

**The Nanking Treaty System, Institutional Changes, and Improved Economic
Performance in Qing China**

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Abstract

Before 1840, China had a traditional economy with three inter-linked components: customary, command and market in a structural equilibrium with which the customary component dominated the economy and dictated China's growth trajectory. China's markets were fragmented, currencies heterogeneous, merchants weak, commercial capital investment small, and transaction costs high. China's foreign trade was for a long time 'silver-pulled' by the outside world.

The opium trade changed this pattern. China's foreign trade became 'consumer goods-pushed'. This did not go well with the Qing state and the Opium War was fought in 1839–40 by the British to remove China's resistance. The real victory for the West was The Treaty of Nanking (1843) which assured commercial property rights and basic market conditions for foreign traders operating in China.

During the following decades until 1894, the consequences, some un-intended, of the treaty included (1) a new liberal ideology which identified modernization with Westernization, (2) new institutions to recognize and protect commercial property rights, (3) new agents, new networks and new investment behavior to match a new market growth, (4) lowered transaction costs for the economy to operate with, (5) new production function to fuel the new trade growth, and (6) a new consumption pattern to cash in what the new market growth delivered.

In the end, the market component outperformed the other two components of the economy, becoming stronger.

The Nanking Treaty System, Institutional Changes, and Improved Economic Performance in Qing China

A. China's economy prior to the Opium War

The opium trade, Opium War, and the Treaty of Nanking, have been the most discussed events of Chinese history and changed China forever.

The term 'treaty system' was commonly used in the 1970s and 80s to describe the rules for how foreign agents and their practices were legally inserted into Chinese society and became the catalyst of further changes (Fairbank 1978, 213–63, Hao 1986, 217–26). This chapter examines not whether China changed, but by how much it actually changed, as well as in which directions change was heading and what the effect was on the economy as a whole.

The period under scrutiny is from *c.* 1800 to *c.* 1890, before the 1895 Treaty of Shimonoseki (*maguan tiaoyue* 馬關條約) with Meiji Japan, also known as the Sino-Japanese Commercial Treaty, this treaty opened China's economy for foreign direct investment in transport, communication, mining and manufacturing (Wu 1958). The current study confines its investigation to a period before large-scale foreign direct investments took place in China in order to investigate how the Chinese economy responded to external shocks on its own.

This chapter examines market conditions in China at the time of The Treaty of Nanking and changes thereafter. The emphasis is on how institutions determined economic changes (North 2004, 59, 106–7), and how external shocks broke a deadlock (Olson 1982). The approach that follows offers estimates of economic change. It converts all prices to a constant price to show real growth momentum and trajectory.¹

What we must first ask is, "How commercialized, or market dependent, was the Qing economy by 1840?" The answer is "Very little". To sketch out the Chinese market and market efficiency, the starting point has to be the size of the economy in terms of GDP. The estimates available are based on Chung-li Chang's path-breaking work on the Chinese gentry. His figure for China's total GDP of the 1880s is 2,781.3 million *liang* (兩) of silver, or 2,203.9 million *liang* in 1839 constant price (Chang 1962, 296). Albert Feuerwerker estimated a total of 3,338.8 million *liang* for the same period (or 2,645.6 million *liang* of the 1839 constant price) (Feuerwerker 1995, 16). These two estimates would not support the size of the population in the 1830s owing to the price of food of the time. The current estimate for the 1830s (1833) is 3,598.3–3,958.2 million *liang* of silver (see Appendix). This estimate, although very conservative, is strictly consistent with the price of food (rice). It will help our understanding of how different components of the Chinese economy performed.

The economy consisted of three inter-related types: customary, command and market (Myers and Wang 2002; Deng 2003). The market component was never the largest of the three. This is supported by a recent study of the market size of China on the eve of the Opium War. It is estimated that on the eve of the Opium War, the aggregate value of China's main commodities was in the region of 350–388 million *liang* of silver (Liu and

¹ The conversion is based on the average silver-to-gold exchange rate from 1880 to 1889 (see Liu and Wang 1996, 178–9).

Wang 1996, 73; Wu 2001, 149).² This is the equivalent of only 8.8–10.8 percent of China's 3,598.3–3,958.2 million *liang* worth total GDP for the same period.

The command economy can be measured by state revenue. In 1820 to 1848, the Qing direct tax revenue, the Land-Poll Tax (地丁銀), was 29.4–32.8 million *liang* per annum (Liang 1980, 401, 415). The indirect taxes such as the salt levy (鹽課) and customs duties (關稅) normally contributed up to a quarter of the Qing annual revenue, and hence another 10 million *liang* maximum (Liang 1980, 401; Zhou 1981, 419–21, 426; Tang 1992, 126–28). They make a total of 40–43 million *liang* of silver, or the equivalent of 1.0–1.2 percent of China's total GDP of 3,598.3–3,958.2 million *liang*.³ If one takes the maximum tax revenue at 80–90 million *liang* a year, the share of the command economy was still the equivalent of 1.8–2.1 percent of China's total GDP. If the taxes in kind and government services are included, the amount was likely to be the equivalent of 5.0 percent of China's total GDP maximum. The combined share of the market and command components is the equivalent of 13.1–14.9 percent of China's total GDP. In this context, the customary component had to dominate the economy.

Another line of inquiry is “What was the structure of China's market economy like?” The answer is “Overwhelmingly rural and fragmented.” From studies of China's domestic market structure, it is obvious that the market was open, decentralized, and even competitive, at least at the grassroots level of *caoshi* (草市), *jishi* (集市), *xushi* (墟市), and *miaohui* (廟會) with easy entry and exit.

Quantitatively, these grassroots markets outnumbered urban markets by a ratio of 7.7–9.2 to 1 (Skinner 1977, 298; Xu 1997, 24). In terms of market participants, the urban-market participants were 21.5 million in China's total of 354.6 million (Skinner 1977, 300).⁴ Even in the most commercially advanced Jiangnan region (江南), the rural–urban ratio is still 5.7 to 1 (or 15 percent of urban population) for the mind-Qing (Li 2003, 412). So clearly, China's market was mainly rural, characterized by communities no larger than 2,000 people (See Myers and Wang 2002, 585).

Many such local markets formed a regional market within a macro-economic area. Premodern China had 8–9 such geo-economic zones (Chi 1936; Skinner 1964–5; Fei 1975). Such a division of zones hindered empire-wide resource allocation. China's highways, navigable rivers and coastal shipping routes helped a little to determine the market size (Wu 1983, 245–9), because the commercial traffic between these regions has remained unknown. At best, each level of the market achieved a local and partial equilibrium, which may have well been sub-optimal in the national economy despite market arbitrage at all levels, including a lack of economies of scale. Ample examples of the systematically documented price differences for the same commodity (such as rice) from the Chinese record have proved the point (see for example Wang 1992).

It is not too hard to imagine that when goods and services were traded across China's macro-economic regions, their volume diminished so much that monopoly over them became easy. This explains the phenomenon that at the top of China's market hierarchy,

² Wu Chenming's early estimate was even lower than 300 million *liang* (Wu 1983, 109).

³ This is largely compatible with Feuerwerker's estimate (Feuerwerker 1984, 322).

⁴ The rural population is estimated as 90 percent of China's total population of 394 million.

trade became more organized, better monitored and controlled by a small number of commercial agents and, especially, the Chinese state. Considering the small quantities of these monopolized goods such as luxuries for export, it was not the case that the Chinese state was very strong and efficient, as portrayed by the practitioners of the ‘Asiatic Mode of Production’ and ‘Oriental Despotism’ (Wittfogel 1957; Brook 1989). Rather, it was the top layer of the Chinese market that was particularly weak.

China’s market fragmentation inevitably depended on multiple interfaces and agents in order to link all parts together. These agents are believed to have been entrepreneurs who would have inevitably sought for market integration for more business opportunities and economies of scale. This is what Karl Marx told us. Indeed, under the influence of the Marxian doctrine, there was once an influential school of thought of ‘sprout of capitalism in China’ (中國資本主義萌芽) in the 1950s and 80s (Li 1981; Xu and Wu 1985). The practitioners of this school failed to explain that why and how China’s capitalist sprout, as precious as it was, never really blossomed before the Opium War (Yang 2005).⁵

The third question is, “What was trade like in China?” The answer is “Mainly rural and primary goods, and mainly local trade.” The composition of the goods marketed suggests that the Chinese market economy was more or less an extension of the rural customary economy (see Table 1).

Table 1. Composition of Goods Marketed

	Total value (million <i>liang</i>)	Of which primary goods
Grain ⁶	163.3	163.3
Cotton cloth	94.6 ⁷	—
Tea	31.9	31.9
Cotton fiber	12.8	12.8
Raw silk	12.0	12.0
Total	314.6	220.0
Equivalent of China’s GDP (%) ⁸	7.9–8.7	5.6–6.1

⁵ Clearly, the great institutional divergence between Western Europe and East Asia began with the Italian city-states, the Italian Renaissance (c. 1330–1550), and then the age of European mercantilism (c. 1500–1800) (Hicks 1969; also Horrocks 1925; Molho 1969; Ekelund and Tollison 1981; Jones 1988; Martin and Romano 2000).

⁶ This would be the value of 80 million *shi* (石) of unhusked rice. If husked, this would be in the region of 56 million *shi*, or 4.1 million metric tons (one Qing *shi* of grain weights 72.49kg), enough to feed 22.5 million adult males for a year at the subsistence level (500 g of rice per day). These 22.5 million people occupied 5.6 percent (based on China’s 398.9 million of 1833) to 6.0 percent (based on China’s 377.6 million of 1887) of China’s total population (see Deng 2004, Appendix 2).

⁷ One estimate suggests that this amount of cotton textiles was sold by a half of China’s rural households who produced textiles to the other half who did not (Xu 1989, 201). If true, the total number of rural textile producers would be in the region of 31.9 million households (based on the 1833’s census, see Deng 2004, Appendix 2). Each such household would, on average, produce 3.0 *liang* worth of cotton textiles for sale annually, an equivalent of 1.5 *shi* of rice.

⁸ Aforementioned 3,598.3–3,958.2 million *liang*.

Source: Based on Wu 2001, 149.

This 314.6 million *liang* accounts for 81–90 percent of the total value of China’s commercial operation of 350–388 million *liang*, of which 70 percent is made of primary products (220 million *liang*). This leaves a small margin for urban goods (Wu 2001, 148–9):

Porcelain	6.0 million <i>liang</i>
Metals	4.5
Silk textiles ⁹	14.6
Total	25.1
Equivalent of China’s total GDP (%) ¹⁰	0.6–0.7

More importantly, it has been estimated that just prior to the Opium War only 20 percent of the 350–388 million *liang* of China’s commercial operation, or 70.0–77.6 million *liang*, was subject to domestic long distance trade (Wu 1983, 253–64). The total value of China’s export was even smaller: just 9.8–9.9 million *liang* a year from 1820 to 1833 (Yan 1955, 3–5).¹¹ Meanwhile, in the 1830s China’s annual purchase of opium, the main item of imports, was worth 22.2 million *liang* a year (Morse 1926–9, vols 4–5).¹² So, by 1839 China’s annual foreign trade value was in the region of 32.0 million *liang* in the 1830–8 average price, or 37.4 million *liang* in 1839 constant price. This is 9.6–10.7 percent of the value of China’s commercial operation, or the equivalent of 0.86–0.95 percent of China’s total GDP of the time.

Fourth, “Were the merchants well organized?” “Not certain” is the answer. During the Qing, there were ten major home-place-based merchant groups (商幫) stemmed from Huizhou (徽商), Sshanxi (晉商), Shaanxi (陝西幫), Shandong (山東幫), Ningbo (寧波幫), Guangdong (廣東幫), Fujian (閩商), Longyou (龍游幫), Dongting (洞庭幫) and Jiangyou (江右幫) (Zhang and Zhang 1993).¹³ Evidence suggests that each *bang* may have a membership of barely over 100 (Yu 1993, 173).

The much-publicized Chinese practice of networks of personal/personalized connections (關係網) did not help much. Geographically, these networks did not seem to spread nation-wide. Merchant associations were few in North China during the entire Qing. Also, over 70 percent of them were established after the Opium War (see Table 2).

⁹ Silk textiles were produced in both rural and urban areas. To count them as urban only does the urban sector a favor. Wu’s total silk value is 26.6 million (12.0 million + 14.6 million), this is compatible with the Jiangnan silk export at 10–15 million *liang* per year (Fan 1990, 212; Fan and Jin 1993, 253).

¹⁰ Aforementioned: China’s total GDP at 3,598.3–3,958.2 million *liang*.

¹¹ However, during this period China’s export value to Britain was mere 1.066 million *liang* per year. And, Britain was China’s single largest trading partner at the time (Shen 1985, 110).

¹² It has been estimated as 43.4 million if smuggling is taken into account (Wu 2001, 286).

¹³ The hybrid of the coastal group also made up an umbrella group of maritime merchants (海商) (Deng 1997, ch. 4).

Table 2. Recorded Private Business Associations, 1644–1911

	Total	North China			South China		
		I	II	III	I	II	III
Total	442	35 (7.9%)	6	29	407 (92.1%)	116	291
A. 1644–1840							
Sub-total	124	24 (19.4%)	3	21	120 (96.8%)	48	72
B. 1841–1880							
Sub-total	140	3 (2.1%)	2	1	137 (97.9%)	29	108
C. 1881–1911							
Sub-total	158	8 (5.1%)	1	7	150 (94.9%)	39	111
C. Distribution	% of Σ I (442)						
Σ II in total	27.6%						
Σ III in total	72.4%						

Source: Peng 1995, 999–1046; cf. Xu and Wu 2000, 179, 181.

Note: Percentages are shares between the north and south during the same period. I – Regional total, II – Home-place associations, III – Sectoral associations.

Before the Opium War, there were only 10 home-place associations (同鄉會, 會館, 公所, 公會, 公墅, 堂) in Hankou (漢口) and 6 in Shanghai (Yu 1993, 38), 4 in Beijing (北京) and 2 in Suzhou (蘇州) (Xu and Wu 2000, 179). Such a distribution of offices was compatible with the limited size of the *bang*. Sectoral associations of merchants (同業會, 會館, 公所) represent a more specialized type, but were far less mobile than their home-place counterparts. Until the early twentieth century the largest sectoral associations barely had over 3,000 members (Yu 1993, 148–9). If anything, these associations were not the equivalent of ‘guilds’ in Western European tradition (Rozman 1973; Peng 1995).¹⁴ Given the small number and small size of these associates, it is safe to assume that the vast majority of the Chinese merchants did not belong to these organizations.

Fifth, “Were operations of the Chinese merchants on a large scale?” “Most of them were not.” The best evidence comes from merchants’ assets. Regarding the salt trade, a lucrative business by the Chinese standard, the aggregate capital investment needed by the Sshanxi (山西) merchants during the late Qing was 1,800 million *wen* of bronze coins for a total of 180 million *jin* maximum (107,430 tons) salt.¹⁵ In 1782, a total of 425 salt

¹⁴ Traditionally, craftsman organizations were subject to state administration (see Ju 1934, 188–9).

¹⁵ The calculation is based on 10 *wen* (文) per *jin* (斤) of salt, FOB (see Yu 2000, 935–6).

merchants shared the 667,000 licensed portions (鹽引, 根窩). About 40 percent of the salt was traded by small and irregular dealers (Wang 1996, 101), which was very much the tradition of the salt trade. On average, each salt merchant needed 4.2 million *wen* investment of 2,000–3,000 *liang* of silver (for cash-silver exchange rate, see Lin 1993, 359; *cf.* Vogel 1987). This sum was the equivalent of free-hold sale of only 765–83 *mu* (畝) of good land (絕賣) in Suzhou during the same period (Yang 1988, 242). Even so, it was reported that during 1796 to 1850 as much as three quarters of salt merchants' capital had to be borrowed by the Huizhou Group, despite its reputation as the richest in the business (Wang 1996, 163).

During the Qing, moneylenders' capital assets were not particular big. A large pawnshop had on average 30,000–40,000 *liang*; and a small one, merely 1,000–2,000 *liang*. In 1812, China had in total 23,139 pawnshops with the aggregate capital of 347,085,000 *liang* based on an average capital asset of 15,000 *liang* (Liu 2000, 81).

Amongst the Sshanxi native bankers (山西票號) the average operators were still small, even in the post-1880 period: the average capital each banker possessed was 10,000 to 20,000 *liang* from 1897 to 1900 (Tian 1994, Appendix).

The only exception was the 'Cohong merchant' group or 'chartered merchant' group (行商) that stayed at the very top of China's market hierarchy with a large-scale operation. The chartered merchants were atypical market operators as they were intimately linked to the command economy. State officials handpicked them and granted official titles *guan* or *qua* (官). In return for their services, the chartered merchants had more than their fair share of China's most lucrative business of exporting and were super-rich. Pan Youdu (潘有度), an early nineteenth century chartered merchant, accumulated a fortune worth 10 million pesos (6.4 million *liang*) by 1820 (Chen 1993, 245). The downside is that the Qing state regularly asked Cohong merchants for donations. In the case of Pan Youdu, donations and contributions came to a total of 800,000 *liang* of silver during his career (see Chen 1993, 266–7, 269, 217, 277–8; also Jörg 1982, 80).

Another related question is whether the Chinese economy was monetized by silver. Probably not much is the answer. So far, no one knows exactly how much silver China imported. There are two ranges of estimates for the period for *c.* 1571–1840. The first range, under 400 million pesos, is based on three figures: (1) 200–300 million pesos (Qian 1986; Zhang 1998, 327),¹⁶ (2) 279 million pesos, or 179 million *liang* (Wu 2001, 33, 287), (3) 53–100 million pesos for from 1571 to 1644 (Liang 1989, 178–9) plus 6,340 tons of silver (or 265.8 million pesos) for 1700 to 1840 (Zhuang 1995, 71), making a total of 365.8 million pesos. The second range is above 400 million pesos. On top of the Liang-Zhuang figure of 365.8 million pesos, it is believed that Japan also supplied a total of 76.5 million pesos (48.9 million *liang*) to 255.8 million pesos (6,100 tons) (Quan 1993, 8; Reid 1993, 27; Zheng 1994, 83), making a total of 442.3–621.6 million pesos. Rodney Gilbert has a figure of £100 million (or 469.2 million pesos) as China's pre-Opium War total (Gilbert 1929, 52).

¹⁶ A Spanish-Mexican peso contained pure silver of maximum 23.85 grams. One million pesos would make 23.85 tons of pure silver.

To minimize the differences, we can take the average value (412.4 million pesos) of the two ranges. If the outflow of 45.4 million pesos (29 million *liang*) during 1800–1830 for opium is considered,¹⁷ the net silver stock is likely to have been in the region of 367.0 million pesos (235.3 million *liang*).¹⁸ If distributed amongst the population of 398.9 million (as of 1833, see Deng 2004, Appendix 2), it would make 0.9 peso or 0.6 *liang* (22 grams) per head.

In addition, the Qing Treasury constantly held a silver reserve of 62.2 million pesos (39.9 million *liang*) on average (Lü 1984; cf. Wu 2001, 224), leaving the economy with 304.8 million pesos as ‘active silver’, 0.8 pesos (0.5 *liang*) per head.

The most damning evidence against the claim of ‘silverization’ (coined in von Glahn 1996) comes from the heterogeneity of silver itself. Apart from Chinese ingots (銀錠, 紋銀元寶, called *sycee*, literally meaning ‘purity’ 成色銀, 92.5–98 percent purity), foreign silver circulated in China in all purities, shapes and sizes: Western coins (European, Mexican, US, 88.0–90.3 percent purity),¹⁹ Asian coins (British Hong Kong, British Indian, Franco-Saigon, and Japanese), and nuggets.²⁰ This coinage heterogeneity required a special market to convert monetary silver between *sycee* and imported coins (Chen 1997, 149–50). Silver testing (估色) became a profession, and manuals for valuing silver coins were circulated (Cribb 1987, 121, 122).

Even worse, there existed different weight measures for silver. There were also 56 Local Official Silver Weight Standards (市平兩) varying by some 11.2 percentage difference across the board (Zhang 1987, 130). Even the measures used by the central government, namely the Treasury Silver Weight Standard (庫平兩) and the Customs Silver Weight Standard (關平兩), were different. In addition, there was a private silver weight standard adopted by the Sshanxi native bankers called the Internal Silver Weight Standard (咱平銀, 本平銀) (RY and CJ 1990, 135–6). A special market also had to be developed to convert different weights (扣平) (Chen 1997, 150–1).

There was another factor against silverization: China had a fully functional bronze currency (銅錢, 制錢, 錢文, often translated into ‘cash’). The bronze currency was not based on a silver or gold reserve. Unlike silver, seigniorage was applicable to the bronze currency, so the state had strong incentives to keep it alive.²¹ But there was a catch: to yield the seigniorage, the currency has to be relatively uniform and guaranteed by the

¹⁷ One study suggests the silver outflow in the region of 150.0 million pesos, or 96.2 million *liang* from 1814 to 1850 (Lin M. 1991, 3).

¹⁸ One Qing *liang* was 37.3 grams in pure silver.

¹⁹ These coins came to China at different times: the Spanish ones before 1821; Mexican, after 1821; British-Hong Kong, after 1866; US, after 1873; Japanese, after 1871; Franco-Saigon, after 1885.

²⁰ Pieces between 1 and 4 *liang* was called 碎銀; those under 1 *liang*, 滴珠.

²¹ Seigniorage also attracted counterfeiting activities that were widespread. From 1790 to 1795, a total of 2.4 billion of such fake coins were confiscated by the Qing authorities, 6.6 fakes per capita (Lin 1993, 389, 392).

state.²² So, Chinese token currency served well as a medium for market exchange with or without silver. In comparison, silver entered circulation only when absolutely necessary, partly because of its heterogeneity and partly because of Gresham's Law, when bronze coins drove silver out of circulation, at least partly.

It is thus too simple to attribute China's economic performance to its silver intake (von Glahn 1996; Ni and Xia 1990; Frank 1998).

B. Transaction costs of the economy before 1840

China's fragmented markets, multiple interfaces and agents, personalized business associations, and small-scale operations made it a high transaction-cost economy, along with an imperfect market economy using imperfect information. Transaction costs are the difference between the total economic costs and the production or transformation costs. They are associated with measuring values of goods or services, protection of property rights, integrating dispersed knowledge of a society, and enforcing agreements (see North 2005, 158). In China's market economy, these costs were borne by consumers as well as producers, and they made for a low productivity market economy

One obvious transaction cost is related to monetary silver which constituted a measuring and service cost associated with the widespread money dealers (票號錢莊業) and silver-smelters (銀爐業) since the seventeenth century. Such activities depended heavily on China's monetary heterogeneity and declined only soon after the Qing state standardized the currency system around the end of the nineteenth century. Such a decline can be seen as a sign of lowering the transaction costs in the monetary market.

To take tea as another example of how it worked, the Guangzhou FOB prices varied between 14.8 *liang* (for *wuyicha* 武夷茶) to 54.9 *liang* (for *gongcha* 貢茶) per *dan* (擔), averaging 29.2 *liang* per *dan*.²³ This was 2.6–3.0 times higher than the local market prices with a mean of 9.4–11.3 *liang* (Huang 1990, 441; Wu 2001, 299). The difference between the export and domestic prices is 19.8 *liang*. This price difference included not only the merchant's profit and overland transportation cost but also transaction cost due to the state monopoly.

Now assuming that the normal profit rate in the eighteenth century was 14 percent, as is what the licensed salt merchants earned (Wang 2000, 85), the merchants' profit would be 1.3 *liang* of silver per *dan* (based on the mean price of 9.4 *liang*). Also, due to Cohong regulations, exported tea had to go through Guangzhou (see Lin R. 1991, 234). The extra cost to transport tea from Fujian to Guangzhou was one *liang* per *dan*. The net difference between the export and domestic prices now becomes 17.5 *liang* per *dan* (19.8 *liang* – 1.3

²² Although bronze coins were not completely uniform, the differences were tolerable as there were only a handful makes: apart from the mainstream 'legal tender' (通寶), there were 'Taiwan Minor Coins' (台灣小制錢) in circulation in the seventeenth and eighteenth centuries in Taiwan and 'Kangxi Minor Coins' (康熙小制錢) or 'Beijing Coins' (京錢, 京墩) in circulation from 1660 to 1860 mainly in the capital city (Zhao 1990, 609, 612, 614).

²³ One *dan* (擔) is normally 100 Chinese liters (升). But traditionally, when measuring non-grain commodities, the term *dan* was used as the synonym of 100 *jin* (斤).

liang – 1 *liang*). The net mark-up is 54.9–86.2 percent on top of the local price of 9.4–11.3 *liang* per *dan*.

Prior to the Opium War, China's annual tea export was 605,000 *dan* (Wu 2001, 149). The annual aggregate extra cost for foreigners was thus 16,516,500 pesos (10,587,500 *liang*²⁴), which dwarfed the earlier rent from trading silver at 416,100–456,000 pesos a year.²⁵ China gained the upper hand by imposing transaction costs on foreigners.

However, China's monopoly rent was later counter-balanced by the opium trade. Although opium consumption in China slowly expanded,²⁶ it took off in 1800 (Gong 1999, 118). In a typical demand shock, the price and quantity of opium both rocketed before 1836 (see Table 3). Opium was, briefly, worth more than its weight in silver. The value-adding capacity of opium even made it a currency (Hao 1986, 55–8, 60–4; Van Dyke 2005, 122, 162).

Table 3. Opium's Demand Shock: Annual Opium Imports, 1800–35

	Chests*	Weight (<i>jin</i>)	Value (pesos)	Pesos [<i>liang</i>]/ <i>jin</i>
1800–5	3,562	401,960	2,009,800†	5.0 [3.2]
1805–10	4,281	484,580	–	–
1810–5	4,713	534,980	–	–
1815–20	4,633	519,740	–	–
1820–5	6,774	729,320	33,502,440	45.9 [29.4] ²⁷
1825–30	12,108	1,312,440	56,930,593	43.4 [27.8]
1830–5	20,546 ²⁸	2,217,260	63,866,684	28.8 [18.5]
1836–7	21,505	2,312,000	14,454,193	6.3 [4.0]
1838	50,000	6,000,000	15,000,000‡	2.5 [1.6]

Source: Morse 1926–9, vols 3–5; Brook and Wakabayashi 2000, 204 (for 1838 figure); cf. Hao 1986, 117 for much lower estimates.

Note: Chest-weight conversion, based on Gong 1999, 281, 284–90, 292. *A chest contained 40 opium balls (the same size as a cannon ball, 15 cm in diameter, 3 *jin* each) of 100–120 *jin* (133.3–140 lb) in total (Booth 1996, ch. 1). †Maximum price based on 2,000 chests for 1,200,000 pesos (Pritchard 1929, 160). ‡Based on

²⁴ One *liang* of silver is equivalent of 1.56 Spanish/Mexican pesos' silver content.

²⁵ It is known that from 1817 to 1833, China's export of tea to the British East India Company alone was on average 1.5 million *liang* of FOB price per year (Chen 1984, 136), the transaction costs for the British tea merchants were in the region of 250,000 *liang* a year (9.3 tons). Tea took the lion's share of British imports from China (about 90 percent on the eve of the Opium War) (Chen 1984, 144–5).

²⁶ In 1720, the Portuguese shipped 'a few chests' of opium to Macao, which may be considered the dawn of the opium trade in East Asia (Van Dyke 2005, 121). A considerable quantity of the drug traded began in 1729 when the Portuguese shipped 200 chests of opium to Macao (Phipps 1835, 208). The first British opium cargo arrived half a century later (Pritchard 1929, 150).

²⁷ One Qing *jin* was made of 16 *liang*. So, the average opium prices per *jin* were all higher than silver in weight. High-quality opium cost up to four times in weight of silver (Qi 2000, 537).

²⁸ It is worth noting that Chinese sources often put a figure of 25,000 to 35,500 chests a year for the late 1830s due to the factor of smuggling (e.g. ZS 1954, 543; Kuang 1989, 38). China could easily afford these inflated figures for opium imports. Morse's data may be taken as the minimum.

Article IV of The Treaty of Nanking regarding six million silver dollars for the seized 20,000 chests of opium (1839 price).

The major economic impact of the opium trade can be seen in China's trade deficits with Britain (including India), as its tea exports were unable to offset its opium imports (based on Chen 1984, 144–5).²⁹

²⁹ Measured by pound sterling, one pound sterling = three *liang* of silver = 4.68 pesos.

	Tea exported	Opium imported	Tea–Opium
1834–37	45.0 x10 ⁵ <i>liang</i>	54.1 x10 ⁵ <i>liang</i>	–9.1 x10 ⁵ <i>liang</i>
1837–40	42.7	40.1	+2.6
1840–43	31.1	49.7	–18.6
Average	39.6	48.0	–8.4

Whichever way we look at it, China was a high transaction cost economy by 1840.

C. The Treaty of Nanking (南京條約, or 江寧條約), a new beginning

The opium trade was not new to China, having a history of over a century by the time the Opium War broke out (Gong 1999). The ‘opium problem’ emerged partly because of the outflow of silver and partly because of the social disorder associated with smuggling (Gilbert 1929, 93–5). The Qing strategy was to reduce the opium trade from the supply side. To blame the ‘foreign barbarians’ would be politically correct: a huge miscalculation by the Qing.

Given the British military supremacy over any Asian country and their advantage in a better understanding of Qing China than China to Britain, the outcome of the war was highly predictable.

The war ended quickly with the Treaty of Nanking formally being ratified at Hong Kong on 26th June 1843 with one-sided gain by the British in terms of war reparations (a total of 18 million silver dollars 洋銀), release of all the detained British subjects or Chinese working for Britain, secession of Hong Kong, opening up ‘without molestation or restraint’ five ports for foreigners – Guangzhou (Canton), Xiamen (Amoy), Fuzhou, Ningbo, and Shanghai and abolishing the Cohong monopoly over China’s foreign trade.

Wars and treaties were classical examples of Western gunboat diplomacy at the time, and the West imposed many similar treaties upon China and its market economy. It was a dynamic process that China had to endure: from 1842 to 1901, China signed 26 treaties having 73 concessions with 12 foreign powers. China was the perfect target for modern imperialism, but did China suffer more than it gained?

D. The role of the West in the Chinese market

Historically, any expanding commerce in China was associated with changes in the customary and command economies. It occurred in the Song and Yuan (Deng 1999a, chs 5–6) and again in the late Qing. Nineteenth century’s commercial revolution and commercial capitalism in China were ‘largely imposed from the West’ (Hao 1986, 342). The West became leader in and guardian of the Chinese market.

China’s trading ports, after becoming integrated with foreign trade centers, became enclaves for a new market economy within the huge Qing agrarian empire. Individual foreign traders, now backed by foreign military capability, had their property rights and businesses fully recognized and protected on China’s soil. In these enclaves, both physical assets and human capital were relatively safe. The incentives provided by

foreigners business also extended to Chinese nationals.³⁰ During the Taiping rebellion, Shanghai enclave's population swelled to 500,000 of which a large proportion was refugees (Gilbert 1929, 175). This pattern repeated itself during political persecution, civil wars and Japanese invasion in the twentieth century. After 1949, Hong Kong was the last enclave.

Also, The Customs Duty Office (海關稅務司, CDO), the front line of China's market economy, was rapidly modernized after 1860, and its tentacles reached into all corners of the empire.³¹ Independent from the Qing government, The CDO hired foreigners as executives with high salaries, better than any Chinese bureaucrats. Performance bonuses were offered to overcome the principle-agent problem.³² Modernization paid off: in real terms China's customs revenue increased from 4.4 million *liang* in 1861 to 9.1 million *liang* in 1891 (in 1839 constant price) by a factor of 2.06 with an annual growth rate of 2.4 percent (see Table 4).

Table 4. Growth in Total Value of China's Foreign Trade (in *Liang*), 1801–1891

	Customs duty revenue	Index	Value of trade	Index
1. Pre-Opium War				
1801	–	–	15,272,029 [15,488,873]*	100
1821	–	–	16,341,267 [16,573,293]*	107
1831	–	–	17,285,309 [17,530,739]*	113
1839	–	–	32,000,000 [37,400,000]*	241
Annual growth			0.87%	
2. Post-Opium War				
1841	–	–	30,010,872 [30,010,872]†	194
1851	–	–	51,375,611 [51,375,611]†	332
1861	4,347,408 [4,418,096]	100	86,948,160‡ [87,826,424]	566 (100)
1871	7,020,150 [7,041,274]	160	140,403,000‡ [140,966,867]	910 (161)
1881	11,114,725 [9,499,765]	216	222,294,500‡ [189,995,299]	1,226 (217)
1891	12,168,096 [9,080,669]	206	243,361,920‡ [181,613,373]	1,172 (207)

³⁰ This was a phenomenon which both the nationalists and communists have been very bitter about. They omit to question why and how China's own state was unable to protect its own merchants so that the Chinese merchants had to find protection from outsiders.

³¹ The opening of Customs services were as follows (Tang 1992, 54–60): 1860: 粵海關, 潮海關, 江海關; 1861: 鎮江關, 東海關, 津海關, 浙海關, 福州關, 廈門關; 1862: 臺灣關; 1863: 九江關, 江漢關, 牛庄關; 1876: 瓊海關; 1877: 蕪湖關, 宜昌關, 甌海關, 北海關; 1887: 九龍關, 拱北關; 1889: 鎮南關, 蒙自關; 1891: 重慶關; 1896: 蘇州關, 杭州關, 沙市關; 1897: 三水關, 江門關, 甘竹關, 梧州關, 思茅關; 1899: 金陵關, 岳州關, 三都澳關, 膠海關; 1902: 騰越關, 秦皇島關; 1904: 長沙關; 1907: 南寧關, 大連關, 安東關; and 1908: 哈爾濱關.

³² The early income, salary and bonuses amounted 48,000 *liang* a year, which was eventually increased to 80,400 *liang* in comparison of 30,000 – 40,000 *liang* living allowance to the rank of Duke (Tang 1992, 13).

Annual growth	4.67%
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Source: Data for 1801–31, based on Yan 1955, 3; those for 1839, based on Yan 1955, 3–5, Morse 1926–9, vols 4–5 and Wu 2001, 286; those for 1861–91, based on Tang 1992, 63–6. The silver-gold exchange rates based on Yu 2000, 865 and Liu and Wang 1996, 178–9.

Note: Figures in brackets are in 1839 price. Indices and annual growth rates are calculated in the 1839 price. *Only the 1800's silver-gold exchange ratio is available and hence is applied as a proxy. †No datum available, estimates are made by linear growth between 1831 and 1861. ‡Conversion based on 5 percent duty rate (Tang 1992, 14). Index in parentheses is for comparison.

It is worth noting that despite the foreign control and dominance over China's foreign trade, there was a symbiotic relationship between foreign traders and the Qing state: the cumulative revenue from 1861 to 1910 was 910.6 million for a total of 49 years, of which 76.3 percent became revenue for the Qing central state (國用) (Tang 1992, 126–8).³³ The beneficiaries of the customs reform did include the Qing state itself. Ironically, foreigner traders paid 94.7 percent of the customs duties (Tang 1992, 21).

Moreover, The Treaty of Nanking functioned as guardian of China's foreign trade. The best example is from the Taiping Rebellion which affected regions from which tea and silk were exported (Fairbank 1978, 272, 300). The foreign presence in the region and foreign interest in tea and silk effectively saved tea and silk production (see Table 5).

Table 5. Tea and Silk Export from Taiping Occupied Zones,* 1848–65

Period	Tea (lb)	Silk (bundle)
1. Pre-occupation		
1848–9	47,240,000 (100)	17,228 (100)
1849–50	53,960,000 (114)	16,134 (94)
1850–1	64,020,000 (136)	22,143 (129)
2. During occupation		
1856–7	61,460,000 (130)	74,215 (431)
1857–8	76,740,000 (162)	60,736 (353)
1858–9	65,789,792 (139)	81,136 (471)
1859–60	85,938,493 (182)	69,137 (401)
1860–1	87,220,754 (185)	88,754 (515)
1861–2	107,351,649 (227)	73,322 (426)
1862–3	118,692,138 (251)	83,264 (483)

³³ In Gilbert's account, the old Canton Customs was able to collect 10 million *liang* (as in 1843). But only 9 percent of the revenue ended in the Treasury in Beijing showing high principle-agent costs (Gilbert 1929, 190).

3. After occupation

1863–4	119,689,238 (253)	46,863 (272)
1864–5	121,236,870 (257)	41,128 (239)

Source: Guo 1991, 423–4.

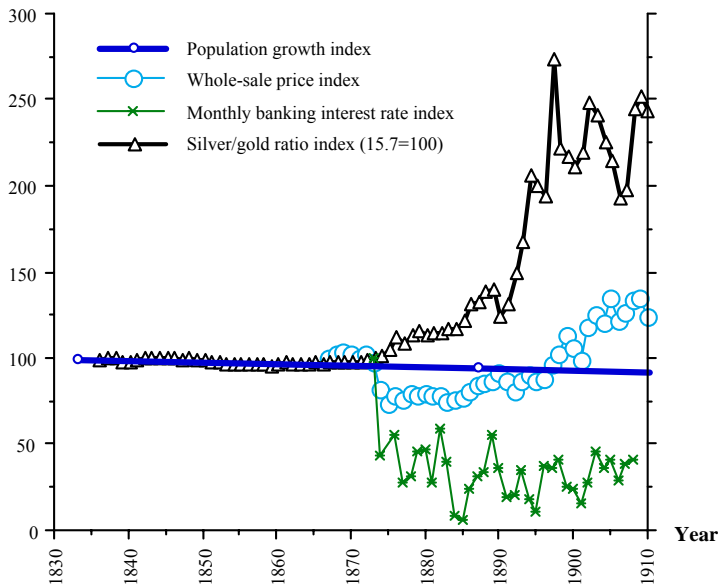
Note: *Including much of the Huguang (湖廣) and Jiangnan.

The Taiping regime did not want to make an enemy of the West. They even simplified taxation to help foreign trade (Guo 1991, 393–431). The result was a safe haven for tea and silk production in the Taping controlled zones. In comparison, the Taipings had no hesitation to reduce Jingdezhen, the best porcelain centre in China, to rubble because porcelain no longer appeared on China's export list.

Furthermore, the Chinese business community followed Western leadership. The best examples are (1) 'buying foreign shares' (附股) and (2) 'borrowing foreign names' for Chinese businesses (寄名). Both practices were common in the post-Opium War era (Hao 1986, 245–67). Even elements of Chinese traditional sectors grasped these new opportunities, and Chinese business associations took-off after 1840. Similarly, China's native banks expanded their operations after the war (Wei 1944; Hao 1986, 51).

With the new leader and guardian, market conditions genuinely improved. Extra-economic restrictions to enter the market were removed; customs duties lowered; price distortions declined; and monopolistic rent disappeared. As far as the market is concerned, transaction costs decreased, as demonstrated in Figure 1 where the wholesale price index remained relatively stable despite the enormous inflationary pressure from the deteriorating silver-to-gold exchange rate. The banking interest rate also declined, signaling reduced risks.

Figure 1. Growth Indices, 1870–1910



Source: (1) Silver-gold ratio, based on Yu 2000, 558, 755, 865. (2) Whole-sale price index, based on Liu and Wang 1996, 164–5. (3) Shanghai banks' short-term interest rate, based on Liu and Wang 1996: 257–8. (4) Population growth, Deng 2004, Appendix 2.

E. Main changes in China's commercial revolution

In the three decades following the Opium War, the first change was to for China to relate to other countries as equals and to recognize the importance of trade with them (Gilbert 1929, 54–5). Accordingly, China's management of foreign relations became modernized: The Foreign Affairs Department was established (*zongli yamen* 總理衙門) (Jia 1867); and foreign relations and affairs (夷務) received unprecedented priority in the circle of China's decision-makers. The deep-seated Chinese culture and beliefs began to change, too, with a new consensus to rebuild China's strength (Sun 1957, 1201).

The second change was the end of any institutional barrier to foreign trade. The trading period allowed for foreigners was extended 300 percent (from 3 months to 10 months). Foreign traders had the free hand to operate everywhere on China's soil; China's duty rates were lowered by 58.5–77.0 percent; ship surcharges were reduced by 92 percent (Yan 1955, 59; Peng 1956, 21; Tang 1992, 14, 17–8; Huang 2005, 492, 507–8).³⁴ To observe the international norm, foreign traders in China were also exempted from the internal

³⁴ It is worth noting that the Canton System had preferential duty rates in favor by a large margin of large companies and large ships (Van Dyke 2005, 106). So, the change benefited mainly small and medium companies.

transit levy *lijin* (or *likin*, 厘金, meaning ‘1% surcharge’) after paying a single sub-tariff (子口稅) (Tang 1992, 15–6).

The third change was the adoption of budget deficit through raising foreign debt in the state finance, once a taboo by Chinese tradition (see Table 6).

Table 6. China’s Foreign Debts, 1861–93

Type	Silver <i>Liang</i>	Debtor	Interest/year (%)
1. Law and order			
1861–6 Counter-Taipings	1,609,925	Foreign merchants	–
1867 Counter-Muslims	2,200,000	Foreign merchants	18.0
1875 Counter-Muslims	3,000,000	British banks	10.5
1877 Counter-Muslims	6,750,000	British bank	15.0
Subtotal	13,559,925		
2. National security			
1874 Taiwan defense	2,000,000	British bank	8.0
1883–5 Coastal defense	13,602,300	British bank	9.0
1886 Naval upgrading	980,000	German bank	5.5
1893 Coastal defense	42,090,000	British, German banks	6.0–7.0
Subtotal	58,672,300		
3. Public works			
1887 Flood control	1,968,800	British bank	7.0
Total	74,201,025*		

Source: Based on Tang 1992, 34–41.

Note: *Equivalent to one year’s Qing state revenue before the Opium War. To put down rebellions was considered as a high-risk undertaking. So, the interest rate was the highest.

To serve these debts, an indirect tax, the *lijin*, became indispensable in China’s state finance in 1853–1927. The *lijin* was potentially a seed for a new relationship between the market and the state in that it implied the need for protection of commercial property rights in exchange for the surrender of a proportion of business income as government revenue. Such reciprocity was important for making the market economy more productive. By managing new public debt and indirect taxes, the Qing state finances began to be increasingly monetized and modernized.³⁵ China’s native banks were

³⁵ Different paces were taken in this process. The salt licensing system remained stubbornly intact until 1900, and China’s currency remained messy (Adshead 1970; King 1965; Cribb 1987).

commissioned to handle tax remittance to Beijing (京餉), moving an average of 1.9 million *liang* of silver a year (70.9 tons, or 2.96 million pesos) (RY and CJ 1990, 135–6). The native business associations thus thrived (see Table 2).

The fourth change was, with the deregulation of China's domestic markets, the rise of the new business class of compradors (買辦),³⁶ representing the real capitalist sprout in China. This group was by far the most market-oriented and the most westernized class in Chinese history in new symbiotic business relationship Western traders (Hao 1970; Hao 1986, chs 8–9; Yan 1986a and 1986b).³⁷ Compradors worked for 2–3 percent commission in a competitive market (Yan 1986a, 85–7, 93; Van Dyke 2005, 157). They often hired assistants (副買辦, 幫買辦) to maximize market opportunities (Yan 1986a, 89–90). Moreover, by investing in a wide range of commercial ventures such as banking, manufacturing, transport and communication (Hao 1970, ch. 4), compradors departed from the old Chinese pattern of re-investing commercial profit in rural estates and Confucian education (Liu 1993). This accelerated the weaning of the market economy from the customary and command economies. Yen-p'ing Hao thus calls the compradors' way of conducting business as in itself a 'new socio-economic institution' (Hao 1970, ch. 7) in a 'commercial revolution' (Hao 1986, 335).

³⁶ Very subtly, after the Opium War, the Portuguese term 'comprador' was replaced by the English term 'purveyor' (Van Dyke 2005, 72), although the Chinese term 買辦 remained unchanged.

³⁷ Yen-p'ing Hao coins this symbiotic relationship as 'The Treaty System' (Hao 1986, 217–26).

F. A new market-growth pattern

First of all, the market rewarded compradors (as well as foreign traders) well. By the end of the nineteenth century, China had a total of over 10,000 compradors (compared with no more than 100 Cohong merchants) with an aggregate wealth of 493–530 million *liang* of silver, averaging 49,300–53,000 *liang* (1.84–1.98 tons) per head, higher than any private merchant group before the Opium War (see Huang 1992, 36; Hao 1970, 105; *cf.* Yan 1955, 155). This indicates a more productive market economy.

Second, in terms of China's GDP structure, changes were significant. If we take Feuerwerker's GDP figure of 3,338.8 million *liang* for the 1880s (or 2,645.6 million *liang* in the 1839 constant price) as the base (Feuerwerker 1995, 16), foreign trade value in 1881 (189,995,299 *liang*, 1839 constant price) accounted for 5.7 percent of China's total GDP (see Table 4). The increase is at least six-fold from that of the pre-Opium War level. Undoubtedly, the market component was expanding.

Considering the growth in trade itself, China's foreign trade increased exponentially after 1840 at 4.67 percent a year for 50 years. This is over 5 times the 0.87 percent annual rate before the war (see Table 4), outperforming other developments in the economy (see Table 7).³⁸

Table 7. Other Changes in the Economy

Type	Period	Annual rate (%)
Urbanization	1843–93	0.3
Population	1833–87	–0.1
Agricultural output (in calories)	1840–80	–0.1
Total GDP	1850–89	–0.6

Source: (1) Urbanization, based on Skinner 1977, 228–9; (2) population, based on Deng 2004, Appendix 2; (3) agricultural output, based on Liu *et al.* 1999, 126; (4) Feuerwerker 1995, 16; Liu *et al.* 1999, 66.

We should not be puzzled by such differences for other patterns of change. A slow total GDP growth might have less to do with market's exponential growth than with changes in the customary economy. China's population decline, on the other hand, was almost certainly a result of civil war. The notorious Taiping Rebellion (1851–64) alone caused a death toll of 30 million (Jian 1946, 4–5).³⁹ State failure might have also contributed to declines, because the rebellions disabled the Qing state's famine relief projects across the

³⁸ After WWI, Western Europe also had a trade boom ahead of its total GDP growth (Kenwood and Lougheed 1992).

³⁹ In the north, there were the Nians (捻子) in who haunted the Qing state from 1853–68 (Fairbank 1978, 458). The Muslim Rebellion (回回) in the West fought the battle on against the Qing rule from 1868 to 1873.

empire after large proportion of the state revenue, from 16 provinces of a total of 24, lost to the rebels (Will and Wong 1991).

Third, before 1800, China's trade pattern was 'silver-pulled' in that economic growth was generated by external supply: China was lured to trade for the foreign metal (Xie 1993, 110–1; Lin M. 1991, 3, 11). After 1840, the pattern of 'porcelain and silk for silver' trade gave way to the 'tea and silk for opium' trade.⁴⁰ But this time, the pattern became 'consumer goods-pushed' in that the market growth was being driven by internal demand.⁴¹ From 1864 to 1894, the aggregate value of China's foreign trade was 5,003.5 million *liang* led by imports (current price). China's exports were unable to keep up with the growth of import value as seen from a total of 352.3 million *liang* deficits (Liu and Wang 1996, 59 – 61; cf. Fairbank and Liu 1980, 46–7). The deficit rate (deficit/total trade value) was 7.0 percent. Moreover, during the same time, the terms of trade (imports/exports) were on an average 100 to 93.5 in favor of imports, which matches China's deficit rate. Such a change was ultimately determined by international competition of tea, silk and porcelain.⁴² Total factor productivity, based on comparative advantage, really mattered now, because The Treaty of Nanking promoted a more productive market economy to emerge (Hao 1986, ch. 7).

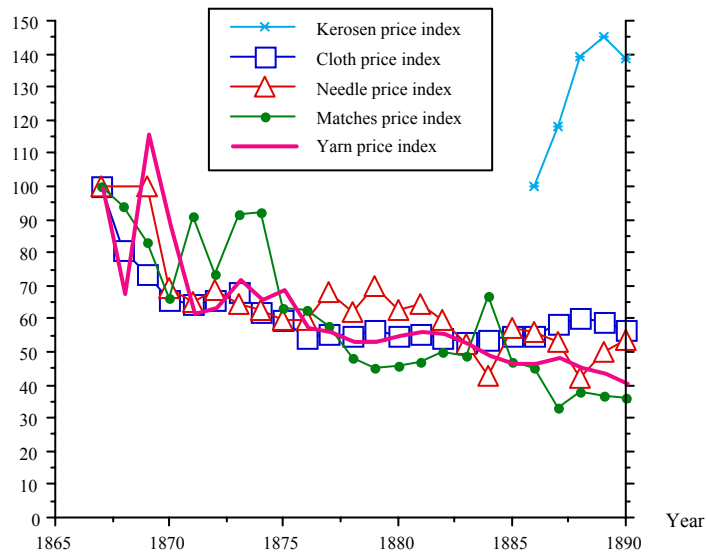
But imports were not a disadvantage. The old days of overcharging the Chinese for silver were long over. China's increasing imports were accompanied by general price decline (see Figure 2). The direct benefit was consumers' surplus for the Chinese, as seen from more and cheaper imports. Thus, it was natural for China to become a 'consumer economy' (see van Dyke 2005: 176).

⁴⁰ The Dutch were keen porcelain traders (see Quan 1993, 11–12; see also Jörg 1982, Appendix 11), while the British concentrated on tea (Chen 1984, 144–5).

⁴¹ After all, opium was a consumer good.

⁴² By the 1860s, Java, Sri Lanka, Japan, Korea, Vietnam, Burma and South America produced tea, while Western Europe, Japan and Korea produced both silk and porcelain. China no longer monopolized any of the items in the world market.

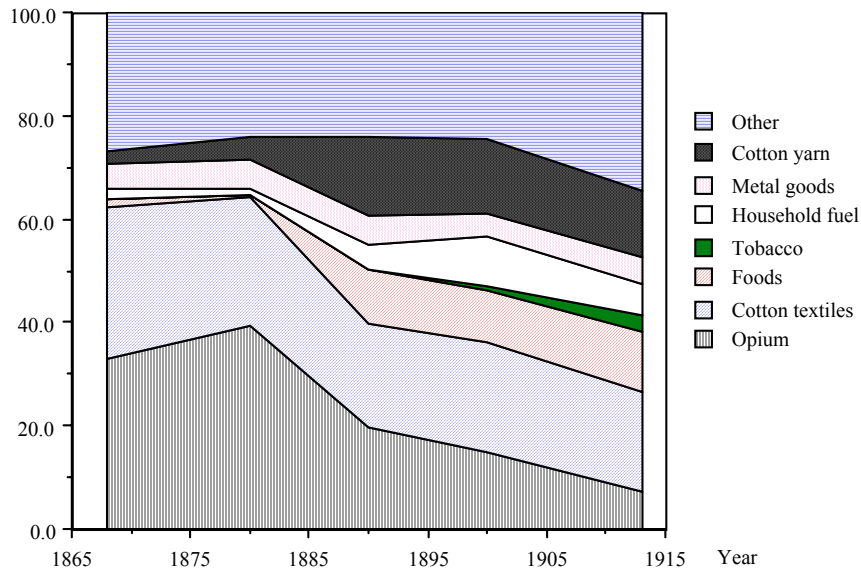
Figure 2. General Price Decline of China's Imports, 1865–90



Source: Based on Xu 1989, 121–4, 150; Guo and Zhang 1999, 62–3.

As these imports (洋貨) directly benefited the material life of the Chinese population (Figure 3), the term *yang* (洋) has been a prefix in the Chinese vocabulary since 1840.

Figure 3. China's Imports' Composition and Value (%), 1870–1910



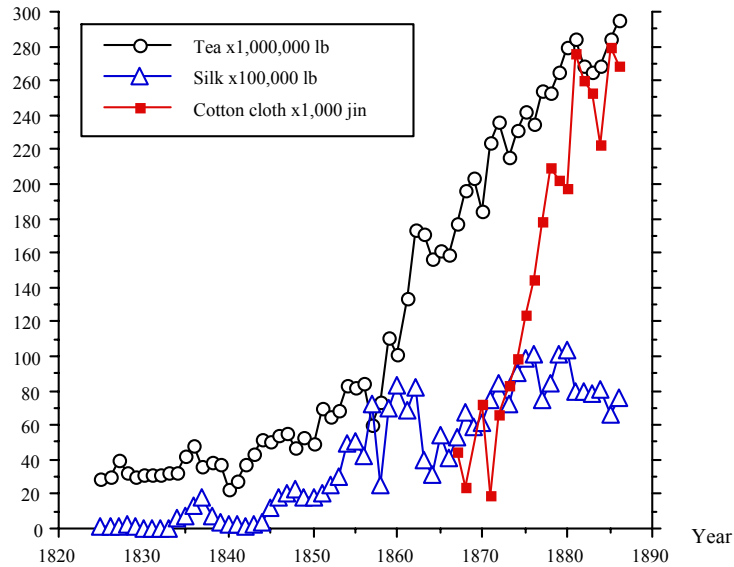
Source: Wu and Tong 2003, 296; *cf.* Yan 1955, 72–3; Yuan and Dong 2001, 234.

Note: The category of 'Other' is for capital goods. Cotton yarn was imported for producing clothes for domestic consumption.

Finally, overall, these changes altered the shares of the customary, command and market components of the economy, as more and more sources, especially from the rural sector, were geared towards exports in a changed production function. Equally importantly, market conditions improved. From the explosive growth in China's cotton cloth and tea exports in comparison with silk, China's law and order improved by and large in favor of the market growth after the crackdown of the Taiping Rebellion (see Figure 4).⁴³

⁴³ Silk export first peaked in 1775–9 and declined. It picked up again in the 1850s (Zhang 2001, 310).

Figure 4. Growth in Silk, Cotton Cloth and Tea Exports, 1825–85



Source: Silk and tea, based on Lin M. 1991, 30–5. Cotton cloth, based on Xu 1989, 105–6; *cf.* Yan 1944, 70.

G. Concluding remarks

Despite ugly British gunboat diplomacy, The Treaty of Nanking positively changed China by liberating the market economy. By 1894, China was on a different growth trajectory. The key elements involved were (1) a new liberal ideology which identified modernization with Westernization, (2) new institutions to protect commercial property rights, (3) new agents, networks and investment behavior to match new market growth, (4) reduced transaction costs, (5) a new production function to fuel the new trade growth, and (6) a new consumption pattern made possible by new market growth.

Appendix

Estimate of China's Total GDP of the 1830s

Commonly, there are two ways to measure a country's GDP (which by definition means the market value of all final goods and services produced within a country in its own currency and in a given period of time): (1) the final goods approach that counts the value of final goods and services, excluding all the intermediate goods and services, (2) the value-added approach that counts nothing but the value of intermediate goods and services (in the form of rent, interest, wages and profits). For our purpose, it is appropriate to adopt the final goods approach as it is almost impossible to work out rent, interest, wages and profits in China for the period in question.

Regarding the final goods approach, there are also two ways to calculate GDP. One is to count the outflow of goods and services, hence the earnings of the providers. The other is to count the costs borne by the recipients. The latter involves (1) consumption expenditure by all ordinary consumers (C), (2) investment expenditure by all investors (I), (3) government expenditure (G), and (4) expenditure on all net imports (X-M) with the following equation: $GDP = C + I + G + (X-M)$.

Given that (X-M) was an insignificant part of China's economy and that the Qing tax rates were low, we can simplify the equation as $GDP = C + I$, suiting well our minimalist approach. Also, considering the lack of data for investment, investment expenditure can be substituted by surpluses (S). Thus, the equation becomes $GDP = C + S$.

It is justifiable to use the total food bill as the proxy of the total consumption expenditure during a chosen period (i) written as $\pi \varepsilon \Sigma_{P(i)}$ (where Σ_P is the total population, π the price level of food, ε being the minimum consumption per adult per year of 180kg husked rice 白米, or 257kg un-husked rice with 30% waste). Agricultural surplus (s) is taken as a percentage of the final output of food (23.7 percent, see Buck 1937b, 10, 128, 129, 131, 135; cf. Riskin 1975, 68). Thus, $(1+s) \pi \varepsilon \Sigma_{P(i)}$ can be used as the proxy of China's agricultural GDP of the same period.

But the agricultural GDP was only a proportion of China's total GDP which can be derived from $1/\alpha (1+s) \pi \varepsilon \Sigma_{P(i)}$ (α being the percentage of China's total GDP, generously, $\alpha = 70$ percent based on Chang 1962, 296 and Feuerwerker 1995, 16). The formula can be re-arranged as $1/(1+s) \alpha \pi \varepsilon \Sigma_{P(i)}$.

It is known the China's population in 1833 was 398.9 million (Deng 2004, Appendix 2). It is reasonable to assume children under working age made up one-third of the total population and that each child consumed two-thirds as an adult. This converts China's population to 355.0 million adults equivalent due to the discount rate of 0.89.

Now, the value of $\varepsilon \Sigma_P$ is 63,900 million kilograms of husked rice. The weight can then be converted to 881.5 million *shi*.⁴⁴ Given that the average price for the husked rice (π) was in the region of 3,000–3,300 bronze coins per *shi* (Yu 2000, 888; cf. Wang 1992, 44), China's total food bill $\pi \varepsilon \Sigma_{P(i)}$ for the 1830s can thus be established as 2,644,500–

⁴⁴ One Qing *shi* equals 72.49 kg (Liang 1980, 545; Chao 1986, 209). Li Bozhong's estimate is slightly higher at 75 kg per *shi* (Li 1998, 210, fn 1).

2,908,950 million coins, or 2,034.2–2,237.7 million *liang* of silver of the 1839 price.⁴⁵ If the silver price (1833) for rice in the Jiangnan region is applied (2.77 *liang* per *shi*), the result is slightly higher at 2441.8 million *liang* (Wang 1992, 44). We spare this higher figure due to the minimalist approach.

Accordingly, China's agricultural GDP $(1+s) \pi \epsilon \Sigma_{P(i)}$ ($s = 0.237$) can be established as 2,516.3–2,768.0 million *liang* of silver. We can now work the whole way for the values of $1/(1+s) \alpha \pi \epsilon \Sigma_{P(i)} = 3,598.3$ – $3,958.2$ million *liang* ($\alpha = 0.7$).

What has to be said here is that this is a crude estimate due to the constraint of data shortage. It however shows a rough size of the Chinese economy before the Opium War.

List of References (to be included)

⁴⁵ Conversion is based on the minimum ratio of one *liang* for 1,300 bronze coins (Yu 2000, 859; cf. Lin 1993).