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China's Road in the Great Divergence

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China's Road in the Great Divergence

**Qing's Model of Economic Development in the
1644-1911 Era**

PhD thesis

to obtain the degree of PhD at the
University of Groningen
on the authority of the
Rector Magnificus Prof. C. Wijmenga
and in accordance with
the decision by the College of Deans.

This thesis will be defended in public on

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Emperors of the Qing Dynasty

Shunzhi	1644-1661
Kangxi	1662-1722
Yongzheng	1723-1735
Qianlong	1736-1795
Jiaqing	1796-1820
Daoguang	1821-1850
Xianfeng	1851-1861
Tongzhi	1862-1874
Guangxu	1875-1908
Xuantong	1909-1911

List of Chinese Terms

Buzhengshi (布政使): the nominal head of the civil service and the treasurer of the provincial exchequer

Changshui (常税): also called changguan shui (常关税), refers to the collection of Chinese Regional Customs

Dan (担): Unit of measurement used to denote mass. Roughly equivalent to 50 kilograms. Also sometimes referred to as a shi.

Dao (道): an official responsible for multiple prefectures

Daqian (大钱): large coins/token metal coins issued during the late Qing period

Diding (地丁): an agricultural land tax collected in silver

Ewai Yingyu (额外盈余): additional Yingyu, adding an Yingyu to ordinary Yingyu in some ports

Ezheng Shu (额征数): the regular quota of a tax

Gongbu (工部): the Ministry of Works

Guan Shui (关税): Customs duties

Guangchu Si (广储司): the Storage Office, a section under the Department of Internal Affairs

Hubu (户部): the Ministry of Revenue

Jiandu (监督): the highest official in some customs ports

Jiangni Zhizhao (江宁织造): the official responsible for weaving the emperor's clothes, located in Jiangni, known today as Nanjing

Jing Xiang (京饷): Provisions to the capital by provinces

Li (厘): a unit of weight (also of length and area); One li = 1/1000 of a tael

Liangtou (樯头): a boat's skipper

Likin (厘金): an ad valorem tax levied in the late Qing and early Republic of China

Mou (畝 or 亩): Unit of measurement formerly used in China to indicate an area of land.

Neiwu Fu (内务府): Department of Internal Affairs, an organisation responsible for the affairs of the royal family

Pi (匹): Unit of measurement used for rolled-up fabric. Typically about four zhang when rolled out.

Pingyu (平余): balance surplus

Qinglisi (清吏司): a division of the Ministry of Revenue

Shilang (侍郎): an official title, assistant minister, for officials holding the rank of grade two within the traditional nine-grade civilian rank system; there were twelve assistant ministers in the Six Ministries

of the central government (each ministry had two Zuo Shilang 左侍郎, meaning Left Shilang, and two You Shilang 右侍郎, meaning Right Shilang).

Tong Jin Shui Jiao (铜斤水脚): copper transport fee, a fee to be paid by those who bought copper and sent it to Beijing

Xian (县): county, the lowest provincial administrative district of ancient China

Xie Xiang (协饷): Provisions sent to other provinces, if sent to the Capital will be named Jing Xiang

Xunfu (巡抚): Viceroy, the highest official in a province; if there was a Zongdu (总督) (governor) appointed in a province, then the Zongdu outranked the Xunfu.

Yamen (衙门): government office

Yangshui (洋税): also called Yangguan shui (洋关税), maritime customs duties

Yanli (盐厘): salt Likin

Yanglian Yin (养廉银): anti-corruption allowance

Yingyu (盈余): surplus of Zheng'e

Yinku (银库): the Silver Treasury

Zheng'e (正额): the regular amount of government revenues and expenditures

Zhou (州): prefecture, the provincial administrative district of the Qing China above Xian (县)

Zongdu (总督): Governor, the highest ranking official in one or several province (s)

Zongli Yamen (总理衙门): the Prime Minister of Foreign Affairs Yamen

Zongren Fu (宗人府): Imperial Clan Court, an organisation responsible for the affairs of the royal family

Zouxiao (奏销): submitting financial reports to the throne for approval

List of Abbreviations

- FHAC** The First Historical Archives of China
- ZPZZ** Zhupi Zouzhe (Palace Midrange Rescript Memorials)
- TB** Tiben (Reports to the Emperor)
- LFZZ** Lufu Zouzhe (Extra Copies of Grand Council Memorials)
- Chaodang** Copy of the Archives, which was stored in the library of the Institute of Economics, Chinese Academy of Social Sciences. These include:
- Guanshui Baogao Biao: Qingdai Guanshui Shouzhi Baogao Biao (Revenue and Expenditure Reports of Customs in the Qing Dynasty) and
- Tiben Guanshui: Customs Duties Reports to the Emperor
- SYD** Shangyu Dang (Edict Records)
- GXCZP** Guangxu Chao Zhupi Zouzhe (Palace Midrange Rescript Memorials of the Guangxu Reign)
- GZDQLC** Gongzhongdang Qianlong Chao Zouzhe (Palace Midrange Rescript Memorials of the Qianlong Reign)
- GZDGXC** Gongzhongdang Guangxu Chao Zouzhe (Palace Midrange Rescript Memorials of the Guangxu Reign)
- SQYJ** Shi Qu Yu Ji, written by Wang Qingyun
- YZCHW** Yongzheng Chao Hanwen Zhupi Zouzhe Huibian (Collection of the Palace Midrange Rescript Memorials in Han Language of the Yongzheng Reign)
- LMGS** List of Money and Grains Sent to and from the Provinces in the Seventeenth Year of Jiaqing in the Qing Dynasty

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Introduction

The argument whether China's model of economic development is unique or similar to the rest of the world, especially when compared with the West, has existed for quite a while. In the sheer relentless quest towards understanding why some nations become rich where others fail, the case of China might represent an exception to the conventional wisdom and the most celebrated model of economic development currently in use. Alternatively, the deeper inspection of this case might help generalise our understanding of economic development in such a way that it allows us to explain China's trajectory as well. As a major milestone, the publication of Kenneth Pomeranz's book *The Great Divergence* in 2000 sparked a new era in global comparative economic history and added a new page to the debate on the question on Chinese or European uniqueness. It would be practically impossible, as well as superfluous, to summarise or even mention all the publications that contributed to this debate in the last 20 years.

In most of the existing review-articles, it stated that England was the 'lucky one' and China the 'normal'.¹ The idea of European exceptionalism was not only argued by specialists in European history, but also voiced by some authors from Asia.² In all of these publications a lot of attention was devoted to the question of timing: when did Europe surpass the Chinese economic development? Was this around 1800, when England entered a phase of continuous modern industrial economic growth, as argued by Pomeranz, or was it earlier, in the mid-18th century, or late-17th century when states in Europe commenced to modernise their institutions and technologies? Of course this strand of the debate was highly connected to the one about explanations. The dominant view here among economic historians followed the lines of Pomeranz, that is, geography, culture, and institutions all played at the background,

¹ Peter C. Perdue. Review of Pomeranz, Kenneth, *The Great Divergence: China, Europe, and the Making of the Modern World Economy*. H-World, H-Net Reviews. August, 2000. URL: <http://www.h-net.org/reviews/showrev.php?id=4476>

² Prasannan Parthasarathi, Review of *The Great Divergence: China, Europe, and the Making of the Modern World Economy* by Kenneth Pomeranz; Past & Present, No. 176 (Aug., 2002), pp. 275-293.

but the technological changes and the effects of transatlantic globalisation were seen as decisive. Currently, this is the standard view for many scholars.³

However there exists a second line of reasoning that includes more institutional arguments. This line of explanation starts off at the views of Douglass North on transaction costs and the prominent role of institutions, including the prevailing systems of written and unwritten laws and the role of the state.⁴ Daron Acemoglu and James Robinson have built upon these arguments. In their seminal article 'The Colonial Origins of Comparative Development' from the year 2001, they argued that the quality of economic institutions was the key long-term determinant of economic growth.⁵ In their view good economic institutions protected property and contract rights, that means the development of private entrepreneurship and investment. In another book (2012) *Why Nations Fail: The origins of Power, Prosperity and Poverty*, the authors go one-step further in arguing that economic institutions in turn are determined by politics.⁶ Here, they concentrate less on the role of the state, but rather on questions of representation and inclusion of different classes of people in the state. Their argument is that the more concentrated political power is, the more a small group in society tries to extract wealth for itself without investing in public goods or the wider well-being. Acemoglu and Robinson's answer to the question on what explains the differences in wealth across the world is in short: representative and inclusive political institutions.

A third and broader line of reasoning also starts with North's institutionalist arguments, but focusses more on state-formation, models of tax-extraction, in combination with empire-building and the broader economic development. Peer Vries made an important, and well received, contribution to this approach: the role

³ Robert C. Allen (2011) *Global Economic History: A Very Short Introduction*. Oxford University Press.

⁴ Douglass C. North (1990). *Institutions, Institutional Change and Economic Performance*. Cambridge University Press.

⁵ D. Acemoglu et al. 'The Colonial Origins of Comparative Development', *American Economic Review*, Vol. 91, No. 5 (Dec., 2001), pp. 1369-1401.

⁶ D. Acemoglu and J.A. Robinson (2012). *Why Nations Fail: The origins of Power, Prosperity and Poverty*. Crown Publishing Group—A Division of Random House, Inc., New York.

of the state and state-making in fostering economic growth. In his opinion it was the state that acted as the prime mover in the economic development of China and Britain. According to him the Chinese tax-extraction in combination with, what he calls, agrarian paternalist policies did not spark the same development as in England. In his seminal book *State, Economy and the Great Divergence: Great Britain and China, 1680s-1850* from 2015, Peer Vries makes valuable observations on the Chinese development.⁷

However, because this book relies largely on second-hand literature the persuasive quality of some of the arguments is hindered. It stands to reason that primary sources allow for a higher level of detail and accuracy. Here are some examples. Vries states on page 91:

“Whereas ‘up to the outbreak of the Taiping Rebellion in 1851 the state had always made the examination system the primary, and the sale of offices secondary, channel of mobility’, it by and large was the other way around after that rebellion. During that rebellion selling offices yielded 4 to 6 million taels annually. For the period we discuss in this book, it seems safe to conclude that Wang’s first type of contributions, in total, apparently did not yield more than, on average, a couple of million taels per year. That is substantial, but not so much as to fundamentally change orders of magnitude of total government income.”

In this statement, Peer Vries refers to four sources. Two do interest us here now. In note 97 on this page Peer Vries refers to K. W. Swart.⁸ This study mentions the 4-6 million taels income from the selling of offices. As its source the author of this study refers to the observations of an American missionary published in 1849 in the *Chinese Repository*. Vries verifies the amount of taels, using Ma Debin LSE Working Paper, ‘Rock, scissors, paper: the problem of incentives and information in traditional

⁷ P. Vries (2015). *State, Economy and the Great Divergence: Great Britain and China, 1680s-1850s*. Bloomsbury Publishing.

⁸ K.W. Swart (1949), *Sale of Offices in the 17th Century* (‘s-Gravenhage, Martinus Nijhoff), p.110.

Chinese state and the origin of the Great Divergence' from 2011. More specifically Vries refers to graph 4 on page 25, where he thinks the 4-6 million taels is confirmed. Actually, this graph shows that the income from the sales of offices between 1800 and 1863 reached just above the 1 million taels for three separate years. Ma Debin refers for these data on revenue to the very reliable source in Luo Yudong, 中国厘金史, History of Chinese Likin Tax.⁹ So this does not confirm Swart his statement from the 1949 dissertation. Swart's book is based on a much less reliable source. While Vries's conclusion remains prudent but even "a couple of millions taels" is too much. In my opinion it was impossible for the government to gain such an amount of money from selling offices. In fact, even the court reduced the requirements of selling offices after the rebellion, it failed to achieve good results because the rich had lost confidence towards the court. In 1851, selling offices only yielded 1,110,385 taels, and in 1853, the amount dropped to 672,611 taels.¹⁰ It never reached to 4 to 6 million taels annually during the rebellion. The second problem is that even in the late Qing period, the examination system was still the principal way to select for offices. As an illustration of its importance, Zuo Zongtang, one of the highest officers originating from the ranks of the military, was appointed by the imperial government as the supreme military commander of Xinjiang province to fight against the rebellion led by Mohammad Yaqub Beg and supported by Russian troops. During this war, even he asked to return to Beijing to take the imperial examination.¹¹

On pages 94 and 95 Vries states:

"By far the most important tax, the one on land, remained almost stable for the entire period of Qing rule that we are discussing here. It basically only increased somewhat with the extension of cultivated land. I did not find any estimate for the period till the First Opium War that was higher than 50 million taels. The yield of the

⁹ Luo Yudong 中国厘金史 *History of Chinese Likin Tax* (Shanghai: Commercial Press. 1936/2010), pp. 6-7.

¹⁰ Luo Yudong. 中国厘金史(1936). P.7.

¹¹ Jin Yuan and Luo Ji. 左宗棠考进士随想 *Zuo Zongtang Attended the Examination Test*, in Shiji Yutang (Century),vol.8, 2002.

rest of official taxes was and continued to be much smaller.”

This sentence is a little vague and it contains a rough estimate of the land tax-revenue. The 50 million is not just the land tax of the Qing Dynasty in the 19th century. The total revenue of Qing Dynasty before the First Opium War rarely exceeded 50 million taels of silver, even surcharge added. As will be discussed later in this dissertation, the total revenue at that time included land tax (about 20~25 million taels of silver), salt tax (about 5 million), customs duties (about 5 million), selling of offices (about 2 million) and miscellaneous taxes (about 1 million).

On page 152 Vries quotes:

“The regular income of officeholders totalled only 6,295,000 taels, while the extra income totalled about nineteen times as much as the regular income. The combined total income of gentry members from office holding was an estimated 121,000,000 taels annually. This large sum was shared by some 23,000 incumbent Chinese officeholders, who constituted about 1.6 per cent of the total gentry ranks in the late nineteenth century. On the average, the gross income of an officeholder amounted to more than 5,000 taels per annum.”

Actually, this sentence was cited from page 42 of Chung-Li Chang’s 1962 dissertation on *Income of the Chinese Gentry*. However, this description is not supported by source material. There are no “personal income” statistics available for this period. This problem with Chang’s work was also observed in the 1963 review of the book in the *American Anthropologist* by Robert M. Mars.¹²

The main aim of this PhD-dissertation is to reflect on the Chinese development and the role of the state and its institutions in a broader understanding. Its specific focus is a fiscal one. The main contribution to the debate on Chinese economic performance builds on fiscal data. To answer the question of China’s or England’s

¹² Robert M. Mars (1963). Bookreview on page 963 and 964 in *the American Anthropologist* 65.

uniqueness in their economic development models, my focus is very much on the role of the Chinese state, on fiscal development, and on to what extent the government or administration intervened in society. The analysis of fiscal data is at the heart of this PhD-dissertation. But to build my argument an understanding is required of the fiscal regime, its options and alternatives regarding the two pillars of any society: the demographic composition and development and the structure and development of the Chinese economy. In addition to this, a chapter has been added on the Chinese state and its willingness to intervene in specific conditions. These arguments combined will hopefully form a reply to Peer Vries's statements on the paternalist Chinese interventionist state.

Another disclaimer, this dissertation will not offer a comparative analysis, although there will be references to literature on Europe occasionally. This dissertation presents specific knowledge of Chinese history based on Chinese sources. My case study is the Qing dynasty, 1644-1911.

Chinese society has a long and continuous development, and can be seen as one of the oldest and most enduring traditions and civilisations in the world. Importantly, this continuity is the result of state formation, and the role of Chinese institutions. In this sense, when compared with the West with its many rising and vanishing civilisations, China could be regarded as special, as its continuity bridges millennia. The question remains how state and economy in China were interrelated. That is the main lens for my research. I am convinced that when conducting research on China's political affairs, one needs to consider economic factors and vice versa, since these two aspects are closely intertwined in the social fabric of a country.

To understand the characteristics of economic development in the Qing dynasty, this study examines some of the relevant aspects of the economy. This includes population development and the way this issue was discussed in China, the production and composition of the total trade value in parts of China, the fiscal transformation that happened during the Qing period and with specific attention for

disaster relief as an indicator of resilience and state response in this period. I focus on these aspects to analyse the existing literature, the most relevant data, and to clarify the type or model of economic development in Imperial China and how the state acted accordingly.

In compiling this dissertation, I have drawn materials from three main unpublished series of sources.¹³ I like to start with the most relevant, which are the First Historical Archives of China (Beijing), including:

- *Zhupi Zouzhe* (Palace Midrange Rescript Memorials), for which the archive accession numbers always begin with the numeral 04, for example, 04-01-35-0326-043. Archive accession numbers give complete information about the archived item. The here mentioned example indicates that the item belongs to *Zhupi Zouzhe* and refers to a report submitted by Gao Chen, a Shanhai Guan district officer, on December 22, 1750 (Chinese lunar calendar).¹⁴
- *Tiben* (Reports to Emperors), whose archive accession numbers always

¹³ As my book Ni, Y. (2016). *Customs Duties in the Qing Dynasty, ca 1644-1911*. indicated, there were only few scholars who used the first hand archives to analyse these topics. An absence of archive material will create a blind-spot within the field of research. For example, with the exception of Tang and myself about the customs duties, most researchers have drawn their data from two sources: *Shi Qu Yu Ji* (SQYJ) by Wang Qingyun; and *The List of Money and Grains Sent to and from the Provinces in the Seventeenth Year of Jiaqing in the Qing Dynasty*. I have shown, however, that these sources are unreliable because customs data are missing for many historical periods and major ports of entry (on land borders or domestic waterways, and along the eastern coast). By inspecting archives from the First Historical Archives of China, I found that data in SQYJ for Chongwenmen, Zuoyi, Youyi, Nanxin Guan and Zhehai Guan are inaccurate for the years 1841, 1842, 1845 and 1849, while the data in LMGS for Zhangjiakou, Shanhai Guan, Shahukou, Chongwenmen, Huai'an Guan, Hushu Guan, Yangzhou Guan, Xixin Guan, Jiujiang Guan, Longjiang Guan and Beixin Guan are inaccurate for the years 1811 and 1812. When customs data from the above mentioned less reliable data points are added, the data in LMGS is higher by more than 200,000 taels of silver per year and higher in SQYJ by more than 1,000,000 taels (Ni Yuping, 2008 A & B.)

¹⁴ Generally, the Governor and Viceroy would report every important affair to the Emperor and the Emperor would write some comments on the report with a red pen. The words in the report will be written in print style and could be easily seen. Zhupi means it was commented by the Emperor with red pen. So *Zhupi Zouzhe* (Palace Midrange Rescript Memorials) was the original report. In order to keep the record, the court had all the copies of the *Zhupi Zouzhe*, which bore the name of *Lufu Zouzhe* (Extra Copies of Grand Council Memorials). *Tiben* (Reports to Emperors) also was one kind of official's reports to the Emperors.

begin with 02, for example 02-01-04-14795-017. Archive accession numbers give complete information about the archived item. The example given refers to an item belonging to *Tiben* and identifies a report submitted by Jiangfu, a minister of the Ministry of Revenue, on May 10, 1754 (Chinese lunar calendar).

— *Lufu Zouzhe* (Extra Copies of Grand Council Memorials), whose archive accession numbers always begin with 03, for example 03-604-040. Archive accession numbers always give complete information about the archived item. The example refers to an item belonging to *Lufu Zouzhe* and identifies a report submitted by Chang Fu, a Shanhai Guan district officer, on November 12, 1789 (Chinese lunar calendar).

— *Shangyu Dang* (Edict Records), the emperors' orders; when cited in this dissertation these are followed by the date of issuance, as given in the archive.

To save space and facilitate ease of use, when I cite *Zhupi Zouzhe*, *Tiben*, or *Lufu Zouzhe* I only give the archive accession numbers of items, which could be traced back through the reporter's name and the date on which the report was submitted.

The second major source is a selection made from a variety of published records, by the First Historical Archives of China and the National Palace Museum in Taiwan and includes the following:

— *Gong Zhong Dang Kang Xi Chao Zou Zhe* (Palace Midrange Rescript Memorials of the Kangxi reign),

— *Gong Zhong Dang Guang Xu Chao Zou Zhe* (Palace Midrange Rescript Memorials of the Guangxu reign),

— *Gong Zhong dang Qian Long Chao Zou Zhe* (Palace Midrange Rescript

Memorials of the Qianlong reign),

— *Gong Zhong Dang Yong Zheng Chao Zou Zhe* (Palace Midrange Rescript Memorials of the Yongzheng reign),

— *Guang Xu Chao Zhu Pi Zou Zhe* (Palace Midrange Rescript Memorials of the Guangxu reign),

— *Guang Xu Xuan Tong Liang Chao Shang Yu Dang* (Edict Records of the Guangxu and Xuantong reigns),

— *Jian Qing Dao Guang Liang Chao Shang Yu Dang* (Edict Records of the Jiaqing and Daoguang reigns),

— *Jian Qing Dao Guang Liang Chao Shang Yu Dang* (Edict Records of the Jiaqing and Daoguang reigns),

— *Kang Xi Chao Man Wen Zhu Pi Zou Zhe Quan Yi* (Translation of the Palace Midrange Rescript Memorials recorded in the Manchu language of the Kangxi reign),

— *Kang Xi Chao Han Wen Zhu Pi Zou Zhe Hui Bian* (Collection of the Palace Midrange Rescript Memorials recorded in the Han language of the Kangxi reign),

— *Qian Long Chao Shang Yu Dang* (Edict Records of the Qianlong reign),

— *Xian Feng Tong Zhi Liang Chao Shang Yu Dang* (Edict Records of the Xianfeng and Tongzhi reigns), and

— *Yong Zheng Chao Man Wen Zhu Pi Zou Zhe Quan Yi* (Translation of the Palace Midrange Rescript Memorials recorded in the Manchu language of the Yongzheng reign).

The first and second sources are the archives and the first hand materials, which are the cornerstone of this dissertation. The third and last source is the *Chaodang* (Copies of the Archives), which is stored in the library of the Institute of Economics, the Chinese Academy of Social Sciences. As some archives have been lost throughout the centuries, sometimes I have had to rely solely on the *Chaodang* as a data source. However, as a rule I gave priority to inspecting archives first hand (rather than copies), and I only cite the *Chaodang* instead if I could not find the original archive entry or data was missing in that archive.

Needless to say, in addition to archives, there are many kinds of official books, gazetteers, and other historical records (such as published collections written by individual officials) that also became relevant in my research. I provide details of these sources when they are cited. These are the building blocks that I use, in combination with the existing and growing scholarship on Chinese economic history. I also will refer to recent publications of Chinese scholars available in Chinese.

There have been a multitude of important debates on Chinese economic history. However, in this dissertation I had to limit myself to only discussing a select few aspects. Firstly, the dissertation aims to describe and contextualise the population expansion of Qing China, analyses the solutions employed, and tries to establish whether or not Malthusian principles had been independently developed in China at about the same time as in the West. Secondly, by accessing first-hand archival materials, the dissertation tries to estimate the total trade value of goods in the early 19th century Qing dynasty, and thereupon compare the role of the trade sector in the economic development of different countries. Thirdly, the dissertation focusses on the fiscal system. In doing so it shows how the Qing court could be typified as traditional and conservative, as no single entity had the power to challenge the natural progression of events. The last element is a case study detailing a big flood in 1823. This aims to verify whether Beijing spent a much higher share on disaster relief in comparison with the disaster responses of major European nations during severe crises in the 19th century. This way, the dissertation tries to answer the central

question, that is, whether the Chinese economic development can be considered unique or similar to the West.

1. Population Expansion and Demographic Pressure in Qing China (1644-1911)

1. “The Chinese Thomas Malthus”

In 1798, Thomas Robert Malthus (1766-1834) published the classical book, *Principles of Population*, which had a worldwide influence. Malthusian thinking consists mainly of the idea, that given fixed resources (usually agricultural land), population growth automatically means less per capita income down to the point where people would starve. A main insight was, that this holds, even if the size of land resources grows. For example because agricultural land is claimed from swamps, or forest, or it is used more intensively due to better agricultural techniques such as rice terrace farming or new American crops. The reasoning is that population may grow exponentially and thus faster than agricultural output increases again bringing down per capita output to a point where it endangers human existence.

According to Malthus, these arguments fall in two sections, the so called “positive checks” and “preventive checks”. Stated simply, the contemporary Chinese arguments fall in the former category where the number of people is checked to a level that allows for a per capita income at which humans are able to survive. The stated policies of infanticide, and outright killing of certain social groups as well as disaster, disease and civil war all fall in the same category and are usually not regarded as acceptable or even preferred “solutions” to the problem of population pressure, because they usually represent problems in their own right to some degree.

More relevant are thus policies and mechanisms that solve the topic before it even arises, i.e. preventing a number of people inconsistent with the availability of food. In 19th century China, controlling the marriage age would be such a policy, as

well as effectively enforcing one or two births per couple. Other mechanisms would include restricting the share of female population getting married at all in connection with restricting the out of wedlock births, a social pattern found in large parts of early modern Europe commonly referred to as the “European marriage pattern” (Clark 2008, Hajnal 1965).

Practically, the literature usually tests for either of these arguments by empirically relating two sets of variables to each other: The positive check supposes that per capita income (as measured in various ways such as GDP per capita or real wage) should be positively correlated with the mortality rate, and the preventive check supposes that per capita income should be negatively correlated with the birth rate. Of course, there are plenty of more or less sophisticated setups to test these hypotheses all coming down to the same basic idea. What is more important, though, that when done properly they rely on time series econometrics and thus annual data and auxiliary information. These are not available for 19th century China. Still, the data presented here are the best available and should be interpreted with the theory just explained in mind.

The other important insight from reflecting in the mirror of Western literature is that the whole point of testing for Malthusian checks is concluding that if and when they don’t apply any more, an economy has apparently moved on. In turn it enters a post-Malthusian era, where population grows and still can enjoy rising per-capita income. European states experienced this sooner or later in the first half of the 19th century, ironically right after Malthus’s treatise.

There have been myriads of writing on demographic subjects since Thomas Malthus’s book publication. Utilising his main arguments and testing his main propositions has been at the core of this type of literature. While this chapter is mainly about the scholarly reflection in Qing China on demographic issues revealing the same analytic approach on the mechanisms of population growth and per-capita income, the most common question in the Western discourse is about, if and when,

this close interaction of resources and per capita income was abandoned in whatever region.

In 1793, the 58th year of the Qianlong period within Qing China, five years before Thomas Malthus published his book, *An Essay on the Principle of Population*, a Chinese scholar named Hong Liangji (1746-1809) wrote an article about the pressures of population growth during his time. It received as a title: Zhi Ping Pian (治平篇, On Governance and the Well-being of the Empire).¹⁵

Hong was a famous scholar in the Qing. In 1790, he won the second place in the Imperial Examination and worked in the Imperial Academy. Among all his works, the most famous was his research on population. Even though his writing predates Thomas Malthus' treatise, Hong almost reached similar conclusions. In the *Zhi Ping Pian* it states:

There have never been people who did not delight in living under a peaceful rule, and none unhappy about living under a peaceful rule that has lasted for a long time (i.e., more than one hundred years). However, in the matter of population, it is noted that today's population is five times as large as that of thirty years ago, ten times as large as that of sixty years ago, and not less than twenty times as large as that of one hundred years ago.

Take for example a family that at the time of one's great-great-grandfather or that of one's great-grandfather was in possession of a ten-room house and a one hundred *mou* piece of farmland. After the man got married there were at first only the two of them (husband and wife) living in the ten-room house and on the one hundred *mou* piece of land, with their resources more than ample. Assuming that they had three sons, by the time the sons grew up, all three sons, as well as the father, would have had their own wives, thus, totalling eight people. Eight people would require the help of hired servants, amounting to say, ten people in the household. With the ten-room house and the one hundred *mou* piece of farmland, they likely would have just enough accommodation and food to eat, although barely enough. However, in time, there would be grandsons, who in turn would marry. The aged members of the household would pass away, but there could still be more than twenty people in the family. With more than twenty people sharing a ten-room house and working on a one hundred *mou* piece of farmland, even if they ate very frugally and lived in crowded quarters, their needs would likely not be met. Moreover, there would be great-grandchildren and great-great-grandchildren, and the total number of

¹⁵ Hong Liangji, *Collections of Hong Liangji*. Zhonghua Publishing House, 2001, p.14.

people in the household would be fifty or sixty times that of the great-great-grandfather's or great-grandfather's time. For every household at the time of the great-great-grandfather, there would be at least ten households at the time of the great-great-grandson and great-grandson. Some families' population would have declined, but there would also be lineages whose male members would have greatly multiplied, compensating for the cases of decline.

One may say that at the time of the great-grandfather and great-great-grandfather, not all uncultivated land had been reclaimed and not all available housing had been filled. However, the amount of available farmland and housing likely had only doubled or at the most increased three to five times, while the population would have grown ten to twenty times. Thus, farmland and houses are always in short supply, while there is always a surplus of households and excess in the population. Furthermore, some families would have bought or otherwise appropriated other people's properties such that one person owns the houses of more than a hundred people and one household occupies the farmland of a hundred households. No wonder that everywhere there are people who have died from exposure to windstorm, rain, and frost or from hunger and cold and the hardships of homelessness.

This leads us to ask whether there is a natural way to deal with such a situation. Floods, droughts, and plagues are natural ways of reducing the population. However, people who unfortunately become victims of such calamities are no more than 10% or 20% of the total population.

Do the ruler and his ministers have a way of dealing with such a situation? They may make adjustments in the following ways: pursuing policies to ensure that no farmland remains unused and that there is no surplus labour. Moreover, migration of farmers to newly reclaimed land may be organized; heavy taxes may be reduced after a comparison is made between past and present tax rates. Extravagance in consumption may be prohibited; and the appropriation of other people's properties to wealthy household may be suppressed. Should there be floods, droughts, and plagues, grains in the granaries may be made available, and all the funds in the government treasury may be used for relief. These are all that the ruler and his ministers can do in the way of adjustments between population and productive land.

In summary, after a long period of peaceful rule, nature cannot stop the people from reproducing; yet, the resources with which nature nourishes the people are finite, and what the ruler and the ministers can do for the people is limited to the policies enumerated above. Among ten youths in a family, there is always one or two who would resist going to school. With some idle people in all the empires, how can it be expected that all will accept control from authorities? Housing for one person is inadequate for the needs of ten people; how can it be sufficient for a hundred people? The food for one person is inadequate for ten people; how can it be sufficient for a hundred people? This is why a period of peaceful rule concerns me.

Hong dared to raise questions regarding current affairs and criticised the chosen

responses, a choice for which he ended up suffering a lot. Hong's lifetime experienced one of the fastest population expansions in Chinese history. The population boom resulted in a series of socio-economic problems. He found that the increase in production was slower than the population's growth, and he believed that the tension would be relieved by disasters, famines, plagues, and wars. Hong pointed out that the government could mitigate the problem through policies such as adjusting taxes, encouraging colonisation, and enhancing the social safety net. However, he expressed his concern about the limits of population boom and policies by the government to solve the population crisis in addressing such an inherent structural dilemma. Hong's article didn't get accepted by the Emperor Qianlong, and he was even sentenced to death in 1799 since he infuriated the court by criticising the current politics. Of course, he was not executed but exiled to the Yili region in the Xinjiang province by the Emperor.

From these analyses, we can conclude that Hong's idea was very similar to Thomas Malthus' idea of positive and preventive or moral checks. It is therefore adequate that Hong was called the "Chinese Thomas Malthus." Referring to an obvious parallel in contemporary Chinese policy, these ideas laid the ground to formulate the one-child-policy (despite their very recent abolition) in modern China.

After Hong, there were also some scholars who had suggestions about the population problem; of them, Wang Shiduo (1814-1889) was the most famous. Wang's idea was mainly recorded in his *Yibin Riji* (Diary in 1855). Wang believed that "the population would double in 30 years if there were no war. However, production did not increase at the same pace. All the mountains had been sown with corn and all the rivers had been changed to agricultural land. The planting technology was already highly developed; all the vegetables had been eaten, but it was still not enough to feed such a huge number of people." "The society would be in poverty and turmoil if there were more people, of which the Taiping Rebellion was a result."¹⁶

¹⁶ Wang Shiduo, *Wang Huiwong Yibin Riji* (Diary of Wang Shiduo). Wenhai Press in Taiwan, 1975, p.88.

Wang had a number of suggestions to reduce the population. The first was to implement a late marriage policy. During his time, a couple would get married generally at the age of 15 or 16. Wang decreed that men and women should be married no earlier than at the ages of 30 and 25 years, respectively. Anyone in violation of this rule should be sentenced to death. The second was to control the birth rate. He said one family could only have one boy or one girl, and two boys would be the maximum allowed but having two girls was not permitted. Children above that number must be killed, and abortion should be used in the family that already had a kid. The third was to adopt even more draconian law. The government should kill large numbers of criminals, especially the rebels who should be killed at once. Just like Hong, Wang's ideas were not accepted by the rulers at all. The population expansion was instead "solved" by the Taiping Rebellion and other series of wars.¹⁷

From above it becomes clear, that Malthusian thinking was independently developed and established in the Chinese discourse at about the same time as in the West, and that the main strands of argument were in fact following Malthusian principles. However, the question when China actually ceased to be a Malthusian society will be left for further research.

2. Population Expansion in the Early Qing

While the first section presented a historical summary of the internal Chinese discourse on demographic policies during the Early Qing era, the following section empirically establishes the size of the Chinese population at the same time. It is very difficult, however, to estimate the population of ancient China since the census standards varied greatly and were primarily used for estimating taxes. However, with

¹⁷ Wang Shiduo, *Wang Huiwong Yibin Riji (Diary of Wang Shiduo)*. Wenhai Press in Taiwan, 1975.

the tedious and impressive work of many scholars, the population estimates of Qing China have become increasingly accurate. Among them, Cao Shuji's data has the biggest influence.¹⁸

Table 1.1: Population in the Qing Dynasty

Provinces	1644	1776	1820	1851	1880	1910
Jiangsu	27120000	32436000	39435000	44719000	29491000	32355000
Zhejiang	19900000	22365000	27335000	30276000	16029000	18490000
Jiangxi	19300000	18783000	22346000	24286000	13316000	14961000
Anhui	27120000	25857000	32068000	37386000	21392000	25197000
Shandong	13080000	27902000	32326000	35585000	38978000	43881000
Henan	8460000	23150000	27498000	30771000	26218000	31087000
Zhili	7300000	17799000	23082000	27055000	31587000	37328000
Hubei	6200000	16173000	19482000	22187000	18966000	22077000
Hunan	7000000	15252000	18981000	21809000	22512000	26320000
Shanxi	5700000	12262000	14339000	15838000	8827000	11867000
Sichuan	5000000	16811000	23565000	29465000	36461000	45633000
Guangdong	7800000	18445000	21405000	23859000	26447000	29461000

¹⁸ In Qing China, there were 18 provinces and 5 new provinces, including Xinjiang (新疆省) in 1884, Liaoning (奉天省) in 1907, Jilin (吉林省) in 1907, Heilongjiang (黑龍江省) 1907, Taiwan (臺灣省) in 1885-1895. In Cao's table, it also includes Qinghai (1928) and Mongolia (1947) and there were some data points missing in certain years and provinces.

Fujian	8800000	13779000	16545000	18407000	14167000	15471000
Guangxi	3500000	7662000	9461000	10962000	12592000	14535000
Yunnan	2400000	7884000	10299000	12675000	11645000	13468000
Guizhou	2500000	5672000	7478000	8794000	10254000	12047000
Shaanxi	7400000	7965000	12130000	13269000	7075000	9545000
Gansu	2390000	15799000	17605000	18990000	4955000	7161000
Liaoning		610000	1757000	2582000	4090000	10696000
Jilin		294000	567000	1238000	2569000	5477000
Heilongjiang		108000	168000	370000	775000	1663000
Mongolia	50000	1855000	2290000	2656000	3052000	3497000
Qinghai		280000	300000	314000	329000	344000
Xinjiang		862000	1105000	1363000	1392000	2169000
Xizhang	800000	1140000	1190000	1231000	1270000	1312000
Total	152470000	311465000	383100000	436087000	364389000	436042000

Source: Cao Shuji, "Population history," vol. 4, pp. 451-452; vol. 5, pp. 703-704. Due to the limit, Cao's book does not offer the 1644 population data for Liaoning, Jilin, Heilongjiang, Qinghai and Xinjiang provinces.

Below you can find a graph of the absolute size of population and how it changed during the Qing Dynasty.

Graph 1.1: Population in the Qing Dynasty

Regarding Graph 1.1, we can see that there was a sharp population increase before 1850, during a period of almost 100 years of peace. The population increased from 150 million in 1644 to 436 million in 1851, more than doubling (almost tripling) in 200 years.¹⁹

The population expansion resulted in a series of socio-economic problems. It is common knowledge that in the last decades of the 19th century, the living standards of ordinary people dropped to a very critical level and even caused the concerns of the court. Even more than 100 years earlier, it already had attracted the attention of the Emperor:

The Kangxi Emperor (in power from 1661 to 1722) had a clear understanding of the pressures associated with the population size. In 1699 when he travelled to the Yangtze area, the richest area of China, he said that “I have always applied an exemption from the land tax and delivered relief as disasters happened in Jiangsu and Zhejiang provinces. However, the living standards of the people are not as good as before.”²⁰ In 1709, he said that “We have had a long peaceful time and the population has increased very quickly. I have always been worried about the situation

¹⁹ Kent Deng, *China's Population Expansion and Its Causes during the Qing Period, 1644–1911*, in London School of Economics paper No: 219/2015.

²⁰ *Qing Shilu of Shengzhu Times* (Veritable records of the Qing Dynasty, in Kangxi Times), vol.193.

where food was not enough for the people, even during the harvest season and year.”²¹ “We have united our country for more than 60 years without any war, and the population has increased very quickly, but the amount of arable land has not increased at the same speed. The level of wealth that belonged to one person before should now be divided into several parts; how could that be enough in such a critical situation?”²² In 1710, he also said that “the people were not as wealthy as before because of the long peace time, and the population increased without the same growth of arable land and food production. Without enough food, how is it possible to become rich?”²³ In 1712, he said that “the price of rice has increased continuously, and many people cannot even find a job.”²⁴

The Yongzheng Emperor (in power from 1723 to 1735) continued his father’s policy. In 1723, he said that;” Our country has last for a long prosperity without any wars and the population expands so quickly that the arable land could not feed the people. If it had a bad crop, people would be hard to find food.”²⁵ In 1729, Yongzheng pointed out that all the uncultivated land should be used to feed the people.²⁶ This situation continued to last well into the Qianlong era. In 1791, the Emperor expressed his worries to the court officials that the resources available might not be able to support the growing population.²⁷

3. Solutions for the Demographic Pressure

The Qing government suggested some solutions to the population problem. First, with the government’s encouragement new world crops such as maize, potatoes, and sweet potatoes were planted. Before it, rice and wheat were the most important

²¹ *Qing Shilu of Shengzhu Times* (Veritable records of the Qing Dynasty, in Kangxi Times), vol.236.

²² *Qing Shilu of Shengzhu Times* (Veritable records of the Qing Dynasty, in Kangxi Times), vol.240.

²³ *Qing Shilu of Shengzhu Times* (Veritable records of the Qing Dynasty, in Kangxi Times), vol.244.

²⁴ *Qing Shilu of Shengzhu Times* (Veritable records of the Qing Dynasty, in Kangxi Times), vol.250.

²⁵ *Qing Shilu of Shizong Times* (Veritable records of the Qing Dynasty, in Yongzheng Times), vol.6.

²⁶ *Qing Shilu of Shizong Times* (Veritable records of the Qing Dynasty, in Yongzheng Times), vol.80.

²⁷ *Qing Shilu of Gaozong Times* (Veritable records of the Qing Dynasty, in Qianlong Times), vol.948.

crops for Chinese. According to the report of United Nations International Fund for Development, we could see that “The oldest written record of maize in China appears in *Dian Nan Ben Cao* by Lan Mao in approximately 1492 (Liang and Johnnessen 1987). The original usage of maize was as traditional Chinese medicine. The earliest written record (from 1560) of maize as a food crop mentions that maize was a popular cereal crop cultivated in conjunction with rice, wheat, and millet in Pinliang Fu, Gansu Province, in northwestern China. Records also indicate that maize was used as a tribute to the emperor (Liang and Johnnessen 1987). Other historical accounts describe the cultivation of maize in the hilly areas of Fujian Province on China’s southeastern coast in the 16th century (Huang and Rozelle 2006). By the early 20th century, maize had become one of China’s major crops (Tong 2000). The maize area expanded to 10 million mou, approximately 12% of total cultivated area, between 1900 and 1930.”²⁸

Corn and sweet potatoes had been introduced in the Ming dynasty (1368-1644). Corn had appeared in the Guangxi province in the period of Jiajin (1521 to 1566) but only appeared in Hunan and Sichuan during the Kangxi era of the Qing dynasty. Sweet potatoes had appeared in China at about 1580 and became popular in the early years of the Qing dynasty. These crops produced more calories per acre than rice and wheat, which were the main food staple for the Chinese people. These new crops could also be planted in barren land. In the late Ming, Xu Guangqi (1562-1633), a very famous scholar and the author of *Longzheng Quanshu* (Encyclopedia of Agriculture), wrote; “Where sweet potatoes were planted, the people would have half of the food. More and more people began to plant it.”²⁹

When the Qing Emperors noticed the increasing pressure of population growth, they implemented tax relief and river maintenance works, developed agricultural technology, and at the same time, Qianlong Emperor ordered all kinds of local

²⁸ Meng, E.C.H., Ruifa Hu, Xiaohua Shi, and Shihuang Zhang (2006). *Maize in China: Production Systems, Constraints, and Research Priorities*. (Mexico, D.F.: CIMMYT), p. 2.

²⁹ Xu Guangqi, *Longzheng Quanshu* (Encyclopedia of Agriculture), vol. 18.

governments to set incentives for planting new crops, especially corn and sweet potatoes. For example, in 1785, Qianlong Emperor said that “sweet potatoes are edible and have good drought resistance. We should let the people know about this and plant them wherever possible. That would be a good solution to the problem of excessive population growth.”³⁰ By checking the records of all kinds of gazetteers in the Qing Dynasty, I found that there were 118 counties that did not plant corn. With the help of the government that number was reduced to 72 in 1820 and 40 in 1851, which means that eventually over 90% of the counties planted corn.³¹

Graph 1.2: The Direction of the Spread of Corn³²

Many books and papers stated that this was how such a huge population was

³⁰ *Qing Shilu of Gaozong Times* (Veritable records of the Qing Dynasty, in Qianlong Times), vol.1268.

³¹ The number of prefectures and countries varied in the Qing Dynasty. Generally speaking, there were about 1500 counties before 1850 and 1700 counties before 1911. See *Qing History Record* (Qing Shi Gao), vol.54-81.

³² Han Maoli, *Jin Wu Bai Nian Lai Yu Mi Zai Zhong Guo Jing Nei De Chuan Bo* (The Spread of Corn in Chinese Territory in Recently 500 years), in *Zhongguo Wenhua Yanjiu* (Journal of Chinese Culture), vol.1, 2007.

fed at that time. Pan Xinghui wrote in his book that “the population increased so quickly, and this was due to the sweet potatoes, corn, and other crops that had appeared in China. These crops had the characteristics of strong adaptability and high yield and thus, became the main food of the poor people in the Qing”³³. However, there are no records on how much area had been used to plant corn or sweet potato. According to the census of 1914-1918, the area for planting corn and sweet potatoes was about 7.2% of the total arable land and its production was 7.7% of the total production. Searching through various sources from 1920, the production had increased to 9% of total production. Since the area for planting corn and sweet potatoes at that time had increased steadily, the ratio during the Qing Dynasty must have been even lower. In the 1930s, there was an investigation about corn and sweet potatoes. There were very small parcels of land to plant corn in Anhui, Inner Mongolia, Fujian, Guangdong, Guizhou, Henan, Jiangsu, Jiangxi, Ningxia, Shandong, Yunan, and Zhejiang province. From the records, we can find the ratios during 1930s: Gansu had 6.5%; Guangxi, 17.2%; Hebei, 15%; Helongjiang, 5.3%; Hubei, 10.7%; Hunan, 3.9%; Jilin, 5.4%; Liaoning, 2.6%; Shaanxi, 5.4%; Shanxi, 11.3%; Sichuan, 13.2%; and Xinjiang, 19.2% of its arable land planted with corn. Only seven provinces had between 10% and 20% of their arable land planted with corn. Regarding sweet potatoes, Inner Mongolia, Ningxia, Qinghai, Gansu, and Shanxi had very little land to sow, and Shaanxi, Hebei, Shangdong, Hennan, Anhui, Guizhou, and Yunnan had 1%, Jiangsu, Hubei, and Zhejiang had 2%, Jiangxi and Guangdong had 3%, Hunan had 5%, Fujian, and Guangxi had 6%, of its land planted with sweet potatoes.³⁴

By Wu Hui’s estimate, the production of these two crops represented 4.63% of the total food production in tons in the Qing dynasty.³⁵ Based on this, we can

³³ Pan Xinghui, *Changes in the History of China*, translated by David T.W. Pun, Hong Kong: Red Publish, 2014, p.44.

³⁴ Han Maoli, Jin Wu Bai Nian Lai Yu Mi Zai Zhong Guo Jing Nei De Chuan Bo (The Spread of Corn in Chinese Territory in Recently 500 years), in *Zhongguo Wenhua Yanjiu* (Journal of Chinese Culture), vol.1, 2007.

³⁵ Wu Hui, *Zhongguo Lidai Liangshi Muchan Yanjiu* (Study on the Grain Production per mu in the Ancient Dynasties of China), Agriculture Press, 1985, p.197.

conclude that the new crops were not as important as scholars previously assumed.³⁶ Traditional food, including rice and wheat, was more important than the new crops in supporting such a huge population, from 100 million to 400 million.

The second solution to the demands of population expansion was to make new parcels of land available to the poor. In 1759, the Qing dynasty occupied Xinjiang (New Frontier or new borderland in Chinese characters), an area of 130 million km² in the northwest. The government attempted to welcome people who wished to settle there, and the emperors always issued an Imperial Edict in order to help poor citizens. It even provided migrants with seeds and tools and tax exemptions for a number of years. By a rough estimate, the land reached 1 billion mou. However, as a whole, in 1773, Qianlong Emperor said that “land reclamation had been carried out everywhere on the mainland and one could hardly find more space. The only available land was in Xinjiang, such as Urumqi, which would still be able to accommodate some settlement.” However, due to the warfare and disease in the 18th century, the population in Xinjiang was still decreasing. In the Late Qing, some poorer people also tried to go to Manchuria in the northeast, especially the Manchus people received help from and organisation by the State.

Table 1.2: Average Population Density in the Qing Dynasty

Provinces	Area	1644	1776	1820	1851	1880	1910
Jiangsu	102907	264	315	383	435	287	314
Zhejiang	100474	198	223	272	301	160	184
Jiangxi	165365	117	114	135	147	81	90
Anhui	143475	189	180	224	261	149	176
Shandong	151547	86	184	213	235	257	290
Henan	167761	50	138	164	183	156	185
Zhili	351176	21	51	66	77	90	106
Hubei	184359	34	88	106	120	103	120
Hunan	210104	33	73	90	104	107	125
Shanxi	196975	29	62	73	80	45	60
Sichuan	611504	8	27	39	48	60	75

³⁶ Chen Zhiwu, *What Does Quantitative Historical Research Tell Us?* in *Economic Observer*, Sep.16, 2013.

Guangdong	225177	35	82	95	106	117	131
Fujian	159016	55	87	104	116	89	97
Guangxi	220950	16	35	43	50	57	66
Yunnan	410124	6	19	25	31	28	33
Guizhou	177083	14	32	42	50	58	68
Shaanxi	188089	39	42	64	71	38	51
Gansu	530294	5	30	33	36	9	14

Source: Cao Shuji, "Population History," vol. 4, pp. 451-452; vol5, pp. 703-704

In the late 18th and early 19th centuries, population increased quickly in areas such as Sichuan, Shandong, Guangdong, Fujian, Guangxi, and Guizhou; but as a whole, the rate of population growth was still low compared to the Early Qing. The Yangtze Delta and North China were still the centres of the Chinese population, the most populated areas in China.

Another important indicator is population per unit of arable land in the Qing dynasty.

Table 1.3: Population per unit of Arable Land in the Qing Dynasty

Time	Population(million)	Million <i>Mou</i>	Per <i>mou</i>
1661	153	645	4.22
1720	215	984	4.58
1850	436	1254	2.88

Source: Cao, "Population History," vol5, pp. 703-704; Shi Zhihong (2015), Qingdai Longye Shengchan Zhibiao de Guji [Estimation of the Agricultural Production Indicators in the Qing Dynasty], Jingjishi Yanjiu [Researches In Chinese Economic History], 3:5-30.

From the table we can see that the units of arable land divided by population had a declining trend. This was also one reason why mandarins tried to carry out the policy of migration to Xinjiang and Manchuria, to increase the number of people per mou in these area's and lessening the population pressure in heartland China.

The third solution was birth control by the people themselves, without being encouraged but tolerated by the administration, just like Malthus's preventive checks. In Malthus's idea, there were two types of checks. The first ones are the positive

checks, which arise from vice and misery and raise the morality rate. He wrote, “Under this head...may be enumerated all unwholesome occupations, severe labour and exposure to the seasons, extreme poverty, bad nursing of children, great towns, excesses of all kinds, the whole train of common diseases and epidemics, wars, plague and famine.” The second ones are the preventive checks, which have an effect on the birth rate and stem from moral restraint (e.g. the delay of marriage). Malthus said; “Promiscuous intercourse, unnatural passions, violations of the marriage bed, and improper arts to conceal the consequences of irregular connections, are preventive checks that clearly come under the head of vice.”³⁷ According to several works by James Lee, Cameron Campbell, and Bozhong Li, taking such measures was popular among poor families. James Lee showed that it was very common to apply infanticide, and the share of babies killed after birth was about 1/5 to 1/4 in rural villages.³⁸ They also found from their study of 33,000 cases of rich families from 1700 to 1830, that 1/10 of infants were killed during the early days of their lives.³⁹ However, the population growth still remained very high since the Chinese maintained their traditional belief that having more kids (especially boys) provided greater happiness.

The fourth way were disasters and wars, a positive check and has the effect of reducing the population number. Disasters were very common in Qing China. Based on the very rough statistics of Qing Shi Gao (Record of the Qing History), there were 2,681 counties (13.75 per year) that experienced big floods and 1,188 counties (6.09 per year) that had intensive droughts during the Qing dynasty. Together, there were 3,871 counties that experienced a large disaster during the Qing dynasty, reported by

³⁷ Malthus, *An Essay on the Principle of Population*, Duke University Press, 1992, pp.15-16.

³⁸ J. Lee, C. Campbell, *Fate and Fortune in Rural China: Social Organization and Population Behavior in Liaoning, 1774—1873*. Cambridge, England: Cambridge University Press, 1997, pp. 58—70; Li, Bozhong. (1996) Qingdai Qianzhongqi Jiangnan Renkou de Disu Zengzhang Jiqi Yuanjing [The Low Population Growth and Its Reasons of the Yangzi Delta Area in the Early and Mid-Qing Times]. *Qingshi Yanjiu* [Journal of Qing History Research], 2:10-19; J. Lee, Wang Feng, *One Quarter of Humanity: Malthusian Mythology and Chinese Realities*. Cambridge, Mass.: Harvard University Press, 1999, p. 51.

³⁹ J. Lee, C. Campbell, p.49.

the administration with the tax reduction.⁴⁰ On average, there were 20 counties yearly that experienced disasters, with substantial losses in terms of material wealth and lives. As discussed later in this PhD-dissertation, in 1823, about 20% of all counties were flooded, and about 50% of the government spending went to disaster relief, leading to great loss, both in terms of wealth and lives. The government started a war sometimes, probably mostly in defence, but also to obtain more territory for Chinese Han people. But of course, population loss caused by wars and disasters was not the intended goal of a policy, it was an unintended effect of such.

Aside from floods and droughts, all other kinds of disasters also happened frequently during the Qing dynasty. I have published a paper on the topic of hail storms and found that there were more than 6,400 hail disasters throughout the Qing era if we counted one county or prefecture as one figure in one year.⁴¹ This means that on average, there were 24 counties or prefectures that had hails storms per year with the consequential harvest loss. However, we hardly found information on the death rate due to hail storms, even though we found records about hails of more than 100 kg in the year of 1806, that led to deaths of farm cattle, which is much heavier than those on the records in the Western world.⁴²

Jiang Tao found that from 1850 to 1877, due to the Taiping Rebellion and various disasters, the population loss was about 180 million (this tally includes age related deaths and unrealised fertility). This significantly changed the trend of population growth. In fact, one can find that a drop in the population during

⁴⁰ As we showed before that the number of prefectures and countries varied in the Qing Dynasty. Generally speaking, there were about 1500 counties before 1850 and 1700 counties before 1911. See Qing History Record (Qing Shi Gao), vol.54-81.

⁴¹ Ni Yuping (2012). 清代冰雹灾害统计的初步分析(A Preliminary Analysis of Hail Disasters in the Qing Dynasty), in 江苏社会科学 Jiangsu Social Sciences, 1:218-224(Jan,2012).

⁴² In February 22th (Lunar time) of 1806, the hail storm happened in Xinhua county of Gongdong province, "it was more than several hundred Jin (half kg) and there was a quake where it fell ", seen Huang Peifang, Gazetteers of Xinhua County, vol.14, 1841. A hailstone of 1 kg is a registered record in the modern world.

<http://www.severe-weather.eu/theory/hail-world-records-the-biggest-heaviest-and-deadliest-hail/> states: Heaviest hailstone: 1.02 kg (2.25 lb); Gopalganj District, Bangladesh, 14 April 1986.

incidences of wars and disasters.⁴³ This war also shows a very interested fact to discuss the existence of Malthusian positive checks. Generally speaking, If population goes up, the likelihood of warfare and military conflicts should go up as resource scarcity increases, similarly when population goes down the likelihood of warfare should also decline. The connection to natural disasters as an endogenous variable here is an even more interesting point because in the first place it appears to be exogenous.

⁴³ Jiang Tao, *Zhongguo Jindai Renkou Shi* (The Population History in Modern China), Hangzhou, Zhengjiang Renmin Press, 1993, pp. 72-79.

Graph 1.3: Population Growth Ratio in the Qing Dynasty

Source: Jiang Tao, *Zhongguo Jindai Renkou Shi (The Population History in Modern China)*, Hangzhou, Zhengjiang Renmin Press, 1993, pp.72-79.

If we checked every province, also by Jiang Tao's research, the picture will be as follows during the Taiping Rebellion.

Graph 1.4: Population Growth Ratio in the Qing Dynasty

Graph 1.4 shows how Jiangsu, Zhengjiang, Jiangxi, Anhui, Shanxi, Shaanxi, and Gansu were the most seriously affected areas, which is in line with their status as the foremost battlefields.

As expected, the government also undertook some measures to help poor people, what is not in line with the idea that during Qing the mandarins became more reluctant to state intervention. For example, tax was reduced and other grain storage methods, which had been widely used.⁴⁴ The peasants also tried to improve

⁴⁴ Carol Hua Shiue, *Local Granaries and Central Government Disaster Relief: Moral Hazard and*

land cultivation using new technologies. However, in Qing China the most effective limiting factor on population growth was war and disaster.

4. Conclusion

The debate about the population in Qing Dynasty has lasted for a long time. From the discussion of the statistical standard of population (including Ho Ping-ti, Cao Shuji and Jiang Tao), to the cultivated land area and yields (including Dwight Perkins, Li Wenzhi, Zhao Gang, Guo Songyi and Shi Zhihong), and to the discussion of the development of farming technology (including Philip Huang, Li Bozhong, Han Maoli and Hou Yangfang, etc.,). All of the problems attracted attention from the academic community without finding the resolution of a certain conclusion.

In addition to population growth, inflation is another aspect of the Qing economy to be taken into account. Exact figures for inflation during the Qing dynasty are perhaps even more difficult to come by than population estimates. The easiest way of getting an idea of inflation during the Qing is to compare the various published estimates of changing price levels. Unfortunately the extent of inflation during the Qing period differs severely between the published estimates, and it is impossible to arrive at an index that is widely accepted.

Graph 1.5 Estimates of Price Trends in the Qing Dynasty

Source: Ma, Y., de Jong, H. J. & Chu, T. 2014, "Living standards in China between 1840 and 1912: A new estimate of Gross Domestic Product per capita", GGDC Research Memorandum No. 147, Appendix B, Table B. 12.

Richard von Glahn has combed these arguments, and he thinks that there is no Malthusian subsistence crisis in the Qing Dynasty: "The price inflation of the eighteenth century most likely reflected the substantial growth of the total money supply rather than the stress of overpopulation. China did not yet face a Malthusian subsistence crisis."⁴⁵ However, he also believes that "the efficiency of domestic markets, regional specialization of production, and an expanding money supply stimulated economic and demographic expansion in early Qing China. The steady rise in prices across the eighteenth century corresponded closely to the increase in population, suggesting that agricultural and industrial output kept pace with rapid population growth without any appreciable decline in per capita income. Yet the prosperity engendered by the quantitative growth in output masked the lack of significant innovation in productive technologies."⁴⁶ Therefore it is necessary to

⁴⁵ Richard von Glahn.(2016) .*The Economic History of China: From Antiquity to the Nineteenth Century*, Cambridge: Cambridge University Press, p.330.

⁴⁶ Richard von Glahn.(2016) .*The Economic History of China: From Antiquity to the Nineteenth Century*, Cambridge: Cambridge University Press, pp.335-336.

analyse and consider these arguments carefully.

Dwight Perkins concluded that per capita grain production remained stagnant during the Qing times, the increases in grain output occurred solely because the expansion in cultivated land, which allowed rising yields to keep pace with population growth.⁴⁷ In contrast, Li Bozhong's studies of Jiangnan agriculture have found substantial improvements in land utilization, capital investment, and labour productivity during the Ming-Qing era that raised agricultural output well beyond Song levels. However, Richard von Glahn disputes this and states that "It should be noted that Li's estimates for Song rice yields almost certainly are too low."⁴⁸

Another important topic is that a vast amount of the disputes concerning agriculture during the Qing Dynasty are concentrated in the Jiangnan area. Of course Jiangnan was very important as a region, but it bears repeating that using Jiangnan as a proxy for the entirety of Qing China is not academically prudent. The development or involution in Jiangnan does not constitute proof other areas had the same experience. Especially when we talk about the population expansion, huge swathes of the population migrated from Jiangxi to Hubei and then rushed on to Sichuan. Later, the White Lotus Uprising broke out and lasted from 1796 to 1804. During which farmers occupied 204 counties and prefectures and the Qing government spent 200 million taels of silver in military expenditure (equivalent to four years of fiscal revenue) in answer. As Hong Liangji had so tragically predicted it took the Taiping Rebellion to solve the population expansion in Jiangnan.

Following from our discussion above, there are no new arguments to state differently; seen in the lens of population development, China was the same as the West at that stage, not a special or different country. Thus, I maintain that Qing China was still in a regime described by Thomas Malthus, and clearly had not experienced a

⁴⁷ Perkins, Dwight H. (1968). *Agricultural Development in China, 1368-1968*. Chicago: Aldine, pp.13-26.

⁴⁸ Richard von Glahn.(2016) .*The Economic History of China: From Antiquity to the Nineteenth Century*, Cambridge: Cambridge University Press, pp.352.

“Malthusian Miracle.” The wars and disasters can undoubtedly be interpreted as "positive checks," and were thus the inevitable ways to reduce the population size. In other words, the same demographic laws applied to China as to the West, and more importantly, thinking about this had been developed contemporaneously and independently in China as well.⁴⁹

⁴⁹ Shou Chen, James Kai-sing Kung, Of Maize and Men: the Effect of a New World Cropon Population and Economic Growth in China, in *Journal of Economic Growth*, vol 1, 2016.

2. Total Trade Value in the First Half of the 19th Century Qing China

When studying the trajectories of the economic and political history of a major country such as China, the size of the population is always an important gauge, both of its economic prosperity and the relationship between the economy and the state. These have been discussed in the first chapter. The following chapter discusses the size of the economy itself in the context of its complex relationship with trade. Here we use the concept of “total trade value” to estimate the magnitude of commercial activities, including the value of both domestic trade and foreign trade. While its main contribution is the detailed presentation and discussion of a new data set, the discourse about trade and growth – however necessary – is painted with a broad brush only for reasons of focus.

The discussion begins with the question: is trade good for GDP growth?⁵⁰ The simple answer is that countries that engage in trade usually gain from it and historically grew faster than others. The two main reasons for *not* trading are – according to Acemoglu, Johnson and Robinson, a major contribution to this literature, -either bad geography or bad institutions. Clearly, China has had both. In the landmark paper of 2005, Acemoglu, Johnson and Robinson did not discuss China explicitly, but they included Maddison’s GDP estimates for China with 1820 being the only data point. Different from other less historically oriented contributions to this literature such as Frankel and Romer (1999), Acemoglu and his co-authors did not

⁵⁰ Frankel, J. A., & Romer, D. H. (1999). Does trade cause growth? In *American economic review*, 89(3), 379-399; Acemoglu, D., Johnson, S., & Robinson, J. (2005). The rise of Europe: Atlantic trade, institutional change, and economic growth, in *American economic review*, 95(3), 546-579. Keller, W., Li, B., & Shiue, C. H. (2012). The evolution of domestic trade flows when foreign trade is liberalized: Evidence from the Chinese Maritime Customs Service, in *Institutions and Comparative Economic Development* (pp. 152-172). Palgrave Macmillan, London.

use trade data, they only used geography as proxy. One reason for this is the lack of historical data about trade transactions for a broad set of countries throughout history. This is where the present chapter offers a contribution.

In recent years, with interdisciplinary communication developing, an increasing number of scholars with a background in economics have begun researching economic history, and theory-based historical research has become more and more popular. In addition, especially in the past 10 years, with the development of historical GDP research, the desire for access to sound historical data has become stronger. However, many time series data have their flaws, and much work is still required. The aim of this chapter is to establish insight on the value of goods traded in China in the first half of the 19th century.

Generally speaking, Chinese economic history data should be considered carefully. China has abundant economic data, but these data lack accuracy for various reasons. However, when supported by other sources and thus the ability for cross-checking, the historical records can be used to prove or reveal valid information.

An important example involves the official government seal: it was the main symbol of the power of the government. Carving official seals privately was a serious challenge to public power and the rule of governance by documents. Still, it was not uncommon to carve official seals in the Qing China, which was an important manifestation of the lack of control of the governmental administrative system. Among the cases of the private production of the official seal during the Qing Dynasty, the Wang Li'nan case in the Zhili province in 1806 involved the largest amount of money, the largest number of people and the longest time. In order to alleviate repeatedly insufficient revenue from land tax, the Zhili authorities illegally sealed the land tax documents of various prefectures and counties, thereby deceiving the accountability apparatus of the empire proper. The resulting inquiries showed that there were many malpractices, such as false stamps and seals. Emperor Jiaqing sent imperial missions to handle the case. After checking one by one, it was found that

there were 24 prefectures and counties involved and more than 310,000 silver was stolen. Moreover, from 1796, the annual collection of land tax in Zhili had had the drawbacks of false income, offset, heavy collection and expenditure. That is to say, the warehouse clerk used loopholes of the fiscal system to privately engrave an official-looking seal, thereby turning public funds into private funds, either exclusively or in collusion with local officials. Their cheating methods consisted primarily of changing decimal numbers to large numbers, replacing number 1 with number 10,000 and number 2 with number 20,000 (taels of silver); reimbursement; the reproduction of official seals to use on false documents; and even destroying official documents directly. The occurrence of Wang Li'nan case demonstrates the overall corruption of the administrator in the Jiaqing era. So, after disclosing the illegitimate 310,000 taels of silver, the land tax could be regarded accurate.⁵¹

The first half of the 19th century was a key turning point in China's economic and social development. Before this period the Qing dynasty can be regarded as a traditional agricultural society and at the end, it had started opening its market to the West. It is useful to model a total trade value for this period, because it will combine the value of domestic trade and the value of foreign trade into a single value. To estimate the total trade value at a particular time, a complete account of the amount of trade is needed, which is the total value of goods in the market, and from this the value added can be estimated. There are two ways to estimate the total value of trade. One is to estimate the value of the circulated quantity of commodities, and another way is to estimate the value of customs duties. In theory, both approaches should lead to the same outcome. Either method has its own advantages and disadvantages. Estimating the total trade value can be done using these two methods: first is to estimate the total trade value based on the trade volume; second is to use the data of customs duties to verify the result.⁵²

⁵¹ Ni Yuping, "Governance by Documents" or "Governance by Petty officials?" A Study on Wang Li'Nan Cases of Carving Official Seals Privately of Jiaqing Times, in *South China Quarterly*, vol.4, 2019.

⁵² Xu Dixin and Wu Chengming, *The Development History of China's Capitalism*, volume 1, *Sprout of China Capitalism*, Beijing: people's publishing house, 1985.

1. Estimating the Market Circulation of Commodities

The main commodities of domestic trade in the Qing dynasty were grain, cotton, cloth, raw silk, silk, tea, and salt. I will start with discussing the relevance of each.

(1) Grain

Grain was the most important commodity in the Qing dynasty. In the middle of 19th century, the population of China reached 436 million, nearly three times that of the Wanli Period (1573-1620, the peak of the Ming dynasty's population). With the development of the commodity economy and the increasing number of towns, the social demand for commodity grain was much bigger than that during the Ming dynasty. This led to grain trade in the Qing dynasty that was far bigger than any other former periods of China's history. Earlier scholars have done quite detailed research on the domestic grain trade of the early Qing dynasty. Xu Dixin and Wu Chengming, the editors of the book series, *"The Development History of China's Capitalism,"* wrote in the first volume, *Sprout of China Capitalism*, that although in the early and middle periods of the Qing dynasty the grain circulation was mostly based on the demand of small local markets and mainly to supply the local urban population, the long distance transportation had made great strides.⁵³

At that time, long distance grain circulation could be divided into ten routes from the south to the north as follows:

1. The grain from the southern provinces transported through the Grand Canal to the capital area, Shanxi, and Shaanxi provinces: 6 million dan annually;⁵⁴
2. Wheat and beans from Fengtian shipped by sea to Tianjin and Shandong province, 1 million dan annually;
3. Beans and wheat from Fengtian shipped by sea to Shanghai, 10 million dan annually;
4. Wheat and sorghum from Henan province and Tianjin transported through the Grand Canal to Linqing of Shandong province, hundreds of thousands of dan

⁵³ Xu Dixin and Wu Chengming, *The Development History of China's Capitalism*, volume 1, *Sprout of China Capitalism*, Beijing: people's publishing house, 1985, pp.517.

⁵⁴ Each dan would be 142.9 Jin, or 72.5 kg.

annually;

5. Wheat and grain from Hankou of Hubei province transported through the Hanzhong area of Shaanxi province, 600 thousand dan annually;

6. Rice from Anhui and Jiangxi provinces transported through the Yangtze River to Jiangsu and Zhejiang provinces, 5 million dan annually;

7. Rice from Hunan and Sichuan provinces through the Yangtze River to Jiangsu province, 10 million dan annually;

8. Rice from Jiangsu and Zhejiang provinces shipped by sea via Shanghai to Fujian province, 100 thousand dan annually;

9. Rice from Taiwan prefecture shipped by sea to Fujian province, 1 million dan annually; and

10. Rice from Guangxi province transported through Xijiang River to Guangdong province, 2 million dan annually.

The total was about 36 million dan of grain circulated annually through the ten routes above. Moreover, Xu Dixin and Wu Chengming believed that “this was roughly representative of the long-distance distribution of the Middle Qing.” Of this volume, excluding the transport of tribute grain and soldiers’ grain, there was about 30 million dan of commodity grain, which was three times that of the late Ming dynasty (about 10 million dan).⁵⁵

Deng Yibing also estimated the grain circulation at that time. Her estimation included rice, wheat, corn, beans, sorghum, other kinds of grains, as well as bean cake. Her research focussed on the nongovernmental food transport, excluding tribute grain, soldiers’ grain, and grain purchased by officials. Her method of estimation mainly used customs duties data to calculate this number. Considering that not all the roads had ports to levy tax on grains, she also used the number of ships for an additional estimation. According to Deng, the rivers that allowed grain to be transported further inland and had the capacity to accommodate grain boats and ships during the early Qing dynasty were predominantly: the Yangtze River, the

⁵⁵ Xu Dixin and Wu Chengming, *The Development History of China's Capitalism*, volume 1, *Sprout of China Capitalism*, Beijing: people's publishing house, 1985, pp.272-277.

Xijiang River, the Minjiang, the Huaihe River, the Yellow River, the Haihe River, the Luanhe River, and the Grand Canal.⁵⁶

Among them, the grain transport volume of the Yangtze River reached its peak in the Qianlong period and was over 18.5 million dan, which included 3 million dan from Sichuan province, 8 million dan from Hunan province, 2 million dan from Hubei province, 4.5 million dan from Jiangxi province, and 1 million dan from the Anhui province. However, due to the nine years unrest caused by the White Lotus Rebellion in the early Jiaqing period (mainly in Hubei, Sichuan, and Shaanxi provinces) the Yangtze River transportation of grain suffered. Moreover the population increase of the Daoguang period prevented further out-transportation from these provinces, and thus the grain transport of the Yangtze River decreased from the Qianlong period and onwards.

The grain transport volume of the Xijiang River should be at least 3.2 million dan annually and that of the Hanjiang River should be more than 100 thousand dan annually. The estimated number for the Minjiang River was also 100 thousand dan annually. For the Huaihe River, the grain transport volume was about 11 million dan in the Qianlong period and experienced the same downward trend as the Yangtze River after that.

The grain transport volume of the Yellow River was about 4 million dan in the Qianlong period, while that of the Haihe River was 1.5 million dan. It was about 100 thousand dan for the Luanhe River. Estimating the mass transported over the Grand Canal area was complicated. Deng estimated that during the peak of the Qianlong period, it was about 3.5 million dan in the north of Linqing Guan section, 5 million dan between Linqing and Huai'an section, 4 million dan between Huai'an and Yangzhou section, 6 million dan between Yangzhou to Hushu section, and 5 million dan below Hushu Guan section. In short, it was about 23.5 million dan. After the highpoint of the Qianlong period, this number also declined. Deng believed that the grain transport volume was over 62 million dan in the early Qing dynasty. However,

⁵⁶ Deng Yibing. Grain Marketing and Market in the Early Qing Dynasty, in *Historical Research*, vol.4, 1995.

she stated that this number was the peak of that time, “before that it was an upward trend, which was followed by a downward trend.” Grain however wasn’t exclusively traded by river. If the volume transported by sea was included, that number for the whole country would be over 85 million dan.⁵⁷

The above mentioned research only relates to long-distance grain transport, excluding trade among local and regional markets. According to Xu Dixin and Wu Chengming's research, it was believed that the total amount of grain circulation through these 10 routes only accounted for about 20% of the total grain trade before the First Opium War (1839-1842). When estimating the total amount of grain traded as commodity at that time, they took into account the make-up of the population to determine grain consumption (i.e., the non-agricultural population and the agricultural population planting cash crops) and the production of industrial food (wine, butter, and others) for analysis. Their conclusion was that the total amount of commodity grain was approximately 24.5 billion Jin (0.5 kg), accounting for about 10.5% of the total grain production.

However, by Shi Zhihong’s estimation, the total grain production ranged from 24.3 billion to 28.1 billion dan, averaging 26.2 billion dan.⁵⁸ If we took 15% into account, the commodity grain would be 3.9 billion dan. Considering the average price of grain (1.1 tael of silver per dan of grain), the total value of commodity grain would be about 4.4 million taels of silver.

(2) Cotton

Based on the research of Xu Xinwu, the cotton output amounted to 11 million dan. As a cash crop, assuming 30% of total production was grown for the commodity market, that would amount to 3.3 million dan.⁵⁹ The market price of cotton at that time, as estimated by Xu Dixin and Wu Chengming, was about 5 taels of silver; which was reasonable. Accordingly, the total value of the cotton commodity in the middle

⁵⁷ Deng Yibing. Grain Transport Volume and the Changing Trend in the Early Qing Dynasty, in *Researches in Chinese Economic History*, vol.3, 1994.

⁵⁸ Shi Zhihong (2015), *Qingdai Longye Shengchan Zhibiao de Guji* [Estimation of the Agricultural Production Indicators in the Qing Dynasty]

⁵⁹ Xu Xinwu, *Jiangnan Tubu Shi (History of Jiangnan Cotton)*, Shanghai Academy of Social Sciences Press, 1992, p.163.

19th Century was about 16.5 million taels of silver.

(3) Cotton Cloth

In Xu Xinwu's book, *Jiangnan Tubu Shi* (History of Jiangnan Cotton), he estimated cotton production per capita in 1840. After that, he further estimated that approximately 45% of the total farming households were weaving households. We estimate the total cotton production at 345.2 million pi of cotton cloth. The commodity value was 0.3 tael of silver per pi, and the total value was 103.5 million taels.⁶⁰ From Xu Xinwu's research, we also have a more interesting information: in 1840 almost half of the southern Chinese rural households was engaged in rural industry: weaving cotton. This cotton was mainly for the Chinese textile consumption, it means that a large part of this rural population earned an income separate from their agricultural production.

(4) Silk and Silk Fabrics

The total output of raw silk in the year 1850 was 13.5 million jin. Since raw silk was mainly for sale, we could estimate that 90% of it, 12.2 million jin, were sold as goods. Out of that amount, 2.2 million jin was exported. The remaining 10.2 million jin was sold domestically. According to Yao Xiangao's statistics, the average price of raw silk in 1850-1851 was 2.62 taels of silver per jin according to customs in export ports. We estimate that the domestic price was 80% of the export price.⁶¹ Based on these calculations, the value of domestic raw silk was 21.0 million taels of silver, and the value of exported raw silk was 5.7 million taels. Moreover, there were multiple different silk fabrics on the market: about 4.49 million pi of mulberry silk, 1.14 million pi of tussah silk, or 5.63 million pi altogether. Based on a production value of 30.3 million taels of silver and an increase by 20% to account for business profits our estimation arrives at a total value of 36.4 million taels for the silk and silk fabric commodities.

(5) Tea

⁶⁰ Xu Xinwu, *Jiangnan Tubu Shi* (History of Jiangnan Cotton), Shanghai Academy of Social Sciences Press, 1992, p. 136.

⁶¹ Yao Xiangao: *Zhongguo Jindai Duiwai Maoyi Shi Zhiliao* (the materials of foreign trade in Modern China), vol.1, Beijing: Zhonghua Bookstore, 1962, p.582.

Tea was the main daily drink of Chinese people with a long history of planting. After the Qianlong reign with the population increasing, the domestic tea market expanded, simultaneously the European market grew too. Tea gradually became the largest export commodity of China to the West. In the first half of the 19th century, the scale of China's tea planting and tea making expanded rapidly with the growth of domestic and foreign markets. According to my estimates, in the middle of the 19th Century the annual output of Chinese tea was 3 million dan. Out of that amount, 800 thousand dan was exported, valued at 19.2 million taels; 2.2 million dan was sold domestically, valued at 26.4 million taels. Since the tea farmers' personal consumption was limited, we could say the total commodity tea value was 45.6 million taels of silver.⁶²

(6) Salt

Salt was a necessity in daily life with a great demand. The Qing government, for financial purposes, formulated a special salt law to strictly control the production and sale of salt, and its ultimate purpose was to collect salt tax. This salt tax was an important revenue stream of the Qing government. After Qianlong, the dynasties collected about 5 million taels of silver from salt yearly, accounting for about 12% of the total fiscal revenue of the Qing government. In 1850, the total salt production was 4 billion jin, valued at 68.9 million taels of silver.⁶³

In short, we can estimate the total value of the main domestic commodities at 600 million taels of silver. However, this estimation of course has some problems. Specifically, some products only had a one-way flow, meaning that there was no corresponding exchange of commodities. As such, this portion should not be regarded as genuine commodity and their values should be deducted. According to Xu Dixin and Wu Chengming's analysis, the government taxes, landlords' rent fees in the towns, and profits and interest of the commercial and usury funds were appropriated from the countryside. Thus, Xu and Wu deducted 15% of the values of

⁶² Yao Xiangao: *Zhongguo Jindai Duiwai Maoyi Shi Zhiliao* (the materials of foreign trade in Modern China, vol.1, Beijing: Zhonghua Bookstore, 1962, p.582.

⁶³ Xu Dixin and Wu Chengming, *The Development History of China's Capitalism*, volume 1, *Sprout of China Capitalism*, Beijing: people's publishing house, 1985, page.336.

grain, cotton, silk, and tea, and 5 million taels of silver from salt.⁶⁴

Considering the reasons above, we also make some adjustments. There is one more thing that needs to be considered. All the estimations above concerned the main commodities in circulation at that time. These seven commodities represented most of the market transactions; however, they were not the only transactions. Aside from these commodities circulation, Tuhuo (local production such as eggs, fans, grass hats, bamboo baskets and all kinds of groceries) should also be included in the total trade value. There were hundreds of thousands kinds of Tuhuo and even though their circulation values may not be large, we should not underestimate their total value. Considering this point, this study assumes that the value of the seven main commodities accounted for 70% of the total market and other commodities accounted for the remainder (30%). This is presented in table 2.1.

Table 2.1: Estimation of Main Domestic Commodities

Type of Commodity	Volume	Value		
		In taels	Adjusted	Ratio (%)
Grain	400 million dan	440,000,000	409,200,000	42.6
Cotton	3.3 million dan	16,500,000	15,340,000	1.6
Cotton cloth	345,200,000 pi	103,560,000	103,560,000	10.8
Raw silk	10,020,000 jin	21,040,000	19,570,000	2.0
Silk fabrics	5,630,000 pi	36,420,000	36,420,000	3.8
Tea	2,200,000 pi	26,400,000	24,550,000	2.5
Salt	4 billion jin	68,940,000	63,940,000	6.7
Others			288,250,000	30.0
Total		712,860,000	960,830,000	100

Source: see the explanation above. There had some difference between value in taels and adjusted, with considering the changing price from copper cash to silver.

From the table above, we can recognise how the estimated value of main domestic commodities has expanded greatly from 349 million taels of silver according to Xu Dixin and Wu Chengming's analysis, not only due to the different items but also due to the newest research results.⁶⁵ Due to the limits of the historical

⁶⁴ Xu Dixin and Wu Chengming, *The Development History of China's Capitalism*, volume 1, *Sprout of China Capitalism*, Beijing: people's publishing house, 1985, page.282-284, table4—1 and table 4—2.

⁶⁵ Xu Dixin and Wu Chengming, *The Development History of China's Capitalism*, volume 1, *Sprout of*

material, exact yearly figures will not be possible, but just a gross estimate of the total value in the first half of the 19th century. Aside from the domestic commodity circulation, Tuhuo exports should also be included in the total value, with items such as books, sugar, peanuts, medicines, paper umbrella, fruit, and so on. Before 1850, the commodity structure and scale of foreign trade did not change significantly. Tea and silk were the main export commodities and these accounted for about 90% of the total export value.⁶⁶ We estimated that the total value of tea and raw silk was 2.491 million taels of silver. Even if we consider the other commodities traded in the Sino-Russian trade and inland border trade, the export value would not exceed 3 million taels of silver, since the total value could not be bigger than the number of Yuehai Guan which represented the foreign trade business. Thus, we think that the total commercial commodity in 1850 was about 990 million taels of silver.

2. Verifying the Value of Commodities with Customs Duties

To check the value of commodities (domestic and abroad), we refer to the total revenues of the customs duties for verification.⁶⁷

(1) Domestic Commodities

The Qing dynasty established the customs duties system which taxed goods as they passed through ports (unloaded boats and ships were also taxed), which is a practice inherited from the Ming dynasty. Since the tax ratio was levied on the quantity and price of the goods, in theory we are able to calculate the commercial volume based on the quantity and the tax rate. However, the system allowed for numerous tax-free goods such as salt and copper. During times of crisis, such as serious disasters, grain was also exempted from these port taxes. Of course, tax

China Capitalism, Beijing: people's publishing house, 1985, page.282-284, table4—1 and table 4—2.

⁶⁶ Such situation continued to 1870s, in 1868 was 94%, 1869 was 88%. From Yao Xiangao: *Zhongguo Jindai Duiwai Maoyi Shi Zhiliao* (the materials of foreign trade in Modern China, vol.1, Beijing: Zhonghua Bookstore, 1962, p.1609.

⁶⁷ Parts of this chapter are based on data used in my book, *Customs Duties in the Qing Dynasty, ca 1644-1911* (Brill 2016).

evasion and corruption of officials were a common phenomenon. It has undoubtedly had an influence on the customs duties records. More important, customs ports only taxed the goods on long-distance transport and the short distances trade were not included. We will have to account for the effect that has had on the records accordingly.

The customs duties of the Qing dynasty can be classified into two types: Huguan and Gonggun. Huguan means the taxes belonging to the Ministry of Revenue (Hubu), and all these taxes should be remitted to the Hubu. Gongguan means they belonged to the Ministry of Works (Gongbu), which mainly taxed bamboo and boats and ships, and the money should be sent to the Gongbu for construction needs. In the latter part of the Qianlong period, that is circa 1760-1795, there were more than 30 ports of Huguan as follows:

- Capital area: Chongwenmen, Zuoyi, Youyi, and Tongzhou (Zuoliangtin);
- Zhili province: Tianjin Guan, Shanhai Guan, and Zhangjiakou;
- Shengjing: Fengtian and Zhongjiang Guan;
- Shandong province: Linqing Guan;
- Shanxi province: Shahukou and Guihuacheng;
- Jiangsu province: Jianghai Guan, Huai'an Guan, Hushu Guan, Yangzhou Guan, and Xixin Guan;
- Anhui province: Fengyang Guan and Wuhu Guan;
- Jiangxi province: Jiujiang Guan and Gan Guan;
- Fujian province: Minhai Guan;
- Zhejiang province: Zhehai Guan and Beixin Guan;
- Hubei province: Wuchang Guan;
- Sichuan province: Kui Guan and Dajialu;
- Guangdong province: Yuhai Guan and Taiping Guan; and
- Guangxi province: Wu Chang and Xun Chang.

Except for Huguan, there were also many other tax ports for Gongguan, which included Tungyong Dao, Chihli Pantaokou, and Gubeikou of Zhili province; Shahukou

Gongguan and Wuyuancheng of Shanxi province; Linqing Gongguan of Shandong province; Longjiang Guan and Suqian Guan of Jiangsu province; Wuhu Gongguan of Anhui province; Nanxin Guan of Zhejiang province; Jingzhou Guan of Hubei province; Chen Guan of Hu'nan province; and Yu Guan of Sichuan province. In the Northeast of China, there were also some small customs duties, such as Ning Guta and Mu Qin, among others. Since their quota was so small and their material was rare, they have been omitted from this study. With regard to Gongguan, it was known that these areas were seldom managed by the officials from the Ministry of Works or by the local officials; they were mainly managed by Huguan officials. For example, Shahukou Gongguan was managed by Shahukou Huguan; Linqing Gongguan was managed by Linqing Huguan; Longjiang Guan was managed by Xixin Guan; Suqian Guan was managed by Huai'an Guan; Wuhu Gongguan was managed by Wuhu Huguan; Nanxin Guan was managed by Beixin Guan and Chongqing and was managed by the Kui Guan. The effect of this tax managed by the Ministry of Revenue was that it became more efficient and economic.

The tax ratio was set by the Ministry of Revenue, whose rules were posted on the gate for the public's information. From the reigns of Yongzheng and Qianlong, tax was generally at 5% of the goods' value. However, this was only in principle; in reality, each port had its own tax rate. Sometimes, even in one port, the tax rates of different branches varied. Aside from the quota, there were all kinds of additional taxes with different names, such as stamp fees, inspection fees, office expenses, and others. Some ports levied taxes based on the style and volume of the ships. Sometimes, if there was a natural disaster, ships that transported grains to these areas would be tax-free. Moreover, if the ships transported goods for the government, such as copper and grains for tribute, there was also no tax charged. If the goods were very small and inexpensive and predominantly consumed by business people, there was also no tax charged.

There was a certain amount of tax required by the Qing government in the

beginning of the dynasty that was named Zheng'e (the regular amount of government revenues and expenditures). With economic development, the tax collected was always over the quota of Zheng'e, and the excess was called Yingyu (surplus of Zheng'e). Zheng'e and Yingyu were both sent to the central government.

Although the amounts of Zheng'e and Yingyu experienced some adjustments, the total number of customs duties was about 2 million taels of silver in the early Qing dynasty but varied yearly. In the early years of Qianlong, the amount of Yingyu was fixed, at the amount taxed in the 13th year of the Yongzheng Emperor (1735). After that, almost each port taxed more money than the amount of 1735. However, as time passed, almost all *Yingyu* coming from the ports either surpassed or fell short of *Yingyu* collected in 1735. In 1777, when Yangzhou Guan and Fengyang Guan once more experienced a gap as compared with the 1735 benchmark, the emperor had to admit that comparing with *Yingyu* collected in 1735 had not been a good idea. He instead created the three-year-comparison as follows: "Customs revenues are linked to harvests and cannot be changed spontaneously. If revenues in a year are lower than those of the previous year, they should then be compared with the preceding two years. If it is not smaller than in any of these three previous years, it will be acceptable. I had good intentions when ordering a comparison with *Yingyu* collected in 1735, but now I know it may not fit every port. Thus, the three-year-comparison will replace the comparison with *Yingyu* in 1735."⁶⁸ Nevertheless, in practice *Hubu* always compared *Yingyu* collected with the highest amount amassed in the previous three years. If *Yingyu* was less, the responsible officials would have to make up for the shortfall from their private means.

Obviously, the system of the three-year-comparison was not a good policy because it did not take into account the reason for increases or decreases in *Yingyu*. In practice, it drove officials to increase taxes by any means possible. Furthermore, trade patterns during the late Qianlong changed significantly and correspondingly the

⁶⁸ SYD of FHAC: 3 August, 42nd year of Qianlong.

customs duties collected changed as well. There were some expected revenue increases by customs offices near the rivers and the coast. However, some other ports close to the Grand Canal experienced decreases in customs revenues, and nobody wanted to be an official at these ports since they would have to pay any shortfall out of their own pockets. As such, in 1799, during the reign of Jiaqing, the government was forced to adjust its policy and cancel the system of the three-year-comparison. Instead the new *Yingyu* was set at a fixed amount (*Zheng'e* was not changed). This was a very important event in the history of customs duties in the Qing dynasty.

On March 18, 1799, Emperor Jiaqing declared: “The amount of customs duties collected has been judged according to a system of the three-year-comparison. If the revenues collected were considered to be insufficient, the responsible officials would be punished, and they would have to make up for the shortfall out of their own pockets. Obviously, this has already resulted in officials taxing the people heavier than their rulers have asked of them to avoid shortfalls from occurring. However, most of the time, the shortfall would not be made up so easily (since the volume of economic transactions fluctuated over time), and this system was based on guesses rather than estimates. I have examined the list of customs offices under the jurisdiction of the Ministry of Revenue and found that different offices face different sets of circumstances. I will introduce a new policy in which *Yingyu* for each port will be fixed and the system of the three-year-comparison will stop permanently. If tax revenues are too low, the responsible officials should then pay the shortfall. And this system is not only applicable for Huguan but also for Gongguan.”⁶⁹

According to this new policy, a fixed amount of *Yingyu* was stipulated for each area as follows (in thousands of taels of silver): Zuoliangtin, 6; Tianjin Guan, 20; Linqing Huguan, 11; Jianghai Guan, 42; Hushu Guan, 235; Huai'an Guan, 111; Miaowan Guan, 2.2 (under the jurisdiction of Huai'an Guan); Yangzhou, 68; Xixin

⁶⁹ SYD of FHAC: 18 March, 4th year of Jiaqing.

Guan, 29; Fengyang Guan, 15; Wuhu Huguan, 73; Jiujiang Guan, 347; Gan Guan, 38; Minhai Guan, 113; Zhehai Guan, 39; Beixin Guan, 6.5; Wuchang Guan, 12; Kui Guan, 110; Yuehai Guan, 855.5; Taiping Guan, 75.5; Wu Chang, 7.5; Xun Chang, 5.2; Guihuacheng, 1.6; Shanhai Guan, 49.5; Shahukou, 15.4; and Zhangjiakou, 40.5. In total these ports collected 2.4 million taels of silver as *Yingyu*.

Five years later, the government once more changed *Yingyu* of some ports. The Ministry of Revenue reported at the time that “After our examination, we find that since 1799, most customs ports have raised more taels of silver than their tax quota stipulates. At ports such as Yuehai Guan, Tianjin Guan, Beixin Guan, and Gan Guan custom duties collected have even doubled, thus meeting the 1799 quota with ease, so we need not worry about these ports any more. Moreover, customs collected at some places, such as Jianghai Guan, Taiping Guan, Wuchang Guan, and Guihuacheng have surpluses of 1 thousand to 10 thousand taels of silver each year, and that is alright too. However, there are still some offices, like Zhehai Guan, Yangzhou Guan, Fengyang Guan, Jiujiang Guan, Hushu Guan, Huai’an Guan, Kui Guan, and Linqing Guan, whose customs revenues are always short of the quota.”⁷⁰ In keeping with this report, Jiaqing Emperor adjusted *Yingyu* of some ports as follows (in thousands of taels of silver): Xixin Guan’s *Yingyu* was increased from 29 thousand to 33 thousand, Jiujiang Guan from 347.8 thousand to 367 thousand, Zhehai Guan from 39 thousand to 44 thousand, Yangzhou Guan from 68 thousand to 71 thousand, Fengyang Guan from 15 thousand to 17 thousand, Hushu Guan from 235 thousand to 250 thousand, and Huai’an Guan from 111 thousand to 131 thousand. *Yingyu* of the other offices was not changed. After this change, the total amount of *Yingyu* collected increased from 2.4 million to about 2.5 million taels of silver.⁷¹

Up until 1831, quotas set for *Yingyu* remained very stable. However, in 1831, because duties collected at the ports of Huai’an Guan and Hushu Guan always fell short of their fixed quotas, the government reduced *Yingyu* at these two ports from

⁷⁰ LFZZ of FHAC:3-1767-064.

⁷¹ Li Hongzhang (1908), Volume 238.

131 thousand to 110 thousand, and from 250 thousand to 230 thousand taels of silver respectively.⁷² From then on, till the end of the Qing dynasty, there were no major changes in the *Yingyu* quotas. This means that the amount of Zheng'e and Yingyu of Huguan was about 4 million taels of silver and 400 thousand taels of silver of Gongguan.

Table 2.2: Customs Duty Quotas in the Middle Qing

(before 1840, in taels of silver)

Port of entry	<i>Zheng'e</i>	<i>Yingyu</i>	Total
Chongwenmen*	102,175	212,789	314,964
Zuoyi	10,008	18,000	28,008
Youyi	10,005.12	7,321.4	17,326.52
Zuoliangtin	6,339.26	6,000	12,339.26
Huai'an Guan	254,363.602	110,000	364,363.602
Hushu Guan	191,151.388	230,000	421,151.388
Yangzhou Guan	92,791.3	71,000	163,791.3
Wuhu Huguan	156,919.08	73,000	229,919.08
Xixin Guan	41,376.325	33,000	74,376.325
Fengyang Guan	90,159.6	17,000	107,159.6
Jianghai Guan	23,980.33	42,000	65,980.33
Tianjin Guan	48,156.313	20,000	68,156.313
Linqing Huguan	37,376.313	11,000	48,376.313
Jiujiang Guan	172,281.306	367,000	539,281.306
Gan Guan	46,470	38,000	84,470
Beixin Guan	123,053.65	65,000	188,053.65
Zhejiang Guan	35,908.23	44,000	79,908.23
Minghai Guan	73,549.547	113,000	186,549.547
Taiping Guan	52,675	75,500	128,175

⁷² SYD of FHAC: 13 August, 11th year of Daoguang.

Yuehai Guan	43,564	855,500	899,064
Shanhaig Guan	61,642.379	49,487	111,129.379
Zhangjiakou	20,000	40,561	60,561
Shahukou	16,919.95	15,414	32,333.95
Guihuacheng**	15,000	1,600	16,600
Tianjin Haiguan	26,000	14,000	40,000
Fengtian	3,307	Not fixed	3,307
Fenghuangcheng Zhongjiang	4,000	1,000	5,000
Wuchang Guan	33,000	12,000	45,000
Kui Guan	73,740.491	110,000	183,740.491
Dajianlu	20,000	Not fixed	20,000
Wuchang	60,913	7,821	68,734
Xunchang	43,741	5,565	49,306
Chen Guan	12,500	3,800	16,300
Wuyuancheng	1,231	2	1,233
Linqing Gongguan	4,572.74	3,800	8,372.74
Wuhu Gongguan	70,146.16	47,000	117,146.16
Longjiang Guan	57,607.225	55,000	112,607.225
Jinzhou Guan	17,687.156	13,000	30,687.156
Tongyongdao	7,115	3,900	11,015
Yu Guan	5,000	No fixed	5,000
Nanxin Guan***	30,247.5	-77.981	30,169.519
Gubeikou	1,212.51	Not fixed	1,212.51
Shengjing Mushui	2,000	Not fixed	2,000
Jilin Mushui	656	Not fixed	656
Pantaokou	6,445	Not fixed	6,445
Yilin Mushui	Not fixed	Not fixed	Not fixed
Total	2,206,991.475	2,792,982.419	4,999,973.894

* Chongwenmen's *Zheng'e* was 8,536 taels higher in the lunar month at 110.7 thousand taels of silver.

** Guihuacheng also had to tax coins, collecting some 9 million coins of *Zheng'e* and 137.6 thousand coins of *Yingyu*. These amounts were not included in the total quota.

*** Nanxin Guan's *Yingyu* was fixed at 3.9 thousand taels of silver, but each year it received an additional 4 thousand taels from Beixin Guan, so the *Yingyu* of Nanxin Guan would be negative.

Sources: Ni Yuping, *Customs Duties in the Qing Dynasty, ca 1644-1911* (Brill 2016), pp.21-22.

In addition to the ordinary *Zheng'e* and *Yingyu*, some offices also had to supply *Ewai Yingyu* (additional *Yingyu*), such as Tianjin Guan, which required sending 12 thousand taels of silver to the Imperial Palace each year.

The analysis of customs duties between Jiaqing and Daoguang periods (1796-1850) in this chapter was based on data from two kinds of archives. The first was the First Historical Archives of China, including Palace Midrange Rescript Memorials (PMRM, film no. 20, 21), Extra Copies of Grand Council Memorials (ECGCM, film no. 126、218-219), and Jiaqing and Daoguang Period Edict Records (Guangxi Normal University Press, 2000). The second was Revenue and Expenditure Reports of Customs in the Qing dynasty, finished by Tang Xianglong in the 1930s and now stored in the library of the Institute of Economics of the Chinese Academy of Social Sciences. It is open to question whether the data in these archives were flawed because for example, customs officials were corrupt or, more simply, because of poor reporting. However, since the reported money had to be sent to the court, the data can be interpreted as representing, at the very least, minimum numbers. The appendix shows all the customs duties in the first half of the 19th century.

Since the material of taxation rates is very scattered and recorded in an unsystematic manner, most scholars prefer to do case studies. Xu Tan and Jing Junjian wrote that "The customs rules and quotas of the Qing dynasty were very stable as a whole, although the rate of taxation of the Qing dynasty had a declining trend."⁷³ However, it is difficult to tell the exact rate of duty at each port in the Qing dynasty since rates were connected to customs rules, and each port had its own set of rules to apply. For instance, Yangzhou Guan levied a duty of 0.02 taels in 1756 for each *dan*

⁷³ Xu Tan and Jing Junjian (1990), p. 95.

of beans, rice, wheat, and sesame that passed through it. At that time, the price of ordinary rice varied between 2.4 taels to 2.5 taels and 3.1 taels to 3.2 taels per *dan*; thus, the rate of taxation (duty) ranged between 0.63% and 0.83% of the value.⁷⁴ Although this was a special case, it does demonstrate the wide variation in rates.

During the reign of Yongzheng, the customs duty at Kui Guan was fixed such that “All goods with the price of 1 tael are taxed at 3 Fen (0.03 taels).”⁷⁵ In other words, the taxation rate was 3% of the value. This rate was maintained during the Qianlong, Daoguang, and Tongzhi periods.

In 1728, Shandong province ordered that “All grains should be taxed at 0.011 taels per *dan*, but taxes on rice and wheat are more expensive. Rice and wheat should be taxed at 0.022 tael per *dan*.”⁷⁶ Considering the price of rice varied from 0.5 to 0.7 taels per *dan*, Deng Yibing estimated the taxation rate of rice at Linqing Guan to have been about 2.2% to 5.5% of its value.⁷⁷

Kishimoto Mio found that during the reign of Yongzheng, the rate of taxation for rice at Hushu Guan varied from about 3.7% to 6.7% of its value.⁷⁸ According to Deng Yibing’s research, the rate of taxation for rice at Hushu Guan was about 2.2% to 4% of its value during the Qianlong and 2.5% during the Daoguan.⁷⁹ Takino Shojiro used the price of beans (1.2 taels per *dan*) to estimate that the rate of taxation (0.05 taels) of Huai’an Guan was 4.2% in 1778; in the beginning of the 19th century the rate of taxation was even lower.⁸⁰

He Benfang estimated that goods passing through the offices of Zuoyi, Youyi, Fengtian Niuma Shui, and Fenghuangcheng Zhongjiang were taxed at a rate of about 3% of the value, while the rate of taxation at Yuehai Guan was kept at about 5.76%

⁷⁴ GZDQLC, Volume 13, p. 710.

⁷⁵ Wo Ren (1865), Volume 70.

⁷⁶ National Palace Museum in Taiwan (1978), Volume 11, pp. 649-650.

⁷⁷ Deng Yibing (2003), pp. 217-218.

⁷⁸ Kishimoto Mio (1997), pp. 118-119.

⁷⁹ Deng Yibing (2003), p.217.

⁸⁰ Takino Shojiro (2001), pp. 116-156.

for imported goods and 3.74% for exported goods.⁸¹ Peng Zeyi calculated that the rate of taxation maintained at Jianghai Guan, Zhehai Guan, Minhai Guan, and Yuehai Guan would have been at about 2% of the goods' value.⁸² Deng Yibing also estimated the taxation rate for white wax at Kui Guan (an example of the category "other goods") to have been 3.75% of the goods' value. For cotton at Hushu Guan, she estimated the rate to be 2.7% of the goods' value, and at Shanhai Guan the rate for green tea to be 1.8% to 2.4%.⁸³ Kosaka Masanori estimated the taxation rate for ordinary silk in the port of Beixin Guan to have been about 1.3%.⁸⁴

The collective insight these case studies provides us indicates that, in general, taxation rates on traded goods during the Qing dynasty were somewhere between about 2% and 5%.⁸⁵ Now we could use this rate to estimate the total trade value of the first half of the 19th century.

**Table 2.3: Estimated Total Trade Value Based on Domestic Customs Duties
(in taels of silver)**

Year	Income	At 2%	At 3%	At 5%
1796	4,279,912.80	213,995,640	142,663,760	85,598,256
1797	4,315,003.70	215,750,185	143,833,456.7	86,300,074
1798	4,074,699.50	203,734,975	135,823,316.7	81,493,990
1799	4,247,623	212,381,150	141,587,433.3	84,952,460
1800	5,111,177.70	255,558,885	170,372,590	102,223,554
1801	4,258,902.80	212,945,140	141,963,426.7	85,178,056
1802	4,287,650.50	214,382,525	142,921,683.3	85,753,010
1803	4,647,897.10	232,394,855	154,929,903.3	92,957,942
1804	4,276,438	213,821,900	142,547,933.3	85,528,760
1805	4,431,512.90	221,575,645	147,717,096.7	88,630,258
1806	3,953,921	197,696,050	131,797,366.7	79,078,420
1807	4,073,611.10	203,680,555	135,787,036.7	81,472,222
1808	4,411,767.80	220,588,390	147,058,926.7	88,235,356
1809	4,300,111	215,005,550	143,337,033.3	86,002,220

⁸¹ He Benfang (1984), p. 75.

⁸² Peng Zeyi (1984), pp. 136-141.

⁸³ Deng Yibing (2003), pp.219-220.

⁸⁴ Kosaka Masanori (1991), pp. 34-57.

⁸⁵ Deng Yibing (2008). *Qingchao Qianqi Guanshui Zhidu Yanjiu* (清代前期关税制度研究 System of Customs Duties in the Early Qing Dynasty). Beijing Yanshan Press. pp.215-224.

1810	4,295,398.80	214,769,940	143,179,960	85,907,976
1811	4,066,343.60	203,317,180	135,544,786.7	81,326,872
1812	4,026,879.30	201,343,965	134,229,310	80,537,586
1813	4,160,078.90	208,003,945	138,669,296.7	83,201,578
1814	4,602,858.40	230,142,920	153,428,613.3	92,057,168
1815	4,105,222.80	205,261,140	136,840,760	82,104,456
1816	4,226,404.80	211,320,240	140,880,160	84,528,096
1817	4,265,727.90	213,286,395	142,190,930	85,314,558
1818	4,202,527	210,126,350	140,084,233.3	84,050,540
1819	4,478,290.70	223,914,535	149,276,356.7	89,565,814
1820	4,027,618.10	201,380,905	134,253,936.7	80,552,362
1821	4,045,148	202,257,400	134,838,266.7	80,902,960
1822	4,720,638.30	236,031,915	157,354,610	94,412,766
1823	3,981,066.60	199,053,330	132,702,220	79,621,332
1824	4,367,917.80	218,395,890	145,597,260	87,358,356
1825	4,033,414.70	201,670,735	134,447,156.7	80,668,294
1826	4,068,137.60	203,406,880	135,604,586.7	81,362,752
1827	4,178,583.30	208,929,165	139,286,110	83,571,666
1828	4,167,454.30	208,372,715	138,915,143.3	83,349,086
1829	4,194,929.60	209,746,480	139,830,986.7	83,898,592
1830	4,343,302.70	217,165,135	144,776,756.7	86,866,054
1831	3,953,880.70	197,694,035	131,796,023.3	79,077,614
1832	4,821,474.50	241,073,725	160,715,816.7	96,429,490
1833	3,697,609.90	184,880,495	123,253,663.3	73,952,198
1834	3,837,796.50	191,889,825	127,926,550	76,755,930
1835	4,392,103.80	219,605,190	146,403,460	87,842,076
1836	4,082,922	204,146,100	136,097,400	81,658,440
1837	4,060,062.90	203,003,145	135,335,430	81,201,258
1838	4,194,119.80	209,705,990	139,803,993.3	83,882,396
1839	3,929,040.20	196,452,010	130,968,006.7	78,580,804
1840	3,989,197.50	199,459,875	132,973,250	79,783,950
1841	4,045,066.50	202,253,325	134,835,550	80,901,330
1842	3,474,314.40	173,715,720	115,810,480	69,486,288
1843	3,483,898.70	174,194,935	116,129,956.7	69,677,974
1844	3,669,176.50	183,458,825	122,305,883.3	73,383,530
1845	3,847,870.50	192,393,525	128,262,350	76,957,410
1846	4,277,447.40	213,872,370	142,581,580	85,548,948
1847	3,747,617.50	187,380,875	124,920,583.3	74,952,350
1848	3,870,426.30	193,521,315	129,014,210	77,408,526
1849	3,987,041.30	199,352,065	132,901,376.7	79,740,826
1850	3,898,583.20	194,929,160	129,952,773.3	77,971,664

Sources: Ni Yuping, *Customs Duties in the Qing Dynasty, ca 1644-1911* (Brill 2016), pp.173-219.

Due to the Opium War (1839-1842), the customs ports, especially the coastal ports, were seriously affected by the military activities. However, despite this the trend was stable in general. From Table 2.4, we can draw some useful information as displayed below:

Table 2.4: Estimated Total Trade Value (in taels of silver)

Assumed Tax Rate	2%	3%	5%
Avg	207716202	138477468	83086481
Min	173715720	115810480	69486288
Max	255558885	170372590	102223554

From the table above we can see that if calculated at the rate of 2%, the circulated commodity value of the first half of the 19th century was about 170 million to 250 million taels of silver. If we estimate it at a rate of 3%, it would be 110 million to 170 million, and if we estimate it at a rate of 5%, it would be about 69 million to 100 million.

There are issues however when using tax revenues for estimating commercial value. Of course, there were numerous recorded cases of tax evasion by businessmen in that era. Then again it was very difficult to collect all the data on tax evasion. However, we are lucky to have Huai'an Guan's records of penalties paid by those businessmen who evaded taxes but were caught, which went by the name of Beifa Yin (double penalty silver).

Table 2.5: Penalty of Huai'an Guan during the Jiaqing and Daogang Times (1796-1850) (in taels of silver)

Year	Number	Year	Number	Year	Number
1796	6630	1813	8433.982	1834	2285.464
1799	8204.034	1815	7200.979	1835	3627.769
1800	8300.881	1818	11410.294	1837	2741.436
1802	10836.157	1819	12440.365	1839	7211.314
1803	7040.982	1820	7830.515	1840	7200.979
1804	11759.841	1821	7105.585	1841	8669.63
1805	13165.259	1822	6155.969	1842	6193.236
1806	8820.875	1823	5964.561	1844	7559.739

1807	7280.954	1824	7446.875	1848	5329.837
1809	14993.613	1825	6052.771	1849	8660.402
1810	7961.189	1828	4012.807	1850	2299.321
1811	9010.083	1829	2739.329		
1812	9803.409	1830	3358.486		

Source: Ni Yuping: Qingchao Jiadao Guanshui Yanjiu (Research on the Customs Duties in the Jiaqing and Daoguang Times of the Qing Dynasty), in *Science Press*, 2017, p.51.

The penalty of Huai'an Guan was not included in the total number of customs duties, but was considered a part of the allowance for the minor officials. This was also the tradition of collecting customs duties in Qing Dynasty. In view of this, when we use customs duties to estimate the domestic commodity circulation value, we should enlarge the number appropriately.

The biggest issue in estimating the commodity circulation based on customs duties is that customs ports only taxed the goods on long-distance transport. Goods transported for short distances and those traded locally are not included in these tallies. Therefore the value of such trade was likely much higher than the customs duties, but academic prudence demands caution when neither primary nor secondary sources can be found. As discussed in an earlier paragraph, the long-distance transport of grain accounted for about 20% of the total commodity grain on the market. Even if other commodities saw a larger proportion of their goods traded over long distances, on average it still should not exceed 30%.⁸⁶ If we accept this percentage as the maximum and estimate the total value of goods traded, then we can say that the domestic circulation of goods was worth about 830 million taels of silver.

(2) Foreign Trade

The tax port of Yuehai Guan was located in Guangzhou prefecture, Guangdong province. Yuehai Guan was established in 1685, two years after Emperor Kangxi annexed Taiwan. Yuehai Guan had its own official Yuehaiguan Jiandu (manager of

⁸⁶ Xu Dixin and Wu Chengming, *The Development History of China's Capitalism*, volume 1, *Sprout of China Capitalism*, Beijing: People's Publishing House, 1985, page.336.

Yuehai Guan), who held a rank as high as governor. Before 1757, the Qing government permitted foreign boats to trade in Jianghai Guan, Minhai Guan, Zhehai Guan, and Yuehai Guan, which had the name Dongnan Si Haiguan (southeast four-sea-ports). However, other than Yuehai Guan, the tax revenues from these ports were very small. According to H. B. Morse's research in the 90 years from 1664 to 1753, there were 199 boats from the East India Company that were active in China, and 153 of these boats traded at Yuehai Guan (i.e., 77% of all the company's boats). Minhai Guan only received 26 of these boats, Zhehai Guan only 17 boats, and Jianghai Guan only one boat.⁸⁷ After 1757, Emperor Qianlong ordered that all foreign boats must trade only in Yuehai Guan. This situation continued until 1842 when the Sino-British "*Nanjing Treaty*" arranged for five ports to be opened for foreign trade (including Yuehai Guan).

Table 2.6: Tax quota of Yuehai Guan in the Qing Dynasty (in taels of silver)

Year	Kangxi*	1688	1699	1799
Zheng'e	91,740.5	82,362	39,030	43,564
Yingyu				855,500
Total	91,740.5	82,362	39,030	899,064

Sources: Materials from *Shilu*, *Huidian*, *Hubu Zheli* and archives (see text for archival references).

* Exact year is unknown.

Seen from a long-term perspective, Yuehai Guan was the only port that levied taxes on foreign trade.⁸⁸ Since it had monopolised foreign trade for such a long time, it is logical that before 1850 Yuehai Guan was the largest port in Qing China. There were two entries of tax data in 1814 and 1846 due to the use of the Chinese lunar calendar.

⁸⁷ H. B. Morse, *The Chronicles of the East India Company Trading to China (1635-1834)*, Oxford Press, 1926, pp. 309-321.

⁸⁸ Peer Vries (2015) explained the inter nation trade between China and Russia (overland trade). He wrote: "Most calculations of China's international trade focus on its overseas trade. Including overland trade would definitely not change the overall picture. There are estimates of the value of trade with Russia, for example, for various moments in time. In the 1770s it had a total turnover of 2.5 million roubles. In 1800, that had increased to 7.5 million roubles. In the period from 1824 to 1830 it varied from 5.5 million to 7.8 million roubles per year. In the middle of the nineteenth century it had increased further to 16 million roubles per year. As a rouble at the time was roughly half a tael in terms of silver weight, even in the 1850s total trade between Russia and China amounted to only 8 million taels, or less than £3 million. These figures are not impressive. Central Asian trade was even less. Here the value of traded goods really was tiny, at least for the first half of the eighteenth century for which I found figures: its 'normal' value can be expressed in terms of tens of thousands of taels. I did not come across a year in which it was over 200,000 taels."p.170.

Table 2.7: Tax of Yuehai Guan (1796-1850) (in taels of silver)

Year	Number	Year	Number	Year	Number
1796	981186.69	1814(2)	1185461.826	1833	1477846.265
1797	973172.975	1815	1331239.86	1834	1669712.641
1798	1035757.477	1816	1446979.965	1835	1424944.169
1799	937073	1817	1421303.799	1836	1674851.728
1800	1201246.537	1818	1302910.999	1837	1789424.322
1801	1336171.831	1819	1380097.088	1838	1242044.215
1802	1540773.092	1820	1479820.102	1839	1448558.993
1803	1695389.03	1821	1497022.492	1840	1186551.857
1804	1555586.405	1822	1485146.83	1841	864232.169
1805	1641971.768	1823	1404913.16	1842	1115742.362
1806	1621375.998	1824	1444322.616	1843	1182488.993
1807	1663830.048	1825	1298828.962	1844	2030543.108
1808	1470460.226	1826	1576637.162	1845	2360832.158
1809	1457201.777	1827	1850045.992	1846(1)	2186530.442
1810	1408641.864	1828	1441924.596	1846(2)	1972089.803
1811	1165263.126	1829	1499580.743	1847	1825223.055
1812	1347936.891	1830	1663634.978	1848	1424045.916
1813	1246708.16	1831	1461806.163	1849	1471318.476
1814(1)	1235257.698	1832	1532933.249	1850	1476867.971

Source: Ni Yuping: Qingchao Jiadao Guanshui Yanjiu (Research On the Customs Duties in the Jiaqing and Daoguang Times of the Qing Dynasty), in Science Press, 2017, pp.369-374.

The trend is below:

Graph 2.1: Tax of Yuehai Guan (1796-1850)

From graph 2.1, we can see the trend of Yuehai Guan clearly. During the reigns of Jiaqing and Daoguang (1796-1850) a number of incidents interrupted this rising trend. For example, as a result of the wide-spread marauding by the pirate Cai Qian, in 1811 the viceroy of Guangdong decided to close all ports and forbade boats to leave.⁸⁹ Naturally, tax revenues declined as trading came to a halt. The First Opium War (1839-1842) had a disastrous impact on Yuehai Guan's tax revenues. In 1839 Emperor Daoguang bestowed upon Lin Zexu (1785-1850) an imperial commission, to abolish the opium trade, which he promptly set about doing. After he forbade the importation of opium the number of foreign vessels visiting Yuehai Guan declined from 138 to 93 (i.e. 45 fewer vessels), which led to a fall in tax revenues from 1,440,000 to 1,180,000 taels of silver (i.e. 26 thousand taels less).⁹⁰ Soon afterwards the First Opium War broke out, the number of foreign vessels calling at Yuehai Guan declined even further to 13, since British warships blockaded the port.⁹¹ Taxes collected in 1841 dropped to half of what they had been before the hostilities, reaching their lowest point during the reigns of Jiaqing and Daoguang.⁹² Under the conditions of the Sino-British Treaty of Nanjing, the Qing government was forced to adopt a more open policy towards foreign trade and as result tax revenues of Yuehai Guan increased in the years that followed. In 1846, due to the use of the Chinese lunar year, there were two periods of taxation – revenues in those periods were 2,186,530 and 1,972,089 taels of silver respectively – it is not surprising to find such high results for this year as a whole.⁹³

In 1843, according to the Sino-British Treaty of Nanjing, four new ports were opened to foreigners: Jianghai Yangguan, Zhehai Yangguan, Fouzhou Yangguan, and Xiamen Yangguan. However, at the beginning, there was no requirement regarding the quota of these four new ports.

Table 2.8: Taxes of Four Foreign Ports (1844-1850)

⁸⁹ ZPZZ of FHAC: 04-01-35-0366-007.

⁹⁰ ZPZZ of FHAC: 04-01-35-0379-028.

⁹¹ ZPZZ of FHAC: 04-01-35-0379-049.

⁹² ZPZZ of FHAC: 04-01-35-0379-049.

⁹³ ZPZZ of FHAC: 04-01-35-0380-043.

(in taels of silver)

Year	Jianghai	Zhejiang	Fuzhou and Xiamen	Total
1844	42617.306	6264.468	15134.438	64016.212
1845	187960.792	6885.047	48275.94	243121.779
1846	1229628.42	2173.379	62767.48	1294569.279
1847	680295.19	1571.926	29136.252	711003.368
1848	587984.925		24599.767	612584.692
1849	670603.018	419.885	30655.622	701678.525
1850	704000	117.63	33684.396	737802.026

Source: Ni Yuping: Qingchao Jiadao Guanshui Yanjiu (Research On the Customs Duties in the Jiaqing and Daoguang Times of the Qing Dynasty), in Science Press, 2017, pp.135-150.

Here is a very interesting comparison between domestic customs duties and foreign customs duties:

Graph 2.2: Domestic trade and Foreign Trade (1796-1850)

From Graph 2.2, we can see that during the Jiaqing and Daoguang times, domestic customs duties is far bigger than foreign customs duties, which means that the internal trade was far more important than international trade.

Peng Zeyi estimated that the tax rates for Jianghai Guan, Zhejiang Guan, Minhai Guan, and Yuehai Guan was about 2% of the goods' value. What is known is that goods transported from around the globe (through Jianghai, Zhejiang Guan, Minhai

and Yuehai customs) were taxed at around 2%. Additionally the four major sea-ports (specifically Jianghai, Zhejiang customs, Fujian customs, and Guangdong Customs) all generally held a rough 2% tax rate.⁹⁴ Here is an illustration of what the international trade value would amount to based on that estimated 2% to 3% rate.

**Table 2.9: Foreign Trade Value Based on Customs Duties
(in taels of silver)**

Year	Tax Amount	By 2%	By 3%
1796	981186.69	49059334.5	32706223
1797	973172.975	48658648.75	32439099.17
1798	1035757.477	51787873.85	34525249.23
1799	937073	46853650	31235766.67
1800	1201246.537	60062326.85	40041551.23
1801	1336171.831	66808591.55	44539061.03
1802	1540773.092	77038654.6	51359103.07
1803	1695389.03	84769451.5	56512967.67
1804	1555586.405	77779320.25	51852880.17
1805	1641971.768	82098588.4	54732392.27
1806	1621375.998	81068799.9	54045866.6
1807	1663830.048	83191502.4	55461001.6
1808	1470460.226	73523011.3	49015340.87
1809	1457201.777	72860088.85	48573392.57
1810	1408641.864	70432093.2	46954728.8
1811	1165263.126	58263156.3	38842104.2
1812	1347936.891	67396844.55	44931229.7
1813	1246708.16	62335408	41556938.67
1814	2420719.524	121035976.2	80690650.8
1815	1331239.86	66561993	44374662
1816	1446979.965	72348998.25	48232665.5
1817	1421303.799	71065189.95	47376793.3
1818	1302910.999	65145549.95	43430366.63
1819	1380097.088	69004854.4	46003236.27
1820	1479820.102	73991005.1	49327336.73
1821	1497022.492	74851124.6	49900749.73
1822	1485146.83	74257341.5	49504894.33
1823	1404913.16	70245658	46830438.67
1824	1444322.616	72216130.8	48144087.2
1825	1298828.962	64941448.1	43294298.73
1826	1576637.162	78831858.1	52554572.07
1827	1850045.992	92502299.6	61668199.73

⁹⁴ Peng Zeyi, "Qing Chu Si Que Guan Di Dian He Mao Yi Liang De Kao Cha" (Researches on the Places and Trade Volumes of the Four Coastal Ports in the Early Qing), in *Social Science*, vol. 3 (June, 1984).

1828	1441924.596	72096229.8	48064153.2
1829	1499580.743	74979037.15	49986024.77
1830	1663634.978	83181748.9	55454499.27
1831	1461806.163	73090308.15	48726872.1
1832	1532933.249	76646662.45	51097774.97
1833	1477846.265	73892313.25	49261542.17
1834	1669712.641	83485632.05	55657088.03
1835	1424944.169	71247208.45	47498138.97
1836	1674851.728	83742586.4	55828390.93
1837	1789424.322	89471216.1	59647477.4
1838	1242044.215	62102210.75	41401473.83
1839	1448558.993	72427949.65	48285299.77
1840	1186551.857	59327592.85	39551728.57
1841	864232.169	43211608.45	28807738.97
1842	1115742.362	55787118.1	37191412.07
1843	1182488.993	59124449.65	39416299.77
1844	2094559.32	104727966	69818644
1845	2603953.937	130197696.9	86798464.57
1846	5453189.524	272659476.2	181772984.1
1847	2536226.423	126811321.2	84540880.77
1848	2036630.608	101831530.4	67887686.93
1849	2172997.001	108649850.1	72433233.37
1850	2214669.997	110733499.9	73822333.23

From the table above we can see that if we put aside the years after the First Opium War and constrain ourselves to the assumed 2% rate, we get a middle value of about 70 million to 90 million taels of silver for the international commercial trade. Moreover, if factors that changed after the Opium War had been considered, the international trade value would have increased to 100 million to 130 million taels. By instead applying a 3% rate, the middle value for the international commercial trade would be about 50 million to 60 million taels of silver; after the Opium War that number would have increased to 70 million to 80 million taels of silver.

Considering that in real life, tax officials misbehave, and businessmen smuggle goods, it would appear that the data reported to the court was too low. Thus, to offset this we take the rate of 2% and use the highest data-point, resulting in an estimated value for the international commercial trade before and after the Opium War at about 100 million and 150 million taels of silver each year.

(3) Total

As discussed above, the domestic goods transported by long-distance was valued at 250 million taels of silver yearly in the mid-19th century.

Table 2.10: Assumed share of taxed trade in total trade

Ratio	20%	30%	40%
Avg	1038581010	692387340	519290505
Min	868578600	579052400	434289300
Max	1277794425	851862950	638897213

Source: original data come from tax rate 2% of the customs duties above.

The overall minimum was 434 million and the overall maximum was 12,777 million. If we took 30% as the proportion of these goods out of total domestic trade, the average total commodity value would be valued about 692 million taels of silver.

When we calculated the value of the circulated goods, one important item was not included. As a special commodity, the salt industry had been monopolised by the Qing government, and its tax was not carried out through the customs duties. From Xu and Wu's research (1985), it came up with a market value of 63.9 million taels of silver for salt.⁹⁵

If we added the 150 million taels of silver for the foreign trade commodity value and the 63.9 million taels of silver for the salt value, the total commodity value for the first half of the 19th century would be 906 million, which is very close to the 990 million estimated in the first part of this chapter.

3. Conclusion

From this total trade value of commodities, we cannot exactly measure the value-added of the commercial industry. Zhang Zhongli, an economic historian, calculated that it was about 20% of the total value of commodities in the 1880s when he tried to calculate the value-added of the commercial industry from agricultural

⁹⁵ Xu Dixin and Wu Chengming, *The Development History of China's Capitalism*, volume 1, *Sprout of China Capitalism*, Beijing: people's publishing house, 1985, page.284.

products.⁹⁶ If this ratio was correct, the value-added of the commercial industry of the mid-19th century domestic and foreign trade would be 200 million taels of silver.

From the estimation of total traded value based on domestic trade and customs duties, there was a slow decrease. At the same time, we could find that the internal trade was far more important than international trade. China's total economy is large, but domestic trade is larger than foreign trade, a lack of trade friendly policies has played a role in this. The population at that time was roughly about 400 million, which means that the annual traded value per capita was only 2.5 taels of silver. Which is really too low to be in line with what Peer Vries wrote: “By not fully opening up their economy China’s governing elites created a situation in which their country did not optimally profit from what modern economists call ‘the gains from trade’ ”.⁹⁷

Based on the data available of customs duties of the Qing, I have made an estimate of the total trade value per capita in real terms in these benchmark years which can be obtained from a combination of the price index data and population figures.⁹⁸

Graph 2.3: Trade value per capita in real terms during the Qing dynasty

Graph 2:3 clearly shows that before 1850, in real terms the highest trade value

⁹⁶ Chang Chung-li, *The Chinese Gentry*, University of Washington Press, 1955, p.313.

⁹⁷ Peer Vries (2015). *State, Economy and the Great Divergence: Great Britain and China, 1680s-1850s*. Bloomsbury Publishing. p.379.

⁹⁸ Sources: Ni Yuping, *Customs Duties in the Qing Dynasty, ca 1644-1911* (Brill 2016), pp. 165-166.

per capita was achieved in the mid-Qianlong, a period regarded as the peak of *Kang Qian Sheng Shi* (Flourishing ages between Kangxi and Qianlong emperors, 1681-1796). Following that, with the expansion of the population the per capita trade value entered the period of slight decline. After 1850, as a result of the modernization of industry, per capita trade value recovered, climbing to reach its highest point in 1887, several years before the First Sino-Japanese war and the Boxer Rebellion. Under the influence of war the subsequent fall in per capita trade value is, of course, to be expected.

Also from our recent research on Chinese GDP per capita between 1661 and 1933, it appears that the trend of per capita commerce closely follows that of the per capita gross domestic product. The lowest point of the latter was occurring between 1812 and 1850.⁹⁹ Although per capita GDP was higher than before and after that period, its rise after 1850 was not as sharp as that of per capita commerce. Of course, this is only a very simple estimate based on customs revenues collected. Nevertheless, in the future it may help to estimate historical GDP more precisely.

China is a large economy with a short coast line relative to its size as compared to Japan, Britain, US or France.¹⁰⁰ It is safe to conclude that the Chinese economy in the first half of the 19th century was mainly based on agriculture. Although the door of China had been opened to the West, this trading relation was obviously based on the traditional agricultural society rather than a mercantilist society with a developed commercial economy. However, this situation could not continue on, and the central government had to make momentous adjustments, especially in the fiscal system, which will be discussed in chapter 3.

⁹⁹ Yi Xu, Zhihong Shi, Bas van Leeuwen, Yuping Ni, Zipeng Zhang, Ye Ma: *Chinese National Income, ca. 1661–1933.*, in *Australian Economic History Review*, vol. 57, 3:368-393(Nove. 2017).1. This paper won Sir Timothy Coghlan Prize of 2017. I was responsible for the service part.

¹⁰⁰ Frankel, J. A., & Romer, D. H. (1999). Does trade cause growth? in *American economic review*, 89(3), 379-399.

3. The Fiscal Transformation of the Qing State in the Middle of the 19th Century

After the First Opium War (1839-1842), The Qing dynasty had to open its doors to the West. Since then, China (in China's scholars' thinking) entered modern society, changing its society in every aspect, its economy, government, politics, military, culture and others. In this transformation, who exerted the biggest influence? Was it the foreigners or the mainland people?

In this chapter, the concept of the "fiscal state" will be used to show the change in attitude the Qing government took to its fiscal affairs. The idea is that the emergence of the 'fiscal state' forms an essential condition for the development of the modern state. Tilly and Bonney use the concept to underline the growth of the state's capacity to innovate tax collection and to create new taxes.¹⁰¹ In general, these developments originated in highly urbanised Western Europe. Other European countries in the East and South are less inventive. Tilly also states that cities were able to collect copious amounts of taxes from their citizenry (based on their wealth and trade) and that they provided citizenship in return. Later on, states in turn started demanding more taxes in return for democratic institutions. A second argument is that warfare made it necessary for states to collect new taxes, marking a phase in the development of the fiscal state.¹⁰² Similarly, in the middle 19th century China, the government tried its best to collect as much taxes as possible, in order to pay for its military activities.¹⁰³

¹⁰¹ Charles Tilly. *Coercion, Capital, and European States, AD 990-1992*. Blackwell Publishers Inc., 1990. Richard Bonney. *The Rise of the Fiscal State in Europe c.1200 ~1815*, Oxford University Press, 1999. Bonney Richard and Ormrod W. *Crises, Revolutions and Self-sustained Growth: Essays in European Fiscal History, 1130-1830*, Stamford, 1999, p.11.

¹⁰² Charles Tilly. Social Boundary Mechanisms, in *Philosophy of the Social Sciences*, vol.34, 2004.

¹⁰³ However, He Wenkai still believes that China failed to "develop into a modern fiscal state". He compares England, Japan and China, and his conclusion is: "England became a modern fiscal state by the 1750s when its government used the revenues from excises and the customs to service its massive long-term debt. Japan made the leap in the late 1880s when tax revenues were employed to back up paper money, i.e., banknotes issued by the Bank of Japan. China, however, failed to develop into a

Because of Europe's and China's different geographies, violent conflict led to autocracy and extraction in China, rather than to democracy or representation like in Europe. The question during the 19th century, was higher taxation possible without allowing for more political representation?¹⁰⁴ A state's fiscal structure provides the foundation for its survival and the means to properly operate the nation. In order to manage income and to realise the objectives and functions of the state the government enacts various activities of a fiscal nature. Studying the fiscal structure thus involves the investigation of government revenues and expenditures.

In the early Qing dynasty, the government's revenues consisted of: land tax, salt tax, customs duties, miscellaneous tax, monetary contributions, and services. Expenditures were divided into the royal family funds, officials' salary, soldiers' pay, coaching inns, imperial examination and education fee, and wages for river maintenance works. In the Daoguang period (1821-1850), the land tax was still the most important and most stable source of income. Notwithstanding the relatively large increase in spending, generally speaking, the budget had not yet come to the brink of collapse.

1. The Fiscal Structure of the Jiaqing and Daoguang Emperors

The fiscal system of the Qing dynasty (1644-1911) before 1850 comprised two basic elements: conventional financial revenue and expenditure, as well as temporary financial revenue and expenditure. Conventional financial revenue came from five main sources: Tian Fu (田賦 land tax), Cao Liang (漕粮 tribute grain), Yan Shui (盐税 salt tax), Guan Shui (关税 customs duties), and Za Fu (杂赋 miscellaneous taxes, including fish tax, tea tax, mineral taxes, and others).¹⁰⁵

Land tax was assessed on the land according to the area and the required

modern fiscal state."See He Wenkai. *Paths toward the Modern Fiscal State*. Harvard University Press. 2013. Abstract.

¹⁰⁴ Mark Dincecco and Yuhua Wang, Violent Conflict and Political Development Over the Long Run: China Versus Europe, in *Annual Review of Political Science*, vol.21, 2018.

¹⁰⁵ Ni Yuping, *Customs Duties in the Qing Dynasty, ca 1644-1911* (Brill 2016), p.1.

fertiliser. In the early Qing dynasty, the government levied taxes on the population. To recover from the war and encourage population growth, the Court announced that the population tax would use as a standard the population during the 50th year of the reign of the Kangxi Emperor (1711) and after that the population tax would be permanently fixed. Subsequently, the Court also factored in the population into the land tax. Therefore, the land tax was also called Di Ding Yin (Land and population silver). Before 1840, the land tax quota was about 25 million dan. Most land tax was assessed in terms of silver; however, some parts were taxed in kind, such as dry grass, medicinal material, silk, tea and others. Among them, the most important was Cao Liang (tribute grain), which was part of the land tax. From a tax perspective, this was derived from the land tax and was a special system. Tribute grain collection was limited to eight provinces, namely: Shandong, Henan, Jiangsu, Zhejiang, Anhui, Jiangxi, Hubei, and Hunan. The amount of tribute grain was more or less fixed at 4 million dan annually.

Salt tax was a resource tax levied indirectly on each salt consumer, and its administration was also quite complicated. The Qing government had a vast territory, and its salt production areas were also numerous. Even in Mongolia, Xinjiang, and other areas, there was also "prolific salt," and "in the mainland, there were 11 salt production sites, which were very useful for the country".¹⁰⁶ In the Qing dynasty, it took a special guild system named Piao Yan (票盐 salt ticket) to administer the tax. All the salt had to be sold in special fixed areas, and only specifically selected businessmen had the right to own salt tickets. Under this system, the Qing dynasty divided the whole country into several salt areas, and each region had a fixed number of merchants who received salt, transported salt, and sold salt in a special area. The government would tax these merchants directly. The salt districts of the Qing dynasty basically followed that of the Ming dynasty, mainly based on the administrative area. Only Fengtian was a new salt area, and Guangdong and Sichuan provinces expanded their salt areas.

¹⁰⁶ The Qing History Record (*Qing Shi Gao*), vol. 123, Salt.

Customs duty was a kind of commodity passage tax in the Qing dynasty. At the beginning of the Qing dynasty, the government did not pay much attention to this type of income, and during the reign of the Kangxi Emperor, it was only taxed at about 1 million taels of silver. “Every custom port had *Zheng’e* (正额 quota) in the beginning of our dynasty. With the passage of time and the development of goods, it began to have *Yingyu* (盈余 surplus).”¹⁰⁷ The quota for each port had been adjusted in the Qing dynasty, but with modest changes on the total number of 1.9 million taels of silver.

In the early years of the Qianlong period, the amount of *Yingyu* was fixed as the number taxed in the 13th year of the Yongzheng Emperor (1735). In 1777, the Emperor ordered that all the ports should adopt a three-year-comparison method. This meant comparing the taxes with that of the three preceding years, and the responsible officials would have to make up for the shortfall from their private means. In the year 1799, the government abolished this three-year-comparison method. In both the years 1804 and 1831, the government adjusted some ports’ *Yingyu*. After the reign of the Qianlong Emperor, the annual total profit from customs duties was about 5 million taels of silver.

The last category was *Za Fu* (miscellaneous taxes). Wang Qingyun, a famous official and scholar in the 1850s said, “all the taxes, except for land taxes, taken from the people were miscellaneous taxes.”¹⁰⁸ However, this is far from the truth when delving into the actual collection process. Miscellaneous taxes were entirely separate, both in different areas as well as different types of taxation. According to *Daqing Huidian Shili* (大清会典事例, Rules Explanation of the Qing Dynasty)¹⁰⁹, there were four types of miscellaneous taxes. The first type was *Ke* (课 a small kind of tax), such as *Lu Ke* (芦课 tax on reed), *Cha Ke* (tax on tea), *Yu Ke* (渔课 tax on fish), and taxes on gold ore, silver ore, copper, iron ore, tin ore, and others. The second type was *Zu* (租

¹⁰⁷ Yao Yuanzhi, “*Zhu Ye Ting Za Ji*”(Miscellaneous Records of Bamboo Leaf Pavilion), Zhonghua Bookstore, 1997, p.118.

¹⁰⁸ SQYJ, vol.6.

¹⁰⁹ edited by Li Hongzhang, Shanghai: Shangwu Yinshuguan, 1908.

rent), such as Qi Zu (旗租 tax on people who rented the land belonging to Manchu Banner men), Xue Tian Zu (学田租 tax on the land belonging to the school), and Guan Tian Zu (官田租 tax on the land belonging to the government). The third type was Shui (tax), such as the tax on house sales, real estate tax, and tobacco tax. The fourth type was Gong (贡 tribute), mainly assessed on the ethnic minority areas, such as Ma Gong (马贡 horses tax) and Hu Pi Gong (狐皮贡 fox fur tax). The modes and uses of miscellaneous taxes were varied, some made use of a fixed quota and some went without. The revenue from miscellaneous taxes was 673 thousand taels of silver in 1685, 698 thousand taels in 1724, and 1.05 million taels in 1753. Because of the complicated and convoluted nature of these miscellaneous taxes, some financial statistics often did not get recorded.

It was an interesting comparison between China and Europe when determining how tax payment was organised. In England, France and the Netherlands around 1800-1850, a new system of tax collection spread. Taxes became increasingly more collected by state officials and were levied per capita or per purchase. Less and less taxes were collected by tax-mongers or tax-farmers, those individuals that rented the right to levy tax and paid the expected quota in advance, and who subsequently taxed the population heavily. Tax-farming guaranteed the state an income, but had as disadvantage that people were exploited by the tax farmers, who sought to maximise their profit. As a result taxpayers tended to arrange their activities in a way it became less taxable. In general tax-mongering stifled economic growth by restricting investment, and consequently also hampering any rise of state revenues in the long-run. However, the government always controlled the power to tax by itself in the Qing China. If more money was extracted by officials, this surplus had to be sent to the Court, and was not a reward for these officials.

In addition to the conventional fiscal revenues stated above, there were two kinds of temporary expenditures, Juan Nan (捐纳 a private donation to a public cause with a predetermined official reward) and Bao Xiao (报效 a similar donation of private funds to a public good but instead without reward). In the Qing dynasty, Juan

Nan could be divided into four types based on the reason and purpose: military donation, river maintenance donation, disaster relief donation, and land reclamation donation. Among them, military donation and river maintenance donation were the biggest. Bao Xiao was a kind of extortion method adopted by the rulers to address imminent fiscal difficulties. According to Chen Feng's statistics, during the reigns of Qianlong and Jiaqing, the salt merchants donated 65 million taels of silver that were labelled Bao Xiao, which were mainly used in the military, river maintenance, and disaster relief.¹¹⁰ This demonstrated that Bao Xiao played a very important role in solving the fiscal difficulties of the rulers. However, both Juan Nan and Bao Xiao had enormous negative effects. It was because that in general the government would reward these generous donors with official positions from which they would quickly extract more money from the ordinary people. Xiao Yishan, the first generation of Qing history researchers said that "When the Daoguang period began, the seeds of fiscal crises already existed, and the government was not as rich as before. The government relied on no other sources except Juan Nan and Bao Xiao."¹¹¹

With regard to fiscal expenditure, according to Daqing Huidian (大清会典, Rules of the Qing Dynasty) of the Jiaqing period; "The country has 12 annual expenditures. The first is the fee for the sacrifice; the second is the fee for the guard; the third is the salary for the officials; the fourth is the fee for examination and education; the fifth is the salary for the soldiers; the sixth is for the Yi Zhan (驿站 courier station, station to transport official letters); the seventh is the fee to the students; the eighth is the fee for reward and pension; the ninth is the fee for building; the tenth is the fee to buy goods for the government; the eleventh is the fee for weaving clothes for the emperors; and the twelfth is the allowance for the officials."¹¹² The Qing court also divided them into three parts based on a fiscal management perspective: the capital's expenditures, the provinces' expenditures, and miscellaneous expenses.

¹¹⁰ Chen Feng, *Qing Dai Yan Zheng Yu Yan Shui* (Salt Administration and Salt Tax in the Qing Dynasty), Zhongzhou Ancient Books Publishing House, 1988, p.220.

¹¹¹ Xiao Yishan, *Qing Dai Tong Shi* (General History of the Qing Dynasty), Taiwan Commercial Press, 1993, p.358.

¹¹² *Jia Qing Da Qing Hui Dian* (Rules of the Qing Dynasty), Vol.12.

Among these items, the biggest expenditures were the officials' salary, military expenses, river maintenance costs, and Yi Zhan.

According to Wei Yuan's research, the number of Manchu and Han soldiers was 800 thousand, and the annual expenditures (in taels of silver) on rice, beans, and grass was 17.04 million; the officials' salary was 938.7 thousand; the allowance for the civil service officials was 3.47 million and for the military officials 800 thousand; the reward for soldiers was 300 thousand; the special allowance for Manchu soldiers was 422 thousand, for the students and teachers in provincial school was 140 thousand; and the Yi Zhan fee was 2 million. To transport grains for tribute, the government built 5,688 boats, which required repairs every ten years at a price of 1.2 million taels. To help the Manchu soldiers repurchase their land and add one more month of salary for them, the government spent 380 thousand taels annually. The second part of the expenditures related to the maintenance of rivers. There was about 800 thousand taels put aside for the Yellow River of Shandong and Henan provinces and 3 million taels allocated for the south part of the Yellow River. There was no quota for the imperial clan pension, but the number would be more than 2 million taels. "It was a large number in the annual expenditures. However, the disaster relief, exemption, and accident affairs were not included."¹¹³

Here we analyse the fiscal structure of the Daoguang period. When it comes to the land tax of that time, researchers usually directly quote Wang Qingyun's book "Shi Qu Yu Ji"(石渠余纪 Fiscal Data Collections):

Table 3.1: Land Tax of Daoguang period by Wang Qingyun (in taels)

Kind	Old Quota	New Tax Quota	1841	1842	1845	1849
Total	32724702	33348037	29431765	29575722	30213800	32813304

Source: Wang Qingyun. "Shi Qu Yu Ji", Vol.3, "local provinces".

Obviously, there were two problems in Wang Qingyun's statistics. First, due to the system of the Qing dynasty, the land tax that was collected generally included the

¹¹³ Wei Yuan, *Sheng Wu Ji* (Record of Millitary Affairs in the Qing Dynasty), Appendix Vol.11

quota of the current year (known as Xin Fu, 新赋 new tax) and the number which had not been taxed from the previous years (known as Jiu Fu, 旧赋 old tax). Whether for new tax or old tax, these figures were related to the size of the lands and again with an exemption during periods of natural disasters. Thus, the quota could not be the same for every year. As such, the numbers under the “old quota” and “new tax quota” in the table above are doubtful. Second, if we check the archive we can find that after the Qianlong period, each province had different naming conventions and particulars in their version of the land tax. In some provinces the land tax included miscellaneous parts, or tribute grain, or reed tax. In general, the data can’t be transposed directly into a general analysis of the land tax without a careful analysis going province by province. To avoid these problems, the author took the data from the Chaodang by Tang Xianglong (stored in the library of the Economy Institute, Chinese Academy of Social Sciences) and the data from the archives in the First Archives Museum in Beijing to offer a time series of land tax data for the years 1821-1850 (more details are provided in the Appendix).

Graph 3.1: Land tax in 1821-1850

From Graph 3.1 we can see that the actual collection of land taxes ranged between 20 million to 25 million taels of silver and generally, with a slightly downward trend. There was only one exception in 1846, with taxes valued at 26 million taels of silver, which might have been connected with the increase in government spending after the First Opium War.

Tribute grain was the biggest type of income for the court. Concerning this vital statistic there are three relevant data sets available. The first is the actual amount of tribute grain collected in the eight provinces; the second is the actual amount of tribute grain transported by these eight provinces.¹¹⁴ The third is the actual amount of tribute grain received in Tongzhou by the court, which was the final transportation point of the Grand Canal. The data of each group are interrelated but have their own connotations. Obviously, the first must have been bigger than the second and the second bigger than the third. To determine the fiscal burden of the people, the first data should be most useful. Meanwhile, the third data set would be most useful if we want to know the income of the central government. Below are the data following from the third set of data (the actual volume of tribute grain received in Tongzhou by the court).¹¹⁵

Graph 3.2: The Tribute Grain Received in Tongzhou (in dan)

From Graph 3.2 we can see that the amount declined gradually in the Daoguang period, which was likely connected with frequent natural disasters and the subsequent inability of the citizenry to pay tax in the late Daoguang period. It is necessary to point out that in the process of grain collection in the Qing dynasty, the

¹¹⁴ In the Qing China, the Court only taxed tribute grain in kind from eight provinces: Shandong, Henan, Anhui, Jiangsu, Zhejiang, Jiangxi, Hubei and Hunan

¹¹⁵ Chaodang, vol.23-24.

government also collected other fees in order to transport tribute grain, due to the highly localised nature of this fee that amount of money was difficult to determine.

When it came to salt tax, Wang Qingyun wrote in his book "Shi Qu Yu Ji" that the quota was 4.1 million taels, the surplus was 2.6 million taels, and with other income the total salt income was about 7.5 million taels.¹¹⁶ However, this number was not the exact number the court received. Based on Wang Qingyun's statistics, the total revenue of the government was 38.6 million taels in 1841 and the salt tax accounted for 12.85% of the total. In 1842, the number was 38.7 million taels and salt tax accounted for 12.87%. In 1845, it was 40.6 million taels and salt tax accounted for 12.49%. In 1849, it was 37.0 million taels and salt tax accounted for 13.47%.¹¹⁷ In this sense, we can speculate that the ratio of the salt tax out of the total conventional fiscal revenue was about 10% to 15%.

The analysis in this chapter of customs duties in the Daoguang period (1821-1850) was based on data from two kinds of archives: 1) the First Historical Archives of China, including Palace Midrange Rescript Memorials (PMRM, film no. 20, 21), Extra Copies of Grand Council Memorials (ECGCM, film no. 126、218-219), and Jiaqing and Daoguang Period Edict Records (Guangxi Normal University Press, 2000) and 2) Revenue and Expenditure Reports of Customs in the Qing Dynasty, finished by Tang Xianglong in the 1930s and now stored in the library of the Institute of Economics of the Chinese Academy of Social Sciences.

Za Fu (Miscellaneous taxes) was a relatively stable income source that amounted to more than 1 million taels annually. However, due to the data limitations we are still unable to provide accurate statistics.

Regarding donations, according to Tang Xianglong's research, there were 33.8

¹¹⁶ Wang Qingyun, *Shi Qu Yu Ji* (石渠余纪 Fiscal Data Collections). Wenhai Press, 1966.p.470.

¹¹⁷ The author is skeptical about the precise data provided by Wang Qingyun. According to Chaodang (vol.7-33), collected by the Institute of Economics of the Chinese Academy of Social Sciences, we can get some real numbers of salt tax collected in the Lianghai Area and Zhejiang provinces in sporadic years, which were quite different from Wang Qingyun's data. The reasons need to be examined.

million taels of silver of Juan Jian (捐监 donation for Jianshen, which were students of the Imperial College in the Ming and Qing Dynasties) during 30 years of the Daoguang period, which translates to about 1.1 million taels of silver each year. Among the provinces, Jiangsu, Guangdong, Jiangxi, and Zhejiang provinces were the most important donors.¹¹⁸ Needless to say, Juanjian income was just one type of donation. It was not easy to estimate the total value of donations. However, we can illustrate the importance of donations in the total revenues based on its ratio as recorded by the Ministry of Treasury. The Ministry of Revenue was responsible for the management of donations and afterwards taking care of standing expenses, the remaining funds were sent to the Ministry of the Treasury. According to the statistics of the Ministry of the Treasury in the Qing dynasty, from 1724 to 1842, there were 182.6 million taels of silver sent to the Ministry of the Treasury, six times the value of the land tax and clearly a significant amount of income.¹¹⁹

Bao Xiao (donation without reward) in the Daoguang period was very popular with the salt merchants. In theory this extraordinary revenue did not form an extra burden for ordinary people, nor was levied by force. Sometimes, the local government even used the funds of the treasury in advance and waited for the merchants to replenish the amount. However, wool comes from the sheep's back, as the Chinese saying is; the money the government received through Bao Xiao will eventually be at the cost of ordinary people. As the situation during the Qing Dynasty changed, more and more of Bao Xiao was apportioned by the local government.

With regard to expenditures, a very important type was the cost of maintaining the royal family members, which included acquisition, weaving (for the Emperor's and his family's clothes), and housekeeping funds which was generally managed by the NeiWu Fu (Imperial Household). The fund was in part from the land tax belonging to the emperor, and partly taken by appropriation from the Ministry of Revenue.

¹¹⁸ Tang Xianglong, *Dao Guang Chao Juan Jian Tong Ji* (Statistics of Donation Supervision in the Daoguang Reign of the Qing Dynasty), Southwest University of Finance and Economics Press, 1987.

¹¹⁹ Luo Yudong, *Zhong Guo Li Jing Shi* (Likin History of China), Commercial Press, 1936, PP. 6-7.

Feng Guifen, a famous scholar in the late Qing dynasty once said, “The state funds are regular, but the expense for the royalty has no quota. I heard that each year there is more than 3 million taels appropriated for this, which was 10 times the amount at the beginning of the Qing dynasty. We should have some limit on this. Another thing is that the number of Manchu soldiers increased day by day, generation by generation, making this an even bigger expense than the royalty expense. As such, how could we feed such a huge number of people?”¹²⁰ In any circumstance relating to fiscal matters, be it public or private, this was a big number but difficult to measure.

As derived from the statistics of 1812, the aggregate salary for officials was 1.9 million taels, the Yanglian Yin(养廉银 allowance for the officials) of civilians was 2.8 million taels cumulatively, and the Yanglian Yin of the military netted 1.4 million taels. Together these amounted to 6.1 million taels each year, excluding the rice salary of 957 thousand dan.¹²¹

In 1727, the soldiers’ salary would have cost the state approximately 13.9 million taels of silver, 3.2 million dan of grain, wheat, and bean, and 6.4 million bunches of dry grass. Even in the Daoguang period, this would have amounted to about 20 million with little change.¹²² The expansion of military expenditure during wartime was a very noticeable phenomenon in the Daoguang period. According to Chen Feng’s statistics, during the war in Xinjiang from 1820 to 1828, 12.4 million taels of silver was spent. The second war in Xinjiang cost 9 million. The rebellion in Hu’nan and Guangdong cost 1.5 million taels.¹²³ During the First Opium War, it was recorded in the Qing Shi Lu (Record of the Emperor), “this war cost more than 20 million taels,

¹²⁰ Feng Guifen, *Xiao Bin Lu Kang Yi* (School Protest), Zhongzhou Ancient Books Publishing House, 1998.

¹²¹ *Jia Qing Da Qing Hui Dian* (Rules of the Qing Dynasty), Vol.12-13.

¹²² Zhang Tingyu, *Qing Chao Wen Xian Tong Kao* (General Examination of Documents in the Qing Dynasty), Vol.42.

¹²³ Chen Feng, *Qing Dai Jun Fei Yan Jiu* (Military Expenditure Research in the Qing Dynasty), Wuhan University Press, 1992, pp.266-275.

and we still receive new reports.”¹²⁴

River maintenance was the second biggest component of fiscal expenditures. Wei Yuan said in 1842 that, “There was no year without river maintenance since the beginning of the dynasty. We have seen that the cost after 1783 was double that of the early years of the dynasty. In 1806, the cost was even double that of 1783. Now, with the bottom silted up, the risk of damage had increased, the cost was double that of 1806. It was even bigger than the royalty cost.”¹²⁵ In Yongzheng times, the regular river fee was 600 thousand taels. In the Jiaqing era, with the sand in the Yellow River increasing, the cost was already 2 million taels. In addition to normal maintenance, the cost for exceptional engineering projects raised the total cost even more. The court spent 5.2 million taels to repair the south part of the Grand Canal in 1826, 5.5 million taels to repair the east part of the Grand Canal in 1841, 6 million taels in 1842, 5.2 million taels in 1843, and about 12 thousand taels in 1844. According to Wang Qingyun’s records, aside from regular engineering, the court also spent 2.1 million taels in the east and 3.3 million taels in the south in 1845; 1.9 million taels in the east and 2.9 million taels in the south in 1846; and 1.8 million taels in the east and 2.8 million taels in the south in 1848.¹²⁶ The Grand Canal required approximately 5 million taels each year in expenses. Seawall building and maintenance expenses were also extremely large. For example, just in 1833 the court spent 1.6 million taels, and in 1834, it was once again 1.6 million taels.

Yi Zhan (驿站 courier station, station to transport official letters) was the main way to transport documents and military commands in the Qing dynasty. These stations were located all over the country (in thousands of locations), and had both a military and civil nature. The costs associated with Yi Zhan included salaries of the postal workers, feeds for the horses, and boats, totalling about 2 million taels each

¹²⁴ According to Mao Haijian’s estimation, the fiscal and military expenditure of the First Opium War was about 25 million yuan (Mao Haijian, *Tian Chao De Beng Kui*, The Collapse of the Chinese Empire, Sanlian Bookstore, 1995, pp.420-421).

¹²⁵ Wei Yuan, *Wei Gu Tang Wai Ji* (微古堂外集 Special Edition of Research Ancient China), vol.6.

¹²⁶ SQYJ, vol.3.

year.

Examination and education fees were mainly used in the Empire Examination and for students. The annual examination expense was approximately 300 thousand taels of silver. There were all kinds of schools: at the central, provincial, prefecture, and county levels. According to Chang Chung-li's estimate, before the Taiping Rebellion (1850), there were 1,741 official schools and 25,089 students. It was estimated that the schools' budget and annual expenditure of an examination was at least 1 million taels of silver.¹²⁷

Aside from the six items above, there were still other items such as sacrifice, reward, and others, which cost about 500 to 600 thousand taels. Each year, the Ministry of Revenue also needed to give 1 to 1.2 million taels to Jilin and Shengjing as these places were "the place of Dragon Appearance", the hometown of the emperors and the Manchu.

Disaster relief and tax exemptions were also very important fiscal expenditures. Our research of the 1823 flood (chapter 4) establishes how much money was used for disaster relief. In the book of Qing Shi Gao, other big natural disasters were studied, such as the 1831 flood in Jiangsu that cost 1 million taels, the 1847 drought in Henan that also cost 1 million taels, and the 1848 flood in Zhili that cost about 1.4 million taels. There were also a lot of exemptions granted during this period, even though not as much as in the Kangxi and Qianlong eras. In 1840, the imperial court ordered a tax exemption for all the provinces amounting to 9.3 million taels of land tax.¹²⁸ In Wang Qingyun's records, it was documented that within the Jiangnan area, there was a land tax of 5.3 million taels of silver that was exempted. In 1836 (1846), there was a debt of 5.6 (10.1) million taels that was forgiven by the emperor. This however was no permanent solution as within the next 10 years the debt again accumulated to 10.1 million taels in 1846. Then in 1850, the debt had reached about

¹²⁷ Chang Chung-li, *The Chinese Gentry*, University of Washington Press, 1955, p. 141.

¹²⁸ Qing Xuan Zhong Shi Lu (Record of the Emperor Daoguang), vol.460.

13.9 million, and this was similarly expunged by the emperor.¹²⁹ From these figures, we can imagine how huge the total was.

From the research of Wang Qingyun we have data on the total revenue and expenditure of the Daoguang period.¹³⁰

Table 3.2: Revenue and Expenditure of the Daoguang Period (in taels)

Year	Revenue	Expenditure	Balance
1838	41272732.659	36209382.386	5063350.273
1839	40307372.41	34787590.447	5519860.96
1840	39035229.796	35805162.109	3230067.687
1841	38597458.73	37341583.492	1255875.238
1842	38715060.818	37149811.287	1565249.531
1843	42264528.629	41904903.693	359624.936
1844	40163854.832	38651694.514	1512160.318
1845	40612280.774	38815891.185	1796389.589
1846	39222630.42	36287159.329	2935470.713
1847	39387316.116	35584467.837	3802848.279
1848	37940093.827	35889872.079	2050221.748
1849	37000019.041	36443909.923	556109.118

From Table 3.2, we can see that the revenues and expenditures in the Daoguang period were balanced and some years even had some slight surplus. However, it is difficult to determine the actual source of the data, as Professor Chen Zhiping had pointed out, the 1849 data provided by Wan Qingyun in 1848 might be incorrect.¹³¹ As any historical data, this should also be handled with caution and examined with a critical eye.

During the Daoguang period the Treasury of the Ministry of Revenue was the main agency in charge of receiving funds and making payments for the country. In this way it performed a function similar to that of a national treasury, and so it was an important indicator of fiscal balance. We should point out that the records of the Treasury of the Ministry of Revenue did not represent a complete image of the total

¹²⁹ Biographies of Wang Qingyun, in the book of Biographies of History of the Qing Dynasty, Vol.46.

¹³⁰ Financial Historical Materials in the Council Office of the People's Bank of China, *Zhong Guo Jin Dai Huo Bi Shi Zi Liao* (Modern Monetary History of China) (Volume I), Zhonghua Bookstore, 1964, p.172.

¹³¹ Chen Zhiping, *The Number Correction of Fiscal Annual Revenue and Annual Expenditure in the 29th Year of Dao Guang Reign*, in *Research on the History of Social Economy in China*, No.2, 2009.

national fiscal revenue and expenditure because it operated mainly based on the taxes sent to Beijing. Much of the total revenue was instead kept and set to use in the local province or sent directly to other provinces. However, during the early Qing, the main portion of the revenue was absolutely controlled by the Court and local government had no power to intercept funds. No more than 20% of the proceeds of the land tax could be kept in their local provinces. Because data from the Treasury of the Ministry of Revenue has been preserved and is now available, this has allowed us to determine an estimate of the real number of the total national fiscal revenue during the Qing period. According to Shi Zhihong's research, there was 9.9 million taels worth of income annually in the Daoguang period, accounting for about 22% of the total national revenue. This remained stable as compared with 26% for the Kangxi period, 33.3% for the Yongzheng period, 24.8% for the Qianlong period, and 23.2% for the Jiaqing period.¹³²

Following are the data we collected from the archives and Chaodang.¹³³

Table 3.3: Revenues during the Daoguang Period (in taels)

Year	Land tax	Customs duties	Juanjianyin	Yinku income	Yinku expense	Yinku surplus
1821	21607658	5154635.8	1528598	7630388.956	11351701.12	27489790.103
1822	21894605	5878812.683	1490371.2	7060251.329	11210691.122	23339350.31
1823	20455728	4868783.643	1043626	8022729.099	9948689.111	21413390.299
1824	23955498	4770416.114	1921774	6979498.3		
1825	23823963	4426222.023	1951433	8507035.548	9218327.77	
1826	23304982	4276750.536	2042534.2		10935444.76	
1827	24458490	4936506.389	1254509.2	23802617.22	11373705.05	30009705.849
1828	23305751	4520912.241	1413666.4	14422806.341	10951956.194	33480555.996
1829	23506229	4608886.514	1149558	11557958.78	11713016.78	33325497.989
1830	23477485	4909004.952	1173688	11289651.043	12575834.261	32039314.771
1831	22024406	4440735.269	1170988	7010524.09	10392799.3	28657039.556
1832	22413419	5036156.363	1172617	8019700.574	10987586.25	25689153.883
1833	22297593	4108735.555	1074308	7160868.728	10886615.761	21963406.85
1834	22756019	4442944.229	1365102	15522249.804	10773738.669	26711917.985
1835	21781675	4733339.056	1062270			
1836	23053143	4675642.575	966572	9551051.47		

¹³² Shi Zhihong, *Qing Dai Hu Bu Yin Ku Sou Zhi He Ku Cun Tong Ji (Statistics of the Income and Expenditure of the Treasury and Inventory of the Ministry of Household Affairs in the Qing Dynasty)*, Fujian People's Publishing House, 2008, pp. 40-42.

¹³³ Chaodang, vol.1-8.

1837	23579481	4854040.647	1094028		9627520.753	
1838	23569752	4448389.581	866072		10651476.16	
1839	22247221	4398491.226	869666	8682740.926	11590119.79	24511409.86
1840	21815510	4137588.848	902104	10350259.8	10312240.88	24549428.777
1841	20491003	4264322.139	741804	6796037.933	15733178.08	15612288.63
1842	20894664	4203919.116	896167	10914110.6	13519846.63	13006552.601
1843	22006097	3267632.329	1215134	7919692.645	10992455.454	9933789.792
1844	26056515	4603793.663	1021138		7609984.665	
1845	21208648	5991007.966	825488	9069653.822	8737518.874	
1846	20261681	8697238.086	840928	9044024.206		
1847	20224568	4874386.84	686802		8479905.436	
1848	20006462	4879912.937	698208	8872939.635		
1849	19764924	5620980.681	872720	8781377.978	9340394.584	
1850	19990057	4449242.682	574456	7748584.997	9531910.219	

The graph below illustrates the trends based on the data above.¹³⁴

Graph 3.3: The Trends of Revenues during the Daoguang Period

From the graph 3.3 above, we can see that the land tax was still the most important and stable revenue source for the country. It is a pity that we do not have records of the population per year during this time. If these records were available it would be possible to provide per capita tax revenues which would show a decreasing trend. Although other revenues had some fluctuations, their contributions as part of the whole were limited. This shows that even though China had begun to move

¹³⁴ Due to the incomplete and limited amount of donation data, the accumulated amount of silver was omitted in the schematic diagram due to the occurrence of the late Daoguang bank case.

towards modernising its society, the basic structure of the fiscal revenues had not yet changed with it. The Treasury of the Ministry of Revenue had changed greatly, and when the deficit happened, the Court would remedy the gap by saving on expenditure or fund projects through donations and Bao Xiao. Wu Tingxie wrote in his book *Qing Cai Zheng Kao* (清财政考 Research on the Fiscal Situation of the Qing Dynasty) that, "The fiscal expenditure increased sharply during the Daoguang period, which had never happened before, especially in the military and river engineering. At that time, the Ministry of Revenue had no good solution, people's livelihood declined. Therefore, the court began to cultivate Xinjiang and Fengtian,¹³⁵ reformed the salt policy, adopted the sea transport of tribute grain, and cut administrative expenses. After the First Opium War, the door was opened, and more silver was moved abroad." Usually, it was the Ministry of Revenue that sent silver to the Neiwu Fu, but in the Daoguang period, it was Neiwu Fu that sent 7.3 million taels of silver to the Ministry of Revenue.¹³⁶

Meanwhile, with significant changes in the social situation, the Qing government maintained the principle of "living within one's income." According to this principle, the fiscal system must be based on controlling existing sources rather than on opening new sources. At that time, the amount of control the Qing dynasty still had over its own fiscal situation had been reduced greatly. Even though there was a huge amount of expenses for military activities, river engineering, and disaster relief, the court still relied on temporary solutions (i.e., donations) to support the lack of funds; it had no long-term plans. Emperor Daoguang even said, "If we consider our country a big house, it had survived for a long time. Even though the eastern part of the wall has not collapsed, the western part of the wall could still collapse. If the people continue to repair the wall now and then, the house would be like new. We really do not need to build a new house."¹³⁷ At that time, the West had entered the era of

¹³⁵ In the Late Qing, Fengtain changed the name to Liaoning.

¹³⁶ Wu Tingxie, *Qing Cai Zheng Kao* (Research on the Fiscal Situation of the Qing Dynasty), p.12.

¹³⁷ Zhang Jixin, *Dao Xian Huan Hai Jian Wen Lu* (Records of Officials Times During the Daoguang and Xianfeng Times), 22th of August, 1847.

capitalism; taxation had changed from being the source of current financial expenditure to being a means for meeting production requirements, thus affecting the structure and direction of production. The Qing court was faced with new problems concerning the fiscal situation, such as how to adjust regular taxes in line with an expansion of spending, and how to adjust the amount of tax required when the value of the currency changed. However, the court did not properly communicate any feasible countermeasures. It is highly likely that even in a hypothetical scenario where the Taiping Rebellion did not happen, the fiscal system of the Qing dynasty would still need to make major adjustments.

However, on the whole, the fiscal situation during the Daoguang time had not yet reached the edge of collapse. If we increase the time-horizon and compare the fiscal situation with the situation after this period, the superiority of the former would be evident. From this point of view I consider the Daoguang period as a transitional fiscal situation “with quantitative changes but no qualitative change.”

2. War: an almost Collapse of the Fiscal System

The Taiping Rebellion (太平天国运动 Taiping Heavenly Kingdom Movement) was the largest peasant rebellion in Chinese history. Hong Xiuquan, the leader of Taiping Rebellion, established its capital in Tianjing (天京, now Nanjing). The Taiping Rebellion was very strong in the early stage and took the provinces of Jiangsu, Zhejiang, Anhui, Jiangxi Hubei and Hunan, the richest provinces of the Qing. Later, it was finally destroyed by Zeng Guofan and Li Hongzhang, new military leaders of the Qing government.

The Taiping Rebellion broke out in Guiping county, Guangxi province on January 11, 1851 and quickly developed into a large-scale war against the Qing dynasty. In the first eight months, the rebels continuously captured multiple counties such as Guiping, Pingnan, Wuxuan, Xiangzhou, Yongan, and others nearby. In 1852, the Taiping army rushed into Hunan and Hubei and even occupied Wuhan, the capital of

Hubei. In 1853, the Taiping army had several hundred thousands of troops that moved along the Yangtze River and occupied most parts of Jiangxi, Anhui, and Jiangsu. In October, the Taiping army broke into Jiangning (today Nanjing, the capital of Jiangsu) and renamed it “Tianjing,” the Capital of the Taiping Kingdom. Afterwards, the Taiping army sent troops (i.e., Beifa, the Northern Expedition) to the north in order to eliminate the Qing court, passing through Anhui, Henan Shandong, Shanxi, and Zhili within half a year. It even reached Tianjin, which is very close to Beijing. Emperor Xianfeng was ready to go north of Rehe (热河 today's Chengde). Due to the lack of back-up, the Northern Expedition finally failed. However, the other rebel groups, such as the Nian army, continued to be active in Henan, Anhui, Jiangsu, and Shandong provinces until 1868, when these rebellions were completely suppressed. During the Northern Expedition, the Taiping army captured most parts of Anhui, Jiangxi, Hunan, Hubei, and Zhejiang province, which were at the time the most prosperous area of China.

Upon capture of these provinces, the Taiping Kingdom’s rebels who led the uprising experienced serious internal strife. Yang Xiuqing, the secondary leader of the Taiping Kingdom was killed, and Tianjing was surrounded by the Qing army. However, with the rise of young generals such as Chen Yucheng and Li Xiucheng, the Taiping forces were restored. In 1860, during the Second Opium War (1856-1860), the Qing army and the Western powers joined together to suppress the Taiping army and the situation on the battlefield reversed. In 1864, the topmost leader of the Taiping Kingdom, Hong Xiuquan, committed suicide. Several months later, Zeng Guofan captured Tianjing, which symbolised the failure and end of the Taiping Kingdom movement. Beyond that, the Qing dynasty spent another two years to eliminate the rest of the Taiping kingdom’s military force.

During the Taiping Rebellion, there were many other rebellions that broke out, such as those in Nian (in Anhui), Henan, and Shandong provinces; those of the Tiandi Hui (天地会 The Heaven and Earth Society) in Guangdong, Guangxi, and Fujian

provinces; the Miao and other minorities' rebellions in Yunnan, Guizhou, and Sichuan provinces; and the Hui minority's rebellion in Shaanxi and Gansu provinces. With all these rebellions, the Qing regime nearly collapsed.

At the same time, the fiscal system of the Qing dynasty was also challenged in an unprecedented manner. Initially, the Taiping army was quite successful and the Qing government's military spending had been huge. In 1851, only several months after the Taiping rebellion had started, when the battles were still limited to Guangxi, the Guangxi province needed monetary support from other provinces, valued at 700 thousand taels per month.¹³⁸ The Ministry of Revenue reported in 1851 that, "in the spring, we only had 640 thousand taels of silver available. Now in the August, we only have 1 million in revenues and no other income. We have no money to pay for disaster relief and exemptions from land tax."¹³⁹ According to Wang Qingyun's records, from 1851 to 1852, the court's expenses amounted to a total of 22.6 million taels of silver, specifically 4.5 million taels for river engineering and 18.1 million taels for the military. The spending for military activities comprised 11.2 million taels for Guangxi, 4.2 million taels for Hunan, 1.9 million taels for Guangdong, 450 thousand taels for Hubei, 200 thousand taels for Guizhou, and 100 thousand taels for Jiangxi.¹⁴⁰ This means that a significant amount of funds were spent in just the first two years of the war.

In 1853, the Taiping army achieved great momentum and the budget of the Qing government had become ever more strained. In June, the Ministry of Revenue reported that it had spent 29.6 million taels of silver in these three years of war. "We have tried our very best to fill the budget."¹⁴¹ However, every province still asked for money from the central government. At the same time, the Yellow River flooded once again, requiring a large sum of money for rescue and repair. "Money is needed

¹³⁸ Qing Wen Zhong Shi Lu (Record of the Emperor Xianfeng), vol.47.

¹³⁹ Xu Daling, *Qing Dai Juan Nan Zhi Du* (Donation System in the Qing Dynasty), Harvard-Yenching Institute Press, p.60.

¹⁴⁰ SQYJ, vol.3.

¹⁴¹ Financial Historical Materials in the Council Office of the People's Bank of China, *Zhong Guo Jin Dai Huo Bi Shi Zi Liao* (Modern Monetary History of China) (Volume I), Zhonghua Bookstore, 1964, p.175.

everywhere, especially by the military actions. However, the provinces at war have no way to collect land taxes, and the provinces not at war have already asked for exemption. We have no way to achieve the quota in land tax.” With regard to the salt tax, Yangzhou of Lianghuai had been occupied by the Taiping army for quite some time. Hankou, the most important market for selling salt, had been repeatedly hit by the enemy. South Hai, the biggest salt producer, was also destroyed by the war. Thus, the salt tax lost half of the potential income. With regard to customs duties, the famous ports of Wuhu Guan, Jiujiang Guan, Fengyang Guan, Hushu Guan, Kui Guan, and the other ports along the Yangtze River had been destroyed by the war. Even the Chongwenmen port, located in Beijing and far from the war, was still affected by the war since the goods that needed to be transported could not. As such, the income quota of customs duties “existed only on paper.”¹⁴²

All the problems involved conventional revenue sources. Even if the taxes would meet the quota, it would still not be enough to meet the demand. Therefore, the Ministry of Revenue attempted to take donations, but at that time donations were not as popular as they used to be. Subsequently, the Ministry of Revenue also executed on other methods to address the shortage of funds, such as stopping Yanglian Yin (allowance for the officials), mining silver ore, and taxing shops. “We have done everything we could but need time to see results. At the same time, all the provincial governors could not offer good suggestions, and they even did not respond to our advice.” On June 12, 1853, the Treasury of the Ministry of Revenue only deposited 227 thousand taels of silver, which was not even enough for next month’s salary. “We have worked in the Ministry of Revenue for a long time, some of us for more than decades, some for one or two years. However, we have never experienced such a distressed situation as today. If the military activity will not stop quickly, the money for foreign and domestic needs would be exhausted at the same

¹⁴² Financial Historical Materials in the Council Office of the People's Bank of China, *Zhong Guo Jin Dai Huo Bi Shi Zi Liao* (Modern Monetary History of China) (Volume I), Zhonghua Bookstore, 1964, pp.175.

time. We dare not estimate the result if no good solution is offered.”¹⁴³ From this report we can see how difficult the fiscal situation was during this period. Even the Ministry of Revenue officials admitted that such a serious situation had never happened before.

The fiscal difficulties would inevitably lead to payment in arrears. A direct consequence of non-payment for soldiers was that in this period, most of them had difficulty buying food. We could just imagine their ability to fight. “Since they had not received their salary, it was very difficult for the general to command and rule these soldiers.”¹⁴⁴ The camp generals could not face the soldiers, issue orders and expect those to be followed. “If we had a huge sum of money, our soldiers would be very brave.”¹⁴⁵ However, if the soldiers had no money, they would not fight. If the soldiers could not fight, the war would continue, and the fiscal problem would become more serious, which was really a vicious circle.

The central government continued to have no money, and the local provincial treasury was also empty. For example, after years of war, the provinces of Hunan and Hubei had been badly hurt. Zhang Liangji, the Viceroy, reported to the court that the treasuries were totally empty, especially Hubei, whose treasury did not even have any coins. “What we could do only is to wait for the help from Guangdong treasury to survive.”¹⁴⁶ The treasury of Hubei only had several thousand taels of silver, and Zhang also said that such a situation had never happened before. In November of 1853, Emperor Xianfeng ordered the Hunan militia deputy, Zeng Guofan, to send troops to rescue Anhui, which was under attack by the Taiping army. However, Zeng Guofan rejected the order directly. He reported that the treasury of Hunan “only has five thousand taels of silver, which is even insufficient for preparing food for the soldiers for one month (...) we also have no hope of getting support from other provinces.” Zeng Guofan used this reason to decline the command, and Emperor

¹⁴³ Financial Historical Materials in the Council Office of the People's Bank of China, *Zhong Guo Jin Dai Huo Bi Shi Zi Liao* (Modern Monetary History of China) (Volume I), Zhonghua Bookstore, 1964, pp.176.

¹⁴⁴ Zhao Liewen, *Nen Jing Ju Ri Ji* (Diary by Zhao Liewen), February 25, 1864.

¹⁴⁵ Zhao Liewen, *Nen Jing Ju Ri Ji* (Diary by Zhao Liewen), February 25, 1864.

¹⁴⁶ Zhang Liangji, *Zhang Da Si Ma Zou Gao* (Zhang Liangji Manuscripts), Volume IV, August 13th, 1853.

Xianfeng had no means to make him do it.¹⁴⁷

The fiscal system also encountered issues when the government did find a way to pay the money, especially in terms of reporting. Since the war lasted too long the provinces had no time to report each budgetary item to the Court, as the system had previously ruled should be the case. In most cases, the court only had a general budget without a more detailed accounting of what payments had been made. The court also had no way of checking the validity of the actual payments. The Ministry of Revenue could not calculate the total sums to be expected beforehand. Bao Jun, the Ministry of Revenue reported that “In the recent ten years, supporting the military cost more than thousands of thousands taels of silver.”¹⁴⁸ This implies that they also did not have the actual amount.

Certain people made some estimation of the total expenditure associated with the Taiping Rebellion. Wang Kaiyun, a scholar from the late Qing dynasty, said that the government spent 280 million taels of silver, 7.6 million wen paper money and 8.8 million guan (1,000 coins per guan) to suppress the Taiping rebellion.¹⁴⁹ Liu Jinzao said that “the battle cost more than 200 million taels of silver.”¹⁵⁰ However, the real number is very difficult to determine. Peng Zeyi; according to Chaodang which was stored in the library of the Economy Institute, Chinese Academic of Social Sciences with other materials (such as the books and drafts by all kinds of provincial governors); estimated that the Qing government spent 170 million taels of silver to eliminate the Taiping army and 31.7 million taels of silver to put an end to the Nian rebellion, together costing about 200 million taels.¹⁵¹ Peng also estimated all other military cost incurred at that time.

¹⁴⁷ Zeng Guofan, *Zeng Wen Zheng Quan Ji* (Zeng Guofan's Complete Works), Vol.1, Jilin People's Publishing House, 1995.

¹⁴⁸ Chaodang, December 10, 1867.

¹⁴⁹ Wang Kaiyun, *Xiang Yi Lou Ri Ji* (Diary of Wang Kaiyun), Vol.7, October 24, 1878.

¹⁵⁰ Liu Jinzao, *Qing Chao Xu Wen Xian Tong Kao* (Continued Examination Edition of the Documents in the Qing Dynasty), vol.74.

¹⁵¹ Peng Zeyi, *Quartermaster Reporting Statistics in Xianfeng and Tongzhi of the Qing Dynasty*, in *Collection of Economic Research Institute in Chinese Academy of Social Sciences*, Volume 3, 1981. The suppression fee in Xinjiang ended in 1877, so this table was only a rough estimate but still included in the Xiantong period.

Table 3.4: The Expenses of the Taiping Rebellion as Estimated by Peng Zeyi (in taels)

Items	Taels	Percentage
Taiping Rebellion	170604104	40.4
Nian Rebellion	31730767	7.5
Northwest Hui Rebellion	118887653	28.2
Southwest Rebellion	78736500	18.6
Southeast Rebellion	22336935	5.3
Total:	422295959	100

Source: Peng Zeyi, *Quartermaster Reporting Statistics in Xianfeng and Tongzhi of the Qing Dynasty*, in *Collection of Economic Research Institute in Chinese Academy of Social Sciences*, Volume 3, 1981.

However, Peng also said that “The number in the table is over 422 million, but we should point out that this number is far from complete. The real number should be over and cannot be lower (...) If we took into account the missing parts, the lowest estimated amount at that time would be over 850 million taels.”¹⁵² I believe this estimate is reasonable. If we allocated this amount to each year and considered the spending in the Second Opium War, there would be over 40 million taels annually. This means that the military expense was over the total revenue during the Daoguang period. With this figure we can start to imagine the fiscal difficulties the Taiping Rebellion represented for the Qing government.

3. Structural Change

The early Qing dynasty implemented a new tax administration, which was roughly equivalent to the annual final accounts. Within a prescribed time limit, the provincial chiefs and commissioners were required to prepare a general tax book based on the drafts made by the prefectures and counties. Such a book was divided into four categories: Qi Yun (起运, which part of taxes should be transported), Cun Liu (存留, which part should be kept local), Bo Yong (拨用, which part had been appropriated by the Court for the local expense), and Yu Sheng (余剩, which part had been left).

¹⁵² Peng Zeyi, *Quartermaster Reporting Statistics in Xianfeng and Tongzhi of the Qing Dynasty*, in *Collection of Economic Research Institute in Chinese Academy of Social Sciences*, Volume 3, 1981.

The Governor was required to report this book to the Ministry of Revenue, and the Ministry of Revenue would check every detail. If there were discrepancies, the province should send another report within four months. The Ministry of Revenue was required to report the books to the emperor by the end of the year. Through this system, the Ministry of Revenue was informed about the fiscal situation of each province.

The Taiping rebellion, the Nian rebellion, the Second Opium War, and the Shaanxi and Gansu Hui rebellion lasted as long as 14 years and covered more than ten provinces. Because of the interference of war, this old Zuoxiao (奏销 the previously discussed system of submitting financial reports to the throne for approval) was difficult to sustain. For instance, from the beginning of the war, the court had stopped the Zuoxiao system for more than ten years. Guangdong province stopped implementing the system in 1852, and until 1861 the province did not report anything. In 1861, the Qing court repeatedly urged that “all the provinces are required to comply with the Zuoxiao system without delay.”¹⁵³ However, Guangdong did not answer back. In 1864, Guo Songtao, the Governor of Guangdong, reported that “the report of Guangdong province could not be sent on time since the war started. We have to wait for several years.”¹⁵⁴ This was a common situation among the other provinces as well.

In the Xianfeng period (1851-1861), the Qing court repeatedly tried to restore the Zuoxiao system but did not succeed. In the early years of the Tongzhi period, with the Taiping Army gradually becoming extinct, the court tried again to resume the Zuoxiao system. The Ministries of Revenue, Works, and Military received the news in advance. They immediately sent servants to the provinces to discuss the matter with the provincial governors in an attempt to prepare.

Faced with such a situation, Wang Wenshao, a member of the Ministry of Revenue, believed that it had become impossible to re-establish the system. He

¹⁵³ SYD of FHAC: 17 September, 11th year of Xianfeng.

¹⁵⁴ Guo Songtao, *Guo Shi Lang Zou Gao* (Guo Songtao's Reports), Institute of Modern History of Academia Sinica, 1971, p.428.

proposed to suspend the Zuoxiao system. Later, he discussed this suggestion with Wo Ren, the Prime Minister and obtained Wo's agreement. When the Qing soldiers captured Nanjing, the capital of the Taiping rebellion, a moment which signified the failure of the Taiping movement and the victory of the Qing dynasty, Wo summoned all the officers to the office of the Ministry of Revenue. He ordered them to prepare a report to the court to stop the Zuoxiao system.¹⁵⁵ In his own report, Wo argued that the Taiping rebellion had lasted for decades and several provinces had become extremely poor. If the Zuoxiao system was strictly followed, most of the battlefield heroes would be punished after their victory. "It really is not a good way to do so." He suggested that all the expenses before this month (June of 1864) be cancelled without any reimbursement.¹⁵⁶ This move was justified and reasonable under the circumstances. The Empress Dowager agreed to this request. As a result, the more than ten years' history of expenses, amounting to hundreds of billions of silver, hastily ended. Some officials' dreams of gaining huge amounts of money came to an end, "Some even cried when they heard the news."¹⁵⁷

In fact, the abolition of the Zuoxiao system was the last resort. Even so this change had far reaching consequences. With the change in the power structure between the central and local governments during this period, the intent of the court to restore the old system met a lot of opposition. Zeng Guofan had the following analysis: "The previous system ordered all the revenues of the state to be arranged by the central government. However, after the Taiping rebellion, each province tried their best to stop the money from being sent to the central government and kept it for local use, be it land tax or tribute grain. Since then, the power of the central government diminished little by little and the provinces' power gained strength."¹⁵⁸

After 1864, although the provinces gradually submitted financial reports to the

¹⁵⁵ Wu Qingdi, *Jiao Lang Cuo Lu* (Collections under Banana Area), Zhonghua Bookstore, 1990, p.39.

¹⁵⁶ Wang Yanxi and Wang Shumin, *Huang Qing Dao Xian Tong Guang Si Chao Zhou Yi* (A Commentary on the Four Dynasties of Emperor Daoguang to Guangxu), Vol.26, Wenhai Publishing House, 1966, p. 1860-1861.

¹⁵⁷ Wu Qingdi, *Jiao Lang Cuo Lu* (Collections under Banana Area), Zhonghua Bookstore, 1990, p.39.

¹⁵⁸ Zeng Guofan, *Zeng Wen Zheng Quan Ji* (Zeng Guofan's Complete Works), Vol.20, Jilin People's Publishing House, 1995, p.995.

court, this submission became merely a formality. In particular, the important local fiscal sources for Likin were not controlled by the central government. In October of 1868, the court said, "Since the Taiping rebellion, we had a long time to use the money without justification. Now, we order the provinces of Jiangsu, Jiangxi, Anhui, Hubei, Guangdong, Zhejiang, and Fujian to report the total income of Likin to the central government. The reports should include the computation of salt tax."¹⁵⁹ However, historical records show that the provinces apparently did not implement this order seriously.

Similar to the fate of the Zuoxiao system, the systems of Jing Xiang (京饷 the transportation of provisions to the capital in lieu of the province's money being sent to Beijing) and Xie Xiang (协饷 provisions sent to other provinces, not to the capital) were also failing. In the early Qing, all of the taxed silver should either be sent to the Capital (Jing Xiang) or assigned by the Court for special purposes within the province (Xie Xiang) save for a part of taxed silver that ought to be left within the local province. After the rise of the Taiping rebellion, due to the large amount of war-related expenses and the failure to book tax revenues, the Ministry of Revenue could no longer control and allocate the fiscal revenues uniformly in the way it used to do. In 1852, Jiang Wenqing, the Anhui Governor, stipulated that all the land tax, customs duties, and miscellaneous taxes be left in Anhui province for military expenses. Although this move was inconsistent with the system, due to insufficient funds, the Ministry of Revenue had to agree. Since then, the generals and governors frequently took action to keep their province's tax revenue.¹⁶⁰

In addition to keeping the money in the local provinces, more and more generals and governors tried to stop the money from passing through their areas. In 1853, 70 thousand taels of silver were stopped by the Anhui governor, the money was intended to be sent from Zhejiang to Hubei. In August of the same year, Zhang Fu, the Jiangxi governor, stopped 150 thousand taels of silver that was being sent from

¹⁵⁹ Qing Mu Zhong Shi Lu (Record of the Emperor Tongzhi), vol.244.

¹⁶⁰ Qing Wen Zhong Shi Lu (Record of the Emperor Xianfeng), vol.139.

Guangdong to the Jiangnan area. Although the Ministry stressed that “We should never permit provinces to stop the delivery of land tax, salt tax, and others. This will lead to dangerous situations and shortcomings.” However, despite the dangerous situation, the court had no choice and only said that “it was temporary permitted.”¹⁶¹ With similar incidents continuing to increase in frequency, the Ministry of Revenue, the nation’s previously supreme fiscal authority, was abolished gradually.

With the reduction of income the Ministry of Revenue had to change its ways, it would now require taxes to be levied with a quota and all the money to be arranged by the court. They began to apportion quotas, which meant the Ministry of Revenue determined the income quotas in the winter and all provinces were required to send the respective amounts the next year. In the beginning, the quota apportioned to Beijing was 4 million taels of silver. In 1860, this increased to 5 million taels, and it was 7 million taels in 1861. From 1867, this number grew to 8 million taels, and this practice continued until the end of the Qing dynasty, with Beijing becoming the most important source of income for the Ministry of Revenue in the late Qing dynasty.

In addition to the quota allocation, the government also added new expense items whose payment was allocated to the provinces. These items included Neiwu Fu’s annual expense funds, the Emperor’s marriage fee, Capital defence funds and others.

Generally speaking, the Ministry of Revenue represented the public ledger of the state and the Neiwu Fu represented the private finances of the emperor and his family. In the Qianlong period, the Ministry of Revenue sent 600 thousand taels of silver to the Neiwu Fu annually. In the Tongzhi period, the Neiwu Fu frequently borrowed money from the Ministry of Revenue. Unable to face such a disturbance of the budget, the Ministry of Revenue asked to send 300 thousand taels to the Neiwu Fu from the salt, tea, and customs duties. In 1868, although very poor, the Ministry of Revenue also added 300 thousand taels (together totalling 600 thousand) to the

¹⁶¹ Qing Wen Zhong Shi Lu (Record of the Emperor Xianfeng), vol.104.

Neiwu Fu, in keeping with traditions of the Qianlong period.¹⁶² However, although there was direct funding, the Neiwu Fu still forcefully borrowed money from the Ministry of Revenue. In the last years of the reign of Tongzhi, these sums of money ranged up from 1.3 or 1.4 million and up to 1.8 or 1.9 million taels. The Ministry of Revenue had again petitioned the court to fix its frivolous spending habits, "We have had less revenue in recent years; however, the expenditure has increased greatly. If we cannot fix the amount for Neiwu Fu, we will be in a dilemma."¹⁶³ However, based on the behaviour of the Empress Dowager Ci Xi, who was simultaneously embezzling from the Navy's funds, this request had not been received favourably and would never be seriously implemented.

In 1871, the court started to prepare for the marriage of the Tongzhi Emperor. The imperial court apportioned "the wedding funds" to the whole nation. This apportionment was in addition to the 4.5 million taels of silver the court expected from the Ministry of Revenue, 550 thousand taels from Jiangning Suzhou weaving, 1.8 million taels from Hangzhou weaving, 370 thousand taels from Guangdong and Guangxi authorities, 1.2 million taels from customs duties. "The amount in total was more than 10 million taels of silver."¹⁶⁴

The quota apportionment to Beijing (Beijing funds) began in 1863. To guard Beijing, a new army was set up in Zhili and Beijing. In Zhili, there were 40 thousand soldiers stationed and in Beijing there were 20 thousand soldiers. The fixed fee for this number of troops was 650 thousand taels of silver, and each province had to pay this new tax.

The adoption of all these new fiscal measures had special significance. It created more than before a clear division between the central and provincial fiscal systems, particularly in the case of unforeseen difficulties. After these adaptations, the province had much more control over its local income. However, sometimes these

¹⁶² ZPZZ of FHAC: 13 November, 27th year of Guangxu. No. 04-01-35-1058-016.

¹⁶³ Wang Yanxi and Wang Shumin, *Huang Qing Dao Xian Tong Guang Si Chao Zhou Yi* (A Commentary on the Four Dynasties of Emperor Daoguang to Guangxu), Vol.26, Wenhai Publishing House, 1966, p.1265.

¹⁶⁴ LFZZ of FHAC: 25 April, 11nd year of Tongzhi.

changes remained in blueprint. In 1863, the Edict said that “in recent years, we have allocated revenues from land tax, salt, customs duties, and miscellaneous taxes, with the quota of 7 million taels annually. However, only Shanxi province could meet its quota. Other provinces always had deficits. Even after the requirement by the court, the deficits still existed.”¹⁶⁵

Before 1851, the fiscal revenue of the Qing dynasty was from land tax, salt, and customs duties, among which land tax was the most important. After the rise of the Taiping rebellion, the fiscal revenue structure quickly changed.

The Taiping rebellion swept through Jiangsu, Zhejiang, Anhui, Hunan, Hubei, Jiangxi, and other provinces. Together with the Nian rebellion, it resulted in a large population decline and widespread destruction of the land. In particular, the Jiangnan area, the most important region for the Qing government as far as taxes were concerned, was instead taxed by the Taiping army. During and after the occupation, the Qing government lost this income and the aggregate land tax was affected greatly. From the Chaodang the extent of this impact can be read. Below were the eighteen provinces’ cumulative land tax values with their corresponding years as reported in the Chaodang.

Graph 3.4: The Land tax in 1851-1874

Source: Ni Yuping, *Cong Guojia Caizheng Dao Caizheng Guojia: Qingchao Xiantong Nianjian De*

¹⁶⁵ Qing Mu Zhong Shi Lu (Record of the Emperor Tongzhi), vol. 85.

Caizheng Yu Shehui (From State's Fiscal To Fiscal State: Finance and Society in the Xian Feng and Tong Zhi Times of the Qing Dynasty), in Science Press, 2017, p.110.

The graph 3.4 shows that during the periods of the Xianfeng and Tongzhi reigns (1851-1874), the land tax declined sharply and ranged from 6 million to 14 million taels of silver. Taking into account the missing data from a number of provinces, I estimate that the real tax revenue ranged from 10 million to 16 million taels. However, during the Jiaqing and Daoguang periods (1796-1850), the land tax was about 20 million to 25 million taels.¹⁶⁶ Considering this, it can be deduced that affected by the war, the land tax declined by about 50%.

Similar to the land tax, the customs duties were also affected greatly. The Qing government had to agree to tax some ports (such as Chongwenmen Guan and Linqing Guan) without quota but tax them as much as possible. More ports had to close, temporarily or permanently, due to the raging war, such as Longjiang Guan, Xixin Guan, Hushu Guan, Nanxin Guan, Beixin Guan, Wuchang Guan, Wuhu Guan, Yangzhou Guan, Jiujiang Guan, and Fengyang Guan. Based on the archives, the customs duties declined from more than 5 million taels to between 1.5 million and 2 million taels.¹⁶⁷

Different from the customs duties, the marine ports experienced another trend. In 1853, Shanghai was occupied by the rebellion and Jianghai Guan turned into chaos. Britain, France, and the United States took the opportunity to control Shanghai. In the second year of occupation, the Qing court was forced to accept the proposal from the British and appointed T. Wade (British), L. Caar (American) and M.A. Smith (French) as the managers of the Shanghai port. At the same time, a "Customs Management Committee" was also established. In 1860, the Gong Prince Yi Xin set up the Prime Minister Yamen as the foreign affairs office. H. N. Lay (British) was appointed as the "Inspector General" of the marine ports. Immediately after, Robert

¹⁶⁶ Ni Yuping, *Qing Chao Jia Dao Cai Zheng Yu She Hui* (Fiscal and Society in the Jiaqing and Daoguang Reigns of the Qing Dynasty), Commercial Press, 2013, p.174.

¹⁶⁷ Ni Yuping, *Customs Duties in the Qing Dynasty, ca.1644-1911*, Brill Publishing House, 2016, p.168.

Hart took over this position. With the tax system changed, the administrative power of China's customs had also been transferred to the West. Robert Hart established the modern customs tax system and since then, the collection rose in a straight line.

Likin was a commercial tax and was first adopted and applied in Yangzhou in 1853. After that, it spread throughout the nation. At its root Likin tax was 1% of the goods' value. It was a more complex system however, not only did the tax ratio range from 1% to 8% of the goods' value, but the tax was also assessed on the stores (Zuo Li 坐厘, a sitting li) and merchants (Xing Li 行厘, a walking li). Not only ordinary goods were taxed with Likin, but salt, tea, medicine, opium, and other goods were also taxed. According to the collection places, Likin could be divided into production Likin, pass-through Likin, and point of sale Likin. It was taxed by the government directly or by an intermediary, who were generally merchants themselves. There were differences between Likin and customs duties. Likin was taxed on everything and everywhere, whereas customs duties were only levied when a good passed through a fixed place. Even when the goods had been taxed through customs duties, a Likin could still be collected on those same goods. The Likin system survived until 1930, when it was abolished by the government of the Republic of China. With increases in the marine tax and the Likin, the fiscal structure was changed greatly in the late Qing dynasty.

Graph 3.5: Main Fiscal Revenues in 1851-1874 (in taels of silver)

Source: Ni Yuping, 试论清代财政体系的近代转型[Modern Transformation of the Fiscal System in

the Qing Dynasty], in 中国经济史研究[Researches In Chinese Economic History], vol. 4, 2018.

From the graph above, we can see that during the Taiping rebellion, land tax revenues decreased rapidly, while customs duties and Likin had a certain degree of growth. Especially in the Tongzhi reign, customs duties and Likin had exceeded the land tax and became the most important source of fiscal revenue.

Meanwhile, with frequent production of large bills and paper cash, the Qing government also gained large amounts of income. There was a cost in casting money, and the profit came from the difference between cost and face value. According to the historical records, in the fourth year of Xianfeng (1854), the Ministry of Revenue decided that the production of each of the higher denominations of currency should come at a standardised cost when it came to salary and materials. “A thousand-wen-value large money was paid the casting money 76 wen, while a 500-wen-value large money was paid 60 wen. A hundred-wen-value large money should be paid with 30 wen of casting money and 20 wen as salary.”¹⁶⁸ Some scholars have made analysis about the profit of casting money.

Table 3.5: Price and Profit of Casting Money (in wen)

Face value	Salary	Price	Cost in total	Profit rate (%)
1000	68.4	12.7	81	91.9
500	54	10	64	87.2
100	27	6.7	34	66
50	14.4	5.3	20	60
10	6.3	2.3	9	10

Source: Shi Zhihong and Xu Yi, Wanqing Caizhen (晚清财政 Fiscal in the Late Qing, 1851-1894), Shanghai University of Finance and Economics Press, 2008, p.80.

Table 3.5 shows that the bigger face value of larger denominations of money casting, the more profitable its creation was for the government. According to incomplete statistics, from 1853 to 1861 the Ministry of Revenue issued 9.8 million

¹⁶⁸ Financial Historical Materials in the Council Office of the People's Bank of China.(1964). *Zhong Guo Jin Dai Huo Bi Shi Zi Liao* (中国近代货币史资料[Modern Monetary History of China]) (Volume I), Zhonghua Bookstore. 1964, p.218.

taels of silver paper money, 87.6 billion wen of big coins, and 30.7 billion capital wen coins, together as 61.3 million taels of silver. At the same time, the Ministry of Revenue only had an income of 86 million taels of silver.¹⁶⁹ This means that through these activities, the government gained an extra 70% of wealth, or nearly 10 million taels of income annually. This additional sum alleviated the tense budgetary situation greatly.

Now we examine the change in fiscal expenditure. In the early Qing dynasty, the military salary, river engineering, and officials' salary were the main components of fiscal expenditures. From 1851 to 1874, the Yong soldiers' salary, military salary, Westernisation Movement expenditures, and compensation for the West became the main components of the state's fiscal expenditures.

During this period, some of the more regular activities were still in progress, but the amount appropriated to them was scant and not nearly as much as these activities had cost before. For example, in the early Qing, river engineering was considered very important. In 1853, the Nanhe Governor Yang Yizeng petitioned the Ministry for 500 thousand taels of silver as the annual fee as it used to be. This petition angered Emperor Xianfeng, "In a situation where the fight against the rebellion is ongoing and funds are insufficient, how could you ask for such money, even if your plan is real. You should share the burden for my sake and that of the Ministry of Revenue. I am truly ashamed of you!"¹⁷⁰ In 1855, the Yellow River of Tongwaxiang flooded, but with the state's financial crisis, the court was still not able to repair the damage. In 1866, the governor asked for money to rebuild flood protections along the Yellow River and was again rejected by the court.¹⁷¹

The military expenditure was about 23 million of taels in the early Qing dynasty, a cost which was shared among the Eight Banners and Lveying (绿营 Green Camp). In the Xianfeng and Tongzhi periods, the Eight Banners and Green Camp had lost their

¹⁶⁹ Peng Zeyi, *Shi Jiu Shi Ji Hou Ban Qi De Zhong Guo Cai Zheng Yu Jing Ji* (China's Fiscal and Economy in the Late Half of the Nineteenth Century), People's Publishing House, 1983, p.114.

¹⁷⁰ Qing Wen Zhong Shi Lu (Record of the Emperor Xianfeng), vol.90.

¹⁷¹ LFZZ of FHAC: 28 August, 11nd year of Xianfeng. No.03-4456-030.

fighting capacity due to the corruption and seldom military training. Yong Ying (勇营 Yong soldiers) was the main force that fought against the Taiping soldiers. The salary of the Yong soldiers was higher than that of the Eight Banner and Green Camp members, with a monthly salary of 4.5, 4, and 2 taels, respectively. Yong soldiers were recruited during the war; however, after the Taiping and Nian soldiers were suppressed, the Yong regional armies remained. They only changed their name to Fangjun (防军 troops for local safety). In addition to the soldiers' salary, the purchase of weaponry was also a very important expenditure. For example, the Huai army, which belonged to Li Hongzhang, spent 650 thousand taels of silver to buy foreign weapons and equipment in 1862.¹⁷² The provincial governors also bought large amounts of weapons from abroad. The total amount of money spent on Yong soldiers was about 20 million.

With the money used on the Eight Banners, Green Camp, and Yong soldiers, the total military expenditure doubled. As time passed, these expenditures continued to increase. In 1885, it was reported that "the Eight Banner and Green Camp had no remaining use in fighting but still needed 14 million taels. After the Taiping rebellion, there were about 540 thousand Yong soldiers, incurring 34 million taels in expenses annually. In short, there were more than 1 million soldiers and 50 million taels spent. There was about 80 million taels worth of revenues annually, but 80% of this was spent on the military."¹⁷³

After the second Opium War (1856-1860), the Qing rulers pursued power and prosperity. It set up the Zongli Yamen to coordinate the relationship with other countries. Among its duties it also held a series of military and economic activities, such as purchasing guns, training the new army, and establishing industrial and other new projects. This represented a new type of fiscal expenditure.

The Jiangnan Manufacturing Bureau, Jinling Machinery Bureau, Fuzhou Dockyard,

¹⁷² Sun Yutang, *Zhong Guo Jin Dai Gong Ye Shi Zhi Liao* (Materials of Modern Industrial History of China), Vol.1, Science Press, 1957, p.262.

¹⁷³ Chinese History Society, *Yang Wu Yun Dong [Westernisation Movement]*, Vol. 3, Shanghai People's Publishing House, 1961, p. 541.

and Tianjin Machinery Bureau were some large-scale enterprises established under the westernisation movement. Most of the funds were allocated by the central government, and a small segment was raised by the provinces. Taking the Jiangnan Manufacturing Bureau as an example, it was the largest and most advanced military enterprise at that time. Its set-up fund was 540 thousand taels of silver. From 1867, it had 400 thousand taels worth of expenses from Jianghai Guan annually.¹⁷⁴

In 1863, Li Hongzhang set up the Suzhou Machine Bureau as an official military enterprise. By May of 1865, it had already spent 288 thousand taels of silver. In 1866, the Fuzhou Dockyard was established by Zuo Zongtang, with expenses totalling 470 thousand taels. After that, its monthly expense was 40 thousand taels. In 1874, it had spent 5.3 million taels in manufacturing costs and 621 thousand taels in repairs, which meant that the annual expense was more than 700 thousand taels.¹⁷⁵ The Tianjin Machinery Bureau was set up in 1867 by Chong Hou, with funds totalling 495 thousand taels. After that, it needed 200 thousand to 500 thousand taels.¹⁷⁶ During the period from 1862 to 1874, the expenditure on shipbuilding was huge. In the records of Qing Shi Gao, it was written that “in 1874, it spent about 5.2 million in shipbuilding and 190 thousand in repairs.”¹⁷⁷ At the end of the Tongzhi period, as the fiscal revenues improved, the amount of expenditures related to the Westernisation Movement increased. On average, the Qing court spent more than 1 million taels each in the Jiangnan Manufacturing Bureau and the Fuzhou Dockyard.

Indemnity for the West was also a big expense during this period since the Court had no ability to pay the indemnity on time and had to resort to payment in instalments and eventual loan repayment. After the First Opium War in the

¹⁷⁴ Wei Yungong, *Jiang Nan Zhi Zao Zhong Ju Ji (Records of Jiangnan Manufacturing Bureau)*, Vol.4, Wenhai Publishing House, 1969, p.1.

¹⁷⁵ Sun Yutang, *Zhong Guo Jin Dai Gong Ye Shi Zhi Liao (Materials of Modern Industrial History of China)*, Vol.1, Science Press, 1957, p. 431.

¹⁷⁶ According to the materials, we could see that Tianjin Machinery Bureau had a total income of 4853332 and expenditure of 4839742 from 1867 to 1870; income of 2560802 and expenditure of 2449882 from 1870 to 1871; income of 3952692 and expenditure of 3947002 from 1872 to 1873; income of 5846172 and expenditure of 575494 from 1874 to 1875 (edited by Chinese History Society, Westernization Movement, Volume 4, Shanghai People's Publishing House, 1961, pp.243-286.

¹⁷⁷ Qing Shi Gao (Record of the Qing History), vol.136.

Daoguang time, the Qing government continued to indemnify the foreign countries. The cost of indemnity related to the First Opium War with Britain was 21 million dollars, about 14.7 million taels of silver. For the Second Opium War, the cost of indemnity to France and Britain was 16 million taels.¹⁷⁸ Japan's invasion of Taiwan in 1774 cost 500 thousand taels in indemnity. In general, the court needed to pay 2 million taels to the foreign countries annually.

In 1866, there were also special expenses. The embassy fund was a new type of expenditure at that time. In 1866, Robert Hart helped bring more students into the then recently established Tong Wen Guan and spent about 25 thousand taels. In 1867, Anson Burlingame, the U.S. Ambassador to China, was appointed by the Qing government as an Imperial Envoy to visit Europe and the United States, spending 160 thousand taels.¹⁷⁹ In 1872, the Qing government sent children to study in the United States with an annual fee of 60 thousand taels.¹⁸⁰

Now we estimate the total revenue and expenditure of the Qing dynasty during the period from 1851 to 1874. As previously mentioned the Ministry of the Treasury in the early Qing dynasty acquired, maintained, and redistributed the 10 million taels of silver of annual income and expenses; which amounted to about one quarter of the national fiscal revenue. This situation changed in the Xianfeng period: not only was the budget far smaller than before, but also in most of the years, the income fell short to the expenditure. In 1857, the Ministry of Treasury only had a deposit of 110 thousand taels and 60 thousand taels for the next year. It was the lowest record in the Qing dynasty.

Wang Zhenji in the Qing dynasty estimated that in the early years of the Xianfeng period, the fiscal revenue was over 30 million taels. Wang Donghuai estimated the

¹⁷⁸ After the Second Opium War, there were also pensions for the British Army of 52,000 and for the French Army of 22,000.

¹⁷⁹ Institute of Modern History of the Central Academy of Sciences, *Haifang File*, Institute of Modern History of the Central Academy of Sciences, 1957, p.694.

¹⁸⁰ Shu Xincheng, *Zhong Guo Jing Dai Jiao Yu Shi Zhi Liao (Materials on the History of Modern Chinese Education)*, People's Education Press, 1981, p.166.

number would have been at about 39 million taels.¹⁸¹ In 1874, the court had the first national fiscal statistics after the Taiping rebellion. According to Wu Tingxie's records, it had approximately 20 million taels in land tax and salt tax, and the salt likin tax was about 8 million taels; domestic customs duties was 2 million taels; tribute grain silver was 2 million; marine customs was 12 million taels; Likin was 15 million taels; and the surplus tax of Sichuan land was 1.8 million taels. The total was 60 million taels, 20 million taels more than the later years of the Daoguang period. Including the winnings of Zuo Zongtang expedition to Xinjiang, the total was about 70 million taels.¹⁸² If we consider the income from donations and the money borrowed from foreign banks, we can say that the revenues and expenditures were balanced.

However, from our research, we found that the land tax at that time was about 15 million; customs duties (including domestic and foreign ports) were increased to 12 million; Likin brought in 20 million; and the income from coin and paper money production was 10 million.¹⁸³ Here we still regard salt tax as 5 million (Wu Tingxie's number included salt likin tax). It was rather complex to estimate the tribute grain value since it had been split in two. Some part had been taxed in kind and another part had instead been taxed in the form of silver. The quota was about 3 million dan and this can be regarded as 6 million taels of silver in total. Including donation and miscellaneous levies, the estimation is that at the end of the Tongzhi period, there was about 75 million taels of revenue. With regard to expenditures, the traditional Eight Banners and Green Camp expenses was 25 million taels; the Yong soldiers' expense was 34 million taels; the expense for the Westernisation Movement was 10 million annually; and indemnity expense was 2.5 million taels. Based on this information, we can roughly estimate the scale of fiscal revenue and expenditure at the end of the Tongzhi period being as follows.

¹⁸¹ Sheng Kang, ed.: *Continuation of Emperor Jingshiwen*, Vol.30.

¹⁸² Wu Tingxie, *Qing Cai Zheng Kao (Research on the Fiscal Situation of the Qing Dynasty)*, p.18.

¹⁸³ Ni Yuping: *Cong Guojia Caizheng Dao Caizheng Guojia: Qingchao Xiantong Nianjian De Caizheng Yu Shehui (From State's Fiscal To Fiscal State: Finance and Society in the Xian Feng and Tong Zhi Times of the Qing Dynasty)*, in Science Press, 2017, p.273.

Table 3.6: Fiscal Revenue and Expenditure at the end of the Tongzhi Period (in taels of silver)

Revenue	Amount	Expenditure	Amount
Land tax	15,000,000	Military Expenditures	25,000,000
Likin	20,000,000	Yong soldier (new military type) Expenditure	34,000,000
Domestic customs	2,000,000	Westernisation Movement	10,000,000
Foreign customs	10,000,000	Indemnity to the West	2,500,000
Coin and paper money	10,000,000		
Salt tax	5,000,000		
Tribute grain	6,000,000		
Total:	68,000,000	Sum	71,500,000
Estimation	75,000,000	Estimation	80,000,000

Source: Ni Yuping: *Cong Guojia Caizheng Dao Caizheng Guojia: Qingchao Xiantong Nianjian De Caizheng Yu Shehui* (From State's Fiscal To Fiscal State: Finance and Society in the Xian Feng and Tong Zhi Times of the Qing Dynasty), in Science Press, 2017, p.273.

It should be said that the above figures are only rough estimates. There were still some deficits in the later years of the Tongzhi period, which could have been fixed by taking out loans, apportionment, and other ways. It is certain that the fiscal revenues and expenditures of this period have nearly doubled that of the time before the Taiping rebellion.

4. Conclusion

Through the material I have presented in this and the former chapters, I have shown that the history of customs revenues collected during the Qing dynasty reflects the development of the Qing dynasty's fiscal system. It shows its transition from a rather traditional, to a more modern economy. It shows how the Qing state changed from a state with a tax system to become a fiscal state.

I readily admit that the data in the records I have accessed may be imperfect, due to some customs officials being corrupt or, more simply, because of reporting errors. However, since the reported amounts of money had to be sent to the Imperial Court, the data can be interpreted as representing, at the very least, minimum amounts of revenue, and the errors can be treated as unsystematic and thus, of no

significant impact on the general picture.

For the period before 1795, it is useful to consider the customs duties of the early Qing in two parts. The first concerns the years before 1723 (which includes the reigns of Shunzhi and Kangxi), for which many data points are missing. The second part concerns the period from 1723 to 1795 (which includes the reigns of Yongzheng and Qianlong). Results from former research on the fiscal revenue of the early and middle Qing periods are summarised here.

Table 3.7: Fiscal Revenue of the Early and Middle Qing Dynasty
(in million taels of silver)

Year	Total	Land Tax		Salt Tax		Customs duties		Miscellaneous taxes	
		Amount	Proportion of total (%)	Amount	Proportion	Amount	Proportion of total (%)	Amount	Proportion of total (%)
1652	24.38	21.26	87	2.12	9	0.642	2.6	0.358	1.55
1685	31.90	27.27	85	2.76	9	1.20	3.78	0.67	2.1
1725	36.53	30.07	82	4.43	12	1.35	3.7	0.68	1.9
1753	41.74	29.38	70	7.01	17	4.30	10.3	1.05	2.5
1766	42.25	29.91	71	5.74	14	5.40	12.8	1.20	2.8
1812	40.13	28.33	71	5.79	14	4.81	11.9	1.20	3
1841	42.45	29.43	69	7.47	18	4.35	10.2	1.20	2.8

Source: He Benfang (1987), pp. 78-81.

As the table shows, customs duties before 1850 still accounted for only a very small part of fiscal revenues. They represented no more than 15% of total revenues and were even smaller than the salt tax. The major contributor to fiscal revenues was land tax. The figures clearly demonstrate that the Qing society before 1850 was still agricultural in nature, with an agricultural fiscal structure. With this perspective in mind, it is easy to see that the Qing fiscal system could be typified as traditional and conservative.

From the end of the 17th century until 1840, the function of levying customs changed substantially in the West, aiming to ensure the stimulation of manufacturing and commerce. However, the Qing government still wanted to use customs duties to safeguard the political system and stimulate its agricultural sector.

From 1840 to 1860, the Qing customs system underwent a process of change, especially due to the Taiping rebellion, which had an unmistakable negative impact on trade and hence, customs revenues. The rebellion forced the Qing government to find all kinds of ways of generating tax revenues. One by one, fiscal innovations were created, including the system of *Likin* and *Yangguan* ports. Among the domestic turmoil and foreign threats, the dynasty was facing, its officials came to realise more and more the potential benefits that a comprehensive system of customs duties offered. Here we see emerging a new tax system, triggered by the Taiping wars.

Finally, from 1860 through to the early 20th century, the Qing customs system gradually – step by step – came under the control of Western powers.

Table 3.8: Sources of Fiscal Revenue in the Late Qing Dynasty (in taels of silver)

Year	Land Tax		Salt Tax		<i>Likin</i>		Customs duties	
	Amount	Proportion of total (%)	Amount	Proportion of total (%)	Amount	Proportion of total (%)	Amount	Proportion of total (%)
1842	29,575,722	76	4,981,845	13			4,130,455	11
1885	32,356,768	48	7,394,228	11	12,811,708	19	14,472,766	22
1888	33,243,437	42	7,507,128	10	13,600,733	18	23,167,892	30
1894	32,669,086	43	6,737,469	9	13,286,816	18	22,523,605	30
1903	37,187,788	38	13,050,000	13	16,252,692	17	30,530,699	32
1911	48,101,346	27	46,312,355	26	43,187,097	24	43,139,287	23

Source: Deng Shaohui (1997).

The trends are below:

Graph 3.6: Sources of Fiscal Revenue in the Late Qing Dynasty

Graph 3.6 illustrates how the fiscal structure underwent great change in the 19th century. Customs duties, together with *Likin* and salt taxes, were almost three times as large as the land tax. At the same time, customs duties had become one of the most powerful fiscal instruments at the Qing government's disposal, and it was to be an indispensable tool in the struggle to keep the government alive in the latter part of the Qing dynasty. Thus, we can say that in the late Qing, China was in the process of changing from a traditional agricultural society that depended on a mainly land-based system of taxation to a modern commercially-based society with a complementary fiscal system. The understanding about the function of customs systems evolved rapidly, and people began to accept Western ideas about its value.

However, due to insufficient development of the production of handicrafts and manufacturing, and in the face of great difficulties in maintaining an agriculture-based fiscal system, the government had little choice but to embrace a commercial fiscal system. Regarding *Yangguan*, Tang's book offers a detailed explanation. Of the income sourced from *Yangguan*, between two-thirds and four-fifths would be sent to the central government and used to pay government salaries, military expenditures, indemnities, and external debt.¹⁸⁴

¹⁸⁴ Tang Xianglong: 中国近代海关税收和分配统计:1861-1910 (Statistics of Customs Revenue and Its Distribution: 1861-1910), in Zhonghua Bookstore, 2005, pp. 25-43.

A second part was sent to the local province. Tang writes that before 1867 the proportion would be 20-30 percent of the total income, while after 1867 it declined quickly, "From 1861 to 1910 provincial expenditures were about 72.3 million taels, which represented about 7.94% of all the *Yangguan*".¹⁸⁵

A third, smaller part, amounting to no more than 15% of total revenues, was set aside to meet administrative overhead and agency expenses (a 63.2% share), which were mainly the salaries (including the Western administrator's fee) and daily working expenses of the Customs Revenue Division. From 1861 to 1910 this part totalled 127.7 million taels of silver, representing 14.03% of all expenditure. Tang also writes that there were 910 million taels worth of income from *Yangguan*, of which the central government took 694.7 million taels, which was used to meet a variety of expenses including military expenditures, indemnities, and external debt.

As a result of his research, Tang arrived at the conclusion that "From these figures, we can see clearly the areas in which the Chinese Customs Service was mainly used and whom it serviced. These 50 years of data on the distribution of customs revenues prove that the Chinese customs system had a semi-feudal nature"¹⁸⁶.

Affected by the big influence of strong centralisation, sometimes China's fiscal history data may not really reflect the real economic development. Sometimes it remained so stable that one cannot directly estimate economic development from the data, which merely demonstrate the fiscal ability of the country without saying much about its economic and social development. However, in the long run the data do, in fact, reflect changes that were taking place in terms of economic development and in the social system. They clearly show that traditional Qing China still followed the rule of the "natural economy" and that nobody had the power to challenge the rule of nature.

¹⁸⁵ Tang Xianglong: 中国近代海关税收和分配统计: 1861-1910 (Statistics of Customs Revenue and Its Distribution: 1861-1910), in Zhonghua Bookstore, 2005, p.44.

¹⁸⁶ Tang Xianglong: 中国近代海关税收和分配统计: 1861-1910 (Statistics of Customs Revenue and Its Distribution: 1861-1910), in Zhonghua Bookstore, 2005, p.47.

Joseph Schumpeter had the conception of tax state and state tax, and he believed that the former would transform to the latter and the latter would eventually become extinct.¹⁸⁷ Here the state tax referred to the state form of taxation as the main source of income. Later, R. Bonney and Ormrod W. Crises used this theory to explain the history of European countries and societies, and they came up with the concept of "fiscal state."¹⁸⁸ From 1796 to 1874, the fiscal transformation of the Qing was not exactly the same as the development of the West. However, during this period, with the rise of Likin and marine customs, they eventually surpassed the relevance of land tax, which was very similar to the evolution of many Western fiscal systems.

There were several examples of fiscal changes in the Xianfeng and Tongzhi periods. Both types and items had been expanding, and the structure of revenue and expenditure also underwent fundamental changes. In the early Qing dynasty, the revenue and expenditure had been fixed in terms of scope and amount. With the outbreak of the Taiping rebellion, the increasing expenditure was so huge and so new that the government had to rely on new types of tax. Even so, the speed of increasing expenditure was still far faster than that of the revenue. At the end of the Qing dynasty, the changes in the fiscal structure went even further. In addition to increasing the amount of Likin tax and customs duties, modern corporate tax had become another new type of tax, mainly referred to the railway, ships, post, and telegram businesses, known as the "official business income." In the late Qing dynasty, to maximise the revenue, a variety of miscellaneous tax increased rapidly. "The tax had been on tobacco, wine, salt, and other ordinary goods."

On this basis, the fiscal income of the late Qing dynasty continued to increase. From Liu Jinzao's book, we know that the fiscal revenue in 1903 was about 105 million taels; in 1908 it was 234 million taels; in 1909 it was 263 million taels; and in

¹⁸⁷ Joseph A. Schumpeter, "The Crisis of the Tax State", in International Economic Association, ed., *International Economic Papers*, no. 4 (1954), pp. 5-38.

¹⁸⁸ R. Bonney and Ormrod W. Crises, *Revolutions and Self-sustained Growth: Essays in European Fiscal History, 1130-1830*, Stamford, 1999, p.11.

1911 it was 297 million taels, with significant increases. The fiscal expenditure also expanded accordingly, for the military, diplomatic, debt, enterprise, and the Royal funds. The fiscal expenditure had increased from 40 million taels before 1850 to 101 million taels in 1899, 237 million taels in 1908, and 338 million taels in 1911.

In conjunction with this transformation, the guiding ideology of fiscal policy changed from "Liang Ru Wei Chu" (To decide the expense according to the income, 量入为出) to "Liang Chu Wei Ru" (To decide the income according to the expense, 量出为入). Since the Western Zhou dynasty, "Liang Ru Wei Chu" had been the basic fiscal policy and "Liang Chu Wei Ru" was regarded as representing tyranny. Taking the principle of "Liang Ru Wei Chu" as the fiscal principle, the government generally will focus on saving. "Liang Chu Wei Ru" will generally focus on opening new sources to tax. At first, the Qing government also followed the rule of "Liang Ru Wei Chu." The fiscal revenue mainly came from the land tax and tribute grain. Since the income and the amount had been fixed, the government could arrange regular expenditure in advance, and the total revenue was usually bigger than the expenditure. With huge surplus year after year, the Ministry of Treasury had more and more silver deposit. In 1777, the number was 81.8 million taels. In 1789, it was still 70 million taels. If unexpected events such as war or serious natural disasters should happen, the government could use that money.

Even though we still see a lot of archival sources repeating the name of "Liang Ru Wei Chu," the government had already used "Liang Chu Wei Ru" to get revenue when there were fiscal problems, which changed the old way to allocate and plan the revenue. "Liang Ru Wei Chu" was just a shell. In 1873, the Imperial Household reported that "Liang Ru Wei Chu had failed to feed our need."¹⁸⁹ Because of the influence of traditional Confucianism, the guiding principle of "Liang Ru Wei Chu" persisted until the destruction of the Qing dynasty and was not abandoned by the rulers of the Qing dynasty. However, since the "Liang Chu Wei Ru" had been the real guiding principle, the government could be so self-confident to rely on Likin tax and

¹⁸⁹ LFZZ of FHAC: 14 April, 12nd year of Tongzhi.

marine customs and generate income by producing big coins and paper money.

However, we should say that even in this period, when the government began to evolve “from state that raises taxes to a fiscal state,” it was still at the beginning step. Since industrialisation had not began and maintaining the people’s needs was difficult relying only on agriculture, the government had to tax commerce excessively, thinking that all the problems should be solved the later successors. From a historical perspective, perhaps this was just the historical status of the Xianfeng and Tongzhi periods.

Van Zanden and Fritschy agree on the idea that taxes on basic consumption goods (like custom duties, salt tax) but also taxes on property (like the Land Tax or Tian Fu) were part of these new tax regimes. But the so called ‘tax-revolution’ that started in England and The Low Countries in the late 16th century (Van Zanden 2009, Fritschy 1990, O’Brien 1988 and O’Brien 2001) shifted the burden to the taxes on basic consumption goods and less on property. However, in the Netherlands a second stage was reached in the tax revolution when, within this category of consumption goods, a change occurred from ‘basic’ to ‘luxurious’. This laid the basis of a Dutch Fiscal-Military state a process similar to the development in England after the Civil War there.¹⁹⁰ It didn’t happen in the first half of the century, but something seemed to happen in the Late Qing.

Taxes do not just take away resources from the economy but under specific conditions they are returned in the form of public goods: security, rule of law, property rights, education, health services and the like. In the 19th century, most Western European states witnessed an increasing citizens’ participation in the political process and an intensification of taxation. Where do we position China in this? Based on our data the Tax-regime was quite light, although it became a bit more

¹⁹⁰ van Zanden Jan Luiten. The Long Road to the Industrial Revolution. Brill, 2009. Fritschy Wantje. Taxation in Britain, France and the Netherlands in the eighteenth century. In *Economic and Social History in the Netherlands*. Vol 2. 1990. Patrick K. O’ Brien. The Political Economy of British taxation, 1660-1815, in *The Economic History Review*, vol.41, 1988. Patrick K. O’ Brien. Fiscal Exceptionalism: Great Britain and its European Rivals from Civil War to Triumph at Trafalgar and Waterloo, working paper No.65/01, <http://www.docin.com/p-724464629.html>, 2001.

severe during the Taiping rebellion but afterwards, the tax collection remained rather decentralised. This is also in contrast with the hypothesis of Charles Tilly (1990), who predicts that taxes rise during wars and that this adds to state formation.¹⁹¹ Chapter 1 dealt with population expansion and solutions and spoke of disasters as one of the positive checks. There were countless natural disasters during the Qing reign. Calamity struck frequently during the Qing dynasty, such as floods, droughts, plague, locusts and hail. The next chapter will offer a case study to show how the Qing government returned the taxes in the form of public goods, disaster relief, when the biggest flood appeared in the Qing.

¹⁹¹ Charles Tilly. *Coercion, Capital and European States, AD 990-1990*. Cambridge Presss. 1990.

4. China's flood in 1823¹⁹²

In 1823, large parts of China were inundated in one of the heaviest floods of the Qing Dynasty (1644-1911). The 'Qing History Record' [Qing Shi Gao] gives us a flavour of how contemporary historians experienced the relevance of this flood: 'As the Qing Dynasty was established, the country entered into a time of peace and prosperity never seen before in history ... However, this ended in 1823 because of the big flood'. Here the publication cites Feng Guifen, a famous scholar in the Late Qing. Feng also wrote: 'A lot of energy and strength was used during the flood of 1823. Merchants and farmers experienced great losses, and ordinary people's lives changed from rich to poor' (Feng 1876, vol. 9). Feng's perspective on the flood was later taken up by Zeng Guofan and Li Hongzhang, two powerful officials, and thus became influential in Chinese historiography.

Despite the prominence of this catastrophe, there is a lack of comprehensive and detailed data on its impact, as well as the government's response, because the historical records have been widely scattered. Following a recent reorganisation of China's First Historical Archives and the instalment of a disaster section, however, researching specific catastrophes has become feasible for the first time. This is why we are able to provide new evidence about the flood's impact as well as the extent and composition of the central government disaster relief.

This is not only important for Chinese history in relation to the year under scrutiny, but also to the rest of this era. The 1823 flood is considered a potential explanation for the Daoguang Depression (Bozhong Li 2007), allegedly a prolonged

¹⁹² This part was from the article by Yuping Ni and Martin Uebele, 'Size and Structure of Disaster Relief when State Capacity is Limited: China's 1823 Flood', published in the *Australian Economic History Review*, vol. 59, 1: 24-54 (March 2019). I was responsible for the content of the Chinese part and Martin was responsible for the Western part, and then we made a comparison between China and the West. It was chosen as the second best article published in the AEHR in 2019 voted by the editorial board.

period of economic stagnation during Emperor Daoguang's reign (1821-50).¹⁹³ This again provides the background to China's 'lost century', in connection with interior and exterior security issues such as the First Opium War (1839-1842) and the Taiping Rebellion (1850-64). In this regard, Sng (2014) has provided a model and quantitative evidence of China's fiscal structure and deteriorating fiscal position, arguing that this is the main reason for economic, military and social decline in the eighteenth and nineteenth centuries. Our evidence, suggesting that the state needed to redirect about half of its total revenue towards disaster relief, speaks of low fiscal capacity and thus fits well with models that envisage the positive role of a capable state in economic growth.

If the consequences of the flood are up for debate, so are its causes. Some argue that the flood occurred in the context of climate change at the end of the sixth Little Ice Age (Wu 2001, p. 240; Bozhong Li 2007). Lillian Li (2007) has pointed to environmental degradation through population growth during the late Qing, with yield declines as one of the symptoms. Flooding due to soil erosion might be another symptom, with both resulting in the greater likelihood of food shortages due to the direct destruction of harvests and the indirect hindering of food shipments through rising transport costs on rivers and canals. A third explanation in the literature argues that the flood was a consequence of the eruption of the Tambora volcano in Indonesia in 1815 (Cao et al. 2012). However, our aim is not to explain the causes of the flood but to present new evidence about its consequences and the ability and willingness of the Qing state to deal with it.

Our findings fit well with the growing literature on the role of the state in economic development, especially in the context of the Great Divergence debate. The recent decade has seen systematic theoretical and empirical investigations of state capacity in the context of Early Modern Europe. The main conclusion is that state capacity, in combination with limited government, was most conducive to

¹⁹³ The parallel between Bozhong Li's (2007) hypothesis and ours concerns a connection between adverse natural conditions and economic performance. However, we emphasize the role of government in response to disasters, with a potential link to economic growth.

long-term economic performance (Dincecco and Katz 2016).

In the context of the Great Divergence, Parthasarati (2011) highlighted the role of the British state, for example, in protecting its infant industries during the eighteenth and nineteenth centuries, in contrast to India and the Ottoman Empire.

Rosenthal and Wong (2011) emphasised the aspect of military conflict in their discussion of the relationship between state and economy. They concluded that the role the state played in the diverging development of China and Europe was the unintended outcome of their respective economic and strategic settings. Initially, conditions in China, with its long-term stability, low taxes, and low incidence of war (compared to Europe) were consistent with a benevolent ruler. However, this turned out not to be beneficial in the long run, as Europe, because of its frequent internal wars, developed capital-intensive production and urbanisation, ultimately leading to sustained growth.

This picture of long run growth Qing state was challenged by Vries (2015, 2012). Although he agreed in general with the empirical facts, such as relative per capita tax levels in Britain and China, he arrived at a different conclusion: the state that Rosenthal and Wong (2011) described as benevolent, he interpreted as simply weak and incapable, showing— not without parallels to Partasarathi (2011) – that a strong fiscal state with high per capita taxes played an important role in the divergence from the pre-modern zero percent growth path.¹⁹⁴

While differing profoundly in their assessments, these authors agree that a capable and benevolent state would have benefited China's economic development during the eighteenth and nineteenth centuries. In contrast, Cha (2012) presented a profoundly pessimistic view about the particular tool of state activism analysis in this paper – disaster relief – and its impact on long-term development in China. He argued that grain loans and tax exemptions led to capital misallocation in the agricultural sector and thus delayed industrialisation. At the same time, he stated

¹⁹⁴ However, note the contrasting conclusion in Vries (2002).

that agricultural subsidies lowered rural savings and investment, the net effect of which could only be estimated. He concluded that the visible hand of the state, by dampening short-term fluctuations of rural income, led to decreasing living standards during the eighteenth and nineteenth centuries in China and Korea, in contrast to Britain and Japan.

Our take on disaster relief is less Malthusian, in that we interpret it as a sign of benevolent rule in the first place. However, while our evidence mostly concerns 1823, there might have been a trade-off between short and long-term food security in the sense described by Andersson and Roumasset (1996), especially because the Chinese central government had to work with a small budget.

We found that in the 17 provinces for which we have data on both disaster intensity and land tax relief, at least 20 per cent of all counties were flooded, half of them seriously. We also found that the total amount in silver per capita spent on the affected population was of a similar order of magnitude to what Britain and the Prussian Rhine Province spent during the Irish Famine (1845-49) and after the 'Year without a Summer' (1816), respectively. As proportional to government size, Chinese spending in 1823 was about 15 to 20 times higher than British spending (or 44 per cent to 58 per cent versus 3 per cent). We also provide evidence that it was the central government's intention to relieve the poor from disaster effects, as disaster relief was proportionally higher in provinces with higher disaster intensity.

Below, we first offer a generic overview of the Qing fiscal state and tax system. The chapter continues with a description of the archival material, before summarising the evidence on the 1823 flood, especially the reports of the extent of the flooding in various provinces. We then describe the types and amount of relief spent by the government and how this was distributed across provinces. In the third part of the dissertation, we analyse the evidence in the light of the debates outlined above, comparing the Qing response to European cases of disaster relief.

1. The Organization of the Qing State

The Qing state comprised four layers of government: the central government with the Emperor at the top, 18 provinces led by governors, and 268 prefectures, which were again divided into 1,700 counties headed by magistrates.¹⁹⁵ In theory, all major decisions, including fiscal expenses, were regulated by the central government down to the local level, but, in practice, the magistrates enjoyed considerable freedom, which probably increased with the distance from the capital due to the relative cost of monitoring of expenses (Shiue 2005, Sng 2014).

Before 1850, the Qing state's fiscal revenues consisted of five elements: land tax, tribute grain, salt tax, customs duties, and miscellaneous taxes, including taxes on fish, tea and minerals (Ni 2013). The land tax was the most important and the largest part of fiscal revenues. Until the Late Qing (taking 1840 as the dividing line between Early and Late), the annual revenue of the central government was about 45 million taels of silver, with the land tax amounting to about 25 million or approximately 55 per cent of total revenue. The annual quota for the land tax was basically fixed. However, the provinces enjoyed permanent reductions to this quota as well as additional short-term reductions due, for example, to disasters. Some of these would simply entail postponement; others would be completely forgiven, depending on the scale of the disaster. On a scale of one to ten, counties would enjoy permanent land tax reductions if their level of destruction was assessed as a five or higher.

Tribute grain, the second item, was claimed from only eight provinces: Jiangsu, Zhejiang, Anhui, Jiangxi, Hubei, Hunan, Shangdong, and Henan. These provinces were all located near rivers or canals, especially the Grand Canal and the Yangtze River. The annual quota for tribute grain was about three to four million dan of rice annually. We value one dan of rice conservatively as equivalent to one tael of silver. Thus, a maximum of four million taels, or slightly less than 9 per cent of the state revenues, would be due to tribute grain. Before the Taiping Rebellion, tribute grain generally

¹⁹⁵ The exact numbers for provinces, prefectures and counties vary by definition and source.

remained constant and was not subject to the relief possible from the land tax.

Salt tax was the third important source of tax revenue for the Qing. Although it was levied per capita and the population was increasing, the annual revenues remained at about five million taels of silver per year or approximately 11 per cent of total revenues. Among the reasons for this was the widespread smuggling of salt, which inhibited effective tax collection. Revenues from salt only increased significantly in the Late Qing when the *likin*, a flat one per cent tax on commercial transactions, was introduced.

The revenues from miscellaneous taxes accounted for about one million taels per year, or less than two per cent. The remainder of tax revenues would thus be due to customs duties and donations, with about five million taels of silver in customs duties representing an important part of the government's tax income. This would be levied at tax stations situated on the canals, in maritime ports and along important roads, and raised on the value of goods that traders transported. This tax would also depend more strongly on commercial activity and the fiscal needs of the government.

The disaster relief system consisted of three parts: reports, surveys, and relief. In general, a disaster report was very simple, typically containing information on how many counties were flooded. In comparison, disaster surveys included detailed information about how many people and how much land was affected by the disaster down to the level of villages and perhaps further.

In ancient China, with its limited means of transport, the speed of information communication was a crucial factor in maintaining control. In 1653, the government ordered that if a disaster occurred in summer, the reports should be completed before June, and if it occurred in autumn, the reports should be completed before September (Tuo 1818).¹⁹⁶ At the same time, local officials were to send junior officers to check on the intensity of the disaster and tabulate the data. All the work

¹⁹⁶ These are Chinese lunar months. In the Gregorian solar calendar, June would be July or August, and September would be October or November.

had to be completed within one month or they would be punished by reduced pensions, demotion, or even dismissal. This rule was followed until 1728, when the period changed to 40 days for the counties and five days for the prefecture and provincial officials. These were reasonable limits, allowing officials sufficient time and providing no incentive to ignore the disaster altogether (to avoid punishment for lack of detail or inaccuracies) but brief enough so as not to delay the relief efforts.

The second stage was the disaster survey, usually carried out by county officials. They recorded the names of disaster victims, where they lived, and the location destroyed or otherwise affected by the disaster. At the beginning of the Qing, the survey unit operated at the county level which often led to omissions and exaggerations. Sometimes the disaster did not affect the county as a whole but only some villages which, nevertheless, might have faced a life-threatening situation. Alternatively, the whole county might have been flooded, with the exception of some important villages, so in 1757 the Imperial court agreed to change the focus of the survey unit from county to village.

To avoid errors and identify misreporting, county officials were to report their results to the prefecture and province levels. After a big disaster, the governor would order a repetition of the survey himself, while prefecture officials would do the same. Finally, when the Ministry of Finance received the report, it would also send central officials to do another survey.

The third step consisted of relief itself. This was organised by issuing vouchers to disaster victims, which could be redeemed for food rations or silver.¹⁹⁷ The vouchers were usually issued by the county administration and in some cases by local elites. As a control measure, the vouchers were duplicated, allowing the government to check the amounts issued at either county, prefecture, province, or central level depending

¹⁹⁷ One food ration was 0.005 *dan* of rice per day for adults and 0.0025 *dan* for a child of at least walking age. As one *dan* equals about 50 kg this would be 250 grams or 900 kcal per day assuming 3600 kcal for 1 kg of rice for an adult. Typically, this would continue for one month, and in exceptional cases for several months. For example, in 1823, Zhili's relief lasted between one and three months, and in Beijing from August 1823 to May 1824 (or nine months), because many flood victims sought refuge in the capital (Tuo 1818). Food rations would be in addition to soup kitchens or public works programmes.

on the specific situation.

2. The 1823 Flood and Government Response

In this section, we summarise the extent of the flood, measured by the number of counties flooded in each province, the death toll, and the reaction, in terms of grain prices, in four large eastern provinces. We begin by explaining the archival sources from which we gathered the evidence.

This chapter is mainly based on archival material, and only relies on secondary literature for some auxiliary comparisons. This section offers an overview of the material we used, providing a deeper understanding of it.

The primary material can be divided into published and unpublished archival records. The most important published material includes research undertaken by the China Institute of Water Resources and Hydropower Research¹⁹⁸ as well as the Edict Records of the Jiaqing and Daoguang Times (2000), published by the First Historical Archives of China.

These publications are valuable for our understanding of the 1823 flood, since they contain the reports of provincial officials to the court in Beijing. Thus, they have been widely used in the literature.¹⁹⁹ However, they comprise only a small part of the material available. Moreover, they mainly focus on the impact of flooding from a water engineering standpoint. To obtain a more comprehensive picture of the 1823 flood then, it is necessary to access unpublished material, which is stored in the First Historical Archives of China in Beijing.²⁰⁰

The published archives amount to no more than 10 per cent of these resources,

¹⁹⁸ Compare Shuili Shuidian Kexue Yanjiuyuan (1981, 1988, 1991, 1993).

¹⁹⁹ Lillian Li (2007) relies partially on them.

²⁰⁰ They mainly include Gongzhongdang Zhupi Zouzhe (Vermilion-endorsed Palace Memorials), Junjichu Lufu Zouzhe [Extra Copies of the Grand Council Memorials], and Qingdai Zaizhen Shiliao Huibian [Collection of Disaster Relief Materials].

thus the unpublished archives offer much more detail and depth. In particular, these reports by the provincial officials list the number and level of damage of the flooded counties in their respective provinces. They also present an assessment of the severity and characteristics of the flood, and explain what kind of measures had been taken and what was expected from the central government in terms of assistance.

We also accessed historical gazetteers containing reports about counties, prefectures and provinces, and historical records such as, published collections of the writings of individual officials. Finally, we used official handbooks, mainly the Daqing Huidian Shili ['Rules and Explanations of the Qing Dynasty'] and the Daqing Huidian ['Collected Statutes of the Qing Dynasty'].

In summary, this chapter draws on excerpts from the archival records on the 1823 flood totalling more than 150,000 Chinese characters, or about 150 pages. Of course, we still cannot claim to have covered all the available sources but we are confident that our collection includes most of the relevant written evidence available.

We compare the intensity of the flood in the provinces by retrieving the number of counties flooded from the archival records, locating them on a map of 1820 Qing China (Graph 4.1), the counties with a damage level of five or higher on the above-mentioned scale are marked in a darker shade than those with levels one to four.

Graph 4.1: Disaster in 1823 of Qing China

Next, we retrieve information on the share of the respective total number of counties flooded in a province. Based on this data, the most seriously affected provinces were Zhili, in which 89 per cent of counties were affected, Jiangsu (84 per cent), Anhui (66 per cent), and Zhejiang (30 per cent), while Hubei (24 per cent), Henan (15 per cent), Jiangxi (14 per cent), and Shandong (13 per cent) were in a somewhat better situation. Finally, provinces such as Yunnan (8 per cent), Guangdong and Hunan (both 7 per cent), Shaanxi (3 per cent), Guizhou, Sichuan and Shanxi (all 1 per cent), were only marginally affected by the flood. According to the archival material, it appears that the flood occurred mainly between May and July 1823, although in some provinces it rained from March to September.

Zhili province was the most heavily flooded. The flooding was concentrated in mid- June when 120 of its 135 counties were under water. Initially, however, the year began with the fear of drought as no rain fell during the spring or early summer. The Emperor and the Governor performed a ceremony to pray for rain. At the beginning

of June it began to rain in Baoding prefecture and other areas. By mid-June, the sources say that 'the rain, especially at night, was so heavy that in some low lands all the seeds were destroyed'.²⁰¹ At the same time, many riverbanks burst. The level of the Yongding River, the largest river near Beijing, rose so high that its banks finally burst in June. The Governor reported that water was everywhere, which was extremely rare. Among the 135 counties, 81 were reported to be awash in July (CFHA, no. 04-01-01-0649-015). Since it was the province nearest to the capital, Zhili initially received the most attention from the central government, but a week later, 21 counties were added to the list (CFHA, no. 04-01-01-0649-046). The flooding continued into September, and the total number of counties affected increased to 120.

The Yangtze Delta area in Jiangsu province was particularly affected. Heavy rain was already falling in May, and many riverbanks burst. Some areas were under one or two metres of water. In June the rain did not cease and continued to fall until mid-July. After a short break the downpours began again and were almost continuous from late July to mid-August. Many riverbanks broke and countless houses collapsed. According to one of the last reports, after several months of continuous rain, 66 of the 79 counties in Jiangsu province were flooded, 47 of them seriously (CFHA, no.04-01-35-0057-049).

The province of Zhejiang also experienced abnormal amounts of rain at that time. The flooding began in April, with many houses destroyed (CFHA, no.04-01-01-0649-002). It was still raining in some areas in August, with 26 of 88 counties inundated, according to the statistics (CFHA, no. 04-01-35-0057-047). In addition to flooded farmland, several salt mines in Jiangsu and Zhejiang were submerged. Due to the extreme rainfall, 16 salt mines in Jiangsu stopped production (CFHA, no. 04-05 01-35-0502-008).

Anhui's flood began in June, later than in Jiangsu. Many counties were under

²⁰¹ The First Historical Archives of China (Beijing) [Hereafter CFHA]: Gongzhongdang Zhupi Zouzhe [Vermilion-endorsed Palace Memorials], No. 04-01-30-487-19.

water, and several rivers overflowed in Luzhou prefecture. Several people were reported dead in Nanling County due to the heavy rainfall. From July to September, more heavy rainfall occurred and, according to the provincial reports, 45 counties were awash in Anhui (CFHA, no. 04-01-01-0643-027). One year later, the Governor of Anhui reported to the Emperor: 'The flood in 1823 was very serious not only because there was a lot of rain in Anhui, but also because of the heavy rains at the same time in Sichuan, Shaanxi, Hubei, Hunan and Jiangxi provinces, as Anhui is the main area for this water to reach the ocean. More than one million people are seriously affected by the disaster'.²⁰²

Shandong, Henan, Hubei, Jiangxi, and Hunan provinces experienced only limited destruction. Henan experienced rain from May to August, with only 11 of 116 counties flooded (CFHA, no. 04-01-01-0643-026). The situation in Shandong was similar to Henan. From May to July, Shandong suffered sustained rainfall, with 15 of its 116 counties inundated (CFHA, no. 04-01-35-0057-052). At the same time, several rivers in these provinces overflowed, including the South Canal, the Wei River, the Zhang River and, the Qin River. During that period, the Wei River burst its banks 16 times and the Qin River three times (CFHA, no. 04-01-01-0647-069).

In Hubei province, the flood occurred mainly in May and June. It rained about five to ten times in early, mid and late May, respectively. In total, 17 of the 72 counties were inundated (CFHA, no. 04-01-35-0057-054). In addition, along the Yangtze River in Jiangxi province, 13 of the 92 counties were affected by the flood (CFHA, no. 04-01-01-0643-014).

Adding to these reports, more floods were reported to the court in other areas of China. From May to July, flooding was experienced in ten of 124 counties in Yunnan, eight of 109 counties in Guangdong, and three of 97 counties in Shaanxi. More relevant reports came from Guizhou, Sichuan, Shanxi, Gansu, and Heilongjiang provinces. In total, from March to August 1823, 348 counties were flooded, more than 20 per cent of China's total of 1,700.

²⁰² Compare Shuili Shuidian Kexue Yanjiuyan (1991), pp. 663-664.

Death toll

The severity of a catastrophe is usually measured by the number of human deaths. We also explored our material for this information but obtaining exact figures was difficult because gazetteers often reported on the number of bodies using imprecise expressions, such as 'many'. Our archival sources produced the same outcome, and Lillian Li (2007, p. 9) concluded: 'In the Qing period ... no one counted or recorded the numbers of deaths from disasters.'²⁰³

Here we summarise all of the written evidence on the number of people who died in connection with the flood in 1823. We can be certain the figures do not reflect the actual death toll in any sense, as this was not assessed in the Governor's reports. They rather indicate single events that found their way into the reports for various reasons.

In the archives, we could not find the number of deaths in Zhili. The only written evidence is that people 'died' in Shuntian, Xuanhua, and six other prefectures (CFHA, no. 04-01-0649-015). In mid-July, the Yongding River broke its banks, and the ships that transported tribute grain to Beijing sank, with many sailors drowning (CFHA, no. 04-01-0649-031). Along with the Wenan and Youngping prefectures mentioned by Lillian Li (2007, p. 264), other gazetteers reported that 'a lot of people were injured' in Jingxing, and 'a lot of people died in the city' in Lulong county (Guangxu) Xuxiu Jingxing Xianzhi, Vol. 3; (Guangxu) Yongping Fuzhi, Vol. 31).

In Jiangsu, we found a record that due to the rain, after July 'a lot of people and animals died' in Kunshan county (Daoguang Kunshan Xianzhi, Vol. 39). Zhejiang province reported that in April, 15 people drowned, three in Jiande county and 12 in

²⁰³ Still, this author suggested 'a death rate of more than 1,000 per day' in Beijing in the summer of 1823 in relation to a cholera epidemic using a compilation of gazetteers, probably because the First Historical Archives were not available (Lillian Li 2007, p. 264). For the counties of Luanxian and Wangduo, the gazetteers state that 'a lot of people died in 1822 (Hebei Sheng Hanlao Yubao Ketu Zu, 1985, p. 682), and the gazetteers for the prefectures Wenan and Youngping report that 'many people died' (Hebei Sheng Hanlao Yubao Ketu Zu, 1985, p. 685). Note also that evidence on 1823 may have been falsely reported for the year 1822 in Hebei Sheng Hanlao Yubao Ketu Zu (1985). This would explain inconsistencies with the flood impact reports found in the First Historical Archives used in this chapter.

Chunan county (CFHA, no. 04-01-01-0649-002). In June, 10 people drowned in Fengshui and Zhuji counties (CFHA, no. 04-01-35-0057-047). Thus, in total, 25 people were counted as dead in Zhejiang, but of course many more must have been unaccounted for.

Regarding Anhui, there were reports that more than ten people died in Jixi county, as well as 'some people' in Xuanchen county and Wuwei prefecture (CFHA, no. 03-169-9853-44, no.03-169-9854-17). A local gazetteer recorded that 'a lot of people drowned' in Caoxian, Hezhou prefecture and Tongchen county (Daoguang) Caoxian Zhi, Vol. 17; (Guangxu) Zhili Hezhou Zhi, Vol. 37; (Daoguang) Xuxiu Tongcheng Xianzhi, Vol. 23). Furthermore, six people drowned in Huangmei county in Hubei province in 1823 (CFHA, no. 03-169-9855-24). In Yunnan, six people drowned in Yongshan county in March, and two women died in Jianshui county in July (CFHA, no. 03-169-9853-20, no. 03-169-9853-46), thus, in total eight in Yunnan. In Sichuan, there were also eight people who drowned in Fuzhou county,²⁰⁴ as well as 12 in May in Zhenghe county, Fujian province, according to the local gazetteer ((Mingguo) Zhenghe Xianzhi, Vol. 3).

In Shaanxi, 12 people were reported drowned in Zhouzhi county in July, and 10 in Zhiyang county in the same month, a total of 22 for that province (CFHA, no. 03-169-9854-14, no. 03-50-2843-18). In Gansu, five soldiers drowned in Zhongwei county in June (CFHA, no. 03-169-9853-39), and three women in Qinzhou (CFHA, no. 03-169-9854-45). In Guangdong province, 27 people drowned in the floods in Lianzhou and, in July, 15 people drowned in Yangshan county (CFHA, no. 03-169-9854-47).

Thus, in summary, the quantifiable number of people who died in the flood is only 141. This, however, does not mean that the death toll was that low. It is possible that the reports sent to Beijing signalled the severity of the flood in qualitative terms, as it was impossible to determine exact figures and they would thus have been regarded as untrustworthy.

²⁰⁴ Compare Shuili Shuidian Kexue Yanjiuyan (1991, p. 651).

While the figure is only 141, we conclude that the precise quantification of the number of bodies was not relevant to the official reports because their aim was to indicate the amount of assistance needed. The reactions that the reports in Beijing were significant in comparison to earlier floods, as 1823 was unique in Qing history and, as the next section will show, unique even when compared to the Early Modern states in Europe. However, before we turn to the topic of government assistance, we will look at the response in terms of market prices for staple food grains after the flooding.

Grain prices

In this section, we assess the severity of the flood by looking at the fluctuations in the price of rice and wheat. For this we rely on auxiliary data from the literature.²⁰⁵ Table 1 provides some evidence about the four provinces of Anhui, Shandong, Zhejiang and Jiangsu.

Table 4.1: Price behaviour during and after 1823 flood
percentage Increase of grain prices from 1822 to 1823

	Province Averages		Prefecture with largest increase			
	Rice	Wheat	Rice		Wheat	
Shandong	13% flooded					
Cal. Year Avg.	0.00	0.07	0.06	Yizhou	0.19	Qingzhou
August Prices	0.00	0.10	0.11	Qingzhou	0.29	Yanzhou
Anhui	66% flooded					
Cal. Year Avg.	0.02	0.02	0.19	Anqing	0.15	Taiping
August Prices	0.08	0.10	0.37	Anqing	0.42	Taiping
Jiangsu	84% flooded					
Cal. Year Avg.	0.03	0.05	0.16	Songjiang	0.11	Songjiang
August Prices	0.10	0.13	0.25	Changzhou	0.31	Yangzhou
Zhejiang	30% flooded					
Cal. Year Avg.	-0.01	0.00	0.13	Hangzhou	0.00	--
August Prices	0.08	0.00	0.33	Hangzhou	0.00	--
Comparison for 1817/16 (national wheat price averages)						
Austria	Belgium	France	Germany	England	USA	Sweden

²⁰⁵ We would like to thank Bas van Leeuwen for the data used in Van Leeuwen et al. (2012).

0.15	0.20	0.29	0.26	0.22	0.19	0.15
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Sources: Chinese prices the same as used in Van Leeuwen et al. (2012). Western prices except Germany refer to the data set in Jacks (2005). Prices for Germany are from Jacobs and Richter (1935).

In theory, price increases depend on the size of the negative supply shock and the price elasticity of demand. Interventions by the government could be accounted for by scaling down the supply shock through food provision from granaries. Our aim is to understand what the price fluctuations tell us about the size of the harvest failures by comparing them with other major food crises in Early Modern history. This can be done only by assuming identical elasticities of demand. The yardstick chosen here is the harvest failure in 1816 in Europe, also known as the ‘Year without a summer’ (Stothers 1984).²⁰⁶

The Chinese dataset consists of 52 monthly price series for rice and wheat from 1736 to 1911, but we will only present the changes in prices between 1822 and 1823. In each province, there are about a dozen of these series at the prefecture level. This allows for some insight into regional variation within and between provinces. We calculated percentage increases for both provincial averages and the prefecture with the largest price increase. We also present the change in calendar year averages and between the respective months of August 1822 and August 1823. Thus, for each province there are eight percentage price changes.

The province hit hardest by the flood for which we have price data was Jiangsu, with 84 per cent of all counties flooded. It is also the one that shows, on average, the largest price increase, with a 13 per cent rise for wheat and 10 per cent for rice. In Changzhou and Yangzhou prefectures, however, we observe 20-30 per cent price increases for both rice and wheat.

Anhui was also hit hard, with 66 per cent of its counties inundated, and its grain markets reacted in a similar manner to those in Jiangsu. Some prefectures had price increases as high as 30-40 per cent.

²⁰⁶ European prices, with the exception of Germany, refer to the dataset in Jacks (2005). Prices for Germany were taken from Jacobs and Richter (1935).

Zhejiang, where 30 per cent of counties were flooded, faced smaller price fluctuations on average, but Hangzhou prefecture was hit harder than others, with a 33 per cent price increase for rice. Similar figures were reached for wheat prices in Shandong.

While these fluctuations seem to reflect the intensity of the flood to some extent, they are not extreme compared to the average national wheat price increases in Europe between 1816 and 1817 after the eruption of the Tambora volcano. Given different sizes of the counties however, a more meaningful comparison would be at the provincial level rather than by examining prefecture averages. By doing this, the results imply that 1823 prices in China, on average, fluctuated less in response to shortages than prices in Europe in 1817. We thus conclude that while the flood caused food scarcity, price fluctuations were comparatively limited. This is in line with Lillian Li's (2007, p. 131-132) findings about price fluctuations after flooding in Zhili. While a detailed discussion is beyond the scope of this chapter, it would include regional variations in harvest shocks, and the analysis of successful private and public disaster management.

Fiscal responses

This subsection summarises the fiscal expenses of the central government. We divide these into direct and indirect expenses. Direct expenses refer to payments by the government to subsidise food, clothing, and shelter for the people affected, including payments made for water infrastructure works. Indirect expenses refer to tax shares the government waived or was not able to collect, including tax exemptions and decreases in the tax base due to the disaster.

Since our sources only provide information on public finances, we do not cover private relief activities. This, however, does not mean they were not been substantial. On the contrary, there is evidence that their extent was large. Chinese landlords and the wealthy in general were, to the best of our knowledge, aware of the Confucian ethics to help the poor. In addition, their generosity was rewarded by the central

government with honorary titles or official positions. Moreover, local officials would sometimes donate their own money to support people affected by a disaster. For example, in Jiangsu province, the wealthy donated large amounts of grain during 1823, ranging from 20,000 to 100,000 dan in various counties. At the same time, officials also donated money as a private initiative. For example, officials at different levels of government in the Jiangsu province Yangzhou prefecture donated 16,000 taels of silver from their private salaries for the flood-affected population in 1823 (CFHA, no. 04-01-01-0643-029). As can be seen below, this compared with 1.86 million taels of direct government support and was thus a substantial addition.

Neither do we discuss the state of the civilian granary system in detail because our focus is on describing the flood impact and the extent of government relief in total as well as between provinces. Will and Wong (1991) described the secular decline of the granary system towards the early nineteenth century, and one might ask if this decline may have been a factor in the state's ability to respond to major disasters. We tested this quantitatively and used data about the long-term development of the granary system from Will and Wong (1991) as a control to explain the distribution of funds between provinces (see Appendix C).²⁰⁷

Direct payments by the central government

The largest part of direct expenditures consisted of relief payments. During the reign of the Daoguang Emperor (1821-50), the process of relief distribution generally worked as follows: the provincial officials had to report the disaster within 40 days; if emergency assistance was needed, the officers of provinces had to support the people in advance using local resources, such as building temporary accommodation and distributing food and clothes to the homeless, as well as contributing money for funerals;²⁰⁸ after the central government received the disaster reports, they would send officials for closer investigation and to check on the measures already

²⁰⁷ The result is that provinces that improved their per capita holdings of grain between 1786 and 1820 received larger permanent reductions in land tax before and during the 1823 flood, but that there was *no* such relationship to short-term tax reductions between 1822 and 1823. The Online Appendix is hosted at <https://sites.google.com/a/rug.nl/martinuebele/home/online-appendix>.

²⁰⁸ In general, there would be five *taels* of silver for soldiers and one *tael* for civilians (Tuo 1818).

undertaken.

The capital city itself was in dire need of relief in 1823. In July, an officer reported that it had been raining in Beijing and surrounding areas since June, which had already caused 'the price of food and other daily necessities to rise quickly'. He suggested that the government introduce measures to reduce food prices, to which the Daoguang Emperor agreed (CFHA, no. 03-9864-001). Because the areas surrounding the capital were heavily awash, 'the number of poor people was twice the number of the previous years', and the measures to control prices continued until the following year. In total, more than 62,600 dan of rice and 7,100 taels of silver were distributed (CFHA, no. 03-9854-011).

Zhili province was the area hit hardest in the flood. When the disaster first began, the local officials supported those in need by using money and food according to the traditional system (CFHA, no. 04-01-01-0649-015). As Tianjin, a major city in Zhili, was massively inundated, the local government first distributed 1,200 dan of rice (CFHA, no. 04-01-35-0057-050). The counties of Wuqing and Baodi were also seriously affected, and received 73,573 taels of silver (CFHA, no. 03-9855-047). In July, 21 of the 135 counties were affected by flooding, collectively receiving relief payments of 1.8 million taels of silver. Because of the lack of rice reserves, 400,000 dan of rice from tribute grain were delivered to Zhili (CFHA, no. 04-01-35-0243-028), in addition to which several other measures were taken (CFHA, no. 04-01-01-0645-009). In total, more than 1,685,700 taels of silver and more than 550,000 dan of rice were used to relieve the province of Zhili from the immediate consequences of flooding.

The relief methods in Jiangsu were similar. In July, 23 counties were flooded and the situation became serious. The Jiangsu Governor initially sent food that could support people for one month, and 200,000 taels of silver were distributed to the poor (CFHA, no. 04-01-01-0649-017). Afterwards, when food prices rose, the government collected silver to buy rice from neighbouring provinces (CFHA, no. 04-01-35-0057-049). According to reports from the Jiangsu Governor, north Jiangsu

was in need of one million taels of silver, and south Jiangsu about 360,000 (CFHA, no. 04-01-01-0643-030). In total, Jiangsu required 1,820,000 taels of silver and 277,187 dan of rice for relief activities.

There are only two records about relief in Zhejiang. The first reveals that 7,000 taels of silver were sent to Jiande and Chunan counties (CFHA, no. 04-01-01-0649-002). The other reveals that the local government sent 300,000 taels of silver to buy rice from the neighbouring provinces (CFHA, no. 04-01-02-0082-007). As the salt mines of Jiangsu and Zhejiang had suffered from the flood, they also received support from the government; however, the amount of silver sent is unknown (CFHA, no. 04-01-01-0643-040).

Unlike Zhejiang, the records on Anhui are detailed. In May, 8,000 taels of silver were sent to those in need (CFHA, no. 04-01-01-0649-004); in July, 1,300,000 taels of silver were used for relief (CFHA, no. 04-01-01-0643-019); and in September, Anhui sent officials to buy 10,000 dan of rice, collected in Sichuan, Hubei, Hunan and Jiangxi provinces (CFHA, no. 04-01-01-0643-015).

Hubei province also spent 138,846 taels of silver on relief for the poor (CFHA, no. 04-01-01-0643-054), but there is only one record about the level of relief in Shangdong, which was 26,776 taels of silver to repair military barracks destroyed by the rain (CFHA, no. 04-01-20-0010-018). The situation in Hunan, Jiangxi and other provinces were most likely similar, but we could not find the respective reports.

As a total, direct relief payments recorded in the archives amounted to 5,383,300 taels of silver and 954,287 dan of rice. However, the flood must also have affected other areas in China. We thus assume that substantial payments were also made in these areas and therefore suggest that the total figure should be revised upwards, with the actual amount of direct payments probably closer to 8,000,000 taels of silver, and total rice shipments probably about 1,500,000 dan.

Apart from silver payments and food shipments, water engineering was the third element of direct fiscal expenditure by the central government. From the archival

records, we can see that the provincial government of Zhili spent 201,972 taels of silver to repair the Yongding River between June and October (CFHA, no. 04-01-01-0647-056), while Zhili also spent 219,062 taels of silver on the northern Grand Canal (CFHA, no. 04-01-01-0648-051), adding up to a total of 421,034 taels.

Henan province spent 196,400 taels of silver to strengthen the dams of the Qin River (CFHA, no. 04-01-01-0647-039), while Shandong province spent 36,514 taels of silver on flood control measures on the Wei River (CFHA, no. 04-01-01-0648-056). The Yellow River, crossing Henan and Shandong provinces, had brought serious flooding from June to August and 1,327,266 taels of silver were spent on repairing dike breaches (CFHA, no. 04-01-01-0648-024). Accounting for the respective provincial contribution between Henan and Shandong provinces, we can divide this number into two parts, such that when including their own expenses, we arrive at 860,033 taels paid in Henan and 700,347 taels paid in Shandong, respectively.

The rivers in Jiangsu province were hit by the flood at the beginning of May, continuing through to October, and 380,000 taels were spent on reconstructing their banks (CFHA, no. 04-01-01-0646-006). Unfortunately, expenditures in Zhejiang were not recorded very carefully, except one record of 20,810 taels for riverbank repairs (CFHA, no. 04-01-01-0648-033).

Finally, the total for Hubei, Jiangxi and some other places amounted to 2,528,693 taels, while for Anhui, Yunnan and Guangxi, which also had known river engineering projects, our records provide no information. Thus, we estimate that the total amount spent on water engineering would be about 3,500,000 taels of silver in 1823.

In summary, direct payments that we can trace back to archival records amounted to 5,383,300 taels of silver and 954,287 dan of rice, plus 2,528,693 taels of silver for river repair works. However, we do not believe the archival records are complete, and estimate that, as a rule of thumb, about 30 per cent of the total are not accounted for. We therefore suggest that direct payments of 8 million taels in silver, plus 3.5 million for rivers, and 1.5 million dan of rice, would be more realistic.

Indirect expenditures: tax reductions

The second part of government expenditure consists of indirect expenditures or explicit reductions to the otherwise expected tax payments in normal years. As mentioned above, there were four major types of payments or shipments arriving in the imperial coffers in normal years, stemming from land tax, tribute grain, salt tax, and customs duties. Since the normal annual amount was relatively stable, deviations in disaster years can be understood as indirect expenses dedicated to disaster relief.

Firstly, land tax was the main revenue source during the Daoguang reign, at about 25 million taels of silver per year. In relation to total tax revenues of about 45 million taels, this is a share above 55 per cent. Table 4.2 summarises the reductions in the land tax quota by province.

Table 4.2: Land Tax and Land Tax Reductions in 1823 (in *tael* of silver)

	I	II	III = I - II	IV = III / I	V
	Quota = tax target	Reduced target	Tax relief	Relief ratio (%)	Target change (%)
Zhili	2,556,866	966,439	1,590,427	62	-28
Jiangsu	3,625,814	2,058,011	1,567,803	43	-23
Zhejiang	2,249,330	1,995,784	253,546	11	-19
Shandong	3,589,694	2,305,385	1,284,309	36	11
Henan	4,354,543	2,734,017	1,620,526	37	3
Anhui	1,807,563	1,143,020	664,543	37	-29
Hubei	1,144,208	1,015,025	129,183	11	-9
Jiangxi	2,423,720	2,249,330	174,390	7	0
Hunan	912,643	886,040	26,603	3	-1
Yunnan	210,073	209,382	691	0	-1
Guangdong	1,148,284	1,091,740	56,544	5	-2
Shaanxi	1,333,169	1,332,535	634	0	-1
Gansu	283,555	267,585	15,969	6	3
Sichuan	768,536	768,536	0	0	-3
Guizhou	121,667	76455	45,532	37	-2
Guangxi	336,951	308,746	28,205	8	4

Fujian	1,234,192	1,034,460	199,732	16	8
Total	28,100,808	20,442,490	7,658,637	27	-5

Sources: Chao Dang (Copies of the Archives), stored in the Library of Economic Institute, Chinese Academy of Social and Sciences. Column V: Own calculations from comparing reduced target in 1823 with reduced target in 1822 (not shown). Unweighted average shown at bottom.

According to Table 4.2, total exemptions from land tax amounted to 7,658,637 taels of silver or about 27 per cent as a national average. Zhili received the highest exemption, at 62 per cent, followed by Jiangsu at 43 per cent. Anhui, Henan, Guizhou and Shandong each received a 36 to 37 per cent reduction, while others received much less in relative terms.

Secondly, at the time, tribute grain was regarded as the most important form of tribute payment and was usually not exempt from the annual quota of about four million dan of grain. However, because the situation in 1823 was so serious, the government had to deviate from its usual practice. According to our records, it only received 3,082,740 dan of grain in 1823, which means a reduction in tribute grain of roughly one quarter.²⁰⁹

The third item, salt tax, was as important for fiscal revenues as tribute grain. When the flood struck the country, Changlu in Zhili province received an exemption of 97,391 taels of silver on the salt tax [The First Historical Archives of China (2000; Vol. 28, p. 331)]. Yunnan was given an exemption of 23,222 and Zhejiang 2,384,000 taels, amounting to a total of 2,504,613 taels of silver (CFHA, no. 04-01-35-0502-011). Unfortunately, however, we were not able to find records about exemptions for the Liang Huai Salt area that was most affected by the flood and provided almost half of the salt tax in normal years. Thus, we estimate that the total tax reduction is unlikely to have been more than four million taels of silver. Finally, the flood also reduced customs duties. According to our records, this amounted to indirect expenditures of about 400,000 taels of silver (Ni 2010).

²⁰⁹ Chinese Academy of Social and Science (various years).

3. Structure and amount of disaster relief

Distribution of disaster relief

In this section, we aim to understand how the central government's bureaucracy decided how to distribute the scarce resources between provinces. A relevant question in this context is to what extent random weather events determined the amount of disaster relief. If the intention was to provide relief from the consequences as evenly as possible, and if all levels of government followed this policy, the level of distribution should have matched the severity of the weather experienced in the respective provinces. Sizable deviations from this pattern would call for alternative explanations, such as proximity to the capital or the presence of a military garrison, as determinants of the level of disaster relief. Such deviations also open the possibility for strategic behaviour among lower levels of bureaucracy, creating the incentive locally to reduce precautionary savings, for example, by not sufficiently stocking granaries (Shiue 2005, 2004).

Our study is the first to analyse the distributional structure of disaster relief by province during one particular year. We are interested in two questions: firstly, was disaster relief proportional to the reported disasters?; secondly, was relief proportional to weather outcomes? The first question aims to understand the intentions of the central government when considering disaster relief and abstracts from the possibility that local officials misreported the size of the disaster in their province. The second question aims to investigate one potential channel of opportunistic behaviour by lower level officials, which is to report higher disaster effects than warranted by the actual weather events. In brief, we found that, in 1823, the distribution of disaster relief did depend to a large extent on flood intensity as reported by officials. This result persists when the analysis is done with weather data from a separate source.²¹⁰

²¹⁰ An anonymous referee highlighted that the weather reports rely partially on court records. However, our comparison of both indices does not suggest exaggerations in the official reports. Instead, some provinces received less disaster relief than weather reports would have suggested.

The relationship between disaster relief and flood intensity reports

The data we used for this analysis concerned the share of counties affected by the flood in a province, and the amount of disaster relief measured in terms of the type of assistance. As explained above, disaster relief consisted of direct and indirect assistance, where the latter was a reduction or postponement of taxes of various types.²¹¹ Since the evidence on direct assistance is too irregular for a representative description of all provinces, we only relied on tax reductions, in particular, the land tax, expressed as a percentage of the original tax quota (Table 2, Column IV).²¹²

For the land tax, we have data for the whole Daoguang reign (1821-1850). Comparing tax quotas and reductions over time shows that some provinces enjoyed permanent reductions, which cannot be attributed to an unexpected weather event. Therefore, we also calculated the change of the land tax reductions between 1822 and 1823 (Table 2, Column V).

We analysed the relationship between the variables of interest by generating simple scatter plots (Graphs 2 and 3) and by regression models with multiple controls. Since the number of observations was below 20, however, we do not want to place the regressions at the centre of the discussion. We see them as a necessary complement and thus present them here only descriptively. The result of the regression models supports the hypothesis that there was a proportionate relationship between disaster intensity and relief, even when controlling for various alternative explanations.²¹³

Delving deeper into the scatter plots, in the left panel of Graph 2 the land tax relief ratio (i.e. the ratio between the reduced tax quota and the original tax quota) is plotted against disaster intensity (share of counties flooded). In the right panel, the

²¹¹ In this section we do not distinguish between forgiveness and postponement because we are interested in short-term effects.

²¹² We also conducted the same exercise with the sum of all available information about direct and indirect assistance, and qualitatively obtained the same results. However, because they are not strictly comparable across provinces, they are only obtainable upon request.

²¹³ The Online Appendix can be found at <https://sites.google.com/a/rug.nl/martinuebele/home/online-appendix>.

land tax relief ratio is replaced by the relative land tax relief ratio (i.e. the change in the land tax relief ratio between 1822 and 1823). We plot disaster intensity again on the x-axis.

Graph 4.2: Land tax relief ratios vs share of flooded countries at province level.

The first and most important observation in relation to Graph 4.2 is that land tax relief was apparently allotted in proportion to the reported intensity of the disaster. This holds for the simple land tax relief ratio as well as for the relative land tax relief ratio. However, we can note that two provinces stand out from the others, which helps to further clarify the likely mechanisms behind disaster relief.

In the left panel, Guizhou is clearly an outlier. It received 37 per cent relief with respect to its normal tax target, although only one of 74 counties was flooded. However, this was part of a pattern, as Guizhou received 33-50 per cent land tax

relief throughout the Daoguang reign (Chinese Academy of Social Sciences, various years b). This becomes evident when looking at the declines in tax targets relative to 1822 in the right panel of Graph 2. When considering this relative measure, Guizhou is no longer an outlier, as the target had already been reduced the year before.

A similar case is Zhili, the province in which the capital Beijing was located. It was affected more by the flood than all other provinces, with 89 per cent of its counties under water, but its tax reduction of 62 per cent was still out of proportion compared with the other provinces. Jiangsu, for example, with 84 per cent of its counties flooded, only received a 43 per cent tax reduction. This shows that Zhili did indeed receive a permanently higher tax reduction than others. In the disaster of 1823, however, there was no bonus for Zhili. When looking at how much its tax target was reduced in addition to the reduction it had already received in 1822, it was clearly in line with the other provinces (right panel). This shows that Zhili was indeed privileged, probably because it was politically and strategically more important than other provinces, but not in response to random disaster events.

In this section, we have investigated the intentions of the central government, taking the information it received from the Governors as given. We conclude that the central government's intention was to ameliorate the effects of disaster as much as possible. The following section compares disaster relief with weather data rather than disaster reports.

The relationship between disaster relief and weather data

In this section, we will replace the disaster intensity measure by weather data to determine if there are systematic differences between them. We will use the 'Yearly Charts of Dryness/Wetness in China',²¹⁴ which contains an index, ranging from 1 (very wet) to 5 (very dry), listing 120 documented sites across China. It is based on meteorological descriptions in local annals and court records, among other documents.

²¹⁴ Published by the Chinese Academy of Meteorological Science (1981).

Two caveats should be mentioned in relation to the usefulness of this data. Firstly, as the boundaries associated with the weather report sites do not exactly reflect the historical provincial borders, we matched them to the provinces by averaging over the index values of the closest sites. As this might randomly lead to higher or lower index values, this is a source of unsystematic error. Following the theory of hypothesis testing, random noise works against finding a statistically significant correlation between two variables. Since it is our hypothesis that there was a proportional relationship between weather data and disaster relief, this is therefore not a point of concern here.

The second caveat is that the data used to form indexes of dryness and wetness might be the very records on which the disaster reports were based. We can thus not state that they are fully independent and therefore explicitly account for the possibility of exaggeration in the official reports when analysing the evidence.

Graph 4.3: Land tax relief ratios vs dryness/wetness index at province level

Graph 4.3 shows the relationships in scatter plots, one for the land tax relief ratio (left) and one for the relative land tax relief ratio (right). There is only a limited degree of proportionality between the land tax relief ratio and wetness, as can be seen in the left panel. In the right panel, there is a much clearer relationship between relief and wetness. The values range from that for Anhui (wetness 1.5, tax quota 29 per cent lower than in 1822) to that of Fujian (wetness 3, or normal precipitation, and tax quota increased by 8 percent) and are situated along an imagined steeply falling regression line.

The notable outliers are Sichuan, Shaanxi, Shandong and Shanxi, none of which lie on the line of best fit, but instead below it. This seems strange – if the flood reports to the government had been exaggerated, adding any degree of independent information (e.g. when constructing the wetness indices) should have pushed the data points in Graph 3 to the upper right corner, as this indicates relief beyond actual need. This effect would be stronger the less information the two indicators share. However, data points in the lower left corner indicate underreporting by the outlier provinces. We do not offer an explanation of why provinces would underreport, but this comparison shows that: (1) the weather data adds independent information to the disaster reports, and that (2) deviations suggest under reporting, not over reporting. This tentatively points to a confirmation of the reliability of the disaster relief reporting system, especially for tax quota changes relative to 1822, which controls for quasi-permanent tax relief.

4. Relationship to debates in the literature

These findings suggest a benevolent interpretation of the central government's intentions. As regards the scope for shirking at the provincial level, the weather data seems to add independent information confirming that relief followed the random distribution of weather events. This needs to be discussed in the context of the

literature concerning corruption in the Qing bureaucracy, in particular, the work of Shiue (2005, 2004), who discussed quantitative evidence suggesting that provinces with higher frequencies of tax relief stored less in their local granaries. The favoured explanation for this behaviour is moral hazard in a principal-agent framework.

Unfortunately, the differences between our own and Shiue's (2005, 2004) datasets do not allow for straightforward comparisons of the results. Our data derives from a case study of 1823, with the amounts and types of relief by province, while Shiue has time series data for 1740-1820 about the existence of relief and disaster reports as well as weather data, but without knowledge of the actual amounts spent in each province. Moreover, even if our case study could be proven to be representative of Qing disaster relief policy in general, the remaining residuals from the proportional relationship between disaster and relief would still leave enough scope for additional factors such as corruption.

Having said this, we can draw two conclusions from comparing our data to Shiue's results. Firstly, we find that the relationship between disaster relief and weather results may be stronger than she claims. The weather-related pattern we observe for 1823 contrasts with her statement that 'the geographical pattern of disaster-relief funding from the centre was skewed and not likely to have been determined by the random occurrence of disasters' (Shiue 2004, p. 101), and we see no reason to assume that in comparable events this should have been fundamentally different.

Secondly, the difference between permanent tax relief (land tax relief ratio) and tax relief changes in the year of a disaster (relative land tax relief ratio) is important. As Shiue (2005, 2004) did not observe the actual amount of relief, she was not able to distinguish these two types of tax reduction.²¹⁵ By relating the change of the tax quota in 1823 with weather indices, we demonstrate that tax relief was partly driven by the intensity of the floods that, as exogenous events, were not foreseeable. This

²¹⁵ This chapter is a first step in reconstructing 'a full account of relief expenditures' envisaged by Shiue (2004, p. 120).

randomness would not allow for opportunistic behaviour.

Comparative size of disaster relief

This final section evaluates China's central government spending on disaster relief in an international context. We are well aware of the pitfalls of international comparisons, but we think it is valuable in this case as it points to both the capabilities and the limitations of the Qing government.

Table 4.3: Total Relief Payments in China 1823 (in *tael* of silver)

	Land Tax	Tribute Grain	Salt Tax*	Customs Duties**	Other means			Total***
	Reduction	Reduction	Reduction	Reduction	Direct payments	infrastructure repair	food provision	
Recorded Total	7,658,637	917,26	2,504,613	388,221	5,383,300	2,528,693	954,287	20,335,011
Assumed total	7,600,000	1,000,000	4,000,000	4,000,000	8,000,000	3,500,000	1,500,000	26,000,000

* Recorded salt tax relief 2,504,613 taels, but data missing for about 50% of the tax base.

**Customs duties reduction 388,221 taels, but some data are missing.

***Assumed price: 1 dan of rice = 1 tael silver.

**** Data missing for Anhui, Yunnan, and Guangxi, which also had known river projects. Thus total amount assumed to be 3,500,000 taels.

During the Daoguang reign, the Qing government had an annual fiscal income of 45 million taels of silver, but how much of this was spent as a response to the flood?²¹⁶ Table 3 summarises spending at the national level according to the actual records found as well as the assumed underlying national total.

If we assume a rice price of one dan to one tael of silver, we can add payments in kind to monetary payments, determining that the relief paid in kind was about 9,500,000 taels of silver.²¹⁷ Outlays on water engineering were probably about 3,500,000 taels. Thus, direct expenditures amounted to 13 million or about 29 per cent of total tax revenues. As we saw above, indirect expenditure (or tax exemptions)

²¹⁶ We refer to Ni (2013, p. 88-96). On the span of estimates see Vries (2015, p. 437-8).

²¹⁷ This implies approximately 0.75 grams of silver per kilogram of wheat.

included 7,658,637 taels of silver in land tax exemptions, a one million reduction in tribute grain, four million in salt tax exemptions, and a lowering of 400,000 taels in customs duties. This roughly amounts to another 13 million taels of silver. As a total, central government expenditures would be about 26 million taels of silver or about 58 per cent of the total fiscal revenue for 1823.²¹⁸

To arrive at this estimate we had to make several assumptions about public spending or tax exemptions for regions where no archival records could be found. While we consider our assumptions to be conservative, our qualitative conclusions also hold when based on the spending observed (although incomplete) in the archives; that is, 20 million taels or 44 per cent.

Table 4 presents the resulting national totals for China, Britain's spending on the Irish Famine 1845-49, and Prussian spending in the Rhine Province 1816-17. We compare both disaster spending as a share of total public tax income and absolute spending per capita, with the aim of providing a better understand the capabilities and limitations of the Qing central government.

Table 4.4: Disaster Spending in Britain, China and Prussia's Rhine Province

Britain (1845-49, annual average), China (1823), and Rhine Province (1816-17).

			I	II	III	IV	V	VI
			GNP	Gov. Revenue (million)	Gov. Share	Disaster Spending per year (million)	GNP Share	Gov. Rev. Share
Local currencies								
China	1823	mn <i>taels</i>	4000	45	1.1%	20	0.5%	44%
		of silver				26	0.7%	58%
Britain	1845-49	pound sterling	579	55.1	9.5%	1.62	0.3%	3%
Rhineland	1816-17	<i>Reichstaler</i>		13.7		1		7%

²¹⁸ This needs to be reconciled with a much cited reference on the topic, i.e. Lillian Li (2007, p. 248): "In one year alone, 1766, the state spent 34.5 million *taels* on relief in various parts of the empire, or approximately 12 per cent of its total expenditures for the year". This is based on a misinterpretation in an article by Xiangjun Li (1995, pp. 71-87). The correct interpretation is that disaster spending was approximately 4.2 million *taels* (12 per cent of total spending), and that the size of total government spending was 34.5 million *taels* in 1766.

Million Grams of silver							
China		g Ag	14920 0	1678.5		746	
						969.8	
Britain		g Ag	60574	6116.1		169.5	
Rhineland		g Ag		232.9		17.0	
Population (million)							
China	383	g Ag / capita	390	4		1.9	
						2.5	
Britain	24	g Ag / capita	2524	255		7.1	
Rhineland	1.9	g Ag / capita		123		8.9	
Affected Population (million)							
China	76.6	g Ag / capita	1948	22		9.7	
						12.7	
Britain	8	g Ag / capita	7572	765		21.2	
Rhineland	0.38	g Ag / capita		613		44.7	

Notes: I: Vries (2012, p. 16) for China, for Britain: Hills et al. (2010). II: Own calculations for China, for Britain Vries (2012, p. 39); Bass (1991, pp. 157-160). IV: Own calc. for China, for Britain, 7 mn pounds over five years from Gray (1995, p. 5). Rhineland: Bass (1991, pp. 157-160). Population Statistics on World Population, GDP and Per Capita GDP, 1-2008 AD: http://www.ggdc.net/maddison/Historical_Statistics/horizontal-file_02-2010.xls; Bass (1991, p. 157). Affected Population: Twenty per cent, authors own calculations for China; Twenty per cent for Rhineland based on various counties in Bass (1991, pp. 157-160).

We start with figures in local currencies and then work our way through to more comparable units. Two observations can be directly made based on local currency figures (Section 1 in Table 4). Firstly, as a share of GNP, the British government was about ten times as big as the Chinese. The Qing government share of about one per cent seems to be surprisingly low, but one to two per cent remains in line with the literature; probably even until the end of the nineteenth century (Perkins 1967, p. 479; Sng 2014; Sng and Moriguchi 2014, p. 3; Shiue 2005, p. 37). The comparability depends, among other factors, on the degree of monetisation of state activity, and it seems plausible that a smaller share of Qing state activities were monetised, which would lead to an underestimation of its size. However, the question of the extent to which state activity was under recorded and does not reflect its share in economic activity in general is impossible to answer in this chapter, especially when bearing in

mind that under recording affected also the economy as a whole.²¹⁹

Secondly, while the difference in terms of state size is already large, the differences in disaster relief spending as a share of total government income are even larger. At about 44 per cent (based on the lower estimate of 20 million taels), China spent at least 15 times as much on the 1823 flood as Britain on the famine (3 per cent), or at least six times as much as the Rhineland (7 per cent) spent on its respective disasters.²²⁰ Compared to earlier floods in China, such as that in 1743 discussed in Will (1990), the share was most likely even higher. The main reason could be that the Qing was already in fiscal decline due to inflation, while nominal taxes could not be raised easily (Sng 2014).

Turning to absolute figures, we need to translate local currencies into comparable units (see Sections 2-5 in Table 4.4). We do this in three steps: grams of silver, grams of silver per capita, and grams of silver per capita actually affected by the flood.

In grams of silver, China spent almost four and a half times more on the 1823 disaster than Britain did annually in the years 1845-49, and of course this was a multiple of the amount spent by the Rhineland in 1816-17. Translating this into per capita figures not surprisingly reverses the picture: per capita, about four and a half times more grams of silver were spent on disaster relief in Britain and the Rhine Province than in China (Section 3 in Table 4. 4).

However, only a part the total population was actually affected by the disaster or the crop failure, we therefore corrected for the varying shares of the population affected (Section 4 in Table 4.4). We took 20 per cent of the population in China, according to the share of counties flooded, as well as the population of Ireland, which was about eight million before the famine. For the Rhineland, the records on

²¹⁹ See further Vries (2015, p. 204-210).

²²⁰ The shares varied extensively in the Rhine Province, with the wealthier cities spending higher shares than the poorer ones (Bass 1992, p. 160). For example, Düsseldorf spent 23 per cent, while Elberfeld and Krefeld spent about eight per cent. Wischermann (1983) estimates 35 per cent for Münster/Westphalia, which is, however, doubted by Bass (1992, p. 160). See Shiue (2005, fn. 7) for more sources on the approximate size and GNP share of government disaster relief funding in Qing China.

the number of people who actually received help vary between 15.9 and 23.9 per cent in larger cities, thus we estimated 20 per cent of the population.²²¹ This again changes the perspective, as now the per capita spending gap between Britain and China is halved (9.7 and 21.2 grams of silver, respectively).

We are aware of the numerous pitfalls potentially limiting the comparability of these figures, especially the per capita figures, so we draw only two very simple conclusions: firstly, China's spending on the 1823 flood was large in absolute terms and was significant even on a per capita basis. Thus, despite its quite small share of GNP, Beijing was willing and able to act, even with its enormous population, in times of extreme crisis. Secondly, the 1823 flood took a much larger part of the state's resources than other disaster relief programs in the West during a similar period. This is evidence of the state's limited capabilities, which might have been a contributing factor to China's poor economic growth during the decades to come.²²²

5. Conclusion

This chapter provides a description and an analysis of Qing government spending during the 1823 flood, broken down by province and type of spending. We describe the extent of the crisis as evidenced by the archival records and the amount of spending in the provinces, as well as a national total. We analyse the relationship between the distribution of resources and the crisis intensity. Finally, we made a rough comparison with Britain's total spending during the Irish Famine and Prussia's Rhine Province after the 'Year without a Summer' in 1816.

We found that about 20 per cent of China's counties were severely affected by the flood. The number of deaths could not be quantified, as the sources do not bear

²²¹ Bass (1992). This seems to be a more precise – and thus a lower – estimate of the numbers of people who *actually* received help, which might explain the relatively high per capita spending figures in Section 4 for the Rhine Province.

²²² Perkins (1967, p. 487) discussed the state's limited role in promoting growth given its small size. However, this discussion was without reference to how the state actually spent its income.

out this information. Finally, food prices rose during the flood, in some prefectures by 20-30 per cent, which seems to be relatively moderate in a period facing a major flood disaster.

We are also able to show that disaster relief across provinces was roughly proportional to their share of counties affected by the flood, especially when controlling for the permanent tax reductions some provinces already enjoyed before the flood. We tentatively confirm this with measures of dryness/wetness during 1823, and we provide evidence for these results even when controlling for various demographic or geographic factors.

Finally, when comparing the total spending, we found that, as a share of government revenue, the amount was enormous: about 15 to 20 times higher than in Britain during the Irish Famine, and about six times higher than in the Prussian Rhineland. While in terms of per capita of the population affected, expressed in silver, the spending was less than the British, but it was not negligible.

From a normative perspective, this sheds some new light on the behaviour of the British government during the Irish Famine, which has often been criticised for not providing sufficient relief because it was believed that this would only lead to greater over population or prevent positive Malthusian checks from working (Gray 1995). On the other hand, the Chinese state's intentions are often presented as paternalistic (heavenly mandate). These impressions do not fit well with our findings that Britain provided more food relief in absolute per capita terms than China.

Taking a step back, we should not forget that the figures presented here only concern the expenditures occurring at government level. With respect to population loss, housing and property damaged, as well as harvest failures, the total economic loss was, of course, much higher. This perspective would allow us to understand why the 1823 flood left such a deep impression on Chinese history.

Conclusion

There have been many important debates on the Chinese economic history, such as the historical GDP research and the famous contribution by the California School on the Great Divergence. However, from this dissertation we can derive a new understanding of these debates.

In the Western economic history tradition, numerous efforts have been made to re-quantify the economic development level of different countries before the Industrial Revolution using GDP calculation methods. These efforts have helped confirm the growing acceptance of the idea that true economic growth did not in fact begin with the Industrial Revolution in the 19th century but with the late Middle Ages or the early Enlightenment, when it was initiated by a sequence of important economic transformations. In other words, the “Malthusian trap” appeared only in the period before the late Middle Ages. This new understanding was referred to by Jan De Vries as the “Revolt of the Early Modernists.”²²³

Angus Maddison is the most important economic historian, who figured prominently in Western research on Chinese historical GDP and was widely influential among Chinese scholars. He is the author of *Monitoring the World Economy, 1880-1992*; *Chinese Economic Performance in the Long Run: 960-2030*; *The World Economy: A Millennial Perspective*; *The World Economy: Historical Statistics*, and a number of other publications in the mid- and late 1990s. In Maddison’s view, for the thousand years or so up to 1000 AD, the Chinese economy did not achieve any substantial growth and its per capita GDP remained lower than Europe’s. However, things began to change dramatically during the Northern and Southern Song dynasties in 960-1279. In this period China saw substantial economic growth

²²³ Kuznets argued that over 15-20 years there was considerable growth in total output or per capita output which could be viewed as modern long-run economic growth. Simon Kuznets, *Modern Economic Growth: Rate, Structure, and Spread*, New Haven: Yale University Press, 1966, p. 27. See Jan de Vries, ‘The industrial revolution and the industrious revolution’, *Journal of Economic History*, 54 (1994), pp. 249-70., p. 253.

and overtook Europe in terms of per capita GDP to become the largest and most developed economy in the world. This wasn't to last however, in the following five and a half centuries the Chinese economy sank into stagnation once again and eventually Western Europe was able to overtake it in the 14th century. Nevertheless, till 1820 China's economic aggregate still amounted to a third of the world economic aggregate. Over the stretch of time between the Opium Wars and the First Sino-Japanese War of 1894-95, a sharp economic decline began to set in. However from 1890-1933, with the progress of industrialisation in some places, the Chinese economy began to show continuous albeit slow growth. However, the outbreak of the Anti-Japanese War and the Liberation War again brought the per capita GDP in 1950 back to the pre-1890 level.²²⁴

Angus Maddison's research provides us with an exciting picture. From then onwards numerous books and articles have focused on this very same topic, which have promoted our understanding of China's historical GDP. Among them, the newest results include Paul Caruana Galizia & Ye Ma in the *Australian Economic History Review* (2016), Broadberry et al in *The Journal of Economic History* (2018), and Ma & de Jong in the *Review of Income and Wealth* (2019)²²⁵ However, from the research of chapter 2, we can find that even when making exceptional effort to collect primary sources on the total trade value of the Qing dynasty, a prohibitive number of data-points remain missing. At the same time, the total trade value was significantly less than the total value of agricultural output and the handicraft industry output value, and the lack of data was more serious. Also, it was not until the late Qing and the early Republican period that modern Western statistical methods were adopted

²²⁴ See Angus Maddison, *Monitoring the World Economy, 1820-1992*, Paris: OECD Development Centre, 1995; and Maddison, *Chinese Economic Performance in the Long Run*, Paris: OECD Development Centre, 1998; *The World Economy: A Millennial Perspective*; and *The World Economy: Historical Statistics*.

²²⁵ Paul Caruana Galizia and Ye Ma, "Chinese Regions in the Great Divergence: Provincial Gross Domestic Product per Capita, 1873–1918," *Australian Economic History Review*, Vol. 56, No.1 (2016), pp. 21-45. Stephen N. Broadberry, Hanhui Guan and David D. Li, "China, Europe and the Great Divergence: A Study in Historical National Accounting, 980-1850," *The Journal of Economic History*, Vol. 78, No. 4 (2018), pp. 955-1000. Ma,Y & de Jong, H, "Unfolding the Turbulent Century: A Reconstruction of China's Historical National Accounts, 1840-1912. *Review of Income and Wealth*. Vol.65. No.1 (2019), pp. 75-98.

to compile and record economic activities. Therefore, there is almost no other choice to study historical Chinese GDP except by using secondary materials and existing research, or conjecture.

Considering the limitations of data, Li Bozhong has limited the scope of his historical GDP research to a very small area. In his monograph *The Early Modern Chinese economy: Examining the GDP of Huating and Lou Counties in the 1820s*, arguing that urbanisation had already been accomplished in the Huating and Lou counties in Songjiang Prefecture by the early 19th century. He further compared the GDP of the two counties in the 1820s with that of the Netherlands in the early 19th century, and concluded that: “the Yangtze region in the early 19th century was no longer a traditional agriculture-based economy, but rather an early modern economy based on business and commerce.”²²⁶ Later, in a collaborative work with Jan Luiten van Zanden, he argued that the per capita GDP of Huating and Lou counties in the 1820s was 86% lower than that of the Netherlands during the same period.²²⁷ Even so, Li’s assessment of living standards on the basis of food consumption or nutrition intake was defective; his use of GDP as the main measure of Huating and Lou counties’ developmental level was biased; his assumption of an incomplete labour market was inconsistent with his conclusion of full employment; and a segment of the data had to be extrapolated from other tangentially related statistics of the period of the Republic of China (1912-1949) and even later, thus affecting the reliability of the conclusion.

Therefore, this dissertation believes that the current research on Chinese historical GDP has encountered great difficulties. Further convincing research, especially scholars who want to make a comparison between China and the West, may have to focus on more specific topics rather than specific areas, such as prices,

²²⁶ Li Bozhong, *The Early Modern Chinese Economy: Examining the GDP of Huating and Lou Counties in the 1820s* [中国的早期近代经济：1820年代华亭-娄县地区GDP研究], Beijing: Zhonghua Book Company, 2010. p. 271.

²²⁷ Bozhong Li, Jan Luiten van Zanden, “Before the Great Divergence? Comparing the Yangzi Delta and the Netherlands at the Beginning of the Nineteenth Century”, *The Journal of Economic History*, vol.72, no.2, 2012, pp. 956-989.

wages, living standards, fertility, education and other aspects.

In 2000, Pomeranz published *The Great Divergence*, arguing that in the 18th century at least, prior to the Industrial Revolution, China's rich Yangtze region had been developing on par with England in northwestern Europe. Pomeranz saw two causes for the subsequent divergence between China and Europe: the opening up of the New World and the geographical advantage of British coal mines. Both factors contributed to the success of the Industrial Revolution in Britain, hence the "Great Divergence."²²⁸ Pomeranz emphasises the contingency factor. Additionally he argues that in the early stage of industrialisation, Western Europe and the region around the southern banks of the Yangtze River in China were facing the same ecological constraints brought by population growth and resource shortage. However, he does recognise differences as well. One of which is how the coal mines in the UK were located in the core area of economic development, saving transportation costs. Yet more importantly, the development of the new American continent had provided Britain with an "ecological windfall", which had given it access to resources, land intensive products, precious metals and economic space essential for economic transformation. Even if it does not rise to the discussion of the relationship between historical contingency and inevitability, from the research of this dissertation, I don't think that the developmental path of China and the European economic core area could be separated by some mere unintentional "good luck". In fact, Pomeranz has since partially revised his opinion that in terms of economic development, 18th-century England and the Low Countries in northwestern Europe were more advanced than China's most developed region, the Yangtze region.²²⁹ China's history is not fortuitous or fatalistic and it has been moving along its own path.

Considering the Great Divergence, Bin Wong (2005) had a high opinion of the developments undertaken during the Qing dynasty: "The Chinese state developed an

²²⁸ Kenneth Pomeranz, *The Great Divergence: Europe, China, and the Making of the Modern World Economy*, Princeton: Princeton University Press, 2000.

²²⁹ Kenneth Pomeranz, "Ten Years After: Responses and Reconsiderations," *Historically Speaking*, vol. 12, 2011, no. 4, pp. 20-25.

infrastructural capacity to mobilise and disburse revenues quite beyond the imagination, let alone the abilities, of European state makers at the moment.”²³⁰ Several years later, Jean- Laurent Rosenthal and Bin Wong (2011) hone their opinions and conclude even more positively: “China did not stagnate economically until the nineteenth century, and even then not all parts of the empire were unable to grow.”²³¹ This notion is not shared by the entire academic community however. On the contrary, Peer Vries (2015) refuted Wong's view comprehensively. Peer Vries believes that the importance of the state in economic history research has not been granted enough consideration, the state’s capacity to act was very poor during the Qing Dynasty. The strength of government during this era was marked by low efficiency and lacking innovation, and did not provide help for modern economic growth, which could have been valuable. I agree with his conclusion: “Mercantilism and the fiscal-military or rather fiscal-naval state, in my view, did not cause modern economic growth in Great Britain in the sense that they would be a sufficient condition for it, but considering the specific conjuncture in which Great Britain took off, I would certainly consider them a necessary condition for the emergence of the first modern industrialising economy.”²³² However, as I have shown, there are many mistakes pertaining to China’s economic data in his book because of the use of second-hand material, which weaken the foundations upon which his assertions are built. I believe the discussion as it stands will have to be continued.

Of course, in reconstructing basic historical data, we should not only take pains to collect, compile and authenticate original data, but should also “infer from” and “estimate” the data in a reasonable way. Generally, basic data that are most apposite fall into two categories. The first refers to the national statistical data released by the central government, including population, cultivated land, revenues and the

²³⁰ R. Bin Wong. *China Transformed. Historical Change and the Limits of European Experience*. Ithaca and London. 1997. p.132.

²³¹ Jean- Laurent Rosenthal and R. Bin Wong. *Before and Beyond Divergence: The Politics of Economic Change in China and Europe*, Harvard University Press, 2011 pp. 8-9.

²³² Peer Vries (2015). *State, Economy and the Great Divergence: Great Britain and China, 1680s-1850s*. Bloomsbury Publishing. p.436.

production and output value of given industries. These data simply constitute the indicators for central government taxation; they do not reflect the reality of the country's economic activities. They must be used together with other materials so that "taxation quantities" can be converted into "real quantities." The other type includes a great variety of economic indicators that reflect economic changes in a given area as documented in materials such as local gazetteers, collected essays and local surveys. However, as these records are kept in varying degrees of detail, and tend to be rife with vague descriptions of "thousands and thousands," "an enormous amount," "a huge amount of money," "all the households practice weaving," "no less than ten thousand households," or "producing as much ten thousand *pi* a day of silk," they must be checked against other sources, so that these "empty figures" can be given substance. In the process of reconstructing different kinds of data, scholars' varying understandings of the economic development level of a historical period and their different uses of original materials may lead them to different or even totally divergent conclusions. Again, we argue that a variety of cross-checking methods should be used as much as possible to enhance the quality of our reconstruction of historical data.

Either way, after examining the Qing dynasty's economic and especially fiscal history, we have to revisit the introductory question, that is, whether the Chinese economic development can be considered unique or similar to the West. This question – as simple as it sounds – is imbued with additional relevance when considering how large China is compared to the rest of the world both in terms of population and economic size and how comparatively little is known about its national history in the West at the same time. This study shows that the scarcity of knowledge is mainly a question of Western access to the wealth of historical material in China. By offering descriptions and interpretations of a large set of original material never before made available in such a way outside China in the English language this study alleviates some of that pain.

Asking the question of uniqueness thus simply acknowledges that offering new material always bears the possibility that something new will be found and thus questions our standard model of economic development – or that it confirms established ideas. This question was in the back of our minds as we approached the original material. Also, the question of being unique or similar to the rest of the world is a simple and at the same time a difficult question. The answer to the simple question is that this is a matter of perspective. Seen from the moon, there is a lot of similarity between people, but when you meet them in the street, you notice their differences, and when you sit quietly for a chat, you will notice many more. The answer to the complicated version of the question is that the only way you can tell is by comparison with other countries. Here our comparison remains tentative, with existing literature on some European countries and some topics in each of the discussed chapters.

From our understanding as established in chapter 1, the population expansion and the solutions employed or necessary conclusions drawn in the Qing dynasty were still in a pre-industrial regime – following the same basic laws as in the West –, and there had been no “Malthusian Miracle” yet. Thus, positive checks such as war and disaster were tragically the most effective ways to reduce population size or at least limit its growth in the late Qing period. From the perspective of the history of economic thought it is particularly important that Malthusian principles had been independently developed in China at about the same time as in the West. As far as uniqueness is concerned part of the question can be answered. The case study of China provides no basis to challenge to the Western understanding of demographic development, but importantly shows no lack of original thinking either.

Chapter 2 on total trade value of goods in the first half of the 19th century asserts that of all the fiscal categories of the Qing dynasty, the data on customs duties is the most complete time-series data available. Although granted some information is still missing. By accessing archival materials first-hand and explaining their background

and meaning, the author has not just attempted to estimate the total trade value of goods in the early 19th century Qing dynasty in this chapter but has also established a database of customs duties organised by port. Of course, we cannot estimate the economic development from this data set directly. However, it does show the fiscal strength of the state. When considered in conjunction with my offered set of assumptions it presents a hypothesis about the relative size of the trade sector within the economy and thus a notion of the level of development and core competence of the Chinese economy and society. Apart from displaying this level of information, the change of the customs income over time in fact reflects an upward movement of economic development and the social system of China during the 19th century. In terms of uniqueness we can conclude that initially, because of its historically grown, rigid tax system situated in a centralised state and in combination with a comparatively short coast line, the trade sector (both international and domestic long distance) may have played a smaller role in economic development than it did in many other nations' histories. Consequently it can be concluded that the shift to a more significant positive impact became only felt after the Taiping wars. At the same time the evidence might not be strong enough to draw such a conclusion yet. The chapter can state with confidence though, to have established, taken and documented a necessary step in further investigating that question.

Chapter 3 dovetails the previous chapter but instead focusses on the fiscal system. We believe that during the periods of Xianfeng and Tongzhi, the government slowly developed "from a state that raises taxes to a fiscal state." It clearly shows that traditional Qing China was still agricultural in nature, with an agricultural fiscal structure. The Qing fiscal system could be typified as traditional and conservative as no single entity had the power to challenge the natural progression of events. Even after the transformative changes during the 19th century, compared to some European nations, China was taxing its citizens relatively lightly. This rate of taxation would be in line with the small degree of political representation and thus confirms a widely accepted model of the fiscal state.

The detailed analysis of archival material about the case of the 1823 flood can support a more balanced conclusion. The Chinese state's intentions are often presented as paternalistic (heavenly mandated). This notion might not fit well with our findings that Britain provided more food relief in absolute per capita terms than China did. On the other hand, when compared to overall tax income, Beijing spent a much higher share on disaster relief than major European nations during severe crises in the 19th century. In this regard China was quite unique as its willingness to help surpassed that of Western countries while its ability (or state capacity) lagged well behind that of the western points of comparison.

In short, late Imperial China was quite a special country with strong traditions and a unique inherited culture. Yet this "quality" did not create distinctive outcomes as China's main trajectory is well within widely accepted ideas about economic and political development. Thus, 19th century China was a quite common country that still followed the "universal agrarian" path, as some Western nations still did and others had only just started stepping away from. The challenges it faced and solutions considered were therefore also comparable. The idea of China being special does not equate to a unique ability to solve its problems but might rather be understood as a veil to be lifted so as to uncover a similarly working mechanism for which a toolbox is readily available. China, much like a kaleidoscope barrel, will show you different colours as it is observed from different angles. To study China's economic history, we need to think more carefully from the point of view of great convenience, but too small issues need to have a larger macro background. China is not a monster, but a country with some characteristics and unique traditions. To have a good understanding of Chinese history, we really don't need *illusions of accuracy or specious reasoning*, but need to have a global perspective and careful research utilising primary sources.

References

Sources, archival, printed and online

- Chinese Academy of Meteorological Science (1981). *Zhong Guo Jing Wu Bai Nian Han Lao Feng Bu Ji* [中国近五百年来旱涝分布集 The Yearly Charts of Dryness/Wetness in China for the Last 500-year Period], Beijing: Beijing Map Press.
- Chinese Academy of Social Science (various years a), *Copy of Chinese Academy of Social Economic Research collage, Transport category*, Library of the Institute of Economics, Chinese Academy of Social Sciences, Beijing.
- Chinese Academy of Social Science (various years b), *Daoguang Chao Guizhou Diding Zhengshou Biao* [Land tax tables of Guizhou province during the Daoguang reign], Chaodang [抄档 Copy of the Archives], Beijing: Library of the Institute of Economics, Chinese Academy of Social Sciences.
- Financial Historical Materials in the Council Office of the People's Bank of China(1964). *Zhong Guo Jin Dai Huo Bi Shi Zi Liao* [中国近代货币史资料 Materials on the history of currency in modern China], (Volume I), Beijing: Zhonghua shuju[Zhonghua Book Company].
- Hebei Sheng Hanlao Yubao Ketu Zu [Drought and Flood Forecast Group for Hebei Province] (1985). *Haihe liuyu lidai ziran zaihai Shiliao* [河海流域历代自然灾害史料 Historical Materials of Natural Disaster in Haihe Area], Beijing: Qixiang Chubanshe.
- Institute of Economics, Chinese Academy of Social Science (2009) *Qingdai Daoguang Zhi Xuantong Jian Liangjia Biao* [清代道光至宣统间粮价表 Grain Price Tables Between 1821 and 1912], Guilin: Guangxi Normal University Press.
- Maddison, Angus, Population Statistics on World Population, GDP and Per Capita GDP, 1-2008 AD: http://www.ggdc.net/maddison/Historical_Statistics/horizontal-file_02-2010.xls
- Shilu, Qing *清实录*[Veritable records of the Qing Dynasty] (1986). Beijing: Zhonghua shuju [Zhonghua Book Company].
- Shuili Shuidian Kexue Yanjiuyuan [China Institute of Water Resources and Hydropower Research] (1991). *Qingdai Changjiang Liuyu Xinan Guoji Heliu Honglao Dang'an Shiliao* [清代长江流域西南国际河流洪涝档案史料 Flood Archives of the Yangtze River and Southeast International Rivers in Qing China] Beijing: Zhonghua shuju[Zhonghua Book Company].
- Shuili Shuidian Kexue Yanjiuyuan [China Institute of Water Resources and Hydropower Research] (1981). *Qingdai Haihe Luanhe Honglao Dang'an Shiliao* [清代海河滦河洪涝档案史料 Flood Archives of the Hai and the Luan River in Qing China] Beijing: Zhonghua shuju[Zhonghua Book Company].

Shuili Shuidian Kexue Yanjiuyan [China Institute of Water Resources and Hydropower Research] (1988). *Qingdai Huaihe Honglao Dang'an Shiliao* [清代淮河洪涝档案史料 Flood Archives of the Huai River in Qing China] Beijing: Zhonghua shuju [Zhonghua Book Company].

Shuili Shuidian Kexue Yanjiuyan [China Institute of Water Resources and Hydropower Research] (1993). *Qingdai Huanghe Liuyu Honglao Dang'an Shiliao* [清代黄河流域洪涝档案史料 Flood Archives of the Yellow River in Qing China] Beijing: Zhonghua shuju [Zhonghua Book Company].

The First Historical Archives of China (Beijing) (2000). *Jiaqing Daoguang Liangchao Shangyu Dang* [嘉庆道光两朝上谕档 Edict Records of Jiaqing and Daoguang Times] Guilin: Guangxi Normal University Press.

The First Historical Archives of China (Beijing) *Gongzhongdang Zhupi Zouzhe* [宫中档朱批奏折 Vermilion-endorsed Palace Memorials].

The First Historical Archives of China (Beijing) *Junjichu Lufu Zouzhe* [军机处录副奏折 Extra Copies of the Grand Council Memorials].

The First Historical Archives of China (Beijing) *Qingdai Zaizhen Shiliao Huibian* [清代灾赈史料汇编 Collection of Disaster Relief Materials].

Bibliography

- D. Acemoglu et al. (2001). 'The Colonial Origins of Comparative Development' *American Economic Review*, Vol. 91, No. 5 (Dec., 2001), pp. 1369-1401.
- Acemoglu, D., Johnson, S., & Robinson, J. (2005). 'The rise of Europe: Atlantic trade, institutional change, and economic growth', *American Economic Review*, Vol.95(3).
- Acemoglu, D., Robinson, J.A. (2012). *Why Nations Fail: The origins of Power, Prosperity and Poverty*, New York: Crown Publishing Group.
- Allen, R.C. (2011). *Global Economic History: A Very Short Introduction*, Oxford: Oxford University Press.
- Anderson, J., and Roumasset, J. (1996). 'Food insecurity and stochastic aspects of poverty', *Asian Journal of Agricultural Economics*, Vol.2, p. 53-66.
- Bass, H.H. (1992). *Hungerkrisen in Preussen während der ersten Hälfte des 19. Jahrhunderts* [Famines in Prussia in the first half of the 19th Century], St. Katharinen: Scripta Mercaturae.
- Bonney, M., Bonney, R., & Ormrod, W.M. (1999). *Crises, revolutions & self-sustained growth: essays in European fiscal history, 1130-1830*. Stamford: Shaun Tyas.
- Cao, S. (2001). *Zhongguo Renkou Shi* [中国人口史 The Population History of Qing China]. Shanghai: Fudan University.
- Cao, S., Li, Y., and Yang, B. (2012). 'Mt. Tambora, Climatic Changes, and China's Decline in the Nineteenth Century', *Journal of World History*, Vol.23, p. 587-607.
- Chang, Chung-li, C. (1955). *The Chinese Gentry: Studies on Their Role in Nineteenth-Century Chinese Society*, Seattle: University of Washington Press.

- Chen, Shou, Kai-sing Kung, J. (2016). 'Of Maize and Men: the Effect of a New World Crop on Population and Economic Growth in China', *Journal of Economic Growth*, vol.1, 2016.
- Chinese History Society (1961). *Yang Wu Yun Dong* [洋务运动 Westernization Movement], Vol.3, Shanghai People's Publishing House.
- Clark, G., (2008). *A farewell to alms: a brief economic history of the world*, Princeton: Princeton University Press.
- Dincecco, M., and Katz, G. (2016). State Capacity and Long-run Economic Performance, *The Economic Journal*, Vol.126, 189-216.
- Dincecco, M. Wang, Yuhua, (2018). 'Violent Conflict and Political Development Over the Long Run: China Versus Europe', *Annual Review of Political Science*, vol.21, 2018.
- Feng, Chen (1988). *Qing Dai Yan Zheng Yu Yan Shui* [清代盐政与盐税 Salt Administration and Salt Tax in the Qing Dynasty], Zhengzhou: Zhongzhou Ancient Books Publishing House.
- Feng, Chen (1988). *Qing Dai Jun Fei Yan Jiu* [清代军费研究 Military Expenditure Research in the Qing Dynasty], Wuhan: Wuhan University Press.
- Feng, G. (1876). *Qing Jian Susongtai Fuliang Shu Daizuo* [Please Reduce the Land Tax in Suozhou and Songjiang]. In: G. Feng, ed. *Xian Zhi Tang Gao* [显志堂稿 Collections of Feng Guifen], Vol.5, p. 509-511.
- Frankel, J. A., & Romer, D. H. (1999). *Does trade cause growth?* In *American economic review*, 89(3), 379-399.
- Fritschy, W., (1990). *Taxation in Britain, France and the Netherlands in the eighteenth century, Economic and Social History in the Netherlands*, Vol.2, p. 56-79.
- Gray, P. (1995). *The Irish Famine*, London: Thames and Hudson.
- Hajnal, J. (1965). *European marriage patterns in perspective*, Chicago : Aldine Publishing.
- Hills, S., Thomas, R., and Dimsdale, N. (2010). 'The UK recession in context - what do three centuries of data tell us?', *Bank of England Quarterly Bulletin*, No. 4, London: Bank of England.
- Jacks, D. S. (2005). *Intra-and international commodity market integration in the Atlantic economy, 1800–1913, Explorations in Economic History*, Vol.42, p. 381-413.
- Jacobs, A., and Richter, H. (1935). *Die Großhandelspreise in Deutschland von 1792 bis 1934* [Wholesale prices in Germany from 1792 to 1934], Sonderheft des Instituts für Konjunkturforschung, Vol.37, Hamburg: Hanseatische Verlagsanstalt.
- Kuznets, Simon (1966), *Modern Economic Growth: Rate, Structure, and Spread*, New Haven: Yale University Press.
- Lee, J., Campbell, C. (1997). *Fate and Fortune in Rural China: Social Organization and Population Behavior in Liaoning, 1774—1873*, Cambridge: Cambridge University Press.
- Tao, Jiang (1993). *Zhongguo Jindai Renkou Shi* [中国近代人口史 *The Population History in Modern China*], Hangzhou: Zhengjiang Renmin Press.
- Li, Bozhong. (1996). 'Qingdai Qianzhongqi Jiangnan Renkou de Disu Zengzhang Jiqi Yuanying' [清代前中期江南人口的低速增长及其原因 The Low Population Growth and Its Reasons of the Yangzi Delta Area in the Early and Mid-Qing Times]. *Qingshi Yanjiu* [Journal of Qing History Research], Vol. 2, p. 10-19.
- Li, Bozhong. (2007). 'Daoguang Xiaotiao Yu Guiwei Dashui [道光萧条与癸未大水'Daoguang Depressions' and the 1823 Flood]. *Shehui Kexue* [Journal of the Social Sciences], Vol.6, p. 173-178.
- Li Bozhong. (2010). *The Early Modern Chinese Economy: Examining the GDP of Huating and Lou*

- Counties in the 1820s [中国的早期近代经济：1820 年代华亭 - 娄县地区 GDP 研究], Beijing: Zhonghua Book Company.
- Bozhong Li, and Jan Luiten van Zanden.(2012). "Before the Great Divergence? Comparing the Yangzi Delta and the Netherlands at the Beginning of the Nineteenth Century", *The Journal of Economic History*, vol.72, no.2, pp. 956-989.
- Li, H. (1908). *Daqing Huidian Shili* 大清会典事例 Rules Explanations of the Qing Dynasty], Shanghai: Shangwu Yinshuguan.
- Li, L. M. (2007). *Fighting Famine in North China: State, Market, and Environmental Decline, 1690s-1990s*, Stanford: Stanford University Press.
- Li, X. (1995). 'Qingdai jiuzai de zhidu jianshe yu shehui xiaoguo' [清代救灾的制度建设与社会效果 The establishment of the famine relief system in the Qing period and its social effects]. *Lishi Yanjiu* [Historical Research], Vol.5, p. 71-87.
- Liangji, Hong (2001). *Hong Liangji Ji* [洪亮吉集 Collections of Hong Liangji], Beijing: Zhonghua shuju[Zhonghua Book Company].
- Luo Yudong. (1936). *Zhong Guo Li Jing Shi* [中国厘金史 Likin History of China], Beijing: Shāngwù [Commercial Press].
- Maddison, A. (1995). *Monitoring the World Economy, 1820-1992*, Paris: OECD Development Centre.
- Maddison, A. (1998). *Chinese Economic Performance in the Long Run*, Paris: OECD Development Centre.
- Maddison, A. (2001 & 2003). *The World Economy: A Millennial Perspective I*; and *The World Economy: Historical Statistics II*, Paris: OECD Development Centre.
- Malthus, T.R. (1992). *An Essay on the Principle of Population*, Durham: Duke University Press.
- Maoli, H. (2007). 'Jin Wu Bai Nian Lai Yu Mi Zai Zhong Guo Jing Nei De Chuan Bo' [The Spread of Corn in Chinese Territory in Recently 500 years], *Zhongguo Wenhua Yanjiu* [Journal of Chinese Culture], Vol.1, 2007.
- Mars, Robert M. (1963). bookreview on page 963 and 964 in *the American Anthropologist* 65.
- Meng, E.C.H.; Hu, Ruifa; Shi, Xiaohua; Zhang, Shihuang (2006). *Maize in China: Production Systems, Constraints, and Research Priorities*, Maize Production System Papers 7648, Mexico City.: CIMMYT.
- Morse, H. B. (1926). *The Chronicles of the East India Company Trading to China (1635-1834)*, Oxford: Oxford Press.
- Ni, Y. (2010). *Qing Chao Jia Dao Guan Shui Yan Jiu* [清朝嘉道关税研究 Research On the Customs Duties in the Jiaqing and Daoguang Times of the Qing Dynasty] Beijing: Beijing Normal University Press.
- Ni, Y. (2012). 清代冰雹灾害统计的初步分析[A Preliminary Analysis of Hail Disasters in the Qing Dynasty], in 江苏社会科学, [*Jiangsu Social Sciences*], Vol.1, p. 218-224 (January, 2012).
- Ni, Y. (2013). *Qing Chao Jia Dao Caizhen Yu Shehui* [清朝嘉道财政与社会 Research on the Finance and Society in the Jiaqing and Daoguang Times of the Qing Dynasty], Beijing: The Commercial Press.
- Ni, Y. (2016). *Customs Duties in the Qing Dynasty, ca 1644-1911*. Leiden: Brill.
- Ni Y. (2017). *Qingchao Jiadao Guanshui Yanjiu* [清朝嘉庆道关税研究 Research On the Customs Duties in the Jiaqing and Daoguang Times of the Qing Dynasty], in *Science Press*.
- Ni, Y. (2019). "'Governance by Documents" or "Governance by Petty officials"? A Study on Wang Li'Nan Cases of Carving Official Seals Privately of Jiaqing Times', *South China Quarterly*, Vol.4, 2019.
- North, D. (1990). *Institutions, Institutional Change and Economic Performance*, Cambridge: Cambridge

University Press.

Prasannan Parthasarathi (2002), Review of *The Great Divergence: China, Europe, and the Making of the Modern World Economy* by Kenneth Pomeranz; *Past & Present*, No. 176 (August), pp. 275-293.

Parthasarathi, P. (2011). *Why Europe grew rich and Asia did not: global economic divergence, 1600–1850*. Cambridge: Cambridge University Press.

Peng, Zeyi. (1984) 'Qing Chu Si Que Guan Di Dian He Mao Yi Liang De Kao Cha' [清初四椎关地点和贸易量的考察 Researches on the Places and Trade Volumes of the Four Coastal Ports in the Early Qing], in *Social Science*, vol. 3 June, 1984.

Peter C. Perdue. (2000). Review of Pomeranz, Kenneth, *The Great Divergence: China, Europe, and the Making of the Modern World Economy*. H-World, H-Net Reviews. August. URL: <http://www.h-net.org/reviews/showrev.php?id=4476>.

Perkins, Dwight H. (1967). 'Government as an obstacle to industrialization: the case of nineteenth-century China'. *Journal of Economic History*, Vol.27 p. 478-492.

Perkins, Dwight H. (1968). *Agricultural Development in China, 1368-1968*. Chicago:Aldine.

Pomeranz, K.(2000). *The Great Divergence: Europe, China, and the Making of the Modern World Economy*, Princeton University Press.

Pomeranz, Kenneth (2011), "Ten Years After: Responses and Reconsiderations," *Historically Speaking*, vol. 12, 2011, no. 4, pp. 20-25.

Qingdi, Wu. (1990). *Jiao Lang Cuo Lu* [蕉廊胜录 Collections under Banana Area], Beijing: Zhonghua shuju[Zhonghua Book Company].

Richard von Glahn.(2016) .*The Economic History of China: From Antiquity to the Nineteenth Century*, Cambridge: Cambridge University Press.

Rosenthal, J.L., Wong, R.B. (2011). *Before and Beyond Divergence: The Politics of Economic Change in China and Europe*, Cambridge: Harvard University Press.

Schumpeter, J.A. (1954). 'The Crisis of the Tax State', in International Economic Association, ed., *International Economic Papers*, no. 4 (1954), p. 5-38.

Shiue, C. (2004). 'Local Granaries and Central Government Disaster Relief: Moral Hazard and Intergovernmental Finance in Eighteenth- and Nineteenth-Century China'. *Journal of Economic History*, 64: 100-124.

Shiue, C. (2005). 'The political economy of famine relief in China, 1740–1820'. *Journal of Interdisciplinary History*, 36: 33-55.

Sng, T.-H. (2014). 'Size and dynastic decline: The principal-agent problem in late imperial China, 1700–1850'. *Explorations in Economic History*, 54: 107-127.

Sng, T.-H., and Moriguchi, C. (2014). 'Asia's little divergence: State capacity in China and Japan before 1850'. *Journal of Economic Growth*, 19: 439-470.

Stothers, R.B. (1984). 'The great Tambora eruption in 1815 and its aftermath'. *Science*, 224: 1191-1198.

Sun, Yutang. (1957). *Zhong Guo Jin Dai Gong Ye Shi Zhi Liao* [中国近代工业史资料 Materials of Modern Industrial History of China], Beijing: Science Press.

Swart, K.W. (1949). *Sale of Offices in the 17th Century*. 's-Gravenhage, Martinus Nijhoff.

Tilly, C. (1990). *Coercion, Capital and European States, AD 990-1990*. Cambridge Mass:Basil Blackwell.
Tuo, J. (1818) *Jiaqing "Daqing Huidian Shili"* [嘉庆大清会典事例 Rules Explanation of the Qing Dynasty] Vol. 270. Beijing.

- Van Leeuwen, B., Földvári, P. and Van Leeuwen-Li, J. (2012). *Market performance in China from Han Dynasty to New China*, ca. 200 BC to AD 1949. Paper presented at the Asian Historical Economics Conference, Japan, September 2012.
- Van Zanden, J.L. (2009). *The Long Road to the Industrial Revolution*. Leiden: Brill.
- Vries, Jan de (1994), 'The industrial revolution and the industrious revolution', *Journal of Economic History*, 54, pp. 249-70.
- Vries, P. (2002). 'Governing Growth: A Comparative Analysis of the Role of the State in the Rise of the West'. *Journal of World History*, 13: 67-138.
- Vries, P. (2012). *Public Finance in China and Britain in the Long Eighteenth Century*, LSE Economic History Working Papers, No. 167 London: London School of Economics and Political Science.
- Vries, P. (2015). *State, Economy and the Great Divergence: Great Britain and China, 1680s-1850s*. New York: Bloomsbury Academic.
- Wenkai, H. (2013). *Paths toward the Modern Fiscal State*, Cambridge: Harvard University Press.
- Will, P.-E., Wong, R. B., Lee, J., Oi, J. and Perdue, P. (1991). *Nourish the people: the state civilian granary system in China, 1650-1850*, Ann Arbor: University of Michigan Press.
- Will, P.-E. (1990). *Bureaucracy and famine in eighteenth-century China* (Stanford: Stanford University Press).
- Wischermann, C. (1983). *Hungerkrisen im vormärzlichen Westfalen* [Famines in former Westfalen], In Düwell, K., and W. Köllmann, eds. *Rheinland-Westfalen im Industriezeitalter* [Rheinland-Westfalen in the Industrial Age]Wuppertal: Hammer, pp. 126-147.
- Wong, R. Bin. (1997). *China Transformed. Historical Change and the Limits of European Experience*. Ithaca and London.
- Wu, Chengmin. (2001). *Zhongguo de Xiandaihua: Shichang yu Shehui* [中国的现代化:市场与社会 China's Modernization: Market and Society]), Hong Kong: Sanlian Press.
- Xiangao, Yao (1962). *Zhongguo Jindai Duiwai Maoyi Shi Zhiliao* ([中国近代对外贸易史资料 the materials of foreign trade in Modern China], vol.1, Beijing: Zhonghua shuju [Zhonghua Book Company]).
- Xianglong, Tang. (1987). *Dao Guang Chao Juan Jian Tong Ji* [道光朝捐监统计 Statistics of Donation Supervision in the Daoguang Reign of the Qing Dynasty], Chengdu: Southwest University of Finance and Economics Press.
- Xianglong, Tang. (1992). *Zhongguo jin dai hai guan shui shou he fen pei tong ji: 1861-1910* [中国近代海关税收和分配统计 : 1861-1910 Statistics of Customs Revenue and Its Distribution: 1861-1910], Beijing: Zhonghua shuju [Zhonghua Book Company].
- Xinghui, Pan (2014). *Changes in the History of China*, translated by David T.W. Pun, Hong Kong.
- Xu, Dixin & Wu, Chengming. (1985). *The Development History of China's Capitalism* [中国资本主义发展史], volume 1, *Sprout of China Capitalism*, People's Publishing house.
- Xu Xinwu. (1992). *Jiangnan Tubu Shi* [江南土布史 History of Jiangnan Cotton], Shanghai: Shanghai Academy of Social Sciences Press.
- Yanxi, Wang & Shumin, Wang. (1966). *Huang Qing Dao Xian Tong Guang Si Chao Zhou Yi* [皇清道咸同光四朝奏议 A Commentary on the Four Dynasties of Emperor Daoguang to Guangxu], Vol.26, Taipei: Wenhai Publishing House.
- Yibing, Deng (1994). 'Qingdai Qianqi zhoubian diqu de liangshi yunxiao-guanyu qingdai liangshi yunshu ynjie zhi er' [清代前期内陆粮食运输量及其变化趋势 Grain Transport Volume and the Changing Trend in the Early Qing Dynasty], *Researches in Chinese Economic History*, vol.3, 1994.

- Yibing, Deng (2008). *Qingchao Qianqi Guanshui Zhidu Yanjiu* [清代前期关税制度研究 System of Customs Duties in the Early Qing Dynasty], Beijing: Beijing Yanshan Press.
- Yishan, Xiao (1993). *Qing Dai Tong Shi* [清代通史 General History of the Qing Dynasty], Taipei: Taiwan Commercial Press.
- Yuan, J. and Luo Ji. (2002) 左宗棠考进士随想 *Zuo Zongtang Attended the Examination Test*, in *Shiji Yutang (Century)*, vol.8.
- Yuanzhi, Yao (1997). *Zhu Ye Ting Za Ji* [竹叶亭杂记 Miscellaneous Records of Bamboo Leaf Pavilion], Beijing: Zhonghua shuju [Zhonghua Book Company].
- Zeng Guofan. (1995). *Zeng Wen Zheng Quan Ji* [曾文正全集 Zeng Guofan's Complete Works], Changchun: Jilin People's Publishing House.
- Zhihong, Shi (2008). *Qing Dai Hu Bu Yin Ku Sou Zhi He Ku Cun Tong Ji* [清代户部银库收支和库存统计 Statistics of the Income and Expenditure of the Treasury and Inventory of the Ministry of Household Affairs in the Qing Dynasty], Fuzhou: Fujian People's Publishing House.
- Zhihong, Shi. (2015). *Qingdai Longye Shengchan Zhibiao de Guji* [清代农业生产指标的估计 [Estimation of the Agricultural Production Indicators in the Qing Dynasty], *Jingjishi Yanjiu* [Researches In Chinese Economic History], vol.3 p. 5-30.
- Zhihong, Shi & Yi, Xu. (2008). *Wanqing Caizhen* [晚清财政 Fiscal in the Late Qing, 1851-1894], Shanghai: University of Finance and Economics Press.
- Zhiping, Chen (2009). 'The Number Correction of Fiscal Annual Revenue and Annual Expenditure in the 29th Year of Dao Guang Reign'. *Research on the History of Social Economy in China*, No.2, 2009.
- Zhiwu, Chen (2013). 'What Does Quantitative Historical Research Tell Us?', in *Economic Observer*, September 16th 2013.

Appendices

Appendix A: Customs Revenues Collected at selected Changguan in 1796-1850 (taels of silver)

Table A-1 Shanhai Guan, Zhangjiakou, Shahukou, Guihuacheng, Dajianlu, Chen Guan, Zhongjiang

Year	Shanhai Guan	Zhangjiakou	Shahukou	Guihuacheng	Dajianlu	Chen Guan	Zhongjiang
1796	137,615.80		43,640.06	27,023.63	24,591.12		3,305.10
1797	137,702.19		43,769.75	27,028.88	21,296.78		
1798	110,642.38		43,972.61	27,032.15	23,409.15		3,305.14
1799	115,624.16	60,906.17	44,199.30		22,460.15	18,215.42	3,305.17
1800		60,937.60	44,340.03	27,032.14	22,306.15	18,215.55	
1801		60,820.09	45,047.93	27,032.15	20,000.00	27,711.08	3,305.25
1802	135,568.17		45,067.88	27,033.28	21,341.52	27,711.14	3,338.37
1803	136,149.27	61,001.07		27,033.37	21,847.11		3,305.30
1804	131,938.73	60,994.62	45,162.81		22,139.14	27,711.16	3,305.32
1805	127,550.15	61,003.40	45,229.98	27,033.81	22,145.61		3,305.35
1806	127,643.55	61,005.62	45,302.81		22,289.14	27,711.19	3,326.81
1807	115,389.90	61,008.71	45,344.36	27,034.09	20,000.00	27,711.19	3,305.39
1808	113,429.42	61,018.12	45,417.98	27,034.21	44,881.49	29,692.00	3,305.45
1809	113,657.63	61,015.80	45,492.80	27,034.38	22,223.46	29,692.00	
1810	114,138.55	61,018.71	45,580.69		21,590.00	29,692.00	3,305.49
1811	114,231.41	61,021.04	45,677.41	54,069.39	21,868.64	29,692.00	3,305.52
1812	111,598.09	61,025.44	45,755.34	27,035.01	22,372.57	29,692.00	
1813	111,551.04	61,028.97	45,780.69	27,035.20	22,433.41	29,692.00	3,305.54

1814	223,063.10	61,034.93	45,795.27		21,490.86	29,692.00	3,305.57
1815	111,430.24	61,041.41	45,845.40	27,035.04	21,407.71	29,692.00	3,305.59
1816		61,043.65	45,848.12	27,035.81	22,104.28	29,692.19	3,305.61
1817		61,045.43	45,887.27	27,036.01	21,584.86	29,692.00	
1818	111,966.80	61,047.63	45,895.13		22,350.60	29,692.00	3,305.66
1819	112,325.50	60,966.73	45,898.27		22,157.00	29,692.00	3,305.69
1820	112,601.34	60,980.75	45,908.94	27,036.36	20,000.00	29,692.00	3,305.71
1821	112,940.44	60,979.51	45,929.13	27,036.65	20,000.00	29,692.50	3,305.74
1822	112,460.96	121,972.13	45,946.50	27,036.46	20,460.60	29,692.52	3,305.75
1823	112,554.41	60,992.16	45,960.37		19,975.49	29,692.00	
1824	112,622.93	60,998.72	45,971.91	27,037.07	20,000.00		3,305.80
1825	112,755.16	61,004.83	45,982.40	27,037.19	20,000.00		3,305.82
1826	111,245.24	61,000.95	46,002.96	27,037.33	20,000.00		
1827	112,611.97	61,006.53	46,021.16	27,037.48			3,305.89
1828	111,446.99	61,011.11	46,029.97	27,037.62			3,305.90
1829	111,738.15	61,013.88	46,058.53				
1830	111,457.15	61,095.93	92,131.27	27,037.93	23,519.19		
1831	111,751.75	61,008.41	46,088.99	27,038.16			
1832	112,203.78	60,950.63	46,094.09	27,038.22			3,305.94
1833	111,887.37	60,953.02	46,109.42				3,305.95
1834	112,291.38	60,953.12	46,125.67	27,038.53			3,305.98
1835	112,514.77	60,966.58	92,304.47	27,038.69			3,305.99
1836	112,381.28	60,980.92	46,176.56	27,038.85			3,305.99
1837	112,429.88	61,076.25	46,187.01	27,039.00			3,306.00
1838	112,626.53	60,996.24	46,198.16	27,039.15			3,306.01
1839	112,890.64	60,985.10	46,206.21	27,039.30			3,306.01
1840	112,836.25	60,970.68	46,215.26	27,039.45			
1841	111,969.29	60,964.98	46,221.86	27,039.60			3,306.03

1842	111,326.84	60,951.05	46,229.11	54,079.70			3,306.04
1843	87,979.13	60,956.12	46,235.42			17,283.63	3,306.05
1844	111,441.78	60,968.26	46,241.80	27,038.25			3,306.06
1845			46,248.52	27,040.45			
1846	223,119.98	60,957.05	46,253.12				
1847	111,997.77	62,270.71	46,257.77				3,306.07
1848	111,844.66	62,283.95	46,258.97				3,306.08
1849	111,862.96	62,285.69	46,263.37	28,840.74			
1850	111,900.68	62,292.50	46,467.37	27,040.93	20,176.68		3,306.09

Table A-2 Fengtian Niuma Shui, Wuchang and Xunchang, Wuyuancheng, Gubeiko, Chonwenmen,

Zuoyi

Year	Fengtian Niuma Shui	Wuchang and Xunchang	Pantaokou	Wuyuanche ng	Gubeikou	Chongwenmen	Zuoyi
1796		124,289.00		1,233.00		288,831.22	
1797	5,059.73	124,286.61		1,233.00		294,029.97	
1798	5,301.04	124,292.00	11,190.84	1,233.00		288,115.57	
1799	5,260.66			1,233.00		299,914.50	
1800	5,290.42			1,233.00		297,829.72	
1801		118,040.49		1,233.00			
1802				1,269.57		307,806.18	
1803	6,016.50	118,043.64		1,233.00		316,729.32	
1804		118,044.19		1,269.58		322,539.72	42,078.99
1805	5,080.16	118,043.26		1,233.00		313,564.82	
1806	5,082.59			1,233.00		314,659.82	42,897.55
1807		118,044.84		1,233.00		322,501.30	
1808	5,087.76	118,045.44		1,233.00		322,645.02	45,286.25

1809	5,090.05		12,553.61	1,233.00		264,387.06	
1810		118,046.73	12,338.44	1,233.00		308,279.96	42,325.78
1811				1,233.00		322,655.34	
1812		118,047.70		1,233.00		286,126.50	
1813				1,233.00		297,142.85	37,911.14
1814		118,049.39		1,233.00		322,804.22	40,798.67
1815	5,093.02			1,233.00		314,871.92	41,532.53
1816	5,099.65			1,233.00		290,118.50	
1817	5,099.76			1,233.00		314,871.24	
1818	5,099.99	118,050.90		1,233.00		314,873.42	40,216.32
1819		118,051.27	11,180.90	1,233.00		322,891.58	39,099.30
1820		118,051.56	11,645.35	1,233.00		314,872.92	39,441.57
1821				1,233.00		290,229.52	40,115.12
1822	5,100.39	118,052.29		1,233.00		291,651.43	39,776.08
1823				1,035.00		320,317.04	39,421.86
1824						319,604.48	38,844.93
1825	5,102.01	118,052.58				319,008.69	39,642.83
1826		118,052.87					38,608.32
1827				1,016.42			78,920.22
1828						319,021.87	38,749.50
1829		118,055.06				319,039.47	38,858.72
1830	5,109.94	118,055.28				328,183.57	38,999.58
1831	5,110.58						38,055.08
1832							38,631.35
1833	5,115.56	118,057.16				323,381.18	37,981.70
1834		117,752.50				315,358.44	38,191.35
1835		118,057.63				328,190.47	39,498.89
1836	5,120.57						39,325.55

1837		118,058.30					39,196.64
1838		118,058.66				323,394.45	39,004.14
1839		118,058.96				315,380.25	38,483.54
1840	5,124.26	118,059.31				315,099.45	39,004.97
1841	5,125.26	118,059.65				323,112.42	38,214.62
1842	5,126.55	118,060.03				315,102.65	37,767.87
1843						323,114.62	37,814.72
1844						315,119.17	38,687.85
1845		118,061.46				315,627.00	38,025.89
1846						323,666.06	38,099.78
1847	5,131.84						37,680.81
1848			11,835.67				37,533.18
1849		118,063.70				323,739.00	37,557.84
1850							37,985.53

Table A-3: Youyi, Zuoliangtin, Huai'an Guan, Hushu Guan, Yangzhou Guan, Wuhu Huguan, Wuhu Gongguan

Year	Youyi	Zuoliangtin	Huai'an Guan	Hushu Guan	Yangzhou Guan	Wuhu Huguan	Wuhu Gongguan
1796		13,157.62	365,399.76	486,429.87	172,313.54	232,699.05	82,453.65
1797		13,160.42	313,994.78	487,550.30	152,594.68	225,347.95	103,812.66
1798		13,162.26	291,340.89	421,285.31	164,461.00	232,754.35	119,994.20
1799	26,987.38	12,339.26	386,796.42	451,384.84	173,792.56	232,756.76	119,995.74
1800	26,740.69	12,339.26	854,170.27	456,585.38	167,262.84	460,401.86	234,638.00
1801	26,721.89	12,346.79	402,244.60	431,676.76	169,039.88	230,394.58	
1802	26,081.08	12,348.30	366,484.41	423,921.38	168,143.00	230,176.38	117,294.76
1803		12,339.26	281,965.69	800,483.74	156,202.00	230,220.58	117,266.56

1804	27,123.44	12,352.29	336,703.47	431,436.19	154,810.00	230,164.38	117,273.66
1805			387,567.23	375,072.04	164,896.47	230,040.78	117,199.66
1806	27,441.43		286,564.85	329,115.08	164,086.70	230,037.68	117,202.26
1807	28,868.48	12,356.24	294,521.55	318,346.29	164,898.51	230,042.88	117,197.36
1808	29,713.54	12,350.62	388,487.63	360,103.53	164,047.79	230,039.58	117,200.96
1809	29,180.29	12,351.89	400,078.92	414,003.50	154,029.00	230,043.68	117,200.06
1810	26,487.51	12,348.39	363,959.37	403,498.86	156,215.00	230,049.68	117,202.46
1811	26,369.71	12,346.79	221,247.21	373,176.95	153,955.00	230,047.88	117,204.66
1812	26,764.11	12,344.62	272,400.97	392,801.95	144,360.00	230,049.58	117,201.86
1813	26,792.74	12,349.00	237,829.17	423,499.48	151,212.00	230,029.38	117,180.26
1814	22,121.63	12,340.74	155,729.67	297,090.64	303,816.00	230,034.18	117,177.06
1815	26,621.47	12,345.72	246,383.94	343,480.25	160,098.00	230,045.98	117,178.56
1816		24,687.67	386,136.60	413,526.13	146,868.85	229,932.08	117,133.16
1817		12,341.43	346,975.60	426,571.05	157,438.00	229,935.00	117,159.74
1818	25,176.45	12,343.99	408,830.62	428,437.49	165,427.34	230,079.92	117,991.15
1819	22,279.78	12,345.86	441,153.45	426,854.17	164,061.00	230,235.92	118,832.14
1820	25,386.18	12,342.33	253,648.93	386,390.79	144,479.00	240,030.36	117,562.93
1821	26,734.07		252,211.15	401,285.23	123,984.90	238,584.33	119,312.54
1822	26,077.46	12,345.79	275,389.96	362,485.99	129,201.20	231,159.18	118,006.46
1823	27,008.73	12,345.62	184,014.17	328,376.95	135,463.00	230,842.48	117,458.76
1824	26,165.60	12,344.89	248,007.88	474,989.18	143,711.30	210,434.08	101,220.26
1825	25,544.13	12,345.72	287,808.78	362,171.62	122,317.00	229,992.64	117,174.00
1826	25,617.30	12,339.26	301,615.26	371,440.09	156,884.00	229,938.58	97,258.55
1827	50,576.82	12,344.38	258,253.76	343,382.54	145,117.00	229,970.06	92,571.33
1828	26,154.91	12,347.00	307,983.71	374,691.18	162,635.00	230,027.50	117,182.94
1829	25,748.53	12,344.34	301,802.60	376,531.02	149,607.00	230,019.08	117,176.16
1830	25,381.63	12,351.49	324,412.07	380,566.04	159,055.00	229,999.08	117,166.16
1831	26,408.09	12,351.90	309,549.38	391,310.14	123,319.00	229,989.08	117,186.16

1832	25,381.99	12,348.61	662,831.88	353,125.00	153,953.00	435,442.11	200,678.07
1833	24,714.30	12,352.62	146,987.85	371,407.03	113,886.30	155,501.56	113,412.22
1834	25,680.13	12,354.27	279,612.80	316,408.82	124,191.30	229,947.38	91,093.44
1835	25,772.21	12,347.82	266,716.33	679,851.15	163,895.30	230,943.42	87,248.66
1836	25,343.13	12,348.27	302,455.63	302,389.46	163,791.30	229,984.41	117,178.96
1837	25,698.57		271,789.27	300,302.54	163,828.00	231,426.31	115,747.61
1838	25,388.42	11,184.07	309,944.64	289,171.85	163,793.30	231,354.11	115,793.91
1839	25,132.39	12,356.81	296,786.64	276,177.94	163,803.00	223,919.08	89,146.16
1840	24,809.64	12,348.70	328,512.46	301,622.70	163,793.00	229,971.08	101,021.54
1841	24,334.62	12,387.00	309,612.67	296,767.76	163,808.00	208,943.75	70,547.84
1842	24,390.58	12,344.57	238,603.67	390,697.90	133,101.30	170,297.21	70,547.00
1843	24,905.81	12,339.26	189,425.67	274,174.92	132,550.30	230,120.42	117,248.73
1844	24,445.53	12,342.38	207,575.10	293,347.04	110,088.00	230,099.40	117,196.38
1845	24,409.81	12,342.31	269,278.94	288,863.26	111,049.30	230,042.70	117,218.02
1846	24,260.88	12,344.00	273,303.04	291,753.88	240,385.30	230,087.83	117,178.28
1847	24,423.99	12,344.62	246,920.69	313,311.53	115,069.30		
1848	24,206.72	12,345.43	189,068.08	317,389.74	118,453.00	230,304.00	117,081.93
1849	24,013.90	23,366.13	304,859.44	279,990.66	129,861.00	223,810.34	123,223.48
1850	24,118.71		327,109.81	414,420.28	144,987.00		

Table A-4: Fengyang Guan, Longjiang Guan, Xixin Guan, Jiujiang Guan, Gan Guan, Beixin Guan, Nanxin Guan

Year	Fengyang Guan	Longjiang Guan	Xixin Guan	Jiujiang Guan	Gan Guan	Beixin Guan	Nanxin Guan
1796	122,291.83	111,521.12	68,815.31	569,013.25	103,394.10	195,749.41	25,430.49
1797	214,522.50	122,393.47	71,513.60	607,087.04	103,398.23	195,931.09	26,128.87
1798	124,421.48	118,003.20	75,148.74	560,027.22	103,402.58	196,043.98	28,602.88

1799	115,001.58	118,462.76	75,637.22	567,054.04	103,401.20	196,182.44	28,765.64
1800	114,495.38	126,669.59	66,422.58	567,821.21	103,403.47	196,415.08	
1801	102,019.52	123,025.57	66,087.07	565,973.43	105,621.33	208,371.93	
1802	105,476.22	117,237.19	65,954.76	538,539.61	108,938.18	218,119.92	29,345.55
1803	105,669.76	120,694.13	64,589.83	513,948.16		248,571.27	29,414.35
1804	110,183.92	121,869.73	61,446.17	542,951.30	121,483.35	248,658.35	29,452.57
1805	107,366.91	124,778.30	53,343.05	561,520.40	121,497.52	429,960.44	29,509.17
1806	95,382.59	93,348.07	54,922.12	492,187.10	120,304.31	202,126.37	29,454.23
1807	110,005.40	128,258.72	59,752.80	528,760.31	120,964.86	202,638.25	29,344.34
1808	119,104.36	130,393.19	51,569.13	500,753.53	121,013.24	202,712.86	29,571.35
1809	125,534.18	133,207.23	54,291.90	544,401.10	121,027.23	192,147.59	
1810	108,977.29	130,114.27	57,181.60	552,154.47	121,050.75	202,888.47	29,354.12
1811	107,227.10	134,428.55	52,888.58	514,948.26	120,933.12	203,362.28	29,444.94
1812	95,488.83	135,372.00	51,969.91	492,123.39	120,550.18	200,125.39	29,474.06
1813	111,570.73	133,984.46	53,234.93	582,486.95	120,701.78	194,343.27	29,485.16
1814	102,527.59	134,185.58	47,944.39	581,323.66	120,082.83	194,403.74	29,061.46
1815	102,301.49	122,827.92	45,177.50	570,105.22	120,178.75	194,435.59	28,844.88
1816	102,506.59	109,624.01	47,745.96	496,809.99	120,279.37	194,377.26	28,864.84
1817	108,182.51	129,467.32	46,820.36	520,566.74	120,289.88	194,535.39	28,953.77
1818	117,258.80	132,861.06	56,161.12	403,372.40	120,291.12	194,372.80	28,725.97
1819	108,411.16	133,457.46	54,850.96	542,679.12	240,580.52	194,423.15	28,715.53
1820	104,273.39	106,428.79	52,922.02	521,924.26	120,268.71	194,451.28	28,757.54
1821	110,053.60	141,903.63	56,702.56	530,623.19	120,715.73	194,475.29	28,824.25
1822	107,391.51	140,463.17	51,640.21	1,169,252.30		194,487.69	30,215.48
1823	107,410.40	144,165.00	51,491.05	579,403.75	112,529.05	192,173.59	30,172.27
1824	107,861.77	262,909.94	98,737.94	584,127.28	120,258.78	190,076.52	29,444.95
1825	102,322.26	115,246.58	47,984.63	540,674.57	120,258.85	189,124.14	20,553.81
1826	102,461.13	115,021.54	52,702.08	523,121.57		189,215.51	30,056.31

1827	114,567.97	137,695.62	51,189.56	526,917.00	116,527.59	189,087.01	29,843.21
1828	127,197.32	142,936.39	45,382.22	539,493.43	116,356.85	188,170.83	30,059.32
1829	128,567.35	139,611.81	47,687.98	600,008.52	115,880.05	189,345.96	29,714.68
1830	247,938.59	127,073.00	45,628.16	541,493.92	114,428.06	190,153.47	30,014.68
1831	116,570.62	118,015.67	45,303.35	371,374.31	113,210.04	188,880.15	30,088.17
1832	108,504.25	91,605.90	41,448.75	463,842.09	102,022.40	188,284.65	60,153.81
1833	107,411.52	92,037.95	42,063.11	505,509.70	98,235.24	189,183.00	28,882.97
1834	107,431.24	88,549.65	42,511.56	522,468.63	97,156.45	162,581.98	30,095.94
1835	107,465.41	88,808.22	42,715.23	531,621.97	96,965.93	154,941.80	30,085.72
1836	116,205.52	114,645.11	41,449.94	599,670.30	96,965.93	169,143.15	29,798.18
1837	108,407.92	110,572.64	41,395.27	603,039.46	94,934.93	188,207.29	30,160.39
1838	108,490.73	99,188.17	41,571.76	589,476.17	94,944.66	337,611.41	29,885.57
1839	100,695.74	90,229.87	43,172.67	574,532.87	93,110.03	188,213.48	30,157.87
1840	107,382.82	95,740.12	42,612.44	562,932.17	92,198.53	188,566.59	30,072.09
1841	107,175.10	90,599.33	41,437.03	536,816.25	81,960.60	188,218.72	28,961.17
1842	96,431.10	95,291.18	41,815.35	424,927.99	92,251.54	170,147.31	28,435.18
1843	128,389.48	74,232.10	34,390.45	398,116.30	92,253.63	185,270.23	30,070.60
1844	116,044.56	100,900.42	41,481.44	451,740.57	92,252.55	188,525.61	28,568.22
1845	107,278.26	118,718.23	41,717.29	583,025.90	89,557.32	188,802.03	30,116.20
1846	109,844.92	106,086.67	41,515.20	545,004.28	83,753.77	188,487.50	29,910.39
1847	110,645.56	97,438.94	41,516.44	484,645.54	79,423.09	179,845.82	30,049.39
1848	99,484.75	120,937.10	41,892.12	585,089.78	78,953.75	188,498.86	30,157.93
1849	106,303.60	98,670.96	41,547.98	562,591.64	93,771.00	188,257.81	30,123.75
1850	109,852.95	86,885.61	41,493.27	469,351.02	79,329.18	188,292.15	28,935.60

Table A-5: Linqing Huguan, Linqing Gongguan, Taiping Guan, Wuchang Guan, Jingzhou Guan, Hubei Xinguan, Kui Guan

Year	Linqing Huguan	Linqing Gongguan	Taiping Guan	Wuchang Guan	Jingzhou Guan	Hubei Xinguan	Kui Guan
1796	55,536.04		134,436.36	58,707.85	34,877.60		188,961.70
1797	55,538.32		134,447.05	58,710.75	27,224.60		133,425.54
1798	55,540.59		132,462.66	58,713.95	26,537.41		90,446.00
1799	39,048.72	5,468.35	133,553.30	58,715.38	23,791.22		113,403.29
1800	36,526.36		134,808.55		58,595.54		142,324.38
1801	40,416.54	5,348.24			28,531.11		154,880.75
1802	53,226.32	8,506.30	134,835.61	58,717.22	25,530.77		183,965.01
1803	69,159.67	6,270.53	134,837.82		30,697.51		
1804	38,656.49		134,838.80	58,708.21	30,707.75		184,002.71
1805	38,343.58	8,007.41	133,967.79	58,708.96	30,695.32		184,014.41
1806	50,860.99	7,042.26	134,889.89		27,036.70		184,019.51
1807	53,307.14	11,042.90	134,901.87	58,711.22	24,235.96		
1808	86,905.14	7,692.15	268,967.21	58,712.49	24,240.67		184,022.27
1809	72,331.23	8,067.40	134,938.17	58,713.34	23,554.93		184,024.39
1810	76,935.52	5,307.64	134,964.21		26,669.55		184,025.60
1811	35,513.96	4,812.80	135,002.90		28,214.18		184,029.72
1812	36,466.11	5,673.00	135,033.52		23,952.89		184,034.83
1813	33,314.79	6,222.37	135,030.40	58,716.92	25,834.41		
1814	117,081.24	7,823.28	135,034.13	58,717.18	22,583.27		184,040.05
1815	79,559.13	8,470.04	135,057.37	58,717.60	22,069.86		184,045.47
1816	50,805.56	5,884.49	135,075.08	117,438.61			
1817	62,221.22	7,148.97	135,079.29	58,720.15	28,820.74		184,089.79
1818	63,246.08	6,121.60	135,105.63	58,720.88	24,600.96		184,106.59
1819	59,089.01	6,396.16	134,204.14		24,663.60		184,108.65
1820	27,151.92	4,596.81	135,129.67		27,224.33		184,114.15
1821	19,415.33	4,402.56	135,103.93	58,721.88	29,749.45		

1822	23,313.22	4,654.63	135,126.27	58,722.19	29,976.12		184,117.51
1823	33,900.08	4,435.45	135,184.22	58,722.91	30,103.07		184,119.04
1824	63,322.41	6,977.96	134,231.29	58,723.35	30,689.07		
1825	48,422.58	5,509.77	135,176.66	58,723.97	30,690.50		
1826	52,055.17	6,418.03	135,219.34	58,724.25	30,687.23		
1827	50,445.38	6,990.42	135,207.80				
1828	53,755.57	6,186.98	135,195.70	58,725.44			184,140.99
1829	41,958.84	5,920.86	134,258.13				184,144.95
1830	47,082.10	9,585.25			30,687.30		184,151.59
1831	58,087.70	6,476.61	135,203.23	58,726.80			184,164.20
1832	53,376.27	7,371.17	135,157.13	58,726.87			368,342.17
1833	51,704.33	7,652.43	135,181.04	58,726.93			
1834	20,966.17	4,653.75	135,182.84	58,726.92			184,178.41
1835	47,752.85	7,348.76	135,188.49	58,726.94			
1836	60,151.01	6,564.86	135,197.65	58,726.98			184,182.71
1837	57,068.59	4,441.04	135,198.39	58,727.00	30,687.37		184,184.29
1838	43,323.37	5,366.21	135,225.61	58,727.03			184,185.58
1839	42,556.36	5,619.54	135,227.43	58,727.06			184,187.10
1840	52,612.67	6,189.17	135,241.84	58,727.09			184,188.31
1841	55,095.12	4,209.81	265,653.27	58,727.13			184,190.49
1842	25,436.60	4,103.85	135,268.36	58,727.17			
1843	35,731.49	4,741.59	135,243.53	58,727.21			
1844	48,036.60	4,607.67	135,252.97				184,201.66
1845	59,739.10	7,998.10	135,253.00				
1846	98,166.54	3,781.93	119,074.11	58,727.28	30,687.28		
1847	41,865.35	2,884.48	117,696.11	58,727.32			
1848	85,441.13	6,611.66	118,643.31				184,220.00
1849	63,144.98	5,477.71	118,970.41	117,454.70			184,221.01

1850	35,134.24	3,383.83	113,651.88				184,229.02
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Table A-6: Yu Guan, Tianjin Guan, Tianjin Haiguan, Donghai Guan, Jianghai Guan, Zhehai Guan

Year	Yu Guan	Tianjin Guan	Tianjin Haiguan	Donghai Guan	Jianghai Guan	Zhehai Guan
1796	5,183.52	103,284.27	0.00		72,934.33	59,224.07
1797	5,120.00	107,992.20	0.00		72,934.44	56,469.36
1798	5,120.00		0.00		72,940.83	80,373.29
1799	5,120.00		0.00		72,954.30	75,123.30
1800	5,120.00	114,874.65	0.00		72,957.52	66,697.91
1801	5,120.00		0.00		73,012.54	75,131.47
1802	5,120.00		0.00		73,330.33	75,132.63
1803	5,120.00	99,200.44	0.00		146,938.25	77,134.70
1804	5,120.00	102,158.99	0.00		73,556.58	77,135.28
1805	5,120.00	99,666.21	0.00		73,561.58	79,047.62
1806	5,121.09	100,167.05	0.00		73,573.82	73,738.73
1807		100,140.98	37,941.60		73,579.51	73,889.23
1808		96,277.06	53,050.60		73,582.82	79,918.23
1809		90,022.85	69,220.00		73,586.73	79,927.98
1810		97,125.68	64,137.76		73,592.91	79,935.06
1811		96,592.04	47,500.00		73,606.64	79,943.16
1812			50,119.00		73,612.77	79,952.48
1813		94,941.77	53,418.00		73,619.63	79,960.51
1814		95,783.27	51,517.00		73,629.00	159,955.08
1815			39,102.00		73,632.68	79,993.85
1816			35,643.00		73,637.20	80,014.13
1817			40,154.00		73,640.65	79,021.79

1818			43,664.00		73,643.86	80,024.39
1819		95,900.95	44,023.00		73,647.08	80,039.30
1820		95,126.08	41,615.00		73,650.97	80,053.78
1821		95,874.40	42,034.00		73,656.68	79,157.82
1822		98,089.90	42,752.00		73,661.20	80,063.51
1823		96,833.69	43,102.00		73,664.59	80,073.19
1824		96,865.62	43,016.82		73,666.64	79,115.58
1825		94,811.15	42,344.53		73,669.35	79,187.41
1826		94,707.11	41,543.80		71,384.79	78,955.40
1827		190,717.85	42,416.58		73,671.36	79,007.65
1828		95,536.04	42,030.39		73,672.51	79,183.59
1829		95,740.87	40,094.49		73,673.35	79,301.68
1830			40,042.89		73,674.29	79,352.81
1831		95,749.86	40,195.09		73,675.19	79,426.38
1832		95,622.37	21,056.01		73,676.15	79,438.15
1833		95,747.44	20,105.33		73,677.22	79,504.11
1834		105,034.28	40,050.78		73,678.23	79,505.52
1835		95,854.26	40,123.46		147,359.77	79,506.30
1836		95,876.56	40,213.56		73,681.25	79,506.74
1837		95,888.20	41,235.40		73,682.26	79,510.12
1838		95,898.70	40,213.40		73,683.29	79,510.45
1839	5,121.18	96,098.70	24,350.62		73,684.39	79,514.36
1840		95,999.76	20,766.92		57,046.51	79,506.29
1841		95,629.74	25,031.30		73,685.54	79,512.14
1842		74,002.90	0.00		32,621.47	0.00
1843		94,812.48	9,191.52		73,686.06	78,025.76
1844		94,908.98	28,045.17		79,821.79	77,037.56
1845		94,992.50	29,053.85		79,788.02	78,018.53

1846		95,024.72	30,311.29		74,291.14	78,020.03
1847		94,841.79	33,863.17		81,893.53	76,542.32
1848		94,127.58			77,796.46	78,265.94
1849		95,153.27	39,676.45		75,731.88	78,376.87
1850		95,315.96	39,587.44		73,752.31	76,546.70

Table A-7: Minghain Guan, Total, Subtotal Huguan, Subtotal Gongguan

Year	Minghai Guan	Total	Contribution <i>Huguan</i>	Contribution <i>Gongguan</i>	Missing data added
1796	192,849.87	4,105,193.56	3,802,087.10	303,106.45	4,279,912.8
1797	198,507.18	4,142,211.93	3,813,762.58	328,449.35	4,315,003.7
1798	199,163.91	3,808,440.62	3,455,019.47	353,421.15	4,074,699.5
1799	227,639.64	3,934,493.86	3,570,475.43	364,018.43	4,247,623
1800	195,974.72	4,692,429.86	4,204,851.15	487,578.71	5,111,177.7
1801	202,152.78	3,331,306.75	3,096,522.82	234,783.93	4,258,902.8
1802	219,251.00	3,934,812.02	3,558,998.45	375,813.57	4,287,650.5
1803	201,520.97	4,143,603.81	3,834,140.73	309,463.08	4,647,897.1
1804	198,851.94	4,224,829.82	3,847,532.14	377,297.68	4,276,438
1805	171,884.80	4,309,959.15	3,949,419.32	360,539.84	4,431,512.9
1806	175,719.96	3,725,494.85	3,373,276.24	352,218.61	3,953,921
1807	168,923.34	3,824,202.52	3,441,067.69	383,134.83	4,073,611.1
1808	186,852.86	4,394,358.94	4,010,150.64	384,208.30	4,411,767.8
1809	193,421.12	4,097,684.49	3,727,916.47	369,768.02	4,300,111
1810	186,617.48	4,198,342.98	3,802,083.81	396,259.17	4,295,398.8
1811	187,061.00	3,823,611.15	3,434,136.61	389,474.54	4,066,343.6
1812	189,539.00	3,802,296.09	3,415,174.95	387,121.14	4,026,879.3
1813	211,477.86	3,834,349.81	3,446,170.46	388,179.35	4,160,078.9
1814	430,906.97	4,552,176.62	4,165,858.70	386,317.92	4,602,858.4

1815	209,672.54	3,872,833.64	3,497,905.00	374,928.65	4,105,222.8
1816	205,844.72	3,608,316.10	3,271,269.29	337,046.81	4,226,404.8
1817	235,865.94	3,850,448.89	3,463,319.09	387,129.80	4,265,727.9
1818	196,855.58	4,061,151.25	3,675,263.38	385,887.86	4,202,527
1819	193,462.45	4,381,215.79	3,982,379.73	398,836.06	4,478,290.7
1820	195,280.47	3,957,579.19	3,585,762.50	371,816.70	4,027,618.1
1821	192,688.46	3,707,676.58	3,307,862.52	399,814.07	4,045,148
1822	186,778.08	4,582,059.15	4,183,104.28	398,954.87	4,720,638.3
1823	186,766.91	3,809,708.29	3,407,721.37	401,986.92	3,981,066.6
1824	186,770.71	4,012,055.65	3,534,841.57	477,214.09	4,367,917.8
1825	186,759.12	3,800,705.28	3,465,548.22	335,157.06	4,033,414.7
1826	188,438.86	3,387,752.81	3,062,308.20	325,444.62	4,068,137.6
1827	188,913.24	3,395,333.78	3,082,212.04	313,121.74	4,178,583.3
1828	189,391.58	3,945,040.34	3,602,644.73	342,395.61	4,167,454.3
1829	187,597.52	4,001,499.58	3,663,017.53	338,482.05	4,194,929.6
1830	186,873.11	4,002,700.51	3,596,042.86	406,657.65	4,343,302.7
1831	187,243.56	3,401,557.65	3,083,702.04	317,855.61	3,953,880.7
1832	186,733.95	4,267,346.74	3,861,443.70	405,903.04	4,821,474.5
1833	152,939.37	3,383,614.94	3,095,519.95	288,094.99	3,697,609.9
1834	176,825.19	3,729,902.64	3,469,384.19	260,518.44	3,837,796.5
1835	186,913.99	4,100,031.48	3,794,235.65	305,795.83	4,392,103.8
1836	184,095.28	3,533,895.61	3,219,531.94	314,363.67	4,082,922
1837	188,886.64	3,642,312.57	3,304,516.50	337,796.07	4,060,062.9
1838	191,665.08	4,086,220.82	3,789,788.80	296,432.02	4,194,119.8
1839	191,391.01	3,826,262.29	3,559,781.47	266,480.83	3,929,040.2
1840	186,900.94	3,883,113.01	3,603,874.83	279,238.18	3,989,197.5
1841	181,451.09	3,918,769.19	3,678,229.18	240,540.01	4,045,066.5
1842	115,953.40	3,187,345.47	2,942,739.15	244,606.31	3,474,314.4

1843	86,059.68	3,076,396.91	2,786,584.83	289,812.08	3,483,898.7
1844	127,569.83	3,396,892.60	3,099,378.12	297,514.48	3,669,176.5
1845	91,462.89	3,333,728.87	3,013,429.81	320,299.06	3,847,870.5
1846	305,932.19	3,880,028.46	3,546,130.78	333,897.68	4,277,447.4
1847	146,417.84	2,657,011.78	2,480,381.20	176,630.57	3,747,617.5
1848	153,179.60	3,225,211.37	2,892,328.10	332,883.27	3,870,426.3
1849	150,830.77	3,888,043.03	3,584,283.76	303,759.27	3,987,041.3
1850	156,091.95	3,001,638.68	2,835,966.26	165,672.42	3,898,583.2

Source: Ni Yuping, Customs Duties in the Qing Dynasty, ca.1644-1911. Brill.2016. pp. 173-210.

Appendix B: Land Tax in 1821-1850 (taels of silver)

Table B-1: Zhili, Shangdong, Shanxi, Henan

Year	Zhili		Shangdong		Shanxi		Henan	
	quota	taxed	quota	taxed	quota	taxed	quota	Taxed
1821	1338990	1290956	2076390	1845356	2647186	2647186	2644793	2391215
1822	1338990	1290956	2076390	1845356	2647186	2647186	2644793	2391215
1823	966439	939009	2305385	2129255	2657395	2657395	2734017	2365963
1824	2332589	2312728	2908700	2446599	2647186	2647186	3096205	2666644
1825	2107787	1914914	2914646	2467836	2657395	2657395	2654629	2423060
1826	2133462	2029644	2833564	2403259	2657395	2653208	2751612	2307619
1827	2122593	2001364	3280087	2695039	2647186	2647186	3025735	2533118
1828	2151732	1922963	3023484	2699043	2657395	2657395	3033326	2639631
1829	2098432	1874916	3070545	2699638	2657395	2657395	2808475	2595304
1830	2050744	1931525	3160746	2755671	2646233	2646233	2665958	2402441
1831	1995422	1919815	3320544	2708069	2656442	2656442	2683525	2485056
1832	1829422	1814899	2739069	2641394	2621198	2621198	2353928	2186700
1833	2021817	2011099	2817964	2618943	2656709	2655167	2606525	2279591
1834	1865464	1836100	2934606	2601791	2656575	2656575	3157885	2461250
1835	1896034	1871793	2536502	2448120	2636922	2636922	3168813	2405348
1836	1981241	1945605	2153805	2054382	2635117	2635117	3213748	2407229
1837	1841133	1793354	2504842	2341482	2646336	2646336	3074989	2539149
1838	1988399	1921176	2516430	2330308	2680526	2678644	3084986	2443211
1839	1936263	1843603	3158080	2423598	2661002	2657649	2917920	2395846
1840	1972308	1890895	3053728	2289810	2665707	2653314	2958379	2463358

1841	2036121	1971761	3245478	2379762	2662507	2653785	2475104	2125219
1842	1996914	1881069	3260581	2277728	2657785	2644947	2500571	2012604
1843	1980378	1913777	3656876	2391798	2638531	2629512	2463221	2080522
1844	1912501	1849759	3434374	2252822	2668853	2655212	2369664	1961542
1845	1799390	1745979	2856461	2125765	2660954	2641248	2653935	1975970
1846	1794160	1704530	2667854	1926556	2656868	2424476	2614826	1995484
1847	1606008	1460610	2956146	2015979	2800934	2705580	1583330	1229012
1848	2029244	1909108	3472006	2300747	2851615	2837477	2375544	1735135
1849	1983670	1874703	3923878	2437778	2672368	2646134	3896066	2538943
1850	1837029	1787507	2490585	2260148	2681474	2670850	3784845	2133972

Table B-2: Jiangnin, Suzhou, Anhui, Jiangxi

Year	Jiangnin		Suzhou		Anhui		Jiangxi	
	quota	taxed	quota	taxed	quota	taxed	quota	Taxed
1821	683473	542880	1811708	1455346	1614501	1156732	2423720	1488956
1822	683473	542880	1811708	1455346	1614501	1156732	2423720	1488956
1823	670556	511416	1387455	931663	1143020	855355	2423720	1488956
1824	762294	629888	2190387	1450066	1520995	1209927	2423720	1488956
1825	844854	652632	2241664	1819796	1640830	1273940	2423720	1488956
1826	610911	430405	2187005	1665485	1587873	1252725	2423720	1488956
1827	780713	639834	2247474	1719486	1573471	1282256	2544572	1485644
1828	654303	533818	2157045	1671168	1391661	1166901	2633359	1568226
1829	750659	643715	2115497	1607448	1438112	1164426	2636821	1494466
1830	726142	620277	2036235	1517518	1400365	1105180	2673777	1479921
1831	475175	387324	1650834	1337325	1078061	801392	2663510	1317299
1832	548934	405906	1915959	1616202	1187688	929493	2936274	1444317
1833	622016	478207	1774319	1363844	1275430	863202	2923595	1433566
1834	738616	604242	1916874	1462791	1786875	1067559	2875023	1320976
1835	704522	556572	2158979	1708149	1381290	1028015	2331404	1064690
1836	788302	562377	2331847	1783812	1908749	1290005	2768369	1306969
1837	834090	578914	2504716	1859475	1597358	1268483	3205335	1549248
1838	843869	591156	2113201	1792697	1702492	1170469	3541265	1661734
1839	615863	505376	1853383	1495217	1304679	960765	3411057	1580952
1840	610535	434738	1658839	1190419	1339765	960371	3424410	1570346
1841	540645	392418	1606534	1051312	1148357	779214	3391081	1476391
1842	675143	443726	1576099	917427	1461103	973750	3463308	1590125
1843	678208	490641	2024678	1277102	1690443	1109069	3519205	1474317
1844	740959	5085935	2371306	1348956	1710038	1121495	3522436	1421033
1845	803711	526546	2717934	1420810	1500460	1133854	3761440	1360015
1846	733898	451169	2715074	1315871	1452153	1109637	4315671	1314084
1847	851535	516854	2303602	1547308	1431509	1116100	4563134	1354212
1848	661558	313579	2138572	1297350	1104460	848693	4024857	1338369

1849	444425	306372	967912	524656	1069862	830700	3486581	1322526
1850	654436	495844	1308300	1180008	1058846	825172	3486581	1322526

Table B-3: Fujian, Zhejiang, Hunan, Hubei

Year	Fujian		Zhejiang		Hunan		Hubei	
	quota	taxed	quota	taxed	quota	taxed	quota	taxed
1821	1927626	851030	2341976	1975450	898129	883619	1110953	982652
1822	2049164	878085	2468254	2210611	898129	883619	1110953	982652
1823	2205538	939210	1995784	1741102	886040	886040	1015025	900407
1824	2299787	889839	2711171	2279085	902910	902910	963386	910178
1825	2444438	934379	2596713	2258521	896739	896739	994199	934864
1826	2544514	908421	2535552	2228108	849646	849646	1023754	991317
1827	2667662	952583	317476	2253574	929410	929410	958320	940692
1828	2748538	923005	2219749	2007894	899949	899949	990754	990754
1829	2859701	927985	2485392	2141493	904093	904093	1035447	1035447
1830	2939139	904223	2502585	2103380	897397	897397	975209	964198
1831	3062117	910538	2416771	2011913	855840	828851	657478	614265
1832	3184898	904992	2347865	1995385	894661	894661	811277	764777
1833	3306435	946803	2649798	2047355	867358	867358	733065	701253
1834	3403254	936487	2770780	2055321	860583	860583	907713	877319
1835	3502407	896233	2072302	1660180	790064	736291	649525	623548
1836	2162022	885894	2283829	2283829	947708	877990	958345	929772
1837	2311696	887652	2224807	2224807	934328	858505	1020759	981600
1838	2458558	894729	2155740	2155740	894572	852678	990796	960080
1839	2599900	888368	1884556	1884556	865337	842164	732918	721927
1840	2747804	899143	1840787	1840787	865162	851545	726295	726295
1841	2904153	895362	1516760	1218795	856558	845445	595994	595994
1842	3060503	891581	1737286	1514450	870645	859880	808124	807851
1843	3197922	880858	3798441	1884646	887955	884386	889953	889408
1844	3354260	853023	4134029	1851976	861588	861588	747550	747550
1845	3510598	825189	3587479	1700193	884952	884959	873120	873120
1846	3002887	852637	3655397	1388993	882852	882852	807665	807665
1847	2495177	880085	4748922	1704112	876680	876680	835435	835435
1848	2651047	871698	5064537	1182768	829855	781348	554897	554897
1849	2814188	843559	5087125	1000650	811319	791437	456430	456430
1850	2988602	893952	1525641	1228863	849896	800399	767488	654526

Table B-4: Shaanxi, Gansu, Sichuan, Yunnan

Year	Shaanxi		Gansu		Sichuan		Yunnan	
	quota	taxed	quota	taxed	quota	taxed	quota	taxed
1821	1340798	1339936	395379	268564	768536	768536	210575	210575
1822	1340798	1339936	395379	268564	790302	790302	211775	211775

1823	1333169	1332535	405790	257282	768536	768536	209382	209382
1824	1340053	1340053	416180	240105	795302	795302	211315	211315
1825	1331148	1331148	419243	270220	768536	768536	210930	210930
1826	1332087	1332087	483746	252176	768536	768536	212254	212254
1827	1339416	1339416	88045	480761	795296	795296	212214	212214
1828	1097789	1097789	165027	119185	681744	681744	211321	211321
1829	1097789	1097789	298078	263976	677406	677406	212249	212249
1830	1349963	1344537	343930	255328	795396	795396	212302	212302
1831	1336486	1336486	269354	237468	768630	768630	212254	212254
1832	1339838	1339838	369025	290517	795503	795503	212449	212449
1833	1328575	1328575	311207	279076	766606	766606	205241	205241
1834	1334405	1334041	294455	249312	768731	768731	212255	212255
1835	1339736	1339736	283946	256460	794797	794797	212497	212497
1836	1330819	1330748	331020	250742	768901	768901	212400	212400
1837	1331525	1331525	315735	244779	768243	768243	212249	212249
1838	1339994	1339339	327669	243497	793894	793894	212497	212497
1839	1324742	1324087	370541	239686	768901	768901	212403	212403
1840	1337928	1337928	362969	232262	768901	768901	212250	212250
1841	1334536	1333359	247910	247910	795683	795683	212502	212502
1842	1337417	1337417	314668	230850	795683	795683	212255	212255
1843	1335686	1334509	422854	250405	795683	795683	212501	212501
1844	1331439	1331439	454479	235322	768902	768902	212399	212399
1845	1331439	1331439	343335	228646	768902	768902	212255	212255
1846	1318461	1306609	389737	228885	795683	795683	212497	212497
1847	1304544	1287731	453775	240620	768902	768902	212398	212398
1848	1331439	1331439	432661	222735	768902	768902	211787	211787
1849	1339155	1339155	434019	279344	795683	795683	211177	211177
1850	1331252	1331252	421133	250365	768902	768902	211177	211177

Table B-5: Guizhou, Guangdong, Guangxi, Total

Year	Guizhou		Guangdong		Guangxi		Total	
	quota	taxed	quota	taxed	quota	taxed	quota	taxed
1821	76452	76452	1169096	1112552	450198	319665	25930479	21607658
1822	78217	78217	1169096	1112552	450198	319665	26203026	21894605
1823	76455	76455	1148284	1104282	467484	361485	24799474	20455728
1824	78218	78218	1161385	1120044	450542	336455	29212325	23955498
1825	76455	76455	1133055	1104225	451053	339417	28808034	23823963
1826	76455	76455	1120524	1102380	448605	352301	28581215	23304982
1827	78218	78218	1135456	1118591	440273	353808	27183617	24458490
1828	76455	76455	1108493	1097192	423466	341318	28325590	23305751
1829	76455	76455	1102718	1097932	419146	334096	28744410	23506229
1830	78218	78218	1131538	1130824	429047	332916	29014924	23477485

1831	75824	75824	1093035	1093035	433151	322420	27704453	22024406
1832	78470	78470	1118304	1118304	454740	358414	27739502	22413419
1833	76708	76708	1020458	1020458	433350	354541	28397176	22297593
1834	76455	76455	1055660	1053745	415836	320486	30032045	22756019
1835	76455	76455	1122003	1122003	373430	343866	28031628	21781675
1836	76455	76455	1112278	1106732	373613	344184	28338568	23053143
1837	64163	64163	1097997	1097023	366469	332494	28856770	23579481
1838	66051	66051	1124520	1123435	378008	338417	29213467	23569752
1839	64284	64284	1095723	1093181	376634	344658	28154186	22247221
1840	64163	64163	1095020	1093717	369027	335268	28073977	21815510
1841	66008	66008	1119418	1118444	377805	331639	27133154	20491003
1842	66072	66072	1093427	1092682	383219	344567	28270803	20894664
1843	66137	66137	1118851	1118106	382676	322720	31760199	22006097
1844	64378	64378	1093187	1092442	397031	340742	32149373	26056515
1845	65259	65259	1093519	1093519	363371	294980	31788514	21208648
1846	66140	66140	1118169	1118169	412439	359744	31612431	20261681
1847	65209	65209	1092513	1092513	389754	315228	31339507	20224568
1848	64278	64278	1093330	1093330	411591	342822	32072180	20006462
1849	65852	65852	1118291	1118291	408594	381534	31986595	19764924
1850	64508	64508	909217	728552	408594	381534	27548506	19990057

Source: Ni Yuping, *Qing Chao Jia Dao Caizhen Yu Shehui* [清朝嘉道财政与社会 Research on the Finance and Society in the Jiaqing and Daoguang Times of the Qing Dynasty], The Commercial Press. 2013. pp. 91-96.

Appendix C: Explaining China's 1823 flood regression model

This appendix describes the regression model discussed in "China's 1823 flood" originally published by the Australian Economic History Review and chapter 4 in this dissertation.

The model estimated is:

$$y_i = c + b_1 \cdot x_{1i} + b_2 \cdot x_{2i} + b_3 \cdot x_{3i} + b_4 \cdot x_{4i} + b_5 \cdot x_{5i} + u_i$$

where:

y_i = [Land Tax Relief Ratio, Relative Land Tax Relief Ratio]

x_{1i} = [Disaster Ratio, Wetness Index, Disaster Ratio*Pop, Wetness Index*Pop]

x_{2i} = Population density

x_{3i} = Land Tax Quota

x_{4i} = Grain Stored Per Capita Change Between 1786 and 1820

x_{5i} = Distance to Beijing

u_i = i.i.d. normally distributed error term

The coefficients were estimated with OLS.

For models with the Land Tax Relief Ratio, an alternative specification was estimated that corrects for the truncation of the dependent variable. The results were, however, almost the same, as shown in estimations 5, 6, 11 and 12.

Dependent variables

(1) Land Tax Relief Ratio (LandTaxRel $\sim$ o): this is the reduction from the land tax expressed as a percentage of the long-term quota. The higher this number, the higher the relief.

(2) Relative Land Tax Relief Ratio (RelativeLa $\sim$ o): this is the change in the reduction of the land tax's long-term quota and accounts for the fact that the long-term quota was often reduced quasi-permanently and thus not likely to depend on yearly variations in the conditions. To allow for the same interpretation as for variable (1) it has been multiplied by -1 in the regressions.

Independent variables of interest

(1) Disaster Ratio (Disasterra $\sim$ o): the number of counties reporting flooding as a share of all counties in a province. The higher this number, the higher the exposure to the flood.

(2) Wetness Index (Wet_Map_1823): an index constructed from contemporary sources measuring precipitation on a scale from 1 = wet through to 3 = normal and 5 = dry. Thus, the lower this number, the higher the exposure to the flood.

(3) Disaster Ratio Population Weighted (dispop): Disaster Ratio times the population in 1820.

(4) Wetness Index Population Weighted (wetpop): Wetness Index times the population in 1820.

Further control variables

(1) Population density (pop_dens): population in 1820 divided by area in square kilometres. The map shows that regions with high disaster exposure were in the areas of the Yangtze delta and North China plain, traditionally intensive agricultural regions and thus high population density and high-income regions. Central government disaster relief might have been influenced by this; for example, by directing funds to regions with higher economic potential and thus more political influence at the court. If this is true, the coefficient should be positive when regressing on Disaster Ratio and negative when regressing on the Wetness Index.

(2) Land Tax Quota ($\text{land_tax_q} \sim o$): this is the long-term quota of land taxes in shi of rice. It was originally stipulated in the early eighteenth century and may be a reflection of agricultural productivity and its size. One might expect that regions with higher agricultural production might be hit harder by floods, and thus expect higher relief, or that simply higher quotas might profit from those quasi-permanent reductions of the quotas, for example, on account of political interventions. In any case, the coefficient is expected to be positive.

(3) Grain Stored Per Capita Change Between 1786 and 1820 ($\text{grain} \sim o_{1786}$): this variable includes grain stored in civilian granaries in 1786 and 1820 divided by population, each measured as a change in time. It might be expected that provinces that saw a long-term reduction in the per capita amount of grain stored would either profit from more direct relief in the case of a flood or because of its degrading disaster relief precautions receive less relief from the capital. Thus, the coefficient might turn negative or positive.

(4) Distance to Beijing ($\text{distance_b} \sim g$): this is the linear distance between Beijing and the provincial capitals. It accounts for the fact that regions closer to the capital enjoyed easier access to the court and thus might have received more relief. The coefficient should therefore be negative.

Results

We report the regression results in 12 tables: Models 1-6 for simple disaster indicators and Models 7-12 for population weighted indicators. Each runs the relevant explanatory variable against one of the four controls and all of them at once. Of course, the number of observations with up to five independent variables plus a constant leaves very few degrees of freedom. However, leaving the constants out does not make a substantial difference, and the results are not shown for the sake of brevity, but can be requested from the authors.

Generally, when letting either explanatory variable in each of the eight models compete against only one of the controls the coefficient b_1 survives in sign, size and significance. This means that the controls – although meaningfully chosen and correlated with the dependent variable – do not challenge the hypothesis that there is a proportional relationship between disaster impact and relief.

An exception is model (3), when the Land Tax Relief Ratio is regressed against the Wetness Index. This is a very weak model mainly for two reasons. Firstly, the Land Tax Relief Ratio is unlikely to be particularly well explained by the weather events of 1823, since it rather reflects quasi-permanent reductions of the land tax stipulated much earlier. Secondly, the Wetness Index is measured with a lot of error as the values were taken from a map and aggregated to provincial level according to their location on the map. This unsystematic error increases the standard errors and biases the results against our hypothesis. Thus, only without controls is there a correct sign and a t-statistic close to statistical significance. It is noteworthy that, as expected, provinces with higher quotas enjoyed permanently higher reductions in land tax (Column 3), and that

provinces further away from Beijing enjoyed less permanent reductions (Column 5).

Our favoured model is 4. The dependent variable (Relative Land Tax Relief Ratio) reflects the change in the permanently lowered reduction in the given year, and is thus likely to be a reaction to events in this period. (Similar comments can be made about Model 2.)

One notable result in Models 1 and 3 is that provinces that improved their per capita holdings of grain in civilian granaries between 1786 and 1820 received larger permanent reductions in land tax before and during the 1823 flood but that there was no such relation to short-term reduction between 1822 and 1823 (Models 2 and 4).

Models 7-10 include the population weighted disaster indicators. The four provinces with the largest populations in 1820 were Jiangsu, Shandong, Anhui and Henan, all in the east, close to the capital and largely affected by the disaster. Thus, these indicators are likely to be correlated even more strongly with the dependent variables but also to be affected more strongly by controls such as population density, distance to Beijing and land tax quota. These predictions are neither strongly refuted nor underlined by the results (Models 7 and 8). What strikes the eye, though, is that the population weighted wetness index fails as an indicator of disaster intensity, while disaster ratio times population reproduces the results of the simple disaster indicators. What might drive this is that measurement error for eastern provinces is larger than in the west, because the provincial borders are more difficult to see with the naked eye, and this is then overweighted relative to the simple indicator because of the larger population in the east.

To conclude, the overall outcome of this exercise is that the hypothesis of a proportional relationship between disaster impact and relief from the central government can be substantiated quantitatively even when controlling for variables such as population density, permanent land tax quota, the changing state of the granary system, and distance to Beijing.

Results 1823 Population Weighted

```
7.
///OLS///
y = LandTaxReliefRatio
x = Disasterratio*population in 1820
-----
              (1)      (2)      (3)      (4)      (5)      (6)
LandTaxRel~o LandTaxRel~o LandTaxRel~o LandTaxRel~o LandTaxRel~o LandTaxRel~o
-----
Dispop      1.37e-08***  1.58e-08**  1.03e-08**  1.13e-08***  9.87e-09***  1.40e-08***
              (3.37)      (2.21)      (2.41)      (4.45)      (3.83)      (4.92)

pop_dens      -0.000289                -0.000697
              (-0.42)                (-1.53)
```

land_tax_q~a	5.03e-08	5.09e-08				
	(1.59)	(1.00)				
grain~0_1786	0.139***	0.109*				
	(3.32)	(2.13)				
distance_b~g	-0.000169**	-0.0000224				
	(-2.87)	(-0.35)				
_cons	0.105**	0.128*	0.0383	-0.0452	0.323***	0.00487
	(2.18)	(1.83)	(0.52)	(-0.84)	(3.72)	(0.03)

N	15	15	15	14	15	14
adj. R-sq	0.415	0.379	0.463	0.464	0.579	0.366

t statistics in parentheses
 * p<0.10, ** p<0.05, *** p<0.01

8.
 y = RelativeLandTaxreliefRatio_neg (the higher the more relief)
 x = Disasterratio*population in 1820

	(1)	(2)	(3)	(4)	(5)	(6)
	RelativeLa~g	RelativeLa~g	RelativeLa~g	RelativeLa~g	RelativeLa~g	RelativeLa~g

Dispop	1.02e-08***	1.28e-08***	1.22e-08***	9.32e-09***	1.06e-08***	7.48e-09
	(4.39)	(4.24)	(4.96)	(3.70)	(3.75)	(1.27)
pop_dens	-0.000343				0.000595	
	(-0.93)				(0.83)	
land_tax_q~a		-3.06e-08**			-5.22e-08	
		(-2.27)			(-1.59)	
grain~0_1786			-0.0107		0.0205	
			(-0.19)		(0.41)	
distance_b~g				0.0000210	0.0000124	
				(0.59)	(0.31)	
_cons	-0.00204	0.0252	0.0388*	0.00943	-0.0276	-0.0185

```

          (-0.12)    (1.19)    (2.10)    (0.18)    (-0.50)    (-0.24)
-----
N          16      16      15      15      16      14
adj. R-sq    0.680    0.702    0.742    0.594    0.666    0.664
-----

t statistics in parentheses
* p<0.10, ** p<0.05, *** p<0.01

9.
y = LandTaxReliefRatio
x = Wetness_1823 (1 wet - 5 dry)
-----

          (1)      (2)      (3)      (4)      (5)      (6)
LandTaxRel~o LandTaxRel~o LandTaxRel~o LandTaxRel~o LandTaxRel~o LandTaxRel~o
-----
Wetpop      2.25e-09   -4.57e-10   -6.58e-09   2.78e-09   -2.45e-10   -1.20e-08*
          (0.83)    (-0.14)    (-1.39)    (0.70)    (-0.08)    (-2.00)

pop_dens          0.000822*                0.000494
          (2.01)                (0.86)

land_tax_q~a          0.000000153***          0.000000227**
          (3.20)                (2.70)

grain~0_1786          0.0691          0.290**
          (0.48)                (2.37)

distance_b~g          -0.000235***  0.000283*
          (-3.18)    (1.95)

_cons      0.0893    0.113    0.244    -0.0408    0.491*    -0.376*
          (0.57)    (0.68)    (1.31)    (-0.34)    (2.01)    (-2.24)
-----

N          16      16      16      14      16      14
adj. R-sq    -0.029    0.031    0.395    0.046    0.379    0.433
-----

t statistics in parentheses
* p<0.10, ** p<0.05, *** p<0.01

10.
y = RelativeLandTaxreliefRatio_neg (the higher the more relief)
x = Wetness_1823 (1 wet - 5 dry)

```

```

-----
              (1)      (2)      (3)      (4)      (5)      (6)
      RelativeLa~g RelativeLa~g RelativeLa~g RelativeLa~g RelativeLa~g RelativeLa~g
-----
Wetpop      -7.48e-10   -3.75e-09**  -5.41e-09*   3.41e-10   -1.05e-09   -2.59e-09
              (-0.50)    (-2.56)    (-2.05)    (0.19)    (-0.57)    (-0.72)

pop_dens              0.000962***              0.00132***
              (4.88)              (4.21)

land_tax_q~a              7.25e-08**              -3.23e-08
              (2.32)              (-0.51)

grain~0_1786              -0.0371              0.0346
              (-0.35)              (0.42)

distance_b~g              -0.0000590   0.0000433
              (-1.13)   (0.45)

_cons      0.0887      0.106      0.190*      0.0718      0.171      -0.0370
              (1.23)      (1.48)      (1.90)      (0.97)      (1.43)      (-0.32)
-----

N              17      17      16      15      17      14
adj. R-sq      -0.054      0.331      0.154      -0.142      -0.039      0.553
-----

t statistics in parentheses
* p<0.10, ** p<0.05, *** p<0.01

```

=====

Tobit

11.

y = LandTaxReliefRatio

x = Disasterratio

```

-----
              (1)      (2)      (3)      (4)      (5)      (6)
      LandTaxRel~o LandTaxRel~o LandTaxRel~o LandTaxRel~o LandTaxRel~o LandTaxRel~o
-----

model

Dispop      1.41e-08**  1.58e-08*   1.06e-08*   1.16e-08***  1.01e-08**  1.35e-08***
              (3.46)    (2.32)    (2.59)    (4.91)    (4.15)    (5.22)

pop_dens      -0.000239              -0.000601

```

```

(-0.36) (-1.35)

land_tax_q~a      5.30e-08      4.85e-08
                  (1.78)      (1.16)

grain~0_1786      0.140**      0.105*
                  (3.61)      (2.71)

distance_b~g      -0.000174** -0.0000274
                  (-3.15)   (-0.56)

_cons      0.0957      0.115      0.0259      -0.0523      0.322**      0.00448
          (1.94)      (1.64)      (0.36)      (-1.03)      (4.02)      (0.04)
-----

sigma
_cons      0.151***      0.149***      0.138***      0.117**      0.123**      0.108*
          (6.73)      (6.63)      (4.59)      (4.21)      (3.93)      (2.93)
-----

N      15      15      15      14      15      14

adj. R-sq
-----

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

12.

y = LandTaxReliefRatio
x = Wetness_1823 (1 wet - 5 dry)
-----

(1)      (2)      (3)      (4)      (5)      (6)

LandTaxRel~o LandTaxRel~o LandTaxRel~o LandTaxRel~o LandTaxRel~o LandTaxRel~o
-----

model

Wetpop      2.21e-09      -8.53e-10      -7.25e-09      2.74e-09      -3.45e-10      -1.47e-08*
          (0.83)      (-0.27)      (-1.61)      (0.74)      (-0.12)      (-2.73)

pop_dens      0.000928*      0.000513
          (2.18)      (1.16)

land_tax_q~a      0.000000164**      0.000000273**
          (3.55)      (3.58)

grain~0_1786      0.0707      0.335**
          (0.52)      (3.32)

```



```

distance_b~g          -0.000241**  0.000346*
                        (-3.51)    (2.84)

```

```

_cons      0.0849      0.111      0.251      -0.0463      0.498*      -0.463**
            (0.56)      (0.71)      (1.43)      (-0.41)      (2.20)      (-3.72)

```

```

-----
sigma
_cons      0.193***      0.180***      0.141***      0.155***      0.144***      0.0976**
            (5.29)      (4.37)      (5.72)      (5.44)      (5.57)      (4.56)

```

```

-----
N          16      16      16      14      16      14

```

```

adj. R-sq

```

```

-----
t statistics in parentheses

```

```

* p<0.05, ** p<0.01, *** p<0.001

```

Results 1823 Simple

```

1.

```

```

///OLS///

```

```

y = LandTaxReliefRatio

```

```

x = Disasterratio

```

```

-----
            (1)      (2)      (3)      (4)      (5)      (6)
LandTaxRel~o LandTaxRel~o LandTaxRel~o LandTaxRel~o LandTaxRel~o LandTaxRel~o
-----
Disasterra~o  0.480***  0.482***  0.382***  0.385**  0.347***  0.369
              (4.85)   (3.22)   (3.28)   (2.95)   (3.64)   (1.54)

```

```

pop_dens      -0.00000918      -0.000300
               (-0.02)          (-0.33)

```

```

land_tax_q~a      4.91e-08      4.55e-08
                  (1.48)          (0.70)

```

```

grain~0_1786      0.124**      0.0804
                  (2.30)          (1.41)

```

```

distance_b~g      -0.000147**  -0.0000274
                  (-2.39)    (-0.39)

```

```

_cons      0.0832      0.0840      0.0197      -0.0373      0.282**      0.00750
            (1.57)      (1.38)      (0.25)      (-0.60)      (2.82)      (0.05)

```

```

-----
N          15      15      15      14      15      14

```

adj. R-sq 0.484 0.441 0.538 0.378 0.586 0.272

t statistics in parentheses

* p<0.10, ** p<0.05, *** p<0.01

2.

y = RelativeLandTaxreliefRatio_neg (the higher the more relief)

x = Disasterratio

	(1)	(2)	(3)	(4)	(5)	(6)
	RelativeLa~g	RelativeLa~g	RelativeLa~g	RelativeLa~g	RelativeLa~g	RelativeLa~g

Disasterra~o	0.355***	0.374***	0.413***	0.374***	0.388***	0.358
	(8.93)	(5.59)	(8.86)	(4.39)	(6.89)	(1.75)

pop_dens	-0.0000968				0.000344	
	(-0.39)				(0.46)	

land_tax_q~a		-2.81e-08**			-4.14e-08	
		(-2.32)			(-1.25)	

grain~0_1786			-0.0240		0.00662	
			(-0.50)		(0.17)	

distance_b~g				0.0000432	0.00000839	
				(1.48)	(0.24)	

_cons	-0.0164	-0.00835	0.0190	0.00684	-0.0710	-0.00864
	(-1.06)	(-0.62)	(1.32)	(0.16)	(-1.53)	(-0.13)

N	16	16	15	15	16	14
adj. R-sq	0.773	0.761	0.835	0.699	0.797	0.743

t statistics in parentheses

* p<0.10, ** p<0.05, *** p<0.01

3.

y = LandTaxReliefRatio

x = Wetness_1823 (1 wet - 5 dry)

	(1)	(2)	(3)	(4)	(5)	(6)
	LandTaxRel~o	LandTaxRel~o	LandTaxRel~o	LandTaxRel~o	LandTaxRel~o	LandTaxRel~o

Wet_Map_1823	-0.137	-0.0895	-0.0713	-0.0738	-0.00404	0.181
	(-1.60)	(-0.60)	(-0.87)	(-0.72)	(-0.05)	(1.06)
pop_dens	0.000498				0.00174	
	(0.68)				(1.63)	
land_tax_q~a		7.47e-08***			-5.29e-08	
		(3.02)			(-0.51)	
grain~0_1786			0.122		0.0465	
			(1.32)		(0.54)	
distance_b~g				-0.000230***	-0.000153	
				(-3.99)	(-0.87)	
_cons	0.521**	0.345	0.236	0.213	0.483**	-0.265
	(2.40)	(0.74)	(1.08)	(0.64)	(2.53)	(-1.49)

N	16	16	16	14	16	14
adj. R-sq	0.102	0.086	0.275	0.034	0.378	0.311

t statistics in parentheses

* p<0.10, ** p<0.05, *** p<0.01

4.

y = RelativeLandTaxreliefRatio_neg (the higher the more relief)

x = Wetness_1823 (1 wet - 5 dry)

	(1)	(2)	(3)	(4)	(5)	(6)
	RelativeLa~g	RelativeLa~g	RelativeLa~g	RelativeLa~g	RelativeLa~g	RelativeLa~g
Wet_Map_1823	-0.146***	-0.130**	-0.198***	-0.121**	-0.188***	-0.145*
	(-3.29)	(-2.24)	(-5.89)	(-2.24)	(-4.33)	(-1.97)
pop_dens	0.000213				0.000595	
	(0.74)				(1.36)	
land_tax_q~a		-1.62e-08			-1.99e-08	
		(-0.99)			(-0.50)	
grain~0_1786			-0.0226		0.0235	
			(-0.37)		(0.55)	

distance_b~g		0.0000693	0.000102
		(1.39)	(1.41)

_cons	0.391***	0.329*	0.555***	0.354**	0.410***	0.197*
	(3.34)	(1.86)	(5.25)	(2.40)	(3.62)	(2.01)

N	17	17	16	15	17	14
adj. R-sq	0.489	0.479	0.696	0.329	0.528	0.733

t statistics in parentheses
 * p<0.10, ** p<0.05, *** p<0.01

=====

Tobit

5.

y = LandTaxReliefRatio

x = Disasterratio

	(1)	(2)	(3)	(4)	(5)	(6)
	LandTaxRel~o	LandTaxRel~o	LandTaxRel~o	LandTaxRel~o	LandTaxRel~o	LandTaxRel~o

model

Disasterra~o	0.496***	0.490**	0.393**	0.402**	0.358**	0.365
	(5.02)	(3.45)	(3.61)	(3.30)	(3.99)	(1.91)

pop_dens	0.0000320	-0.000239
	(0.07)	(-0.32)

land_tax_q~a	5.14e-08	4.39e-08
	(1.65)	(0.83)

grain~0_1786	0.124*	0.0777
	(2.49)	(1.80)

distance_b~g	-0.000151*	-0.0000331
	(-2.62)	(-0.62)

_cons	0.0734	0.0707	0.00717	-0.0460	0.279*	0.00757
	(1.37)	(1.16)	(0.10)	(-0.78)	(2.99)	(0.06)

sigma

_cons	0.141***	0.141***	0.128**	0.125***	0.121**	0.115*
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(5.72)      (5.73)      (3.92)      (4.80)      (3.84)      (3.11)
-----
N           15          15          15          14          15          14
adj. R-sq
-----

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

6.
y = LandTaxReliefRatio
x = Wetness_1823 (1 wet - 5 dry)
-----

(1)         (2)         (3)         (4)         (5)         (6)
LandTaxRel~o LandTaxRel~o LandTaxRel~o LandTaxRel~o LandTaxRel~o LandTaxRel~o
-----

model
Wet_Map_1823  -0.132      -0.0740     -0.0621     -0.0678     0.00763     0.275
              (-1.55)     (-0.49)     (-0.76)     (-0.69)     (0.09)      (1.54)

pop_dens              0.000605                  0.00235*
                    (0.81)                  (2.30)

land_tax_q~a              7.97e-08**                  -9.09e-08
                    (3.16)                  (-1.02)

grain~0_1786              0.123                  0.0241
                    (1.41)                  (0.29)

distance_b~g              -0.000242**   -0.000233
                    (-4.04)   (-1.41)

_cons          0.505*      0.288      0.200      0.193      0.465*      -0.393*
              (2.29)      (0.61)      (0.90)      (0.61)      (2.44)      (-2.38)
-----

sigma
_cons          0.181***     0.175***     0.156***     0.156***     0.144***     0.107***
              (6.94)      (5.56)      (4.96)      (5.53)      (5.64)      (5.68)
-----

N           16          16          16          14          16          14
adj. R-sq
-----

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

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Summary

This dissertation includes 4 chapters and examines the question whether the Chinese economic developments of the late 18th and early 19th century can be considered unique or were similar to the West.

Chapter 1 analyses the population expansion and the solutions employed in a Qing dynasty before the “Malthusian Miracle”. Thus, positive checks such as war and disaster were tragically the most effective ways to reduce population size or at least its growth in the late Qing period. It also shows that Malthusian principles had been independently developed in China at about the same time as in the West.

Chapter 2 is on total trade value in the first half of the 19th century. The outlined changes in customs income over time in fact reflects an upward economic development and a bolstering of the social system of China during the 19th century. Due to a rigid tax system situated in a centralised state, in combination with a comparatively short coastline a geographic characteristic, the trade sector may have played a smaller role in economic development than in many other nations’ histories. The positive impact that trade offers became only felt after the Taiping wars.

In chapter 3 the development of the fiscal system is discussed. The dissertation is that during the periods of the emperors Xianfeng and Tongzhi, the government slowly developed “from a state that raises taxes to a fiscal state”. The Qing fiscal system could be typified as traditional and conservative, because nobody had the power to challenge the rule of nature. Compared to the most advanced European nations China was taxing its citizens relatively lightly, which would be in line with the small degree of political representation the system offered. This chapter confirms the widely accepted model of the fiscal state.

Chapter 4 analyses how the Chinese government reacted in the case of the 1823 flood. In comparable cases the British government provided more food relief in per capita terms than China did. However, when compared to overall tax income, Beijing spent a much higher share on disaster relief than major European nations during crises in the 19th century. So here China was quite unique. It surpassed Western countries by in its willingness to redress the crisis.

In conclusion, the dissertation criticises some of the existing research on the historical

GDP research, the Great Divergence, and emphasised the importance of using first-hand historical sources. The dissertation states that late Imperial China was a special country with strong traditions and a unique inherited culture. However this “quality” was not so distinctive to divert the country’s economic and political development trajectory. In a way China was a common country that still in the 19th century followed the “universal agrarian” path, as some Western nations did and other countries also did until recently.

Samenvatting

Dit proefschrift onderzoekt in zijn 4 hoofdstukken de vraag of de Chinese economische ontwikkelingen van de late 18e en vroege 19e eeuw als uniek kunnen worden beschouwd of vergelijkbaar zijn met die in het Westen.

Hoofdstuk 1 analyseert de bevolkingsgroei en de beperking daarvan in de Qing-dynastie voorafgaand aan het "Malthusian Miracle". 'Positive checks' zoals oorlog en rampspoed waren tragisch genoeg nog de meest effectieve manier om de bevolkingsgroei te beperken tot in de late Qing-periode. Het hoofdstuk laat ook zien dat denkbeelden over de 'Malthusiaanse principes' in China en in het Westen gelijktijdig maar onafhankelijk van elkaar tot ontwikkeling kwamen.

Hoofdstuk 2 onderzoekt de totale handelswaarde in de eerste helft van de 19e eeuw als indicator voor economische ontwikkeling. De geschetste veranderingen in de douanerechten weerspiegelen de opwaartse economische ontwikkeling en de versterking van het sociale systeem van China in de 19e eeuw. Als gevolg van het rigide belastingstelsel in deze gecentraliseerde staat, in combinatie met geografische gegevens van de relatief korte kustlijn, heeft de handelssector mogelijk een kleinere rol gespeeld in de economische ontwikkeling dan in de geschiedenis van veel andere landen het geval was. Het positieve effect van handel werd pas gevoeld na de Taiping-oorlogen.

In hoofdstuk 3 wordt de ontwikkeling van het belastingstelsel besproken. De stelling is dat de regering zich in de perioden onder de keizers Xianfeng en Tongzhi langzaam heeft ontwikkeld "van een staat die belastingen heft naar een belastingstaat". Het Qing-belastingstelsel kon als traditioneel en conservatief worden getypeerd, omdat niemand de kracht had om de gang van zaken te veranderen. Vergeleken met de meest ontwikkelde Europese landen belaste China zijn burgers relatief licht, wat in overeenstemming is met de geringe mate van politieke vertegenwoordiging die het systeem bood. Het hoofdstuk vindt bevestiging voor het algemeen aanvaarde model van de fiscale staat.

Hoofdstuk 4 analyseert hoe de Chinese overheid reageerde in het geval van de overstroming van 1823. In vergelijkbare situaties bood Groot-Brittannië in per hoofd van de bevolking meer voedselhulp dan China. Maar vergeleken met de totale belastinginkomsten

besteedde Peking een groter aandeel aan rampenbestrijding dan de grote Europese landen tijdens crises in de 19e eeuw. China was hier dus vrij uniek. Het overtrof de westerse landen in bereid tot crisis bestrijding.

Ten slotte bekritiseert het proefschrift veel van het bestaande historische BBP-onderzoek, onderzoek naar de 'Great Divergence', en het benadrukt het belang voor dit onderzoek van primair historisch materiaal. Het proefschrift stelt dat het late keizerlijke China een land was met sterke en bijzondere tradities en een unieke overgeërfde cultuur. Deze 'kwaliteit' was niet zo onderscheidend dat het leidde tot een andere economische en politieke ontwikkeling dan elders. China was in dit opzicht een vrij gewoon land dat in de 19e eeuw nog het "universele agrarische" pad volgde, zoals sommige westerse landen dat ook deden en andere landen tot voor kort.

摘要

本文试图探讨 18 世纪末和 19 世纪初的清朝中国与西方国家相比较，其经济发展道路是独特的还是相似的问题。正文部分分为四章：

第一章分析了“马尔萨斯奇迹”发生之前的清代人口膨胀及其对策。战争、灾难等“积极制约措施”，是晚清时期减少人口规模或者减少人口增长的最有效途径。马尔萨斯主义人口理论在中国和西方几乎同时出现，并得到了独立的发展。

第二章以主要商品的市场流通量和关税记录，估算 19 世纪上半叶的商业总产值。关税收入随时间的变化，实际上反映了 19 世纪中国经济发展的上升趋势和社会制度的加强。僵化的税收制度与高度中央集权相结合，再加上相对较短少的海岸线，导致贸易部门在经济发展中所起的作用，要比其他许多国家小得多。贸易对经济推动的积极作用，只有在太平天国运动之后才充分显现出来。

第三章集中探讨清朝财政制度的变迁。咸丰、同治时期，清政府逐渐完成了“从国家财政到财政国家”的转变。清朝前期的财政制度可以被视为传统的和保守的，中后期发生转变的原因在于没有人可以违背经济本身的“自然规律”。与欧洲国家相比，清政府对民众的征税相对较轻，这与该体系所提供的政治代表性很小相一致，从而更加证实了这种广为接受的财政国家管理模式。

第四章分析了清朝 1823 年大水灾的情况。以人均绝对值计算，同期爱尔兰大饥荒期间，英国政府为灾民提供了更多的粮食救济。然而在 19 世纪的严重危机中，相对于总的财政收入，清政府在救灾方面所支出的份额，要远高于欧洲主要国家。这是非常不同的特点，即便考虑到财政能力，清政府也比西方国家更愿意投入资金用于救灾。

结论部分，对现有的历史 GDP 研究和“大分流”研究进行批判，强调利用第一手史料进行研究的重要性。帝国晚期的中国是相当特殊的国家，有着很强的传统和独特的文化遗产，但这种“独特”并没有强烈到让中国可以违背普适的政治经济规律。清代中国仍然是一个非常“相似”的国家，仍然遵循着“普遍农业国家”的发展道路。这种发展道路，一些西方国家早已完成，一些国家则直到现在还在完成过程之中。

关键词：“大分流”，“马尔萨斯奇迹”，关税，财政国家，荒政