinese Imports, 1900 to 1946

<b>Country</b>	<b>%</b>
Japan	24.51
United States	22.05
Great Britain	17.02
British India	9.65
Germany	4.19
Java (Dutch East Indies)	2.91
French Indochina	2.39
Russia (Soviet Union)	2.10
Belgium-Luxembourg	1.85
Singapore	1.56
Australia	1.25
Other countries	10.53

*Notes:* Figures represent each country's share of total imports directly into China net of imports from Hong Kong.

**Table 3:** World Merchandise Trade by Country

Country	Year				Mean
	1913	1925	1930	1938	
China	1.88	2.30	1.83	1.98	2.00
Great Britain	15.24	14.90	13.44	13.90	14.37
United States	11.15	14.31	12.61	10.70	12.19
Japan	1.79	3.07	2.62	3.20	2.67
British India	3.60	3.59	2.87	2.50	3.14
Germany	13.12	8.00	9.65	9.20	9.99

*Notes:* Figures for China are from the CMC reports, various volumes. Numbers in the table measure exports plus imports as a percentage share of the world total.

Table 2 shows the breakdown of China's imports for 1900 to 1946, which show with the turn of the century, a number of additional countries became important in China's trade. During the first half of the 20th century, Japan was the most important source of Chinese imports, followed by the United States, while Great Britain had fallen to third place. Beyond the level of overall trade, the types of goods imported from these countries differed, with Great Britain and the United States exporting relatively more machinery and other producer goods than Japan to China. Significant amounts of imports originated from nearby sources such as the Dutch East Indies, French Indochina, Singapore and Australia. Among the Continental European countries, the relatively early industrializers such as Germany and Belgium were more important than countries that industrialized later such as Italy. Overall, while the relative importance of trade with the British Empire had diminished, the evolution of China's trade patterns transitioned smoothly along the foundations laid during the 19th century.

It is useful to examine China's share of world trade in comparison with other countries. While statistics on China's trade were meticulously recorded by the CMC, it was only at the beginning of the 20th century that trade statistics for many other countries in the world became available. These figures are given in Table 3.<sup>58</sup>

China accounted for about 2 percent of world trade from 1913 to 1938, with a peak in the 1920s. As we will see below, it took a large part of the 20th century before it was able to capture a similar share of world trade. The value of China's foreign trade corresponds to about three-quarters of that of Japan and around two-thirds of that of British India. Unsurprisingly, China's foreign trade during this period fell far short of that of industrialized

<sup>58</sup>For countries other than China, see League of Nations (1940).

countries such as Great Britain, the United States, and Germany.

### 3.4 The Volume of Trade

This section considers the volume of foreign trade of China. For concreteness, we focus on the most important port of China during this period, which is Shanghai.<sup>59</sup> We employ the so-called gravity equation of trade to examine Shanghai’s bilateral trade with foreign countries. Generally, because the gravity equation is highly successful in explaining bilateral trade, and it has been established that many trade theories imply a version of the gravity equation.<sup>60</sup> It is also of interest to see whether Shanghai’s bilateral trade volumes 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. For example, if there were forced trade for certain bilateral partners, then this could violate the gravity model if the trades were imposed in a way that ran counter to the economic basis of trade. What we demonstrate is that in the case of China’s opening, the gravity model still applies, suggesting that natural trade flows resulted when ports were opened, with implications of gains from trade to China and foreign partners.

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

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

where  $i$  and  $j$  are two trading economies.  $TRADE$  is either exports or imports,  $GDP$  is gross domestic product, and  $DIST$  is shipping distance. The idea is that bilateral commercial interaction is increasing in the size of each economy (The GDPs) and declining in as trade barriers increase (distance would be one example of a trade barrier). In its log-linearized regression form, the equation is

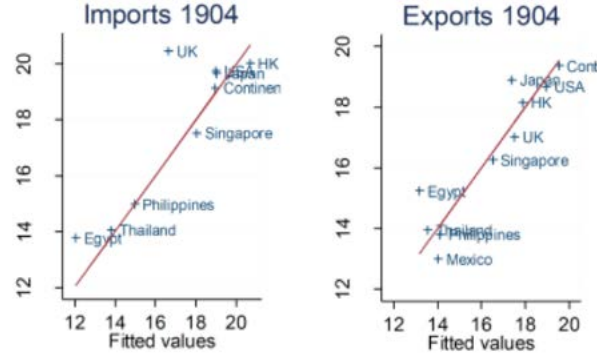
$$\ln TRADE_{ij} = \alpha \ln GDP_i + \beta \ln GDP_j + \gamma \ln DIST + X'_{ij} \delta + \varepsilon_{ij}, \quad (2)$$

where  $X$  refers to a set of control variables, and  $\varepsilon$  is a regression error. We expect  $\alpha, \beta > 0$  and  $\gamma < 0$ . The usual signs of the estimated coefficients are  $\hat{\alpha} > 0$  and  $\hat{\beta} > 0$  because bilateral transactions increase in the size of the trade partners, and  $\hat{\gamma} < 0$  because greater distance

<sup>59</sup>See Keller, Li, and Shiue (2013) for additional analysis.

<sup>60</sup>Anderson (2011) presents an overview.

**Figure 3:** Predicted vs. Actual Bilateral Trade Volume for Shanghai



*Notes:* On the horizontal axis is the predicted value of trade using values on the independent variables in the year 1904 and the gravity equation coefficients of Table 4. On the vertical axis the actual value of trade for the same years is given. Trade data from CMC (2001a) and Shanghai Statistical Yearbooks, various volumes.

implies more resistance to trade due to higher transport costs and other impediments. The term  $X$  includes time fixed-effects in some specifications.

The following countries and regions are included in the analysis: Continental Europe, Egypt, Hong Kong, Japan, the Philippines, Singapore, Thailand, and the United States.<sup>61</sup> Among these, Hong Kong and Singapore were entrepôts, and to control for this we include an indicator variable. GDP for Shanghai is proxied by population. Using data for years 1869 to 1904, we estimate a positive coefficient on foreign GDP and a negative coefficient on distance. Furthermore, the coefficients are not far from plus one (GDP) and minus one (distance). This is in line with other findings (Head and Mayer 2014).

The fit of the gravity equation can be assessed by comparing actual with predicted trade for a particular year. The results for 1904 are reported in Figure 3. The diagonal in each of the graphs of Figure 3 denotes the 45-degree line, where the prediction is equal to actual trade. We see that bilateral trade during the Treaty Port Era indeed follows the gravity equation. The gravity equation in trade is typically derived for models of market economies based on voluntary exchange; the results indicate that it also explains trade volumes in a time when colonial trade and regular trade are intertwined (see Keller, Li, and Shiue 2013 for more analysis).

<sup>61</sup>Results for foreign GDP and distance are similar when we include the United Kingdom.



## 4 Foreign Direct Investment in China

With the arrival of foreign traders, consulates, firms, and residents, Chinese treaty ports were exposed to aspects of British and Western technologies in mechanization, transportation, steam power, and other innovations in financial institutions and banking. Two channels through which major transfers of technology can place between countries are first, capital flows through foreign investments, and second, through foreign firms and residents. There is abundant evidence for both direct capital flows and for the possibility of knowledge and technological know-how to have diffused from western countries to China.<sup>62</sup>

### 4.1 Capital Flows

In this and the following subsection, we highlight the fact that capital flows increased during the 19th to early 20th century. Remer (1933) shows that Foreign Direct Investment (FDI) grew considerably over time, even after adjusting for inflation. As shown in Table 4, in 1902, business investments totaled around \$503.2 million and this grew to \$1,048.5 million in 1914 and \$2,474.5 million in 1931. The primary investor was Britain who invested around 30-40% in each year, and Japan who became a large investor by 1931 with 36.9% of the investment. Russia, on the other hand, was a large investor in 1902 with 43.7% of the investment but was down to only 11.1% by 1931. To put the total FDI numbers in context, Remer notes comparable estimates for India in 1933, with between 2,000 million and 3,500 million U.S. \$ in total FDI. Similar to the trade flows, FDI activity was concentrated at Shanghai (and to a lesser extent Manchuria). In 1931 as seen in Table 5, 46.4% of the business FDI was based in Shanghai.

### 4.2 Foreign Firms and Residents

Foreign Direct Investment can be seen as not just a transfer of capital, but also as a transfer of technological know-how. Furthermore, foreign-owned companies and individuals that can be sources of spillovers to the local economy. Generally, it is challenging to find quantitative evidence of technological know-how transfers in historical contexts, but CMC statistics can provide useful information for China, as summarized in the following.

---

<sup>62</sup>See also data tabulated in Kung's chapter on the western impact in China, in this Title.

**Table 4:** Business Investments in China by Country

	Business Investments in China by Country					
	1902		1914		1913	
	Mill. US \$	% of Total	Mill. US \$	% of Total	Mill. US \$	% of Total
Britain	150	29.8	400	36.9	963.4	38.9
Japan	1	0.2	210	19.4	912.8	36.9
Russia	220.1	43.7	236.5	21.8	273.2	11.1
U.S.	17.5	3.5	42	3.9	155.1	6.3
France	29.6	5.9	60	5.5	95	3.9
Germany	85	16.9	136	12.5	75	3
Total	503.2	100	1,084.50	100	2,474.50	100

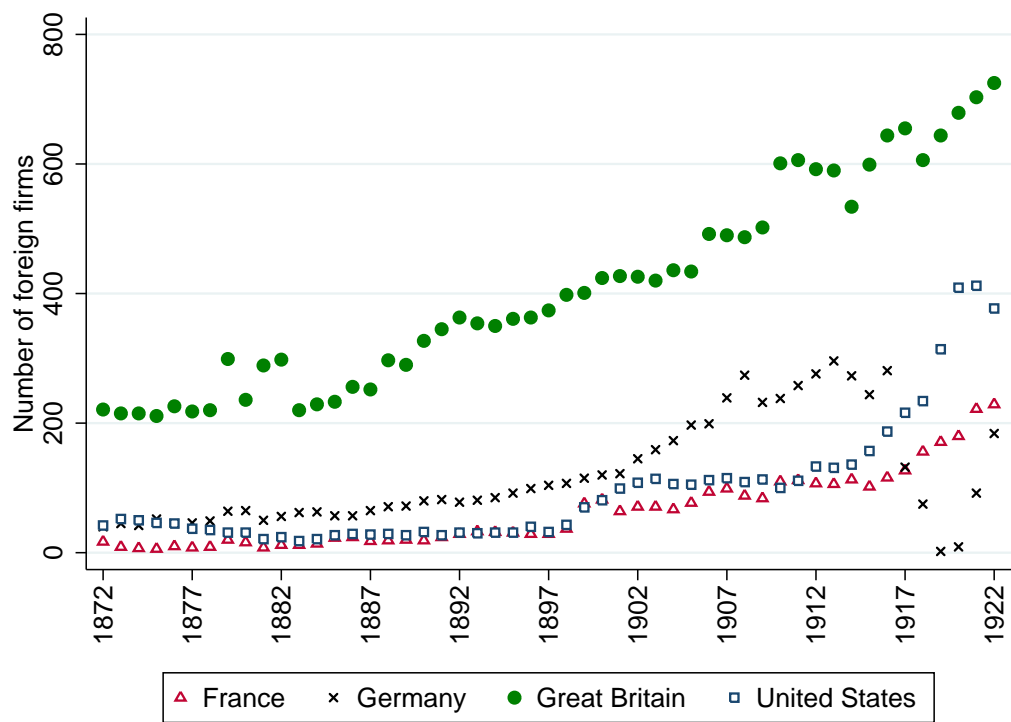
*Source:* Remer (1933), Table 13.

**Table 5:** Geographical Distribution of the Direct Business Investments of Four Countries, 1931

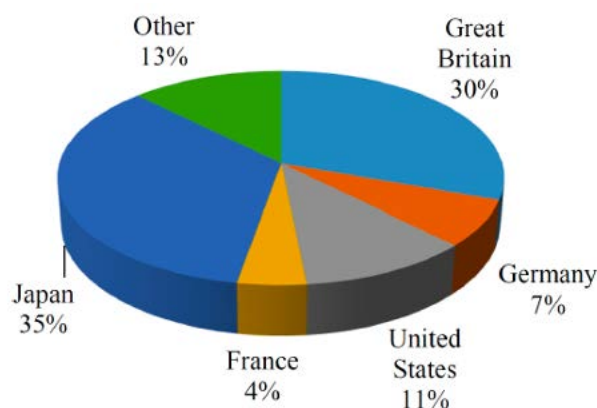
	Direct Business Investments (Millions of U.S. Dollars)					
	Great Britain	Japan	Russia	USA	Total	% of Total
Shanghai	737.4	215		97.5	1,049.90	46.4
Manchuria		550.2	261.8		812	36
Rest of China (incl. Hong Kong)	226	108.9	11.4	52.7	399	17.6
Total Business Investments	963.4	874.1	273.2	150.2	2,260.90	100

*Source:* Remer (1933), Table 11.

**Figure 4:** Foreign Firms in China by Country of Origin



**Figure 5:** Foreign Firms in China: The Case of Shanghai, 1872 - 1921



*Notes:* Shown are shares of firms by foreign country (source: CMC 2001a, various volumes).

Figure 4 details foreign presence over time for some of the largest Treaty Powers, as measured by the number of foreign firms. Great Britain's position as the premier colonial power of the day is evident from the hundreds of firms and thousands of residents present in China over the 50 years portrayed. Other powers saw their presence grow over time, though the number of German firms and residents declined noticeably following the country's defeat in the First World War.

Initially, much of the foreign-owned activity was linked to trade, such as retail and wholesale operations, banking to finance the trade, insurance to cover trade risk, shipyards to repair ships, and railroads to provide land-based transportation. From there it spread into other sectors of the economy. Manufacturing and mining became important especially after the Treaty of Shimonoseki (1895) established the legal right of foreigners to establish manufacturing firms in China.<sup>63</sup>

As the most important destination for FDI, Shanghai's situation merits closer examination. During the Treaty Port Era, the number of foreign firms in Shanghai was 152 for the year 1872 and 1,741 in the year 1921, implying an annual growth rate of about 5 percent. These firms originated primarily from Japan and Britain, with concerns from these countries accounting for 35 and 30 percent, respectively (Figure 5). The largest five sources accounted for 87 percent of all FDI into Shanghai.

There was much heterogeneity in the nature and scope of foreign firms operating in China.<sup>64</sup> They included large firms such as the British Jardine, Matheson and Company trading

<sup>63</sup>Hou (1965, Ch. 3); Feuerwerker (1976, Ch. V).

<sup>64</sup>See Feuerwerker (1976), pp. 80–81.

company. From its head office in Hong Kong and with branches in every major port, it not only controlled its trade operations, but also managed other activities such as the operation of the 41 Yangtze steamers of its affiliate, the Indo-China Steam Navigation Company, 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 *Schlachtereier W. Fütterer*, which was the butcher for Shanghai's German community.

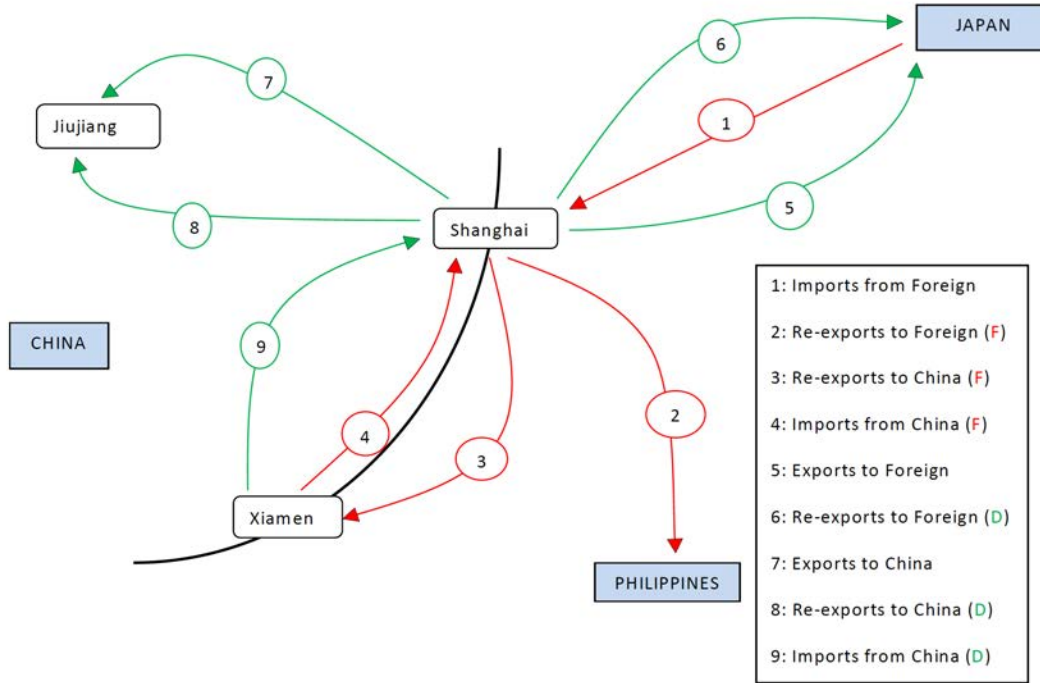
## 5 Quantifying Foreign Influence in China during the Treaty Port Era

### 5.1 Integrated Statistics on Foreign and Domestic Trade

When a country shifts to opening its economy to more foreign trade, this also affects commerce in the country's interior. In the case of China during this period this can be traced out because every port was treated as its own customs area. The following graph illustrates the nature of the information contained in the CMC reports. Figure 6 shows the trade flows to and from Shanghai, for example, that were reported by the CMC. These flows are decomposed and labeled from one to nine. The first breakdown is by type of good; flows 1 to 4 concern goods that are produced abroad (foreign goods; abbreviated F), while flows 5 to 9 show trade in goods that are produced in China (Chinese-produced goods; abbreviated D). Flow 1 gives the imports of goods from Japan into Shanghai. Other imports of foreign goods into Shanghai consist of those coming from other Chinese treaty ports; in the figure, flow 4 represents the foreign goods reaching Shanghai via Xiamen. Once imported into Shanghai, these foreign goods may be re-exported. The CMC data allow us to distinguish between re-exports of foreign goods to foreign countries (flow 2) or to other treaty ports within China (flow 3).

The statistics on re-exports of foreign goods provide key information on the extent to which foreign imports diffused throughout the country, something that has important welfare implications in the case of a large country such as China. They also offer a direct measure of the consumption of foreign goods in the treaty ports as within-port foreign goods consumption may be obtained by subtracting re-exports from foreign imports. Separately from foreign goods trade, the CMC data also reports trade in Chinese-produced goods. Flow 5, for example, shows Chinese-produced goods that are exported from Shanghai to foreign countries.

**Figure 6:** Export and Import Flows to and from Shanghai



These exports are direct exports in the sense that the goods are produced in the Greater Shanghai area. The direct exports are to be distinguished from other Chinese-produced goods that are exported abroad from Shanghai but were produced elsewhere in China (flow 6). Both direct exports and re-exports capture major aspects of the evolution of an economy. In particular, the size of direct exports demonstrates the change in the production possibility of the local economy, while the extent of re-exports sheds light on the development (and trade integration) of the hinterland as well as the capacities of the entrepôts (in this case, Shanghai).

Flow 7 represents Shanghai-produced goods that are exported to other parts of China, whereas flow 8 gives the export of Chinese-produced goods that flow from one region of China to another through Shanghai. The information on domestic exports of Chinese-produced goods at the port-level is thus comparable to the information on foreign exports. Finally, flow 9 shows Shanghai's imports of Chinese goods that were produced elsewhere in China.

## 5.2 Welfare Effects from Foreign Influence: China's Domestic Trade

This section quantifies the size and distribution of welfare effects from new technology due to foreign influence in terms of China's domestic trade using a well-known trade model (Eaton

and Kortum 2002).<sup>65</sup> The model captures the Ricardian determinants of comparative advantage, differences in relative productivities across goods, and relates them to the geography separating the trading partners.

First, there is the technology of each trading partner, which determines the cost at which a good can be produced in different regions, and, therefore determines which region has the lowest factory-gate production costs. Second, there is the size of trade barriers between regions; for example, trade barriers between regions  $i$  and  $j$  determine the trade-cost-inclusive price in region  $j$  of a good that is produced in region  $i$ . Because trade costs are increasing in geographic distance between regions, geography is the second key force in the model. Using historical data on prices, trade flows of domestically produced goods, and input uses, we can calibrate and solve the model in the context of Treaty Port Era China.

Figure 7 shows the volumes of aggregate bilateral trade, with the thickness of each line proportional to the size of the flow. The maximum distance between any two regions in our bilateral pairs is about 2,700 kilometers. Exports are shown in the same shade as the region's label and are offset towards the center of the figure. We see that Hankow exports a large amount of its production to Shanghai, for example, while Tientsin's imports from Hankow are smaller than Tientsin's imports from Shanghai. Importantly, the trade volumes shown in Figure 7 are for locally produced goods.

Commodity-level trade data are employed to estimate a key model parameter governing the strength of comparative advantage. Employing 26 homogeneous commodities that are traded between virtually all 15 regions—including coal, matches, and cotton yarn—price differences across ports are used to pin down this parameter. The commodity-level trade data are also employed to estimate trade costs between any two regions, because arbitrage ensures that the price difference for a given good between two regions is an upper bound on the trade costs between these two regions.<sup>66</sup>

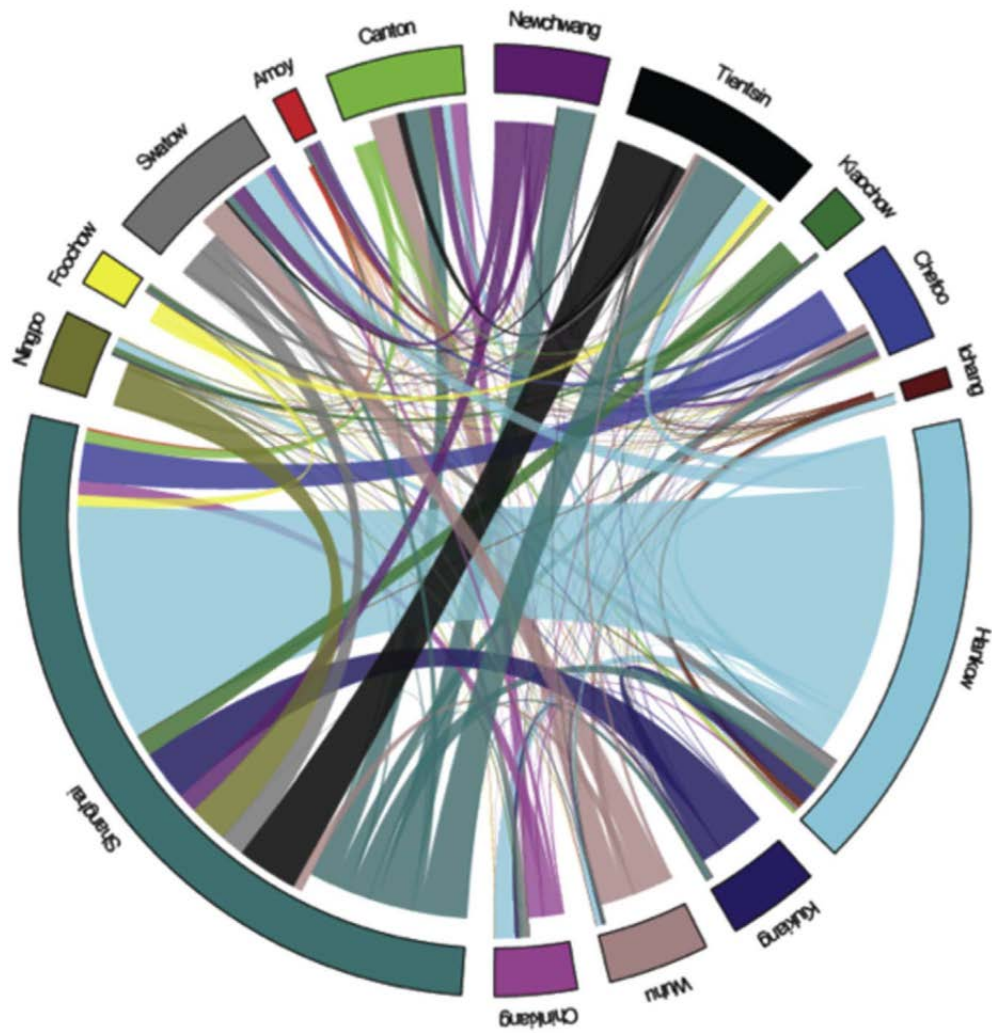
With key parameters and the model in hand, one can perform interesting counterfactual experiments. One is to increase the parameter capturing port productivity by 20 percent. This magnitude is reasonable given that customs operation by the CMC brought with it a wide range of improvements, such as dredging of the harbor, the construction of new lighthouses, increased protection from pirates, and the customs process itself. Increasing the productivity of Shanghai by this amount while leaving all other parameters unchanged raises GDP (our measure of welfare) in Shanghai by 1.5 percent, and general equilibrium

---

<sup>65</sup>This section is based on Keller, Santiago, and Shiue (2017).

<sup>66</sup>See Keller, Santiago, and Shiue (2017) for information on other data.

Figure 7: The Size of Bilateral Trade between Regions



Source: Calculated from CMC trade data.



**Table 6:** Lower Geographic Barriers and Welfare

	Trade Barriers ↓50%		
	% change relative to baseline		
	(1) Welfare	(2) Prices	(3) Wages
Amoy	2.58	-7.15	-2.07
Chefoo	0.17	4.25	9.36
Chinkiang	0.75	-2.90	-3.53
Foochow	2.15	0.05	4.02
Canton	1.67	-0.03	3.24
Hankow	2.01	10.23	10.30
Ichang	8.90	-26.89	-24.80
Kiaochow	1.95	-6.13	-2.79
Kiukiang	3.51	-8.00	-2.26
Newchwang	4.22	-3.48	9.96
Ningbo	-31.41	15.12	-32.25
Swatow	0.27	3.22	14.44
Tientsin	3.43	4.25	8.95
Wuhu	2.38	-4.59	1.77
Shanghai	-17.29	23.73	-7.76
	% change in overall trade		
	13.14		

**Notes:** Table shows results of lowering geographic barriers by 50 percent relative to baseline trade costs.

effects lead to an increase of GDP by about a quarter of one percent on average in the other regions.

Table 6 presents the results of reductions in trade costs, as would have happened through the introduction of foreign steamship technology. Trade increases by 13 percent as a result of the lower trade costs. Welfare gains, however, are unevenly distributed across ports, and some regions, in particular Shanghai and Ningbo, experience welfare losses.

The intuition for this lies in the reallocation of production and trade. Lower trade barriers diminish the relative importance of technology-based advantages. Notice that the four regions with the lowest welfare gains are Shanghai, Ningbo, Chefoo, and Swatow. They turn out to be also the four regions with the highest level of labor-cost adjusted technology. For such regions lower trade barriers means that they might no longer be the low-cost source of supply in some region because with lower trade costs that region now imports from elsewhere. As a result, welfare in the high-technology regions might fall.

Further, Shanghai and Ningbo are relatively centrally located in China, which means that before the reduction of trade barriers these regions had a sizable low transport-cost based advantage compared to other regions. In contrast, Chefoo and Swatow are located in geographically more remote parts of China. They lose some markets as a result of the lower trade barriers at the same time when they maintain their hold on others precisely because of their geographic location. As a consequence, Chefoo and Swatow lose less than Shanghai and Ningbo.

### 5.3 The Geographic Scope of Foreign Influence

The previous analysis has assessed the welfare effects of foreign trade and technology for China through the lens of a specific trade model. The impact of foreign influence in China can also be studied using a less-structural, regression-based approach. Specifically, foreign influence in China originated from the foreign places, often treaty ports, in which the foreigners with their firms, families, and institutions were located. While treaty ports never accounted for more than ten percent of China's output, foreign influence in the treaty ports might have generated spillovers for neighboring areas and China's hinterland.<sup>67</sup> Moreover, this literature emphasizes the role of institutions for the impact of foreign countries in China.<sup>68</sup>

Connecting the anecdotal and case study evidence, Keller and Shiue (2020) estimate the impact of foreign institutions on the level of interest rates in China's regional capital markets during the 19th century. Using variation on the location of opening treaty ports, customs stations, and foreign consulates, which supported trade by enforcing legal courts in China, they show that foreign institutions had a positive impact by substantially lowering regional interest rates relative to areas without foreign influence.<sup>69</sup>

Their work also quantifies the scope of foreign influence by estimating the size of geographic spillovers of the foreign impact. Figure 8 shows that a foreign consulate located at up to 200 kilometers from the center of the region leads to a lower interest rate by about -1.3 percentage points, and a similar effect comes from an open treaty port within 200 kilometers. The results

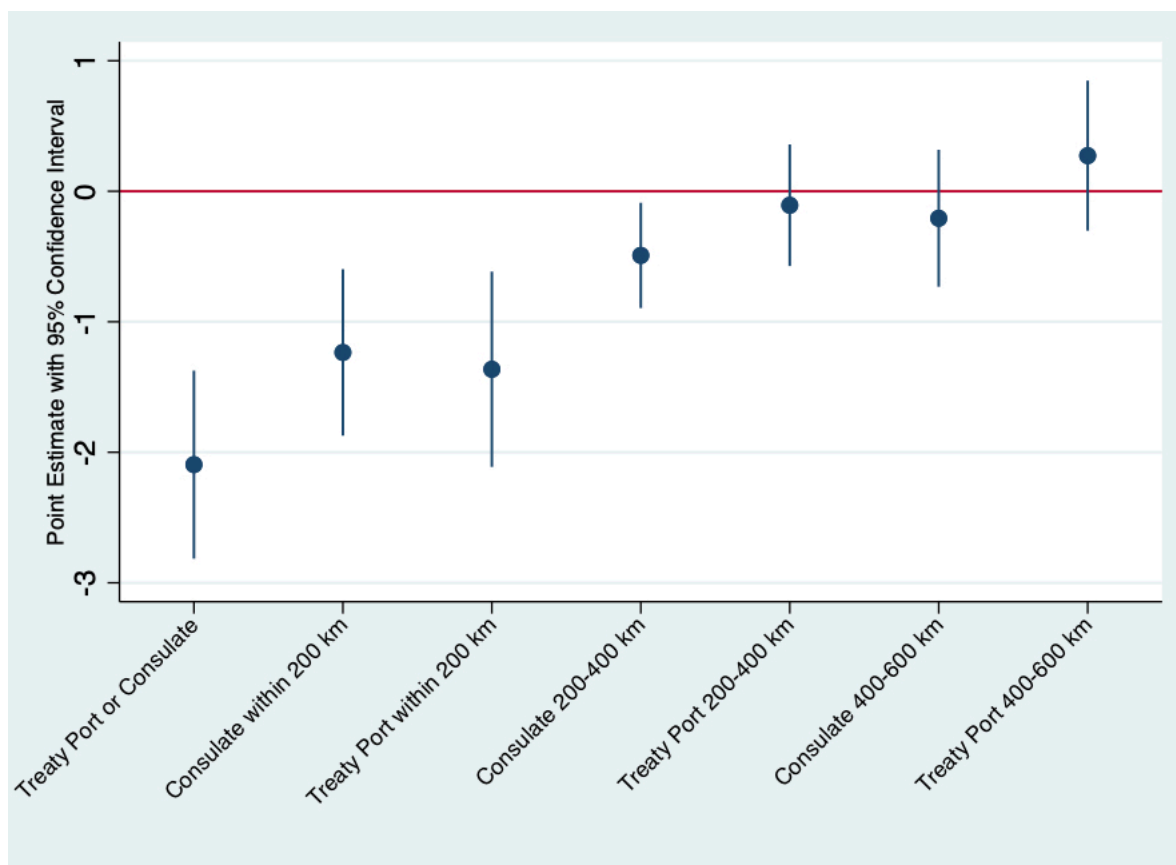
---

<sup>67</sup>See So, Yip, Shiroyama, and Matsubara (2011).

<sup>68</sup>Ma (2011) discusses the expansion of Western institutions in Shanghai in the early 20th century. Shiroyama's (2011) article deals with institutional changes in real estate markets that promoted economic change, and Chan (2011) shows how the expansion of vertical integration in grain markets was directly related to the presence of foreign technologies and economic activity in treaty ports.

<sup>69</sup>Chinese capital markets are compared with British markets for the period 1770 to 1860 in Keller, Shiue, and Wang (2020a); see also Keller, Shiue, and Wang (2020b) for more on the estimation of comparable interest rates.

**Figure 8:** The Impact of Foreign Influence in China: Geographic Effects

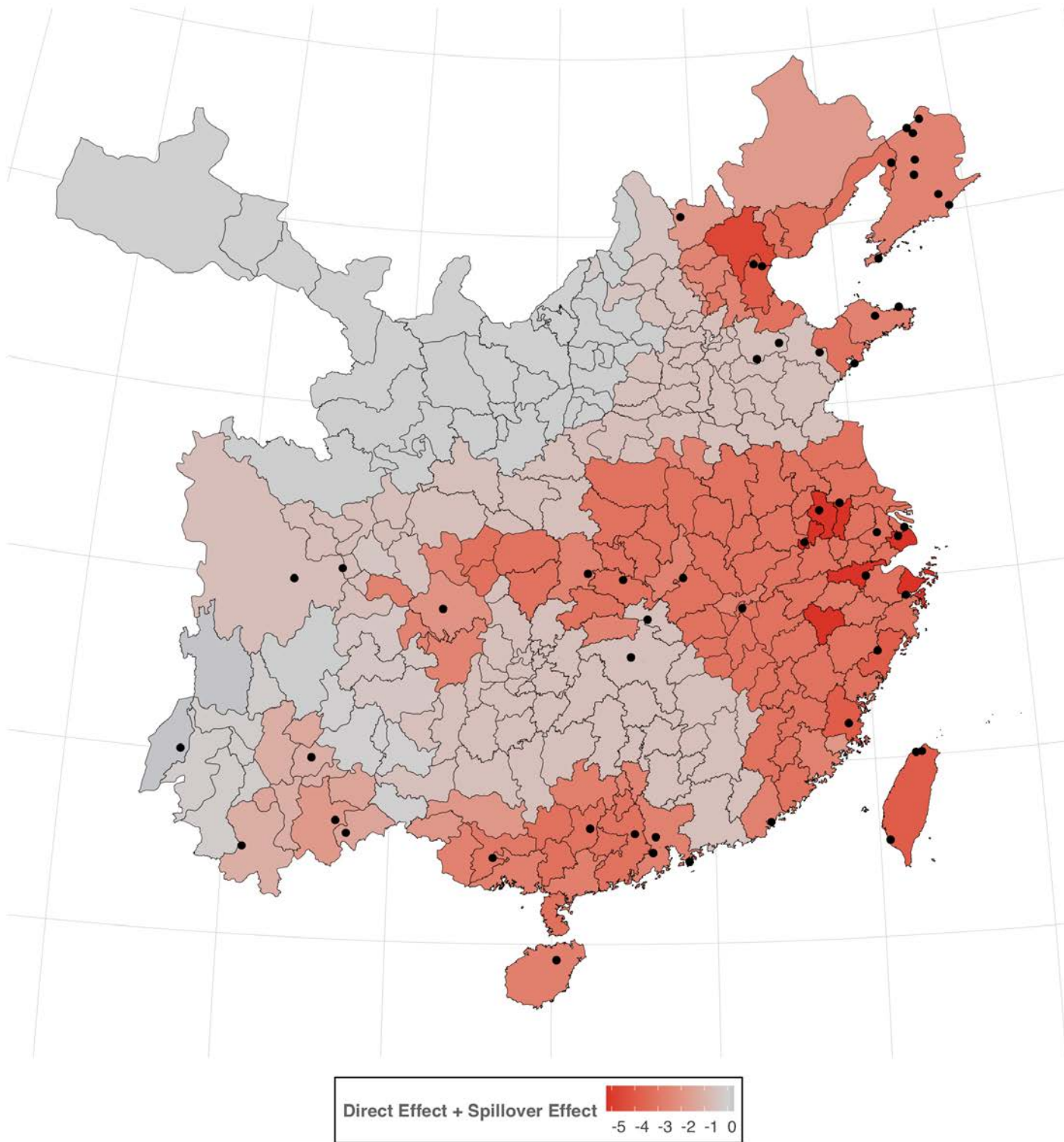


**Notes:** Source is Keller and Shiue (2020).

point to a relatively strong impact through foreign consular courts, with their foreign legal practices due to extraterritoriality, because consulates generated significant spillovers for up to four hundred kilometers (in contrast to treaty ports).

The implications for the geographic scope of foreign influence can be seen by plotting the predicted effects from the regression on a map of China, see Figure 9. While the analysis confirms that foreign influence in China was strongest where foreigners had their strongest presence, Figure 9 also indicates that by the 1890s, the geographic scope of foreign influence may have been felt in the majority of China's areas.

**Figure 9:** The Impact of Foreign Influence on Local Capital Markets



Notes: Figure gives predicted effects for the year 1890 of analysis underlying Figure 8; treaty ports shown.

## 6 The Granular View: Chinese Commodity-Level Trade

### 6.1 Mapping China's Trade to the First International Trade Classification

The League of Nation's Minimum List of Commodities (1935; MLC) emerged as the first way of recording international trade data in a consistent way from the 1931 League of Nation's tariff Nomenclature. The MLC is the precursor of the modern day Standard International Trade Classification (SITC). At the time of the MLC's creation China's government stated that it was not prepared to compile statistics based on the MLC classifications. However, to be able to consistently track China's international trade over time and for making international comparisons, we have matched CMC information on Chinese exports of the years 1867 to 1930 to the MLC classification.<sup>70</sup>

We create a match to the MLC classification by assigning each CMC export to an MLC commodity number with up to 8 digits for every year from 1867 to 1930. For example, our version of the MLC classification contains in its Chapter 8 the item "Beans and Peas," classified with item number 0803 (item 03 in chapter 08). This item is further disaggregated into other items such as "Beans" (080301) or "Peas" (080302). The item "Beans" contains an even finer classification with different varieties of beans such as "Beans, Black" (08030101) or "Beans, Green" (08030103), among others.

This detailed mapping of China's commodity-level trade enables us to consistently track the evolution of China's exports starting in a period for which to date there is little systematic information. It is also instrumental to studying the changing commodity structure in China's trade, in particular the emergence of new goods, to which we turn now.

### 6.2 The Extensive Margin of Trade: New and Disappearing Goods

New goods in trade matter for several reasons. For one, in the absence of comprehensive information on supply, exports of a new good is proof of a certain level of production capability. The arrival of new goods also provides evidence on the level of specialization in production. On the demand side, new goods reflect changes in consumption patterns, and they are indicative of changes in income because demand is non-homothetic (e.g., the share

---

<sup>70</sup>China's foreign imports are examined in ongoing work.

spend on luxury goods increases with income). New goods can also be an important source of utility (welfare) gains. See Feenstra (1994) for more analysis.

The appearance or disappearance of export goods can be measured using the following expressions:

$$\lambda_t = \frac{\sum_{i \in I} V_{it}}{\sum_{i \in I_t} V_{it}} \quad \text{and} \quad \lambda_s = \frac{\sum_{i \in I} V_{is}}{\sum_{i \in I_s} V_{is}}$$

where  $s$  and  $t$  are any two years (with  $s \leq t$ ),  $I_t$  denotes the set of goods available in year  $t$ ,  $I_s$  denotes the set of goods available in year  $s$ , and  $I$  denotes the set of goods available in both years, such that  $I \subseteq (I_t \cap I_s)$ . The expressions  $V_{it}$  and  $V_{is}$  represent, respectively, the export values of item  $i$  in years  $t$  and  $s$ . The term  $\lambda_t$  measures the year- $t$  value of all goods exported in both years  $t$  and  $s$  (i.e., those in set  $I$ ), relative to the year- $t$  value of all exported goods in year  $t$  (including those that were not available in year  $s$ ). Similarly,  $\lambda_s$  captures the year- $s$  value of all exports in the overlapping set  $I$ , relative to the year- $s$  value of all exported goods in year  $s$  (including those goods not available in year  $t$ ). Note that  $\lambda_{it} \leq 1$  because the set of goods that is exported in both years  $t$  and  $s$  must be weakly smaller than the set of goods exported in year  $t$  (analogously,  $\lambda_{is} \leq 1$ ).

Table 7 summarizes the possible combinations of the values of  $\lambda_t$  and  $\lambda_s$ . The  $\lambda$ s capture the appearance and disappearance of goods in the following sense.  $\lambda_t = 1$  indicates that all goods that are available in year  $t$  were also available in  $s$  (no new goods; although some of the goods available in year  $s$  might have disappeared), whereas  $\lambda_t < 1$  indicates that some of the goods available in year  $t$  were not available in year  $s$ . That is, some new goods appeared in year  $t$  (although some of the goods available in year  $s$  might have disappeared). The case  $\lambda_s = 1$  indicates that all the goods that were available in year  $s$  are also available in year  $t$  (none of the  $s$ -period goods disappeared, but there could be new ones in year  $t$ ). Finally,  $\lambda_s < 1$  indicates that some of the goods available in year  $s$  were not available in year  $t$  (goods disappeared by period  $t$ ; although, some new goods could be available in year  $t$ ).<sup>71</sup>

### 6.3 Implementation

Ideally, one would like to have the value of trade on every item in every year—at the most disaggregated, eight-digit level—that was ever exported in *any* year during the period 1867 to 1930. Because the information collected by the CMC covers virtually the universe of

<sup>71</sup>For values of  $\lambda$  below one, it is important to keep in mind that the  $\lambda$ s reflect the value, not the product count of new and disappearing goods.

**Table 7:** Measuring the Appearance and Disappearance of Goods

	$\lambda_s = 1$	$\lambda_s < 1$
$\lambda_t = 1$	<ul style="list-style-type: none"> <li>• Same goods in both years</li> </ul>	<ul style="list-style-type: none"> <li>• Some goods disappear between years <math>s</math> and <math>t</math></li> <li>• No new goods in year <math>t</math></li> </ul>
$\lambda_t < 1$	<ul style="list-style-type: none"> <li>• No goods disappear between years <math>s</math> and <math>t</math></li> <li>• New goods in year <math>t</math></li> </ul>	<ul style="list-style-type: none"> <li>• Some goods disappear between years <math>s</math> and <math>t</math></li> <li>• New goods in year <math>t</math></li> </ul>

China’s foreign trade it is well-suited for an extensive-margin analysis. At the same time, the CMC reports China’s universe of exports with a classification that has a varying degree of disaggregation and is changing over time. In essence, in the early years China’s exports are relatively low and only a few relatively aggregate categories are distinguished, while in the final years of the sample period exports are higher and many more goods are reported at a relatively disaggregated level. The category that ensures that CMC statistics cover the universe of exports in every year is called “Sundries, unenumerated”, which is listed in every year. The Sundries category is not further defined but it includes all other goods that do not fit into any of the other categories defined in the CMC statistics in a particular year.

Our approach for studying the extensive margin of trade is based on the fact that the CMC produced a major update of its goods classification only every couple of years.<sup>72</sup> In a year when there is a major increase in terms of reported product groups, one typically observes a substantial decline in Sundries exports. This is indicative the fact that before this year, the newly reported product groups were part of the Sundries category. To fix ideas, beginning in the year 1896, CMC statistics report the value of “Cattle, Sheep, Goats and Pigs” as its own export category. Presumably, this is due to the fact that there was a sizable and sustained export of these animals, but it would be erroneous to conclude that China did not export *any* cattle, sheep, goats, or pigs before the year 1896—export of such livestock is not a “new good” export of China in the year 1896. Rather, prior to that year, the value of the exports of such livestock was recorded as part of the Sundries category. Further, starting in the year 1910 CMC statistics report export values for “Cattle”, “Sheep”, “Goats” and “Pigs” separately.

An extreme approach to the new-goods margin is to assume that there are not any new goods, only redefinitions of previously traded goods. In the example, this means that given

<sup>72</sup>To identify these years we employ a threshold value for the change in Sundries exports from one year to the next; different threshold values are employed to ensure the robustness of the analysis.

we observe positive exports of “Cattle”, “Sheep”, “Goats” and “Pigs” separately in the year 1930, we assume that all of these items were also exported already in the year 1867. Our way of implementing this approach to estimate disaggregated export values for 1867 (and any later year) is to use the 1910 export values of “Cattle”, “Sheep”, “Goats” and “Pigs” to allocate the given export values of the single category “Cattle, Sheep, Goats and Pigs” during 1896 and 1909 between the four different types of livestock. To obtain values for earlier years we use the fact that livestock exports before 1896 are part of Sundries, which implies that livestock exports in 1895 are equal to the change in Sundries exports between 1895 and 1896.<sup>73</sup> We arrive at disaggregated export values for the year 1867 (and any later year) by using the change in Sundries exports between 1895 and 1867 together with the disaggregated livestock shares that are available for the years 1910 to 1930.

While this approach is conceptually straightforward,  $\lambda_t$  is equal to one for every year  $t$ , that is, there are no new goods by assumption. To allow for the possibility of new goods, we define a baseline threshold value of exports for the new good relative to the change in Sundries exports category. Thus, for example, if the exports of “Cattle” in 1895 that we estimate based on the change in Sundries exports from 1895 to 1896 is below this threshold, we take “Cattle” to be a newly exported item in the year 1896. We vary this baseline threshold to ensure the robustness of our analysis.

## 6.4 The Importance of New and Disappearing Goods

The sixty-four years of data, 1867 to 1930, provide an excellent setting to explore the introduction of new goods and the disappearance of existing goods. We construct a  $64 \times 64$  matrix of  $\lambda$ 's for each  $s$  and  $t$  pair, with ones on the main diagonal ( $s = t$ ). It is shown in Figure 10.

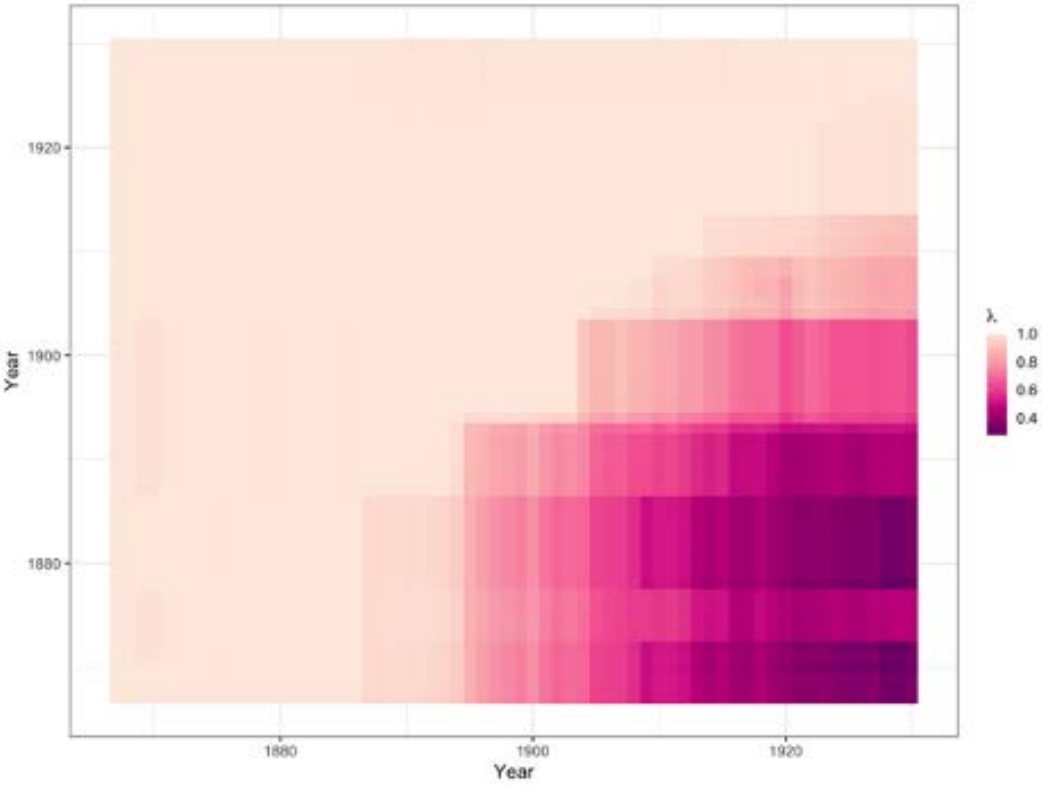
For any pair of different years ( $s < t$ ),  $\lambda_t$  appears in position  $(t, s)$  of the matrix (below the diagonal), and  $\lambda_s$  appears in position  $(s, t)$  (above the diagonal). The evolution of export goods between 1867 and 1930 can be evaluated by examining the  $(64, 1)$  and  $(1, 64)$  elements of the  $\lambda$  matrix. Using our baseline approach to identify years of major classification change and export threshold relative to Sundries, the  $(64, 1)$  element is equal to 0.334 (lower right corner). This indicates that the 1930 value of the goods available in both 1867 and 1930 represents about one third of the 1930 value of all the goods available in the year 1930.

---

<sup>73</sup>In practice, “Cattle”, “Sheep”, “Goats” and “Pigs” exports are not the only new categories that are introduced in the year 1896. We account for that by assuming the sum of all new category exports in a year, when there are major changes, is equal to the change in Sundries trade.



**Figure 10:** New and Disappearing Goods: China's Exports



**Notes:** Source is authors' computations based on CMC (2001b) trade statistics.

Thus, many new goods appeared between 1867 and 1930, or at least the new goods had relatively high value compared to the old (1867) goods. This figure indicates that there was a substantial change in the composition of the goods exported from China over this period. Furthermore, the (1, 64) element in this matrix is equal to 0.999 (upper left corner). Thus, the 1867 value of the goods available in both 1867 and 1930 represents almost 100 percent of the 1867 value of all the goods available in that year. It means that either only few goods disappeared between 1867 and 1930, or that those goods that disappeared had a relatively low value. This indicates that the appearance of new goods (or their value) tends to be more important than the disappearance of old goods in China in the 19th and early 20th century.

The work on mapping the commodity-level trade of China over time is still in progress, yet the above analysis has shown that investigations of various margins of trade are feasible with historical trade data for China. The new goods that enter foreign trade are likely to generate implications for welfare; they are likely to impact domestic markets and domestic firms by changing the conditions for innovation and competition. The fact that the CMC collected detailed statistics on commodity-level trade means that we will ultimately be able to produce a complete picture of the historical evolution of China's comparative advantage and trade, which is rarely available in the case of other countries.

## 7 Conclusions

Today, China is one of the largest traders in the world. Unlike the emperors of the past, China is actively engaged in and pursuing the gains from trade, be that commodity trade or foreign direct investment. Nevertheless, China's prominence in global trade today can be linked to its historical past. From the 17th to the 18th century, China's foreign trade and foreign diplomacy was an inherent part of the the socioeconomic and political context of Asia. The empire had emerged as a dominant power in the region through a wide combination of strategies that included tributary trade, colonialism, economic investment, and military conquest. Compared to the Ming state, the Qing state had a relatively laissez-faire stance towards the activities of merchants in domestic markets and within the sphere of intra-Asian foreign trade. Nevertheless, Qing emperors reserved the right to regulate trade, and in particular, the Sino-Western trade. For over a century, China was able to enforce its foreign policy on Western traders. In the 1839, a combination of conflicts on market access, opium imports, and foreign diplomacy resulted in the Opium Wars. Over the 19th century, China was forced to sign a series of treaties with foreign powers that legally entitled Western

nations and Japan to establish numerous ports of trade, customs stations, consular cities and other types of port cities within China.

The Treaty Port system originated in the effort to open up China's markets to Western traders, and subsequent institutions that arrived in China sought to support that trade. Besides for the Chinese Maritime Customs Service, pervasive legal institutions—in the form of consular offices and more formal courts—were also established to support foreign trade. From the mid-19th century until the departure of the Chinese Maritime Customs Service in the 20th century, the quantity and quality of data that was collected on Chinese international and domestic trade increased dramatically. This chapter documented the trends and highlighted a few methodologies that can be use to allow researchers to gain a window into the economy of China during this time. These data can be used to investigate numerous additional questions about international and domestic trade, as well as the impact of foreign trade on the welfare of China. In addition, as the data is particularly detailed with respect to port-level information, it is exceptionally valuable for understanding the conceptual relationships between international trade and regional (domestic) trade more generally when a country changes its trading regime.

We find that already by the 1890's foreign influence in China was strongest where foreigners had their strongest presence, and spillover effects may have resulted in the majority of China's areas being affected. While we have yet to reach a complete understanding of the global effects of foreign trade and factor flows in the past two centuries, beyond the direct impact of trade and specialization, the most important effects during the Treaty Port Era are likely related to interactions with foreign institutions and technology transfer. Investigations of the various margins of trade on welfare, innovation, and competition are promising areas of further research. More generally, it will open new ground with respect to our understanding of China's history of development as it relates to the legacy of the Treaty Port Era.

## References

- [1] Allen, R., J.-P. Bassino, D. Ma, C. Moll-Murata, and J. J. van Zanden (2007). Wages, Prices, and Living Standards in China, Japan, and Europe, 1738–1925. *The Economic History Review Special Issue: Asia in the Great Divergence* 64 (1): 3-38.
- [2] Anderson, J. (2011). The Gravity Model. *Annual Review of Economics* 3, 133–160.
- [3] Bergère, M. (2009). *Shanghai, China’s Gateway to Modernity*. Palo Alto, CA: Stanford University Press.
- [4] Beeching, J. (1975). *The Chinese Opium Wars*. NY: Harcourt Brace Jovanovich.
- [5] Berg, M. (2006). “Britain, industry and perceptions of China: Matthew Boulton, ‘useful knowledge’ and the Macartney Embassy to China”, *Journal of Global History* 1 (2): 269-288.
- [6] Bickers, R. (2008). Revisiting the Chinese Maritime Customs Service, 1854–1950. *The Journal of Imperial and Commonwealth History* 36 (2), 221–226.
- [7] Bickers, Robert, and Isabella Jackson, eds. (2016). *Treaty Ports in Modern China: Law, Land, and Power*. London: Routledge.
- [8] Brenner, R. (2003). *Merchants and Revolution: Commercial Change, Political Conflict, and London’s Overseas Traders, 1550-1653*. Princeton University Press.
- [9] Brook, T. and B.T. Wakabayashi eds. (2000). *Opium Regimes: China, Britain, and Japan, 1839-1952*. Berkeley: University of California Press.
- [10] Brunero, D. (2004). *Britain’s Imperial Cornerstone: The Chinese Maritime Customs Service, 1854–1949*. New York: Routledge Curzon.
- [11] Chan, K. (2011), “The Rice and Wheat Flour Market Economies in the Lower Yangzi, 1900-1936”, in So and Myers (2011), chapter 4.
- [12] Chang, H. (1964). *Commissioner Lin and the Opium War*. Harvard University Press.
- [13] Chen J. and P. Cheng, M. Lestz, with J. Spence (2013). *The Search for Modern China: A Documentary Collection*, 3rd edition. W.W. Norton & Company.
- [14] Chinese Maritime Customs (CMC) (2001a). *Decennial Reports, First Issue (1882–1891), Second Issue (1892–1901), Third Issue (1902–1911), Fourth Issue (1912–1921) and Fifth Issue (1922– 1931)*. Shanghai: Statistical Department of the Inspectorate General of Customs.
- [15] Chinese Maritime Customs Service (CMC) (2001b). *Returns of Trade and Trade Reports, various years*. Shanghai: Statistical Department of the Inspectorate General of Customs.

- [16] Chuang, H.S. (1969). “Ming-Qing jian meizhou baiying de shuru zhongguo (The inflow of American Silver into China from the Late Ming to the Mid-Ch’ing Period)”, *Zongguo wenhua yanjiusuo xuebao* (The Journal of the Institute of Chinese Studies of the Chinese University of Hong Kong) 2: 61-75.
- [17] Dikötter, F. and L. Laamann, Z. Xun (2002). “Narcotic Culture: A Social History of Drug Consumption in China”, *The British Journal of Criminology*, 42 (2): 317-336.
- [18] Downs, J.M. (2014). *The Golden Ghetto: The American Commercial Community at Canton and the Shaping of American China Policy, 1784-1844*. Hong Kong: Hong Kong University Press.
- [19] Eaton, J. and S. Kortum (2002). Technology, Geography, and Trade. *Econometrica* 70 (5), 1741– 1779.
- [20] Elliot, M. (2009). *Qianlong: Son of Heaven, Man of the World*. Pearson.
- [21] Fairbank, J.K. (1942). Tributary Trade and China’s Relations with the West. *The Far Eastern Quarterly* 1(2), 129-149.
- [22] Fairbank, J.K. (1969). *Trade and Diplomacy on the China Coast: The Opening of the Treaty Ports, 1842-1854*. Harvard University Press. First edition published in 1953.
- [23] Fairbank, J.K. and S.Y. Teng (1941). “On the Ch’ing Tributary System”, *Harvard Journal of Asiatic Studies* 6 (2): 135-246.
- [24] Fay, P.W. (1998). *The Opium War, 1840-1842: Barbarians in the Celestial Empire*. University of North Carolina Press.
- [25] Feenstra, R. (1994). New Product Varieties and the Measurement of International Prices. *The American Economic Review* 84 (1), 157–177.
- [26] Feuerwerker, A. (1976). *The Foreign Establishment in China in the Early Twentieth Century*. Ann Arbor, MI: University of Michigan.
- [27] Feuerwerker, A. (1980). Economic Trends in the Late Ch’ing Empire, 1870–1911. In *The Cambridge History of China Vol. 11, Part 2*. Edited by J. Fairbank and K.C. Liu. Cambridge, UK: Cambridge University Press, 1–69.
- [28] Findlay, R. and K. O’Rourke (2007). *Power and Plenty: Trade, War, and The World Economy in the Second Millennium*. Princeton University Press.
- [29] Frank, A.G. (1998). *ReOrient: Global Economy in the Asian Age*. University of California Press.
- [30] Great Britain. Foreign Office. (1840). *Correspondence relating to China: presented to both houses of Parliament, by command of Her Majesty*. 1840. London: Printed by T.R. Harrison.

- [31] Greenberg, M. (1951). *British Trade and the Opening of China 1800–1842*. Cambridge, UK: Cambridge University Press.
- [32] Hall, B.E.F. (1977). “The Chinese Maritime Customs: An International Service, 1854–1950”. *The Chinese Maritime Customs Project Occasional papers: No. 5*. Reproduction. Bristol: University of Bristol.
- [33] Hamashita, T. (2008). *China, East Asia, and the Global Economy: Regional and Historical Perspectives*. Routledge.
- [34] Hang, X. (2015). *Conflict and Commerce in Maritime East Asia: The Zheng Family and the Shaping of the Modern World, c. 1620–1720*. Cambridge University Press.
- [35] Head, K. and T. Mayer (2014). Gravity Equations: Workhorse, Toolkit, and Cookbook. In *Handbook of International Economics, Volume 4*. Edited by G. Gopinath, E. Helpman, and K. Rogoff. Amsterdam: Elsevier, 131–195.
- [36] Hevia, J.L. (1995). *Cherishing Men from Afar: Qing Guest Ritual and the Macartney Embassy of 1793*. Durham: Duke University Press.
- [37] Hou, C.-M. (1965). *Foreign Investment and Economic Development in China 1840–1937*. Cambridge, MA: Harvard University Press.
- [38] Hsiao, L. (1974). *China’s Foreign Trade Statistics*. Cambridge, MA: Harvard University Press.
- [39] Hsü, I.C.Y. (1970). *The Rise of Modern China*. Oxford University Press.
- [40] Jia, R. (2014). “The legacy of forced freedom: China’s treaty ports”, *Review of Economics and Statistics* 96 (4): 596–608.
- [41] Jiang, F.T. (1938). *Zhongguo jindai shi [Modern Chinese History]*. Reprint, Jilin zhuban jituan fen youxian gongsi, 2016.
- [42] Kang, David (2010). *East Asia Before the West: Five Centuries of Trade and Tribute*. Columbia University Press.
- [43] Keller, W., B. Li, and C. H. Shiue (2011). “China’s Foreign Trade: Perspectives from the Past 150 Years”, *The World Economy* 34 (6): 853–892.
- [44] Keller, W., B. Li, and C. H. Shiue (2012). “The Evolution of Domestic Trade Flows when Foreign Trade is Liberalized: Evidence from the Chinese Maritime Customs Service”, in *Institutions and Comparative Economic Development*, M. Aoki, T. Kuran, and G. Roland (eds.), Palgrave Macmillan.
- [45] Keller, W., B. Li, and C. H. Shiue (2013). “Shanghai’s Trade, China’s Growth: Continuity, Recovery, and Change since the Opium War”, *IMF Economic Review* 61 (2): 336–378.

- [46] Keller, W., J. A. Santiago, and C. H. Shiue (2017). “China’s Domestic Trade during the Treaty-Port Era”, *Explorations in Economic History* 63, 26–43.
- [47] Keller, W., M. Lampe, and C. H. Shiue (2020). “International Transactions: Real Trade and Factor Flows”, *Cambridge Economic History of the Modern World*, Broadberry, S., and K. Fukao (eds.).
- [48] Keller, W., and C. H. Shiue (2020). “Capital Markets and Colonial Institutions in China”, presentation at NBER Summer Institute, July 2020, Cambridge, MA.
- [49] Keller, Wolfgang, Carol H. Shiue, and Xin Wang (2020a), “Capital Market Development in China and Britain, 18th and 19th Century: Evidence from Grain Prices”, forthcoming, *American Economic Journal: Applied Economics*.
- [50] Keller, Wolfgang, Carol H. Shiue, and Xin Wang (2020b), “Capital markets and grain prices: assessing the storage cost approach”, *Econometrica* Vol.14, pages 367–396.
- [51] League of Nations (1940). *Statistical Yearbook of the League of Nations*. Geneva: League of Nations.
- [52] Liu, T. and K. Yeh (1965). *The Economy of the Chinese Mainland: National Income and Economic Development, 1933–1959*. Princeton, NJ: Princeton University Press.
- [53] Lovell, J. (2015). *The Opium War: Drugs, Dreams and the Making of Modern China*. Abrams Press.
- [54] Lutz, J.G. (2008). *Opening China: Karl F. A. Gützlaff and Sino-Western Relations, 1827-1852*. William B Erdsman Publishing.
- [55] Lyons, T. (1973). *China Maritime Customs and China’s Trade Statistics, 1859–1948*. Trumansburg, NY: Willow Creek Press.
- [56] Ma, D. (2011), “The Rise of Modern Shanghai: 1900-1936: An Institutional Perspective”, in So and Myers (2011), Chapter 2.
- [57] Mayers, William Frederick, N. B. Dennys, and Charles King. (1867). *The Treaty Ports of China and Japan: A Complete Guide to the Open Ports of Those Countries, Together with Peking, Yedo, Hongkong and Macao*. London: Trübner.
- [58] Miyakawa, H. (1955). “The Naitō Hypothesis and its Effects on Japanese Studies of China.” *Far Eastern Quarterly* 14 (4), Special Number on Chinese History and Society: 533-52.
- [59] Mokyr, J. (2016). *A Culture of Growth: The Origins of the Modern Economy*. Princeton University Press.
- [60] Morse, H. B. (1926–29) *The Chronicles of the East India Company, Trading to China 1635–1834*, volumes 1–5. Oxford: The Clarendon Press.

- [61] Morse, H.B. (1910). *The International Relations of the Chinese Empire*, Vol. 1. Longmans, Green, and Company.
- [62] Murphey, R. (1977). *The Outsiders: The Western Experience in India and China*. Ann Arbor: University of Michigan Press.
- [63] Nield, R. (2015). *China's Foreign Places: The Foreign Presence in China in the Treaty Port Era, 1840-1943*. Hong Kong: Hong Kong University Press.
- [64] Peng, H. (2019). *Trade Relations between Qing China and Tokugawa Japan*. UK: Springer.
- [65] Perdue, P.C. (2011). "The First Opium War: The Anglo-Chinese War of 1839-1842" MIT Visualizing Cultures, [https://visualizingcultures.mit.edu/opium\\_wars\\_01/ow1\\_essay01.html](https://visualizingcultures.mit.edu/opium_wars_01/ow1_essay01.html).
- [66] Perdue, P. C. (2005). *China Marches West: The Qing Conquest of Central Eurasia*. Cambridge: Harvard University Press.
- [67] Perkins, D. (1969). *Agricultural Development in China 1368–1968*. Chicago: Aldine Publishing Company.
- [68] Pomeranz, K. (2000). *The Great Divergence*. Princeton University Press.
- [69] Qi, S. (1959), *Huangfuezi Xu Naiji zouyi hekan* (A combined volume of Huangfuezi's and Xu Naiji's memorials). Beijing: Zhonghua shuju.
- [70] Qin, H. (1998), *Yunnan yapian wenti yujinyan yundong* (The problem of opium in Yunnan and the movement of opium prohibition). Chengdu: Sichuan minzu chubanshe.
- [71] Rawski, T. (1969). "Chinese Dominance of Treaty Port Commerce and its Implications 1860-1875", *Explorations in Economic History* 7 (1-2): 451-473.
- [72] Reid, A. (1990a). "An 'Age of Commerce' in Southeast Asian History", *Modern Asian Studies* 24 (1): 1-30.
- [73] Reid, A. (1990b). "The Seventeenth-Century Crisis in Southeast Asia", *Modern Asian Studies* 24 (4): 639-659.
- [74] Reinhardt, A. (2018). *Navigating Semi-Colonialism: Shipping, Sovereignty, and Nation-Building in China, 1860–1937*. Harvard East Asian Monograph Series, no. 41. Cambridge, Mass.: Harvard University Press
- [75] Remer, C. F. (1933). *Foreign Investment in China*. MacMillan.
- [76] Rowe, W. (2009). *China's Last Empire: The Great Qing*. Cambridge, MA: The Belknap Press of Harvard University Press.
- [77] See, C. S. (1919). *The Foreign Trade of China*. NY: Columbia University Press.



- [78] Shiroyama, T. (2011), “The Shanghai Real Estate Market and Capital Investment, 1860-1936”, in So and Myers (2011), Chapter 3.
- [79] Shiue, C. H. (2002). Transport Costs and the Geography of Arbitrage in Eighteenth Century China. *The American Economic Review* 92 (5), 1406–1419.
- [80] Shiue, C. H. (2017). “Human Capital and Fertility in Chinese Clans.” *Journal of Economic Growth* 22: 351-396
- [81] Shiue, C. H. and W. Keller (2007). “Markets in China and Europe on the Eve of the Industrial Revolution”. *The American Economic Review* 97 (4), 1189–1216.
- [82] Slade, J. (1839). *Narrative of the late proceedings and events in China*. Canton Register Press.
- [83] So, B. K. L. and R. Myers (2011), *The Treaty Port Economy in Modern China*, So and Myers (eds.), Institute of East Asian Studies, University of California-Berkeley.
- [84] So, B.K.L. and J. Su (2000). *Prosperity, Region, and Institutions in Maritime China: The South Fukien Pattern, 946-1368*. Harvard University Asia Center.
- [85] So, B. K. L., H. Yip, T. Shiroyama, and K. Matsubara (2011), “Modern China’s Treaty-port Economy in Institutional Perspective”, paper presented at the All-University of California Group in Economic History, Berkeley, CA, February.
- [86] Spence, J. (1992). “Opium”, *Chinese Roundabout*. Norton.
- [87] Su Z. (1997). *Zhongguo dupin shi [A History of Drugs in China]*. Shanghai: Shanghai renmin chubanshe.
- [88] van de Ven, H. (2004). Globalizing Chinese History. *History Compass* 2 (1), 1–5.
- [89] von Glahn, R. (2007). Foreign Silver Coins in the Market Culture of Nineteenth Century. *International Journal of Asian Studies* 4 (1), 51-78.
- [90] von Glahn, R. (2016). *The Economic History of China: From Antiquity to the Nineteenth Century*. Cambridge University Press.
- [91] Wade, Geoff (2005). “The Zheng He Voyages: A Reassessment”, *Journal of the Malaysian Branch of the Royal Asiatic Society* 78 (1): 37-58.
- [92] Wade, Geoff (2009). “An early Age of Commerce in Southeast Asia, 900-1300 CE”, *Journal of Southeast Asian Studies* 40 (2): 221-265.
- [93] Wakeman, R. (1997). *Strangers at the Gate: Social Disorder in South China, 1839-1861*. Berkeley, CA: University of California Press.
- [94] Wallerstein, I. (1974). *The Modern World System: Capitalist Agriculture and the Origins of the European World-Economy in the Sixteenth Century*, Vol. 1. Academic Press: New York.

- [95] Waley, A. (1963). *The Opium War through Chinese Eyes*. Stanford University Press.
- [96] Wang, Z. (2012). *Never Forget National Humiliation: Historical Memory in Chinese Politics and Foreign Relations*. New York: Columbia University Press.
- [97] Wong, R.B. (1997). *China Transformed: Historical Change and the Limits of European Experience*. Ithaca, N.Y.: Cornell University Press.
- [98] Wong, R.B. and J. Rosenthal (2011). *Before and beyond Divergence: The Politics of Economic Change in China and Europe* Cambridge, Mass.:Harvard University Press.
- [99] Zhao, G. (2013). *The Qing Opening to the Ocean: Chinese Maritime Policies, 1684-1757*. Honolulu: University of Hawaii Press.