Economic History Working Papers No: 364

Main Socio-economic Trends in Ming Qing China

Kent Deng, LSE

December 2023

Economic History Department, London School of Economics and Political Science,
Houghton Street, London, WC2A 2AE, London, UK. T: +44 (0) 20 7955 7084.

Main Socio-economic Trends in Ming Qing China

Kent Deng

JEL Codes: N15, N55, Q15

Keywords: Socio-economic trends, institutions, resource endowments, population, market, technology, and living standards

A. Introduction: How the Ming and Qing began, respectively

In the study of the long history of Empire of China which officially began in 221 BC, the Ming (1368-1644) and Qing (1644-1911) periods have commonly been regarded as an integrated block due to similarities between the two, regarding state ideology, institutions, government personnel, economic life and so forth. Thus, this chapter lumps these two dynasties together as one apart from their distinctive inaugurations.

Prior to the Ming Dynasty, China was ruled by the alien Mongols who defeated the Song (960-1279 AD), a dynasty run by the Chinese. The Mongol conquest of China was brutal, partly because the Chinese managed to resist the invaders for four long decades, a record in East Asia, South Asia, the Middle East, and Western Caucasus (hence Russia) of the time. By 1291, the population across the bygone Song territory dropped by about a half.[1] The victorious Mongols made no attempt to assimilate with the Chinese who made up the vast majority in society. Rather, the Mongol rule was a fully-fledged apartheid.[2] To run China, an army of mercenaries of the 'coloured-eye' race (*semu ren*) - Turks, Persians, Arabs and Europeans - were hired as Yuan officials.[3] Mongolian and Persian were the official

[1] Wu Songdi, *Zhongguo Renkoushi, Disan Juan, Liao, Song, Jin, Yuan Shiqi* (*Demographic History of China: Vol. III, The Liao, Song, Jin and Yuan Periods*) (Shanghai: Fudan University Press, 2000), p. 625.
[2] Han Rulin, *Yuanchao Shi* (*A History of the Yuan Dynasty*) (Beijing: People's Press, 1986), vol. 1, p. 9; vol. 2, pp. 54-5.
[3] Han, *History of the Yuan Dynasty*, vol. 1, pp. 6, 430-1; vol. 2, p. 2. Marco Polo was allegedly appointed as a high-ranking official working for the Mongol Imperial Court because of his coloured eyes. It is questionable whether Marco Polo ever spoke Chinese, used chopsticks, drank

languages for the Mongol Court.[4] Of the eleven Yuan emperors, only one, Emperor Chengzong (r. 1294–1307), ever made some effort to learn Chinese calligraphy (unsuccessfully). Politically, Confucianism and Imperial Examinations were both abandoned; and the Confucian literati were regarded as untouchables.[5] Economically, the Chinese population were treated as an outcast, of whom millions were enslaved (*quding*), including all skilled artisans;[6] differential taxes impost on the ethnic Chinese increased twenty times from the Song level;[7] horses belonging to the Chinese were confiscated and vast agrarian areas were enclosed for the new Mongol owners and tilled by their serfs.[8] To prevent Chinese rebellions, metal tools (including kitchen knives) were tightly controlled; and so were martial arts.[9] In addition, international trade thrived, which has often been seen as Mongol openness and tolerance, but Chinese were not allowed to partake in it.[10] All such policies made the Mongol rule hateful. Rebellions by the Chinese were

---

tea, or saw the Great Wall. If he physically went to China, he lived at best and if at all in a non-Chinese circle of Mongols and their cronies; see Frances Wood, *Did Marco Polo Go to China?* (London: Secker & Warburg, 1995). In addition, there is no record on Marco Polo and his services to the Mongols from the known Yuan official documents.

[4] Of all the known travels to the Yuan Empire by outsiders, the languages, both written and spoken, in use in the empire were Mongolian, Persian, Turkish, Arab, and Latin; see Han, *History of the Yuan Dynasty*, vol. 2, pp. 434-50.

[5] Zhao Yi, *Gaiyu Congkao* (*Reading Notes While Looking After Parents*) (1772. Reprint. Beijing: Zhonghua Books, 1963), ch. 'Confucians and Beggars'.

[6] Large numbers of slaves were reported to be used as gifts in Mongol diplomacy; see Han, *History of the Yuan Dynasty*, vol. 2, pp. 424, 430.

[7] Ibid., vol. 1, pp. 391, 429; vol. 2, p. 48; Guo Zhengzhong, *Zhongguo Yanye Shi* (*A History of the Salt Sector in China*) (Beijing: People's Press, 1997), vol. 1, pp. 302, 493.

[8] According to the Yuan official record, the forcefully created state farmland through appropriation by the Mongol state from Chinese legal owners amounted for 17.5 million *mu*; about 500,000 households became serfs; see Han, *History of the Yuan Dynasty*, vol. 1, pp. 362, 374-5. See also Wang Qi, *Xu Wenxian Tongkao* (*Imperially Commissioned Continuation of the Comprehensive Study of Literature*) (Publisher unknown, 1586 AD), vol. 1; D. H. Perkins, *Agricultural Development in China, 1368–1968* (Edinburgh: Edinburgh University Press, 1969), pp. 23-4, 197-9; The Chinese Academy of Agricultural Sciences, *Zhongguo Nongxue Shi* (*History of Chinese Agronomy*) (Beijing: Sciences Press, 1984), vol. 2, pp. 51-3; Zheng Xuemeng, Jiang Zhaocheng and Zhang Wenqi, *Jianming Zhongguo Jingji Tongshi* (*A Brief Panorama of Chinese Economic History*) (Harbin: Heilongjiang People's Press, 1984), pp. 242-4, 254-5; Han, *History of the Yuan Dynasty*, vol. 1, pp. 361-2, 375; vol. 2, p. 47. In other accounts, 2.8 million Chinese households (about 14 million individuals) were treated as 'gifts' to Mongol families and 18.2 million *mu* farmland were bequeathed to Yuan officials and Buddhist temples; see Liang Fangzhong, *Zhongguo Lidai Huko Tiandi Tianfu Tongji* (*Dynastic Data for China's Households, Cultivated Land and Land Taxation*), Shanghai: Shanghai People's Press, 1980), pp. 316, 318, 320.

[9] Han, *History of the Yuan Dynasty*, vol. 1, p. 392; vol. 2, pp. 44, 45.

[10] Ibid., vol. 2, p. 43.

common. Finally, the tide was turned in 1638 against the conquests.[11] What followed was a new (and the last) 'Chinese dynasty', the Ming (1368-1644). Given that the Mongol rule represented a major setback for the Chinese civilisation and economy, it becomes understandable why and how the Mings prioritised an economic Renaissance once the Mongols were driven out.

B. Socio-economic trends

Seven socio-economic trends can be identified regarding institutions, resource endowment, population and taxes, proto-welfare, markets, technology, and living standards. There are two caveats: (1) the approach is to take the empire of China as a whole, and (2) for the sake of accuracy, historical data are preferred over modern estimates.

B.1. Trends in institutions

The Ming Dynasty was also ended violently. During severe droughts in Northern China during the 1620s-30s,[12] a rebellion broke out.[13] In 1644, the rebels captured the Imperial Palace in Beijing. However, the rebels did not take into account the diplomatic skills of the Ming elite. A Ming Army general Wu Sangui (1612-1678) persuaded nomads to intervene. So, 60,000 Manchu cavalrymen were practically hired as the Ming mercenaries in a bid to expel the rebels. The fate of the rebels was doomed. But after the Manchus took over Beijing, they stayed and established their own dynasty, the Qing (1644-1911). This caused resentment and animosity on the Chinese part. All that the Manchus could do was to redeem their 'sin' of breaching the 1644 contract with the Ming elite. The measures for the Manchu

[11] The Mongol cavalry was highly decentralised with a few hundreds to a couple of thousand horsemen in any geographic location. The grand total of Mongol soldiers began with 18,000 prior to 1260 AD and grew to 70,000 strong in 1295; see Song Lian, *Yuan Shi* (*History of the Yuan Dynasty*) in *Ershiwu Shi* (*The Twenty-five Official Histories*) (Shanghai: Shanghai Books, 1986), vol. 9, pp. 7525, 7530. This was disadvantageous in the defence warfare. So, the Mongol military were fatally defeated in 1368 and then wiped out on China's soil by 1370.
[12] Zhang Tingyu, *Ming Shi* (*History of the Ming Dynasty*), in *Er-shi-wu Shi* (*Twenty-Five Official Histories*) (Shanghai: Shanghai Classics Press, 1986), vo. 10, p. 7837.
[13] Ibid., vo. 10, pp. 8643-44.

coûte que coûte redemption included (1) Sinicisation and Confucianisation,[14] (2) power-sharing with the indigenous Han Chinese, and (3) full adoption of the Confucian benevolent rule. This explains why and how the Qing followed the Ming religiously.

For the victorious Ming ruler Zhu Yuanzhang (1328-98) who defeated the Mongols, his legitimacy hinged on the 'Chineseness' of his institutions and policies which led to the Ming Renaissance culturally, ideologically, and institutionally. To understand how far this renaissance went, it is necessary to briefly review three overarching and long-lasting traditions in China: (1) a state-peasant alliance (which began *circa* 356 BC), (2) Confucianism (which began unofficially in *circa* 530 BC and officially endorsed in 141 BC),[15] and (3) a bureaucratic monarchy (which began in 221 BC). All three were wrecked by the Mongols during 1279-1368. Thus, it was urgent task for the Ming state to rebuild the farming economy whereby taxes were imposed.[16] In doing so, China-wide cadastral registrations and population censuses were resumed, but now given a new names as 'Imperial Fish-scale Registration of Farmland and Imperial Census' (*yulin huangce*).[17] Confucianism and Imperial Examinations for bureaucratic recruitment (*keju*) were both reinstated, too.[18] With all these measures in place, China's economy soon recovered. As a result, the Ming state financed an armada under Admiral Zheng He (Cheng Ho, 1371–1433 AD) to tour the Indian Ocean seven times to show off China's re-gained sovereignty, wealth, and confidence, although maritime

[14] E. S. Rawski, 'Reenvisioning the Qing', *The Journal of Asian Studies* 55/4 (1996): 829–50; Ping-ti Ho, 'In Defense of Sinicization', *The Journal of Asian Studies* 57/1 (1998): 123–55; P. K. Crossley, *A Translucent Mirror: History and Identity in Qing Imperial Ideology* (Berkeley: University of California Press, 1999); M. C. Elliott, *The Manchu Way: the Eight Banners and Ethnic Identity in Late Imperial China* (Stanford: Stanford University Press, 2001).

[15] Two important figures responsible for the establishment of Confucian ideology were Confucius (551-479 BC) and Mencius (372-289 BC). But, it was not until 134 BC when Dong Zhongshu (192-104 BC) persuaded Emperor Wudi (r. 141-87 BC) of the Han Dynasty was Confucianism adopted as the state philosophy. The time lag from an ideology to a state philosophy was over three centuries.

[16] Zhang, *Ming Dynasty*, vol. 10, pp. 7911, 7913.

[17] Official records show that multiple cadastral surveys were carries out between 1370 and 1550; see Zhang, *Ming Dynasty*, vol. 10, p. 7983. Population censuses ran a cycle of ten years to capture population growth; see ibid., p. 7983.

[18] Zhang, *Ming Dynasty*, vol. 10, pp. 7911, 7913.

trade which was directly associated with the Mongol rule was not on Admiral Zheng's agenda.

Now, turning to the Qing, a lesson from the Mongol conquest was learnt by the Manchus who now actively and willingly assimilated themselves with the Chinese.[19] Thus, all the Chinese social norms and customs were carefully observed.[20] The last Ming Emperor was given a state funeral organised by the new Qing authorities.[21] Ming Imperial tombs were carefully protected.[22] The Chinese language was granted the status of the first official language, and all Manchu Imperial family members were strictly educated from a young age by top Chinese scholars to indoctrinate their 'Chineseness'. Most important of all, key Ming institutions stayed intact.[23] The double-barrel 'Imperial Fish-scale Registration of Farmland and Imperial Census' (*yulin huangce*) were religiously copied.[24] And so was the Imperial Examinations and their rubric.[25] Top places (*zhuangyuan*) were awarded overwhelmingly to the ethnic Han (Table 1); and with it, power-sharing was achieved (Table 2).

Table 1. Distribution of Examination Champions during the Qing

	Manchu, % in total	Han, % in total
Civil examinations	2.7	97.3
Military examinations	2.8	97.2

Source: Song Yuanqiang. *Qingchaode Zhuangyuan* (*Champions of the Qing Imperial Examinations*) (Changchun: Jilin Culture and History Press, 1992), pp. 52-104, 451-5.

[19] It is worth noting that in 1234 AD the Mongols conquered the Jin Kingdom of North China (1115-1234 AD), slaughtered and enslaved the Jurchens. The Jurchens were, no less, the ancestors of the Manchus. Among the Han, Jurchens/Manchu and Mongols, the Mongols were *the least* civilised and were thus *persona non grata.*

[20] Dong Lun, *Ming Taizu Shilu* (*Veritable Records of Emperor Taizu of the Ming Dynasty*) (1399 AD, reprinted 1961, Taipei: Academia Sinica), vols 30, 53, 264.

[21] See Zhao Erxun, *Qingshi Gao* (*Draft of the History of the Qing Dynasty*), in *Er-shi-wu Shi* (*Twenty-Five Official Histories*) (Shanghai: Shanghai Classics Press, 1986), vol. 12, p. 9826.

[22] Wei Zaitian, Xu Xuechu and Li Yawei (eds), *Kangxi Zhiguo Shengxun* (*Emperor Kangxi's Instructions on State Management*) (Beijing: Expatriates' Press, 1995), p. 251.

[23] J. K. Fairbank, *The United States and China* (Cambridge [MA]: Harvard University Press, 1965), p. 77.

[24] Zhao, *Qing Dynasty*), vol. 11, pp. 9259-60.

[25] Song Yuanqiang. *Qingchaode Zhuangyuan* (*Champions of the Qing Imperial Examinations*) (Changchun: Jilin Culture and History Press, 1992), pp. 52, 451-5.

Table 2. The Ethnic Distribution of Qing Officials/Officers (% in Total)

	Manchu	Chinese	Others	Total
I. 1st–3rd Grades				
Civil officials*	52.5	45.9	1.6	100
Military officers†	38.5	38.5	23.0	100
II. 4th–6th Grades				
Civil officials*	63.1	32.7	4.2	100
Military officers†	57.7	24.4	17.9	100
III. 7th–9th Grades				
Civil officials*	77.6	16.4	6.0	100
Military officers†	40.9	31.8	27.3	100
Total (I+II+III)	59.4	25.5	15.1	100

Sources: Based on Zhang Deze, *Qingdai Guojia Jiguan Kaolue* (*The State Apparatus of the Qing Period*) (Beijing: Xueyuan Press, 2001), pp. 6, 38–43, 57, 79, 105–6, 126; Song, *Champions*, pp. 477–80, 483–7.
Notes: * Positions in the central administration only. † Officers of the elite Eight Banners.

B.2. Trends in resource endowments: farmland expansion, and land ownership diversification

Although the Qing state may be seen as minimalist and lethargic,[26] it was by no means passive towards rural growth. Firstly, the Qing state made more arable land available than the Ming.[27] The expansion yielded some of the best farming zones in Manchuria and South Mongolia. Efforts were also made to open up the north-western corner (Gansu and Xinjiang) and the south-western corner (Guizhou and Yunnan) for farming.[28] Qing reclamation left only Tibet and its neighbouring Qinghai untouched. In the interior, huge areas of the Sichuan Basin and Yangtze–Han Plain were purposely redeveloped to become new rice exporting

[26] J. K. Fairbank and Merle Goldman, *China: A New History* (Cambridge [Mass]: Harvard University Press, 1998), p. 203; , E. L. Jones, *Growth Recurring: Economic Change in World History* (Oxford: Clarendon Press, 1988), ch. 8.
[27] The Qing territorial expansion was associated with Kangxi (r. 1662-1722) and Qianlong (r. 1736-1795).
[28] By the 1820s, the new farmland in the Balikun and Yili regions of Xinjiang (also known as 'Chinese Turkistan') alone totalled 908,500 *mu* or 121,735 hectares; see Chen Hua, *Qingdai Quyu Shehui Jingji Yanjiu* (*Regional Socio-Economic Conditions during the Qing Period*) (Beijing: People's University Press, 1996), p. 265; see also J. K. Leonard, and J. R. Watt, *To Achieve Security and Wealth* (Ithaca: Cornell University Press, 1992), pp. 21-46.

regions. There is no evidence that such re-development led to ecological depletion on a large scale before 1800.[29]

In Table 3, a 30-percent increase in privately farmed land was likely to be the minimum, because not all new lands were taxed due to tax holidays or avoidance of tax registration. Moreover, it is harder to measure the fiscal gain from the redeveloped interior (equivalent to 16 percent of Ming's total). However, it is known that the yield ratio between China's key crops rice and wheat was 2.8:1.[30] To use this ratio as the weight, (1) the gain from farming virgin land in China's new frontier was likely to be an 11-percent increase in China's food supply; and (2) the gain from switching from wheat to rice in the redeveloped interior was likely to be another 29-percent increase in China's food supply.[31] China's compounded food output was likely to increase by about 40 percent, counting one crop per annum.

Table 3. Supplies of New Farmland (km^2), 1644 vs.1887

1. Land mass	Territory	Private farmland*
Qin	11,604,000	607,984
Ming (I)	5,964,000	467,598
Gain by the Qing (II)	5,640,000	140,386
II/I (%)	94.6	30.0
2. Interior land redevelopment		
Sichuan Basin	560,000	–
Yangtze–Han Plain	400,000	–
Total (III)	960,000	–
III/I (%)	16.1	–
3. Total gain (IV=II+III)	6,600,000	
IV/I (%)	110.7	

Sources: Based on Liang Fangzhong, *Zhongguo Lidai Huko Tiandi Tianfu Tongji* (*Dynastic Data for China's Households, Cultivated Land and Land Taxation*) (Shanghai: Shanghai People's Press, 1980), pp. 346, 380; *cf.* W. J. Peterson (ed.), *The Cambridge History of China* (Cambridge: Cambridge University Press, 2002), vol. 9, pt. 1, p. 571.
Notes: Ming territory as of 1644; Qing territory as of 1812. Conversion of *mu* to square kilometre with the ratio of 1,500:1. * Privately farmed land was about 90–95 percent of the Ming-Qing total farmland.

[29] Kenneth Pomeranz, *The Great Divergence, Europe, China and the Making of the Modern World Economy* (Princeton: Princeton University Press, 2000), pp. 20, 241.
[30] As in 1900; see J. K. Fairbank and Kwang-ching Liu (eds), *The Cambridge History of China, Late Ch'ing, 1800–1911* (Cambridge: Cambridge University Press, 1980), vol. 11, pt. 2, p. 11.
[31] It is known that the redevelopment was to convert the two regions to irrigation and better seed. Therefore, before the redevelopment, dry farming must have been common.

With such an elastic supply of land, a new round of internal migration began.[32] The Qing policy was to 'fill the regions of land abundance with people from regions of land scarcity' (*yi zhai bu kuan*). Government measures included 'farming by invitation' (*quannong*), free passage and tax holidays. Large numbers of people indeed left old core regions (such as Hebei, Henan, Shandong, Shanxi, and Shaanxi) to resettle elsewhere.[33] By 1668, Manchuria alone had absorbed a staggering 14 million immigrants from the interior.[34] In the nineteenth century, immigrants to Manchuria amounted to 600,000 a year. It became two million people a year to Manchuria in 1907.[35] On the Mongolian front, in 1712, immigrants from Shandong counted for over 100,000.[36] Migrants moved to China's southern frontiers, too.[37] During 1743–8, a quarter of a million migrants settled in Sichuan. Consequently, the population share of advanced farming regions in dropped from 72 percent (as of 1787) to 55 percent (as of 1933), thanks to the rise of new farming regions.[38] Qing migration left permanent marks on Manchuria, Mongolia and Sichuan where lineages originated in Shandong, Hebei, Hubei and Hunan are common.[39]

New lands and migrations reset resource allocation on a large scale. Labourers leaving from the farming core improved the marginal product of labour in donor

---

[32] For a spatial survey, see Yeh-chien Wang, *Late Taxation in Imperial China, 1750–1911* (Cambridge [MA]: Harvard University Press, 1973), p. 85.
[33] For the eighteenth century, see Pierre-Etienne Will, *Bureaucracy and Famine in Eighteenth-Century China* (Stanford: Stanford University Press, 1990), pt. 2. See also Peterson, *History of China*, vol. 9, p. 567.
[34] Anon., *Qing Gaozong Shilu* (*Veritable Records of Emperor Gaozong of the Qing Dynasty*) (1799, reprint 1964, Taipei: Hualian Press), vol. 311, Entry 'Shisannian Sanyue' (The Third Month of the Thirteenth Year under the Gaozong Reign); Zhang Limin, 'Chuang Guandong Yiminchao Jianxi' (Advancing to Manchuria), *Zhongguo Shehui Jingjishi Yanjiu* (*Study of Chinese Socio-Economic History*) 2 (1998): 57-64.
[35] Tian Fang and Chen Yijun, *Zhongguo Yimin Shilue* (*Brief History of Migration in China*) (Beijing: Knowledge Press, 1986), pp. 110-2.
[36] The Qing state imposed a ban on permanent immigration to Manchuria (1668-1860) and Mongolia (1740-1897). But there was little control over seasonal migrants to both regions. Moreover, by the time the restriction was introduced, a large number of immigrants had already settled in; see Zhao, *History of the Qing Dynasty*, vol. 11, p. 9253.
[37] James Lee, 'Population Growth in Southwest China, 1250-1850', *Journal of Asian Studies* 41/4 (1982): 711-46.
[38] Wang, *Late Taxation*, p. 90.
[39] Yuan Yida and Zhang Cheng, *Zhongguo Xingshi: Qunti Yichuan He Renko Fenbu* (*Chinese Surnames: Group Genetics and Demographic Distribution*) (Shanghai: East China Normal University Press, 2002), pp. 6-57.

regions. The labour recipient regions turned idle land into productive farms. Meanwhile, multi-cropping became the norm.[40] The best practice was promoted by Imperial projects.[41]

Overall, China gained twice regarding factors of production: labour and land. Therefore, from 1750 on, Manchuria annually supplied the Yangtze Delta with 10 million *shi* (725,000 metric tons) of wheat, rice and bean-cakes (as fertilizers) a year which was unavailable before the migration.[42] In return, the Yangtze Delta supplied Manchuria with cotton goods, a market which did not exist before the migration.[43] By 1760, the Yangtze–Han Plain had doubled its food output capacity from the Ming level to 2.2 million tons of grain a year,[44] not to mention extra outputs of silk and cotton.[45] China-wide, there was a 20 to 50 percent rise in China's yield level from 1770 to 1850, excluding the New World crops (maize and sweet potatoes).[46]

The compounded effect of the new land, internal migration and improved farming technology on the Qing food supply can be calculated with the following simple formula:

---

[40] John L. Buck, *Land Utilization in China: Atlas* (London: Oxford University Press, 1937), pp. 48-9, 52, 86.
[41] Gang Deng, *Development versus Stagnation: Technological Continuity and Agricultural Progress in Premodern China* (New York and London: Greenwood Press, 1993), pp. 9, 25-6.
[42] See Mark Elvin, *The Pattern of the Chinese Past* (Stanford: Stanford University Press, 1973), p. 214; Pomeranz, *Great Divergence*, p. 226; *cf*. Perkins, *Agricultural Development*, p. 210, fn 1.
[43] See Zhang Haiying, *Mingqing Jiangnan Shangpin Liutong Yu Shichang Tixi* (*Commodity Flows and Market Structure in the Jiangnan Region during the Ming-Qing Period*) (Shanghai: East China Normal University Press, 2001), pp. 198-206. See also Peterson, *History of China*, vol. 9, pt. 1, p. 613.
[44] Zhang Jiayan, 'Mingqing Jianghan Pingyuande Nongye Kaifa Dui Shangren Huodong He Shizhen Fazhande Yingxiang' (Impact of Agricultural Development in the Yangtze-Han Plain on Commercial Activities and Urbanization during the Ming-Qing Period), *Zhongguo Nongshi* (*Agricultural History of China*) 4 (1995): 42.
[45] Chen Hua, *Qingdai Quyu Shehui Jingji Yanjiu* (*Regional Socio-Economic Conditions during the Qing Period*) (Beijing: People's University Press, 1996), ch. 4.
[46] China's land yield level increased during this period from around 200 *jin* per *mu* to 243 to 367 *jin* per *mu*. For 200 *jin* per *mu*; see Perkins, *Agricultural Development*, pp. 14-17. Perkins' figure for 1850 is 243 *jin* per *mu*. Wu Hui and Shi Zhihong's figures are 310 *jin* and 367 *jin* per *mu*, respectively; see Wu Hui, *Zhongguo Lidai Liangshi Muchang Yanjiu* (*A Study of the Long-term Grain Output per Mu in China*) (Beijing: Agriculture Press, 1985), p. 188; Shi Zhihong, *Qingdai Qianqide Xiaonong Jingji* (*Petty Farming in the Early Qing Period*) (Beijing: China's Social Sciences Press, 1994), p. 197.

$$Q = (1 + \alpha)\ (1 + \beta)$$

Where Q = total food output, α = 'percentage gain in land expansion', and β = 'percentage gain in crop yield level'. To avoid double counting, the value of α only includes the growth in the frontiers (thus 30 percent). The value of β refers only to crop yield level (40 to 70 percent). The result is a factor between 1.8 and 2.2.

Meanwhile, landholding evolved. Previously, China ran two main types of land ownership: (1) freehold with a sole owner, and (2) leasehold with rights of tilling the land. During the Ming-Qing Period, a third type emerged, known as the 'dual landownerships' (*yitian liangzhu*, literally 'one piece of land with two owners') with a divide between topsoil rights (*tianmian quan*) and base soil rights (*tiandi quan*) on the same land.[47] In most cases, a freeholder sold his base-soil rights to a buyer for a fee whereby the right ownership became split.[48] Given that base-soil owners were often gentry members who enjoyed tax exemption, base-soil owners took advantage on government policy.

Under the 'dual landownerships', the rent burden on the topsoil owners was 30-50 percent of his main crop per year, his second crop was rent-free. The real annual share-cropping burden can be calculated as follows:

$$R = \frac{\frac{Y1}{n}}{Y1 + Y2}$$

Where R stands for the rent burden for the year, n is the rent rate; Y_1 is the output of the main crop, Y_2 is the output of the second crop.

[47] R. M. Marsh, *The Mandarins: Circulation of Elite in China, 1600-1900* (New York: Free Press of Glencoe, 1961), p. 62.
[48] The topsoil land was thus called 'no tax land' (*wushuitian*); see Li Sanmou, 'Lun Mingqing Nanfang Zhudianzhide Teshuxing' (On the Characteristics of the Ming-Qing Tenancy System in South China), *Zhonggou Nongye Shi* (*Agricultural History of China*), 2 (1995): 46.

If Y_2 yields 80 percent of Y_1; and n is set at 50 percent (the ceiling rate),[49] the real annual rent burden R is 0.5 / 1.8 = 0.27 (or 27 percent of the annual output). If n drops to 30 percent, R becomes 0.17 (or 17 percent of the annual output). But during the Qing, fixed rent became the normal, often at the level of 1-2 *shi* per *mu* depending on soil fertility.[50] With increased yield levels, such a rent burden seems tolerable.

B.3. Trends in population growth and tax categories and burden

The Ming-Qing Era moved from population stagnation to population take-off, although official numbers are patchy and heterogenous (Table 4).

Table 4. Ming-Qing Census Data

Year	Households (*hu*)	Male adults (*ding*)	Persons (*kou*)
1381	10,654,362		59,873,305
1578	10,621,436		60,692,856
1661		21,068,609	
1753		102,750,000	
1766		209,839,546	
1812			361,683,179
1820	48,962,335		
1887			377,636,000
1911	92,699,185		341,428,867
Change %	866	994	570

Source: Liang, *Dynastic Data*, pp. 8-10, 340-1, 391-3, 395, 396, 400-1.
Note: It has been a common endeavour to reconcile variations in households, male adults and persons in historical records as if they should be freely interchangeable. The current purpose is to show how different they were in the original forms.

However, the Ming-Qing taxation did not synchronise with China's demography. Rather, there was a clear trend to lower tax burden. Regarding direct taxes, the decisive change occurred in 1712, documented as 'Emperor Kangxi [r. 1661-1722] issued an edict during the 51st Year of his rein (1712) that China has enjoyed peace and prosperity for a long time now. Our population has increased but farmland

[49] Li, 'Tenancy System', pp. 46-7.
[50] Fei Hsiao-t'ung, *Peasant Life in China; A Field Study of Country Life in the Yangtze Valley* (London: Paul, Trench, Trubner, 1939); E. S. Rawski, *Agricultural Change and the Peasant Economy of South China* (Cambridge [Mass.]: Harvard University Press, 1972), p. 190; Yang Guozhen (1988) *Mingqing Tudi Qiyue Wenshu Yanjiu* (*A Study of Documents of Land Deeds of the Ming-Qing Period*) (Beijing: People's Press, 1988), ch. 2; and Li, 'Ming-Qing Tenancy'.

has remained hardly unchanged. We ought to take the current tax revenue as the constant (*chang e*), any increased population in the future will not pay taxes. … So, no increase in tax burden is permitted for good (*yongbu jiafu*).'[51] In absolute terms, the 'Kangxi tax revenue constant' was about 30 million taels of silver (1,125 metric tons). On top of the new Land-Poll tax, there was the 'silver-loss surcharge' (*haoxian*) of 12.1–12.4 percent for silver's wearing and tearing.[52] This made the land-related direct tax a total of 33.7 million taels of silver (1,263.8 tons).

Soon, under the 1723 scheme of 'combing the poll with the land tax' (*tanding rudi*, *tanding rumu*) the timeless poll tax stopped as an independent category. Consequently, population size became irrelevant to tax revenue, leading to an inverse relationship between population size and tax burden:

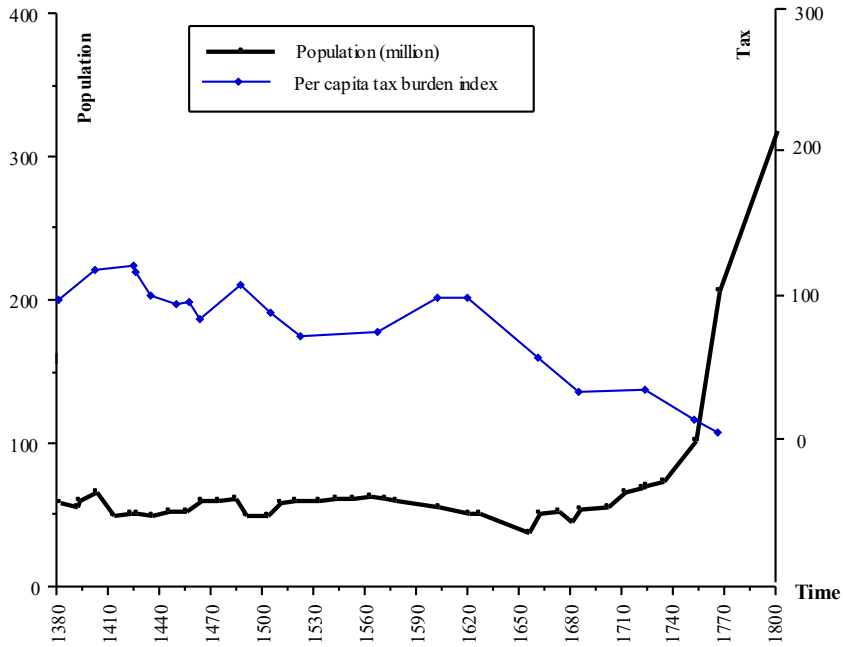
$$T_r = \frac{\bar{A}}{P}$$

Where T_r is per capita tax burden; $\bar{A}$ is the permanently frozen tax revenue; P is the population size.

In per capita terms, the Qing direct tax was exactly halved (Figure 1).

[51] Zhao, *Qing Dynasty*, vol. 11, p. 9261.
[52] See Liang, *Dynastic Data*, p. 419; Wang, *Late Taxation*, p. 70.

Figure 1. Trend of Ming-Qing Direct-Tax per Capita, 1380–1800



Sources: Population based on K. G. Deng, 'Unveiling China's True Population Statistics for the Pre-Modern Era with Official Census Data', *Population Review* 43/2 (2004): Appendix 2. Total direct taxes, based on Liang, *Dynastic Data*, p. 428.

In absolute terms, the amount of 33.7 million silver *taels* was about 0.08 *taels* (3 grams) per head per year (as of the 1880s). According to Sidney Gamble, the average daily wage for unskilled labourers in Beijing during the 1850s was 0.05-0.08 silver *taels* in the sluggish season and 0.09-0.15 silver *taels* in the busy season.[53] Thus, the annual Land-Poll burden per head was about 1-2 days' wage earned by an unskilled urban worker. Thus, people 'barely noticed the tax system, almost as if they suffered no tax burden at all.'[54]

In addition, to pay bureaucrats and soldiers stationed in North China, four million *shi* (about 290,000 metric tons) of 'Stipend Rice Tax' (*caomi*, *caoliang*) was

[53] For the wage data see S. D. Gamble, 'Daily Wages of Unskilled Chinese Laborers, 1807–1902', *The Far Eastern Quarterly*, 3/1 (1943), p. 62. For the money exchange rate, see Yu Yaohua, *Zhongguo Jiage Shi* (*A History of Prices in China*) (Beijing: China's Prices Press, 2000), p. 860.
[54] Susan Mann, *Local Merchants and the Chinese Bureaucracy, 1750-1950* (Stanford: Stanford University Press, 1987), p. 16.

annually collected from eight provinces (Shandong, Henan, Anhui, Hubei, Hunan, Jiangsu, Zhejiang and Jiangxi) along the Grand Cannel.[55] This amount accounted for 1.3 kg of rice per head in the provinces in question,[56] or 5 grams of grain (about 0.00001 silver *tael*) per capita a year for the whole empire. This burden is too light to be counted. Hence, the tax burden of 1-2 days' wage stays.

Unlike the direct taxes, indirect taxes were far more fluid. That include the 'Salt Levies' (*yanke*) ever since the Western Han (206 BC - 25 AD) and the new 'Transit Surcharge' (*likin*, *lijin*) after 1850. These taxes were voluntary on the consumer and hence less tyrannical. Until 1850, Salt Tax was the main form of the Ming-Qing indirect tax.[57] The available data indicate that in the 1840s a total of 10 million *taels* (375 tons) were collected annually from salt levies.[58] As China had a population of about 400 million at the time (1833),[59] the Qing Salt Tax were merely 0.025 *taels* per head per year. Again, if one uses the aforementioned wage benchmark, the annual burden was 0.2-0.5 days' pay. Meanwhile, most marketed goods traded in local markets were tax-free until 1850.[60] Salt Tax was a rare exception.

Then, there was the much publicised 'One-Percent Transit Surcharge' (*likin*, *lijin*) which began in the 1850s when China suffered from empire-wide and powerful social unrest.[61] The Qing state faced the real possibility of being toppled. The transit surcharge began in the region under the attacks from the Taiping rebels

---

[55] He Changling and Wei Yuan (eds), *Huangchao Jingshi Wenbian* (*Collection of Documents of the Qing Administration*) (Reprint, Beijing: Zhonghua Books, 1992), p. 1087; also see Liang, *Dynastic Data*, pp. 366-73; Kang Chao, *Man and Land in Chinese History: An Economic Analysis* (Stanford: Stanford University Press, 1986), p. 209. Another figure is 5 million *shi* per year; see Zhou Buodi, *Zhongguo Caizhengshi* (*A Financial History of China*) (Shanghai: Shanghai People's Press, 1981), pp. 419-21, 426; Wang, *Late Taxation*, p. 70. One *shi* = 72.49 kilograms, according to Liang, *Dynastic Data*, p. 545.

[56] For the population of the eight provinces, see Liang, *Dynastic Data*, pp. 262-5.

[57] Zhao, *Qing Dynasty*, vol. 11, pp. 9269-83.

[58] Zhou, *State Finance*, pp. 419-26.

[59] Deng, 'Population Statistics', Appendix 2.

[60] G. W. Skinner, 'Marketing and Social Structure in Rural China', *The Journal of Asian* Studies, 24/1 (1964), pp. 3–44; 24/2 (1965), pp. 195–228; 24/3 (1965), pp. 363–400; and his *The City in Late Imperial China* (Stanford: Stanford University Press, 1977), p. 24. For trade routes, see Fairbank and Liu, *History of China*, vol. 11, pt 2, p. 42.

[61] Gang Deng, *The Premodern Chinese Economy – Structural Equilibrium and Capitalist Sterility* (London, Routledge Press, 1999), ch. 4.

in the Yangzhou region (Jiangsu) as a temporary measure.[62] The new indirect tax of one percent of goods' value was simple, easy, and light, bearing the hall mark of the Confucian tradition. Soon, all provincial governors were permitted to impose Transit Surcharge to pay for the war.[63] Consequently, 'Transit Surcharge Check Points' (*lika*) mushroomed across the empire, described as 'within 30 miles there are no less than 15 *lijin* checkpoints.'[64] By 1864, there had been 123 such check points across Anhui, Jiangsu, Hubei, Hunan and Jiangxi, or 25 checkpoints in each province on average.[65] Revenue-wise, it has been estimated that between 1853 and 1864, the total Transit Surcharge revenue was in the region of 100 million silver *taels*,[66] averaging 9 million a year. Even so, it was merely 0.02 *taels* per head per year. Once again, with the aforementioned Beijing wage benchmark, the annual burden of Transit Surcharge counted for 0.2-0.5 days' pay.

Now, all the taxes can be paid with half-week's wage for an unskilled worker (Table 5).[67] Such a light tax burden justifies the assessment that the Qing state controlled 1-5 percent of China's total GDP.[68]

Table 5. Tax Burden per Capita per Year, *circa* 1860

Type	≈ Days' pay, high seasons	≈ Days' pay, low seasons
Land-Poll	1.0	2.0
Salt Levies	0.2	0.5
Transit Surcharge	0.2	0.5
Total	1.4	3.0

Source: S. D. Gamble, 'Daily Wages of Unskilled Chinese Laborers, 1807-1902', *The Far Eastern Quarterly* 3/1 (1943): 62.

[62] Zhao, *Qing Dynasty*, vol. 12, p. 10178; see also E. G. Beal, *The Origin of Likin, 1853–1864* (Cambridge [Mass.]: Harvard University Press, 1958).
[63] Luo Yudong, *Zhongguo Lijin Shi* (*A History of the Transit Surcharge in China*) (Shanghai: Commercial Press, 1936), vol. 1, pp. 20, 308.
[64] A. F. Lindley, *Ti-Ping Tien-Kwoh: the History of the Ti-ping Revolution* (London: Day and Son, 1866), vol. 1, pp. 43-4; vol. 2, p. 296.
[65] Zhao, *Qing Dynasty*, vol. 11, p. 9281.
[66] Luo, *Transit Surcharge*, vol. 1, p. 38.
[67] One way to measure this tax burden out of 52 weeks a year: One percent.
[68] Albert Feuerwerker, 'The State and the Economy in Late Imperial China', *Theory and Society*, 13/3 (1984): 322.

Related to tax burden, there was a trend to simplify taxes throughout the Ming-Qing Era. When the Ming rule began in 1368, direct taxes were complex with seven categories: (1) two types of land tax (one in summer with wheat and one in autumn with rice), (2) two types of poll tax (one on males above 16 years old, and one on males under 16) and (3) three types of corvée services (provided by unskilled adult males, semi-skilled workers and skilled artisans). Land tax and poll tax were paid either in grain, or textiles, or money, or a combination of the three. Corvée services ranged from annual, bi-annual, tri-annual, quad-annual and penta-annual, depending on skills of the service-providers. Normally, annual service was imposed on unskilled labourers; bi-annual on semi-skilled workers (such as masons); and tri-annual, quad-annual and penta-annual on highly skilled artisans (such as tailors, carpenters, and tool makers).[69] Calculation, collection, transport, storage and distribution of non-monetary tax payments – typically grain and textiles - were a mammoth task. Tax-trimming began.

Table 6 contains the main steps over 300 years. The main trend was to replace low-value but high-cost tax payment such as grain with textiles, and ultimately with money. In the case of high-monitory-cost corvée, it was replaced with low-monitory-cost grain. The process began with multi-denominators (textiles, bronze coins or silver ingots) and eventually moved to a common denominator.

[69] Zhang, *Ming Dynasty*, vol. 10, pp. 7982, 7984.

Table 6. Conversions of Direct Taxes, 1376-1723

Year	Reform known as	From	To	No. of types
1368	-	-	-	7
1376	Conversion of grain (*zhese*)	grain	textiles, bronze coins or silver ingots	6
1436	Tribute payment (*jinhuayin*)*	grain	silver ingots	5
1539	Conversion of corvée (*gangyin*)	labour	grain	4
1581	One whip (*yitiaobian*)†	grain, textiles and labour	silver ingots	2
1723	Poll combining with land (*tanding rudi*)§	grain and labour	silver ingots	1

Sources: Zhang Tingyu, *Ming Shi* (*History of the Ming Dynasty*), in *Er-shi-wu Shi* (*Twenty-Five Official Histories*) (Shanghai: Shanghai Classics Press, 1986), vol. 10, pp. 7982-834; Zhao Erxun, *Qingshi Gao* (*Draft of the History of the Qing Dynasty*), in *Er-shi-wu Shi* (*Twenty-Five Official Histories*) (Shanghai: Shanghai Classics Press, 1986), vol. 11, p. 9261.
Notes: * Regions permitted were those where grain transport costs were high including Zhejiang, Jiangxi, Hunan, Fujian, Guangdong, and Guangxi. † This reform suffered from a difficult birth with begin in 1522.[70] § The timeless Poll Tax and its matching corvée services were ended.

The conversion rates were set by law. For example, in 1395, Ministry of Revenue (*hubu*) publicised rates measured by rice as the common denominator (Table 7). Evidently, the one whip approach was not completed, as taxes were still paid in kind until the end of the Qing (Table 8).

Table 7. Conversions of Direct Taxes, 1376-1723

Conversion of	Type	To	Food (*shi*)
Gold ingot	1 *liang*	rice*	10.0
Silver ingot	1 *liang*	rice	2.0
Paper money	1 *ding*†	rice	1.0
Cotton cloth	1 bolt§	rice	1.0
Linen	1 bolt	rice	0.7
Plain silk cloth	1 bolt	rice	0.2
Cotton wool	1 *jin*	rice	0.2

Source: Zhang, *Ming Dynasty*, vol. 10, p. 7982.
Note: * Unhusked rice that was the standard form for tax payment because it lasted longer in storage. One Qing *shi* of unhusked rice weights 72.5 kg; see Liang, *Dynastic Data*, p. 545; Chao, *Man and Land*, p. 209. † *Ding* was the face value of 1,000 coins. § One bolt of plain cotton was 30 *chi* long (1 Qing *chi* = 0.31 m) for the taxpayment purpose; see Liang, *Dynastic Data*, p. 542.

[70] Zhang, *Ming Dynasty*, vol. 10, p. 7983.

Table 8. Pattern of Tax Payments during the Qing

Year	Grain payment (*shi*) I	Grain price (*taels/shi*)	Silver payment (*taels*) II	I:II
1661	6,479,465	1.0	21,576,006	0.30
1685	4,331,131	1.0	24,449,724	0.18
1724	4,731,400	1.0	26,362,541	0.18
1753	8,406,422	1.5	29,611,201	0.43
1784	4,820,067	2.0	29,637,014	0.32
1820	8,971,681	2.0	30,206,144	0.65
1903	112,966	2.5	35,116,387	0.08
Average				0.31

Sources: Taxes are based on Liang, *Dynastic Data*, pp. 391–418. Grain prices are based on Jiangsu and Zhejiang during harvest reason; see Wang Yejian, *The Database of Grain Prices in the Qing Dynasty*, *Academia Sinica*, 2013, available online *vide*: http://ccts.ascc.net/integration.php?lang=en.

B.4. Trend in proto-welfare provision

From the available data for 1821 to 1910, 30 percent of all the counties in China suffered crop failures, 54 percent had normal harvests; and only 16 percent had bumper harvests.[71] Also, about a quarter of the population in North China was at the mercy of flooding of the Yellow River.[72] Without income redistribution, one-third of the counties could have suffered from population losses.

Under the Ming, there were devices such as tax exemptions and famine relief aid. But the budget was inadequate, because the Ming project depended on donations (Table 9).

Table 9. Redemptions and Donations with Food for Ming Famine Relief

Food amount (*shi*)	Redemption of	Donation reward with
60	death sentence	
40	exile sentence	
100		Imperial studentship
250		Official title of the 9th Grade
300		Official title of the 7th Grade
900		Official title of the 6th Grade
500		Public archway

Source: Zhang, *Ming Dynasty*, vol. 10, p. 7984.

[71] This is based on Fairbank and Liu, *History of China*, vol. 11, pt. 2, p. 7; also Buck, *Atlas*, pp. 30-1.
[72] See Perkins, *Agricultural Development*, p. 172.

As a result, the Ming relief were sporadic: Only four figures are available in *The History of the Ming Dynasty*: (1) exemptions of 2.77 million *shi* of rice for Jiangsu and Zhejiang in 1436,[73] (2) exemptions of two million *shi* of rice for Jiangsu and Zhejiang in 1454,[74] (3) handout of one million *shi* of grain to Jiangsu in 1455,[75] and (4) another 400,000 *shi* of grain to Shaanxi in 1485.[76] In 1579 the Ming Treasury lavishly spent 24 million taels of silver (worth at least 24 million *shi* of rice) on a royal wedding, but allocated no money for a famine in Shaanxi Province.[77] Likewise, from 1399 to 1644 a total of 97 disasters were left without government help, affecting 119 provinces assumptively.[78] Inadequate disaster relief was responsible, at least partly, for the population stagnation under the Ming.

But all that was changed during the Qing when welfare provision was an effective means to win hearts and minds of the Han Chinese. The Qing authorities allocated an annual budget for disaster-aid and maintained a stockpile of 30 to 45 million *shi* of unhusked rice (2.2-3.3 million metric tons).[79] The beneficiaries were over 100 million souls over time (Table 10). In that regard, the Qing population growth received a helping hand from the state.

Table 10. Welfare Relief and Its Impact, 1666-1836

	Food aid (rice *shi*)	Cash aid (silver *tael*)
Annual average aids	102,134	90,088
Lives rescued*	60.8–90.5 million	52.8–80.6 million
Total lives rescued	113.6–171.1 million	
Annual average	0.7–1.0 million	

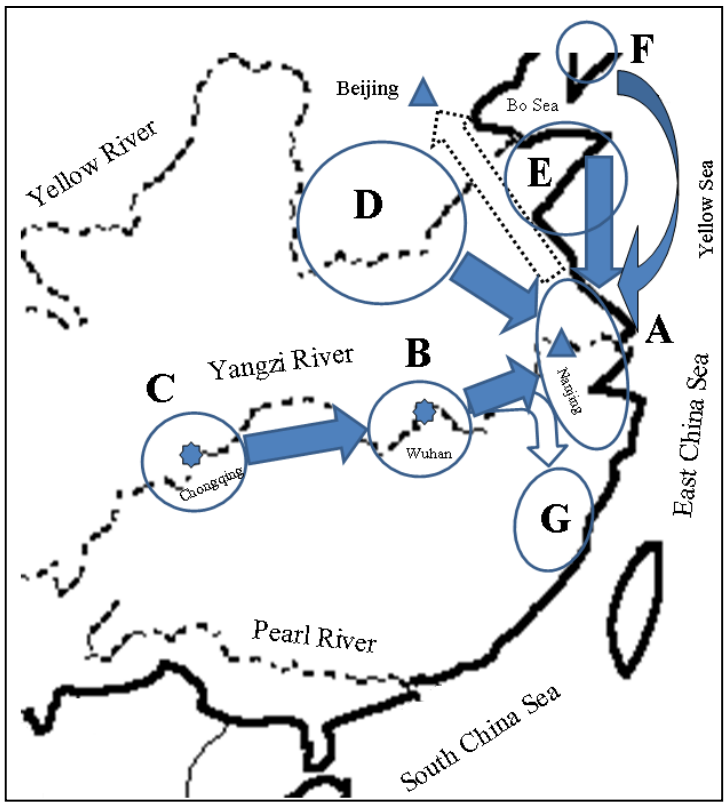
Source: Zhao, *Qing Dynasty*, vol. 11, pp. 8827–8937.
Note: * Estimation is made by the Ming standard: 20–30 *sheng* per head to survive a famine.[80]

[73] Zhang, *Ming Dynasty*, vol. 10, pp. 7800-7802.
[74] Ibid., vol. 10, p. 7803.
[75] Ibid., vol. 10, p. 7803.
[76] Ibid., vol. 10, p. 7805.
[77] Ibid., vol. 10, p. 7815.
[78] Zhang, *Ming Dynasty*, vol. 10, pp. 7787-7820.
[79] Pierre-Etienne Will and R. B. Wong, *Nourish the People: the State Civilian Granary System in China, 1650-1850* (Ann Arbor: University of Michigan Center for Chinese Studies), pp. 21, 482-3; Peterson, *History of China*, vol. 9, p. 602.
[80] Zhang, *Ming Dynasty*, vol. 10, pp. 7791, 7807.

B.5. Trends in market activities

Data for market activities for the Ming-Qing Era are sporadic. An import reason was the *laissez-faire* attitude towards rural grassroots activities.[81] Nevertheless, trade in staple goods was common (Figure 2).

Figure 2. Flows of Stipend Rice Tax and Marketed Grain during the Ming-Qing Period

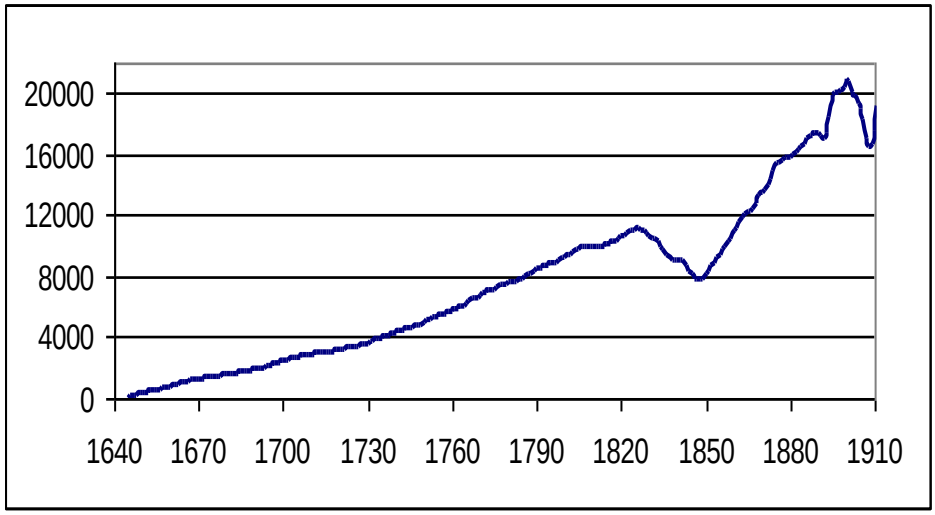


Sources: Based on Guo Hong and Jin Runcheng, Zhongguo Xingzheng Quhua Tongshi, Ming (A *General History of Administrative Division in China, the Ming Period*) (Shanghai: Fudan University Press, 2007), p. 152; Feng Xianliang, *Mingqing Jiangnan Diqude Huanjing Biandong Yu Shehui Kongzhi* (*Environmental Changes and Social Control in the Jiangnan Region during the Ming-Qing Period*) (Shanghai: Shanghai People's Press, 2002), pp. 24–7.
Notes: Broken lines: main rivers. Broken arrow: flow of taxes to the central government. Black arrows: flows of grain. White arrow: a detour flow of food. Blue triangles: Capital cities. A = the Lower Yangzi Delta. B = Hubei of the Middle Reaches of the Yangzi River. C = Sichuan of the Upper Reaches of the Yangzi River. D = the Lower Yellow River. E = Shandong (shipping by sea routes). F = Port Niuzhuang of Manchuria (shipping by sea routes). G = Coastal Fujian. The shipping distance from C to A is 2,400 km.

[81] Skinner, 'Marketing and Social Structure'; and his 'Chinese Peasants and Closed Community: an Open and Shut Case', *Comparative Studies in Society and History* 13/3 (1971), pp. 270-81.

Meanwhile, the Ming legacy of maritime ban (*haijin*) was lifted for good after 1683. What follows was a 250-year-long silver trade from 1565 to 1815, known as the 'Manila Galleon Trade', linking China and Mexico across the Pacific Ocean via Macao and Manila. However, the quantities of the silver in this trade are subject to estimation (Figure 3).

Figure 3. China's Cumulative Silver Imports, 1644–1910



Sources: Based on Li Longsheng, 'Qingdai (1644–1911) Meinian Liuru Zhongguo Baiyin Shulangde Chubu Guji' (Preliminary Estimates of Annual Silver Inflow to China during the Qing Period (1644–1911), *Journal of Humanities and Social Sciences* (Taiwan), 5/2 (2009): 45–56; *cf.* Peng Xinwei, *Zhongguo Huobi Shi* (*A History of Currencies in China*) (Shanghai: Shanghai People's Press, 1965), pp. 855, 868.
Note: In metric tons.

As the history unfolds itself, the silver was later replaced by opium (Table 11).

Table 11. China's Opium Imports, 1800-37

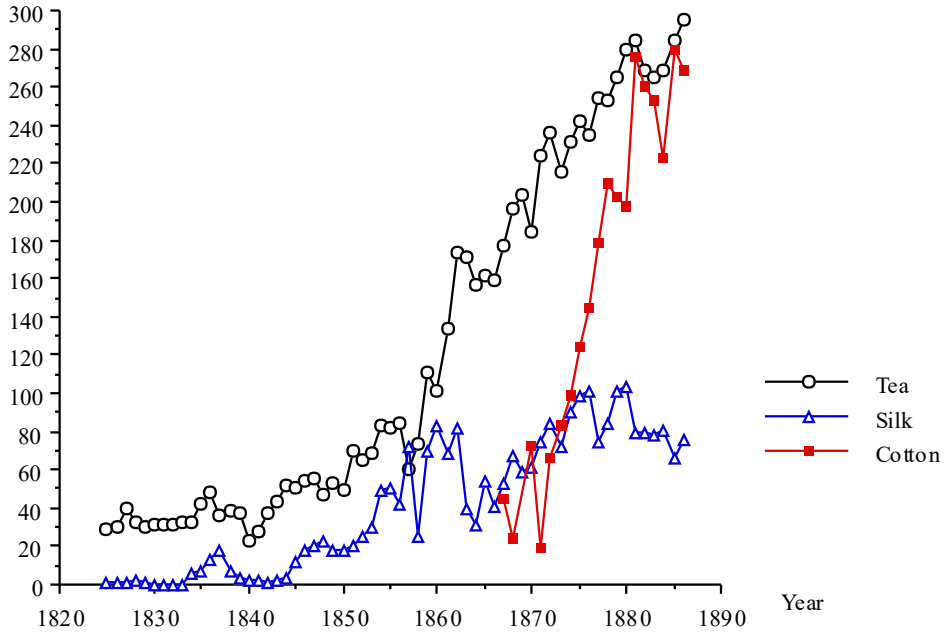
Year	Weight (*catties*)	Index	Value (peso)	Index
1800–5	401,960	100	2,009,800	100
1805–10	484,580	121	–	–
1810–5	534,980	133	–	–
1815–20	519,740	129	–	–
1820–5	729,320	181	33,502,440	1675
1825–30	1,312,440	327	56,930,593	2845
1830–5	2,217,260	552	63,866,684	3194
1836–7	2,312,000	575	14,454,193	725

Sources: H. B. Morse, *The Chronicles of the East India Company Trading to China, 1635–1834* (Oxford: Oxford University Press, 1926–9), vols. 3–5; Timothy Brook and B. T. Wakabayashi (eds.), *Opium Regimes* (Berkeley: University of California Press, 2000), p. 204.
Note: Smuggling is excluded.[82]

To purchase silver, and later opium, China actively exported silk, tea and cotton cloth (*nankeen*), although data are available for the Late Qing only (Figure 4).

[82] This is based on a comparison between Morse and Wu. The former has China's annual purchase of opium in the 1830s as worth 22.2 million *liang* (832.5 tons) a year on the book; see H. B. Morse, *The Chronicles of the East India Company Trading to China, 1635-1834* (Oxford: Oxford University Press, 1926-9), vols. 4-5, while the latter has an estimate of 43.4 million *liang* (1,627.5 tons) including smuggling; Wu Chengming, *Zhongguode Xiandaihua: Shichang Yu Shehui* (*China's Modernization: Market and Society*) (Beijing: Sanlian Books, 2001), p. 286.

Figure 4. Export Growth in Silk, Tea and Cotton Cloth, 1820–90



Sources: Silk and tea, based on Wu Jiangxiong, *Zhongguo Haiyang Fazhanshi Lunwen Ji* (*Selected Essays on the Maritime History of China*) (Taipei: *Academia Sinica*, 1991), vol. 4, pp. 30–5. Cotton cloth, based on Xu Xinwu, *Jiangnan Tubu Shi* (*A History of Traditional Cotton Textiles in the Yangzi Region*) (Shanghai: Shanghai Social Sciences Press, 1989), pp. 105–6; *cf.* Yan Zhongping, *Zhongguo Mianyezhi Fazhan* (*Development of Cotton Textile Industry in China*) (Shanghai: Commercial Press, 1944), p. 70.
Notes: Tea in 1,000,000 lb (453,600 kg); silk in 100,000 lb (45,360 kg); and cotton cloth in 1,000 (500 kg) *jin*. Cotton cloth was *nankeen*.

With the rise of foreign trade, the government benefited by customs duties in an unprecedented amount (Table 12).

Table 12. China's Customs Revenues, 1861-1910

Year	Revenue (silver *taels*)	in 1839 price	Index
1861	4,347,408	4,418,096	100
1871	7,020,150	7,041,274	160
1881	11,114,725	9,499,765	216
1891	12,168,096	9,080,669	206
1901	14,598,787	6,576,030	149
1910	23,116,999	9,435,510	214

Sources: Based on Tang Xianglong, *Zhongguo Jindai Haiguan Shuishou He Fenpei Tongji* (*Statistics of Customs Revenue and its Distribution in Modern China*) (Beijing: Zhonghua Books, 1992), pp. 63–6. The 1839 price conversion is based on Liu Foding and Wang Yuru, *Zhongguo Jindaide Shichang Fayu Yu Jingji Zengzhang* (*Market Development and Economic Growth in Early Modern China*) (Beijing: Tertiary Education Press, 1996), pp. 178–9.

B.6. Trends in technological changes

Ming-Qing China began to receive technology from the outside world in both top-down and bottoms up fashions. Firstly, in wake of Vasco de Gama's trans-Atlantic-Indian ocean voyage in 1498 (de Gama: 1460-1524) there was a string of Jesuit missionaries coming to China to establish the Christian Church.[83] They managed to convince the Ming-Qing authorities that the post-Renaissance technology, especially mathematics, astronomy, and firearms, benefited China's establishments. As a result, Jesuits dominated the Ming Imperial Board of Astronomy to produce more accurate calendas for China. They were also responsible for new textbooks in the Chinese language such as mathematics and geometry. They were also involved in the making of the first Atlas of the world in 1602 on China's soil. The most well-known figures were Matteo Ricci (1522–1610) and Ferdinand Verbiest (1623-88). The former collaborated with Xu Guangqi (1562-1633), the Ming Prime Mister of the time; and the latter reached the Second Grade in the Qing bureaucracy taking charge of Ministry of Works (*gongbu*).

[83] They all adopted Chinese names: Giulio Aleni (艾儒略, 1582-1649), Diego de Pantoja (庞迪我, 1571-1618), Sabbatino de Ursis (熊三拔, 1575-1620), Johannes Schreck (邓玉函, 1576-1630), Johann Adam Schall von Bell (汤若望, 1592-1666), Nicolas Longobardi (龙华民, 1565-1655), Jacques Rho (罗雅各, 1593-1638), Ferdinand Verbiest（南怀仁, 1623-88), Thoma Pereira (徐日升, 1645-1708) , Philippus Maria Grimaldi (闵明我, 1639-1712), Joachim Bouvet (白晋, 1656-1730), Jean Francois Gerbillon (张诚, 1654-1707), Bernard-Kiliam Stumpf (纪理安, 1655-1720), Joseph Giuseppe Castiglione (郎世宁, 1688-1766), Ignatius Koegler (戴进贤, 1680-1747), Andre Pereira (徐懋德, 1690-1743), Augustin de Hallerstein (刘松龄, 1721-74), William A. Martin (丁韪良, 1827-1916), and John Fryer (傅兰雅, 1839-1928).

Secondly, and at the village level, there were two 'green revolutions', both during the Ming. One was a 'cotton revolution' and the other was the New World crops thanks to the 'Columbian exchange'.

Cotton was known to China very early on (Table 13). It begs the question why cotton did take China by storm before the Ming. The answer was that cotton competed for resources with grain production in general and with rice in particular: it requires fertile farmland, plenty of water and constant field management. In addition, cotton yields were low. But the resistance was overcome by the Mongols. It was documented in 1289 Kublai Khan (1215-94) ordered all provinces in South China to pay annual taxes in cotton.[84] By 1328, the ratio between silk cloth and cotton cloth in taxpayment had been 1.7:1 whereby cotton was a force to be reckoned.[85] In 1522, the ratio became 1.6:1. So cotton began as a regular crop in China due to tax obligations.[86]

Table 13. References to Cotton vs. Wheat in Agricultural Treatises

	Pre-Qin	Han	Jin	N.+S.	Sui	Tang	Song	Yuan	Ming	Qing	Total
Cotton	1	3	8	5	1	8	19	11	24	70	151
Wheat	19	20	18	19	-	35	48	35	36	71	301

Sources: Based on Chen Zugui, *Mian* (*Cotton*) (Beijing: Zhonghua Books, 1957); Chen Zugui, *Zhongguo Nongxue Yichan Xuanji* (*Selected Texts of China's Agronomic Heritage*) (Beijing: Zhonghua Books, 1957); Hu Xiwen, *Mai* (*Wheat*) (Beijing: Zhonghua Books, 1958).
Note: N. + S. - Northern and Southern Dynasties.

Unlike silk whose weaving had to be performed by specialists in urban workshops, cotton spinning and weaving could all be done by a rural household for a finished marketable product. Thus, during Ming times a 'cotton revolution' took China and reshaped China's household manufacturing. Although the aggregate quantity of household manufacturing of cotton goods is unknown, a sensible estimation can be made. If one assumes that 'husband tilling and wife weaving' (*nangeng nüzhi*) dominated China's rural production and that tilling was mainly for self-consumption of food and weaking mainly for a monetary income. Thus, tilling and

[84] Song, *Yuan Dynasty*, vol. 9, p. 7277.
[85] Liang, *Dynastic Data*, p. 304.
[86] Liang, *Dynastic Data*, p. 352.

weaving each generated its own incentives. In this context, the wife could work full time, hence 365 days per year in spinning and weaving which can be taken as a maximum. The husband would work for about 100 days in the field per year (monocropping) in most parts of North China, or 200 days in the field per year (double cropping) in the Yangzi Valley, all dictated by frost-cum-seasonality in different locations. So, the husband's non-farming time was 265 days in the North and 165 days in the South, available for spinning and weaving. So, the total labour allocation for cotton manufacturing is as follows:

$$Q_L = (365 - H_t) + 365W_w$$

Where Q_L is total labour for spinning and weaving; H_t, husband's time for tilling land, W_w wife's time for spinning and weaving. So, it was likely to be 630 person-days per year in North China, and 530 person-days per year in South China without counting inputs from children and the elderly.

If so, the weaving to tilling ratio (or market to self-sufficiency ratio) is likely to have been in the range of 6.3:1 in the north and 2.7:1 in the south. In other words, regardless of regions, ordinary rural households devoted more working days to the marketable cotton goods. This force led to exponential growth in China's high-quality *nankeen* for export, which increased exponentially during the Qing (Table 14).

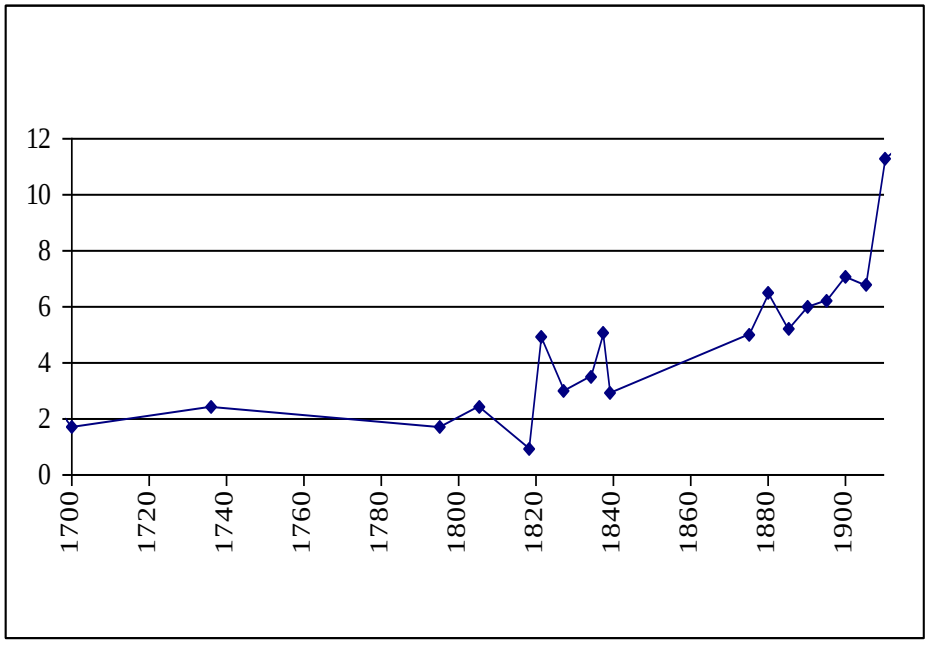
Table 14. Export of Home-made *Nankeen* Cloth, 1736–1825

Year	Bolts exported	Index
1736	10,374	100
1786	372,020	3677
1805	1,679,500	16149
1825	1,217,000	11702

Source: Fan Jinmin, *Mingqing Jiangnan Shangyede Fazhan* (*Commercial Development in the Jiangnan Region during the Ming-Qing Period*) (Nanjing: Nanjing University Press, 1998), pp. 123, 125–6.
Note: * One bolt of plain cotton was 30 *chi* long (1 Qing *chi* = 0.31 m) for the taxpayment purpose; see Liang, *Dynastic Data*, p. 542.

This also explains why the terms of trade between food and cotton cloth gradually moved against cotton by a factor of 9, suggesting that too much rural resources were allocated to cotton so diminishing returns began (Figure 5).

Figure 5. Terms of Trade, Bolts of Cotton Cloth per *Shi* of White Rice



Sources: Huang Miantang, *Zhongguo Lidai Wujia Wenti Kaoshu* (*Study of Prices in China's History over the Long Term*) (Jinan: Qilu Books, 2007), pp. 10, 11–12, 47–9, 52–7, 61–5, 101–7, 109–14, 314, 318–21, 330–3, 336–9; Xu, *Cotton Cloth*, pp. 176, 201; Yu Yaohua, *Zhongguo Jiage Shi* (*A History of Prices in China*) (Beijing: China's Prices Press, 2000), pp. 805, 921–2, 929.
Notes: (1) Here plain cotton (three *zhang* per bolt) was the common homemade type for tax payment and domestic trade, not for export. White rice was husked rice ready to cook. (2) For much lower cotton cloth pries, see Xu, *Cotton Cloth*, pp. 92, 94. For much higher *nankeen* cloth prices, *cf.* Anben Meixu, *Qingdai Zhongguode Wujia Yu Jingji Bodong* (*Prices and Economic Fluctuations in Qing China*) (Beijing: Social Science Academic Press, 2010), Table 4.8.

Finally, there was the 'Columbian Exchange' in China in term of the introduction of new sources of staple: maize and sweet potatoes. *Prime facie*, maize was mainly grown along a narrow inland belt along Yunnan-Guangxi, Sichuan and Shanxi-Shaanxi. Sweet potatoes landed in three small enclaves of central Sichuan (about one-third of the province), southern Guangdong (one-fifth of it) and central Fujian (one-eighth of it). In the end, maize and sweet potatoes used less than four percent of China's farmland (Table 15).

Table 15. Actual Land under the New World Crops, the 1920s

Maize	Shanxi-Shaanxi	Sichuan	Yunnan-Guangxi	Average
Nominal share*	25.0%	25.0%	25.0%	25.0%
Multi-cropping index	118	167	152	146
Adjusted share†	21.2%	15.0%	16.4%	21.0%
Sweet Potato	Sichuan	Guangdong	Fujian	Average
Nominal share*	25.0%	25.0%	25.0%	25.0%
Multi-cropping index	167	176	169	171
Adjusted share†	14.9%	14.2%	14.8%	14.6%
Actual share in China's total				3.6%§

Source: J. L. Buck, *Land Utilization in China: Atlas* (London: Oxford University Press, 1937), pp. 48, 50–1, 62, 82.
Notes: * Mean value of Buck's range of 20–29 percent. † Calculated with one New World crop in a multiple cropping system. § Based on 14.5 percent for maize and four percent for sweet potatoes.

The key problem was low nutrition values of the newly introduced species. Maize output is commonly 30 percent higher than wheat, but provides only two-thirds of wheat's protein in the same weight.[87] Similarly, pound-for-pound, fresh sweet potatoes have on average only 17 percent of the carbohydrate, 15 percent of the protein, and 17 percent of the energy of long grain rice or white wheat of the same weight.[88] In the economics' jargon, maize and sweet potatoes are 'Giffen Goods' whose consumption is positively related to economic hardships. So, James Lee's observation in Southwest China is an exception rather than the rule.[89]

On balance, the cotton revolution did indeed change rural China, but maize and sweet potatoes did not.

B.7. Trend in living standards

Due to a lack of China-wide historical data, living standards can be assessed at the 1920s' level as the result of the Qing legacy. Firstly, there was a clear tendency of 'diseconomies of scale', as smaller and medium farms were more productive than

[87] Based on information on www.nutri-facts.com.
[88] Ibid.
[89] Lee, 'Population Growth'.

the large ones (Table 16) which rebukes the notion of 'production involution' and/or 'Malthusian poverty' (Figure 6).[90]

Table 16. Farm Sizes and Annual Grain Yields per Hectare, in Kg, the 1920s

Scope	Small	Medium	Medium-large	Large	Very large	All farms
China-wide	1723.4	1726.6	1673.6	1621.1	1455.4	1663.9
Wheat mega-zone	1024.7	1062.6	1010.7	984.0	896.1	1013.3
Rice mega-zone	2608.3	2572.3	2397.1	2578.9	2383.2	2489.6
Spring wheat zone	363.2	480.1	410.6	372.9	439.6	456.0
Winter wheat-millet zone	1230.0	1060.9	1078.2	1013.4	1015.5	1040.5
Winter wheat-kaoliang zone	1377.3	1368.8	1290.2	1314.3	1100.2	1283.6
Yangtze Rice-wheat zone	2140.0	1985.0	1756.2	2217.7	1832.5	1913.7
Rice-tea zone	2656.4	2589.7	2623.2	2532.6	2600.8	2664.0
Szechwan rice zone	1944.5	2431.9	2654.8	2416.5	3373.1	2556.9
Double cropping rice zone	3021.4	2808.1	3276.0	3180.8	2741.3	3680.0
Southwestern rice zone	4650.0	4075.6	3817.5	3211.6	1855.4	3731.1

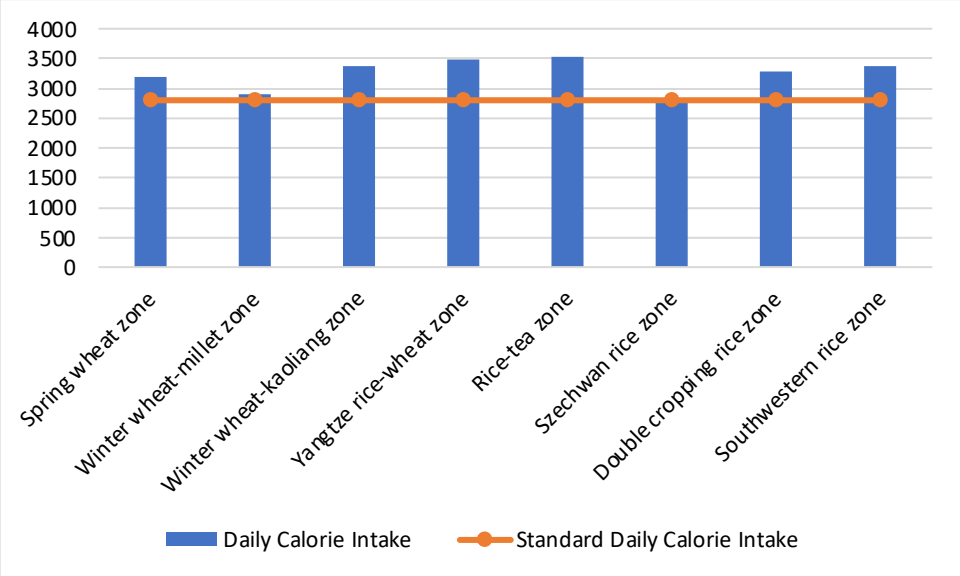
Source: Buck, *Land Utilization*, pp. 291, 297, 302

Secondly, there is the issue of living standards as the end-result of farming. All surveyed 136 localities in 21 provinces achieved an average of 3,295 kilocalories per capita per day, well above the modern 2000-2500 kilocalorie mark (Figure 6).[91]

[90] E.g. Chao, *Man and Land*; P. C. C. Huang, *The Peasant Economy and Social Change in North China* (Stanford: Stanford University Press, 1985).

[91] For the 2000 and 2500 kilocalories for adult women and men, respectively, see the guidance of the British Heart Foundation, 'A balanced diet: do the numbers matter?' *vide*: https://www.bhf.org.uk/informationsupport/heart-matters-magazine/nutrition/how-many-calories-should-i-eat-a-day#:~:text=It%27s%20estimated%20that%20the%20average,important%20rather%20than%20individual%20days, available on 19th December, 2023.

Figure 6. Daily Calorie Intake in Different Zones



Source: Buck, *Land Utilization*, p. 73.
Note: 2800 kilocalories per day is used as the floor level of food intake.

C. Final remarks

A Renaissance in Ming-Qing China successfully reset the clock for the Oriental Empire. Evidence shows that improvements were made in all seven areas, ranging from institutions to technology and living standards. In this regard, it barks the wrong tree by the outsider to question why China did not become industrialised *à la* Western Europe.

Bibliography

Anben Meixu, *Qingdai Zhongguode Wujia Yu Jingji Bodong* (*Prices and Economic Fluctuations in Qing China*) (Beijing: Social Science Academic Press, 2010).

Anon., *Qing Gaozong Shilu* (*Veritable Records of Emperor Gaozong of the Qing Dynasty*) (1799, reprint 1964, Taipei: Hualian Press).

Beal, E. G., *The Origin of Likin, 1853–1864* (Cambridge [Mass.]: Harvard University Press, 1958).

Buck, John L., *Land Utilization in China: Atlas* (London: Oxford University Press, 1937).

Chao, Kang, *Man and Land in Chinese History: An Economic Analysis* (Stanford: Stanford University Press, 1986).

Chen Hua, *Qingdai Quyu Shehui Jingji Yanjiu* (*Regional Socio-Economic Conditions during the Qing Period*) (Beijing: People's University Press, 1996).

Chen Zugui, *Mian* (*Cotton*) (Beijing: Zhonghua Books, 1957).

Chen Zugui, *Zhongguo Nongxue Yichan Xuanji* (*Selected Texts of China's Agronomic Heritage*) (Beijing: Zhonghua Books, 1957).

Crossley, P. K., *A Translucent Mirror: History and Identity in Qing Imperial Ideology* (Berkeley: University of California Press, 1999).

Deng, Gang, *Development versus Stagnation: Technological Continuity and Agricultural Progress in Premodern China* (New York and London: Greenwood Press, 1993).

Deng, Gang, *The Premodern Chinese Economy – Structural Equilibrium and Capitalist Sterility* (London, Routledge Press, 1999).

Deng, K. G., 'Unveiling China's True Population Statistics for the Pre-Modern Era with Official Census Data', *Population Review* 43/2 (2004): 1-36.

Dong Lun, *Ming Taizu Shilu* (*Veritable Records of Emperor Taizu of the Ming Dynasty*) (1399 AD, Reprinted 1961, Taipei: Academia Sinica).

Elliott, M. C., *The Manchu Way: the Eight Banners and Ethnic Identity in Late Imperial China* (Stanford: Stanford University Press, 2001).

Elvin, Mark, *The Pattern of the Chinese Past* (Stanford: Stanford University Press, 1973).

Fairbank, J. K., *The United States and China* (Cambridge [MA]: Harvard University Press, 1965).

Fairbank J. K. and Kwang-ching Liu (eds), *The Cambridge History of China, Late Ch'ing, 1800–1911* (Cambridge: Cambridge University Press, 1980).

Fairbank, J. K. and Merle Goldman, *China: A New History* (Cambridge [Mass]: Harvard University Press, 1998).

Fan Jinmin, *Mingqing Jiangnan Shangyede Fazhan* (*Commercial Development in the Jiangnan Region during the Ming-Qing Period*) (Nanjing: Nanjing University Press, 1998).

Feng Xianliang, *Mingqing Jiangnan Diqude Huanjing Biandong Yu Shehui Kongzhi* (*Environmental Changes and Social Control in the Jiangnan Region during the Ming-Qing Period*) (Shanghai: Shanghai People's Press, 2002).

Feuerwerker, Albert, 'The State and the Economy in Late Imperial China', *Theory and Society*, 13/3 (1984): 297–326.
Gamble, S. D., 'Daily Wages of Unskilled Chinese Laborers, 1807–1902', *The Far Eastern Quarterly*, 3/1 (1943): 41–73.
Guo Hong and Jin Runcheng, Zhongguo Xingzheng Quhua Tongshi, Ming (A *General History of Administrative Division in China, the Ming Period*) (Shanghai: Fudan University Press, 2007).
Guo Zhengzhong, *Zhongguo Yanye Shi* (*A History of the Salt Sector in China*) (Beijing: People's Press, 1997).
Han Rulin, *Yuanchao Shi* (*A History of the Yuan Dynasty*) (Beijing: People's Press, 1986).
He Changling and Wei Yuan (eds), *Huangchao Jingshi Wenbian* (*Collection of Documents of the Qing Administration*) (Reprint, Beijing: Zhonghua Books, 1992).
Ho, Ping-ti, 'In Defense of Sinicization', *The Journal of Asian Studies* 57/1 (1998): 123–55.
Hsiao-t'ung, Fei, *Peasant Life in China; A Field Study of Country Life in the Yangtze Valley* (London: Paul, Trench, Trubner, 1939).
Hu Xiwen, *Mai* (*Wheat*) (Beijing: Zhonghua Books, 1958).
Huang Miantang, *Zhongguo Lidai Wujia Wenti Kaoshu* (*Study of Prices in China's History over the Long Term*) (Jinan: Qilu Books, 2007).
Huang, P. C. C., *The Peasant Economy and Social Change in North China* (Stanford: Stanford University Press, 1985).
Jones, E. L., *Growth Recurring: Economic Change in World History* (Oxford: Clarendon Press, 1988).
Lee, James, 'Population Growth in Southwest China, 1250-1850', *Journal of Asian Studies* 41/4 (1982): 711-46.
Leonard, J. K., and J. R. Watt, *To Achieve Security and Wealth* (Ithaca: Cornell University Press, 1992).
Li Longsheng, 'Qingdai (1644–1911) Meinian Liuru Zhongguo Baiyin Shulangde Chubu Guji' (Preliminary Estimates of Annual Silver Inflow to China during the Qing Period (1644–1911), *Journal of Humanities and Social Sciences* (Taiwan), 5/2 (2009): 45–56.
Li Sanmou, 'Lun Mingqing Nanfang Zhudianzhide Teshuxing' ('On the Characteristics of the Ming-Qing Tenancy System in South China'), *Zhonggou Nongye Shi* (*Agricultural History of China*), 2 (1995): 39-48.
Liang Fangzhong, *Zhongguo Lidai Huko Tiandi Tianfu Tongji* (*Dynastic Data for China's Households, Cultivated Land and Land Taxation*), Shanghai: Shanghai People's Press, 1980).
Lindley, A. F., *Ti-Ping Tien-Kwoh: the History of the Ti-ping Revolution* (London: Day and Son, 1866).
Liu Foding and Wang Yuru, *Zhongguo Jindaide Shichang Fayu Yu Jingji Zengzhang* (*Market Development and Economic Growth in Early Modern China*) (Beijing: Tertiary Education Press, 1996).
Luo Yudong, *Zhongguo Lijin Shi* (*A History of the Transit Surcharge in China*) (Shanghai: Commercial Press, 1936).
Mann, Susan, *Local Merchants and the Chinese Bureaucracy, 1750-1950* (Stanford: Stanford University Press, 1987).

Marsh, R. M., *The Mandarins: Circulation of Elite in China, 1600-1900* (New York: Free Press of Glencoe, 1961).
Morse, H. B., *The Chronicles of the East India Company Trading to China, 1635–1834* (Oxford: Oxford University Press, 1926–9).
Peng Xinwei, *Zhongguo Huobi Shi* (*A History of Currencies in China*) (Shanghai: Shanghai People's Press, 1965).
Perkins, D. H., *Agricultural Development in China, 1368–1968* (Edinburgh: Edinburgh University Press, 1969).
Peterson, W. J., *The Cambridge History of China* (Cambridge: Cambridge University Press, 2002).
Pierre-Etienne Will and R. B. Wong, *Nourish the People: the State Civilian Granary System in China, 1650-1850* (Ann Arbor: University of Michigan Center for Chinese Studies.
Pomeranz, Kenneth, *The Great Divergence, Europe, China and the Making of the Modern World Economy* (Princeton: Princeton University Press, 2000).
Rawski, E. S., 'Reenvisioning the Qing', *The Journal of Asian Studies* 55/4 (1996): 829–50.
Rawski, E. S., *Agricultural Change and the Peasant Economy of South China* (Cambridge [Mass.]: Harvard University Press, 1972).
Shi Zhihong, *Qingdai Qianqide Xiaonong Jingji* (*Petty Farming in the Early Qing Period*) (Beijing: China's Social Sciences Press, 1994).
Skinner, G. W., 'Marketing and Social Structure in Rural China', *The Journal of Asian* Studies, 24/1 (1964): 3–44; 24/2 (1965): 195–228; 24/3 (1965): 363–400.
Skinner, G. W., *The City in Late Imperial China* (Stanford: Stanford University Press, 1977).
Song Lian, *Yuan Shi* (*History of the Yuan Dynasty*) in *Er-shi-wu Shi* (*Twenty-Five Official Histories*) (Shanghai: Shanghai Classics Press, 1986), vol. 9.
Song Yuanqiang. *Qingchaode Zhuangyuan* (*Champions of the Qing Imperial Examinations*) (Changchun: Jilin Culture and History Press, 1992).
Tang Xianglong, *Zhongguo Jindai Haiguan Shuishou He Fenpei Tongji* (*Statistics of Customs Revenue and its Distribution in Modern China*) (Beijing: Zhonghua Books, 1992).
The Chinese Academy of Agricultural Sciences, *Zhongguo Nongxue Shi* (*History of Chinese Agronomy*) (Beijing: Sciences Press, 1984).
Tian Fang and Chen Yijun, *Zhongguo Yimin Shilue* (*Brief History of Migration in China*) (Beijing: Knowledge Press, 1986).
Wang Qi, *Xu Wenxian Tongkao* (*Imperially Commissioned Continuation of the Comprehensive Study of Literature*) (Publisher unknown, 1586 AD).
Wang Yejian, *The Database of Grain Prices in the Qing Dynasty*, *Academia Sinica*, 2013, available online *vide*: http://ccts.ascc.net/integration.php?lang=en
Wang, Yeh-chien, *Late Taxation in Imperial China, 1750–1911* (Cambridge [MA]: Harvard University Press, 1973).
Wei Zaitian, Xu Xuechu and Li Yawei (eds), *Kangxi Zhiguo Shengxun* (*Emperor Kangxi's Instructions on State Management*) (Beijing: Expatriates' Press, 1995).

Will, Pierre-Etienne, *Bureaucracy and Famine in Eighteenth-Century China* (Stanford: Stanford University Press, 1990).
Wood, Frances, *Did Marco Polo Go to China?* (London: Secker & Warburg,1995).
Wu Chengming, *Zhongguode Xiandaihua: Shichang Yu Shehui* (*China's Modernization: Market and Society*) (Beijing: Sanlian Books, 2001).
Wu Hui, *Zhongguo Lidai Liangshi Muchang Yanjiu* (*A Study of the Long-term Grain Output per Mu in China*) (Beijing: Agriculture Press, 1985).
Wu Jiangxiong, *Zhongguo Haiyang Fazhanshi Lunwen Ji* (*Selected Essays on the Maritime History of China*) (Taipei: *Academia Sinica*, 1991).
Xu Xinwu, *Jiangnan Tubu Shi* (*A History of Traditional Cotton Textiles in the Yangzi Region*) (Shanghai: Shanghai Social Sciences Press, 1989).
Yan Zhongping, *Zhongguo Mianyezhi Fazhan* (*Development of Cotton Textile Industry in China*) (Shanghai: Commercial Press, 1944).
Yang Guozhen (1988) *Mingqing Tudi Qiyue Wenshu Yanjiu* (*A Study of Documents of Land Deeds of the Ming-Qing Period*) (Beijing: People's Press, 1988).
Yu Yaohua, *Zhongguo Jiage Shi* (*A History of Prices in China*) (Beijing: China's Prices Press, 2000).
Yuan Yida and Zhang Cheng, *Zhongguo Xingshi: Qunti Yichuan He Renko Fenbu* (*Chinese Surnames: Group Genetics and Demographic Distribution*) (Shanghai: East China Normal University Press, 2002).
Zhang Deze, *Qingdai Guojia Jiguan Kaolue* (*The State Apparatus of the Qing Period*) (Beijing: Xueyuan Press, 2001).
Zhang Haiying, *Mingqing Jiangnan Shangpin Liutong Yu Shichang Tixi* (*Commodity Flows and Market Structure in the Jiangnan Region during the Ming-Qing Period*) (Shanghai: East China Normal University Press, 2001).
Zhang Jiayan, 'Mingqing Jianghan Pingyuande Nongye Kaifa Dui Shangren Huodong He Shizhen Fazhande Yingxiang' (Impact of Agricultural Development in the Yangtze-Han Plain on Commercial Activities and Urbanization during the Ming-Qing Period), *Zhongguo Nongshi* (*Agricultural History of China*) 4 (1995): 40–6.
Zhang Limin, 'Chuang Guandong Yiminchao Jianxi' (Advancing to Manchuria), *Zhongguo Shehui Jingjishi Yanjiu* (*Study of Chinese Socio-Economic History*) 2 (1998): 57-64.
Zhang Tingyu, *Ming Shi* (*History of the Ming Dynasty*), in *Er-shi-wu Shi* (*Twenty-Five Official Histories*) (Shanghai: Shanghai Classics Press, 1986), vo. 10.
Zhao Erxun, *Qingshi Gao* (*Draft of the History of the Qing Dynasty*), in *Er-shi-wu Shi* (*Twenty-Five Official Histories*) (Shanghai: Shanghai Classics Press, 1986), vols 11-12.
Zhao Yi, *Gaiyu Congkao* (*Reading Notes While Looking After Parents*) (1772. Reprint. Beijing: Zhonghua Books, 1963). Wu Songdi, *Zhongguo Renkoushi, Disan Juan, Liao, Song, Jin, Yuan Shiqi* (*Demographic History of China: Vol. III, The Liao, Song, Jin and Yuan Periods*) (Shanghai: Fudan University Press, 2000).
Zheng Xuemeng, Jiang Zhaocheng and Zhang Wenqi, *Jianming Zhongguo Jingji Tongshi* (*A Brief Panorama of Chinese Economic History*) (Harbin: Heilongjiang People's Press, 1984).

Zhou Buodi, *Zhongguo Caizhengshi* (*A Financial History of China*) (Shanghai: Shanghai People's Press, 1981).