THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

In Search of Power and Credibility

Essays on Chinese Monetary History (1851-1945)

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Abstract

In many respects, the mid-nineteenth century marks the beginning of China's modern history: the Opium War (1839-42) and domestic turbulence compelled Chinese statesmen to realise that the old state apparatus was no longer able to cope with the changing world. However the pursuit of greater state capacity collided with a feeble ability to raise taxes and an ancient monetary system far from being unified. How did the government carry out even limited alterations to the monetary system in times of urgent fiscal need? And how did the monetary evolution proceed with these partial reforms? This thesis focuses on the movement of the Chinese monetary system from a traditional metallic system to a modern fiat money system, and discusses three issues during different phases of the transition.

The first part re-examines the case of 'Xianfeng inflation' (1853-61) when the government attempted to issue new monies to resolve the crisis in public finances. It points out that under the traditional commodity money system the government had little impact on money supply, and that the so-called inflation was an outcome of coinage debasement combined with a banking crisis resulting from the debt default. The second part focuses on the introduction of modern coinage minted with steam power around the 1900s, enabling the government to supply credible monies that no longer relied on their intrinsic metallic values. It argues that this technological innovation allowed the Chinese government for the first time to implement effective monetary manipulation and exert an impact on the rural economy. The third part investigates the behaviour of money holders during a war. It compares the velocities of paper notes issued in Free China and Occupied China during the Second World War (1937-45) and demonstrates that the credibility of the monies depends most on people's expectations about the survival of the regime.

The transition from a traditional to a modern currency system is a search for a new monetary credibility that had formerly lain within the value of the metal. The evolution of the Chinese monetary system illustrates vividly the constant state struggle between monetary credibility – via coercion, technology, or legitimacy – and its pocket gain, when the fiscal soundness is at stake.

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This thesis is dedicated to Papa and Mama.

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List of Traditional Chinese Units

Chinese weights

10 *fen* = 1 mace (*qian*)

10 maces = 1 tael (*liang*)
= 583.3 grains (1⅓ oz. avoirdupois)
= 37.783 grammes

16 tael = 1 catty (*jin*)
= 1⅓ lb. avoirdupois
= 604.53 grammes

100 catties = 1 picul (*dan*)
= 133⅓ pound
= 60.453 kilogrammes

Accounting units

For copper cash:

1 string (*chuan*) = 1,000 *wen*

1 metropolitan *diao* = 1,000 metropolitan *cash*
= 500 pieces of standard *cash* (before 1853)
= 50 pieces of big *cash* (after 1861)

Between silver and copper cash (official ratio):

1 silver tael = 1000 wen (before 1820)
= 2000 wen (after 1840)

Exchange rates of Chinese currencies

Silver tael during 1840-1900:

1 Market Tael = $1.38 silver dollars (Spanish peso)

Silver tael in 1907:

1 Haikwan Tael (*Hk.Tls*) = 3*s*. 3*d*. British Pound
= $0.79 American dollars
= $1.51 Mexican dollars

Chinese dollar in 1935:

1 Chinese dollar (*fabi*) = 14½ *d*. British Pound
= $0.3 American dollars

Introduction

The century following the First Opium War (1839-42) was perhaps one of the worst of times as well as the best of times in the Chinese history. It was a time when the Manchu regime suffered from great political turbulence both abroad and at home; it was also a time when China was, willingly or not, widely exposed to foreign trade, culture and technology at an accelerating speed.

State reforms were needed in order to accommodate the changing environment and new challenges. It was in these circumstances that China's monetary system transformed from the traditional metallic system to a modern fiat money system. The course of the evolution followed a zigzag pattern, because the reforms were often alterations to, or manipulations of, the existing system in order to meet the government's urgent fiscal needs. How was the evolution of the monetary system shaped by the development of the state and how did the market react during the process?

This thesis consists of three chapters that fall under the broad banner of early modern Chinese monetary history, with a particular focus on the evolution of the monetary system influenced by the collapse and formation of state capacity. Each of the chapters covers an independent research and together they are interrelated by the theme of the monetary evolution within a context of the state formation. The introduction will first lay out a succinct illustration of the historical context of the state formation and the traditional monetary system; brief sketches of the three main chapters will be provide, followed by an outline of the organisation of the thesis.

State and money

The state: crisis and reform in context

The mid-19th century undeniably marks the beginnings of modern China: it witnessed an ancient empire on the wane and a modern state in formation. From the 1840s and 1850s the increasingly frequent and violent domestic rebellions tested the state's fiscal and military capacity. With the opening of treaty ports following the ratification of the

Treaty of Nanjing, the traditional institutions encountered unprecedented challenges: not only were the Chinese authority and its legal institutions confronted within the jurisdiction of the treaty ports; the whole country gradually underwent fundamental economic changes following the opening of foreign trade and the integration with international markets. At the same time, new technologies, new business organisations and banking practices and new concepts of socio-political reform were introduced into the country.

The conservative Qing government carried out limited reforms in order to cope with the changing socio-economic environment. However the reforms were only partial and were not carried out quickly enough. The central government remained to be undermined and the regional powers continued to strengthen. Decentralisation continued after the fall of the Qing Dynasty (1644-1911): conflicts among regional warlords dominated the first two decades of Republican China (1912-49).[1] The country was unified when the army of the Nationalist Party established the new capital in Nanjing, and defeated the Beiyang government in Beijing in 1928. The following decade saw a surge of economic and institutional development, and was remembered as the 'Nanjing decade'. However, this period was short and sweet. With acts of Japanese military aggression since the early 1930s and the outbreak of the Second Sino-Japanese War, China again fell into segmentation.

Monetary system: unity and diversity

The history of the Chinese monetary system generally followed a cycle of unity and diversity. During the century from the 1850s to the 1940s, the Chinese monetary system was transformed from a traditional metallic system to a modern fiat money system. And the evolution of the Chinese monetary system after the 1850s mirrored the waves of dynastic collapse and modern state formation.

[1] The Republican era can be divided into three periods according to the change of legitimate governments: the warlord period or Beiyang government (1912-28) with the capital in Beijing; the Nanjing decade or Nationalist government (1928-37), the wartime period (the Second World War from 1937 to 1945 and the civil war from 1946 to 1949) during which the Nationalist government fled to Chungking in 1937 and returned to Nanjing in 1946.

Copper *cash* had been adopted as the common currency in China as early as the third century B.C.[2] The bronze coin standard dominated China for almost ten centuries. With the country's economic development, copper *cash* alone no longer met the market need (for both quantity and convenience as regards long-distance trade), and the currency composition diversified. A major change was the wide use of silver ingots. China was not a silver producing country but from the 16th and 17th centuries, with the development of trade and the influx of foreign silver, the latter became an important part of the monetary system.[3] By the time of the Qing Dynasty the currency system had consolidated into a system comprising copper *cash* and silver. The state monopolized the production and supply of copper *cash*, while silver circulated in bullion form.[4] There was no state coinage of silver and the supply of silver depended completely on markets and trade.[5] Copper *cash* were used in daily exchanges, while silver ingots were more often used in long-distance trade or saved as a store of value.[6] Silver bullion and copper *cash* were loosely linked by an exchange ratio, which was flexible but was always maintained at a certain level.[7][8]

The commodity money system encountered two challenges after the 19th century, one from within and one from the outside. First, the monetary system gradually decentralised. During the 19th century the price of copper increased, and the minting of

[2] Copper *cash* (or *cash*, or standard *cash*) was a full-bodied bronze coin with a round shape and a square hole in the middle. Being full bodied means that copper *cash* basically circulated according to its intrinsic value, despite the fact that they circulated by tale (by counting). Since all copper *cash* were of only one denomination (1 wen), they all counted as units in a total; and the value of copper *cash* served as the unit of account. There was no face value on the bronze coin (since they all carried the same value). Instead, the words cast on the coin often indicate the time (name of the Emperor's reign) and place (name of the mint) of issue. Dynasties changed and so did the words inscribed on the *cash*. However, the use of bronze coins lasted throughout (and even beyond) the imperial epoch. Frank H. H. King, *Money and Monetary Policy in China, 1845-1895*(Cambridge, Mass: Harvard University Press, 1965), 52.

[3] Richard Von Glahn, "Myth and Reality of China's Seventeenth-Century Monetary Crisis," *The Journal of Economic History* 56, no. 2 (1996a): 48-9, 113-4.

[4] Official silver coinage started in 1890 (initiated from Guangdong Province), but silver ingots and foreign silver dollars continued to circulate. Throughout the Qing dynasty, silver did not have to be coined before it could circulate. Xinwei Peng, *A Monetary History of China (Zhong-Guo Huo Bi Shi)* (Shanghai: People's Press, 1958), 521-51.

[5] Man-houng Lin, "Latin America Silver and China During the Daoguang Reign," in *Asian Historical Economics Conference*(Hitotsubashi University, Tokyo, Japan2012), 15-6.

[6] Akinobu Kuroda, "Concurrent but Non-Integrable Currency Circuits: Complementary Relationships among Monies in Modern China and Other Regions " *Financial History Review* 15, no. 1 (2008): 19.

[7] Peng, *A Monetary History of China*, 566-72.

[8] Scholars such as Peng and King characterize this system as a 'parallel bimetallic system' of which the relative values of silver and copper *cash* 'were determined by market forces', ibid., 521. King, *Money and Monetary Policy in China*, 57.

full-bodied copper *cash* incurred a loss, instead of a profit, to the state vault.[9] In the meantime, natural calamities intensified and domestic rebellion escalated, putting the state in serious financial difficulty. Expenditure on the state mints, provincial mints in particular, was curtailed; the latter were entirely left to provincial governors' own devices (the provinces funded their own mints, produced coarser coins, or encouraged the use of banknotes).[10] Second, the bimetallic relationship of silver and copper *cash* was destabilized. Following the permanent drop in the price of silver in the international market (a result of the demonetization of silver after the 1870s and the discovery of new silver deposits in the Rocky Mountains), the exchange ratio between silver and copper *cash* not only permanently dropped, but also became increasingly volatile.[11] The central government did not act, and the provincial governments tried to tackle the issue by introducing their own silver and copper coinage minted with steam power techniques. This was a fresh attempt to control the number and value of the coins in circulation. However, without central coordination and with a common drive for profit, silver dollar coinage turned into a game of competitive depreciation and copper coins became seriously over-issued.[12] The regionalisation of the monetary system continued in early Republican China. The Beiyang government (1912-28) centralised silver dollar coinage and the silver dollar minted by state mints became popular.[13] Banknotes (issued by private Chinese banks and foreign banks[14]) convertible to silver were also widely used.[15] By 1927, however, the currency system was still 'a complicated mixture of

[9] Hon-wai Ho, "From the Cheap Silver and Copper Famine to the Depreciation of the Copper Coinage - the New Currency Issue and Its Consequence in Late Qing (Cong Yin Jian Qian Huang Dao Tong Yuan Fan Lan - Qing Mo Xin Huo Bi De Fa Xin Ji Qi Ying Xiang)," *Bulletin of the Institute of History and Philology Academia Sinica (Zhong Yang Yan Jiu Yuan Li Shi Yu Yan Yan Jiu Suo Ji Kan)* 62, no. 3 (1993): 395.

[10] Ibid., 393-5.

[11] The silver price in the London market dropped even more drastically after 1890: from 48.375 pence per ounce of silver in 1890 to 27.844 in 1904. "Global Financial Data," (Online historical database).

[12] Qichao Liang, "Concise History of the Excessive Provincial Copper Coinage (Ge Sheng Lan Zhu Tong Yuan Xiao Shi)," in *Collected Works of Yinbingshi, with Annotation (Yin Bing Shi Wen Ji: Dian Jiao)*, ed. Song Wu(Kunming: Yunnan Education Press, 2001).

[13] The dollar minted by the state mint was called 'Yuan Shikai dollar', named after the President of the Beiyang Government. Akinobu Kuroda, "The Collapse of the Chinese Imperial Monetary System " in *Japan, China, and the Growth of the Asian International Economy, 1850-1949*, ed. Kaoru Sugihara(Oxford; New York: Oxford University Press, 2005).

[14] Half the banknotes were issued by foreign banks. Thomas G. Rawski, *Economic Growth in Prewar China* (Berkeley: University of California Press, 1989), 134-5.

[15] Debin Ma, "Money and Monetary System in China in the 19th-20th Century: An Overview " *Economic History Working Paper Series, London School of Economics* 159/12(2012): 14.

silver coins and weights, fluctuating copper coins and paper money, all varying from place to place'.[16]

In 1928, when the Nationalist Government in Nanjing became the legitimate central government in China, steps to reforming the monetary system were hastened. The Central Bank of China was established in Nanjing in 1928 and a supervision committee was set up to ensure that banks maintained adequate reserves behind their note issues. In 1933, the tael was abolished and the silver dollar became the exclusive unit of account. In 1935, China abandoned its traditional silver standard and adopted a managed currency system. The new Chinese dollar (CHD), also called the Nationalist Yuan or *fabi*,[17] became the legal tender of the Republic of China. The new Chinese dollar was a managed currency, backed by foreign exchange: it had a fixed exchange rate with the British pound as well as the US dollar. The government banks were to keep the exchange value of the currency at this level and to this end they would buy and sell foreign exchange in unlimited quantities.[18] *Fabi* were issued by government banks,[19] and the banknotes issued by other banks were gradually retired. By 1936 the notes issued by foreign banks had shrunk to 8% of the total number of notes in circulation.[20][21]

The currency reform proceeded successfully for the first twenty months until the outbreak of the Second Sino-Japanese War in 1937. The Nationalist Government moved to the interior (Free China); and puppet regimes were set up in Japanese occupied areas. Although *fabi* was still used in the occupied area, puppet governments soon issued their own currencies to gradually replace the use of *fabi*. These currencies were inconvertible. The free exchange of *fabi* was also suspended during the war. During the wartime period, inflationary monetary policy became the most obvious way of raising funds and sustaining the war. These depreciated the fiat currencies competing in their area of

[16] Arthur N. Young, *China's Wartime Finance and Inflation, 1937-1945*(Cambridge: Harvard University Press, 1965), 3.
[17] *Fabi* means legal tender in Chinese. Kia-ngau Chang, *The Inflationary Spiral: The Experience in China, 1939-1950* (Cambridge: Technology Press of Massachusetts Institute of Technology, 1958), 3-4.
[18] The exchange rate of fabi was anchored at 1 CHD = 0.3 USD = 14 ½ d. Frank H. H King, *A Concise Economic History of Modern China (1840-1961)*(Bombay: Vora, 1968), 138.
[19] The four government banks were the Central Bank of China, Bank of China, Bank of Communications and the Farmers Bank of China.
[20] Rawski, *Economic Growth in Prewar China* 135.
[21] The provincial and local banks had some problems, too, the number being limited to a fifth of the total. Young, *China's Wartime Finance and Inflation*, 135.

circulation, just as the regimes all competed to be the one legitimate government in China. After the Second World War and the retreat of Japanese troops in August 1945, the Nationalist Government was restored in Nanjing and *fabi* again became the sole legal tender of the country. However, the currency experienced hyperinflation during the subsequent civil war, and was replaced by a new currency in 1948. Still hyperinflation continued, even after the Nationalist Party and its troops fled to Taiwan just before the establishment of the Communist Regime.[22]

Episodes under examination and outline of the chapters

This thesis studies the period of monetary transition and analyses three of the critical episodes in the transitional period. The first chapter looks at the inflation puzzles of the 1850s when China was still under a metallic monetary standard. The second chapter examines the problem of small coin shortage at the end of the nineteenth century, and shows how the new copper coinage minted under steam power solved the problem. The third chapter focuses on the behaviour of holders of different currencies during the wartime inflation period between 1937 and 1945. Various methods and kinds of evidence are used in the thesis. Below I provide more detailed summaries of the arguments and findings of each of the above chapters.

Chapter 1 Reassessing the Xianfeng inflation (1853–1861): government finance and monetary instability in early modern China

This chapter examines the new monetary policies introduced during the fiscal crisis of the 1850s and the subsequent inflation (the Xianfeng inflation). In the 1850s the Qing government encountered unprecedented fiscal stringency due to huge military outlays which it could not afford. Even the mint output of standard copper *cash* dropped and eventually stopped as the supply of copper ingots from Yunnan was cut off by the Taiping rebels.[23] As a result the government resorted to different methods of money creation (debased coinage and government paper notes) in order to cover the deficit, leading to serious inflation in the metropolitan Beijing area.

[22] Shun-hsin Chou, *The Chinese Inflation, 1937-1949* (New York: Columbia University Press, 1963), 25-8.
[23] King, *Money and Monetary Policy in China*, 144-6.

The Xianfeng inflation is well known to historians because it was one of the highlighted outcomes of some important historical events (two Opium Wars, the Taiping Rebellion and the opening of the treaty ports) that marked the start of modern Chinese history. However, documents concerning this period have not been well preserved and have been even less well studied. This seemingly well-known event in fact contains a number of unresolved puzzles. One fundamental puzzle is how the government was able to manipulate money when China was under a bimetallic monetary standard in which only the supply of copper *cash* was under state control.

The chapter examines archival materials including government memorials, treasury records and account books, and compiles new data series of the money creation and annual money stock in Beijing; it thereby re-investigates the nature of the new monetary policies and their market behaviour. It argues that the inflation resulting from coinage debasement combined with government debt default, rather than deriving directly from the increased quantity of money.

Chapter 2 The Big Problem of Small Change in Late Imperial China (1890-1910): Silver inflow, rural deflation, and how it was solved by steam power technology

The second chapter examines the problem of shortage of small coin at the end of the nineteenth century. The drastic drop in the price of silver, together with China's integration with the international market, permanently destabilized the traditional silver-copper *cash* system. The Chinese economy suffered constantly from a shortage of 'small money' (i.e., copper *cash*) because of the higher cost of minting them compared with that of minting coins with higher values.

The chapter looks into the archives of the Imperial Customs Service and identifies a monetary shortage in rural areas in particular. It argues that the introduction of debased copper coinage manufactured by steam power successfully solved this monetary problem. Unlike the previous case of debased big *cash* (during the Xianfeng inflation), which immediately invited counterfeiting, the new technology allowed the state to mint sufficient copper coins at an affordable cost and without inviting forgery.

The chapter compiles a dataset of monthly grain prices at the prefectural level, and applies a differences-in-differences estimation to test the impact of the institutional shocks on the regional economy before and after the introduction of the new coinage, demonstrating that the introduction of new coinage helped to ease the monetary stringency in the countryside and acted as a positive shock to the economy.

Chapter 3 The Second World War and Chinese Money Holders (1937-45): how did the wartime situation affect people's money holding behaviour?

This chapter identifies through the eyes of contemporary Chinese money holders the events that were considered important to the credibility of money during the war. It was a period when currency reform was successfully introduced and paper money became the only legal tender. During the war the country was split into competing political regimes, all issuing their own fiat currencies.

The chapter applies structural break estimations on the series of real demand of money in Free China and in Japanese-occupied China (1937-45). It detects a problem during the war of asymmetric information across different monetary regimes, as the reaction in the Shanghai market to the same historical event usually preceded that in Chongqing. It also reveals that after the attack on Pearl Harbour, the divergence of interests between Free China and the Japanese-occupied parts of China increased. In addition, the people in Free China were more affected by domestic news (news that threatened the existence of the National Government); whilst in the occupied areas people's expectations were closely tied to the Japanese military advance, above all in the Pacific theatre.

Outline

Chapter 1 deals with monetary policies during the Xianfeng period and the inflation mechanism. Chapter 2 discusses the small change problem at the end of the nineteenth century. Chapter 3 focuses on the behaviour of fiat money holders in wartime. In the conclusion, I examine again the relationship between state and money, with examples from the above three historical episodes.

Chapter 1 Reassessing the Xianfeng Inflation (1853-1861):

Government finance and monetary instability in early modern China

1.1 Introduction

When Xianfeng (r. 1851-61) succeeded his father Daoguang (r. 1821-50) as the seventh Emperor of the Qing Dynasty, he should have realised that the Celestial Empire was no longer the formidable kingdom it once was. The country had just been defeated in the First Opium War (1839-41) and had paid a massive indemnity.[24] It was still facing a series of domestic insurgencies and declining tax revenues caused by bad harvests and the difficulty of collecting taxes in riot-torn areas. Military outlays and expenditure on disaster relief and the like greatly outpaced the fiscal capacity of the ancient state. In 1853, the Taiping rebels occupied several southern provinces in the lower Yangtze Delta (the richest agricultural area) and established their capital in Nanjing,[25] to bring the fiscal difficulties of the central government in Beijing to a climax: the stock of silver in the Treasury was depleted and the government was not able even to pay its troops and government officials.[26] Other methods were not readily available, for the Chinese empire had no well-defined way of borrowing. Instead, drastic monetary policies, minting coins and the issuing of government notes, were used to quickly multiply the quantity of money. Facing serious fiscal stringency, the Qing government resorted to expansionary monetary policies, which led to inflation and market disorder that lasted for more than a decade.[27] For a pre-modern society the inflation rate was high: from 1854 to 1861 grain prices increased six to eight times over, and in 1862 the price level

[24] The total indemnity of the Opium War was 21 million silver pesos, which was approximately 14.7 million silver taels, or 5,075,000 British Pounds (using the formula that 1 peso equals to 4 shillings 10 pence). The average annual government income was around 45 million silver taels (including incomes for central and local government, as well as grain tributes which were paid in kind). Zeyi Peng, *Public Finance and Economic Condition of Late 19th Century China (Shijiu Shiji Houbanqi De Zhongguo Caizheng Yu Jingji)* (Beijing: People's Press, 1983), 9. Zhihong Shi, *Statistics on the Income, Expenditure and Stocks of the Treasury under Board of Revenue in Qing Dynasty (Qingdai Hubu Yinku Shouzhi He Kucun Tongji)*(Fuzhou: Fujian People's Press, 2009), 42-3.

[25] King, *Money and Monetary Policy in China*, 144.

[26] People's Bank of China Financial Archive Division, ed. *Selected Archive in Modern Chinese Monetary History, Vol. I. Late Qing Period (1840-1911) (Zhong-Guo Jin Dai Huo Bi Shi Zi Liao 1840-1911)* (Beijing: Zhonghua Book Company, 1964), 341.

[27] Opinions differ as to when the crisis ended. Although the crisis is commonly known as the 'Xianfeng' inflation, some scholars consider 1868 to mark the end of the crisis (Peng 1983) although the Emperor Xianfeng died in 1861. Others refer to 1861 as the end (King, 1965). The whole money-creation scheme was abandoned by the end of Xianfeng's reign in 1861, although the repercussions of the crisis lasted much longer. Some of the new types of monies created were still in circulation after 1861 and the debased coinage continued until 1889. This paper considers 1853-61 to be the period of crisis, but the period after 1861 will also be the subject of investigation since repercussions followed the crisis. Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 87. King, *Money and Monetary Policy in China*, 144-63.

stabilized at a level five times higher than the pre-crisis level.[28] This event is remembered in history as the 'Xianfeng Inflation'.

In fact, the decade following the period of the First Opium War and the Taiping Rebellion marks the beginning of China's modern history. The Qing government was forced to introduce a series of reforms to the traditional monetary and fiscal system. However, due to the lack of power and the limited knowledge of modern monetary and fiscal systems, the early measures of reform were far from well-designed, nor were they carefully executed over the whole country. Most of the measures hastily carried out by the central government during the 1850s and 1860s met with setbacks and brought about chaos. The monetary policies introduced during Xianfeng's reign (1851-61) and the ensuing Xianfeng Inflation (1853-61) illustrates this. The Xianfeng Inflation is often cited by researchers studying the monetary history of early modern China. For monetary economists, it is an interesting period because the government was unprecedentedly active in the field of monetary policy. Zeyi Peng has accomplished remarkable work in three articles based on his careful study of the archives of the Qing Dynasty.[29] Frank King's book chapter on the Xianfeng period and Jerome Chen's article are also exemplary.[30] King's chapter provides the most in-depth discussion of the post-inflation monetary system in Beijing. Most writers understand this event as the government's using expansionary monetary policy to achieve its fiscal ends. Inflation followed, which also redistributed the nation's wealth in the government's favour and to the disadvantage of the common people. Peng argues that the fiscal need created by the military operations against the Taiping Rebellion was the main factor in the issue of notes and the minting of debased coins, and that these 'exploitative' methods caused inflation and damaged the common people's standard of living.[31] Chen devotes a quarter of his article to describing the fiscal deficit problem and in his conclusion points out again that 'the inflationary measures made it possible to carry on the military

[28] For grain price index, please see Figure 1-11, p.51.
[29] The three articles deal with three issues: the central government's treasury account, the Xianfeng inflation and the military expenditure. Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 24-137.
[30] King, *Money and Monetary Policy in China*, 144-63. Jerome Chen, "The Hsien-Feng Inflation," *Bulletin of the School of Oriental and African Studies* 21(1958): 578-86.
[31] Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 87.

operations of the day, at the cost of disrupting the financial system of the country as a whole.'[32]

However, previous studies have raised as many questions as they have answered. The monetary system in pre-modern China was a traditional commodity money system composed of silver and copper *cash*, and the government had very limited control over the money supply.[33] The fiscal scheme of a monetary policy is normally of two kinds: financed by seigniorage revenue or by inflation (to reduce government debt). At first glance it appears that in the reign of Xianfeng the Qing government did both (big *cash* for seigniorage and paper notes to induce inflation). However, on second thoughts, we find that an increase in neither the seigniorage revenues nor inflationary finance could be easily achieved when the government had such limited control over the money supply. Moreover, under a commodity monetary system, how did the government persuade the market to accept depreciated or even worthless money, causing the serious inflation that it did?

Historical documents concerning this period were not well preserved and have been studied even less well. The seemingly well-known events in fact contain many unresolved puzzles. Two puzzles should be addressed first to fully understand this area of history. First, did the Xianfeng monetary policy achieve its fiscal ends? How much revenue was generated by monetary expansion and was it enough to cover the military outlay? Second, given the monetary confusion, by what mechanism did the inflation develop?

This paper re-examines the history of the Xianfeng Inflation with a statistical investigation of the Xianfeng monetary policies. It looks into various archival materials, analyses the structure of public finance, and compiles data tables showing both the amount of money issued and their market exchange prices. It then compares the growth trend of the money stock with the trend of retail price rises in Beijing, and finally proposes an alternative explanation of the inflation mechanism. The inflation resulted from two separate policy processes: coinage debasement and the issue of government

[32] Chen, "The Hsien-Feng Inflation," 586.
[33] The government monopolized only the issue of copper *cash* which constituted less than 20% of the total money stock in terms of value.

paper (which led to a financial crisis). The paper notes issued by the government were really government debts that were made tradable on the market. The major inflation was generated by the market expectations of a government default rather than by the increased money stock per se.[34]

This paper contributes to the existing literature in several ways. First, it investigates new archives and collects market information to form a more vivid picture of the events and to clear up the puzzling parts of the story. Second, by calculation and reasoning the paper disentangles the mechanism of the inflation, which is the essential part of the history and is often overlooked by previous writers. Third, the research helps to explain the government's reserved attitude and the market's sceptical reactions to the monetary innovations (for instance, the new copper coinage and the introduction of government fiduciary money) in subsequent years.

The rest of the present paper is organised as follows: Section 1.2 sets out the historical and institutional background; Section 1.3 examines the Xianfeng monetary policy with the help of monetary and price data newly constructed from archival materials. It looks at the function of the newly created money in government finance, as well as the impact of the money in the market; using the data and calculations from Section 1.3, Section 1.4 seeks to solve the above two puzzles: whether the monetary policy achieved its fiscal ends and by what mechanism did the inflation develop in Beijing. Section 1.5 concludes. Detailed discussions on the available archival sources, data reconstruction and calculation are provided in Appendices A-D (Section 1.6).

[34] Dates using the Chinese traditional calendar differ from those of the modern calendar. In a Chinese calendar, a date is expressed by a combination of the number of days, the number of month and the number of regnal years. For example: the 27th day of the 2nd month of the third year of Xianfeng is 5 April 1853 in the Gregorian Calendar. Because most of the archival materials (account books in particular) were all recorded using the Chinese traditional calendar, this paper also follows the practice. In this paper, the same historical date will be expressed as: [Day27, Month2, XF3], or [Day27, Month2, 1853], both indicating a Chinese calendar year, unless stated otherwise. For more details please see Appendix A (explanations of archival and Chinese dates) and the table of Chinese regnal years (Appendix A 1-1).

1.2 Historical and institutional context

In the nineteenth century, significant economic and political changes took place in China: the impact of foreign powers was clearly felt through trade and military conflict, notably during and after the Opium Wars (1839-42 and 1856-60). Internal conflicts grew increasingly frequent and intense. Both internal and external pressures called for a fiscally modernised state, which the Qing government was obviously failing to deliver. A crisis in public finance loomed at the beginning of the 1850s.

Incapable of offering timely fiscal reform, the imperial government attempted to remedy the fiscal deficit with a series of new monetary policies. In 1853, the central government introduced several new types of monies into the market, including debased coins, government paper and the operation of official banks. The monies were not well received in the market and they allegedly led to serious inflation in the Beijing area. Having accelerated since 1858, inflation reached its highest level in the summer of 1861. After the crisis, banks folded and the market took a while to stabilize: the price level dropped in 1862, and stabilized at a level which was five times higher than the pre-crisis price level.[35]

This section offers a brief account of the historical context and the fiscal and monetary systems in the late Qing period, and the mounting crisis faced by the ancient system from the 1850s.

1.2.1 Socioeconomic challenges of the nineteenth century

The crisis in public finance in the mid-nineteenth century is the major reason for the new monetary policies. While public expenditures escalated, the tax capacity of the state remained at its pre-modern level. Behind the increasing fiscal crisis, some deeply-rooted political and economic changes (economic depression and trade deficits) had been evident since the beginning of the century, undermining the fundamentals of the Chinese fiscal institutions.

[35] For price level indicators please refer to Figure 1-9 and Figure 1-10, p.49. For descriptions on market chaos please see: Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 101.

The country had been experiencing economic difficulties throughout Daoguang's reign (1821-50). This period was marked by less agricultural activity, a drop in commodity prices, reduced demand for farm products, and the appearance of credit crises.[36] Apart from the increased frequency of natural disasters, many studies attribute this depression to outflow of silver resulting from a long-term unfavourable balance of trade (mainly because of China's import of opium). Whether or not opium was the culprit has often been contested,[37] but it is true that, along with the increased foreign trade activity, China suffered from a trade deficit that resulted in silver outflows. It is estimated that during the period 1808-56 the net silver outflow had reached as much as 384 million silver dollars (approx. 276.48 million silver taels),[38] and the market exchange ratio between silver and copper *cash* more than doubled: from 1040.7 *cash* per tael in 1801 to 2230.3 in 1850.[39]

The shortage of silver discouraged production and interregional trade. In addition, taxes were collected in silver, whereas the majority of taxpayers, the farmers, usually earned their income in the form of copper *cash*.[40] The appreciation of silver against copper *cash* meant that farmers needed more copper *cash* to exchange for a tael of silver, increasing their real tax burden.[41] Therefore during the first half of the nineteenth

[36] The notion of the 'Daoguang Depression' was coined by Chengming Wu in 1997, and examined by many scholars such as Mio Kishimoto and Man-houng Lin. There are debates on whether this should be called a 'depression' as well as about the causes of the phenomenon, but it is agreed that during Daoguang's reign the whole country witnessed a continued fall in the money supply, agricultural output and commodity prices. Mio Kishimoto, "Foreign Silver and China's Domestic Economy During the First Half of the 19th Century," in *Asian Historical Economics Conference*(Hitotsubashi University, Tokyo, Japan2012), 23-6.

[37] Recent studies (by Lin Man-houng, Von Glahn and Irigoin) attribute the depression to the change in foreign silver supply, because of the Napoleonic Wars and the Latin-American independence movement. Ibid., 1-4.

[38] This is Lin Man-houng's estimate, although according to Von Glahn, the estimate is exaggerated. Von Glahn's own estimation is a net outflow of only 22.608 million taels. Kishimoto reckons that the point of debate should not be the amount of net flow, but a change in the speed of the silver inflow. As in many ancient countries in the Middle and Far East, silver was used as a store of value as much as a means of payment. Silver therefore tended to flow from Europe to other countries and never flowed back. China's economy relied on a constant inflow of silver. Thus a reduced speed for the silver inflow – which eventually turned negative – was detrimental to the Chinese economy. Richard Von Glahn, "Monetary Demand and Silver Supply in 19th Century China,"ibid., 95; Man-houng Lin, "China Upside Down: Currency, Society, and Ideologies, 1808-1856,"(2006). Kishimoto, "Foreign Silver and China's Domestic Economy During the First Half of the 19th Century," 27-9.

[39] Exchange ratios varied in different places. This figure is taken from the account book of a grocery shop in Ningjin County of North China. Zhongping Yan, *Selected Statistics in the Economic History of Modern China*(Beijing: Science Press, 1955), 37.

[40] Lin, "China Upside Down," 10-11.

[41] During Daoguang's reign, while the exchange rate between silver and copper *cash* almost doubled, the agricultural prices did not show obvious change. Kishimoto, "Foreign Silver and China's Domestic Economy During the First Half of the 19th Century," 30.

century, farmers' lives became extremely difficult, first because of the reduced income from bad harvests and reduced market demand, and second because of their increased tax burden produced by the increase in the exchange ratio between silver and copper *cash*.[42] Tensions arose between taxpayers and the state. The government had to face the dilemma of reduced tax revenue (by cancelling tax payments in difficult areas) and the possibility of a large-scale uprising. Eventually, government tax income was indeed curtailed. However internal conflicts, instead of being resolved, became increasingly severe and spread through the country.

1.2.2 Public finance in crisis

It is clear that in the nineteenth century the Qing government witnessed a structurally enlarged disparity between income and expenditure. However, in facing this changing world, the fiscal system was so rigidly designed that it was not able to cope with these economic changes and the subsequent deficit issue.

Fiscal structure and its defects

There are three main issues concerning the incompetency of the old fiscal regime: the rigidity of the sources of tax revenue, the relation between income and expenditure, and the power imbalance between central and local governments.

The main sources of tax revenue included the land and pool taxes (*tianfu* or *diding*, land and population tax), the grain tributes (*caoliang*), the salt tax and the merchandise taxes (maritime and inland tariffs). Apart from grain tributes that were collected in kind, the

[42] During 1830s and 1840s, numerous memorials depicted tax payment difficulties following the silver shortage and the increasing exchange rate between silver and copper *cash*, and the majority of the memorials came from the provinces of Jiangsu and Zhejiang. For example, Mr. Sun's memorial [Day11 Month9 DG12] described the general difficulty for merchants and farmers to pay taxes due to 'cheap *cash* and expensive silver'. Zexu Lin (the man who later became government special commissioner and burned opium in Guangdong Province, igniting the Opium War), the then viceroy of Jiangsu Province also submitted memorial [Day6 Month4 DG13] in demanding the government to mint its own silver coins, as well as to ban silver outflow, in order to suppress the escalating silver-copper exchange ratio. Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 9-39. The southeast coastal provinces (Jiangsu, Zhejiang, Fujian and Guangdong) might be the area mostly affected by the change of exchange ratio because of their active engagement in trade. The market rate in these areas exceeded the official rate between silver and copper *cash*. However, merchants and farmers could rarely take advantage of the discrepancy between official and market rates, as calculating government officials would demand taxation payment in market rate instead. In fact as long as the market and official rate differed, government officials always demanded taxation being paid by the 'undervalued' money and profited personally. The actual amount of tax payment depended on the negotiation between government officials and tax payers and their relative bargaining power, which varied from place to place.

taxes were all collected in silver.[43] The taxation system did not change much from the beginning of the Qing Dynasty until the 1850s. Land and poll taxes constituted almost 80 per cent of the total tax revenue, and the amount of land and poll taxes levied each year had been fixed by law since 1712 and had never changed.[44] In the early 1850s, the population more than doubled the number in the early eighteenth century,[45] while the revenues from the land tax did not increase proportionately. In the nineteenth century this important source of government revenue even dropped: frequent crop failures meant that many provinces were not able to pay their land tax in time. Throughout the 1840s, in particular, frequent bad harvests delayed the collection of land tax.[46]

The collection of salt tax suffered from an increase in salt smuggling.[47] With the growth in trade and business activities, merchandise tax should have been an important source of revenue. However, the inland tariff collection suffered from systemic corruption,[48] and an effective maritime customs service was only established in 1854.[49] The inadequate taxation system made it certain that government revenue would not benefit from good years when it came to difficult times, such as a bad harvest or war.[50]

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[43] Xianglong Tang, "The Fiscal System in Pre-Opium War China (Yapian Zhanzheng Qianxi Zhongguo De Caizheng Zhidu)," in *Selected Thesis on Modern Chinese Fiscal and Economic History (Zhongguo Jindai Caizheng Jingjishi Lunwenxuan)*(Chengdu: Southwest University of Finance and Economics Press, 1987), 53-60.

[44] Chen, "The Hsien-Feng Inflation," 578-9. In the original text the land and poll taxes was referred to as 'land and pool taxes', which might be a typo.

[45] The total population of China was 436.1 million in 1851. There is no census or population estimate for around the year 1712, but we do know that in 1679 it was 160 million, and that the figure rose to 331.5 million in 1776. Shuji Cao, *Population History of China: Qing Period (Zhongguo Renkoushi: Qing Shiqi)* (Shanghai: Fudan University Press, 2001), 832.

[46] Lin, "China Upside Down," 133-4. King, *Money and Monetary Policy in China*, 144-5.

[47] Chen, "The Hsien-Feng Inflation," 579.

[48] Ibid.

[49] The Chinese customs offices included inland customs (*Changguan*, also called native customs) and maritime customs (*Haiguan* or *Jianghaiguan*). The inland customs was a long-established institution of the state. Before 1842, the government imposed a partial ban on maritime activities (*haijin*). The only maritime customs office was set in Guangzhou ('Canton' to the foreign merchants of the day) in the southeast of China, and the receipts formed part of the revenues of the Imperial Household (*Nei wu fu*), not the government revenue. After 1842, following the Treaty of Nanking, maritime customs were established in treaty ports. It was after 1854 that an effective Imperial Customs Service (the Inspector General system) was gradually established, by a British-dominated bureaucrat. Frederic Wakeman Jr., "Chapter 4 - the Canton Trade and the Opium War," in *The Cambridge History of China Volume 10: Late Ch'ing 1800-1911, Part 1*, ed. John K. Fairbank(Cambridge: Cambridge University Press 1978), 163-4. Ruixue Jia, "The Legacies of Forced Freedom: China's Treaty Ports," *IIES working paper, Stockholm University* (2010): 16-7. R. A. Brickers, "Purloined Letters: History and the Chinese Maritime Customs Service " *Modern Asian Studies* 40, no. 3 (2006): 691.

[50] Precisely because the rate of official taxation was low, other means of 'quasi-taxing' such as land surtax and rent extraction were used to support administrative costs. However, instead of adequately increasing public income, these informal revenues were often tainted by personal corruption and gave rise to local resentment. Loren Brandt, Debin Ma, and Thomas G. Rawski, "From Divergence to Convergence:

Second, in terms of the relation between income and expenditure, budget and deficit had never been part of the traditional concept of Chinese fiscal policy. Instead, the Chinese fiscal concept is 'to live within one's means' whereby the government tailored the amount of expenditure according to the estimate of its annual income. Three-quarters of the estimated income would be divided under specific expenditure headings, leaving a quarter of the income for emergency use.[51] This practice seemed a very conservative and stable policy in the good old days of peace, when bad harvest years were only occasional.[52] However, this conservative fiscal concept, coupled with the rigid revenue structure, promoted a low fiscal surplus. During times of sudden increase in expenditure, such as the 1840s-1850s, the small surplus was soon depleted.

But certain measures were available to temporarily increase fiscal income during abnormal years. The two biggest sources of occasional income were *juanna* and *baoxiao*. *Juanna* is the sale of government offices (or titles). *Baoxiao*, also called *juanshu*,[53] is a type of contribution from wealthy merchants (more often than not a forced contribution from merchants in a monopoly business, such as salt sales) to the government to finance a particular project such as army munitions, disaster relief, or water conservation projects.[54] It is estimated that, during the thirty years of Daoguang's reign (1821-50), government income from *juanna* exceeded 33 million taels (more than one million per year), of which more than 18 million went into the Imperial Treasury as central government income.[55] Records show that during the reign of Jiaqing (1795-1820) income from *baoxiao* was around 26 million taels (also more than one million per year).[56] Still, these occasional incomes are quite different from methods of tax

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Re-Evaluating the History Behind China's Economic Boom," *Department of Economic History Working Paper Series, LSE* 158, no. 12 (2012): 52.

[51] Takeshi Hamashita, *Studies on Economic History of Modern China: Public Finance of Late Qing Maritime Customs and Treaty Port Market Network (ChūGoku Kindai Keizaishi Kenkyū : Shinmatsu Kaikan Zaisei to KaikōJō ShijōKen, Chinese Edition)* (Nanjing: Jiangsu People's Press, 2006), 47-8.

[52] This seemingly virtuous fiscal regime resulted from centuries of peace and unity, and a small bureaucracy. The taxation structure was designed during the heyday of the empire (when Manchu rulers appeased aggressions from the north and never dreamed that stronger threats would come from the sea), and would soon be tested in the nineteenth century.

[53] Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 148-9.

[54] Madeleine Zelin, *The Magistrate's Tael: Rationalizing Fiscal Reform in Eighteenth-Century Ch'ing China* (London: University of California Press, 1984), 54.; Tang, "The Fiscal System in the Pre-Opium War China," 61.

[55] Also called '*juanshu'*, "The Fiscal System in the Pre-Opium War China," 60.

[56] Feng Chen, *Papers on the History of Qing Public Finance (Qing Dai Cai Zheng Shi Lun Gao)*(Beijing: The Commercial Press, 2010), 108-9.

smoothing. At the time, methods such as public borrowing were not yet developed to weather 'fiscal storms'.[57]

Third, in terms of the balance between central and local government, the fiscal power of central government was supreme in the administrative structure but rather limited in practice. Administratively, the fiscal system was highly centralised, more so before 1840: the central government (Board of Revenue[58]) was in charge of setting the amount of income and expenditure for each year and the division between central and local administration. However, it was in practice rather a 'bottom-up' process. Local magistrates were responsible for tax collection. Provincial governments would keep part of the tax revenue for local use (the daily functioning of the local governments and the provision of public goods); and sent a certain amount as 'fiscal assistance' to other provinces, according to the central directions for its allocation;[59] only the remaining part of the tax revenues (around 20-30 per cent of the total national revenue) would be sent to the Board of Revenue in the capital. This part of the revenue, known as the 'capital revenue' (*jingxiang*), was stored in the Imperial Treasury, and was mainly for the maintenance of the central government and for major military expenditure, as well as some immediate spending (for instance on disaster relief and war indemnities).[60] The Board of Revenue allocated, rather than controlled, the tax revenues. Regional governments, however, had a firmer grip on the sources of revenue. Although local governments usually had to obey the central government, the provincial viceroys were not accountable to the director of the Board of Revenue, but on equal terms. A subtle antagonism between the two was perceptible. In times of domestic turbulence, tax revenues were quite often kept at the local level and never reached the capital. Various reasons or excuses were provided: the money might be used for local military purposes, or it might be claimed that rebels had intercepted the money en route.

[57] The traditional Chinese government did not borrow (explicitly). The first foreign debt dated back to 1854 (negotiated between Chinese and foreign merchants on behalf of the local government in Jiangsu Province) and the first government debt was issued in the 1890s.

[58] Board of Revenue, called *hubu* in Chinese pronunciation, can roughly be understood as the Treasury Department of the Chinese empire.

[59] Known as '*'xiexiang'* in Chinese.

[60] The central government revenue is called '*jingxiang'* (capital revenue) in the original government documents. Shi, *Treasury Statitstics* 25-33. Zhiyong Ren, "A Study of the Silver Vault of the Ministry of Revenue in the Late Qing and Its Reform after the Boxer Uprising (Lun Shu Wan Qing Hu Bu Yin Ku Zhi Du Yu Gen Zi Zhi Hou De Bian Ge)," *Studies in Qing History (Qing shi yan jiu)*, no. 2 (2005): 47.

Growing deficit and crisis of 1853

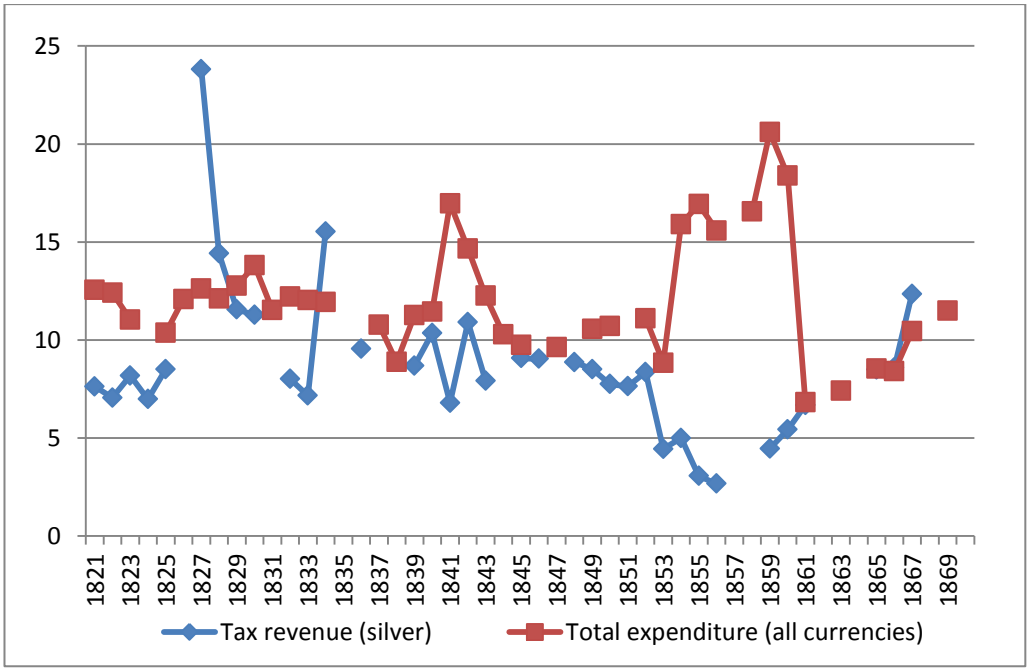
From the 1840s on, military conflict created a huge increase in expenditure. After the costly First Opium War (1839-42), the government had to pay a total indemnity of 21,000,000 Spanish silver dollars,[61] which was approximately 14,700,000 silver taels.[62] Domestic military expenses were even higher than that caused by foreign forces. Internal conflicts, increasingly frequent, and intense: regional uprisings mushroomed, amongst which the Taiping Rebellion (1850-64) caused the most damage to the economy. The Nian Rebellion (1851-68) in the north and the Mohammedan Rebellion (1853-74) in the southwest were also long-lasting and damaging.[63] Take the Taiping Rebellion, for example: the military expenses to the central government for the first three years alone (from the end of 1850 to the summer of 1853) amounted to 29,630,000 taels. A non-exhaustive study shows that the expenditure on the Taiping Rebellion from the central government's vault alone was 170,604,104 taels at the very least, not to mention the much higher figure spent by local governments.[64] Because of continued unexpected natural calamities, such as a sudden change in the course of the Yellow River in 1852, expenditures of government relief money also increased.[65]

These expenses immensely exceeded the government's fiscal capacity, which was already affected by a delay or cancellation of land tax payments because of crop failures in the 1840s.[66] From 1820 to 1850, the average annual government revenue was around 45,000,000 taels per year,[67] of which the average amount of revenue that reached the central government in Beijing (measured by the income received in the Treasury) was only around 9,900,000 taels per year.[68] As expenditures for unexpected events were the responsibility of the central government, and, at the same time, delays at the local level

[61] The exchange rate between a Spanish dollar (*peso*) and a tael is: 0.72:1.
[62] Article VII, *Treaty of Peace, Friendship and Commerce between Her Majesty the Queen of Great Britain and Ireland and the Emperor of China*, (26 June 1843).
[63] King, *Money and Monetary Policy in China*, 3 and 6.
[64] These figures were extracted from central government reports and therefore do not include expenditures by the provincial government, which would have been much higher. After 1853, the military expenditures were mostly covered by regional governors and not central government. The real total military expenditure in fighting the Taiping Rebellion would have been much higher. The total central government expenditure may be underestimated because of missing documents in the government fiscal report. Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 127-30.
[65] Ibid., 37-8.
[66] Lin, "China Upside Down," 133-5.
[67] Shi, *Treasury Statitstics* 42-3.
[68] Compared to 50,000,000 taels and 12,420,000 taels as the total and central government revenue, respectively, during Qianlong's reign (1735-96) in the High Qing period. The figures for central government revenue were collected by Shi from *Imperial Treasury Records*. Ibid., 43.

caused the capital revenue (revenues sent to the central government) to decrease,[69] central government suffered more from the fiscal crisis than the provincial governments did. During the reign of Daoguang, the total expenditure already slightly exceeded the total income from tax revenues (Figure 1-1, p.21).[70] The deficit increased from 1853 on: income was almost halved while expenditure expanded sharply. The Imperial Treasury was almost depleted. There had been a very large stock of silver in the Treasury from the fiscal surplus accumulated over the years. The average stock of silver during Qianlong's reign was around 70 million taels, while during Xianfeng's reign the figure fell to an average of no more than 3 million.[71]

Figure 1-1 Annual tax revenue (in silver) and expenditure of central government, 1821-70 (in millions of taels)



Source: Shi (2009), pp. 198-242.

[69] Ibid., 45.

[70] The revenue shown in Figure 1-1 are government revenues (from taxations, the sale of titles, and also contributions), received by the Treasury. The Treasury Records consist of two volumes: a book of incoming items (the Incoming category) and books of outgoing items (the Outgoing category). Before 1853 (when the new monetary policies were introduced), the incoming category was composed of not only taxation revenues (in silver only), but also copper *cash* which were cast by the Imperial mints. The copper *cash* were deposited (therefore standing as an entry in the incoming category) in the Treasury vault, and would be used as part of the salary for bannermen and construction workers. Strictly speaking, the amount of copper *cash* registered each year was not government revenue. The revenues shown in Figure 1-1 are therefore figures extracted from the Incoming category of the Treasury book, and would all have been in silver. The expenditure, however, is a combination of silver, copper *cash* (and later other monies such as big *cash* and government paper notes). For a sample of the composition of the Incoming and Outgoing categories, please see Appendix B.

[71] Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 84-5.

1.2.3 Monetary system and its changes in Xianfeng

Traditional commodity money system

The monetary system during the Qing Dynasty was a commodity money system consisting of copper *cash* and silver.[72] Copper *cash* currency consists of copper coins bearing the face value of one *wen*;[73] a *string* of copper *cash* consists of 1,000 copper *cash* and can be used for larger payments.[74] As copper *cash* had a uniform shape and value, the face value is not cast on the coin, and during exchanges copper *cash* were paid by counting them. Silver circulated in the form of both silver ingots and silver dollars. Used more in large transactions and interregional trade, it was measured by weight in terms of tael.[75] The government monopolized the supply of copper *cash* (which constituted less than 20 per cent of the total money in circulation[76]), while the supply of silver was determined by the market.

The government monopolized copper mining and the minting of copper *cash*. The major copper provider for the imperial mints was in Yunnan province.[77] There were two imperial mints in Beijing and many regional mints, and the coins cast in each mint were mainly for regional use (normally to pay bannermen's salaries and the wages of workers on government construction projects). The imperial mints (Baoyuan and Baoquan Mints) situated in Beijing were the two most important ones: their output sustained the demand of the market not only in Beijing, but also in the part of northern China near the

[72] King, *Money and Monetary Policy in China*, 27.
[73] A standard piece of copper *cash* in the 18th century weighted 0.12 *liang*, containing 50%-70 % of pure copper, and other metals such as zinc and lead. *Liang* is a Chinese unit of weight, equivalent to 37.783 grams using the standards of the Imperial Maritime Customs; the actual weight of liang varied in different locales. Peng, *A Monetary History of China*, 524-5. Hamashita, *Public Finance of Late Qing Maritime Customs* 2.
[74] A string (or '*chuan'* in Chinese) of copper *cash* consists of 1,000 copper *cash* bound on a strand, which can be used for larger payments. A string was valued at a premium. For example, a string of copper *cash* was worth 1,000 *wen*, but normally it contained only around 980 copper *cash*. Kuroda, "The Collapse of the Chinese Imperial Monetary System " 103.
[75] Tael, or *liang* in Chinese, was used for both the unit of weight and the unit of account. The concept seems similar to that of a 'pound' and a 'pound sterling'. There were various standards for defining one *tael*, because weighing scales varied between regions and government bodies. As a unit of weight, a *liang* varies from 33.99 to 37.50 grams. When 'tael' is used as a unit of account specifically for 'silver tael', various taels also had different definition in terms of purity and fineness of the silver. For example, the Treasury tael (*kuping liang* or *kuping tael*) is the standard for taxation, the customs tael (*haiguan liang* or *haikwan tael*) is the standard used in the Maritime Customs Service, the market tael (*shiping liang*) is the standard used in the market in Beijing. Lin, "China Upside Down," xxiii-xxiv.
[76] Peng estimates that during the late Qing period, the total copper sector (copper coins including standard *cash* and the new type of copper coin minted after 1900) constituted 17% of the total money in circulation. Peng, *A Monetary History of China*, 595.
[77] Ibid., 568.

capital.[78] Since Qin Dynasty (221BC) every dynasty took it an imperial duty to provide good quality copper *cash*. The Qing Dynasty was no exception: the copper *cash* was minted as a full-bodied coin. It was written into the law that there must be at least one state mint in each province in order to ensure the sufficient provision of good money circulating in every region.[79]

The supply and demand of silver, in contrast, was determined solely by the market. China's domestic silver production was low and the silver in China came mostly from Japan and later from Latin America, mainly through international trade.[80] This situation is similar to that of medieval England. England did not produce significant amounts of silver and therefore its coinage was closely associated with its overseas trade. The monarchs, in China and in England, did not own the silver supply.[81] But unlike the English Crown, which set up royal mints to strike the bullion into coins with face value, the Chinese Emperor allowed only silver bullion to circulate in various forms. The Qing government provided only the standard unit (the *kuping* tael) that a silver ingot should be melted into, which evolved into one of the many 'taels' for silver bullion.[82]

The purchasing powers of one piece of copper *cash* and a *tael* of silver are hugely different.[83] They were used in different types of trade and therefore occupied different levels of markets. Copper *cash* was therefore not taken as subsidiary money: it was the currency for daily transactions and the only currency in rural area. Silver, on the other hand, was used in long distance exchange and foreign trade; it is also the major form of money used in tax payment and government expenditure. The government tried to fix exchange rate between silver and copper *cash*.[84] However, this fixed official ratio was

[78] Baoyuan operated until 1905 and Baoquan until 1910.
[79] Minting was decentralised due to the very high transaction cost of moving large amount of metallic coins (and especially heavy copper cash with small values). Sometimes production at provincial state mints was suspended but minting in the capital was always ensured. Peng, *A Monetary History of China*, 524-27. Lin, "China Upside Down," 5.
[80] "Latin America Silver and China During the Daoguang Reign," 15-6.
[81] Nick J. Mayhew, "Coinage and Money in England, 1086-C.1500," in *Medieval Money Matters*, ed. Diana Wood(Oxford: Oxbow, 2004), 72.
[82] Lin, "Latin America Silver and China During the Daoguang Reign," 21.
[83] Around 1840s, the price ratio between silver and copper bullion is around 1:100, Shichang Ye, *Chinese Monetary Theories before and after the Opium War (Ya Pian Zhan Zheng Qian Hou Wo Guo Di Huo Bi Xue Shuo)*(Shanghai: Shanghai People's Press, 1963), 6.
[84] During most of the time during Qing Dynasty, the official ratio was maintained at 1:1,000 (1 tael equals to 1,000 *wen*). The ratio was revised to 1:2,000 during the 1840s. Ibid., 3.

not enforced by any government institution,[85] and the government did not control the supply or demand of silver (the state did not coin silver) which could flow in and out the country depending on foreign trade conditions. Therefore the market exchange ratio between copper *cash* and silver fluctuated, and varied from place to place.[86] Services specialising in money exchanges developed in this currency system, and the exchange normally took place in commercial centres and trade ports where different trades were frequently carried out.[87] The system in China is sometimes called a 'parallel bimetallic system', to distinguish it from the conventional model of a bimetallic system. The term 'parallel' is given because the system functioned more like a coexistence of 'two currency systems, each using a different metal'.[88] Also unlike real bimetallism, the exchange ratio between the two currencies was not fixed; the ratio rather varied in time and in place.[89] [90]

Currency and units in Beijing

Qing China's monetary system was far from fully integrated. In terms of circulation, many of the monies had their own regional or local circuits. As in many traditional economies, in China's the monetary unit and the unit of account were often separate. Various 'ghost units' were adopted in different places for accounting purposes only.

In Beijing, the local unit for silver was the market tael (*shiping*), and the unit of account for copper *cash* was metropolitan *cash* (*jingqian*) instead of *wen*.[91] Because of the

[85] China did not have the concept of central banking until 1902. Money exchange service was dominated by private banks, which profited from the volatile market exchange ratio. The semi-official banks (*guanqianpu*) that discussed later in this chapter were all modelled after the private banks, and were established for profit purpose instead of for market stabilisation purpose.

[86] The market exchange rates between silver and copper *cash* fluctuated from 1:800 in early Qing period (1647-1764) to 1:2230 in 1855, Lin, "Latin America Silver and China During the Daoguang Reign," 29.

[87] These native banks are normally called *yinhao* in the North and *qianzhuang* (*ch'ien-chuang*) in the South. King, *Money and Monetary Policy in China*, 41. Rawski, Rawski, *Economic Growth in Prewar China* 139-45.

[88] ibid.

[89] Peng and King both preferred the use of 'parallel bimetallic system'. Peng, *A Monetary History of China*, 521. King, *Money and Monetary Policy in China*, 39-42.

[90] Some scholars argue that the currency of modern China could not be called a system. It is rather composed of a number of systems. The systems only encountered each other (i.e. the silver and copper sectors were only loosely connected) in trade centres. Wen Pin Wei, *The Currency Problem in China*(New York: Columbia University, 1914), 30.

[91] Unlike the market in Beijing, the central government treated *kuping* silver tael and strings of copper *cash* as its official units.

nature of small daily transactions, metropolitan *cash* currency was the universal unit in price quotations, denominations of paper notes and in account books.

Besides silver and copper *cash*, there were the banknotes issued by private local banks in big cities. These were convertible notes linked to copper *cash* or silver. In Beijing, the notes convertible to silver were denominated in market tael and were usually issued for long-distance remittance. Most of the banknotes in market circulation were notes convertible to copper *cash*; these were denominated in the local unit 'metropolitan *cash*', or a *diao* of 'metropolitan *cash*'.[92] Because private banks did not form a national network, private banknotes, although convertible, normally had a very limited area of circulation (normally within a city).[93]

1.2.4 The looming fiscal crisis and monetary policy debates

To make things worse, the Taiping Rebellion swept through the Yangtze Valley in 1853 and established its capital in Nanjing. The Taiping occupation of the south cut off the central government from several important sources of revenue: tax revenues and grain tributes from the southern provinces; the salt tax from the Huai area; and the copper from Yunnan (for the imperial mint).[94] As a consequence, the central government was short of both silver (from taxation) and copper *cash* (from the imperial mint). During the summer of the same year, the central government realised that it could not even afford pay salaries: there were only 293,798 taels of silver stored in the Treasury vault, while the payroll for lower-ranking officials already required 300,000 taels,[95] not to mention another 420,000 taels of silver as the salary for the bannermen.[96] The government was in such urgent need of money that three giant gold bells from the imperial household, weighing more than a thousand kilogrammes, and later, some copper utensils from the imperial vault were melted down to cast copper *cash*.[97]

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[92] One copper *cash* was worth 2 metropolitan *cash*. This ratio changed permanently after the Xianfeng Reign. A *diao* was 1,000 metropolitan *cash*. Kaixiang Peng, "Price and Wage Change in Contemporary Beijing: From the Early 19th to Early 20th Centuries (Jindai Beijing Jiage Yu Gongzi De Bianqian: 19 Shiji Chu Zhi 20 Shiji Chu)," *Seminar on Chinese Financial History Working Paper* (2011): 3-4.
[93] Rawski, *Economic Growth in Prewar China* 127.
[94] Chen, "The Hsien-Feng Inflation," 580. King, *Money and Monetary Policy in China*, 144-5.
[95] Salaries were paid twice per year, once in spring and once in autumn. The salaries for high ranking officials had already been suspended in the spring of 1853.
[96] Board of Revenue memorial submitted by Junzao Qi (Day16 Month7 Xianfeng3), Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 177.
[97] Ibid., 179-82.

The central government struggled to increase income and cut expenditure. However, occasional incomes such as *juanna* and *baoxiao* took time to collect, and this source of income was declining. Concerning *juanna*, there were only so many degrees and offices to sell to a limited number of purchasers each year.[98] *Baoxiao* also declined as the economy did.[99] Furthermore, military expenses as the major expenditure would be most unlikely to come to an end. The salaries of government officials and soldiers were not increased after1838 on, and in real terms even declined.[100]

Various remedies were discussed among state officials to temporarily increase government income. Most of the proposals related to monetary policy. Given the silver shortage, some suggested that the state should manage its own silver mining so that the money circulation in China would depend less on the supply of silver dollars from abroad.[101] Some disagreed, pointing to the practical difficulty of mining and minting silver, and suggested putting an end to the use of silver,[102] increasing the copper *cash* coinage and also coining copper coins of higher denominations.[103] This suggestion was in fact a coinage debasement, and it would also make the already high silver-copper *cash* exchange ratio rise further.[104] Some suggested including other precious minerals (gold and even jade) as part of the currency system and banning the secular use of precious metals such as gold and silver.[105] Others, recognising the difficulty of setting multiple exchange rates and the high transaction cost of low-value metal coins (such as copper *cash*), advocated the use of paper money, convertible or inconvertible.[106]

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[98] The government encouraged *juanna* by giving discounts on the original price of each title. During 1851-53, the total income from *juanna* amounted to around 3,670,000 taels, which made up almost 22% of the central government income. However, from 1854 onwards this income shrank sharply to a mere 40,000 taels in a good year and 3,000 in a bad year. Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 146 and 67.

[99] Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 175-6. Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 167-8.

[100] Lin, "China Upside Down," 129-30.

[101] Most notably by Yuan Wei, intellectual and social reformist of the early 19th century. Shichang Ye, Baojin Li, and Xiangcai Zhong, *History of Chinese Monetary Theory Vol. 2 (Zhongguo Huobi Lilun Shi: Xia Bian)*(Beijing: China Finance Press, 1993), 7-11.

[102] Ibid., 40-5.

[103] Traditional copper *cash* did not have the value inscribed on the face. All *cash* carried the same face value, one *wen*.

[104] Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 143-58.

[105] Ibid., 182-4.

[106] Whether or not the paper money should be convertible was a debate which had lasted for decades, before its materialization in 1853. For details please refer to: Ye, Li, and Zhong, *History of Chinese Monetary Theory Vol. Ii*, 11-40. Lin, "China Upside Down," 147-64.

Despite its initial hesitation, the central government was forced to introduce a series of new monetary policies. They included a debased coinage, the issue of inconvertible government paper notes, and the opening of official banks. Hastily introduced, these policies differed greatly from the ideas of the original court debates, and the policies lacked coherence. King comments that 'the coherent monetary reform which had been planned […] by several of the Emperor's advisers had degenerated into an attempt to force a depreciated currency on the people while placing obstacles in the way of its return to the government'.[107] The following sections will explore the details of the monetary policy (by examining the new monies one by one), using information extracted from archival materials.

[107] King, *Money and Monetary Policy in China*, 156.

1.3 Analysis of the Xianfeng monetary policy: monies and their performance

Monetary policies during Xianfeng's reign were basically a series of forms of money creation (coinage debasement and the issue of paper notes) followed by the founding of institutions to facilitate their circulation. The debased coins and paper notes were distinct in nature and should be discussed separately.

This section traces data about these new monies in archival materials (most of all in the *Imperial Treasury Records* and court memorials) and examines each of the new monies.[108] The discussion includes the legal and institutional design of the money, the approximate quantities issued by the government, the channel through which the government introduced it into the market, and the market reaction.

After the individual examinations, this section will assess the Xianfeng monetary policy as a whole. Data series of annual money creation and total money in circulation have been compiled. I first look at the function of the new monies in central government revenue and expenditure. I then calculate the approximate annual money stock by integrating the newly created money and compare the growth trend of this money with Beijing's price index.

Table 1-1 Timeline: introduction and suspension of new types of monies

	Unit	**Types**	**Issue**	**Suspension**
Big *cash*	*wen, string*	5, 10, 50, 100, 200, 300, 400, 500, 1000	1853	1855 - casting of denominations other than 10-*wen* stopped; 1890 - casting of 10-*wen* denomination stopped.
Iron *cash*	*wen, string*	1, 5, and 10	1854	1859
Silver notes	*tael*	1, 3, 5, 10, and 50	1853	Printing stopped in 1856, use suspended in 1860.
Copper notes	*wen, string*	500, 1000, 1500, 2000, 5000, 10000, 50000, 100000	1853	1860
Official banknotes	*Met.cash, diao*	Various	1853	1861

Source: Peng (1983), p.88.

[108] For details of the archives consulted and the features of the treasury records, please see Appendices A and B.

1.3.1 Decomposition of the new monies

Debased coins

Big cash

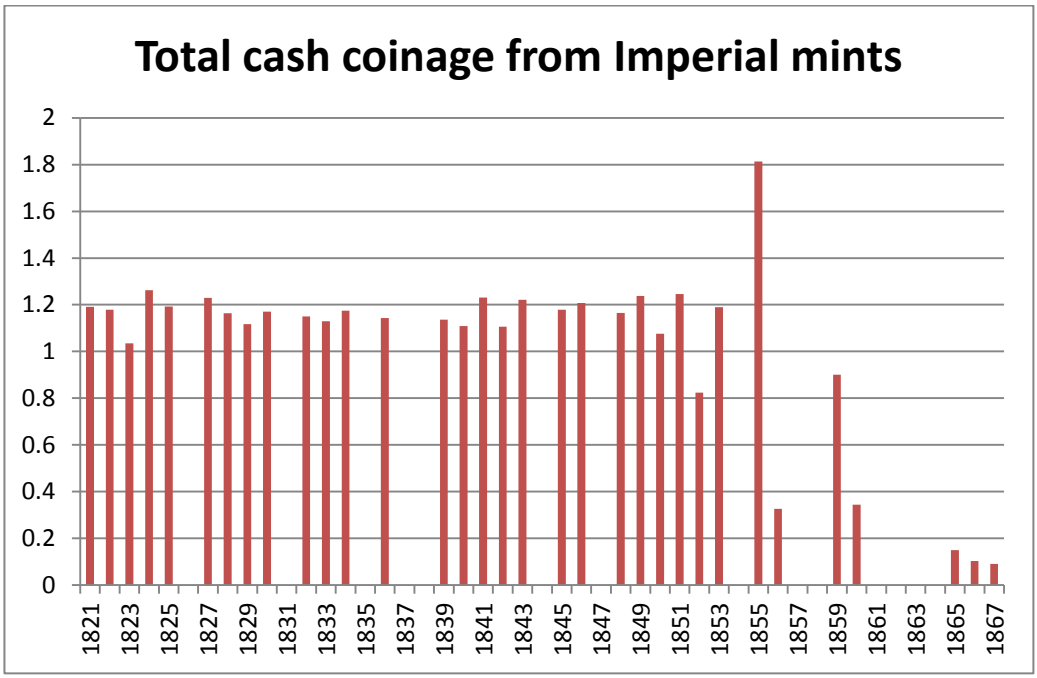
Big *cash* were different from the traditional copper *cash* (the standard *cash*) in shape, weight and face value. The standard copper *cash* had a uniform shape, purity and weight. They all bore the same value (1 *wen*) and therefore no face value was engraved on standard *cash*. Big *cash* were, as the name suggests, bigger and heavier than the traditional *cash*. Big *cash* also had different face values engraved on them. The denominations were 5, 10, 50, 100, 500 and 1,000 *wen*, although the weights did not increase proportionately to the increase in face value. (For an image of the big *cash* please see Appendix E 1-1; and for an image of the standard *cash* please see Appendix E 1-2)

In the third month of 1853,[109] after repeated campaigns by the group of metallists at court,[110] the Emperor approved the issue of big *cash* in order to solve the copper *cash* shortage caused by the lack of copper ingots in the imperial mints.[111] The first big *cash* were 10-*wen* big *cash*,[112] with a weight of 0.6 *liang* and a fineness similar to that of a standard *cash*, indicating a depreciation of 50 per cent.[113] In 1854, big *cash* with much higher denominations were also minted: 50-*wen*, 100-*wen*, 500-*wen*, and 1,000-*wen*, weighing 1.2, 1.4, 1.6, and 2 *liang* respectively.[114] The higher the denomination, the more debased they were: the 1,000-*wen* big *cash* (of similar purity and 2 *liang* of weight) represented a debasement of 98.3 per cent. Big *cash* of very high denomination (such as 500 or 1,000 *wen*) were so debased that people refused to use them. These big *cash*

[109] Day18, Month3, Xianfeng3 (24 April 1853), Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 88.
[110] Notably Princes Gong and Hui, Shaoji He and Zaiquan. Chen, "The Hsien-Feng Inflation," 580-1.
[111] Big *cash* is translated from the Chinese equivalent '*da qian*', meaning copper coins bigger than copper *cash*.
[112] 10-*wen* big *cash*, called '*dang shi da qian'* in Chinese, meaning 'big *cash* equivalent to ten'. Because 10-*wen* big *cash* were the only form of big *cash* accepted and widely circulated, the '10-*wen* big *cash'* is referred to hereafter *as* 'big *cash'* unless stated otherwise.
[113] A standard *cash* weighs 0.12 *liang* and is worth one *wen*. The official weight of the 10-*wen* big *cash* was later reduced to 0.44 *liang*. Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 89.
[114] Big *cash* with denominations of 200, 300 and 400 *wen* were also cast in Beijing, for a brief period in 1854. However their exact mint output has never been found in any document and it is therefore suspected that the casting of those coins was only a trial and they never circulated. *Selected archive in modern Chinese monetary history,* op. cit., pp. 254-55, iibid.

were heavy to carry, and also difficult to distinguish: there was little difference of weight between a piece of 100-*wen* big *cash* and a 500-*wen* one. Although the face value was inscribed on the coins, most of their users were illiterate and therefore could not tell the difference.[115] Lacking both real value and convenience, big *cash* denominations higher than 50 *wen* ceased to be minted within a year.[116] The casting of 10-*wen* big *cash* dominated the production of the imperial mints.[117] The manufacture and use of 10-*wen* big *cash* in Beijing lasted until 1890.[118]

Figure 1-2 Annual mint output (copper *cash* and big *cash*) from the Imperial mints in Beijing (total nominal values, in millions of strings), 1821–70



N.B. figures are calculated from entries under 'Department of Guangxi', Incoming Category of Treasury Records of the reigns of Daoguang (1821-50), Xianfeng (1851-61) and Tongzhi (1862-74).
Source: *Imperial Treasury Records*, copies from the Library of The Institute of Economics, CASS.

Coins minted by the Imperial mints were deposited in the Treasury, and therefore the mint output (in nominal values) can be tracked through the Treasury Records. Figure 1-2 shows the annual mint output (in nominal value) from the Imperial mints, taken from the Treasury Records. With part of the Treasury Records missing, we have only the

[115] Chen, "The Hsien-Feng Inflation," 584.
[116] Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 103-4. Memorial of Junzao Qi of Board of Revenue (Day26 Month7 Xianfeng4), Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 265-6.
[117] The production of 5-*wen* big *cash* was also suspended because of they cost more to produce than the 10-*wen* big *cash* did.
[118] Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 104-5.

mint output in 1851, 1852, 1853, 1855, 1856, 1859 and 1860. The total coinage from 1851 to 1861 is reported as 11,090,500 strings.[119] As the mints cast *cash* according to the quota set by the Board of Revenue and the quota was in turn set according to the quantity of *cash* needed in the budget, most of the *cash* stored in the Treasury would be spent by the end of the year. We can therefore take the amount of *cash* in expenditure as a proxy for the mint output for the years 1854, 1858 and 1861. The output for the year 1858 is calculated by deducting the total of other years' figures from the reported grand total (11,090,500 strings). Making a reasonable guess, we can form an estimate of minting conditions during Xianfeng's reign (1851-61) shown in Table 1-2. Except for 1854 and 1855, the average mint output during 1851-61 was actually lower than the average of the previous decades. Moreover, the relatively high output during 1854-55 may be attributed to the casting of big *cash* with extremely high denominations (they became valueless immediately, and their coinage was suspended after 1855). Since all figures in the Treasury Records are total nominal values, we cannot know the exact numbers of the various *cash* minted; however it is certain that most of the coins were 10-*wen* big *cash*.[120]

How were big *cash* channelled into the market? The government did not own or operate any banks. Traditionally during the Qing Dynasty, copper *cash* cast in state mints were only used for paying bannermen[121] and workers on government construction projects.[122] The big *cash* minted after 1853 served the same function. Standard and big *cash* were then brought into the market through the purchases of bannermen and workers. The

[119] Ibid., 88.

[120] After the confusing period of 1854-55, the imperial mint coinage stabilized the combination of standard *cash* and big *cash*. The output of standard *cash* fell to around 20% of the total output, and after 1857 to less than 7%. Ibid., 79-80, 88.

[121] In fact all Manchu people (including the imperial house) were classified into one of the eight banners, which were both a social and military unit). Later some Han people (usually Manchu's family servants for generations) also became bannermen. After the conquering of China, bannermen served as guards in the capital and also several strategic posts around the country, and Manchus were forbidden to take any other type of job because they were not allowed to mix up with the Han people. Therefore beside from the actual standing army and some government officials with royal descent, the majority of ordinary bannermen in Beijing became jobless inhabitants living on a low but stable income paid by the Manchu government. This sort of government expenditure was named as 'salaries for bannermen' in the treasury account books, although they in fact resembled today's social security assistance, but only for population within the eight banners. After centuries of living south of the Great Wall, the Standing Imperial Army composed of bannermen proved incapable of combat. Since 1850s, the real army fighting the rebels consisted entirely of local military troops recruited and financed by provincial officials (therefore rarely occurred in central government expenditure).

[122] Before 1853, 20% of the salaries for bannermen and workers were paid in *cash*, with the other 80% paid in silver. All other central government expenditure (such as military expenditures or salaries for government officials) was paid purely in silver.

introduction of the 10-*wen* big *cash* met some reluctance in the market, and was soon followed by rampant counterfeiting. Big *cash* were, by government decree, intended to circulate according to their face value, side by side with the standard copper *cash*. The traditional standard *cash* were therefore not called in to be reminted. Predictably, the undervalued standard *cash* were melted down and forged into 10-*wen* big *cash.* (The forgeries weighed less than those minted by the state; eventually the weight of a big *cash* dropped to around 0.22 *liang*, and the intrinsic value of a 10-*wen* big *cash* was only 2 *wen.*)[123] The market was finally dominated by 10-*wen* big *cash*[124] and standard *cash* were rarely seen. Still, these coins could circulate only within the capital and at a discount.[125] We see from that within two months of its introduction, a 10-*wen* big *cash* coin attracted a discount of more than 30 per cent. The exchange rate of big *cash* fluctuated with a clear downward trend, and stabilized at 20 per cent of its face value, being credited with a value of 2 *wen* instead of its face value of 10.

Table 1-2 Annual money creation, amended by estimation (in strings)

Regnal Year	Year	Copper *cash*	Iron *cash*	Silver notes	Copper notes	Banknotes
XF1	**1851**	1245809				
XF2	**1852**	823833				
XF3	**1853**	1190287			*(1000000)*	
XF4	**1854**	*(3040551)*	*(1808160)*		*(6000000)*	*(7846072)*
XF5	**1855**	1812804	*(1808160)*		4063302	7613332
XF6	**1856**	326546	*(1360920)*		4405443	7448997
XF7	**1857**	*(606602)*	*(1360920)*		*(4150834)*	*(7448997)*
XF8	**1858**	*(629857)*	*(1360920)*		*(1510663)*	*(11360116)*
XF9	**1859**	900000			2120455	18337552
XF10	**1860**	344671			3706823	3442130
XF11	**1861**	*(169540)*			*(155518)*	*(408881)*
Total		11090500	*(7699080)*	9781200	27113038	*(63906076)*

N.B. For detailed calculations please see Appendices A and B (Appendix B 1-4). Figures in brackets are estimations, of which: 1) for 1854, 58 and 61: the figures for expenditure are used as a proxy of money creation, and for 1857 the figures are calculated by deducting the total of other years from the grand total; 2) annual output of iron *cash* as estimated by Peng (1983); 3) figures for the issue of copper notes (see page 28, below) in 1853 and 1854 are from the minimum estimation from archive documents, Huang

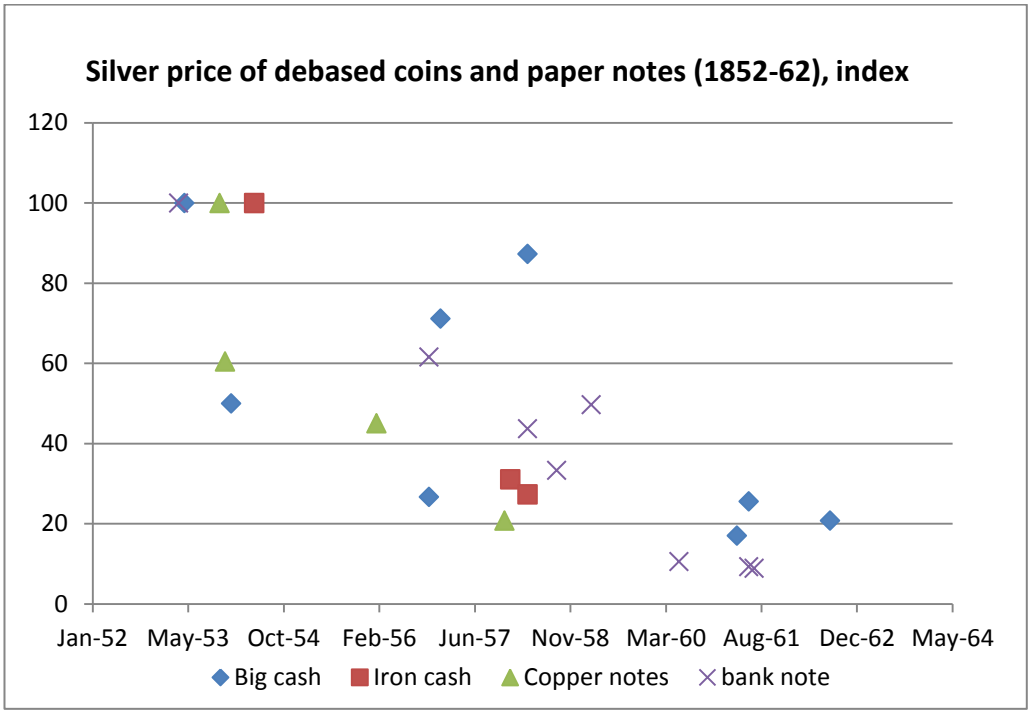
[123] Because copper *cash* had little value, they were less likely to be used as a store of value; nor were they likely to be exported elsewhere, since a large number of copper *cash* would be very heavy and the cost of moving them would be very high. Therefore when copper *cash* was undervalued, it was more likely to be melted down for counterfeiting than to be stored or exported. Moreover, it is likely that the copper *cash* of areas near Beijing might be shipped into the city to be reminted into big *cash*.

[124] As 10-*wen* big *cash* was the only type of big *cash* really in use, the paper will use big *cash* to refer to '10-*wen* big *cash'* for purpose of simplicity, unless stated otherwise.

[125] Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 277-8.

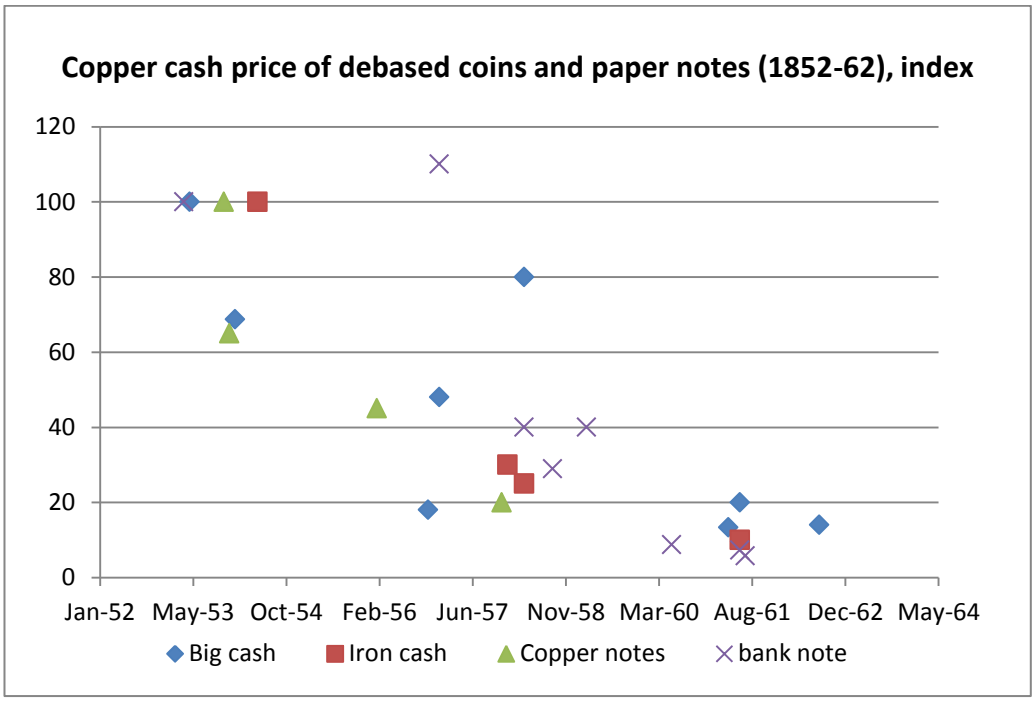
(2012); 4) the value of the banknotes deposited in the Treasury includes notes issued by official banks and by the Copper Donation Bureau. The estimation is therefore higher than Peng's figure.
Source: *Imperial Treasury Records*; Huang (2012), p. 137; Peng (1983), pp. 80 and 115.

Figure 1-3 Index of the value of the new debased coins and currency against silver.



Sources: *Secret memorials of the Qing Court* (First Historical Archive); *Expenditure reports of Imperial Household Department* (First Historical Archive), *Selected archive in modern Chinese monetary history, Vol. I.* (1965); Zhang (1970). For details please see Appendix C.

Figure 1-4 Index of the value of the new debased coins and currency against standard copper *cash* (i.e. the original full-bodied copper coin)



Sources: Ibid. For details please see Appendix C.

Other debased coins

From the second month of 1854, iron *cash* was minted to supplement the big *cash*.[126] Because it was made of a base metal, the intrinsic value of iron *cash* was much lower than that of the standard copper *cash*. The aim of casting iron *cash* was to meet the demand for small change, now that the market was flooded with *cash* of high denominations and standard *cash* (valued at 1 *wen*) were rare. Denominations included 1, 5 and 10 *wen*. Compared to standard copper *cash* (1 *wen*), a 1-*wen* iron *cash* indicated a debasement of 70 per cent. Similar to big *cash*, iron *cash* with higher face value represented a greater debasement.[127] It was also reported that lead *cash* was minted for a brief period in 1854, although it seems that lead coins were never actually introduced into the market.[128]

Iron *cash* were first minted by the Imperial mints. Later an iron *cash* office was set up specifically for casting iron *cash*.[129] Iron *cash* were stored at the iron *cash* office. The Treasury Records registered very few entries of iron *cash*[130] and the actual annual output of iron *cash* is not clear. Peng provides an estimated annual figure based on information disclosed in government memorials: an average of 1,808,160 strings per year during 1854-55 and 1,360,920 strings per year during 1856-59.

Similar to the function of big *cash*, iron *cash* was mainly used mainly to pay the salaries of bannermen and workers. Government memorials show that big quantities of iron *cash* were used for salary payments during 1856 and 1857, because 'the public was craving small change'.[131][132] By the end of 1856, 10-*wen* iron *cash* had depreciated too much and dropped out of circulation. Only 1-*wen* iron *cash* still circulated, but shops often refused to take the coins. The counterfeiting of iron *cash* was also intensive,

[126] Day2 Month2 Xianfeng4 (28 February 1854), Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 88.
[127] The market price of iron was 40 *wen* (standard *cash*) per *jin* (catty). A catty iron could be cast into 133 1-*wen* iron *cash*, or 66 5-*wen* iron *cash* (a total face value of 330 *wen*), or 53 10-*wen* iron *cash* (a total nominal value of 530 *wen*). Disregarding the cost of minting, a 1-*wen* iron *cash* indicated a debasement of 70%. Iron *cash* can easily be minted with iron scrap, which cost 15 *wen* per *jin*. Peng, *A Monetary History of China*, 89.
[128] Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 223-4.
[129] Ibid., 232-4.
[130] Only one entry in the Incoming Category of 1856 shows that 431,515.849 strings of iron *cash* was deposited in the treasury vault. "Copy of the Imperial Treasury Records ", ed. CASS Social research division(Beijing1930).
[131] *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 277-8.
[132] This may be supplementary evidence to suggest that copper *cash* almost disappeared in or before 1856.

hastening the money's depreciation.[133] Iron *cash* soon became valueless and the coinage was suspended in 1859.[134]

Impact of the policy of debased coinage: depreciation of the unit of account

The coins during Xianfeng's reign were limited in number and in use. The total output of copper *cash*, big *cash* and iron *cash* is estimated at 18,789,580 strings, equivalent to around 9.4 million silver taels for the entire eleven years.[135] Given an average central government expenditure at around 11.8 million taels per year in normal years, the numbers created from debased coinage were unable to relieve the fiscal pressure to any significant extent.[136] Moreover, debased coins could hardly be used for important expenditures. They were instead used to pay salaries, making sure that in nominal figures the payments seemed to be unaffected by any actual budget cut.

Coinage debasement during this period was drastic (in terms of the high face value and the coarse metal used) and unprecedented in the Qing Dynasty, suggesting that the government was aiming for higher seigniorage. However, given the limited storage for copper ingots in Beijing, the big *cash* coinage seems more like an economical use of copper. Seigniorage revenue generated by debasement can be lucrative if the debasement compels the market to bring metal and old coins into the mint to have them reminted into new and lighter coins. However, in Xianfeng's case, the mint did not remint old coins at all. Demonstrating Gresham's Law, the reminting process nonetheless took place via large-scale counterfeiting which eventually eliminated standard *cash* from the Beijing market. In this sense, lucrative seigniorage revenues did occur during the debasement originally led by the government, but the profit went into private rather than public hands.

The coinage debasement added to the chaotic monetary situation in Beijing. The overvalued big *cash* completely drove out the standard *cash* in 1857, and when iron *cash* were introduced to the market (with the aim of providing *cash* of small

[133] Elisabeth Kaske, "Silver, Copper, Rice and Debt: Monetary and Office Selling in China During the Taiping Rebellion " in *Money in Asia (1200-1900): Small Currencies in Social and Political Contexts*, ed. Jane Kate Leonard and Ulrich Theobald(Forthcoming), 361.
[134] King, *Money and Monetary Policy in China*, 150.
[135] The total was estimated as shown in Table 1-2 (p.31) Conversion into silver taels is carried out according to the official exchange ratio which was 1 tael of silver to 2 strings (of copper cash).
[136] Average annual expenditure during 1821-50, calculated from Appendix B 1-1.

denominations), big *cash* became a relatively valuable currency, and its exchange rate in the market soared from the beginning of 1857 until mid-1858 (see Figure 1-3 and Figure 1-4). By 1859, only big *cash* remained in circulation. Within six years, the commonly used money in Beijing had changed from standard *cash* to big *cash*.

This change of the money in common use permanently changed the unit of account, which depreciated to 20 per cent of its original value. In the Beijing market, prices were quoted either in metropolitan *cash* or a *diao* of metropolitan *cash* (which was 1,000 metropolitan *cash*); but both were ghost units. Before 1853, a *diao* of metropolitan *cash* was satisfied by paying 500 standard *cash* (i.e. 500 *wen*). During the period of inflation, 10-*wen* big *cash* gradually replaced standard *cash*, and a *diao* of metropolitan *cash* was nominally satisfied by 50 big *cash* (nominally also 500 *wen)*, except that the purchasing power of a big *cash* continued to slide. After the crisis, standard *cash* totally disappeared, though the market use of big *cash* and the practice of counting 50 big *cash* as one *diao* remained.[137] By then a coin of 10 *wen* big *cash* was worth only 2 standard *cash*. If we measure the value of the unit by a stable anchor currency – the standard *cash*, a *diao* of metropolitan *cash* was worth 500 *wen* before 1853; after 1861, however, a *diao* of metropolitan *cash* was worth 100 *wen*. The unit had depreciated by 80 per cent. It seems that during the interval of 1853-61 (when currency situation was chaotic and many coins had unstable metallic contents due to various reasons such as official debasement, implicit mint debasement as well as private counterfeiting), money's purchasing power explains better the rate of inflation. After the currency stabilisation of 1861, the quantity theory of money for explaining general price levels becomes credible.

Government paper notes

Two types of government note were introduced during Xianfeng's reign: the silver note (*yinpiao*) and the copper *cash* notes (*baochao*). The Board of Revenue printed these two paper notes to fill the gap (at least in book value), as the supply of real silver and real copper *cash* was running low in its vault. The government decree stated that these paper notes should be taken and used as if they were real silver and copper *cash*, and should

[137] Kaixiang Peng, "Research on the Currency and Prices of Beijing, 1830s-1920s: Focusing on the Account Book of the Fire-God Society (1835-1926) (Jindai Beijing Huobi Xingyong Yu Jiage Bianhua Guankui: Jiandu Huoshenhui Zhangben 1835-1926)," *Forum of Economic Development Working Papers Series* No. FC20080161(2008): 3-5. King, *Money and Monetary Policy in China*, 158-63.

circulate side by side with silver ingot and copper *cash* at par. Although the names of these two notes seem to link them with metals, they were inconvertible from the outset.[138]

Silver notes

The full name of a silver note was 'Official Paper Note of the Board of Revenue' (*hubu guanpiao*); it was carefully printed in blue ink on a piece of fine paper. Below the title was stated the value of the note: the denominations were 1, 3, 5, 10 and 50 taels.[139] (For an image of the silver note, please see Appendix E 1-3)

Silver notes were introduced in the second month of 1853.[140] They were first used to pay the salaries of government officials because the Board of Revenue reported that the real silver stock in the vault was too low even for immediate payments.[141] In the summer of 1853, to partly replace real silver the use of notes was extended to all other kinds of expenditure. Silver notes issued in Beijing were also sent to other provinces mostly as central government expenditure on military or construction projects.[142] The regulation stated that all government expenditures would be 80 per cent in real silver and 20 per cent in silver notes. Silver notes could be used for the payment of taxes and title sales (*juanna* and *juanshu*), and the composition of payments should also be 80 per cent real silver and 20 per cent silver notes.[143] This ratio (in government expenditure and in people's payments to the government) changed to half in silver and half in government notes (silver notes as well as copper notes up to a total of 50 per cent) in the later months of 1853.[144]

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[138] Notable supporters for the use of paper notes included Maoyin Wang (Vice-President of the Board of Revenue), Yide Wang (Governor of Fujian Province) and Huashana (former vice-president of the Board of Revenue). While Maoyin Wang argued for the issue of convertible notes linked to banks, other officials were all inclined to issue unbacked paper notes. Chen, "The Hsien-Feng Inflation," 581. King, *Money and Monetary Policy in China*, 154.

[139] It was often referred to as an 'official paper note' (*guanpiao*), or silver note (*yinpiao*) in government documents.

[140] 'Regulation on the issue of silver notes', memorial submitted by Huashana (Day17, Month2, Xianfeng3), Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 352. Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 88.

[141] Financial Archive Division of the People's Bank of China, *Selected archive in modern Chinese monetary history, Vol. I. Late Qing Period (1840-1911), (Zhongguo jindai huobishi ziliao)*, Beijing: Zhonghua Book Company, 1964, p. 341.

[142] Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 75-7.

[143] 'Regulation of silver notes' memorial by Huashana (Day 17 Month2 Xianfeng3), Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 350-2, 410-6.

[144] Ibid., 410-6.

The silver notes had limited use in the market. Because of their high face value, silver notes were not a convenient means of daily exchange. More importantly, silver notes were not convertible to monies with real value. When they were first used to pay official salaries in the second month of 1853, the government made a promise that, after six months, people could take the notes to the Treasury to have them redeemed.[145] Apparently by the eighth month of 1853 this promise had not been kept. During the ninth month of 1853, official banks were established to exchange silver notes.[146] However, these official banks refused to exchange silver notes for real silver. Instead, they exchanged silver notes, as well as copper notes, for big *cash* and their own banknotes.[147] During the ninth month of 1853, a 1-tael silver note could be exchanged for 200 pieces of 10-*wen* big *cash*.[148]

Although silver notes did not circulate well, they were sometimes traded through official banks. Some people were willing to purchase silver notes (at a discount), and use them as part of their payment of taxes or for title purchases. The regulation stated that people were not allowed to make more than half of the payment in paper notes, but in practice the proportion of paper notes that would be accepted was lower.[149] The difficulty of paying tax with silver notes further undermined their credibility. Silver depreciated quickly in the exchange market: by the end of 1856 a 'one-tael' silver note could be exchanged only for 800 to 900 *wen* (standard *cash*), exhibiting a depreciation of more than 60 per cent. Furthermore, in 1859 silver notes depreciated to only 5 per cent of their face value.[150] In 1856, the government stopped printing new silver notes

[145] 'Memorial on issuing silver notes and other promissory notes' submitted by Zaiquan, (Day26, Month12, Xianfeng2), ibid., 327-9 and 55-6.
[146] Month4, Xianfeng3. Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 93.
[147] Memorial submitted by Ciheng Zhang on 'Suggested modifications on government note regulation for the purpose of better circulation' (Day22 Month8 Xianfeng3), Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 361-2.
[148] On the same day, the market exchange rate for a real silver ingot against standard copper *cash* was 1 tael = 2,500 *wen*. In addition, big *cash* had already depreciated by more than 40%. Currency exchange information is taken from Dechang Zhang, *Life of a Qing Mandarin in Beijing*(Hong Kong: Chinese University of Hong Kong Press, 1970), 233.
[149] It was repeatedly mentioned in the memorials that local prefects and magistrates often insisted on all taxes being paid only in silver, and then used the silver to buy (often heavily discounted) paper notes and then paid the due total into the provincial treasury with a combination of silver and paper notes, earning themselves a profit and undermining the credibility of paper notes (Chen, "The Hsien-Feng Inflation," 585.
[150] The calculation is based on the exchange ratio (2,230 *wen* per tael) in North China in 1850 provided by Yan (1955). The exchange ratio in Beijing in 1856 may have been even higher with the scarcity of copper

(although the use of silver notes in expenditure continued until 1860) and concentrated on the manufacture and promotion of copper notes.[151]

According to the Board of Revenue memorial, the total amount of silver notes issued during 1853-60 was 9,781,200 taels.[152] This figure is not particularly high, and a large share of the silver notes was used outside Beijing. Unfortunately, the Treasury Records bookkeeping did not distinguish silver notes from real silver. In the Treasury Records all transactions with 'taels' as the unit of account were recorded as 'silver taels' without specifying whether they were real silver or silver notes,[153] so the annual figure of silver notes pumped into the Beijing market through government expenditure is regrettably unknown.

Copper notes

Copper notes were introduced by the end of the year 1853 to replace that part of the expenditure which was formerly paid in copper *cash*.[154] The official full name of copper notes was 'Precious paper money of the Great Qing'.[155] The copper notes had a design similar to that of silver notes, except that the unit of copper notes was *wen*. The denominations were: 500; 1,000; 1,500; and 2,000 *wen*.[156] (For an image of the copper note, please see Appendix E 1-4)

As with silver notes, the regulation stated that copper notes could be used for government payments, and would be accepted by the government in payment of taxes and for the purchase of degrees and titles (up to 50 per cent of the amount could be paid in silver notes and copper notes).[157] Like silver notes, copper notes had limited convertibility, but they were better received by the market than silver notes were.

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cash being driven by big *cash* and iron *cash*. Yan, *Selected Statistics in the Economic History of Modern China*, 37.

[151] Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 415-6.

[152] Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 115.

[153] Occasionally beside an expenditure entry is a note that this was paid in 'silver notes', mostly in bannermen's payrolls and in the payment of bank reserves.

[154] Day 24 Month11 Xianfeng 3 (24 December 1853), Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 88.

[155] In Chinese this is called '*daqing baochao*', often shortened to '*baochao'*.

[156] Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 88.

[157] 'Regulation on copper notes', submitted by Junzao Qi, of the Board of Revenue (Day17, Month11, Xianfeng3), Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 372-8.

Government reports show that shops refused to accept copper notes[158] but they could be fairly easily exchanged for official banknotes. Copper notes could also be purchased (at a discount) from the official banks to purchase titles and to pay taxes. The government soon recognized the greater popularity of copper notes than silver notes, and promoted the issue of copper notes instead. In 1855, many more copper notes were issued,[159] and five more official banks (the Yu Group) were set up specifically for exchanging copper notes. Having insufficient reserves, the banks of the Yu Group could not exchange copper notes for big *cash*, but they exchanged copper notes mainly for their own banknotes. Because they seriously over-issued banknotes and had very limited reserves, the Yu Group banks folded in 1857.[160] Although copper notes were still issued after 1857 and could be exchanged in other official banks (Qian and Tian Groups), they were rarely seen in the market. In 1859, copper notes could no longer be used to pay taxes.[161] In 1860, the central government suspended the issue of copper notes (as well as the use of silver notes),[162] and ordered the gradual withdrawal of the existing paper from the market.[163]

We can reconstruct approximate annual note issues through the information in the treasury records. Because of their relatively small face value, the copper notes issued by the Board of Revenue were used mostly for salary payments and their circulation was restricted to Beijing.[164] The treasury records are incomplete, however, and information about copper notes is missing for the years 1853, 1854, 1857, 1858, and 1861. For the years 1853 and 1854 we use the figures mentioned in memorial reports; for the years 1858 and 1861, the figures of copper notes in expenditure are used as a proxy of copper note issue; the figure for 1857 is then calculated by deduction, since the total issue of copper notes is known to have been 27,113,038 strings. In the reconstructed data (Table

[158] One of the reasons was that copper notes were denominated in *wen*, instead of metropolitan *cash*, the unit commonly used on private banknotes in Beijing.
[159] Copper notes with much higher denomination were issued in 1855, such as 50,000 *wen* or 100,000 *wen*. Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 423-4.
[160] Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 91-4.
[161] Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 424-8.
[162] Ibid., 415-6.
[163] Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 96.
[164] When central government allocated funds to the provinces, they were normally paid in silver and silver notes. In addition, copper notes were printed specifically for the provinces, and central government made sure that these provincial copper notes could not be used in the capital; they would not be accepted in banks or in the payment of taxes.

1-2, p.31), we also see that the note issue was maintained at a high level during 1854-57. The issue dropped after the bank run of 1857.

The value of copper notes depreciated steadily from the date of issue: they depreciated to half their face value in 1854, and in 1857 they fell to around 20 per cent of the face value (see Figure 1-5 and Figure 1-6, p.48). After 1857, quotes for copper notes were rare. It is reported that copper notes dropped to 5 per cent of their face value during the eighth month of 1861.[165]

Impact of the policy of government paper notes: a tradable forced debt

Silver notes and copper notes were printed and issued under the name of the Board of Revenue, but from the very beginning they were mere printed paper without any reserves.[166] Unlike big *cash*, which nevertheless contained some metallic value, paper notes were valueless without the institutions that insured convertibility. Commoners in Beijing were familiar with paper notes. With the development of private native banks during the Qing Dynasty (*qianzhuang*), banknotes became common in Chinese cities: they were promissory notes convertible to the amount of copper *cash* or silver specified on the paper.[167] Besides the issue of convertibility, both silver notes and copper notes did not enjoy market preference because of their high face value: the smallest copper note had a face value of 500 *wen*, while the daily income in the period 1853-60 for an unskilled labourer was approximately 93-255 metropolitan *cash*.[168]

The total issue of government notes amounted to 23,337,719 in terms of silver taels (of which a considerable amount in silver notes may not have circulated in Beijing at all).[169] This sum was not particularly high compared to the issue of official banknotes. Besides, government paper notes were primarily used in salary payment but the recipients of these paper notes could not use them to purchase goods in the market, unless they

[165] Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 102-3.
[166] Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 350-2, 58-9. Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 93.
[167] Peng, *A Monetary History of China*, 557-8.
[168] Sidney D. Gamble, "Daily Wages of Unskilled Chinese Laborers 1807-1902," *The Far Eastern Quarterly* 3, no. 1 (1943): 60-1.
[169] The total amount of silver notes was 9,781,200 taels and of copper notes was 27,113,038 strings (

Table 1-2, p.31). The amount of copper *cash* in terms of silver taels is converted at the official exchange rate: 1 tael is equivalent to 2 strings.

exchanged the government paper notes at the official banks, which involved a huge discount. The government paper notes helped relieve the fiscal deficit by acting as a forced loan from government employees. Through the exchange service of official banks and the certainty that government notes could be used for tax payments, government debts became a tradable loan (at a discount). With their limited number and limited use in the market, the government paper notes are unlikely to have been a major cause of the inflation in the market. However, the default on these government papers, and the ensuing market panic may have been one cause.

Official banks and official banknotes

Strictly speaking, banknotes issued by official banks did not form part of the monies issued by the government. However, the issue of official banks needs to be addressed, since big *cash* and government paper notes were both intertwined with the function of official banks, and the over-issue of banknotes was probably the real reason for the inflation. Because official banks were not directly controlled or supervised by the Board of Revenue, and their operations were semi-commercial (operated by merchants), few records of official banknotes exist and their impact on the market has often been overlooked in previous research.[170]

There were three official banking groups: the Tian, Qian and Yu Groups. The Qian Group was opened with four branches in 1853, operated directly by the Board of Revenue for the purpose of salary payment of the bannermen. The Tian Group was originally the royal pawnshop operated by the Imperial Household Department (*Neiwufu*) in 1841, in order to increase the private vault of the imperial household (which was separate from the government vault). The Tian Group was converted to official banks in 1854 in order to 'facilitate' Tian Group in the service of salary payment.[171] The Yu Group was set up in 1855 and was semi-official: operated by

[170] King confuses copper notes with the banknotes issued by the official banks. He mentions that silver notes were the direct responsibility of the Board of Revenue while *cash* notes were issued through official banks which were the fiscal agents of the Board of Revenue. But, in fact, silver notes and copper notes were both issued by the Board of Revenue, and the official banks were responsible for accepting the notes (mostly copper notes) in exchange for big *cash* or their own banknotes. It seems that King has mixed up copper notes with the banknotes issued by official banks, because of their close relationship (King, *Money and Monetary Policy in China*, 150.

[171] Memorial of Sushun, Director of the Board of Revenue [Day 3 Month10 XF10], Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 474-75.

merchants with imperial charter and received (very infrequent) deposits from the Board of Revenue. All these banks were modelled on the private native banks of Beijing, and they offered money exchange services, accepted deposits and issued their own banknotes denominated in 'metropolitan *cash*'.[172] Different groups delivered slightly different services; their funding situation also differed.

The official banknotes were fully convertible notes similar to the banknotes issued by private banks (to begin with, at least). Therefore official banknotes were recognised and widely used in the market, together with private banknotes. The difference of these official banks was that they were responsible for changing government paper notes (mostly copper notes) into real money (a combination of big *cash*, iron *cash* and official banknotes).[173] With official banks as intermediaries, government paper notes became convertible: they were linked to big *cash* and a larger amount in unbacked official banknotes. (For images of the official banknotes please see Appendix E 1-5 and Appendix E 1-6; an image of a private banknote is also provided in Appendix E 1-7)

Seeing that banknotes denominated in metropolitan *cash* could circulate well in the market, the government, besides promoting government copper notes, focused on the promotion of official banknotes with three major measures. First the government put money into the Qian and Tian Groups and encouraged them to issue more banknotes. The newly printed banknotes were directly transferred to the Treasury vault and used in government expenditure. Second, the government also deposited money with the Yu Group, whose banks concentrated on exchanging government copper notes into official banknotes.[174] Moreover, the government established another institution called the Copper Donation Bureau (*juantongju*). Originally set up to encourage people to donate copper (in exchange for titles and or degrees), the Bureau became solely responsible for receiving all kinds of donations (*juanna* and *juanshu*). With these donations in hand, the Bureau issued its own banknotes (similar to the official banknotes) that were also put

[172] Banknotes denominated in metropolitan *cash* were called '*jingqianpiao'* or '*jingpiao'* in Chinese.
[173] Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 470.
[174] Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 93.

directly into the Treasury to be used in government expenditure (mostly bannermen's salaries).[175]

The total number of official banknotes issued is difficult to track down, in that none of the bank account books exists today. The number of banknotes printed specifically for use in government expenditure can be found in the treasury records. By supplying the missing years, we can get a rough idea of the size of the banks' annual note issue. The figures in Table 1-2 (p.31) show that note issues increased significantly during 1858-59.[176] The total number of notes issued through government expenditure (from Qian and Tian Groups, and the Copper Donation Bureau) was equivalent to 31,953,038 taels.[177] As this estimate does not include banknotes circulated in the market through money exchange services (in particular the amount issued by the Yu Group), the total quantity of banknotes in the market was probably much higher.

The reserves deposited by the government seemed obviously far from enough. From government documents we could only learn that each Qian Branch was endowed with a government deposit of 20,000 *diao* of *metropolitan cash* (directly from the treasury under the Board of Revenue) as initial capital. The documents do not specify how often the government pumped money into those banks, nor do they specify in which form of money the payment was realised.[178] The treasury records show that in 1853 a total of 13,784 taels of silver was transferred to the Qian and Tian Groups 'as their 20 percent reserve money'.[179] This kind of information never appears in the records of subsequent years. From their salary payment service, we could guess that the bank reserve of Qian and Tian Group should include big *cash* and copper *cash*, as most of the salary payments were made in a combination of big *cash*, standard copper *cash* and

[175] Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 219-21. Kaske, "Silver, Copper, Rice and Debt: Monetary and Office Selling in China During the Taiping Rebellion " 363-8.

[176] Banknotes were denominated in metropolitan *cash* or *diao*. In the treasury accounts all figures for banknotes were kept with strings as the unit; the figures were converted by the official ratio between metropolitan *cash* and strings, which was 2,000:1 (the official ratio between a *diao* and a *string* is therefore 2:1).

[177] The total was 63,906,076 strings, and was equivalent to 31,953,038 silver taels at the official exchange rate. Peng's estimate of the total banknote issue is equivalent to 24,723,955 taels, because he does not include the number issued from Copper Donation Bureau. Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 115.

[178] From the knowledge learnt from various government documents, the contents were normally kept vague on purpose in order to cover an obvious fact of capital shortage.

[179] Outgoing Category of 1853, "Treasury Records." The accounting details of these banks no longer exist and the treasury records hold incomplete and disorganised information about the official banks.

banknotes.[180] The reserve of the semi-private Yu Group seemed to be the weakest: it had an initial capital reserve of around 10,000 *string*, the group later received government deposit composed mainly of iron and lead *cash*.[181] Without any surprise Yu Group experienced the worst case of the over-issuing which caused the great demand to exchange copper notes against a limited reserve of mainly big *cash* and copper *cash*. After several bank runs, the Yu Group folded in 1857 and the Qian and Tian Groups followed suit in June 1861.[182]

[180] Memorial submitted by Sushun, director of Board of Revenue (Day3 Month10 Xianfeng10), Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 474-76.
[181] Memorial of Mr. Fuxiang Wu [Day27 Month12 XF4], ibid., 494-95. Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 93.
[182] *Public Finance and Economic Condition of the Late 19th Century China*, 91-94.

1.3.2 New monies in public finance: the currency composition of government income and expenditure

Through the above discussion, it is quite clear that a great deal of worthless currency was thrown into the market but not much of it flowed back into the treasury vault. This section confirms this suggestion by a more thorough examination of the currency composition of government income and expenditure at the time.[183]

Structure of government income and expenditure

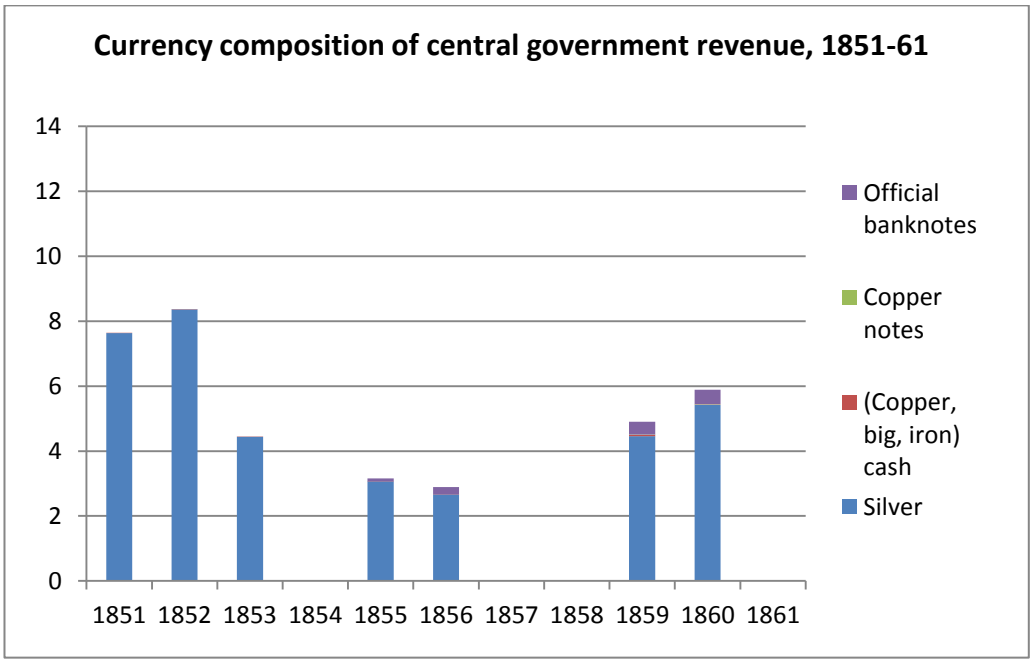
The central government revenue and expenditure are reconstructed with information extracted from the treasury records (Appendix B 1-1and Appendix B 1-4). From the figures (Figure 1-5 and Figure 1-6, p.48), we see that throughout the Qing Dynasty until the third year of Xianfeng (1853), revenue consisted of silver only.[184] After 1854, although the specie of expenditure changed (from mainly silver, to a greater part in the form of paper notes), the main composition of government income did not vary much: revenues were still mainly collected in silver and, at a later stage, in the form of numerous official banknotes.[185]

Further investigation on the specific entries of the expenditure shows that payment for military purposes was almost always made in silver; other expenditures were paid partly in silver and partly in copper notes, with salaries for bannermen being almost always paid in banknotes.

This examination shows that although large quantities of government notes were pumped into the market, most of the monies did not flow back to the government's vault (except for some official banknotes).

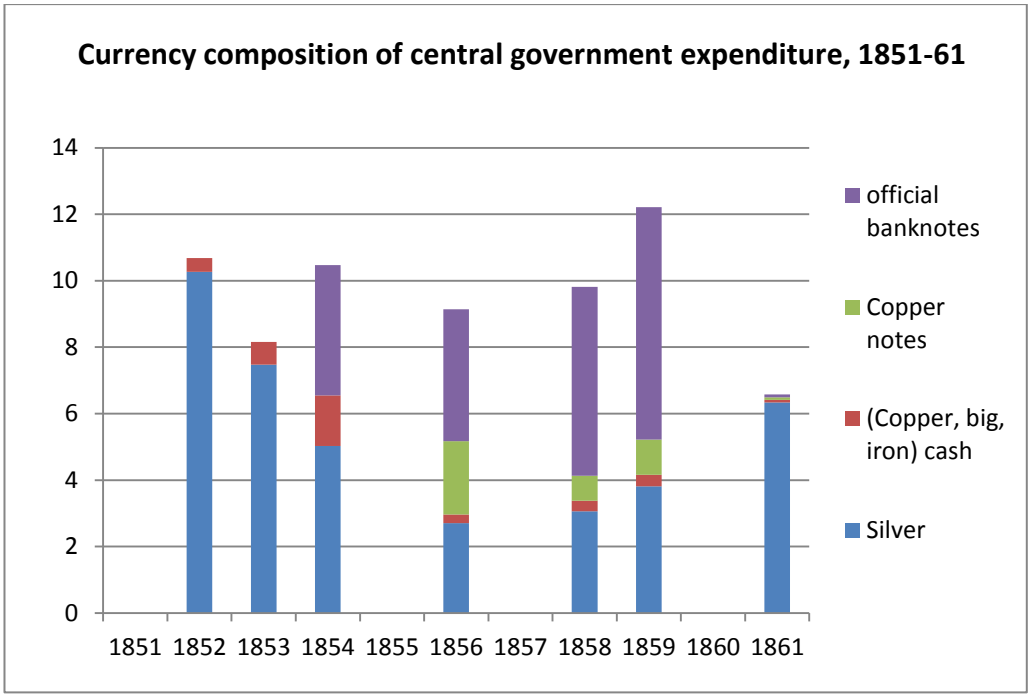
[183] For details of the composition of the treasury record, please see Appendix B.
[184] There were occasional appearances of very small amounts of copper *cash*, and they were originally payment by legal offenders to the Board of Punishment as compensation for their wrongdoing.
[185] Copper *cash* (mostly big *cash*) and copper notes formed only a very small proportion of the revenue. They entered the vault as a source of income mainly through the Board of Punishment and the Office of Title Selling. Payments for titles were usually made half in silver and half in copper *cash* or copper notes.

Figure 1-5 Currency composition of central government fiscal revenue (in millions of taels)



N.B. In the original treasury records, the unit of silver is the tael; the unit for all other forms of money is the string. In the above chart, all monies denominated in strings are converted into tael at the official ratio of 2:1 (1 tael equals to 2 strings). Source: Incoming Categories (Regnal Years XF 1, 2, 3, 5, 6, 9, and 10), *Imperial Treasury Records*. For details please see Appendix B 1-3. Bigger charts of Figures 1-5 and 1-6 with patterns provided in following pages)

Figure 1-6 Currency composition of central government expenditure (in millions of taels)



Source: Outgoing Categories (XF 2, 3, 8, and 9), summary tables of annual income and expenditure (XF 4, 6, 9, 11), *Imperial Treasury Records*. For details please see Appendix B 1-1.

Figure 1-5 (Bigger chart with patterns) Currency composition of central government fiscal revenue (in millions of taels)

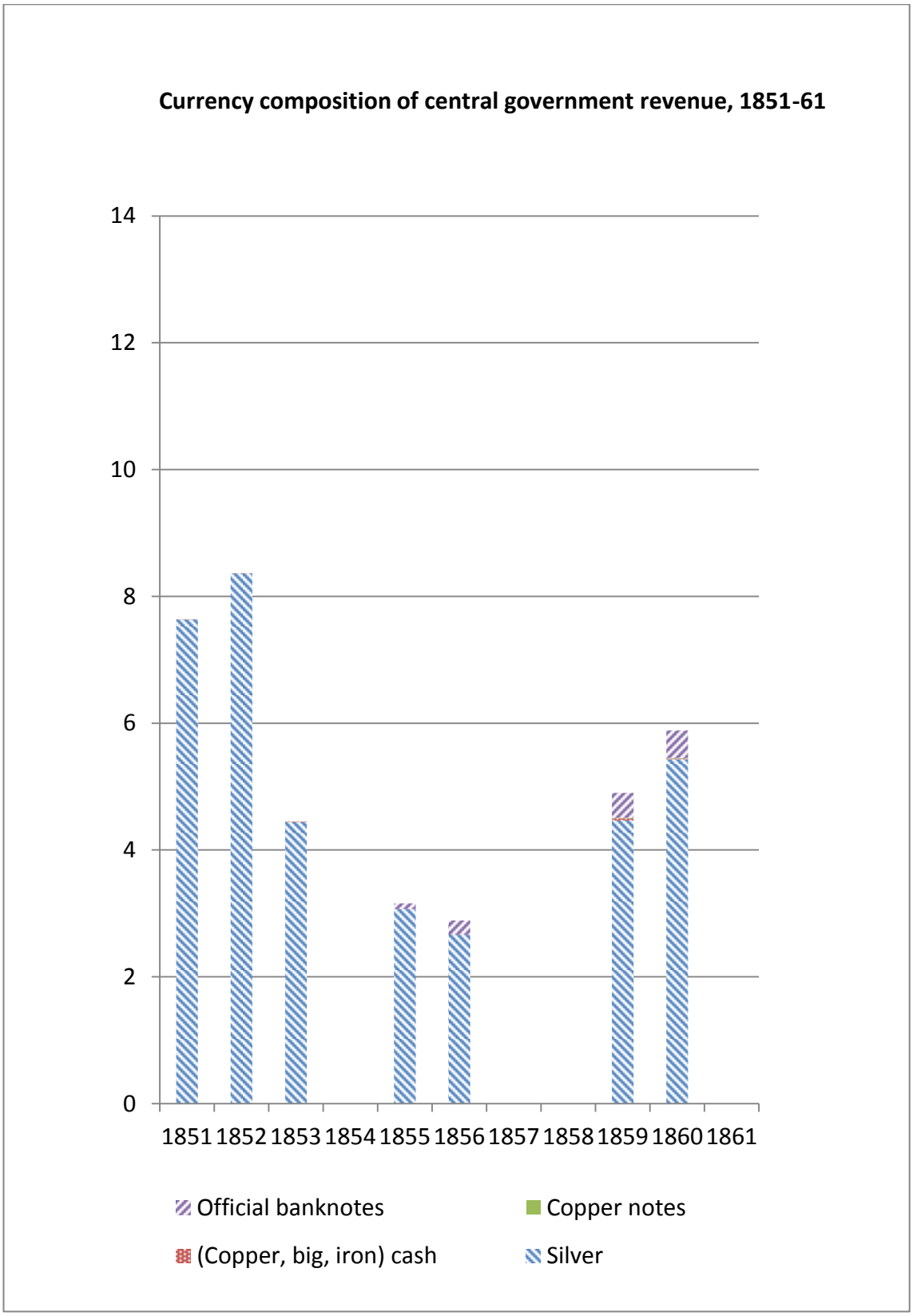
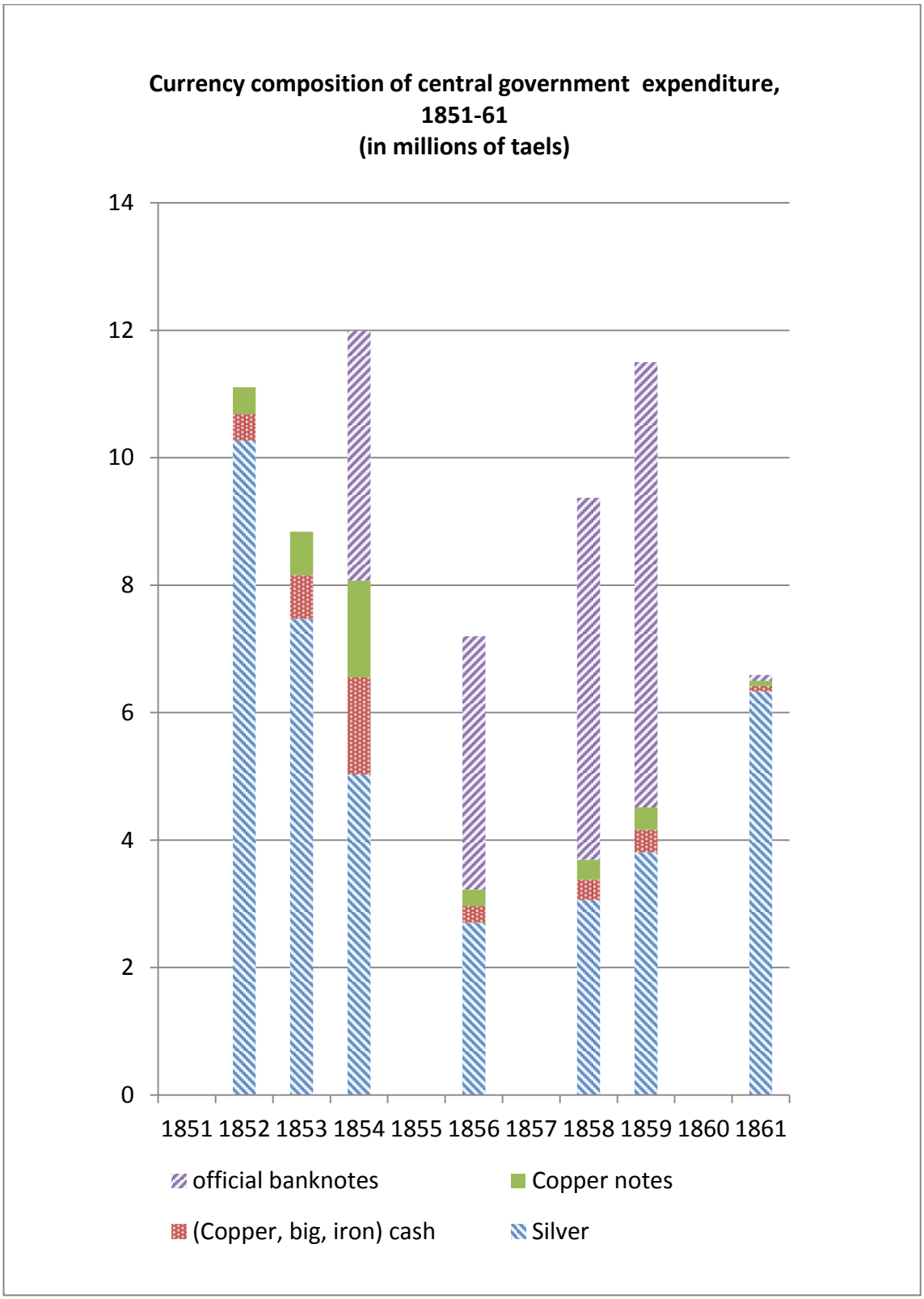


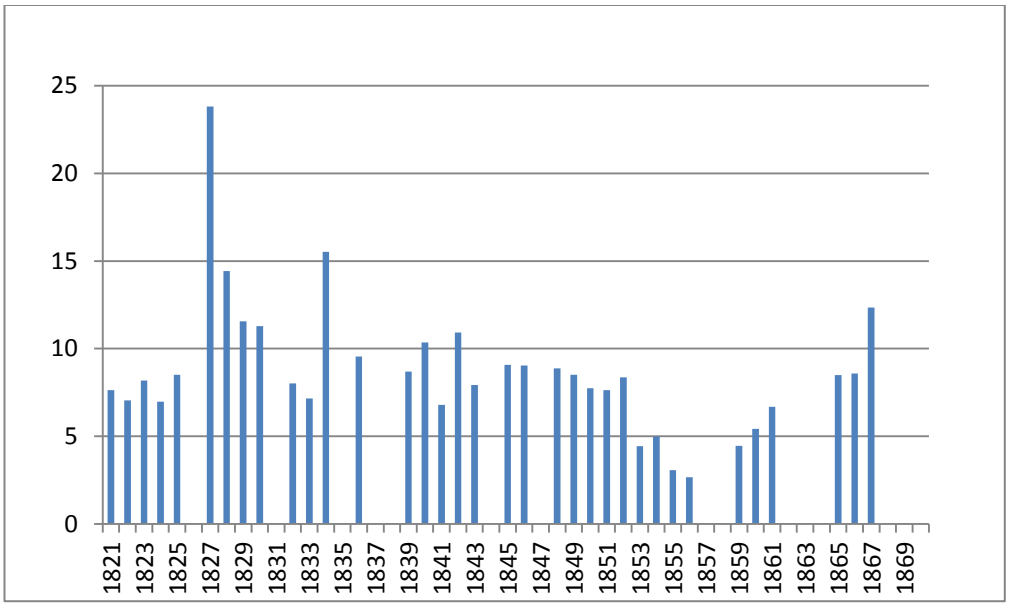
Figure 1-6 (Bigger chart with patterns) Currency composition of central government fiscal revenue (in millions of taels)



Improved fiscal situation after 1859

After 1859, the government's fiscal situation was ameliorated: the amount of tax collected in pure silver increased to the pre-crisis level. The evidence of the treasury records is supported by government reports. Take salary payments to bannermen, for example. Throughout the Qing Dynasty, 20 per cent of the salaries for bannermen were paid in copper *cash* and 80 per cent in silver. From the start of the crisis in 1853, the composition of the bannermen's salary was revised to: 20 per cent in (big or iron) *cash*, 40 per cent in silver and 40 per cent in paper notes (a combination of government notes and official banknotes). By the end of 1853, all the silver payment was made in a combination of *cash* and banknotes. The year 1857 was probably the direst for the bannermen, since the composition of their salary was again revised, to 30 per cent copper notes and 70 per cent banknotes. The situation improved after 1859 when the composition was changed to 20 per cent in (big or iron) *cash*, 70 per cent in silver and 10 per cent in banknotes.[186]

Figure 1-7 The silver component of the central government's annual revenue (in millions of taels), 1821–70



Source: Shi (2009), pp. 198-242.

[186] Memorial submitted by Sushun, director of Board of Revenue (Day3 Month10 Xianfeng10), Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 474-5.

1.3.3 New monies in the market: Money stock and the price level in Beijing, 1851-61

How much currency was then circulating in the market and how did it impact on market prices?

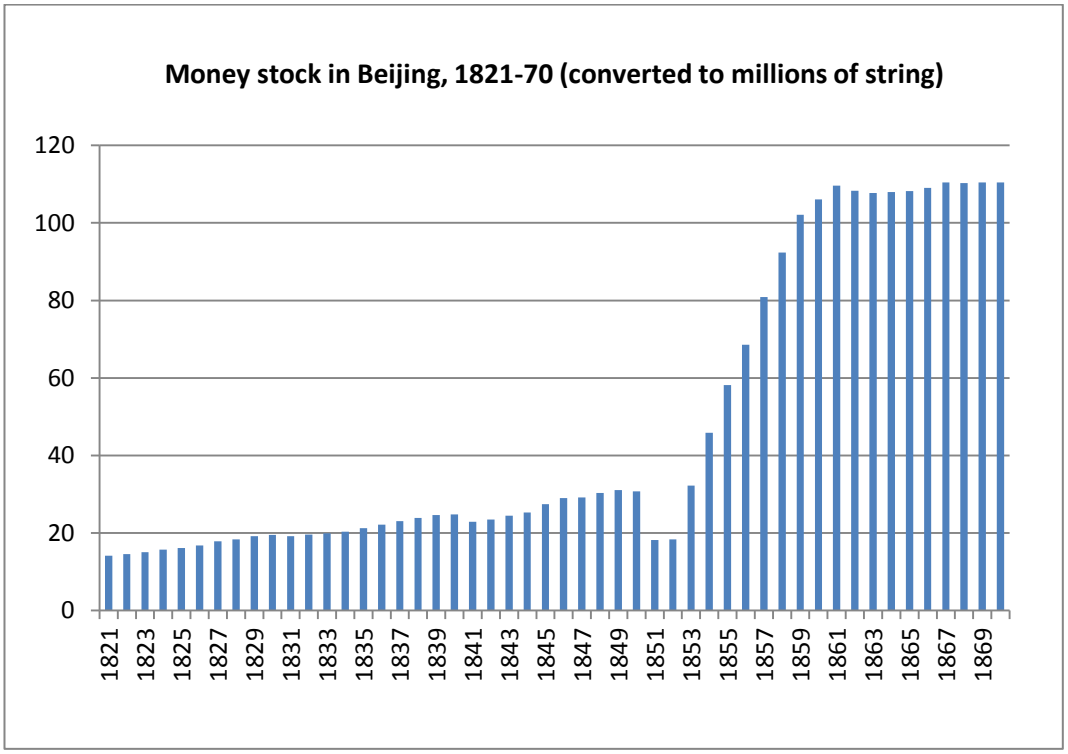
The previous literature focuses without exception on estimating the 'increased' part of the money supply and emphasizing how the additional supply of money disturbed the market. Admittedly the nominal value of annual money creation was extremely high during the period 1853 to 61: it increased almost nine-fold, from 1.14 million (strings of copper *cash*) to 9.5 million (strings of a mixture of monies). However, if the original total of money in circulation (the total money supply before 1853) was large, then even a relatively high increase in the money supply would not significantly disturb the money market. If, however, the original total amount of money in circulation was already small, then even a slight increase of money supply would be serious enough to be detected in the market.

Trend of money growth in Beijing (1821-70)

This paper provides an approximate series of the annual money stock: it estimates the money stock in Beijing in 1821 as a benchmark year, and adds to this basis the annual mint output and note issues in subsequent years.[187] Figure 1-8 (p.54) shows that the money supply continued to increasing slowly throughout 1821-50, and dropped suddenly in 1851 and 1852, then surging upwards until 1861. After 1861, there was a mild monetary contraction and then the money supply remained stable. Figure 1-8 (p.54) is only a very conservative estimate. Still, the growth of money is very high: by the end of the inflation period, the money supply had risen to four to five times its original size in 1850.

[187] For details of the data and method used, please refer to Appendix D.

Figure 1-8 Money stock in Beijing, 1821-70.



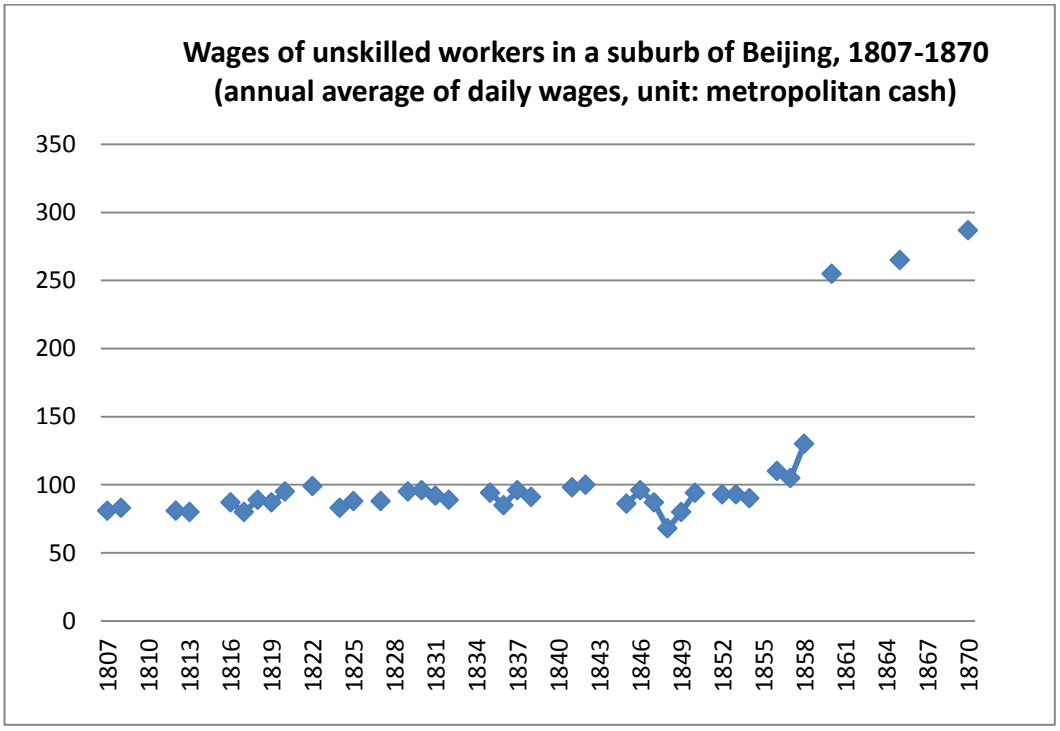
Source: Appendix D.

Trend of price rises in Beijing

The paper also collects market price information. It is impossible to construct a price index with a basket of weighted goods and services for a certain time period. But it is possible to obtain a series of certain important goods (for example, grain prices or exchange rates).[188] Two figures (Figure 1-9 and Figure 1-10) show that both wages and prices experienced inflation to different degrees. The daily wage of unskilled workers increased from less than 100 metropolitan cash in 1854 to over 250 in 1861. Retail prices experienced much higher inflation: the indexed figures for the prices of selected goods (picked up from account books) show a price rise of five to nine times from 1854 to 1861.

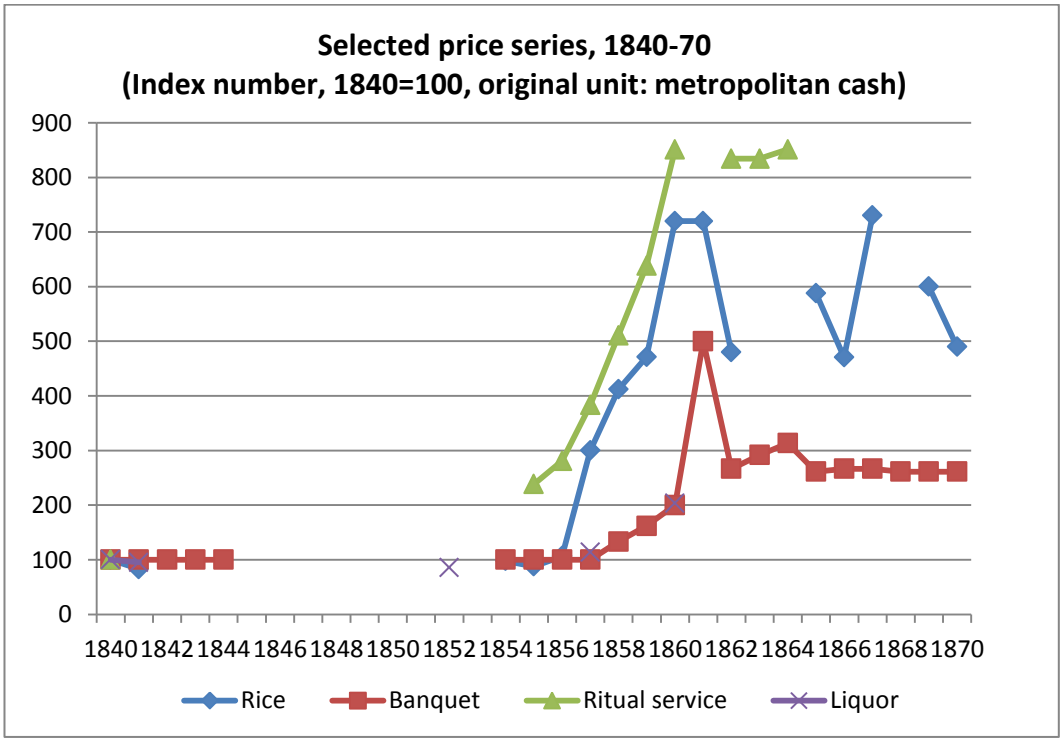
[188] For a further explanation of the archival materials concerning price series, please refer to Appendices A and C.

Figure 1-9 Wages of unskilled workers in a suburb of Beijing, 1807-1870



Source: Gamble (1943), pp. 60-1.

Figure 1-10 Selected price series, 1840-70 (Indexed 1840=100, original unit: metropolitan *cash*)



Source: Peng (2008; 2011). For more details, please see Appendix C.

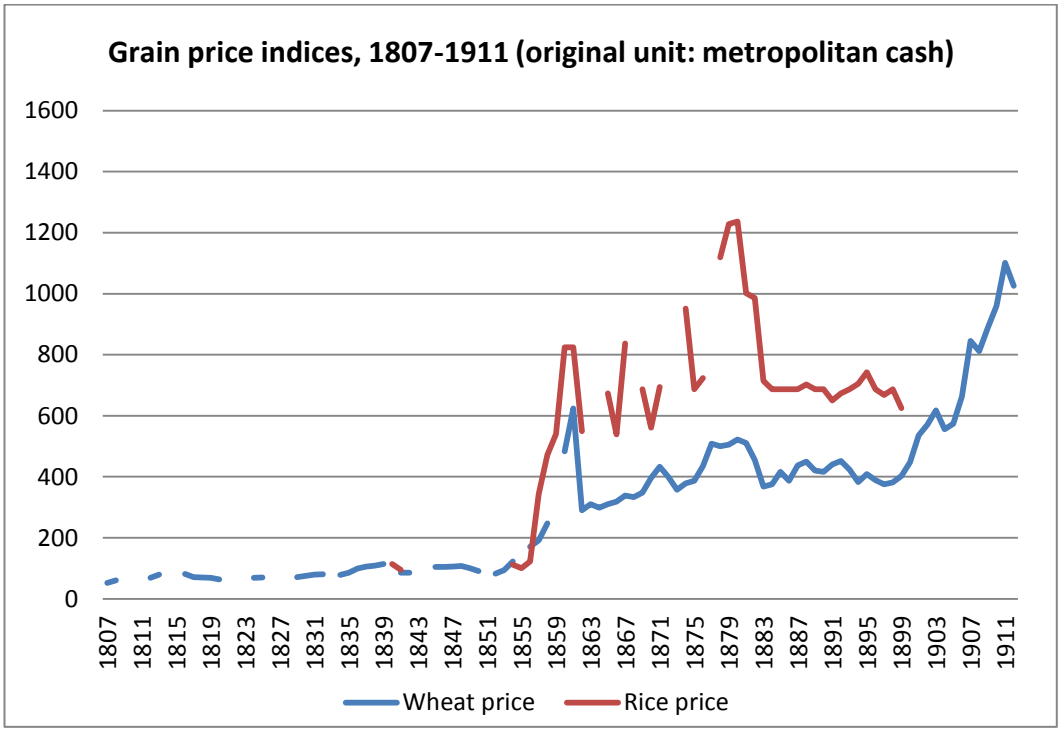
Comparison of money the stock and price level

Grain prices (Figure 1-11) are the most consistent and reliable series, and because wheat (rather than rice) was the major grain consumed in North China, we take the wheat price series to compare with the trend in money growth (Figure 1-12). Because the data are limited, the figures provide only a rough picture, which is nonetheless very interesting. Although the price level kept pace with the increase in money supply during the first half of the century, it lagged behind the increase of money stock from the beginning of the Xianfeng inflation. A great amount of money (and in the table the amount of money increase is only a lower-range estimate) was pumped into the market, whereas the price adjustment seemed slow. It was only in 1861 that prices rose sharply and almost exceeded the level of money stock.

Oddly enough, the inflation gathered pace from 1858 on, while the growth of note issues greatly slowed down in 1859 and 1860, and virtually halted in 1861. As discussed above, official banknotes were the major currency that the government successfully channelled into the market, and in 1860 the number of banknotes printed dropped to 3.4 million strings, less than 20 per cent of the amount in the previous year (Table 1-2, p.31). In 1861, only 0.17 million strings in banknotes were used in government spending (see Appendix B 1-1). At the same time real government revenues (by taxation and in real silver) increased from 1859, and in the years 1860 and 1861, the revenue in real silver was already restored to the pre-Taiping Rebellion level of 1852 (Figure 1-7, p.51). It seems that the worst inflation occurred after the injection of money, with a lag of one or two years. The original purpose of the monetary policy from 1853 was to tackle the fiscal crisis of the central government. From 1860 on, the government started to bring the rebellion under its control, and the fiscal situation ameliorated at the same time. The inflation did become more serious, but only when the fiscal crisis was almost over.[189]

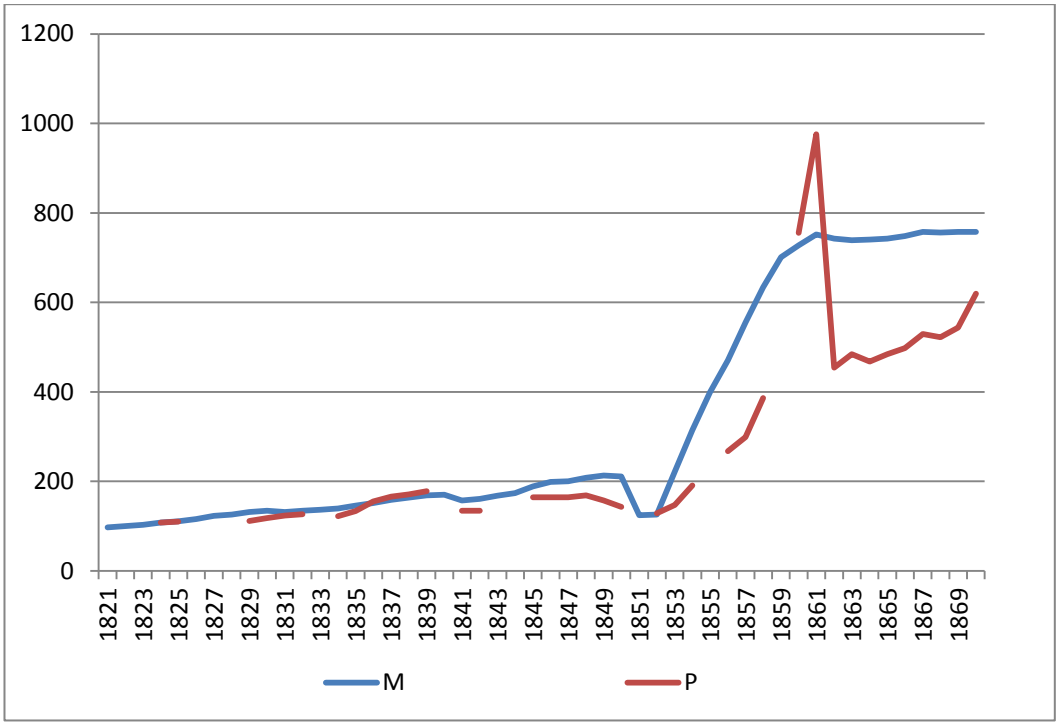
[189] With the stabilization of the war situation during 1859-60, the provinces were able to transfer to the central government the tax revenues which had been kept for local military use, or had been unable to reach Beijing because of interception en route). Not only this, but they could also transfer more: the ability to tax at the local level was greatly enhanced by the introduction of *likin* as a new source of revenue. In addition, the Inspector-General of Imperial Maritime Customs Service was installed in Beijing in 1859, and the customs revenue became a source of income for the Qing government from 1860.

Figure 1-11 Grain price indices, 1807-1911 (original unit: metropolitan *cash*)



Source: Peng (2008; 2011). For more details please see Appendix C.

Figure 1-12 Index of money stock and price in Beijing, 1821-1870 (1821=100)



Source: Appendix D 1-3

1.4 The Xianfeng Inflation: a Reassessment

Examination of the treasury records into the number of money issues allows us to answer the fiscal puzzles identified at the beginning of the paper: first, did the Xianfeng monetary policy achieve its fiscal ends (how much revenue was generated by monetary expansion and was it enough to cover the military outlay?); second, by what mechanism did the inflation develop?

1.4.1 Tackling puzzle I: did the monetary policy achieve its fiscal ends?

Did monetary expansion cover military outlays?

The problem of an inadequate fiscal system prompted by the expanding military outlay was undoubtedly a motive for proposing monetary reform. However, the Xianfeng monetary policies carried out were a series of hasty measures that helped only to finance the survival of the central government, rather than sustain a series of military operations. The monetary policies were first of all temporary and regional. Moreover, the size of the fiscal revenue generated by money creation was trivial compared to the actual military expenditure. In fact, the military expenditure was covered by the provincial governments through their own fiscal reforms.

The monetary policies originated from the central government's desperate need to fund its fiscal deficit, and they were meant to be temporary and regional. Although the central government ordered provinces to follow the example set, few provinces genuinely implemented those policies. In the 1850s, domestic warfare had rendered the country less integrated and the power of the central government over other regions was greatly undermined. The Emperor had limited access to fiscal resources, and obedience to his commands was equally limited. After its introduction of big *cash* in 1853, the central government ordered provincial mints to follow this precedent in the following year. However, the Board of Revenue reported one year later that only three provinces had observed the edict.[190] Most provinces followed by casting big *cash* a year or two

[190] Memorial by Junzao Qi of Board of Revenue (Day18 Month5 Xianfeng4): only the Provinces of Shanxi, Shaanxi and Fujian observed the new measures. Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 234-5.

later, and the output was never significant.[191,192] The printing and issue of silver notes was controlled and supervised by the Board of Revenue, which would send part of the notes (mostly in silver notes) to other provinces. The central government did encourage provincial governments to issue their own copper notes and to establish their own official banks.[193] However, with the immediate example of monetary chaos in Beijing, even some central government officials objected to a nationwide implementation, stating that the situation would simply be more chaotic in places further away from the capital. Therefore, provinces were reluctant to implement the policy, despite the repeated commands of central government over three years.[194]

Besides the limited area of implementation, the fiscal revenue raised by the monetary policies was too small to cover the huge military expenditure. Putting aside the puzzle of how valueless papers could be used to buy munitions and feed the army, the nominal value of the total issue during 1853-61 was 63,650,726 taels.[195] Statistics for the military expenditure during 1853-61 (which would include operations in several domestic rebellions, such as the Taiping Rebellion and the Second Opium War) are incomplete. However, central government records show that during 1851-53, the central government expenditure on the Taiping Rebellion alone exceeded 170,604,104 taels.[196] The total military expenditure during 1853–61 could only be far higher. The huge military expenditures over nine years could never be covered by an amount less than 64 million taels.

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[191] King, *Money and Monetary Policy in China*, 149.

[192] The exact output of the provincial mints is unknown. However, if the debased coinage was of considerable size, the big *cash* would in the end drive standard *cash* (the good money) out of the market. After the chaos, big *cash* were the only coins circulating in Beijing; and only standard *cash* circulated in the rest of the country. This would suggest that the policy of coinage debasement was vigorously implemented only in Beijing.

[193] Copper notes issued at the provincial level were called '*shengchao'* (provincial notes), Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 114-5.

[194] Imperial edict on the use of government notes and the establishment of official banks in each province (Day13 Month10 Xianfeng5), Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 450.

[195] Calculated from

Table 1-2 (p.31). The figure was even smaller according to Peng, who estimates it to be 60,249,000 taels. Peng does not provide details of his calculation. Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 114-5.

[196] The military expenditure during 1851-53 may be higher; this figure was calculated only from existing trackable records of the central government. Neither does the figure include expenditures by the provincial government. After 1853, the military expenditures were mostly raised by regional governors instead of coming from central government. Ibid., 127-30.

After 1853, the relevant provinces were left to their own devices to cover most of the cost incurred by the war. Facing a sudden rise of military expenditure, any province would have had the same fiscal difficulties as the central government, but their problem was far less acute than Beijing's because they enjoyed local tax revenues and had also devised better means of resolving fiscal difficulty. As well as local tax revenues, two methods of raising funds – a transit tax (*likin*) and foreign loans – were introduced by provincial governments. *Likin* was a transit tax collected from inland merchandise and was first introduced in Jiangsu province (the location of the camps of the Qing army against the Taiping rebels) to finance the army in suppressing the Taiping Rebellion.[197] During this period also the first foreign loan between local officials and foreign merchants in Shanghai was negotiated in order to hire mercenaries for the defence of the city. The loan was later paid off by the tax revenue from the customs house in Shanghai.[198] These two province-initiated fundraising methods proved to be extremely important sources of income, and they changed the entire fiscal structure of the Qing Dynasty in the post-Taiping period.[199]

The Xianfeng monetary policies therefore did not help to cover actual military outlay because they were limited in their place of implementation and also limited in terms of the amount of revenue they could raise. They were first and foremost methods to resolve the public finance crisis in the capital caused by the sudden contraction of capital revenue (*jingxiang*) when the provinces could not (or would not) send the tax revenues to the capital but instead kept them for local military use. Treasury records show that money creation had a considerable role in meeting the needs caused by increased expenditure. Acting more like a government debt, these temporary measures

[197] *Likin* is called '*lijin*' in Chinese, meaning 'one per cent of money', because *likin* was normally levied at one per cent of the value of the goods involved.
[198] Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 150-6.
[199] The appearance of *likin* replaced the malfunctioning inland customs houses (*changguan*), and levied taxes on trade and business – a growing substantial sector of the economy. Foreign loans backed by maritime customs revenues also became a common way of issuing domestic and foreign loans in later times. Revenues from customs tariffs often proved to be reliable collateral when otherwise the regime itself lacked credibility. It is also worth mentioning that, during the siege by the Taiping rebels, the actual control of the customs house in Shanghai was handed to foreign counsellors (mainly British), who eventually helped to found the Imperial Maritime Customs Service. Later the Customs Services also collected salt tax and *likin* on behalf of the Chinese government. From late Qing until Republican China before the Second World War, *likin*, a salt gabelle and customs revenues, together with land tax, formed the three pillars of tax revenue. Chen, *Papers on the History of Qing Public Finance*, 109-31. Yinpu Yang, *A History of Public Finance in Republican China (Min Guo Cai Zheng Shi)*(Beijing: Finance and Economics Press of China (Zhong guo cai zheng jing ji chu ban she), 1985), 46-50.

did help to solve the urgent problem of central government financing and therefore sustained its functioning, although at the cost of monetary instability and inflation.

Did the money expansion generate revenue for central government finance?

The answer is complicated. Monetary policy can generate revenue via seigniorage revenue or by inflation (to reallocate wealth and to reduce government debt). However, when the government has very limited control over money supply, neither seigniorage revenue nor inflationary finance is easy to gain.

The coinage of big *cash* is an effective debasement – the most common monetary policy in early history; it earns the ruler seigniorage revenue but induces inflation.[200] In a typical government-led debasement, the mint would raise the mint equivalent by reducing the commodity content of a coin or raising its face value (thereby reducing the commodity content of the corresponding unit of account). Therefore the new coins minted were overvalued in relation to the old ones, attracting people to take their metal (or old coins) to the mint to have it cast into (more) new coins.[201] Hence debasement often had two fiscal functions for the state: first, it would induce a wave of increased coinage (or re-coinage), increase the mint output and as a result increase the seigniorage revenue. Second, with the gradual price adjustment inflation would occur soon afterwards, transferring wealth from nominal creditors to nominal debtors. [202] Debasements were common in early modern Europe partly because kings tended to be big debtors themselves.

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[200] Although some would argue that it is more a fiscal policy than a monetary one. Michael D. Bordo, "History of Monetary Policy," ed. Steven N. Durlauf and Lawrence E. Blume, Second ed., *The New Palgrave Dictionary of Economics Online* (Palgrave Macmillan, 2008), http://www.dictionaryofeconomics.com/article?id=pde2008_H000180.

[201] The mint equivalent is the total face value of the number of coins that can be struck from a certain quantity of metal. The mint price is the market value of the raw metal (the price at which the mint purchased the metal). The difference between mint equivalent and mint price is the gross seigniorage. For example in early 16th century France, the legal tender value of one gold *écu* was 2 *livres tournois* (*l.t.*). From a *marc* of gold (4,608 grains) 74.26 *écus d'or* could be made, with a total face value of 148.52 *l.t.*, and therefore the mint equivalent of gold is 148.52 *l.t.* The mint price was 147 *l.t.* per *marc*, leaving 1.52 *l.t.* as the gross seigniorage for the mint. Debra Glassman and Angela Redish, "Currency Depreciation in Early Modern England and France," *Explorations in Economic History* 25, no. 1 (1988): 77.

[202] François R. Velde and Warren E. Weber, "Commodity Money ", ed. Steven N. Durlauf and Lawrence E. Blume, *The New Palgrave Dictionary of Economics Online* (Palgrave Macmillan, 2008), http://www.dictionaryofeconomics.com/article?id=pde2008_C000235.

Chinese monetary history is also full of repeated debasement and reinforcement.[203] During the Qing Dynasty, however, copper *cash* constituted only a small part of the total money stock, and debasement of copper coinage was not an effective way of raising funds.[204] During the Qing Dynasty the authorities gradually realised that by minting full-bodied *cash* the mint lost money.[205] Therefore there were sometimes copper *cash* debasements before 1850, but they were very mild to conceal the government's wish to make ends meet.[206][207]

The debasement during Xianfeng's reign was drastic in terms of depreciation,[208] but very limited in terms of scale.[209] Moreover, old 'undervalued' coins were not reminted by the mints. Instead, the state explicitly ordered that the big *cash* should circulate together with standard *cash*. Although the imperial mints did not remint standard *cash* into big *cash*, the market did. With waves of counterfeiting, the Beijing market was left with nothing but big *cash,* and inflation followed. Seigniorage income did occur with waves of debasement, but a large share of the profit was enjoyed by counterfeiters instead of the state.

The government paper notes – silver notes and copper notes – were not full legal tender in the eyes of the common people. They could be used to pay part of the taxes, or to purchase titles and degrees, but they barely qualified as monies. Although they were called 'silver' or 'copper' notes, they were in no way convertible to real metal. They

[203] Reinforcement is a restoration of coinage to its original fineness and weight.
[204] Less than 20% of the total money stock in terms of value. Peng estimated that during the late Qing period, the total copper sector (copper coins including standard *cash* and the new type of copper coin minted after 1900) constituted 17% of the total money in circulation. Peng, *A Monetary History of China*, 595.
[205] The government intended to fix the exchange rate between silver and copper *cash* at 1 (tael) : 1,000 (*wen*). However with the increasing inflow of silver, the coinage of full-bodied copper *cash* became increasingly costly.
[206] In 1660 (the early Qing period), a copper *cash* weighed 0.14 *liang* and contained 70% copper. The weight of the copper *cash* was reduced to 0.1 *liang* in 1684 and in 1702 it was further reduced to 0.07 *liang*. The weight was stabilized at 0.12 *liang* in the mid-18th century. Since the 19th century, the regime had undergone a slow and discreet debasement by secretly reducing the copper content from 60% to around 50% (i.e. a debasement of around 17%). Peng, *A Monetary History of China*, 522-26, 66-68.
[207] The debasement in 1702 led to a permanent devaluation of the unit of account in Beijing. This unit of account, called the 'metropolitan *cash'*, used to be at par with 1 *wen* of copper *cash*. It depreciated when the weight of one *cash* was reduced to half: from 0.14 to 0.07 *liang*. Later the weight of copper *cash* was restored to 0.14 *liang*, and the debased 'small coins' were called back from the market. The 'metropolitan *cash*' remained as a ghost unit in Beijing (and certain northern areas) even though the 'small coins' no longer existed, and one copper *cash* (one *wen*) was worth 2 metropolitan *cash* thereafter. King, *Money and Monetary Policy in China*, 58-65.
[208] Minting a piece of 1,000-*wen* big *cash* means a debasement of 98.3%.
[209] The production of big *cash* was prompted by the lack of copper ingot stock.

were finely printed IOU papers forced into the hands of the government employees (who happened to be the last group wishing to protest against the Emperor), but they could hardly be pressed into market circulation. In order to ease the lives of the IOU holders, official banks were set up to exchange these government paper notes for other, usable, money (big *cash* and banknotes) at a discount. The official banks also sold the government paper notes at a discount to people who wanted to pay tax or buy titles, thereby establishing a secondary market for trading in debt. As the government progressively reduced the proportion of tax payment that could be paid in government paper notes, silver notes and copper notes depreciated quickly in the currency market. The market would not be fooled into accepting the face value written on a valueless piece of paper. From 1857, government notes were rarely seen in the market. From 1859 on, only big *cash* and official banknotes circulated in the market. In 1860 and 1861, serious inflation occurred in Beijing.[210] If government notes were almost extinct as early as 1857, what then was responsible for the inflation of 1861?

[210] Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 99.

1.4.2 Tackling puzzle II: a new explanation of the inflation mechanism

How to explain the much higher money increase and relatively low inflation? And why did inflation gather momentum only when the increase in money supply slackened?

The larger increase of money compared to the slower momentum of this inflation may have been a result of genuine economic growth, or a slowed velocity in money transactions. Beijing was a consumer city (similar to Madrid in the twentieth century[211]) without any substantial economic production. The city relied on supplies from other parts of the country and consumption was sustained by a large number of salary receivers (the royal household, the bureaucrats, and the personnel of the eight banners). The disturbance of the trade route during the Taiping Rebellion would only cut the supply of goods and money.[212] A low velocity of money would be a more reasonable explanation: in this case monies would not have been treated as money (but stored instead of circulating in the market) until 1861. The part of the money which was more likely to have been stored was silver notes and copper notes: they were less suitable for daily exchange, but they could be taken to the official banks and exchanged for banknotes when necessary. Since the exchange rates between these government notes and the banknotes were low, people might have preferred to keep the government notes until the exchange rates had risen (for instance, when the government's fiscal situation was better). Or they might have tried to get rid of the paper quickly if they expected the exchange rate to deteriorate.

Withdrawal of emergency policies

From 1859, the government finances improved, which can be seen from the improvement in the bannermen's salary. Bannermen received salaries according to their social status, not from their seniority in service. Their salaries were a heavy burden on central government expenditure: they were the first victims when a budget cut was required, and usually the last to have their salary raised. During the crisis beginning 1853, bannermen's salaries were paid with a small amount of *cash* (mostly big *cash* and

[211] David R. Ringrose, "Towns, Transport and Crown: Geography and the Decline of Spain," in *Geographic Perspectives in History: Essays in Honor of Edward Whiting Fox*, ed. E. D. Genovese and L. Hochberg(Oxford: Blackwell, 1989).

[212] Some reports show that there was a shortage of everyday necessities because of the war, and also because of the monetary confusion in the city, which made merchants reluctant to bring in goods and trade. Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 108-9.

iron *cash*) and a combination of different paper notes (including copper notes and banknotes). From 1859, in contrast, silver made up 70 per cent of their salary.[213]

However, in addition to the restoration of the old payment rules, the government wanted to restore the old taxation and monetary system. In early 1859, Xianfeng's most trusted official, Sushun,[214] known for his heavy-handed approach, was appointed the president of the Board of Revenue. Sushun first suspended the casting of iron *cash*, signalling the government's rejection of the value and use of iron *cash*.[215] The market responded quickly by exchanging iron *cash* for other forms of money: big *cash* and, more often, banknotes. By the fourth month of 1859, the exchange rate of iron *cash* had plummeted, and during the seventh month, iron *cash* was hardly accepted by shops any longer and rarely seen in the market (except for one or two occasions when it was reported that iron *cash* were thrown into Sushun's face by passers-by on the street).[216]

This uncompromising politician then turned his attention to limiting the issue and use of copper notes: from 1859 on, copper notes could no longer be used for tax payment.[217] Copper notes could still be used to purchase titles, but only at the Copper Donation Office. However, in 1860, the use of copper notes for the purchase of titles was also ordered to end.[218] Later the Court also discussed the possibility of a total abolition of copper notes, causing people to rush to exchange their copper notes for banknotes.[219]

Sushun's way of regulating the monetary situation is more like 'cleansing' than 'dredging' the channels of circulation. Measures such as limiting the use of copper notes and iron *cash* could be taken as the government's admitting the failure of its temporary monetary policies. This open acknowledgement of failure undermined the credibility of an already frail government, compelling the market to exchange the government-issued money for banknotes, thereby further adding to the already high

[213] Memorial submitted by Sushun, director of the Board of Revenue (Day 3 Month10 Xianfeng10), Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 474-5.
[214] Sushun was a Manchu noble and an influential statesman. He was named a regent after the death of Xianfeng, but was executed in the *coup d'état* of 1861 plotted by the Empress Dowager Cixi.
[215] King, *Money and Monetary Policy in China*, 157-8
[216] Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 100, 470-1. King, *Money and Monetary Policy in China*, 158.
[217] Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 424.
[218] Ibid., 426-7.
[219] Ibid., 488-9.

liquidity of banknotes in the market. The city's monetary stability could easily be challenged by any untoward event.

Market panics of 1860-61 and stabilization of 1862

In the summer of 1860, Tianjin, the last point of defence between the sea and Beijing, was taken by the joint Franco-British force. Fleeing from the endangered capital, people rushed to the banks to exchange their banknotes for real metal coins (since the banknotes of Beijing would be worthless elsewhere). Banknote depreciation was rampant: they fell to 10-28 percent of their face value, while in 1858 banknotes had depreciated only to 50 per cent of their face value (see Figure 1-3 and Figure 1-4, p.34).[220] Since banknotes could be exchanged for 10-*wen* big *cash*, banknotes already depreciated in step with the depreciation of big *cash*. After 1860, banknotes depreciated further, and even their link with big *cash* could no longer be sustained: a banknote of 1,000 metropolitan *cash* could be exchanged for big *cash* of only 700 metropolitan *cash* (i.e. 35 10-*wen* big *cash* coins).[221]

The crisis of 1860 exposed the serious over-issue of official banknotes in the city. Because banknotes had been over-issued for years, unbacked by proper reserves and official banks were unable to exchange as many banknotes as people demanded. (Private banks fared much better because they had not received a government order to issue so many banknotes.) Although, with hindsight, one should understand this as a systemic corruption, a forced negligence caused by a deliberately ill-designed institution, Sushun understood the over-issue of banknotes as the product of the negligent officials and corrupt merchants who had been in charge of the official banks. He undertook a thorough investigation of the accounts of the official banks and even the treasury, and arrested over a hundred notables and merchants for being involved in corruption.[222] He also suggested that the official banks should be allowed to exchange the banknotes at a discount.[223] Instead of reassuring the market, Sushun's actions made people suspect that

[220] Government reports show that banknotes fell to 28% of their face value. This may only have been the official exchange rate, for the official banks were ordered to exchange banknotes of 1,000 metropolitan *cash* for 35 big *cash* (i.e. a nominal value of 700 metropolitan *cash*, equivalent to 70 *wen* standard *cash* only). Records kept by contemporaries show that the banknotes fell to around 10% of their face value. Ibid., 473. Zhang, *Life of a Qing Mandarin in Beijing*, 234.
[221] Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 473.
[222] King, *Money and Monetary Policy in China*, 158.
[223] Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 473.

the government would soon repudiate official banknotes, following the example of copper notes and iron *cash*.[224]

In the following summer (the sixth month of 1861), rumours spread again that official banks would soon be dissolved because of Sushun's investigation.[225] Moreover, a secret memorial from the Board of Revenue somehow leaked out; it informed the Emperor that the government would never have enough silver to exchange for all the official banknotes.[226] A renewed wave of bank runs occurred in the summer of 1861 (in the sixth month). People lined up outside the banks day and night to exchange their banknotes. Official banks had to close early in order to avoid the overwhelming demand for money exchange, and they folded within a month.[227] This was a virtual suspension of the convertibility of the official banknotes. They were no longer accepted in shops and private banknotes were once again in favour.[228] Two months after the banking crisis (i.e. the ninth month of 1861), the official banks were officially dissolved. Instead of setting up an institution specifically to recall the official notes that were in the market, the government declared that banknotes would be used for purchasing titles through the Copper Donation Bureau.[229]

The over-issue of official banknotes led to a depreciation of the unit itself. However, private banknotes fared better during the inflation, although they too depreciated.[230] After the crisis when official banknotes were no longer recognised, the market was under some monetary stringency. The stringency was relieved partly by big *cash* and partly by the issue of private banknotes. Price stability was restored in 1862. The level did drop, but stabilized at five times the pre-crisis level (see Figure 1-12, p.56). It could do because the private banknotes after the crisis were linked to big *cash* instead of the traditional standard *cash*. Since big *cash* represented a depreciation of 80 per cent

[224] Some officials sensed that this would send negative signals to the market, and suggested timidly that 'before we arrest the merchants, we need also to pay attention to the overall situation that might be brought up by those arrests'. Ibid., 477.
[225] Ibid., 477, 88.
[226] Ibid., 488.
[227] Ibid., 489. Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 101.
[228] Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 489. Zhang, *Life of a Qing Mandarin in Beijing*, 235.
[229] Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 484.
[230] In the summer of 1861, official banknotes of 1,000 metropolitan *cash* accounted for only 10-30 pieces of standard *cash* (i.e. 5-15 pieces of big *cash*, equivalent to 20-60 metropolitan *cash*); while private banknotes of the same face value could be used as 100 pieces of standard *cash* (i.e. 50 pieces of big *cash*, equivalent to 200 metropolitan *cash*). Zhang, *Life of a Qing Mandarin in Beijing*, 235.

compared to the standard *cash*, the unit of account – metropolitan *cash* – also depreciated by 80 per cent.

The government's original monetary policy was debased coinage and government paper notes. These new monies did not work well in the market and therefore the policies could hardly achieve the government's fiscal goal. However these monetary policies produced unexpected consequences. First, big *cash* replaced standard *cash* as small change in Beijing, and a permanent depreciation of the unit followed. Second, although government notes never quite circulated as money, they functioned as a tradable debt through the exchange service of official banks.[231] In this regard, the official banks, and to some extent the whole banking sector in Beijing, were hijacked by the government and compelled to amortise its debts. It was the ensuing banking crisis, rather than the new monies created under the government plan, that had triggered the inflation.

[231] There was a (small) market for the government notes, since purchasers of degrees and titles would buy these government notes through official banks (at a discount).

1.5 Concluding remarks

In pre-modern China, under a commodity money system in which the government exerted very limited control, nothing could sound more far-fetched than exercising a successful monetary policy by means of limited debasement and the introduction of inconvertible paper monies.

This paper investigates the Xianfeng monetary policy by consulting historical archives and proposes an alternative explanation for the mechanism of the Xianfeng Inflation. The paper compiles monetary and price datasets from archival materials. It calculates the nominal value of the total money created and also traces their major functions in government expenditure, demonstrating that the monetary policy during Xianfeng hardly achieved the fiscal need of covering the government's military expenses. It then constructs a rough picture of the annual money stock in Beijing and compares the money growth with the price index, showing that the increase in the amount of money alone cannot explain the development of inflation.

In terms of monetary policy, both policies – big *cash* coinage and the issue of government notes – were of limited size and fiscal impact. However, the appearance of big *cash* drove out the standard *cash*, changed the money and daily exchange, and induced the depreciation of the unit of account. The inconvertible government paper notes (silver notes and copper notes) acted rather like a forced loan to government employees and government banks. Official banks issued official banknotes in order to exchange government paper notes. Because the official banks had insufficient reserves (mostly big *cash* and even iron *cash*), official banknotes were clearly over-issued. At first, official banknotes, similar to private banknotes, were convertible to copper *cash* upon demand. This linkage was soon broken and banknotes were redeemed with big *cash* instead of copper *cash*. In 1861, the government finally defaulted on its debts (government paper notes), leading to bank runs and the inflation of banknotes. In 1862, this financial crisis was consolidated when the remaining banknotes (issued by private banks) resumed their convertibility with real money. Because all banknotes after the crisis were linked to big *cash* instead of copper *cash*, the market price stabilized, though a level at which they did so was five times higher than the pre-1853 price level.

Through a mechanism of debasement and default, the monetary measures caused inflation in the capital. The monetary policies during Xianfeng's reign were in fact a series of incoherent monetary measures intended to temporarily ease the fiscal stringency of the central government. With the restoration of the central government's income and subsequent fiscal reform, those monetary policies were soon abolished (except the coinage of big *cash*).

Earlier parallels existed in European monetary history: John Law's experiment (1716-20) in France is an example. Law's system was a more sophisticated mechanism involving both public finance and fiat money creation. The system converted existing French public debts into (public company) equity. At the same time, the system replaced existing commodity money with fiat money. As the company took over government's role of tax collection and also monopolized overseas trade, the fiat money can be understood as backed by state revenue.[232] If Xianfeng's currency change was led and managed by a business genius (for instance, by Maoyin Wang who insisted on the importance of establishing banks in facilitating money exchange and circulation) instead of government officials with closed minds, or if the issue of government debts (and later legal tender) was issued by a more credible entity (for instance, the de facto independent Imperial Maritime Customs Service founded in 1858) with tax collection as a backing, the result of Xianfeng's monetary policy might be different: it might well be a chance for successful monetary and financial innovation.

The monetary measures during Xianfeng crisis were incoherent, unsuccessful and short-lived: it was implemented only very limited area and old practices were restored quickly after the end of the crisis. In retrospect, however, the crisis and the temporary monetary measures left a long term legacy with unexpected consequence on the course of monetary evolution: the central government became extremely conservative in terms of monetary reform; and both monetary reform and monetary innovation became regionalised. The monetary measures during crisis therefore precipitated the collapse of the once unified traditional monetary system during a time when regional power grew

[232] François R. Velde, "Government Equity and Money: John Law's System in 1720 France," *Federal Rserve Bank of Chicago Working Paper Series*, no. 2003-31 (2003). Larry Neal, *The Rise of Financial Capitalism: International Capital Markets in the Age of Reason*(Cambridge: Cambridge University Press, 1991), 62-88.

much stronger (regional fiscal capacity as well as military power grew much stronger after the Taiping Rebellion). Regional initiated monetary reforms became extremely active in subsequent decades, and pushed forward the modernisation of the monetary system.

With the lesson of the Xianfeng inflation, the central government was not eager to try any new monetary reform too soon. The Xianfeng inflation deprived the central government of its last remaining bit of capability or willingness to innovate. With the failure of official banks and inflation caused by the over-issue of unbacked banknotes, the government had squandered the last morsel of its credibility. The government reaffirmed the dynastic fear of the issue of paper notes, and tried its best never to issue paper notes any more. Similar to the case of France, after the bust of Mississippi bubble there was hesitation even in pronouncing the word 'bank' for 150 years thereafter,[233] the notion of paper money became the 'you-know-what' taboo for the Manchu rulers till the end of dynasty.[234]

The depreciation of the market price of big *cash* also convinced the government that the market would accept only a coin with a face value matching its intrinsic value as a piece of metal and not only by the face value stamped on the coin. The government recognized a dilemma: although the minting of full-bodied small coins cost the government a disproportionate amount, the minting of debased coins would invite counterfeiting which would soon wipe out any seigniorage profit. Therefore, several decades later, when Li Hongzhang (Viceroy of Guangdong and Guangxi) sent a memorial to Beijing suggesting the minting of a new type of copper coin with steam-powered machines, the proposal was immediately and furiously rejected.

In addition, because the monetary measures were most vigorously carried out in Beijing and only partially put into force in some of the other provinces, the uneven implementation accidentally accelerated the nation's monetary disintegration. At the same time, provinces unwilling to carry out the monetary policies found better ways to raise funds – by restructuring their fiscal system. In the end, after the political

[233] Charles Poor Kindleberger, *A Financial History of Western Europe*(London: George Allen & Unwin, 1984), 98. Cited from Neal, *The Rise of Financial Capitalism*, 62.
[234] The next successful introduction of a national paper currency was in 1935.

turbulence and monetary chaos, fiscal power was also regionalised. Provincial leaders had more say and more resources to carry out their own initiatives, including regional reforms in the monetary sector. It turned out that the regionalisation of the currency system could be a blessing in the Chinese context (when Beijing remained conservative or even counteractive). The next chapter (Chapter Two) describes how ten years after Li's initial proposal, copper coinage produced by steam-powered machines was implemented in Canton against the wish of the central government (which itself was too busy with the Boxer Rebellion and a foreign siege), and this coinage proved to be an economic and fiscal success.

If things had to get worse before they could get better, the impact of Xianfeng inflation was not entirely negative: it kick-started the whole monetary modernisation process.

1.6 Appendices

Appendix A: Archival materials concerning Xianfeng's Reign

Government publications

Archive materials directly related to the monetary policy are scarce, and material on mint output or the amount of paper notes printed do not exist. Nor could we find many systematic records of market information, such as price series or exchange rates between different currencies. Scholars therefore need to research government publications to piece the picture together. Government compilations that were frequently consulted by previous writers include: *Veritable Records of the Qing* (*Qing Shi Lu*), *The Collected Statutes of the Qing Dynasty* (*Da Qing Hui Dian*), and *A Classified Compendium of the Administrative Statutes of the Imperial Dynasty* (*Huang Chao Zheng Dian Lei Zuan*). These works were compiled by court scholars and provide an important and relatively reliable source of information. However, as official publications, they were usually a biased description favouring the government's standpoint. In addition, these works emphasize big events, regulations and government statutes; the details of a particular policy (for instance, the date of the issue of big *cash*, or the exact number of the *cash* minted) were of the least concern to government officials. This paper relies on previous studies of the above government compilations.

Government internal documents

Compared to government publications, government internal documents are of greater value because they are more direct and contain more detailed information. Materials consulted by this paper include: Memorials, Secret memorials, and annual ministry reports including treasury records.

Memorials and secret memorials were records of communication from officials to the Emperor encompassing all aspects of public affairs. Memorials (*tiben*) were reports submitted by Board officials to the Emperor for discussion. They are a more routine form of communication, and needed to pass through many levels of bureaucracy before they could reach the Emperor. Secret Memorials (*zouzhe*) were more important communication documents from top officials, which for security reasons were submitted directly to the Emperor without being handled by any other bureaucrat. Secret memorials are also called 'Palace memorials' (*gong zhong zhe*) or 'Folded memorials' (*zouzhe*), because these memorials were folded and could be opened only by the Emperor himself. Memorials contain details of government decision making and also reveal rich information on socio-economic conditions. Secret memorials often disclose important statistics, such as military expenditures, government fiscal actions, actual tax income and real stock in the vaults instead of those stated in the regulations.

Besides memorials, the six ministries (Six Boards) submitted each year a statistical report to the Emperor, stating the Board's activities (fiscally-related activities in particular). The reports were submitted each year directly to the Emperor. The reports were bound in bright yellow covers (the royal colour) and are therefore known in Chinese as '*huangce*' (Royal Yellow Copies). One of the most important reports was the treasury records compiled by Board of Revenue listing all the monetary transactions in the Imperial Treasury vault. All central government tax incomes, all copper cash minted by the Imperial mints (and later big cash as well as government

paper notes) were deposited in the Treasury vault before being used. The treasury records document every single item that came into or went out of the vault. These records therefore give us the most direct information on the income and expenditure of central government.

Private account books

The best archival materials containing market information (for retail prices, currency exchange rates, etc.) would have to be account books for shop keeping or personal use. As commercial records in everyday use, they are not as well preserved as government documents. Today, account books which are kept in archives are difficult to use: most of them are not digitalised; the originals are too delicate to touch; all the figures in the account books were kept in Suzhou code instead of normal written Chinese. Moreover, most account books are seriously damaged: some of the years are missing and the rest in a state which makes it difficult to discern what is written. It is therefore impossible to construct a price index with a basket of weighted goods and services for a certain period of time. But constructing a series of the cost of certain important goods (for example, grain prices or exchange rates) is possible.

Access to archives

These government documents were first made public in the 1920s when the Forbidden City became the state property of the new Chinese Republic. The Palace Museum was established on the site of the original imperial residence and those documents were sent to the Library of the Palace Museum. Because of earlier riots in Beijing and fire accidents, some of the documents had been destroyed during the Qing Dynasty. More were lost in the chaos in the Forbidden City following the fall of the Qing Dynasty and the warfare of subsequent decades. The remaining original documents are now kept partly in the First Historical Archive in Beijing and partly in the National Palace Museum in Taipei.

Parts of the collections in both archives underwent a separate digitalisation process. In the First Historical Archive, scanned copies of the memorials and secret memorials can be consulted by using the computers in the research room of FHA. The National Palace Museum has made its scanned copies available online, requiring a license to access them. Parts of the memorials relating to currency issues have been published in the *Selected Archive in Modern Chinese Monetary History* (1964).

In the 1930s, Academia Sinica undertook a project to make handwritten copies of the Qing government documents, including the Memorials and the Ministry Reports from the Palace Museum. These huge collections are now kept in the Library of the Institute of Economics of the Chinese Academy of Social Science (CASS) in Beijing. This library is not strictly speaking open to the public. Only scholars related to CASS can have access to the whole collection.

The Antiquity Branch of the National Library of China has the most important collection of private account books, which are readily available for public consultation (although reading through the original copies is a challenging and daunting task). The Beijing Municipal Archive also has a considerable collection which is digitized and therefore more user-friendly.

Dates and years in Chinese calendar

Dates using the Chinese traditional calendar differ from those of the modern calendar. In a Chinese calendar, a date is expressed by a combination of the number of the day, number of the month and number of the regnal year. Appendix A 1-1 lists out all the regnal years that may have appeared in the text and their corresponding year in the Gregorian Calendar. Please note that a year in Chinese calendar and a year in the Gregorian calendar are not exactly the same. For example the First Year of Xianfeng (XF1) started in February 1851 and ended in January 1852.

Appendix A 1-1 Chinese era name and approximate year

Chinese era name	Regnal Year(s)	Corresponding year in Gregorian Calendar
Daoguang	DG1	1821
|	DG2	1822
|	DG3	1823
|	DG4	1824
|	DG5	1825
|	DG6	1826
|	DG7	1827
|	DG8	1828
|	DG9	1829
|	DG10	1830
|	DG11	1831
|	DG12	1832
|	DG13	1833
|	DG14	1834
|	DG15	1835
|	DG16	1836
|	DG17	1837
|	DG18	1838
|	DG19	1839
|	DG20	1840
|	DG21	1841
|	DG22	1842
|	DG23	1843
|	DG24	1844
|	DG25	1845
|	DG26	1846
|	DG27	1847
|	DG28	1848
|	DG29	1849
|	DG30	1850
Xianfeng	XF1	1851
|	XF2	1852
|	XF3	1853
|	XF4	1854
|	XF5	1855
|	XF6	1856
|	XF7	1857
|	XF8	1858
|	XF9	1859
|	XF10	1860
|	XF11	1861
Tongzhi	TZ1	1862

Appendix B: Statistics from treasury records

Original statistics

The Imperial Treasury (*yinku*) was a department under the Board of Revenue. The collection and management of the tax revenues were the responsibilities of the Board of Revenue, which regulated all the central government revenues (in monetary form) that were deposited in the Imperial Treasury. Every year, the Treasury compiled a book (the *Imperial Treasury Records*, or *hubu yinku huangce*) to submit to the Emperor containing detailed information about the monetary transactions and the-end-of-year money stock. The book consists of two volumes: the 'Incoming category' (*dajin*) and the 'Outgoing category' (*dachu*). The former kept details on every monetary entry for deposits in the Treasury, and the latter details on every item that was withdrawn from the Treasury. The Library of the Institute of Economics of CASS has the best-preserved copy of treasury records, but it is still far from complete. For the eleven years of Xianfeng's reign, for example, the collection contains only seven years of the 'Incoming category' (Xianfeng 1, 2, 3, 5, 6, 9, and 10; roughly speaking, 1851, 1852, 1853, 1855, 1856, 1859 and 1860) and four years of the 'Outgoing category' (Xianfeng 2, 3, 8, and 9, roughly speaking, 1852, 1853, 1858 and 1859).

The annual reports were supplemented by a separate table summarizing the total figures of both categories. Copies of the summary tables of Xianfeng 4, 6, 9, and 11 were kept in the archive. Sometimes even when the original volumes of the incoming and outgoing categories were lost, the table was kept in the collection, which could help us work out the overall (though not detailed) monetary transactions of the year. They could be used to make up a relatively complete picture.

The treasury records simply registered everything that entered or left the vault. The 'Outgoing' category was indeed a record of the expenditures of central government, but the 'Incoming' category should not be taken for granted as revenue. Besides revenues from various sources (such as taxation monies sent by the provinces, income from royal lands, and income from the sale of degrees and titles), copper *cash* minted by the imperial mints were also kept in the Treasury and therefore their figures also appear in the 'Incoming' category. After 1854, other monies such as copper notes, official banknotes and iron *cash* were also deposited in the vault immediately after manufacture, and therefore also appeared in the 'Incoming category' of the treasury records (Appendix B 1-1).

There are some problems with the original figures. First, some monies were not consistently deposited in the Treasury vault, and their totals would be underestimated (for example: only part of the amount of iron *cash* and the official banknotes were deposited in the vault). Second, the style of bookkeeping of the records has erased some important information: all the entries were all recorded in nominal values (for example, there are various big *cash* with different face values. We cannot track further details of the numbers of different big *cash*.) Moreover, the treasury records did not distinguish silver ingots from silver notes: all entries paid with real silver or silver notes were kept under the 'silver sector' category, making it difficult to work out the proportion of silver notes to real silver. Third, the records are incomplete (years 1854, 1857, 1858 and 1861 are missing).

Appendix B 1-1 Original statistics: Incoming and outgoing categories, *The Imperial Treasury Records* (1841-61)

Regnal year	Year	Incoming Category				Outgoing Category			
		Silver (taels)	***Cash* coins: copper *cash* and iron *cash*** (strings)	**Copper notes** (strings)	**Official banknotes** (strings)	**Silver** (taels)	***Cash* coins: copper *cash* and iron *cash*** (strings)	**Copper notes** (strings)	**Official banknotes** (strings)
DG21	**1841**	6796038	1233614			15733178	1233598		
DG22	**1842**	10914111	1144433			13519847	1140848		
DG23	**1843**	7919693	1222831			10989389	1270073		
DG24	**1844**					9018625	1266883		
DG25	**1845**	9069654	1160832			8737519	1014232		
DG26	**1846**	9044024	1209094						
DG27	**1847**					8479905	1158391		
DG28	**1848**	8872940	1165946						
DG29	**1849**	8507408	1238528			9340395	1219044		
DG30	**1850**	7748585	1076127			9531910	1177265		
XF1	**1851**	7635529	1247809						
XF2	**1852**	8361837	834109			10268561	835110		
XF3	**1853**	4443174	1198580			7471746	1368406		
XF4	**1854**	4996127	3045824	--	7846072	5031019	3040550	--	7834543
XF5	**1855**	3067774	1898807	4088318	7791060				
XF6	**1856**	2669663	811063	4405082	7884489	2704989	517736	4405082	7950869
XF7	**1857**								
XF8	**1858**					3061904	629857	1510663	11360116
XF9	**1859**	4463478	968530	2133825	19131590	3808417	903324	2124455	13976064
XF10	**1860**	5429091	366762	3725297	4315242				
XF11	**1861**	6678614	295355	155518	408881	6331926	169540	155431	174287

Source: Shi (2009), pp. 198-237, 264-5; *Imperial Treasury Records*, CASS.

Splitting the Incoming Category: money creation and government income

By reading the detailed entries of the treasury records, we can find details about the amounts of newly created monies. Appendix B 1-2 is a summary of figures for money creation extracted from the Incoming records in the treasury.

By deducing the money created (Appendix B 1-2) from the Incoming category, we can also calculate the real government revenue. Appendix B 1-3 shows the real central government revenue, apart from the coinage and paper note printing.

Reconstruction: annual issue of money (government money creation)
As most of the monies (except real silver) deposited in the vault were meant to be used in government expenditures for the year, the amount of different monies in expenditure can be used as a proxy for the figures of money creation. We thereby can supply the numbers for the years 1854, 1858 and 1861. Because we know from government reports the total amount of each kind of money created, the figures for money creation in 1857 can be obtained by deduction. We can therefore draw a very approximate picture of the annual money creation during 1851-61 (Appendix B 1-4).

Appendix B 1-2 Number of monies created, according to treasury records

Regnal year	**Year**	**Copper *cash*** (strings)	**Iron *cash*** (strings)	**Silver notes (taels)**	**Copper notes** (strings)	**Banknotes** (strings)
XF1	**1851**	1245809				
XF2	**1852**	823833				
XF3	**1853**	1190287				
XF4	**1854**					
XF5	**1855**	1812804			4088318	7613332
XF6	**1856**	326546	431515		4405082	7448997
XF7	**1857**					
XF8	**1858**					
XF9	**1859**	900000			2120455	18337551
XF10	**1860**	344671			3706823	3442130
XF11	**1861**					
Total		11090500	15026000	9781200	27113038	49447910*

N.B.* The totals of banknotes provided here are only the total number of banknotes issued from official banks to the Treasury; they do not include banknotes issued by the Copper Donation Bureau. The figure of 49447910 strings therefore underestimates the number of banknotes generated in government finance.
Source: annual figures come from the treasury records, Incoming Categories, Regnal Year: XF 1, 2, 3, 5, 6, 9, and 10, *Imperial Treasury Records*, CASS; total figures are originally from government reports, Peng (1983), p. 115.

Appendix B 1-3 Total revenues of central government (excluding money creation)

Regnal Year	Year	Silver (taels)	Copper *cash* (strings)	Copper notes (strings)	Banknotes (strings)
XF1	**1851**	7635529	2000		
XF2	**1852**	8361837	10276		
XF3	**1853**	4443174	8294		
XF4	**1854**				
XF5	**1855**	3067774	86002 (3510)*	0	177728
XF6	**1856**	2669663	53001 (479)*	0	667805
XF7	**1857**				
XF8	**1858**				
XF9	**1859**	4463478	68530	13370	13256794
XF10	**1860**	5429091	22091	18474	3192501
XF11	**1861**				

N.B. * In 1855 and 1856 with the 'salary saving' scheme, some undistributed salaries for bannermen (mostly in the form of copper *cash*) in previous years were returned to the Treasury vault. If these deductions are not taken as income, the copper *cash* revenue in 1855 and 1856 becomes 3510 and 478 respectively.
Source: annual figures come from the treasury records, Incoming Categories, (Regnal Years: XF 1, 2, 3, 5, 6, 9, and 10), *Imperial Treasury Records*.

Appendix B 1-4 Annual money creation, amended by estimation (in strings)

Regnal Year	Year	Copper *cash*	Iron *cash*	Silver notes	Copper notes	Banknotes
XF1	**1851**	1245809				
XF2	**1852**	823833				
XF3	**1853**	1190287			*(1000000)*	
XF4	**1854**	*(3040551)*	*(1808160)*		*(6000000)*	*(7846072)*
XF5	**1855**	1812804	*(1808160)*		4063302	7613332
XF6	**1856**	326546	*(1360920)*		4405443	7448997
XF7	**1857**	*(606602)*	*(1360920)*		*(4150834)*	*(7448997)*
XF8	**1858**	*(629857)*	*(1360920)*		*(1510663)*	*(11360116)*
XF9	**1859**	900000			2120455	18337552
XF10	**1860**	344671			3706823	3442130
XF11	**1861**	*(169540)*			*(155518)*	*(408881)*
Total		11090500	*(7699080)*	9781200	27113038	*(63906076)*

N.B. Figures in brackets are estimations, of which: 1) for 1854, 1858 and 1861, the figures in expenditure are used as a proxy of money creation, and for 1857 the figures are calculated by deducting the total of other years from the grand total; 2) annual output of iron *cash* as estimated by Peng (1983); 3) figures for the copper notes issued in 1853 and 1854 are from the minimum estimation from an archive document, Huang (2012); 4) the amount of banknotes deposited in the Treasury includes notes issued by official banks and by the Copper Donation Bureau. The estimation is therefore higher than Peng's figure.
Source: *Imperial Treasury Records*; Huang (2012), p. 137; Peng (1983), pp. 80 and 115.

Appendix C: Market price information

Market information is also collected from secondary sources, including the exchange rate of the new monies, retail prices and wages.

Previous studies consulted

The paper relies on the work of previous studies. The series are amended by information extracted from memorials and secret memorials. Extensively consulted works include: Peng (2008, 2011), Zhang (1970) and Gamble (1943).

Peng (2008, 2011) studies a wide range of account books in Beijing's archives and provides an important collection of price series, including a long-term sequence of grain prices; prices of common consumables, such as cooked rice (served in restaurants), festive banquets (price per table), and liquor. Zhang (1970) studies the lifetime personal accounts of a government official in Beijing, and compiles different series from 1840s to 1870s, including: retail prices, official wages and currency exchange information. Gamble compiles a wage list for unskilled labour from the account books of a fuel store near Beijing.

Explanation of currency exchange rate series

Because the currency exchange information comes from various non-statistical sources and there were so many different currencies, the figures are not readily comparable. Typical descriptions of the exchange rates are as follows: '1 tael is equivalent to 2,000 (no unit given)'; '1 tael is equivalent to 30,000 paper money (no unit given)'; '1 tael is equivalent to 12,000 metropolitan *cash* (no type of money given)'; '1,000 paper money is equivalent to 500-600 standard *cash*, or 1,100-1,200 big *cash*, or 1,500 iron *cash*', etc.

This paper therefore converts all the observations into exchange rates against silver (taels) and standard *cash* (*wen*). This conversion is feasible because most of the actual exchange rates were either related to silver or to standard *cash*; and information on the annual exchange ratio between silver and standard *cash* is also available.

Figure 1-3 shows the exchange rate of each new currency against silver and Figure 1-4 shows their exchange rates against copper *cash* (p.34). the exchange rates of silver notes and copper notes are not included in the figures, because there are not enough observations of them (there were occasional mentions of copper notes; but almost no mention of silver notes) – evidence that government notes were not frequently used in the market.

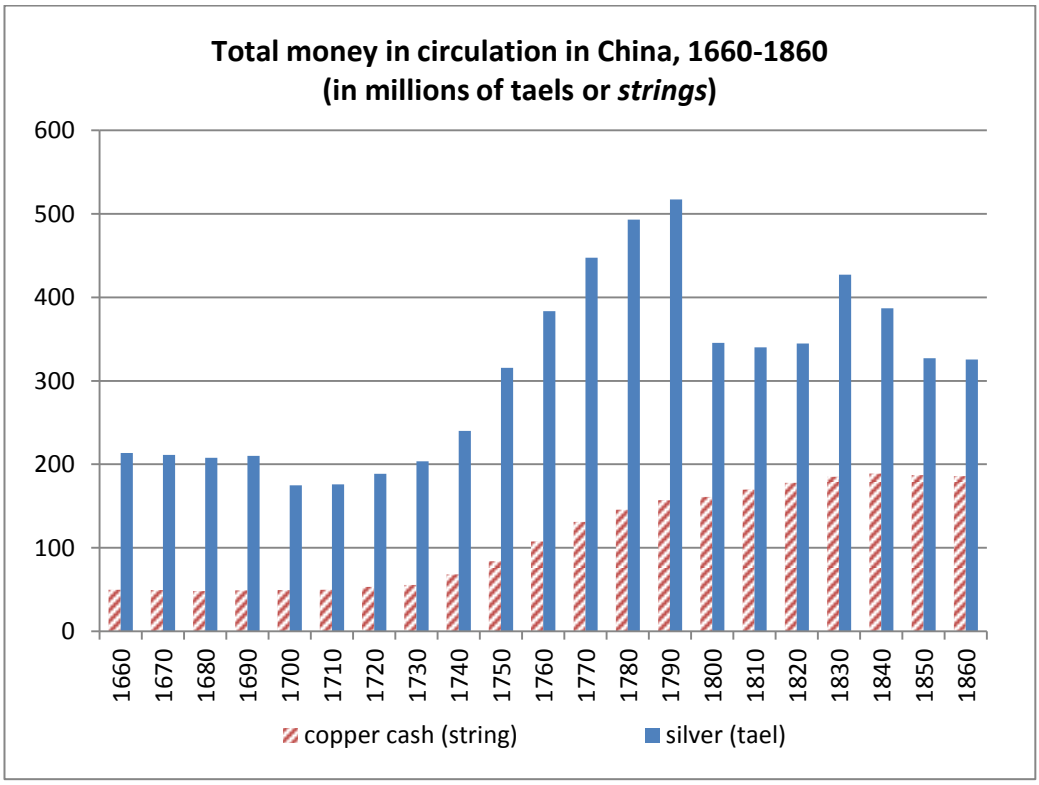
Appendix D: Estimates of Beijing's money stock

Information of the total money stock in Beijing on an annual basis during the nineteenth century is not readily available. In order to facilitate the discussion in this chapter, I estimated the annual total money stock in Beijing from 1821 to 1870. The estimation is carried out with the following steps: first, I estimated the total amount of money in circulation in Beijing in a benchmark year (1821); second I estimated the annual increase in the money supply (annual money issues deducted by net outflow and depreciation) during the period under investigation; third, the annual money stock can be calculated by adding annual money increase onto the base year total money stock. The estimates are crude due to data limitation, but the results define the upper and lower bounds, and thus give us a straightforward idea of the money growth trend.

Money stock of Beijing in 1821

Previous studies provide estimated series of the total money stock in China from 1660 to 1860 (an estimation of the total silver and copper *cash* in circulation at intervals of ten years, Appendix D 1-1).[235] Estimates on regional money stock changes are not available. I take the year 1821 as the base year. And I calculate the approximate money stock in Beijing by taking its percentage GDP as an indicator of the percentage of money circulating in Beijing.

Appendix D 1-1 Total money in circulation in China, 1644-1860 (in millions of silver taels and millions of copper *cash* strings)



Source: Yan (2008), p. 33.

[235] Hongzhong Yan, "Economic Growth and Fluctuation in the Early Qing from the Perspective of Monetary Circulation (Cong Huobi Liutongliang Kan Qingdai Qianqi De Jingji Zengzhang Yu Bodong)," *Studies in Qing History (Qing Shi Yan Jiu)* 24, no. 3 (2008): 33.

The year of 1821 is selected as the benchmark year for several reasons: first, 1821 is a normal year during a peaceful time period before the major socio-economic storm of the 1840s. Second, data information relatively good: a nationwide population census was conducted in 1820, GDP estimates (national level and in Jiangnan region as well) are also available during the 1820s.

This paper then uses Beijing's GDP percentage in national GDP - instead of its population percentage - as a proxy of the percentage of money stock, because the per capita GDP in capital (and therefore the concentration of money and wealth) was obviously much higher than the national average. Estimate of the GDP of Beijing as a city is again not available. But we have the per capita GDP estimate (23.2 taels per capita in 1821) in Jiangnan, an area considered as wealthy as the capital.[236] In 1820, the population in metropolitan Beijing (*shuntianfu*) was 2,934,449 (0.83% of total population in China). If we assume that the GDP per capita in Beijing was similar to that in Jiangnan, the regional GDP in Beijing during the 1820s was around 68 million taels.

In terms of national GDP, there are different estimates available for this period ranging from 3,818 million (Liu 2009) to 5,337 million taels (Broadberry et al, 2013).[237] [238] The relative size of the capital economy to total Chinese economy therefore ranged from 1.28 (Broadberry et al estimate) to 1.78 per cent (Liu estimate).

We take both percentages (1.28 and 1.78) to calculate the lower and upper bound estimates of the money stock in Beijing. The lower bound estimate suggests that the money stock in Beijing of 1821 was around 5,451,630 million taels of silver, plus 2,959,448 *strings* of standard copper *cash*. The upper bound estimate indicates 7,618,289 million taels of silver, and 3,899,056 *strings* of standard *cash*.

Annual increase of money supply in Beijing since 1821

With total money stock in Beijing in the benchmark year of 1821, we can estimate the annual money stock by adding annual changes of money supply onto the base year. The annual change of the money supply depends on the money issue (copper coinage and later issues of government paper notes), net outflow (or inflow) of the money, as well as depreciation.

Different types of money enjoyed circulation areas of different widths. As silver were more used for regional trades, silver (and silver notes) were more likely to be flowing in and out of the city. Monies of smaller denomination had relatively more restricted area of circulation.[239] As two most important Imperial mints (Baoquan and Baoyuan) were

[236] Bozhong Li, "Investigation of the Early Modern Chinese Economy: From the Gdp Estimation of Huating-Louxian Area in the 1820s," *Journal of Tsinghua University (Philosophy and Social Sciences)* 14, no. 3 (2009): 14-6.

[237] Ti Liu, "An Estimation of China's Gdp from 1600 to 1840 (1600-1840 Nian Zhongguo Guonei Shengchan Zongzhi De Gusuan)," *Economic Research Journal (Jingji Yanjiu)* 55, no. 10 (2009): 153.

[238] Broadberry et al. (2013) estimate that in 1800 the Chinese GDP was 5364 million taels; the figure dropped slightly to 5,337 million taels in 1840, suggesting a GDP of at least 5,337 million in 1820. Steve Broadberry, Guan Hanhui, and Li Daokui, "China, Europe and the Great Divergence: A Study in Historical National Accounting," *Working paper series for the Project 'Reconstructing the National Income of Britain and Holland, c.1270/1500 to 1850'*, no. F/00215AR (2013): 33-4.

[239] The transaction cost of carrying small money for long-distance trade is very high. For example, to transfer the same value of money, carrying copper *cash* was 100 times heavier than carrying silver.

located in Beijing meeting the demand of copper *cash* of capital and adjacent areas, there should be a net outflow of copper *cash* in normal years (from 1820s till early 1850s).

After 1853, the Xianfeng crisis changed the types of monies in circulation as well as their circulation patterns: silver tended to travel less frequent due to military disturbances and the cut off of normal trade routes. Apart from silver and silver notes, all other types of money seemed to be able to circulate only within the capital area, because the metropolitan Beijing area adopted the use of brand new monies while other areas did not, making these monies hardly acceptable anywhere outside the capital. Plenty of reports show that big *cash* could not be used at all outside this city or within a few kilometers, as the contemporary writings record.[240] Copper notes could be exchanged only through certain designated banks. The circulation of banknotes was also restricted to local areas: the national banking networks were not well developed and banknotes for small amounts could circulate only within a city or even within a block. Besides, banknotes in Beijing were denominated in metropolitan *cash* (*jingqian*, the unit of account in the Beijing area), making them less likely to be recognised or used in other places.

Therefore the basic assumption of the annual monetary flow is: before 1853, the increase in money supply therefore came basically from the copper *cash* produced by the Imperial mints (banknotes issued by private banks were unknown). With the two Imperial mints being the most important providers of copper *cash* in north China, I assume that half of the newly minted copper *cash* would have circulated outside Beijing. Figures for copper coinage are available from the treasury records. From 1853 onwards, the increase in the money supply included a mixture of *cash* coins (copper *cash*, big *cash*, and iron *cash*), government paper notes (silver notes and copper notes), and official banknotes. And most of the new monies circulated only within the city of Beijing. A depreciation of 10% per decade (suggested by Yan, 2008) is used for *cash* coins.[241]

Figures of the mint's production and note issues are available from the table in Appendix B 1-4, which is a reconstruction of the original data from the treasury records.

Estimate of money stock in Beijing (1821-70)

The paper estimates the stock of silver and copper *cash* separately: the trend of silver stock is deduced from the number for the decennial total silver stock in China (assuming the percentage GDP of Beijing as the percentage of copper *cash* stock in Beijing over the whole country).

For the stock of copper *cash*, I estimated the stock of copper *cash* in Beijing 1821 (assuming the percentage GDP of Beijing as the percentage of copper *cash* stock in Beijing over the whole country). The figures for the copper *cash* in circulation in the following years are calculated by adding the annual mint output figures. I assumed that during 1821-53, half of the copper *cash* minted would flow outside Beijing, and that

[240] Peng, *Public Finance and Economic Condition of the Late 19th Century China*, 108.
[241] Yan, "Economic Growth and Fluctuation in the Early Qing from the Perspective of Monetary Circulation," 31.

after 1853, the big *cash* circulation would be restricted to the city. A depreciation of 10% per decade is used for *cash* coins.[242]

In order to reach a total sum of silver and copper cash, all monies were converted into strings. Silver was converted at the silver-copper cash exchange rate of the same year. Two GDP percentage estimates (1.28 per cent and 1.78 per cent) are both used to produce two different series. Both estimates are plotted and in fact look very similar (

[242] Ibid.

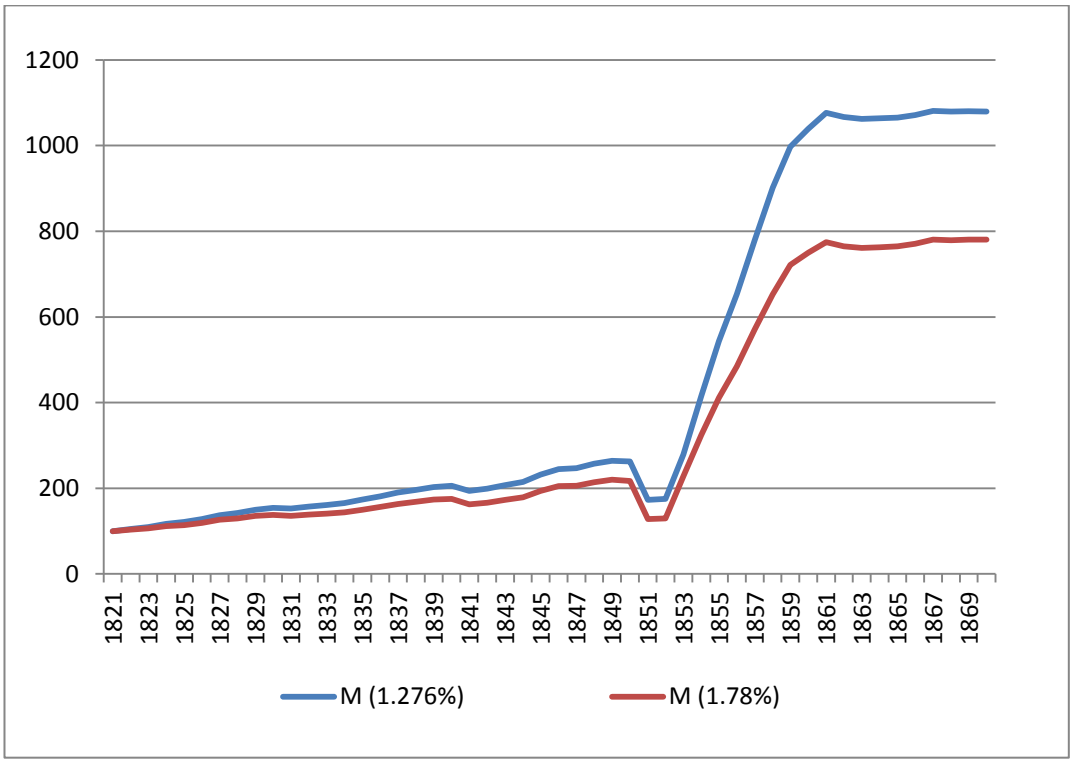
Appendix D 1-2). Both money growth series are plotted against the wheat price index (Appendix D 1-3 and Appendix D 1-4). During the paper's discussion, only Appendix D 1-3 is used, since as it gives the lowest estimates of the money growth.

Further discussion on the estimate

The estimate is lower than the actual figure due to the lack of information on government silver notes, and banknotes. The amount of silver notes is unknown, but we do know that the issue of silver notes was limited and many of them were sent to other provinces (and never flowed back). As silver notes were rarely seen in the market and its total issue was quite limited, the exclusion of silver notes from the figures for money increase do not impact too much on the final outcome. As official banks also issued banknotes which were not sent directly to the Treasury, estimates of banknotes in the treasury records probably underestimate the total amount. In addition, the amount of private banknotes is also unknown.

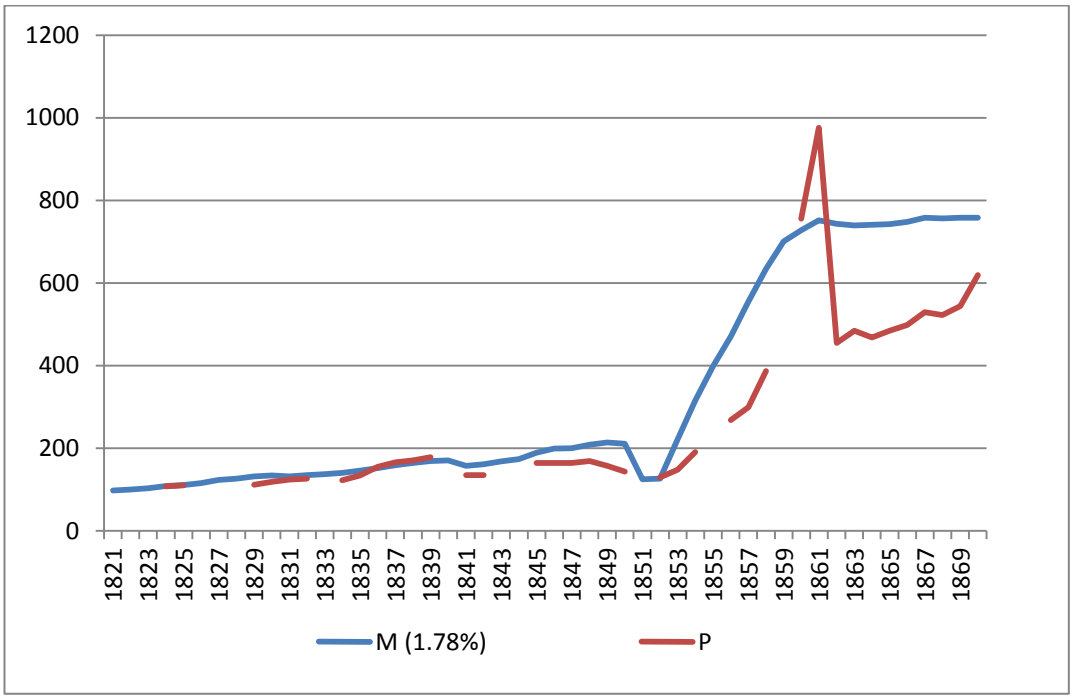
However, this problem does not affect the use of this estimate for the purpose of the chapter (in comparing and demonstrating the separate development of money growth and price rise). In fact the calculation uses a relatively big monetary base and a minimum estimation of the increase of annual money supply, and it shows a lower-bound estimate. It demonstrates that most of the time money increased much faster than the increase of price level (hence supporting the argument that some of the money was not really taken as money, and that price rise did not respond to the quantity of money, but more to the signal of the government on whether it would honour its debts). The actual money stock would be even higher, strengthening the argument of the chapter.

Appendix D 1-2 Estimates of the annual money stock in Beijing (indexed 1821=100), 1821-70



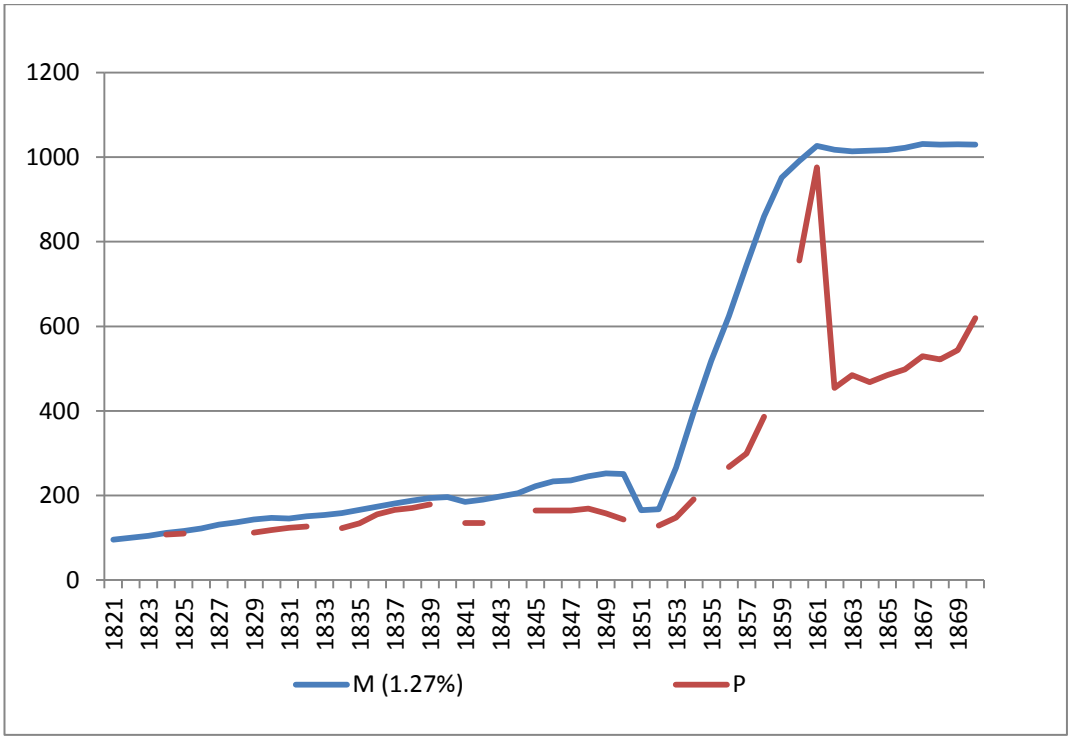
Source: Yan (2008); Appendix B 1-4.

Appendix D 1-3 Index of money stock and price in Beijing (assuming that the money stock in Beijing took 1.78% of the national total), 1821-1870 (1821=100)



Source: Peng (2008; 2011), Appendix D 1-2.

Appendix D 1-4 Index of money stock and price in Beijing (assuming that the money stock in Beijing took 1.276% of the national total), 1821-1870 (1821=100)



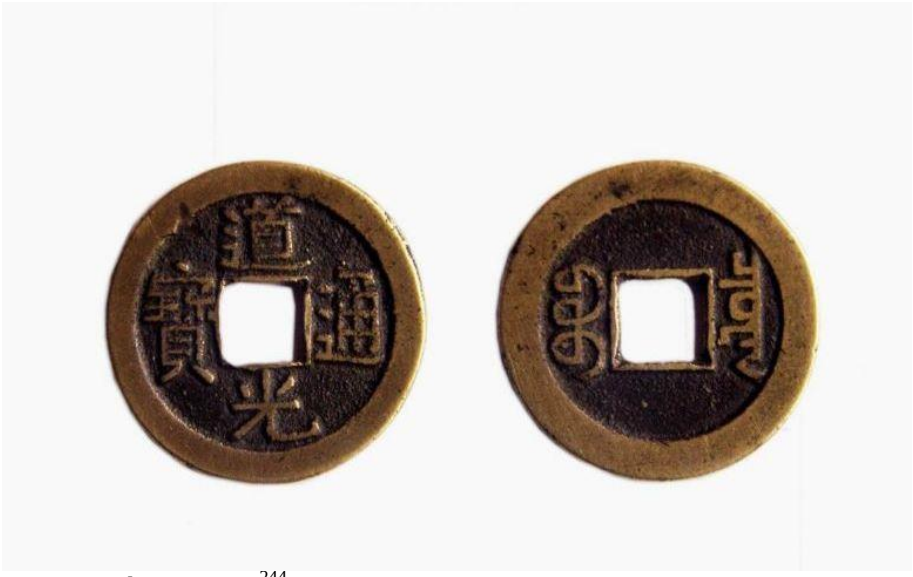
Source: Peng (2008; 2011), Appendix D 1-2.

Appendix E: Sample images of monies circulating during Xianfeng's Reign

Appendix E 1-1 Image of the big *cash* in Xianfeng's Reign (Qing dynasty, issued AD 1854)

Source: online sources [243]
Front (reading from top to bottom, then from right to left): *xian feng zhong bao* ('heavy treasure of Xianfeng');
Back (reading from top to bottom): *dang shi* ('as ten'); (read from right to left): (as ten in Manchu).

Appendix E 1-2 Image of the standard copper *cash* in Daoguang's reign (Qing dynasty, issued around AD 1821–50)



Source: online sources[244]
Front (reading from top to bottom, then from right to left): *Dao guang tong bao* ('common treasure of Daoguang);
Back (reading from right to left): (name of the mint in Manchu).

[243] Big *cash* of Xianfeng, [date of access: 27 Mar 2015] (http://www.dfsc.com.cn/collection/2008/0723/Content_353.html)
[244] Standard cash of Daoguang, [date of access: 27 Mar 2015] (http://www.shoucw.com/shop/view.aspx?id=29694)

Appendix E 1-3 Image of the silver note (Qing dynasty, issued AD 1854)

Source: British Museum

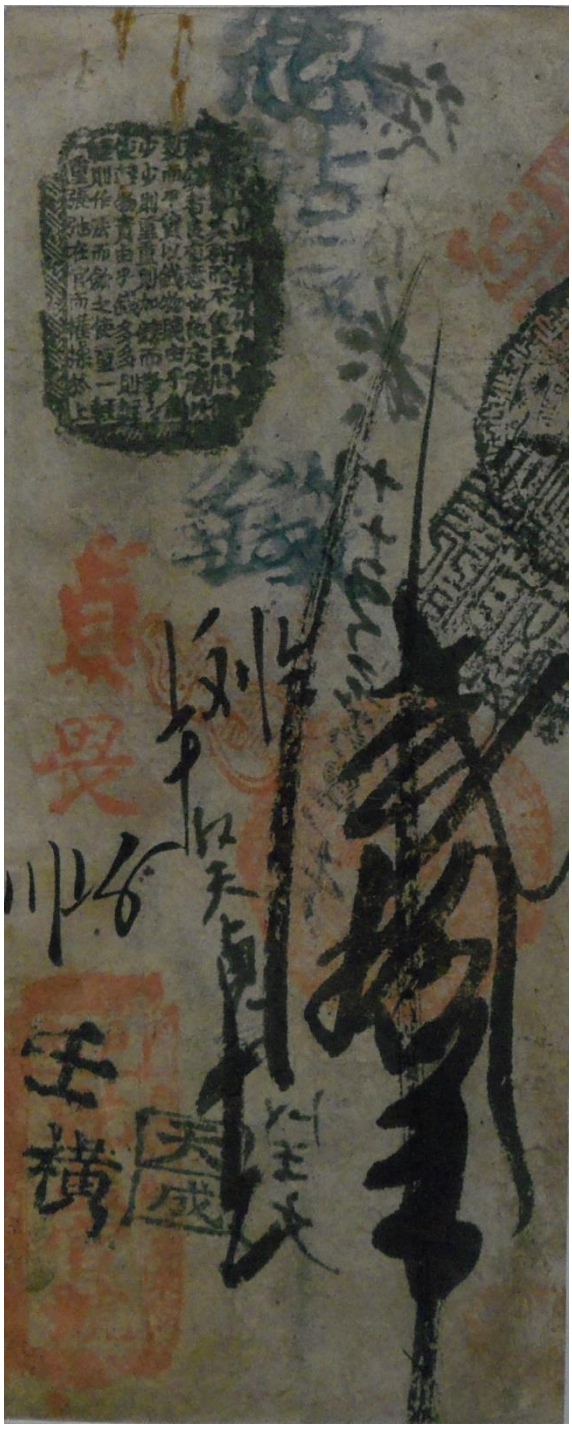
At the top: *Hu bu guan piao* ('Official Paper Notes of the Board of Revenue');
Down the centre: the denomination ('1 tael');
Right-hand side: the serial number, left-hand side: the date of issue;
The blue block of text below gives instructions for use ('issued by the Board of Revenue; may be used as real silver taels; can be used for government payments at a proportion according to regulation; forgers will be punished with the utmost severity.')

Appendix E 1-4 Image of the copper note (Qing dynasty, issued AD 1857)

Source: British Museum

At the top: *Da qing bao chao* ('Great Qing Treasure Certificate');
Down the centre: the denomination ('1000 wen');
Right-hand side: the serial number, left-hand side: the date of issue;
The blue block of text below gives instructions for use (‘issued by the Board of Revenue; may be used as real silver taels; can be used for government payments at a proportion according to regulation; copper notes with the amount of 2000 wen can be exchanged for a silver note of 1 tael’).

Appendix E 1-5 Image of the official banknote (Qing dynasty, issued AD 1850s–1860s)



Source: Archive Branch, Peking University Library

Top left-hand side: stamp (on rules of circulation, not easily legible);
Bottom left-hand side: stamp of the issuing bank: *Qian yi guan hao* (an official bank under the Qian Group);
In the centre: figures showing the real values of each transaction, signatures and stamps of the persons responsible for the transactions.

Appendix E 1-6 Image of the official banknote (Qing dynasty, issued AD 1840s–60s)

Source: Archive Branch, Peking University Library

Top left-hand side: stamp (on rules of circulation, not easily legible);
Bottom left-hand side: stamp of the issuing bank: *Tian zhen yin qian hao* (a bank under the Tian Group);
In the centre: figures showing the real values of each transaction, signatures and stamps of the persons responsible for the transactions.

Appendix E 1-7 Image of the private banknote (Qing dynasty)

Source: Library of the Economic institute, CASS

Top the centre: *Pin tie qu yin* ('we redeem silver upon presentation of this paper');
Down the centre: the amount ('4 tael') and specification on denomination (seems 'market tael', not written clearly);
Right-hand side: parts of two stamps (the paper containing the remaining part of the stamps should be kept as a record within the private bank), left-hand side: the date of issue;
Bottom left: *Jin yi hao* (name of the bank, a remittance bank by shanxi bankers).

Chapter 2 The Big Problem of Small Change in Late Imperial China (1890-1910): [245]

Silver inflow, rural deflation, and how it could be solved by steam power technology

[245] The title of the chapter is inspired by the work of Sargent and Velde (2002), Thomas J. Sargent and François R. Velde, *The Big Problem of Small Change*(Princeton, N.J. ;Oxford: Princeton University Press, 2002)., which was in turn inspired by Carlo Cipolla. Carlo M. Cipolla, *Money, Prices, and Civilization in the Mediterranean World: Fifth to Seventeenth Century*(Princeton: Princeton University Press 1956, 1956).

2.1 Introduction

Silver had long been the currency for China's overseas trade until the mid-1930s. China was not a silver producing country and its silver supply relied on imports from abroad. One focus of research on Chinese economic history is therefore the relationship between silver (its international price and supply) and China's economic condition (economic growth and trade). Therefore one focus of research on Chinese economic history is the relationship between silver (its international price and supply) and China's economic condition (economic growth and trade). For instance, whether the silver inflow/outflow leads to economic boom/depression is a continuous subject of debate among scholars.[246] Proponents of the classic bimetallic system would suggest that having two metals dampens the shocks resulting from a shortage of one of the metals and therefore stabilises the currency. Besides the movement of silver, the price of silver also affects trade and economy. Theoretically, 'cheap silver' (a cheap price of silver in international market) can be taken as a sudden and exogenous currency devaluation, and would indicate favourable terms of trade for silver standard countries as the devaluation would encourage exports.[247, 248] However, events in China that developed since the 1870s contradicted the theory. With the wide adoption of the gold standard in major economies, silver was demonetised and the price of silver plunged.[249] But compared to other Asian countries such as Japan, Vietnam or India, China benefited little from the depreciation of silver.[250] In fact, the Imperial Maritime Customs statistics even show that during this period the price of Chinese exports quoted in silver increased, and that

[246] For an analysis using historical events see William S. Atwell, "Notes on Silver, Foreign Trade, and the Late Ming Economy," *Late Imperial China (Ch'ing-shih wen-t'i)* 3, no. 8 (1977). Mio Kishimoto-Nakayama, "The Kangxi Depression and Early Qing Local Markets," *Modern China* 10, no. 2 (1984). For more recent debate see papers of Von Glahn, Irigoin, Kishimoto and Lin in *Asian Historical Economics Conference* (Hitotsubashi University, Japan, 2012).

[247] Jeffrey B. Nugent, "Exchange-Rate Movements and Economic Development in the Late Nineteenth Century," *Journal of Political Economy* 81, no. 5 (1973): 1110-14.

[248] Milton Friedman, "Franklin D. Roosevelt, Silver, and China," *The Journal of Political Economy* 100, no. 1 (1992): 62-83.

[249] The new silver deposits discovered in the Rocky Mountains also contributed to the price drop. The demonetization of silver not only led to a drop in the price, but also increased the volatility of the price.

[250] During 1872-96, the average annual growth rates of export (%/annum) for these countries are 5.6, 1.7, 9.8 and 0.5 respectively. Nugent, "Exchange-Rate Movements and Economic Development in the Late Nineteenth Century," 1123.

while exports did increase, imports increased more, resulting in an enlarged trade deficit.[251, 252]

This paper considers the positive effect of 'cheap silver' on China's trade to be limited for several reasons. First, the increase of both exports and imports should also be attributed to China's trade expansion during this time period: the number of treaty ports was extended from eighteen cities along the coastal and border line (by 1870) to almost all strategic trading venues throughout the country.[253] Second, the demonetisation of silver made the gold price of silver not only low but also volatile, and an unstable exchange also offset some of the benefit from silver depreciation[254] Moreover, it was observed that during this period, the price of Chinese exports generally increased, further offsetting the depreciation benefit.[255] This is because China was not on a pure silver standard, but a dual metallic standard composed of silver and copper. Most Chinese exports at the time were rural products quoted in copper *cash*; the prices were then translated into silver at the point of export.[256] A depreciation of the silver means a cheaper exchange rate between silver and copper *cash*. Therefore when rural price (quoted in copper *cash*) remained stable, the export prices quoted in silver would increase instead.

This paper argues that the 'cheap silver' phenomenon had at least two potential impacts on Chinese economy: trade impact and monetary impact. Apart from currency depreciation and potential silver inflow, 'cheap silver' impacted Chinese through other more subtle but perhaps more fundamental mechanisms: the sudden and permanent drop in the price of silver greatly destabilised the price relationship between copper and silver, and therefore challenged the monetary system and pushed it for a change. Studies

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[251] C. F. Remer, "International Trade between Gold and Silver Countries: China, 1885-1913," *The Quarterly Journal of Economics* 40, no. 4 (1926).
[252] Figure 2-4 provides more detailed information on trade.
[253] By 1896 after Treaty of Shimonoseki, the number of treaty ports increased to 1896 and by 1910 (end of the period under investigation of the paper) it grew to 82. The number of treaty ports kept increasing during Republican China (1912-49), and the total number amounted to 105. Yan, *Selected Statistics in the Economic History of Modern China*, 41-48.
[254] Nugent, "Exchange-Rate Movements and Economic Development in the Late Nineteenth Century," 1115.
[255] Remer, "International Trade between Gold and Silver Countries: China, 1885-1913," 614-16.
[256] Yu-kwei Cheng, "Change in Silver and Copper Cash Prices and Their Relationship with Price and Foreign Trade in China in the Late 19th Century (Shi Jiu Shi Ji Hou Qi Yin Jia Qian Jia De Bian Dong Yu Wo Guo Wu Jia Ji Dui Wai Mao Yi De Guan Xi) " *Research In Chinese Economic History (Zhong guo jing ji shi yan jiu)* 1, no. 2 (1986).

on bimetallism also suggest a potential source of instability from which a monometallic system is immune: precisely due to the existence of two metals, a shock in the supply of either metal will lead to a discrepancy between the mint ratio and the market ratio.[257] In the case of China, the market relied heavily on the use of 'small money' (i.e., copper *cash*) for daily transactions and for all exchanges in rural area, while the economy suffered constantly from a shortage of copper *cash* because of the high cost of minting them. A drop in the price of silver aggravated the shortage of *cash*: the mint consequently suspended copper coinage due to the increased cost; and the existing *cash* as 'undervalued money' were melted down. The trade impact of 'cheap silver' might be restricted by the limited scope of international trade,[258] while its monetary impact seemed to be nationwide as arbitrage in money market was quicker than arbitrage in goods market with imperfect market integration. In addition, the provision of coinage was a centralised decision implemented by regional governments throughout the country.

Therefore the 'cheap silver' presented an opportunity for China (silver depreciation should have promoted exports; also a potential silver inflow would have provided more liquidity for trade and production) that China was then not able to grasp. The 'cheap silver' rather loomed as a challenge for the stability of China's monetary system: despite a silver inflow to treaty ports and urban centres, its vast rural population was suffering from a shortage of money (the copper *cash*) leading to potential deflation. Only when the copper sector was adequately depreciated could the trade benefit be realised. The only way to fully appreciate the benefits of silver devaluation is to adequately devaluate the copper sector as well (i.e. to find a way to produce a sufficient

[257] Then a 'bimetallic arbitrage' occurs, which in turn results in a *de facto* monometallic standard. Lawrence H. Officer, "Bimetallism," in *The New Palgrave Dictionary of Economics Online*, ed. Steven N. Durlauf and Lawrence E. Blume.(Palgrave Macmillan, 2008).

[258] Brandt's work has shown that areas adjacent to treaty ports became increasingly integrated to international market and the agriculture activities adjusted (to grow more cash crops) according to demands from the international market, i.e.: their rural economy had a developed export sector. These are normally coastal areas with much more developed financial institutions. For most hinterland area, where trade was still carried out by middlemen who travelled and collected rural produces, it seems that 'cheap silver' did not have much positive impact: as before the travel, the middlemen had to spend more silver than before in order to exchange for the same amount of copper cash. And farmers would be less likely to accept other forms of money when they are farther away from commercial cities or from the well-developed financial facilities. Contemporary reports show that some specific trade disappears as the middlemen cancelled the trip when they found it unprofitable. Loren Brandt, *Commercialization and Agricultural Development: Central and Eastern China, 1870-1937*(Cambridge: Cambridge University Press, 1989). Junya Ma, "Traditional Finance and China's Agricultural Trade, 1920-1933," *Modern China* 34, no. 3 (2008).

quantity of small coins at affordable cost). However, it has been a long term dilemma for premodern societies to provide debased small coins to the public: it might be discounted in the market and might well invite counterfeiting.[259] This dilemma had persisted in premodern societies and was only solved by the introduction of new coinage with steam power technology: unlike the ancient cases of debasement which immediately invited counterfeiting, the new technology cast high-quality, standardized coins with machined edges. Therefore the new technology provided a way to coin sufficient token coins at an affordable cost without inviting forgery.

This paper looks into archives of the Imperial Maritime Customs Service and identifies a monetary shortage, despite the inflow of silver at the time. It argues that the introduction of debased copper coinage manufactured by steam power technology successfully solved this monetary problem (the new technology allowed the state to mint sufficient copper coins at an affordable cost, and at the same time to avoid counterfeiting, which normally followed debasement). Since the new coinage was introduced across China in different regions at different paces, the paper uses a differences-in-differences estimation on regional price data to test the impact of the institutional shocks on the regional economy before and after the introduction of the new coinage, and demonstrates that the introduction of new copper coinage helped to ease the monetary stringency in the countryside and acted as a positive shock to the economy. The paper also suggests that despite the technological innovation that endorsed the credibility of the new coinage, the lack of adequate institutional innovation (to check on the government's over-issue of coins) finally led to monetary chaos at a later stage of China's history.

This paper is closely related to a broad literature on monetary history and theory. First, existing historical literature on machine-made copper coins overwhelmingly emphasizes the negative impact of this currency (Liang, 1910; Ho, 1993; Liang 2001; Lai 2013), while ignoring the positive aspects. The original discussion of Qichao Liang, one of the most influential intellectual and political figures during late Qing and early Republican China, focused on the seigniorage revenue motive behind the mints and the over-issuing

[259] Angela Redish, "The Persistence of Bimetallism in Nineteenth-Century France," *The Economic History Review, New Series* 48, no. 4 (1995): 719-20.

of copper coins that caused inflation.[260] Ho discusses in detail the shortage of copper *cash* as justifying the new copper coinage, indicating the urgent need to increase the supply. But instead of further exploring the positive aspects, Ho's paper focuses on the impact of coinage on local fiscal revenue and on people's lives during the inflationary period.[261] The inflation in fact ensued five years after the introduction of new copper coins and the issue was more of a problem in the Republican period than in the late Qing period. The copper coinage was to begin with a great success and was well received.

Second, one of the big questions raised by researchers on the Chinese monetary system is the relationship between China's silver standard and its international trade. Many believe that 'cheap silver' (a drop in the price of silver in the international market which normally resulted in a silver inflow) would indicate favourable terms of trade for China, whereas expensive silver would discourage the export trade (Friedman 1992).[262] One example is the fall of the Ming dynasty in 1644, which in many studies is associated with the drastic fall in silver imports during the same period (Atwell 1977).[263] The 'Kangxi Depression' during the early part of the Kangxi period (1661-1722) is also attributed to the reduced silver inflow due to the prohibition on foreign trade and the subsequent monetary stringency (Kishimoto-Nakayama 1984).[264] This generalised view is, however, often contested (Von Glahn 1996a, 2012; Kishimoto 2012). The case of the Daoguang depression, for example, has recently been revisited and many have argued with convincing evidence that the silver outflow is not necessarily directly linked to, nor a definite cause of, the alleged economic depression.[265] The historical period under investigation of this paper offers another example: the drastically large quantity of inflowing silver did not benefit Chinese exports. On the contrary contemporary reports show that the economy and trade had been adversely affected.[266] Many more factors

[260] Liang's work was first published in 1910, and is re-printed in Liang, "Concise History of the Excessive Provincial Copper Coinage (Ge Sheng Lan Zhu Tong Yuan Xiao Shi)," 1179-85.
[261] Ho, "From Cheap Silver and Copper Famine to Depreciation of the Copper Coinage," 389-494.
[262] Friedman, "Franklin D. Roosevelt, Silver, and China," 62-83.
[263] Atwell, "Notes on Silver, Foreign Trade, and the Late Ming Economy," 1-33.
[264] Kishimoto-Nakayama, "The Kangxi Depression," 227-56.
[265] Von Glahn, "China's Seventeenth-Century Monetary Crisis."
[266] Cheng, "Change in Silver and Copper Cash Prices and Their Relationship with Price and Foreign Trade in China in Late 19th Century " 1-27.

other than the direction of the silver flow should be taken into account.[267] This paper shows that the peculiar monetary system should be taken into account, and that the copper sector – functioning more like the domestic part of the bimetallic standard – and the relationship between copper *cash* and silver must not be overlooked.

Third, the paper supports the literature on the problem of small changes in premodern monetary system and how technology facilitated the monetary modernisation (transition from bimetallic system to monometallic one) by making token money widely circulated and accepted. There is a large body of literature regarding the role of small coins in the money standard of medieval Europe. Coins of smaller denomination provide an 'extra liquidity service,' unlike larger coins,[268] although the cost of producing smaller coins is higher (Sargent and Velde 2002). This case often resulted in a chronic shortage of small coins.[269] Theoretically valid, this view is often challenged by the observation of specific historical periods (Munro 1988; Volckart 2008). It is pointed out that lower- value coins in the past were by no means of very small denomination.[270] And the chronic shortage of low-denomination coins seems to be more in theory than in history.[271] The production of such coins in terms of their intrinsic metallic content gives rise to another dilemma (Redish 1995). When the intrinsic value is high (higher compared to its legal tender value), the coin may be melted; but when the intrinsic value is low, it may be counterfeited.[272] These lines of analysis apply well to the case in China. The specific period under scrutiny in this paper is in fact a period in which numerous attempts were made to resolve the big problem of small change, and the new copper coinage accidentally ticked the correct 'standard formula'. The 'tokenisation' of the small coins in fact prepared China to move onto a pure silver standard instead of a dual metallic one. Redish (1995) argued that France remained on a bimetallic standard instead of adopting

[267] For example, domestic economic conditions, the demand for money the bimetallic system, the market structure and the disaggregated currency circuits. Von Glahn, "Monetary Demand and Silver Supply in 19th Century China." Mio Kishimoto, "Foreign Silver and China's Domestic Economy During the First Half of the 19th Century,"ibid.

[268] Admittedly the use of small change in large payments incurs a higher transaction cost. Still, large coins cannot be used in small transactions, and therefore small coins did have a merit of providing 'extra liquidity'.

[269] Sargent and Velde, *The Big Problem of Small Change*, 50-52.

[270] John H. Munro, "Deflation and the Petty Coinage Problem in the Late-Medieval Economy: The Case of Flanders, 1334-1484," *Explorations in Economic History* 25, no. 4 (1988): 387-423.

[271] Oliver Volckart, "'The Big Problem of the Petty Coins', and How It Could Be Solved in the Late Middle Ages," *Economic History Working Papers* 22310(2008): 1-55.

[272] The problem of the state provision of small coins is that: the gap between the legal tender value and the intrinsic metallic value will always be followed either by counterfeiting or by melting. Redish, "The Persistence of Bimetallism in Nineteenth-Century France."

the Gold Standard because of the government resistance of adopting steam power technology to mint token coins. Her paper looks into this issue through a careful examination of government documents. This paper strengthens this line of argument through statistical analysis as well as studies on contemporary reports.

The rest of the paper is organised as follows: Section 2.2 provides an institutional context for the shortage of copper *cash*; Section 2.3 discusses the minting of new coinage made possible by steam power technology and analyses the reasons behind the relative success of the new copper coinage; Section 2.4 carries out a simplified empirical test to gauge how far the technological shock generated positive effects on the economy; Section 2.5 concludes the paper.

2.2 Bimetallic System: Cheap Silver and Copper *Cash* Shortage

2.2.1 The monetary system in imperial China

2.2.1.1 Evolution of the monetary system: foreign silver, domestic copper

That imperial China had a silver/copper bimetallic system is a highly simplified, if not distorted, conceptualisation. China was originally on a bronze coin standard (a monometallic standard), which with international trade and large inflows of silver, later evolved into a system with two metallic monies.

Copper *cash* (a type of bronze coin) was adopted as the common currency in China as early as the third century B.C. The bronze coin standard dominated China for almost ten centuries before the diversification of the currency system, which started to include iron coins, paper notes and silver ingots. China was not a silver producing country but from the 16th and 17th centuries, with the development of trade and the influx of foreign silver, the latter became an important part of the monetary system.[273] However, while copper *cash* provision was a state monopoly (and the major supply of copper was from state-owned copper mines), the supply of silver depended completely on markets and trade. There was no coinage of silver and the metal often circulated in the form of ingots.

During the Qing Dynasty the makeup of Chinese currency consolidated into a system comprising copper *cash* and silver. Copper *cash* full-bodied copper coins. A piece of standard *cash* is a round coin with a square hole in the centre.[274] All coins bear the same face value of 1 *wen*,[275] and a string of copper *cash* consists of 1000 pieces of copper *cash* and can be used for larger payments.[276] Silver circulated in the form of both silver

[273] Von Glahn, "China's Seventeenth-Century Monetary Crisis," 48-9, 113-4.
[274] King, *Money and Monetary Policy in China*, 52.
[275] A typical piece of copper cash in the 18th century, for example, would weigh 0.12 *liang*, containing 50-70 per cent of pure copper, and other metals such as zinc and lead. Peng, *A Monetary History of China*, 524-25.
[276] One thousand cash equivalent to a string is rather an idealisation. In reality a *string* (or '*chuan'*) was valued at a premium. For example, a *string* of copper cash was worth 1000 cash but normally it contained only around 980 copper *cash*. Kuroda, "The Collapse of the Chinese Imperial Monetary System " 105.

ingots and silver dollars. Silver was more valuable than copper and was used in large transactions and interregional trading; it was measured by weight in terms of tael.[277]

2.2.1.2 Comparison with the bimetallism in Europe

In some significant respects the monetary system in late imperial China differed from the European bimetallic system: the supply of money (whether the state or the market decided the amount of money supply); the exchange rate between two monies (whether exchange rate was flexible or fixed); and the function and interaction of two monies (whether they were inter-changeable during a transaction, or rather occupied different markets and serve very distinct functions in the economy).

In Europe, both gold and silver were legal tender and could be used for any transaction payment.[278] The state mint defined the seigniorage charge of minting as well as the content of pure metal in each coin and therefore there was a fixed legal price ratio (mint ratio) between two types of coin. Private parties could bring metal of any quantity to the state mint for coinage. Coins could be freely melted,[279] imported or exported, so that the fixed exchange rate was effectively maintained (i.e. free coinage).[280][281]

[277] Tael, or *liang*, was used for both the unit of weight and the unit of account. The concept seems similar to that of a 'pound' and a 'pound sterling'. A tael was rather a ghost unit that varied over time and space. There were various standard to define one tael, because of different weighting scales in different regions and different governmental bodies. As a unit of weight, a *liang* varies from 33.99 to 37.50 grams. When 'tael*'* is used as a unit of account specifically for 'silver tael*'*, different taels also had different definition in terms of the purity and fineness of the silver. For example the treasury tael (*kuping liang* or *kuping* tael) was the standard for taxation, the customs tael (*haiguan liang* or *haikwan* tael) was the standard used in the Maritime Customs Service, the market tael (*shiping liang*) was the standard used in the market in Beijing. Lin, "China Upside Down," xxiii-xxiv.

[278] This is only a highly generalised model of the system in Europe. One exception is in Britain: after 1774, the maximum sum up to which small money (i.e. silver coins) had to be accepted in payment was restricted to £25.

[279] The notion of total free minting is a highly generalised picture. Here were historical cases in which European state attempted to influence the supply of money (for example, by restricting the minting output). Oliver Volckart, *The Monetary Policy in German Teutonic States and the Duchy of Prussia from 1370 to 1550 (Die Münzpolitik Im Deutschordensland Und Herzogtum Preußen Von 1370 Bis 1550)* (Wiesbaden: Harrassowitz, 1996), 131 and 346.

[280] Officer, "Bimetallism."

[281] This again is a highly generalised model. The state ratio was only enforced at the moment when the coins were issued and the market ratio between two metallic coins might fluctuate. Peter Spufford, Wendy Wilkinson, and Sarah Tolley, *Handbook of Medieval Exchange* ed. Royal Historical Society(London: Boydell and Brewer 1986), 1-25.

In China, only copper *cash* was coined and the copper *cash* circulated by tale. Silver generally circulated by weight as uncoined metal.[282] Copper was minted (the amount was not freely determined by the public), while silver was freely used but not minted.[283] The government monopolized copper mining and the minting of copper *cash*. Copper *cash* was cast in a number of state mints (two in the capital and one in almost each province) situated in each region, and the circulation was rather regional.[284] Private melting and minting were illegal. China's domestic production of silver was low and therefore the silver stock was accumulated through international trade.[285] As silver circulated by weight and in all forms (ingots, and silver dollars imported from Latin America), with the supply determined by the market, it could be melted, cast (into some particular form, but not into a coin with a face value), imported and exported by private individuals.

Silver and copper *cash* served in different types of transaction and also in different types of market. As they differed significantly in value, copper *cash* was used in retail markets and for paying daily wages, and silver was used in large transactions such as land purchase, wholesale, interregional and overseas trade. In rural areas, copper *cash* was usually the only accepted form of money. The use of silver was more frequent in areas associated with higher trading activities.

The actual exchange rate between silver and copper *cash* fluctuated, depending on the relative supply and demand of each currency. King (1965) characterizes this system as a 'parallel bimetallic system', which diverged from the 'classic form' of bimetallism.[286] Despite the endless attempts by the state to fix the ratio at 1 silver tael equivalent to 1000 *wen*, this principle was actually reflected more in government fiscal conduct (taxation and government spending) than in market behaviour.[287] This is not to say, however, that the government official exchange ratio had no effect on the functioning of the market. On the contrary, the impact of the interplay between the government and the

[282] The term 'by tale' refers to exchanges in which the value of money is determined by counting the number; while 'by weight' applies to situations in which the value of money is determined by weighing the intrinsic value of the precious metal. Sargent and Velde, *The Big Problem of Small Change*, 16-7.
[283] Silver coinage in China started during the 1890s. Before 1890, foreign silver dollars circulated alongside various silver ingots.
[284] Peng, *A Monetary History of China*, 523-4.
[285] Lin, "Latin America Silver and China During the Daoguang Reign," 15-6.
[286] King, *Money and Monetary Policy in China*, 39-40.
[287] Ye, *Chinese Monetary Theories before and after the Opium War*, 3.

market is an interesting subject of investigation. For example, the imposed (and inadequate) official ratio was one of the reasons behind the illegal melting and counterfeiting activities which seem to have been rampant throughout the dynasty. History holds several examples of official rate modification, aiming at closing the gap between the official and market rates.[288]

2.2.1.3 The innate instability of the Chinese bimetallic system

In the case of Europe, the viability of an idealised bimetallic system depends on effective private arbitrage, which requires a large size of specie supply in the public's hands and free minting. When these conditions could not be fulfilled thus the bimetallic arbitrage was no longer feasible, the monetary system became a 'limping bimetallism'.[289] Judging from these criteria the Chinese bimetallic system was 'born limping' and the system itself was indeed very unstable from within.

In a bimetallic economy like China's, where either type cannot be imported and exported freely, a flexible exchange ratio would be the key to maintaining the system.[290] This practice, however, would be at the expense of convenient means of exchange and predictable market activities.

The self-adjusting mechanism of the parallel bimetallic system lies in the exchange ratio, and the system may be very costly to maintain when the change of the ratio becomes frequent and volatile. For most of the time, the Chinese system was contained because markets were far from integrated, and the two currencies were only loosely linked in seasonal wholesale markets. Even if there had been a gradual change in the quantity of one metal, the change would have been reflected only on a seasonal basis. Conditions

[288] The official exchange rate between silver and copper cash was set at 1:700 (tael/*wen*) at the beginning of the dynasty. The exchange rate was altered to 1:1000 in 1645, and this lasted for most of the Qing Dynasty. The rate was officially modified to 1500 in 1848, and again to 2000 in 1850s, according to *Qing Shi Lu* and other government decrees. Peng, *A Monetary History of China*, 522. Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 585. Chen, "The Hsien-Feng Inflation."

[289] One example is towards the end of the bimetallic system in France in the 1870s, silver coins were still legal tender but the minting of silver was first subject to a restricted quota system and later the minting was entirely suspended (the French Crime of 1873). Consequently the face value of the silver coins no longer corresponded to the intrinsic value and the system eventually turned to a Gold Standard. Marc Flandreau, *The Glitter of Gold: France, Bimetallism, and the Emergence of the International Gold Standard, 1848-1873* (Oxford: Oxford University Press, 2004), 175-209.

[290] This precondition of stable bimetallic system was relatively easily met in Europe than in China, as the trading partners of the European state all had similar systems.

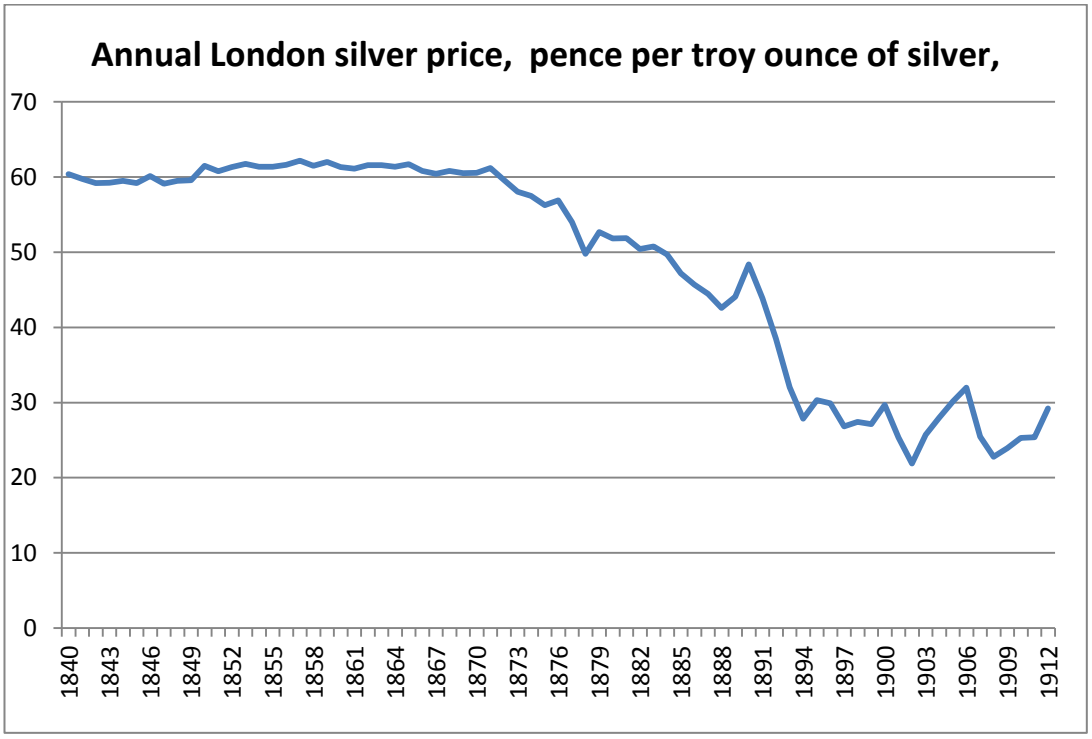
changed, however, in the 19th century: the integration into the international market made the movement of silver more frequent and sudden; the subsequent development in exports tied different markets closer together; the fluctuations of the exchange ratio were more easily observed and the financial arbitrage became more frequent because of the readily available modern communication and transport.

In my view, this system could have been sustained only so long as the silver/copper *cash* ratio did not fluctuate too greatly, or too frequently. Throughout history, this condition was satisfied thanks to some special conditions. First, given a big and relatively closed economy, cases of a sudden and large change of the quantity of either metal were rare. Second, silver and copper *cash* functioned on different levels of the market and did not confront each other very often. Third, despite the official rate, the market exchange ratio between silver and copper *cash* adjusted according to the relative supply and demand of the region and reached a local equilibrium. At the same time, because the domestic market was far from integrated, the different local equilibria rarely if ever confronted each other; therefore the discrepancies in terms of exchange ratio in different regions did not impose a huge challenge to the economy overall. In this way the exchange ratio between silver and copper *cash* was loosely defined and remained flexible; it allowed modification which were not too frequent nor too drastic. Hence the soundness of the bimetallic system.

However, the stabilising factors would change in the 19th century: the relative supply of the two metals would gradually change; the relative price of the two metals would change, sometimes drastically; China would be increasingly connected with the international market and at the same time the domestic market would be more and more integrated with higher trading activities. The relative quantity of two metals changed because the domestic copper mines were almost depleted and the copper supply for the state mints relied on imports. The supply of silver, in contrast, increased with the increasing activity in overseas trade. With the adoption of the gold standard and the subsequent demonetization of silver (coupled with the discovery of silver in the Rocky Mountains), the price of silver fell dramatically and permanently, and so did the relative pricing of copper and silver (in particular when the supply of both metals relied on the international market). The exchange ratio between silver and copper *cash* would also be permanently affected. Moreover, in 1840 China was forced to open itself to overseas

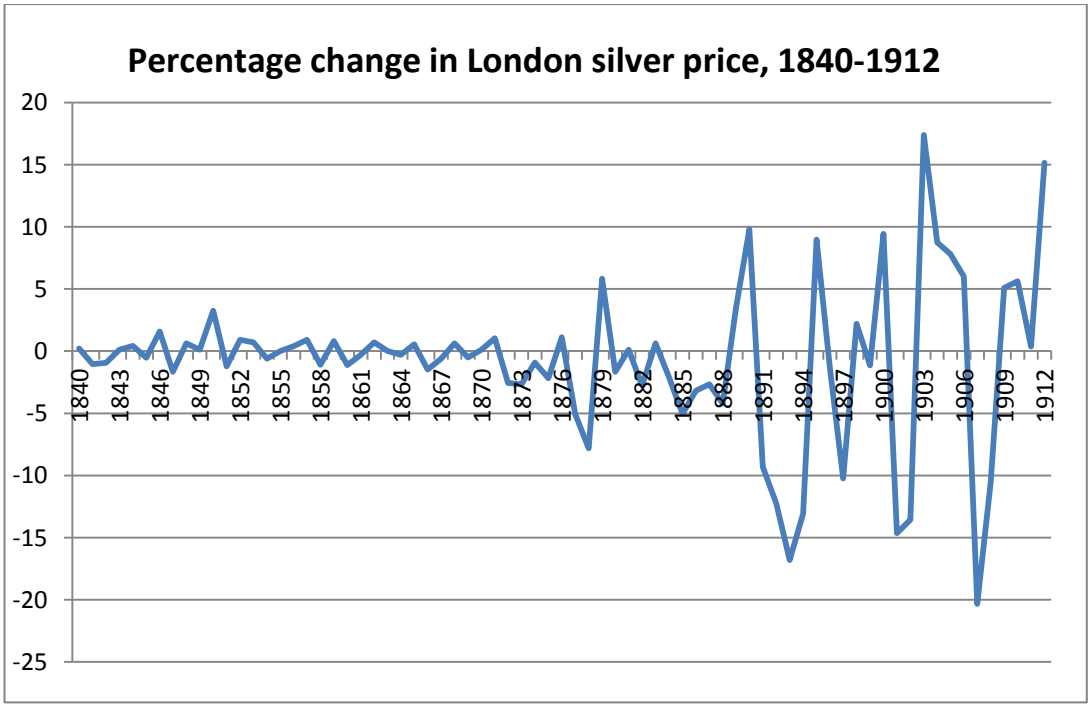
trade. With a stronger link to overseas markets (and also when the supply of both metals relied almost solely on import), the silver/copper *cash* exchange ratio became subject to constant fluctuation, worst in the urban areas and trade centres. Finally, with the development of telecommunication and banking networks and therefore a more integrated domestic market, the regional variation of the exchange ratio revealed itself as a more serious problem for monetary stability.

Figure 2-1 Annual London silver price (pence per troy ounce of silver) 1840-1912



Source: Global Financial Data.

Figure 2-2 Percentage change in London silver price, 1840-1912



Source: Global Financial Data.

2.2.2 Copper *cash* shortage – the big problem of small change

2.2.2.1 The big problem of small change in China

A big problem of small change for a commodity money regime has been a chronic shortage of it.[291][292] Given that petty coins – coins of smaller denominations – can be used in big transactions while big coins cannot be used in small transactions, petty coins render extra 'liquidity services', and therefore the demand for petty coins is generally higher than for coins with higher denominations.[293] At the same time, however, the cost of striking a coin is more or less the same, whatever its denomination. In terms of its face value, the cost of producing a small coin is therefore proportionately higher than that for big ones. Studies on the medieval European monetary system show that the supply of petty coins tended to be insufficient.[294] William Lowndes, the secretary to the Treasury of Great Britain summarized the monetary issue in early eighteenth century Britain: 'take care of the pence, and the pounds will take care of themselves'.[295]

This problem of small change is a feature of the Chinese monetary system, too. Copper *cash* has been the money of common use for centuries. Copper *cash* is small money but by no means only subsidiary money. For common people with moderate needs, copper *cash* was the principal means, or even the only medium of income and payment.[296] This is even truer in the countryside. It has been observed that even in the 1890s copper *cash* was still 'the real coin of the country: the entire trade is conducted in it. The farmer will take nothing else for his produce. Produce is bought, goods are sold, and prices are quoted in *cash*.'[297]

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[291] Sargent and Velde, *The Big Problem of Small Change*, 4-5.
[292] Concerning the chronic shortage of petty coins, its historical viability is often challenged. Volckart, "The Big Problem of the Petty Coins." Munro, "Deflation and the Petty Coinage Problem in the Late-Medieval Economy: The Case of Flanders, 1334-1484," 387-423. However, this pattern of shortage does seem to hold good in the Chinese case.
[293] Sargent and Velde, *The Big Problem of Small Change*, 9. This theoretical view on the 'extra liquidity service' provided by small-denomination coins vis-à-vis big-denomination coins is challenged by observation of specific historical periods, as the possible high transactions cost of using bulks of small coins to make large payments. Volckart, "The Big Problem of the Petty Coins," 3.
[294] Sargent and Velde, *The Big Problem of Small Change*, 10-11.
[295] George A. Selgin, *Good Money: Birmingham Button Makers, the Royal Mint, and the Beginnings of Modern Coinage, 1775-1821 : Private Enterprise and Popular Coinage* (Ann Arbor: University of Michigan Press, 2008), 38.
[296] Hans Ulrich Vogel, "Chinese Central Monetary Policy, 1644-1800 " *Late Imperial China* 8, no. 2 (1987): 4.
[297] *RTTR* (1899), 88.

Throughout Chinese history, the production of copper *cash* was most of the time a state monopoly, and the governments in each dynasty often made it a point of honour to maintain the coinage.[298] However, this seemingly benevolent conduct was in reality more than often hampered, whenever the cost of production was too high. As a result since early times the empire has suffered from chronic shortages of currency. Even during the North Song dynasty (960-1127), when the annual production of copper *cash* reached its overall peak, China was still afflicted by 'currency famines'.[299] The Ming dynasty (1368-1644) set out (not very successfully) to replace metallic monies with government maintained paper currency, and did not provide adequate copper coinage.[300]

In addition, the shortage of copper *cash* in China seems to have been much more troublesome than in Europe, because silver and copper *cash* are far from perfect substitutes for each other especially in China. While silver helped enlarge the whole money stock in China and facilitated long-distance trade, it was copper *cash* that appeared to be the fully functioning currency. Copper *cash* was almost the only currency accepted in rural areas, while in urban areas, it was still in practice the only money used in daily transactions. The wider use of silver and the increased inter-exchangeability of these two monies took place at a very late stage. In 1899 in Jiaozhou, a Northern port city, the dominant currency was still copper *cash*:[301]

> 'The currency of this region is copper *cash*, sycee silver,[302] and dollars. […] The last do not enter into mercantile transactions outside of the German territory. Sycee silver only enters into transactions between merchants, bankers, and the Custom House. […] Copper *cash* is the real coin of the country: the entire trade is conducted in it. The farmer will take nothing else for his produce. Produce is bought, goods are sold, and prices are quoted in *cash*, or *tiao* - i.e., strings of 1,000 *cash*.'

2.2.2.2 Copper supply and mint output in Qing Dynasty

During the Qing dynasty (1644-1912), the government expanded its coinage provision beyond the totals of its predecessor, but the overall copper *cash* supply during the

[298] King, *Money and Monetary Policy in China*, 37.
[299] Von Glahn, "China's Seventeenth-Century Monetary Crisis," 48-50.
[300] Peng, *A Monetary History of China*, 429-34.
[301] 'Trade Report of Kiaochow', *RTTR* (1899), 88.
[302] Sycee is a Cantonese word meaning 'fine silk'. Sycee silver means silver ingots with fine quality.

dynasty was still insufficient, in particular when juxtaposed with more significant population growth. There was a slight deflationary trend in the prices quoted in copper currency.[303] During the early Qing period, the copper supply mainly relied on cheap imports from Japan. The copper imports shrank greatly at the beginning of the 18th century, due to Japan's restriction on its copper exports.[304] Fortunately, from the early 18th century to the early 19th, the Chinese state was able to secure a supply of cheap copper from Yunnan province, and the mint output was maintained at an adequately high level.[305]

However, the mint output started to decline in the early 19th century, mainly due to the exhaustion of the copper supply as well domestic disturbances. The copper mine in Yunnan was so over-exploited that from 1810 onwards its output started to decline. In 1853, the route by which copper from Yunnan was transported to major mints was cut by the Taiping rebellion group,[306] further curtailing the mint output. The copper mine was seriously damaged during the Mohammedan rebellion (1853-74) in Yunnan Province. Copper production was suspended even after the rebellion. It was only resumed in 1887, after more than a decade of reconstruction but the production level dropped to only around 13% of its original level in the mid-18th century.[307] Subsequently the copper supply to the state mints relied on imports from overseas, mainly from Japan.[308] With the increased cost of raw material, the mint output was further reduced. The gap between the supply and demand of copper *cash* continued to widen in the latter half of the 19th century.

A shortage of copper for the mints had already been noticed during the reign of Emperor Daoguang (1821-50).[309] As early as the 1840s, the scarcity of copper *cash* was already a concern of top government officials.[310] During the Taiping Rebellion of the 1850s and 1860s, the government issued new types of seriously debased copper *cash*,

[303] Peng, *A Monetary History of China*, 569.
[304] Ho, "From Cheap Silver and Copper Famine to Depreciation of the Copper Coinage," 393.
[305] Vogel, "Chinese Central Monetary Policy, 1644-1800 " 9-10.
[306] King, *Money and Monetary Policy in China*, 145.
[307] Jianbing Dai and Ke Xu, "Brief Account of Copper Cash Policy in Qing Dynasty (Qing Dai Tong Zheng Lue Shu) " *Jiangsu Numismatics* 36, no. 03 (2007): 7-8. Ho, "From Cheap Silver and Copper Famine to Depreciation of the Copper Coinage," 394. King, *Money and Monetary Policy in China*, 219-20.
[308] Vogel, "Chinese Central Monetary Policy, 1644-1800 " 7.
[309] King, *Money and Monetary Policy in China*, 145.
[310] Lin, "China Upside Down," 73.

most of which were rejected by the market.[311] After the 1860s there was no systematic coinage of standard *cash* in large quantities.[312] The exact quantities of annual national copper coinage are not available, but the surviving documentation on the mint output in Beijing is suggestive enough. The two mints in the capital, Baoquan and Baoyuan, were the two most important in the country. They enjoyed priority in terms of copper provision and were responsible for almost half the total mint output. Copper *cash* produced by the two mints were deposited in the state treasury before being used in government expenditure. The record of treasury books therefore is indicative of the copper coinage in the capital area, but the statistical series is incomplete: many years have missing records and records are especially incomplete during the period from the 1870s to the 1910s, probably due also to the low production level of the two royal mints. Figure 2-3 (p.112) shows that the trend of the radically reduced production is still more than visible: after 1860s, copper coinage in these two major mints became infrequent and much smaller in scale: within a century, from 1751 to 1850, the average mint output was around 1,178,923 strings per year; after 1860 the annual coinage dropped to 217,249 strings per year, less than one fifth of the former output. The mint output was nil in 1883, 1891 and 1892. There was a brief revival of coinage in 1896-99, following a heavy demand for copper *cash* in market, but the annual output still scarcely reached a quarter of the output of a normal year (the annual average of 1751-1850).[313] The output level in other provincial state mints would only have been lower, if not nil.

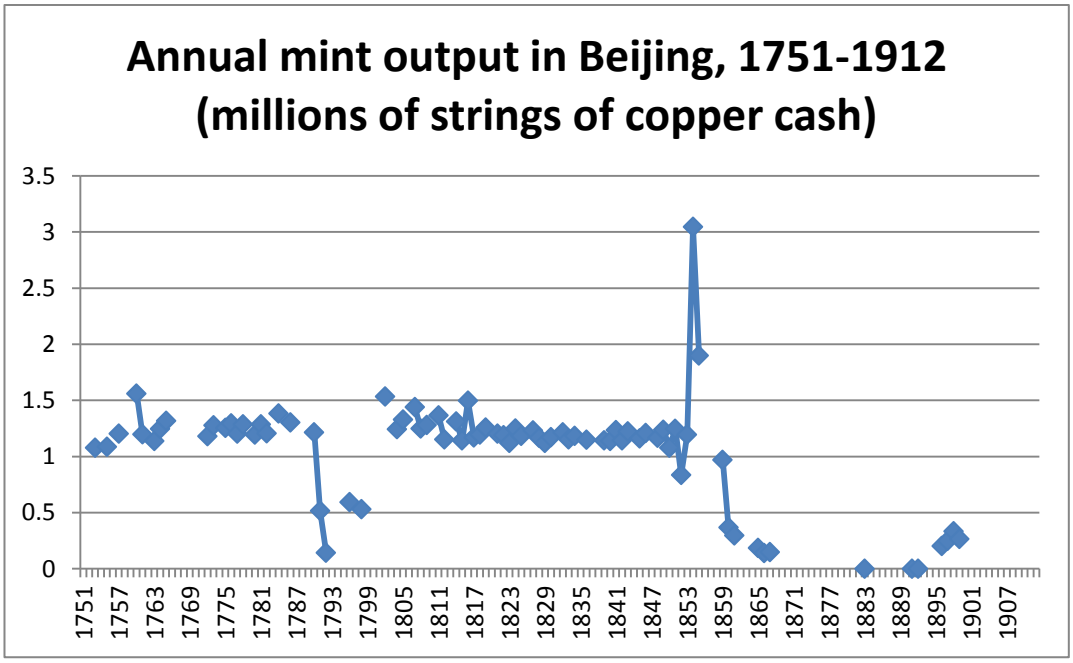
This insufficient provision of copper *cash* induced a series of problems, both monetary and real. The scanty supply of copper *cash* would destabilise the exchange rate between silver and copper, confuse the market and impede long distance trade that involved exchanges between the two currencies. In rural areas where copper *cash* was the only currency acceptable, the shortage of means of exchange might discourage trade activities (especially long distance trade). More important, with a relatively established

[311] The debased copper cash is called '*daqian'*, or 'big *cash'*, with extremely high face value but little copper content, due to the scarcity of copper supply and the urgent need of financing military action. King, *Money and Monetary Policy in China*, 147-9.
[312] Peng, *A Monetary History of China*, 528.
[313] The treasury's books were compiled each year by the Qing Court, but parts of the archive were lost. What we see today are records only of the years that are still preserved. It should be noted that there was a sudden increase in terms of copper cash production during 1850-60. This was due to the issue of largely debased coins (with very high face value) and the mint output was artificially increased, as the output was a mixture of copper coins of different denominations, and the record shows only the total nominal value. The statistics here are taken from the book of Shi. Shi, *Treasury Statitstics* pp.167-253.

silver/copper *cash* ratio and an ever decreasing quantity of copper *cash*, copper *cash* became overvalued and risked being driven out of the market. Government reports show that copper coins were being melted and the production of illegal counterfeit copper *cash* (with less copper content) was rampant.

This situation became even more serious towards the end of the 19th century. Because of the changes in commodity prices, copper *cash* coinage became even more costly for a government that was already facing huge deficits. Mint production was virtually suspended despite an ever growing market demand for more copper coins. The following subsections illustrate the aggravated situation and analyse the cause and consequences of this monetary phenomenon, as shown in contemporary narratives.

Figure 2-3 Mint outputs of the Baoquan and Baoyuan Mints in Beijing, 1751-1912 (millions of strings of copper *cash*)



Source: *Imperial Treasury Records*, CASS

2.2.3 Turn of the century: challenges to the monetary system and its economic consequences

2.2.3.1 Gold standard, cheap silver and copper cash shortage

During the latter half of the 19th century, changes in the supply of both silver and copper became more volatile, for two reasons: developments in trade and the demonetization of silver.

Foreign trade expanded at a quickened pace in the mid-19th century, after China's defeat in the Opium Wars (1839-42 and 1856-60) and the subsequent agreement to open various treaty ports.[314] Trade statistics (Figure 2-4, p.116) show that the value of total trade (net import plus export) was 95 million taels in 1864. Foreign trade expanded steadily: by the end of 1889, total trade value had increased to 207.8 million and by the end of 1899 it was already 460.5 million.[315] As foreign trade transactions were settled in terms of silver, the silver stock in China was increasingly affected by the trade expansion. Meanwhile, with most Chinese exports being produced outside towns, the development of foreign trade also promoted rural production, new trade routes and the emergence of intermediate markets connecting rural and urban areas. With this trade integration both internally and internationally, the whole market became more sensitive to changes in the supply of any metal, as well as to the changes in silver/copper *cash* exchange ratio.

The big change in the silver sector was prompted by the wide adoption of the Gold Standard in the 1870s and the demonetization of silver: after the Franco-Prussian War (1870-71) Germany was able to adopt Gold Standard. France, together with the Latin Monetary Union, also switched to the Gold Standard in late 1870s.[316] This 'gold wave' continued in periphery countries and, towards the end of the century, extended to many

[314] Studies on the international commodity market (of rice and cotton in particular) show that since the late 19th century, commercialised areas in China (especially Shanghai and other centres connected to it) were increasingly integrated into the world market: the agricultural prices and outputs were affected by overseas supply and demand. Brandt, *Commercialization and Agricultural Development*, 1-38. A. J. H.; Latham and Larry Neal, "The International Market in Rice and Wheat, 1868-1914 " *The Economic History Review* 36 no. 2 (1983).

[315] Liang-lin Hsiao, *China's Foreign Trade Statistics, 1864-1949* (Cambridge, Mass.: East Asian Research Center, Harvard University : distributed by Harvard University Press, 1974), 22. Hsiao's data was collected from statistics originally published by the Imperial Maritime Customs Service. Systematic and comparable trade statistics were available only after 1864, and statistics on the movement of treasure (gold, silver and copper) were available after 1888.

[316] Flandreau, *The Glitter of Gold*, 175-77.

Asian countries like Japan, and India.[317] Figure 2-1 (p. 107) illustrates the permanent change in the price of silver in the London market; between 1840 and 1870 it remained at more or less the same level (at around 60 pence per troy ounce). After 1870, the price of silver dropped and never bounced back. After demonetisation, silver became a common commodity: not only did the price drop to less than half of its original price, but the price movement was also increasingly volatile after 1870 (Figure 2-2, p.107). The silver price in the London market dropped even more drastically after 1890, from 48.375 pence per ounce of silver in 1890 to 27.844 in 1904. After 1900, the price fluctuated between 20 and 30 pence and the movement was even more volatile.[318]

As noted, large quantities of silver had flowed into China since the beginning of its drastic drop in price (the 'cheap silver' phenomenon), despite the enlarging trade deficit. [319]. The actual number would be difficult to pin down, due to the unrestrained smuggling. The customs statistics nevertheless show that silver imports soared during the last decade of the century and in particular in 1894-95. From 1888 to 1900 the total inflow through Customs alone was 88.771 million H. K. taels (Figure 2-5, p.116).[320] It is estimated that from 1871 to 1913, the total value of silver that flowed into China amounted to 241 million H. K. taels.[321] (Some statistics indicate the magnitude of this inflow: the average annual government income in 1885-94 was around 83.6 million taels,[322] and the total silver money stock in China by the end of the Qing Dynasty was believed to be around 936 million taels.[323])

Given that China suffered from a trade deficit in the 1880s, the silver inflow probably occurred against a gold outflow, not as a consequence of increased exports. In addition,

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[317] Some of the periphery countries were on a 'gold exchange standard'. Japan was able to adopt the Gold Standard because of China's huge payment of war reparation after the First Sino-Japanese War (1895-96). Michael D. ; Bordo and Hugh Rockoff, "The Gold Standard as a "Good Housekeeping Seal of Approval"," *The Journal of Economic History* 56, no. 2 (1996).

[318] "Global Financial Data."

[319] Ho, "From Cheap Silver and Copper Famine to Depreciation of the Copper Coinage," 398-9.

[320] It was only after 1888 that the Imperial Maritime Customs Service systematically collected and published figures on the movement of treasure, probably in response to an unusual surge of movement in precious metals. Figures here are cited from: Hsiao, *China's Foreign Trade Statistics, 1864-1949* 128.

[321] Charles F. Remer, The Foreign Trade of China (Taipei: Cheng-wen Publishing Company, 1967, reprinted ed.), p. 215. Cited from Ho, "From Cheap Silver and Copper Famine to Depreciation of the Copper Coinage," 399.

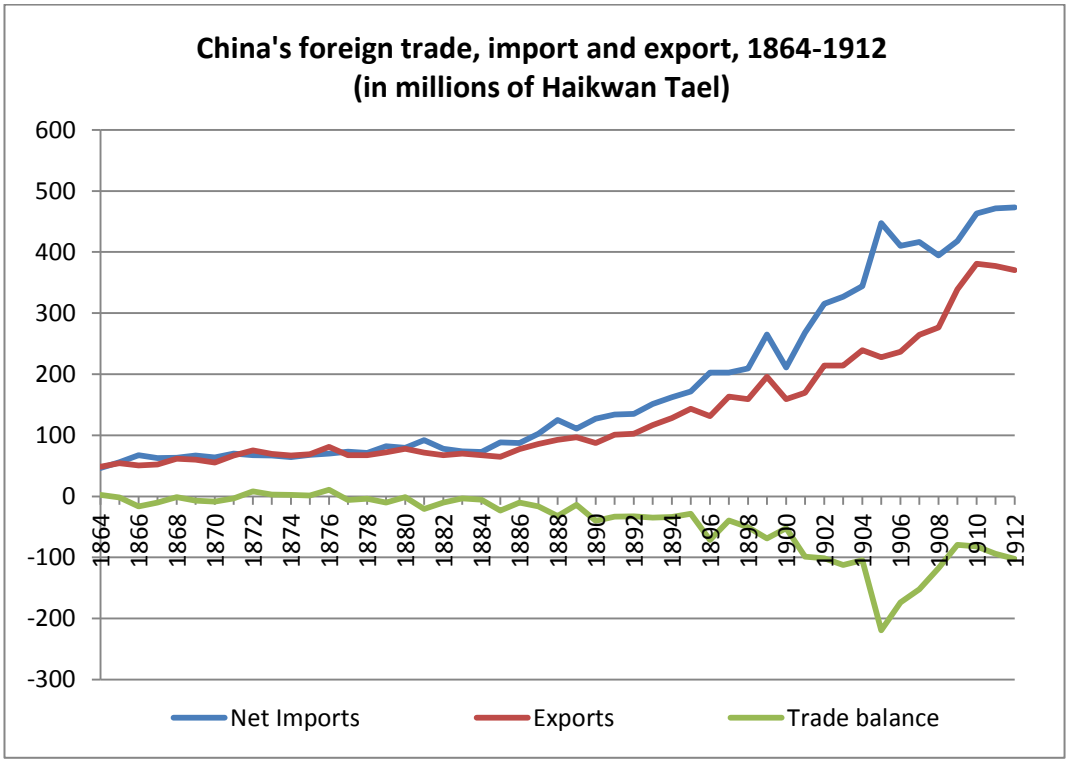
[322] Chen, *Papers on the History of Qing Public Finance*, 127-8.

[323] The original estimation by Peng was 1.3 billion silver dollars, which this paper converts into tael denominated by the conventional exchange rates between silver tael and silver dollars (one silver dollar equals 0.72 silver tael), Peng, *A Monetary History of China*, 592.

foreign direct investment and money remittance of overseas Chinese were also two important sources of capital imports. Latham mentioned that the Chinese migrant workers in the United States would put silver in with the bodies of deceased family members sent back to be buried in their home villages. This fact suggests that the actual capital import (silver inflow) might well exceed the figure captured by the Imperial Customs Statistics (Figure 2-5). Although Dernberger argues that despite the fact that China enjoyed a continuous capital inflow, most of it was used for current consumption. The total import for producer goods constituted a mere 6% of the total important in 1880, and 8% in 1913.[324]

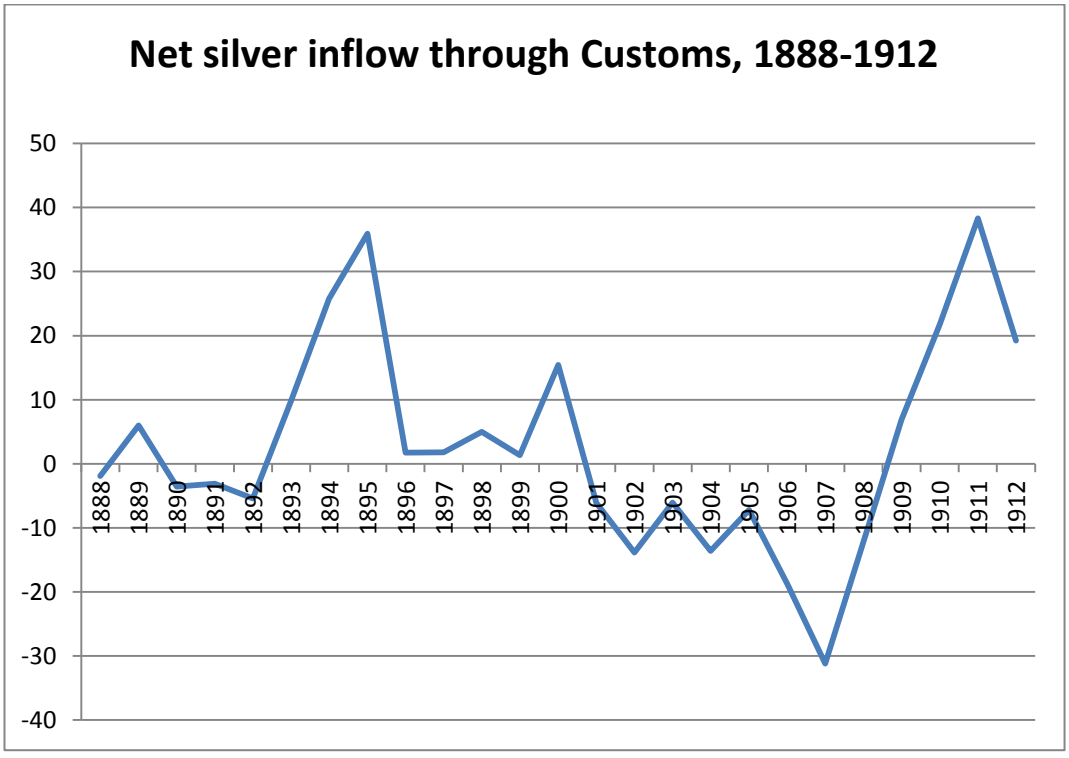
[324] Robert F. Dernberger, "The Role of the Foreigner in China's Economic Development, 1840-1949," in *China's Modern Economy in Historical Perspective*, ed. Dwight H. Perkins(Stanford, California: Stanford University Press, 1975), 35.

Figure 2-4 China's foreign trade (in millions of Haikwan Tael), 1864-1912



Source: Hsiao, Liang-lin, 'China's Foreign Trade Statistics 1864-1949'.

Figure 2-5 Net silver inflow through the Imperial Customs Service (millions of H.K.Tael), 1888-1912



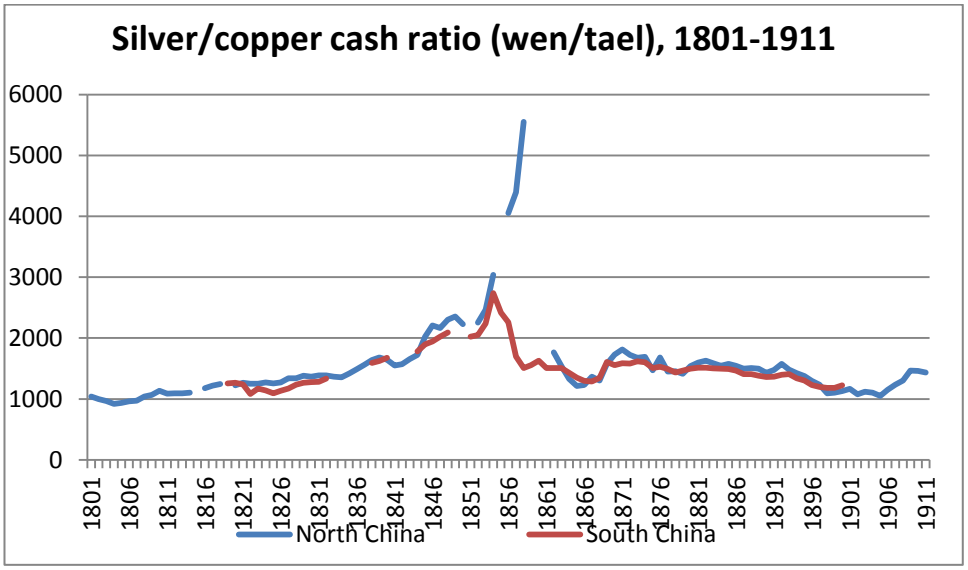
Source: Hsiao, Liang-lin, 'China's Foreign Trade Statistics 1864-1949'.

As well as the volatile price decrease in the silver sector, there were changes to the copper sector too. It is observed by contemporaries that copper *cash* were increasingly 'dear and scarce' across the country. The Commissioner of Customs in Chongqing (Chungking) reported in 1895 that copper *cash* was growing more and more expensive compared to silver:[325]

> 'The long-continued and widespread 'dearness' of copper *cash* relatively with silver deserves very serious consideration. […]; whereas *Hk.Tls* 1 exchanged, on the average, for 1,639 *cash* in 1891 and 1,538 in the first nine months of 1895, in December it would buy only 1,389 *cash*.'

The sudden fall in the price of silver irreversibly altered the market ratio between copper *cash* and silver tael. Towards the end of the 19th century, with two important neighbouring countries (Japan and India) also adopting the Gold Standard, the instability issue grew unprecedentedly acute. As the metal for copper *cash* minting relied on imports, the market ratio between copper *cash* and silver tael was directly influenced by their pricing in the international market. The situation of the 'dearness' of *cash* was especially acute in commercial centres and port cities, because the pricing of both metals were more directly influenced by the fluctuations in the international pricing of the two commodities.

Figure 2-6 Silver/copper *cash* exchange ratio (*wen*/tael), 1801-1911.



Source: Peng (2008, 2011)

[325] *RTTR* (1895), 46-9.

The dearness of *cash* soon turned into *cash* stringency, resulting from a series of instances of policy misconduct, a rigid official ratio and a ban on counterfeiting. As previously mentioned (in section 2.2.1 on the monetary system), the government maintained an official rate between silver and copper *cash* which was deviating more and more from the market ratio (the official silver/copper *cash* ratio was much higher than the market one). Silver was increasingly overvalued, while copper *cash* was seriously undervalued. The general Gresham's Law predicts that overvalued money (bad money) will prevail while undervalued money (good money) will be hoarded, melted down or exported. A more nuanced version of the Law would further suggest that when money in small denominations is undervalued, it is more likely to be scarce because 'the use of good money at its market price is too expensive' (i.e. the price of distinguishing good from bad money).[326] In China counterfeiting activities would normally also follow: melting down the high-quality copper *cash* turned out by the government mint and producing illegal copper *cash* with much lower copper content.[327] Although counterfeiting was illegal, it was nevertheless a *de facto* market response to the official silver/copper *cash* ratio – by adjusting the copper content of the money it actually helped maintain the official rate (between one tael and one *wen*). The volatile market ratio between silver and copper *cash* was admittedly harmful to normal commercial activities, but the government response at that time was counterproductive: instead of adjusting the official rate to be close to the market rate, it reinstated the original official rate and also banned counterfeiting. The Commissioner of Shanghai Customs observed in 1895 that:[328]

> 'Last year, it having been found that a dollar's worth of *cash* contained metal that would sell for more than a dollar, *cash* were melted down; and the dollar value fell (from 960-1000 to 920-930, and then to 840 of *cash*). […] the various provincial authorities have endeavoured, but of course in vain, to remedy this by issuing proclamations prohibiting melting and fixing a rate of exchange with silver.'

[326] Arthur J. Rolnick and Warren E. Weber, "Gresham's Law or Gresham's Fallacy?," *Journal of Political Economy* 94, no. 1 (1986): 185-6.
[327] There are many examples in history of debased coins being minted illegally and used to meet the market demand, when the government failed to produce sufficient copper cash. Sui-wai Cheung, "Copper, Silver and Tea - the Quesiton of Eighteenth-Century Inflation in the Lower Yangzi Delta," in *The Economy of Lower Yangzi Delta in Late Imperial China : Connecting Money, Markets, and Institutions*, ed. Billy K. L. So(London: Routledge, 2013), 119-20.
[328] *RTTR* (1895), 203.

As a result large quantities of copper *cash* were melted, but instead of being cast into coarser coins (at least to provide the market with more liquidity) they were used to make utensils, or melted and sold as import substitutions, or exported. It was a vicious circle that made copper *cash* even more expensive and scarce. In the city of Ningbo, 150 kilometres from Shanghai, the Customs Commissioner reported:[329]

> 'I am told by a good authority that the chief cause of the scarcity of copper *cash* throughout China is that the largest and best are melted down and made into pipes, manufacturers finding that they can obtain the copper on more favourable terms in this way than by purchasing the metal in bulk.'

Besides Gresham's Law operating in the market, insufficient supply (which another result of relative price) was another cause of the scarcity of copper *cash*. Insufficient *cash* supply leading to the high value of copper *cash* relative to silver had been a long-standing problem before the 1870s. The cheap silver since the 1870s meant a fall in the purchasing power of Chinese currency compared to that of other gold standard countries. Imports, including copper, were severely discouraged. Copper coinage became totally unprofitable and most mints virtually ceased production, aggravating the monetary stringency. The general secretary of the Imperial Customs Service gave a clear summary of the copper *cash* issue:[330]

> 'A real difficulty the government has to face is the scarcity of copper *cash* – a difficulty which is likely to increase, as the intrinsic value of the *cash* as metal is actually greater than that of the silver for which they at present exchange. The copper money purchasable for a tael of silver costs the Government for metal (copper and zinc) not less that *Tls*. 1,354, which does not include the cost of minting. This condition has not only restricted coinage but has resulted in a serious disappearance of the coins, due to melting down for the sake of the copper. The number of *cash* exchanged for a tael in Shanghai has fallen since 1892 from 1,400 to 1,170, and a further fall is to be feared.'

The 'dearness' (in terms of their silver prices) and the subsequent 'scarcity' of *cash* were universal and were described in port cities all over the country, from big ports

[329] 'Trade Report of Ningpo', *RTTR* (1895), 269.
[330] *RTTR* (1898), 3. Possibly because of the spelling habit of the time, figures quoted in this original text such as 1,354, 1,400 and 1,170 should be understood as 1.354, 1.400, and 1.170 respectably.

along the coast (Shanghai) and rivers (Chongqing) to trade points in the remotest areas of southeast China (Simao and Tengyue in Yunnan province): Chongqing,[331], [332] Shanghai, [333] Ningbo, [334] Wuhu, [335] Guangzhou, [336] Yantai, [337] Yichang, [338] Wuhan, [339] Qingjiangpu,[340] Suzhou,[341] Fuzhou,[342] Shantou,[343] Beihai,[344] Niuzhuang,[345] Tianjin,[346] Xiamen,[347] Wuzhou,[348] Qiongzhou,[349] Longzhou,[350] Simao,[351] Jiaozhou,[352] Kowloon,[353] Tengyue,[354] Changsha.[355]

2.2.3.2 Economic impact of the monetary adjustment

It is generally perceived that the cheap silver phenomenon of this period benefited silver standard countries by encouraging export and by pumping liquidity into the economy. The cheap silver price acted as currency devaluation which would encourage export. The subsequent trade surplus, together with the demonetization and devaluation of silver, might also result in a continuous flow of silver into countries on a silver standard, thus adding liquidity to the market. These two consequences (devaluation and money inflow) brought by the 'cheap silver' phenomenon should have been extremely beneficial for China. However, contemporary reports seem to suggest that China did not

[331] *RTTR* (1895), 46-9; *RTTR* (1897), 71; *RTTR* (1898), 80.
[332] One *Haikwan* tael could be exchanged for 1,738 cash and in 1895 it was only 1,398. 'Trade Report of Kiukiang', *RTTR* (1895), 126-7.
[333] *RTTR* (1895), 203; *RTTR* (1896), 239; *RTTR* (1897), 234-7.
[334] *RTTR* (1895), 269; *RTTR* (1896), 300; *RTTR* (1904), 106.
[335] *RTTR* (1895), 151; *RTTR* (1896), 185; *RTTR* (1898), 193; *RTTR* (1902), 289-90; *RTTR* (1903), 322-5.
[336] 'Trade Report of Canton', *RTTR* (1895), 432-3; *RTTR* (1896), 435-8; *RTTR* (1899), 557.
[337] 'Trade Report of Chefoo', *RTTR* (1896), 54; in 1897 copper cash were even imported from Hong Kong due to the scarcity issue, although the situation in local market was not improved, *RTTR* (1897), 49-52; *RTTR* (1898), 55.
[338] Exchange rate with *Hk.Tls* dropped from 1644 in 1891 to 1292 in 1896, 'Trade Report of Ichang', *RTTR* (1896), 90-1.
[339] 'Trade Report of Hankow', *RTTR* (1896), 125-6; *RTTR* (1897), 124.
[340] 'Trade Report of Chinkiang', *RTTR* (1896), 209; *RTTR* (1897), 206-7; *RTTR* (1899), 263; *RTTR* (1902), 334.
[341] 'Trade Report of Soochow', *RTTR* (1896), 291.
[342] 'Trade Report of Foochow', *RTTR* (1896), 362.
[343] 'Trade Report of Swatow', *RTTR* (1896), 415; *RTTR* (1897), 372; *RTTR* (1899), 489.
[344] 'Trade Report of Pakhoi', *RTTR* (1897), 614-5.
[345] 'Trade Report of Newchwang', *RTTR* (1898), 1-8; *RTTR* (1899), 8-9; *RTTR* (1901), 8.
[346] 'Trade Report of Tientsin', *RTTR* (1898), 29; *RTTR* (1899), 32.
[347] 'Trade Report of Amoy', *RTTR* (1898), 401.
[348] 'Trade Report of Wuchow', *RTTR* (1898), 503-4.
[349] 'Trade Report of Kiungchow', *RTTR* (1898), 613.
[350] 'Trade Report of Lungchow', *RTTR* (1898), 656.
[351] 'Trade Report of Szemao', *RTTR* (1898), 679.
[352] 'Trade Report of Kiaochow', *RTTR* (1899). 88.
[353] *RTTR* (1899), 595.
[354] 'Trade Report of Tengyueh', *RTTR* (1902), 913-6.
[355] *RTTR* (1904), 232-3.

benefit much from the 'cheap silver' phenomenon. This section seeks to unravel this myth and to suggest that China was affected differently because it was on a dual metallic system instead of a pure silver standard. For China in particular, 'cheap silver' had a special and profound impact on its economy by destabilising the monetary system (i.e. aggravating the *cash* shortage problem). The effect of cheap silver combined with the scarcity of *cash* on the economy can be complicated. This section will start with the conventional view of the positive impact of cheap silver, followed by the investigation on how China benefited relatively little during this period.

Since the 1870s, silver was both currency in China and a commodity in the international market, the international price of silver was therefore considered indicative of the exchange rate of the Chinese currency. Cheap silver indicated therefore favourable terms of trade for China, whereas expensive silver would discourage the export trade.[356] Theoretically, 'cheap silver' can be taken as a sudden and exogenous currency devaluation, and would indicate favourable terms of trade for silver standard countries as the devaluation would encourage exports.[357]

In addition, the potential silver inflow following the demonetization and price drop of silver should have been extremely benefiting to countries like China, as for most of the time in history China's market had been suffering from shortage of money, for both large (China was not a silver producing country and the supply of silver depended on overseas trade) and small transactions (insufficient public provision). It is generally perceived by many Chinese historians that the inflow of silver (more liquidity and mild inflation) have boosted production, while a silver outflow would have induced money stringency and therefore a deflationary pressure on the economy. [358]

[356] Friedman has a vivid illustration of the way in which this mechanism worked in early Republican China (1911-49). This mechanism is theoretically very convincing. In reality the mechanism probably describes more accurately the situation of the 1910s and 1920s than in earlier periods (1870s-1900s), as in the earlier period China was on a dual metallic standard, while in the Republican Era with the 'tokenisation' of the copper sector China as technically a truly silver standard (monometallic). Whether the mechanism could be applied to the situation in the 1930s is also contested. Brandt and Sargent (1989) argues that with the rapid development of modern banking and much wider circulation of banknotes, the immediate effect of silver outflow on monetary base would be dampened. Friedman, "Franklin D. Roosevelt, Silver, and China," 71-3. Brandt, *Commercialization and Agricultural Development*.

[357] Nugent, "Exchange-Rate Movements and Economic Development in the Late Nineteenth Century," 1110-14.

[358] For example the fall of the Ming dynasty in 1644 is sometimes associated with the drastic fall in silver imports during the same period (Atwell, "Notes on Silver, Foreign Trade, and the Late Ming Economy."). The 'Kangxi Depression' during the early part of the Kangxi period (1661-1722) is attributed to the

The positive impact of cheap silver was found true in many silver standard economies during this period.[359] However, although contemporary studies show that 'cheap silver' benefited most silver standard countries, China seemed to benefit very little compared to other countries like Japan and India.[360] [361] With China's bimetallic system, the effect of 'cheap silver' on both export and liquidity provision was not as straight forward as for countries on pure silver standard. An examination on contemporary reports and memoirs on China reveals a different picture: export prices did not all drop in line with the drop in price of silver; the volatility of silver price following the silver demonetization also hindered trade; more importantly, despite the silver inflow, cheap silver aggravated the copper shortage problem.

First, under China's bimetallism the link between currency devaluation and export is less obvious. Most of China's exports were rural produces, and copper cash occupied the lower level markets (rural market and market for daily transactions). In fact, the price of Chinese exports depended also on copper *cash* as much as, if not more than, on the price of silver.

As most Chinese exports were goods produced in small rural households, they were first collected by middlemen who paid with copper *cash*. These goods were then exchanged for silver priced according to the actual silver/copper *cash* exchange rate, and exported. Because copper *cash* was the sole currency and also because money circulation in rural areas was limited, price levels were rarely volatile as a result of sudden movements of

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reduced inflow of silver due to the prohibition on foreign trade and the subsequent monetary stringency (Kishimoto-Nakayama, "The Kangxi Depression."). The economic depression during the Daoguang period (1821-50) was also believed to have been triggered by the silver outflow following the opium trade. This generalised view is often challenged. The case of the Daoguang depression, for example, has recently been revisited and many have argued with convincing evidence that the silver outflow was not necessarily directly linked to, nor a definite cause of economic depression; many factors (domestic economic conditions, the demand for money, the bimetallic system, the market structure and the disaggregated currency circuits) other than the direction of silver flow should be taken into account in examining the Chinese monetary situation. For recent discussions please refer to Von Glahn, "China's Seventeenth-Century Monetary Crisis." "Monetary Demand and Silver Supply in 19th Century China." Mio Kishimoto, "Foreign Silver and China's Domestic Economy During the First Half of the 19th Century,"ibid.

[359] Nugent, "Exchange-Rate Movements and Economic Development in the Late Nineteenth Century."

[360] Nugent's paper shows that during 1872-96, the annual growth rates of Japan, Vietnam, and India were 16.9%, 9.8% and 1.7% respectively, while the figure of China was 0.5%. Ibid., 1123.

[361] We also have to pay attention to the fact that during this time period (1870-1911) the growth of China's export benefited largely from a continuous trade expansion (number of treaty ports more than tripled), the better management of the Customs Service by the British which increase the customs revenue by attacking pirates and putting junk trade under tariff control (i.e. a better capture of existing trade statistics).

large amounts of money (except for harvest seasons). Thus retail prices in rural areas remained relatively stable. The export price vis-à-vis foreign currency from gold standard economies therefore remained more or less unchanged, while export prices in terms of silver even increased. The Customs Commissioner in Wuhan (Hankow) explained this purchasing mechanism through a vivid example:[362]

> 'The rise in value of *cash* vis-à-vis silver will decrease the Export trade, for it will increase the price of all Exports. Take Skins: the people who sell Skins in the interior to collectors require payment in *cash*; the collector, in turn, requires *cash*, and *cash* only; if he does not get enough *cash* as profit he will not collect Skins. The export of Skins became possible because these Skins were purchased with *cash*, which *cash* was purchased with silver, which silver was purchased with gold – the Skins being sold for gold in Europe. Now, however, the gain between gold and silver has to be balanced by the loss between silver and *cash*.'

It was noticed in many ports that the prices of export goods quoted in silver increased. Take Chongqing (Chungking), for example; it was observed in 1895 that:[363]

> 'Retail prices, which are measured in *cash*, have nominally remained unchanged, but it takes more silver to buy the same number of *cash* to pay the prices. Measured in silver, therefore, the retail prices are higher, and as the world has found out, relative fluctuations in the measures of value do more harm than good to trade.'

Abundant similar descriptions of other locations can be found can be found in the trade reports of this period. Although not every customs house reported this phenomenon at the same time due to the regional diversity,[364] the overall picture was still not an optimistic one. China's exports did increase but the increase was rather limited compared to other silver standard countries of the same period.[365] And when we examine more closely, the trade statistics show that during this period the price of

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[362] *RTTR* (1896), 125-6.
[363] 'Trade Report of Chungking', *RTTR* (1895), 46-9.
[364] As China is extremely big, it has several macro-economic regions with their own dynamics. William G. Skinner, "The Structure of Chinese History," *The Journal of Asian Studies* 44, no. 2 (1985).
[365] Nugent's paper demonstrates the development of trade of 18 silver standard countries/regions including China and the study shows that China's export performance was the worst amongst the 18 countries. While the annual growth rate of Japan's export was 16.9% during 1872-96, China's record was a mere 0.5%. Nugent, "Exchange-Rate Movements and Economic Development in the Late Nineteenth Century," 1123.

Chinese export quoted in silver increased.[366] In addition, import increase exceeded the increase in export, and the balance of trade turned negative after 1880; the trade deficit increased after 1895 and reached a historical high in 1905 (Figure 2-4, p.116).

Second, the wave of silver depreciation came at the price of increased volatility in the price of silver, which might disturb both import and export. The general secretary of the Imperial Customs Service noticed as early as 1893 that the depreciation of silver (in terms of gold) curtailed not only imports but also exports:[367]

> '[T]he division of the import trade […] has been characterised by an unprecedented retrograde movement, which can only be ascribed to the depreciation in the gold value of silver causing an immense curtailment, at their greatly enhanced prices, in the demand for textiles, Opium, etc. Indeed, if this decline continues, it will completely nullify the advantages expected to accrue from the opening of new ports and great markets, such as Chungking, where the value of Foreign merchandise imported has fallen off by over *Hk.Tls* 1,250,000 as compared with the figures of 1892. Nor has the depreciation in the gold value of silver stimulated the Export trade abroad to the extent anticipated. It would thus appear that, to the trade of China, the great appreciation of gold has proved ruinous to the Import business, and the instability of silver utterly disorganising to the Export trade.'

The report shows that the unstable exchange rate of the Chinese currency made pricing less predictable and therefore discouraged trade. Trade was more affected by the volatility of the price of silver than encouraged by the drop in price of silver (competitive depreciation). [368] In addition, international trade took on a more

[366] In his report on trade between China and gold standard countries, Remer found that the relative price of principal exports generally increased over the whole period from 1885 to 1913. Remer, "International Trade between Gold and Silver Countries: China, 1885-1913," 614.

[367] *RTTR* (1893), 1-2. The report was written by the then Statistical Secretary (position only beneath the Inspector General Sir Robert Hart) H. Kopsch. His other publications include 'The appreciation of gold: notes illustrative of the disastrous effect upon foreign commercial interests in the Far East and upon the industries and wage-earners of the west' (Shanghai: Eastern Bimetallic League; 1894), which might suggest that the anxiousness expressed in the report might be due to more than one reason.

[368] Compared to the trade performance of other Asian countries/areas such as Japan and Indochina, China's export behaviour was astonishingly mediocre and benefited very little. Besides the difference in terms of the monetary system mentioned before, the different trade performances should also be attributed to the economic structure of the countries, as well as the export composition. These areas enjoy similar currency devaluation, and they also competed for similar export market towards gold standard countries. But it seems that they benefited to different extents due to their different domestic conditions. Take Japan for instance: the country has been highly commercialized with high level of market integration even before the Meiji Restoration (1868). And the Meiji government emphasized on economic modernisation

complicated nature. The negotiation of export prices, for example, involves other factors such as dominant trading partners, and competing exporters in the international market. Therefore weak exchange alone would not necessarily strengthen exports (see

and sponsored modern industries including those in direct competition with China like the silk industry. In 1860s, China's raw silk export was three times as high as that of Japan. After the Meiji Restoration, the government introduced technologic transplantation from France and Italy, sponsored R&D to improve the quality of mulberry and silk worm species, invested heavily in the construction of public infrastructure (especially in railway and rural credit). During the same period China had no functioning railway at all, the cocoon quality in Yangtze area deteriorated, and the whole silk production remained a handicraft industry and silk trade relied on the 'putting-out system' (household production and products collected by merchants). Since 1880s Japan took over China and became the major exporter of raw silk in Asia. During 1890-1930, the Japanese export was three times that of China and occupied 80% of the total raw silk export. China. China became a net importer of Japanese raw silk. Therefore different from China, Japan since the late 1860s was a constitutional modern monarchy with unified currency, integrated markets. It became a new developmental state with strong fiscal capacity, and with specific interest in modern and export sector. Cheap silver arrived on time for Japan and added to its excellent economic performance throughout 1870s-1890s. China's trade, on the other hand, not only benefited little due to the internal market and currency issue, but also suffered from the fact that a large part of its market share was taken by other neighbouring countries. Debin Ma, "Why Japan, Not China, Was the First to Develop in East Asia: Lessons from Sericulture, 1850-1937," *Economic Development and Cultural Change* 52, no. 2 (2004).

Figure 2-7, Figure 2-8, p.128).

Finally, the other subsequent impact of the cheap silver – the silver inflow – also had a mixed impact on the economy, due to the bimetallic system. Despite an increasing trade deficit, China received stable silver inflow until 1900 (Figure 2-5). This silver inflow was a mixed result of gold outflow,[369] foreign direct investment and money remittance of overseas Chinese.[370] China was regarded as very fortunate to enjoy a constant silver inflow as the country will be suffering from a monetary stringency resulting from the deficit and silver outflow.[371]

However, China's bimetallic system obstructed the liquidity to be enjoyed by markets of all levels. The excessive increase of silver stock made the silver/copper *cash* ratio plummet. With the monetary arbitrage between cheap silver and 'undervalued' copper, copper *cash* became dear and scarce. A scarcity of *cash* in rural areas might, on the other hand, discourage trade (especially long-distance exchanges), and theoretically might even lead to deflationary pressure on the economy.

The scarcity of copper *cash* had a negative impact on daily transactions. The impact on inland rural areas was more serious: the rural population had an inelastic demand for copper *cash*, and the inflow of silver did not mitigate the monetary stringency caused by the scarcity of *cash*. Rural workers earned copper *cash* only and paid their taxes in silver at the official exchange rate. With the rural deflation they earned less copper *cash* but the official exchange rate between silver and copper *cash* remained high. Provincial governors' reports in 1896 show that, while the government official exchange rate remained 2200 *wen* for a tael of silver, the market rate dropped to around 1600-1700

[369] The exchange ratio between gold and silver was 1:5 in ancient China. Gold started to flow out of the country with the development of overseas trade, and the outflow speed was quickened with the wide adoption of gold standard which further widened the exchange ratio between gold and silver.
[370] Overseas remittances and their role in China's balance of payments is an important and interesting topic. For example, Takeshi Hamashita refers to Chen (1923) on Chinese emigration and they sent money back to their hometown. Takeshi Hamashita, "Financial Structure of the East Asian Economic System with Special Reference to Hong Kong and Singapore " in *The Evolving Structure of the East Asian Economic System since 1700*, ed. A. J. H. Latham and Heita Kawakatsu(London & New York: Routledge, 2011), 100-04.
[371] Dernberger, "The Role of the Foreigner."

wen per tael. Even in the most developed agricultural areas such as Hubei, Jiangsu and Anhui provinces, farmers were unable to pay their taxes.[372]

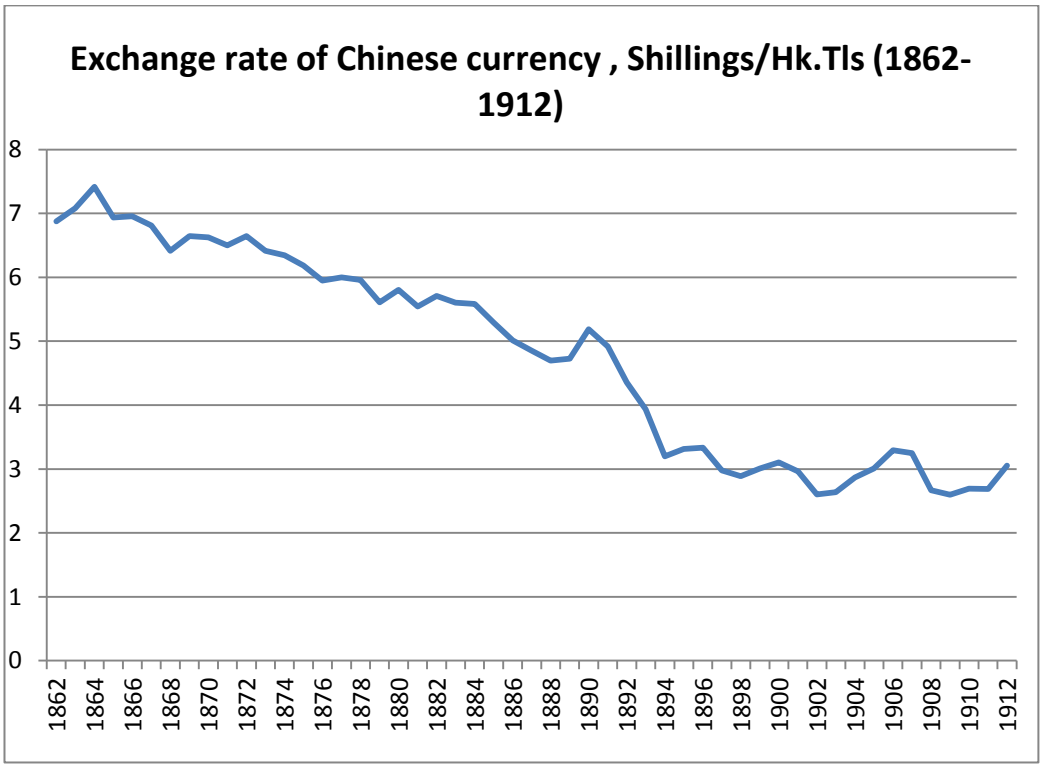
The problem of copper *cash* shortage also aggravated problem in trade and export. In Chongqing in 1897 it was still the case that:[373]

> 'Owing to the dearness of *cash*, which are particularly scarce in this province, the prices of articles of export have been somewhat higher than last year.'

In short, with the market structure split by the use of different currencies, the increased liquidity was not able to penetrate the economy in a fast and effective fashion. The domestic distribution of silver inflow was imbalanced between coastal and inland, and between urban centres and rural area. In urban areas and trading cities, where people are more likely to deal with transactions with silver, the increased liquidity from silver inflow might benefit the economic activities (for instance, modern industry, transport and public utilities, banking and finance, etc.) as well as breed speculation. However in late 19th and early 20th centuries, the vast majority of population resided in rural area and most of the economic activities still took place in the countryside. While silver kept flowing into the country, it seems that this liquidity increase benefited little the place where money was most needed. And with the monetary impact of the cheap silver, the scarcity of copper *cash* grew even more serious, creating a money shortage in rural area. The solution was to increase the supply of copper coinage.

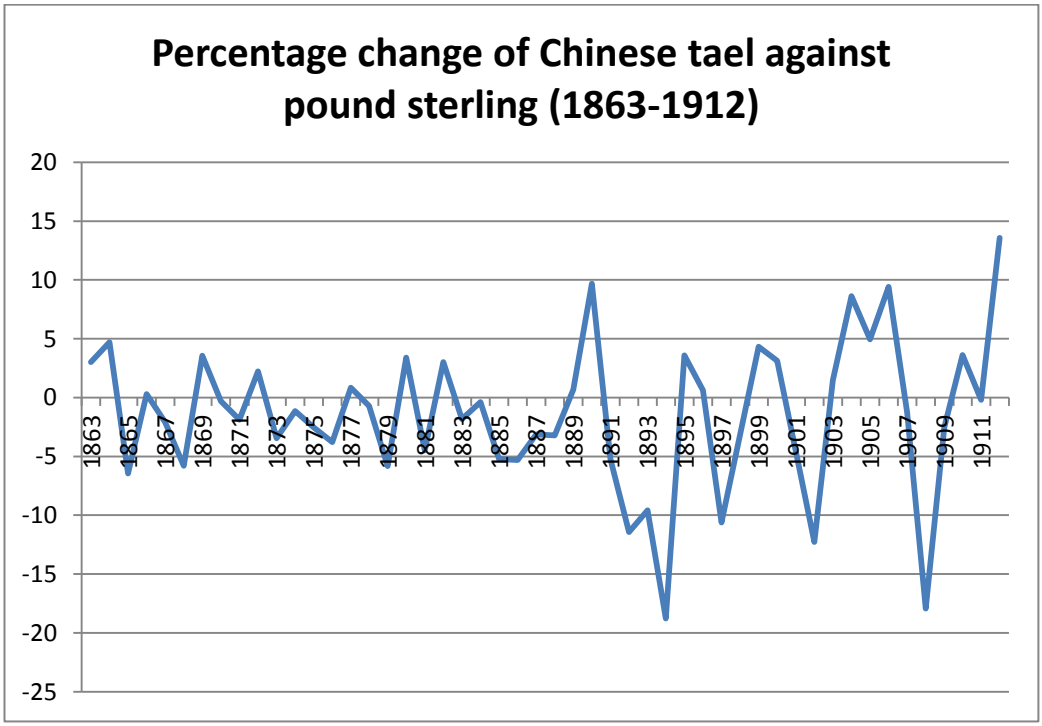
[372] Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 584-7.
[373] *RTTR* (1897), 71.

Figure 2-7 Exchange rate of Chinese currency, Shillings per Customs teal (Haikwan tael, or *Hk.Tls*), 1862-1912



Source: Hsiao, Liang-lin (1974).

Figure 2-8 Percentage change of the Chinese tael exchange rate, 1863-1912



Source: Hsiao, Liang-lin (1974).

2.2.3.3 Linking back to the bimetallic system and the internal monetary situation

Starting in the 1850s critical changes in the Chinese economy (developments in trade, both home and abroad, transformed the closed economy into something more open, and also encouraged the integration of the domestic market) and the world market (changes in commodity prices) destabilised the silver/copper *cash* monetary system. The sudden drop in the price of silver led to permanent changes in relative prices, and hence changes in the quantity of the two metallic coins: the size of silver stock increased while the number of copper *cash*, instead of remaining constant, even shrank.

As discussed above, regarding China's bimetallic system (section 2.2), silver and copper *cash* were far from perfect substitutes for each other; an increase of silver would not automatically offset a reduction in the quantity of copper *cash*. Besides, the impact of the relative change of one metal (in price or quantity) is further complicated by the existence of a 'multiplicity of markets', in which silver was used in the 'upper level market' and copper *cash* was used in the 'lower level markets'. In her recent conference paper investigating the impact of silver outflow in the Daoguang period (1821-50), Kishimoto cites strong evidence to show that the prices of rural products (in terms of copper *cash*) 'show neither [an] obvious decline nor obvious rise throughout the Daoguang period'.[374] The overwhelming evidence from the Customs reports (section 2.3.2) shows that in the latter half of the 19th century this situation remained: prices in the '*cash*-using' rural market remained more or less the same. The impact of cheap silver (and in this case silver inflow as well) on the pricing and economic activities of the rural areas was therefore not direct. The indirect impact of cheap silver worked through other channels: the exchange ratio between the monies which would change the quantity of copper *cash* in circulation.

Cheap silver in fact induced other monetary problems: by altering the silver/copper *cash* exchange ratio, it discouraged the state mint from continuing the copper coinage (it cost more silver to import copper and to manufacture coins from it); and meanwhile the

[374] Kishimoto, "Foreign Silver and China's Domestic Economy During the First Half of the 19th Century," 30.

government attempt to maintain the original official silver/copper exchange ratio made copper *cash* an 'undervalued money' (of which the intrinsic metallic value of the coin exceeds its official face value), thus driving them out of the market and contributing to the acute scarcity of copper *cash*. Since copper *cash* functioned as a currency of high frequency in daily transactions and the only currency in rural areas, the economy was hampered by the diminution in the number of copper *cash*, rather than encouraged by the silver inflow. Eventually rural prices might deflate, but the speed of adjustment in the rural markets would lag considerably behind the adjustment of the money market.

In terms of the impact of monetary instability on the real economy, because most Chinese exports were rural products priced in terms of copper *cash* before being exchanged for silver as exports, the decline in the price of silver in terms of gold did not bring down China's export price and therefore in most cases did not encourage rural exports from China. Moreover, the unstable exchange itself cast a shadow on price forecasts and therefore hindered trade activities. From contemporary records we can establish that in the 1890s the monetary situation became increasingly unstable, with a precipitous fall in the price of silver: copper *cash* grew increasingly expensive and scarce.

2.3 Local Minting initiative and New Coinages as Remedies

The immediate reaction in many provinces was to ban the export of copper *cash* to other provinces. It was the most straightforward way, incurred no cost and involved less bargaining with the central government. However, the restriction on the free flow of copper *cash* blocked trade and interregional business, and created more regional disequilibrium.[375] Acknowledging the failure of banning internal exports, provincial governors all started reviving their own local mints. This 'new wave of minting' started with a revival of debased copper *cash* coinage (too expensive and quickly abandoned), followed by the minting silver subsidiary dollars, and the introduction of new types of copper coin.

2.3.1 Short revival of traditional mints

The call from the market for the coinage of subsidiary money coincided with the central government's wish to restore the traditional monetary system – by casting more (and debased) copper *cash* coins. Since the 1870s, the central government had been trying to restore its copper *cash* coinage, which had been interrupted by internal disorder. Having almost depleted its copper mine in Yunnan, the government decided in 1887 to import copper (mainly from Japan) for minting purposes. This decision greatly increased minting costs, in particular when the purchasing power of silver kept sliding. Therefore the official weight of a piece of copper *cash* was reduced in 1888 from the original 0.12 *liang* to 0.1 *liang* and further reduced to 0.08 *liang* in 1899.[376]

Provincial mints, which had long been suspended, were instructed to resume production. In the late 1890s additional mints, equipped with steam power, were also established in various provinces to coin both copper *cash* and silver dollars.[377] However, this practice did not last long, due to high cost. The central government pushed this policy without

[375] Ho, "From Cheap Silver and Copper Famine to Depreciation of the Copper Coinage," 412-3.
[376] Ibid., 394-7.
[377] For example, Tientsin Arsenal and the Imperial Naval Yard in the north and Kiangnan Arsenal in the south were all established in 1896. *RTTR* (1896), 24 and 239.

any fiscal commitment: it was each provincial governor's responsibility to finance this evidently loss-making business. Although the newly minted copper *cash* were greatly debased compared to those minted in previous decades, the cost still vastly exceeded the proceeds.[378] The minting of copper *cash* was soon suspended.[379]

2.3.2 New mints and new coinages at the local level

2.3.2.1 Decentralisation, modernisation and the new coinage

The late 19th century was an era of decentralisation: after a series of domestic insurgences and military defeats,[380] the central government relied almost solely on regional military forces; and in return regional governors also gained more fiscal discretion. It was also a period when enlightened Chinese statesmen pushed forward modernisation projects within their jurisdiction. Recognising its military defeats (especially the defeat during the First Sino-Japanese War in 1894-95), the central government gave consent to these innovative experiments as long as the projects did not rely on central government financing.

The consequence of the First Sino-Japanese War profoundly shocked the Manchu rulers both psychologically and economically. Being defeated by western powers might be still understandable, but being defeated by its closest neighbour (which used to be culturally and economically much more backward than China) is intolerable.[381] Economically, the Treaty of Shimonoseki (1896) pushed China for more economic openness, and also demanded an indemnity of 230 million silver tael to be paid in full within three years.[382] Another consequence of the Sino-Japanese War was that Western powers learned from it to negotiate better 'deals' with China: after the Boxer Rebellion (1899-1901), China was demanded to pay a war reparation of 450 million tael (the

[378] A piece of standard copper *cash* in the high Qing period weight 0.12-0.14 *liang*; and weight of the *cash* minted by provincial mints during the 1890s ranged from 0.05 to 0.08 *liang*. Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 579-83.
[379] Ibid., 567-78.
[380] Notable domestic insurgences including the Taiping Rebellion (1850–64) centred in South China, the Nian rebellion (1851-68) in the north of Yangtze Delta, the Mohammedan rebellion (1853-74) in southwest China, and the Boxer Rebellion (1899-1901) originated in the countryside to the north of Beijing. Major foreign defeats include the Opium Wars (1839-41 and 1856-60), the Sino-French War (1884-85), and the First Sino-Japanese War (1894-95).
[381] Marius Jansen, "Japan and the Chinese Revolution of 1911," in *The Cambridge History of China*, ed. John K.; Fairbank and Kwang-Ching Liu(Cambridge: Cambridge University Press, 1980), 339-74.
[382] This amount is more than three years of total government income. The war reparation demanded by Great Britain after the Opium War was only 19.44 million tael (equivalent to 27 million silver dollar).

Boxer Indemnity). The government paid the indemnity mainly by borrowing from foreign banks, and the foreign debts were consolidated into government securities (backed by maritime customs revenue) with 4% annual rate of return, payable within 39 years.[383]

The heavy debt burden was transformed into much higher taxation quota imposed on each province.[384] As provincial leaders were directly appointed by the central government and would still like to demonstrate their loyalty to the central government by their performance (in order to get imperial support as well as promotion). At the same time, local governments enjoyed much more freedom in terms of its involvement in economic activities and policy innovation. These two forces – centralised personnel control and decentralisation of economic and fiscal power – boosted economic activities and institutional innovations at local level.[385] The provision of money became one of the major targets for regional leaders as firstly the market needed liquidity for better development, and secondly, regional minting provided lucrative profits for the leaders to increase local revenue (for tax quota payment as well as for implanting other effective government policies). It is therefore true that the regional minting initiative was not only for the well-being of local life, but also profit-driven.[386] But as the chapter develops it will show that these activities did also benefit local economy and (unexpectedly) pushed forward the modernisation process of the monetary system.

Provincial mints used to be part of the state mint system which produced copper *cash* according to a centralised minting quota and received a certain amount of copper allocated by the state administration. It was realised that coinage should be one of the areas for modernisation (under the assumption that modernised currency and sufficient liquidity could promote the economy), and at the same time that the seigniorage

[383] Shigeki Iwai, *A Study of the Fiscal System in Late Imperial China*(Beijing: Social Sciences Academic Press (Chinese translation of the 2004 edition published by Kyoto University Press), 2004), 373-75.
[384] Regional governments were mainly responsible of collecting taxes (mainly land tax and transit tax or likin) and sending all of them to the central government. After the Xianfeng crisis, the totally centralised fiscal system collapsed and local governments stopped sending the total amount to the central. Instead they only sent 'assigned quota' to the central government and this quota was negotiable.
[385] The system can be understood by the framework of 'Regionally Decentralised Authoritarian Regime' (RDA) proposed by Chenggang Xu, which remains to be the fundamental institutional setting behind the economic reforms and development of today's China. Chenggang Xu, "The Fundamental Institutions of China's Reforms and Development," *Journal of Economic Literature* 49, no. 4 (2011).
[386] This explains why local leaders tried silver minting before copper coinage, as silver coinage was obviously more profitable if the market accepted the use of silver coins at their face value.

revenues from minting would provide more resources to fund other projects. Therefore provincial governors all strived to gain greater liberty to operate their own mints. They had already successfully rejected the central government's demand to fully revive the traditional copper *cash* coinage, due to high financial loss; they now carried out other experiments to renovate their mints with a view to continuing to keep them viable and at the same time making the minting profitable.

The new wave of provincial coinage included the casting of silver subsidiary coins (from 1890 to 1901) and of a new type of copper coin (from 1900 until the Republic of China) with steam power. Both initiatives were introduced in the Canton mint in Guangdong Province and then spread to other parts of China. This was the first time that the Chinese state had minted silver (officially recognising silver as part of the currency system) and suggested that this money should not circulate in bullion. The new copper coinage was also the first to replace the standard copper *cash* (which had been circulating for many dynasties) with a brand new type of coin. Some monetary historians consider them to be a result of pure economic motivation which was attributed to fear of a future monetary chaos. Still, these two coinages indicate a great departure from the traditional monetary system and should be considered a milestone in Chinese monetary history. Moreover, an examination of the court debate (which lasted for decades before the establishment of the new mints) would suggest that these coinage innovations were indeed responses to market demand. Although contemporary reports show that, despite the initial good intentions, these two coinages had very different impacts on the market, not all of which were positive. The rest of section 3.2 seeks to give a succinct and objective outline of the adoption and consequences of the two coinages, based on a study of the imperial customs reports as well as other sources.[387]

2.3.2.2 Silver subsidiary coinage

In 1889, the first silver mint equipped with brand new steam powered machinery was set up in Guangdong Province under the slogan 'get back the right to seigniorage (from foreign silver dollar providers)'. In 1890 it started to mint Chinese silver dollars[388] as

[387] Compared to other sources, the Imperial Customs Reports provide the most impartial, systematic and continuous economic information at both national and regional levels.

[388] Also called dragon dollars (*long yang*), as they bear a dragon design on the face, together with the name of the provincial mint.

well as silver subsidiary coins of 5, 10, 20 and 50 cents.[389] It was the first time that the state authority had manufactured its own silver coins. Other provinces followed suit after 1896 – the year of China's defeat in the first Sino-Japanese war – and by 1900 there was at least one silver mint in every province (Appendix A 2-1).

The silver coinage was a lucrative business. Compared to silver ingots which required weighing (and sometimes even the testing of finesse), standardised coined silver dollars were a more convenient means of exchange and attracted a premium in the market. Before 1890, the state minted no silver at all and the market was supplied with foreign silver dollars. Now, minting their own silver, the provincial government made a profit by manufacturing dollars similar to foreign silver dollars.[390] The minting of small denominations was more profitable since they contain proportionately less silver.[391] The concentration among provincial mints on minting small coins of 10 and 20 cents seems to suggest the profit-driven motivation of the local governments.[392]

The coinage was welcomed by foreign observers, who considered it an improvement on the existing monetary system. A customs commissioner in Jiujiang (Kiukiang) commented that the 'dearness of *cash*' could be addressed by more coinage, and reckoned that this would be 'a golden opportunity for the introduction, in judicious quantities and under proper guarantees from the Government, of the much-required subsidiary silver coinage and the gradual retirement from circulation of the cumbrous *cash*.'[393] The secretary general of the customs service commented that the 'extended minting of subsidiary silver coins' was the obvious remedy to the monetary problem.[394]

[389] The fineness of most silver cents was around 0.800 while the finesse of a silver dollar is usually 0.900. Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 825-6.
[390] Most common silver dollars are Spanish and Mexican dollars, with a weight of 0.72 *liang* and a fineness of around 0.900 (0.898 for Spanish dollar and 0. 902-0.903 for Mexican dollar). Peng, *A Monetary History of China*, 555-6. Silver dollars minted by Guangdong, Hubei and Jiangnan had a similar weight and fineness to those of foreign dollars, while silver dollars minted from other provincial mints contained less silver (from 0.844 to 0.890) and weighed less. Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 825-6.
[391] The fineness of most silver cents was around 0.800. *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 825-6.
[392] Take Guangdong mint, for example: during its first nine years of operation, 95% of the total value of output was 10- and 20-cent coins. Wei, *The Currency Problem in China*, 48.
[393] *RTTR* (1895), 126-7.
[394] *RTTR* (1898), 3.

The silver subsidiary coinage did address the problem of the widespread shortage of small money to a certain degree, and was welcomed in some cities but not all.[395] In most rural areas it was not a recognised means of exchange. Due to a serious over-issue and uneven quality of small silver coins from different mints, small silver coins depreciated quickly and circulated at a discount. The silver coinage of most mints was suspended in 1901 by imperial mandate.

An imperial customs report shows that in certain urban areas, silver subsidiary coins were welcomed. According to the Customs Report, in some northern cities, at least, with a 'scarcity of *cash* and increase of population, the dollar and its subsidiary coins have become popular and are freely used all over Manchuria'. The subsidiary silver coins were 'freely used at full value in small transactions', although in large amounts the coin was 'only accepted at a discount of from 3 to 6 per cent'.[396] However in Suzhou, an eastern coastal commercial centre 100 kilometres from Shanghai, the market perception of the small silver coins was quite different. The customs commissioner commented that the silver subsidiary coinage was 'a drug on the market here'. At the beginning of the year it was rated with dollars at 5 per cent discount; at the end of the year the discount had reached 8 per cent. Small coins do not fill the place of copper *cash* for general use.'[397] In Chungking, an important inland treaty port along the Yangzi River, it was also reported that:[398]

> 'Hupeh Dollars and subsidiary coinage were again imported to the value of $50,000, making, with last year's amount, $100,000 in all that has entered this province, but have not found much favour with the people. The only way to put these coins into circulation is by enforcing all Government offices to pay their staff and receive taxes, Likin, etc., in them. The use of subsidiary silver coins would tend to relieve the present dearth of *cash*.'

It seems that subsidiary silver coins did mitigate the monetary stringency caused by the lack of small currency. However, even in places where small silver coins circulated, the

[395] *RTTR* (1899), 351.
[396] Reports from Newchwang, *RTTR* (1899), 8-9; *RTTR* (1901), 8.
[397] *RTTR* (1899), 351.
[398] *RTTR* (1897), 71.

market was over-supplied with small silver coins of heterogeneous quality bearing different mint names. People treated the coins according to their intrinsic value instead of using them as fractions of silver dollars.[399] In fact not only the small silver coins, but also the Chinese silver dollars in general, even those of best quality (from Guangdong and Hubei), were treated most of the time as silver ingots:[400]

> '[The mint is] produced more dollars and less subsidiary coin [in 1896 compared to previous years]. The dollars are chopped, defaced, and deformed, and simply accepted at bullion value.'

Because of the chaos added by the unlimited minting of silver coins of uneven quality, the emperor decreed in 1901 that all provincial mints, except those of Guangdong and Hubei, should immediately stop work.[401]

2.3.2.3 New copper coinage

The new copper coinage started in 1900 and was again initiated in Guangdong. The new copper coinage was very different from the traditional version and was regarded as a great technological and institutional advance. The traditional copper *cash* were cast in moulds; they were round coins with a square hole in the middle and bore no denomination. The new copper coins had no holes; they were mechanically struck and had different denominations, namely 2, 5, 10, and 20 *wen*. They contained around 95% pure copper and 5% coarse metals (zinc and lead). The weights of 2-*wen*, 5-*wen*, 10-*wen* and 20-*wen* copper coins were 0.04 liang, 0.1 liang, 0.2 liang, and 0.4 liang respectively.[402] Most of the coins were was 10-*wen* pieces.[403] With much higher denominations than copper *cash* had, the new copper coinage was also a profitable business.[404]

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[399] Ho, "From Cheap Silver and Copper Famine to Depreciation of the Copper Coinage," 406-7.
[400] *RTTR* (1896), 435-38.
[401] Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 804-5.
[402] Jiaxiang Zhang, *History of Chinese Currency System (Zhonghua Bi Zhi Shi)*, Reprint of the 1925 ed.(Beijing: Intellectual Property Publishing House Co., Ltd., 2013), 69.
[403] Eduard Kann, *The Currencies of China: An Investigation of Silver & Gold Transactions Affecting China with a Section on Copper* (London: P. S. King & Son, Ltd., 1928), 420-35.
[404] It was estimated that the gross profit on copper coinage could reach 30%, Ho, "From Cheap Silver and Copper Famine to Depreciation of the Copper Coinage," 416.

The central government was at first sceptical about this new copper coinage for reasons of its own. First, these coins apparently were of had very different design from the traditional copper *cash* that had been in circulation for dynasties. The market might not recognize this new type of coin at all. Second, in terms of copper content, a 10-*wen* copper coin contained as much copper as 2 copper *cash* did.[405] The new copper coin was an official debasement.[406] Similar copper *cash* debasements could be found in Beijing only decades ago and they were a monetary disaster. The previous time in the 1850s, the coinage of 'big *cash*' with face values ranging from 10 to 1000 *wen* was introduced in the Beijing area; they soon depreciated and prompted rampant counterfeiting activities. With this disastrous memory in mind compounded with the recent chaos made by small silver coins, the central government was far from eager to try this method again.

The central government had been putting off the minting proposal, which could have started in the early 1890s. The first new copper coinage was in fact introduced in secret when Beijing was under siege and the central government was in disorder.[407] But to everyone's dismay, the coinage was a huge success. The new coinage had been adopted in all the other provinces within ten years. It is reported that in many cities people queued outside the office throughout the first day of issue and the office had to impose a quota on the number of coins that could be exchanged per person per day.[408]

In theory and in history these debased new coins would either quickly depreciate or drive copper *cash* (the good money) out of the market (to be melted, hoarded or exported).[409] The new copper coin was a *de facto* debasement compared to the traditional copper *cash* in terms of copper content per unit of account (i.e. per *wen*).

[405] The big cash introduced in 1853 contained 70% pure copper and the official weight was originally 0.6 *liang*, and was reduced to 0.44 *liang* in 1855 (although with rampant counterfeiting big cash circulated in the market probably weighed around 0.2 *liang* eventually). In this regard, a 10-wen copper coin contained less copper content than a piece of 10-wen big cash.
[406] The debasement was achieved not by reducing the proportionate metal content, but by increasing the legal tender value of a coin (compared to its intrinsic value), commonly known as 'crying up the money' or enhancement. Glassman and Redish, "Currency Depreciation in Early Modern England and France," 78.
[407] The 'Siege of the International Legations' in the summer of 1900, in which the Empress Dowager and Emperor fled the capital to Xi'an.
[408] Ho, "From Cheap Silver and Copper Famine to Depreciation of the Copper Coinage," 417.
[409] Rolnick and Weber, "Gresham's Law or Gresham's Fallacy?," 194-6.

Despite all this, however, historical evidence shows that these new copper coins neither depreciated nor drove out the traditional copper *cash*.

The chief statistics secretary of the Imperial Customs Service compared this new copper coinage with previous debased issues and reached a positive conclusion:[410]

> 'the Mints have been devoting their energies to the production of copper coins […]: the cent, or 10-*cash* piece, a token coin new to China except for the 10-*cash* pieces dating from the reign of *Hsien Feng* (1851-61) and now current only at Peking. These coins, accepted by the capital, were rejected by the rest of the Empire; but the success of the new cents has been pronounced. […] The people have taken them readily as being uniformly correlated to the *cash* and not to the dollar; and so great has been the demand that the authorities of the provinces minting them have had to impose restrictions on their transport to other provinces.'

First, because their standardised quality greatly facilitated exchange and the longstanding shortage of small changes, these new coins were readily accepted by the market and even circulated above their face value. The customs commissioner in Shanghai commented in 1901 that the '10-*cash* Copper Coins, struck at the provincial mint of Soochow, were introduced and seem to have found favour, despite the fact that intrinsically they are scarcely worth eight good *cash*'.[411] The commissioner in Hankow – a major trade city along the Yangtze River – also reported in 1902 that the '5-*cash* and 10-*cash* copper pieces […] have found considerable favour with the people' and 'the coin is freely used'.[412]

Interestingly, instead of being melted or hoarded, copper *cash* also turned out to be the subsidiaries of copper coins of larger denominations. The customs in Yichang (Ichang) observed in 1904 that:

> 'Copper *cash* rates fluctuated considerably during the year; but the 10-*cash* brass and copper coins, issued in such vast quantities by the provincial Mints during the past three years, seem to be relieving the stringency at last. These coins are now to be

[410] *RTTR* (1904), i-ii.
[411] *RTTR* (1901), 293.
[412] *RTTR* (1902), 219.

> found in the remotest country districts and are accepted readily everywhere at their face value.'

One of the reasons for the coexistence of the two currencies is that after several decades of 'cheap silver and scarce *cash'*, good standard copper *cash* had already disappeared from the market. The copper *cash* that remained in circulation were no longer the once 'standard copper *cash*'; they were either debased or spurious *cash* containing copper in various proportions. Since *cash* was legal tender of very small denominations, verification would be too expensive to conduct for each transaction. Therefore in spite of a possible gap in intrinsic value between these *cash* and the new copper coins, the market preferred to take them at face value.

Hence, instead of driving out other money and inducing an immediate inflation, the debased copper coinage assisted by modern minting technology successfully resolved the problem of small change: it provided more monies of small denomination at affordable cost, and mitigated the monetary shortage issue, in the countryside in particular.

The co-existence of copper *cash* and copper coin forms a landmark in Chinese monetary history: this is perhaps the first time in Chinese monetary history that monies were largely taken at their legal tender value instead of their intrinsic metallic content. This value of exchange came from the uniformity of standard guaranteed by the new minting technology and the limitation of coinage size endorsed by the state credibility.

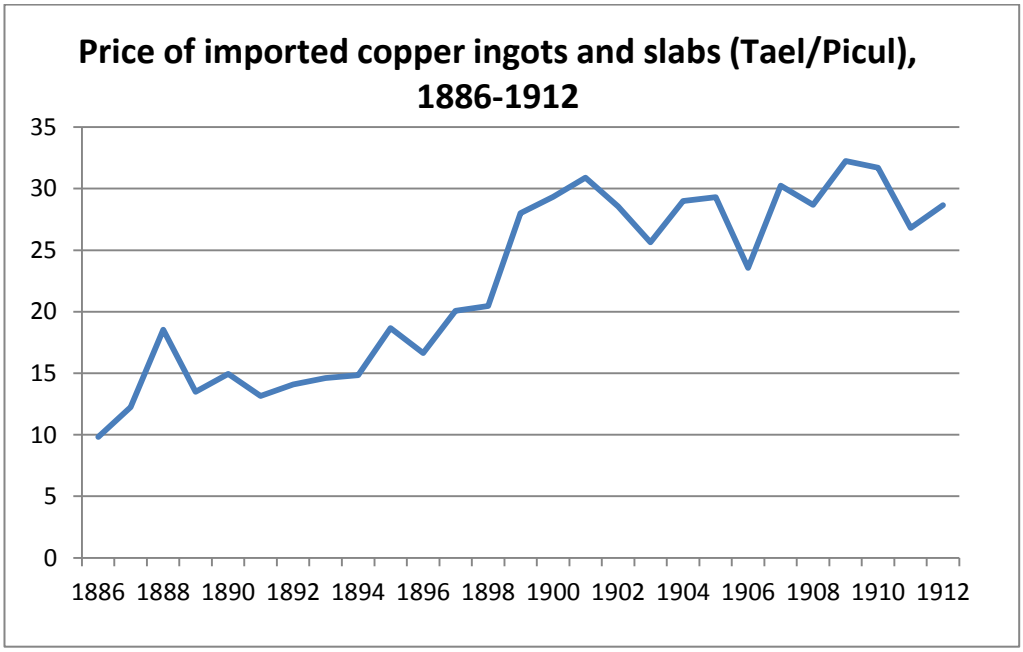
The good name of the new copper coins, however, did not last long. The new minting technology could prevent counterfeiting (which would lead to the over-provision of money and therefore inflation) from the outside, but it could not prevent the government itself from over-issuing for seigniorage profit. Uncoordinated coinage competition between provincial governments further aggravated the situation of oversupply. In 1905, reports started to claim that copper coins had saturated the market, and that the market had started to discount them.[413] When copper coins were introduced, one silver dollar could only be exchanged into 80 copper coins, despite the mint suggestion that the

[413] *RTTR* (1905), xvi.

exchange ratio should be set at 1:100 (dollar/coin). From 1905 on, a dollar can be exchanged with more than 100 coins.[414] The central government first set a cap on the imported copper ingots each province might purchase;[415] and in 1910, legislation was passed to centralise the copper coinage and officially make copper coins a subsidiary currency.[416] The long-term effect of the legislation is unfortunately unknown, for the imperial dynasty was overthrown in the next year.

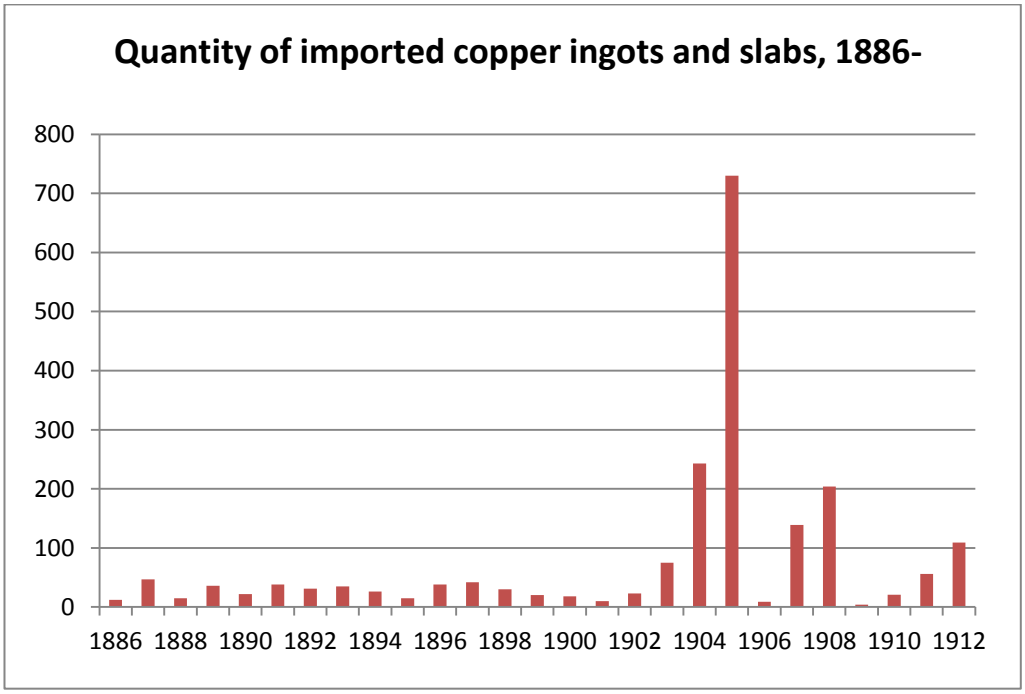
[414] Ho, "From Cheap Silver and Copper Famine to Depreciation of the Copper Coinage," 427.
[415] ibid., 433-5.
[416] Written in the new *Currency Regulation (Bi zhi ze li)* published by the government in 1910, cited from Zhang, *History of Chinese Currency System (Zhonghua Bi Zhi Shi)*, 321-3.

Figure 2-9 Import price of copper ingots and slabs (Tael/Picul), 1886-1912



Source: Hsiao, Liang-lin (1974).

Figure 2-10 Quantity of imported copper ingots and slabs (in 1000 piculs), 1886-1912



Source: Hsiao, Liang-lin (1974).

2.3.3 Evaluation of the new coinages

2.3.3.1 Contemporary criticism of the coinages

Most previous literature criticised the local minting activities and historians seem to take this view as a foregone conclusion without much questioning: these regional mint innovations were allegedly profit-driven and they only aggravated the already chaotic monetary system of the country. Provinces adopted the new coinage at different times, making regional markets more fragmented. The qualities of the new coins varied from province to province, with the prospect of competitive depreciation. The drive for profit tempted governments to over-issue the coins and provoked inflation.

However, the previous literature only emphasized part of the obvious truth and overlooked the positive effect during this wave of monetary modernisation. Most of the criticisms focus either on the motivation of the provincial government (that their intentions were not pure) or the undesirable consequences (inflation and monetary chaos).[417]

Regarding the first criticism, it should be pointed out that no political action (including the making of monetary policies) can ever be purely benevolent. In fact, it is policies of the opposite type of (policies driven purely by ideology or passion, instead of being economically sound) that we should fear. In the 19th century traditional Chinese scholars still believed that money was a public good and should be provided by a benevolent state, without realising that such an unaffordable belief had already in the previous dynasty made it impossible for the state to provide sufficient currency. In addition, court debates on monetary innovation and the adoption of new minting technology had lasted for decades before they were actually implemented by provincial governors.[418] The debates centred on the backward currency system, the huge market need and the

[417] Many articles were written during the 1910s and 1920s, of which Qichao Liang's was the most influential. In recent years, Hon-wai Ho has worked comprehensively on this issue, and published several excellent papers. The focus of Ho's research centres on the historical development of this institution, in particular the negative impact of the new coinage. Liang, "Concise History of the Excessive Provincial Copper Coinage (Ge Sheng Lan Zhu Tong Yuan Xiao Shi)."; Ho, "From Cheap Silver and Copper Famine to Depreciation of the Copper Coinage."; Chen Liang, "Research on Copper Coin (1900-1935)" (Nankai University, 2010).

[418] A series of government discussions on the insufficient supply of copper cash and the need for a monetary reform – including the coinage of copper *cash* and silver coins using steam power, the introduction of convertible paper notes and banks, adoption of a gold standard with silver subsidiary coins, etc. - started as early as 1875. Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 511-82, 626-97, 863-74.

insufficient supply due to high minting costs, suggesting that the new coinage indeed represented local attempts to meet local market needs instead of being purely profit-driven. The inconsistent provincial initiatives are of course far from ideal as reforms. But given a central government which was neither willing nor able to conduct any reform, experiments at the provincial level and wide adoption could provide a solution, albeit not the best.

With regard to the latter criticism, contemporaries making their judgement were more likely to be influenced by the disastrous end, forgetting the other side of the story. Take criticisms on the new copper coinage, for instance: Copper coinage became a serious monetary issue more than ten years after its introduction, not in the Qing dynasty but during the Chinese Republic, and drastic institutional changes had taken place in the meantime. The most powerful attack on the copper coinage came from Qichao Liang (1873-1929), an influential political and cultural figure during the late Qing and early Republican period. All later research on this topic was to a certain degree influenced by his work. However, Liang's original article, less than 10 pages long, was written as a political column for a newspaper, condemning the fragmentation of the political framework and the predatory fiscal behaviour of regional warlords during Republican China. The serious inflation that he addressed occurred in the Republican era rather than rather than in Qing dynasty. In addition, his criticism was later proved to be exaggerated, as the whole work was based on his own estimation of mint output instead of the actual figures.[419]

2.3.3.2 New coinages as necessary experiments

The aim of an ideal monetary reform is to provide a stable currency which meets the requirements of a wide range of transactions, at an affordable cost. It is true that neither coinage (of small silver coins or copper coins) at provincial level was a perfect answer; nor were these measures the end of the monetary evolution. But they were both necessary and natural steps towards a more advanced system, and therefore deserve fair re-examination. They were as a matter of fact two attempts to transform the existing bimetallic system into a monometallic one, and thus reduce the problem raised by a

[419] Ho, "From Cheap Silver and Copper Famine to Depreciation of the Copper Coinage," 419.

change in the supply of either metal within the system (the innate instability of the Chinese system, as discussed in section 2.2.1).

The silver coinage represents the state's first attempt to include the silver sector under the control of its monetary system, acknowledging the value of seigniorage. The original goal of silver coinage was to provide the market with its own coined dollars and other subsidiary coins linked to the dollar standard. If successfully implemented, it was to lead to a monometallic monetary system with the silver dollar as the unit of account. Because of the higher minting cost of small coins, small silver coins tend to contain less silver than silver dollars do. Otherwise, small silver coins would be too costly to produce and there would be less incentive to provide silver coins of small denominations. However, in an economy which was accustomed to using silver bullion (and in which silver bullion as well as foreign silver dollars of varying fineness were still allowed to circulate side by side with domestic silver coins), the market would distinguish silver coins according to their metallic content rather than their face value, and coins with s lower silver content would soon be discounted. Without the technological endorsement and certain institutional arrangements (control over the amount issued and convertibility with normally the more precious metal), silver should not be the first choice for small money under the Chinese contest (where silver was the more precious metal, where silver as ingot was circulating all the time).

The dilemma of small silver coins is a common problem experienced in a monometallic currency system in which one metal is used as currency and is cast into coins of different denomination and varying fineness. One way to circumvent this dilemma is to adopt multiple media of exchange. Another way is to issue fiduciary monies convertible to silver dollars, such as convertible bank notes or token coins. The convertibility of fiduciary monies must be guaranteed; and they must also be manufactured in a way that is hard to counterfeit.[420]

The production of new copper coins happened to be the answer to the dilemma raised by the silver subsidiary coinage. The debased new copper coins manufactured by steam power were *de facto* token money. And because copper coins were of much lower value

[420] Angela Redish, *Bimetallism: An Economic and Historical Analaysis*(Cambridge: Cambridge University Press, 2000), 15-26.

and were used in frequent daily exchanges, the market was happy to accept them at their face value, and did not bother to spend them according to their intrinsic value. Although the market might have had an incentive to counterfeit them, this could be prevented by steam power technology (the coining press), which made private counterfeiting expensive and therefore uninviting. The coinage was based on the understanding that tokens (made by high technology and with their number controlled by the issuer) can circulate at their face value instead of their metallic content – a great breakthrough in traditional Chinese monetary theory shaped by commodity monies. The success of the new copper coinage (relative to the silver one) echoes the idea of the 'standard formula' that subsidiary money has to be token money. The value of token money was guaranteed by the technology (no counterfeiting) and the government's credibility (no over-issuing), and therefore this option owed everything to the introduction of steam power.[421] If well managed, this would also lead to a monometallic monetary system in which silver was the main unit and copper coins the subsidiaries.

2.3.3.3 Why new copper coinage, not silver coinage, provided a solution?

While silver subsidiary money did not work well due to its natural attributes (high value metals not being suitable for small coinage), copper coinage failed because of the institutional defect. If the government mint could have controlled its appetite (the mint output) the new copper coinage might have functioned well in the market. Both silver and copper coinage eventually failed and caused monetary chaos. Still, historical records seem to suggest that the two coinages in the market made a different impact and that copper coinage was to some degree a success at least during the first few years after its introduction. It successfully responded to the urgent problem of the market by providing more small change for daily transactions and by alleviating the monetary stringency in rural areas.

Theoretically there are several reasons for the failure of silver subsidiary coins. First, small silver coins are still too big for small daily transactions. Even the smallest silver coin is still too large in terms of face value (a 10-cent silver coin in 1900 was worth

[421] "The Persistence of Bimetallism in Nineteenth-Century France," 717-20.

around 88 standard copper *cash*[422]). Therefore, small silver coins could only partially replace copper *cash* in urban areas and in terms of tax payment. These subsidiary coins could not be taken as the unit of account, and could therefore hardly replace copper *cash* in much smaller transactions in rural areas. Because of this relatively higher denomination, moreover, small silver coins could hardly be used as real small change, or an anchor of price quoting.

Second, small silver coins had a very awkward position within the Chinese bimetallic system: they were linked to silver dollars at a time when the economy still recognised silver as bullion. Although silver dollars were widely accepted (sometimes even with a premium) in transactions, tael instead of dollars were the unit of account in both state taxation and private book keeping. Moreover, the state did not prohibit the use of silver bullion or foreign silver dollars and thus to promote the use of domestic silver dollars and their subsidiaries. Given that there were silver dollars of very different qualities in the market, the market treated different dollars according to their intrinsic value and ghost units (e.g.: *Haikwan* Tael, *Kuping* Tael) were widely adopted to measure the real value of silver coins. Domestic silver coins were soon accepted for their intrinsic value and circulated at a discount. Therefore small silver coins circulated at a price considerably below their face value.

Because of the higher production cost of small change, small silver coins understandably contained proportionately less silver than silver dollars did. They were also more likely to be the subject of wear and tear. Because of their lower metallic content, coins of small denomination often depreciated quickly. In a market where silver was treated as an ingot (exchanged by weight), people would quickly adjust the value of small coins according to their silver content rather than their face value. Instead of being real subsidiary money, small silver coins served only as an alternative means of payment (smaller than silver dollars and bigger than copper *cash*) and increased the liquidity of the silver sector, instead of relieving domestic monetary stringency as a whole. The enlargement of the silver sector even further contributed to the phenomenon of 'cheap silver and scarce copper *cash*'.

[422] The calculation is based on the silver-copper cash exchange ratio of South China in 1900 (Figure 2-6): 1 tael = 1222 *wen*; and also on the conventional exchange rate between a silver dollar and a silver tael: 0.72:1.

Reasons for the relative success of copper coinage are also multiple. First, compared to silver subsidiary coins, debased copper coins are more fitted as a medium for small transactions. Because of copper's lower value, copper coins provide a more convenient basic unit of account; and in addition debased copper coins provide much less incentive to counterfeiters because the profit margin is much smaller. The new minting technology further discouraged counterfeiting.

Second, there was also a reason why 'big *cash*' (another attempt at minting copper coins with different denominations) failed while copper coins did not. Normally debasement would induce counterfeiting, generating inflation which would phase out the effect of the initial increase in liquidity (as the historical 'big *cash'* had once done). Steam power technology provided added value to the copper coins – their uniform standard facilitated trade - besides its intrinsic metallic value. Therefore the market accepted the coins at their face value instead of discounting them or faking them.

Third, the new minting technology also resolved the problem of 'bad money driving out good', a frequent headache in traditional monetary systems which treasure the intrinsic commodity value of money. Because of their high value in terms of exchange and also because of their small denominations, the market did not have the incentive to assay the variation of intrinsic metallic contents of the coins. Copper coins were therefore treated as token money, and were able to co-circulate with the traditional copper *cash*, instead of driving them out.

In addition, the fact that the coinage experiment took place in one province probably also contributed to its ultimate success. Guangdong province was one of the economically most developed regions and enjoyed a long-established status in China's foreign trade. It is also the province closest to Hong Kong and its population had long been observing the convenience of the machine-made 'copper cent' (*tong xian*) widely used there as subsidiary money.[423] This institutional exposure is important for the market acceptance of a new coinage which was drastically different from the traditional one in terms of value, shape and institutional implications. With the success in

[423] Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 651-2.

Guangdong province, the experiment was adopted in other provinces without much obstacle. If it had been introduced nationwide at the very beginning, the new copper coins might well have been rejected in places where people were not familiar with this kind of coinage.

To summarize, the new copper coinage made possible by modern minting technology was able to provide sufficient small change in an affordable way. The market accepted the money at its face value, and did not counterfeit or discount it. The debased coinage did not push up prices in proportion to the level of debasement, and therefore provided real liquidity to the market.[424] In rural markets where copper was the only accepted money, the coinage successfully resolved the money stringency issue, and thus promoted output and trade. In urban areas and big trade centres where copper was used side by side with silver, the increased supply of copper coins altered the silver/copper *cash* ratio back to the original rate ('improved the rate,' to use the wording of the merchants at the time[425]). This adjusted exchange ratio was welcomed by the market and facilitated trade. The fact is that it is only with proportionate expansion in the copper sector (copper monies with *wen* as the denomination) that copied the expansion in the silver sector could one say with certainty that there was a real monetary expansion in China. As a country that frequently experienced monetary stringency, monetary expansion did more good than bad. In addition, with the low cost token coinage, the state would have been able to maintain a certain coinage level according to the changes in the silver sector, so as to maintain a stable silver/copper exchange ratio which encouraged trade and commerce (something the Qing government often strived to do but never could because of the high cost of traditional minting). The introduction of copper coinage minted with modern steam power technology was therefore a positive shock to the monetary system and to the economy.

[424] The only institutional flaw is the credibility of the government. If the government could have maintained an adequate mint output according to the amount of silver dollars and to the market demand, the new copper coinage would have functioned well in this monetary system.
[425] Report from Hankow, *RTTR* (1904), 271-2.

2.4 Empirical Test: why did the new copper coinage, not the silver one, solve the problem of shortage?

This paper argues that the adoption of steam power technology for minting copper coinage would have acted as a positive shock to the economy, while the silver coinage did not. As the timing of adopting the new coinage technology varied from province to province, DID estimations can be applied to test the impact of the institutional shocks on each regional economy before and after the introduction of the new coinage.

2.4.1 Empirical framework - an indirect approach

2.4.1.1 Theoretical speculation

The silver and copper coinages minted with steam power technology were two institutional shocks to the monetary system. The discussion in the previous sections suggests that the silver coinage merely increased unwanted liquidity (induced inflation), while the copper coinage acted as a positive shock to the economy. The mechanism of the positive shock is complicated and needs further explanation.

Most obviously, the shock would increase the supply of small coins in the copper sector, which in turn would increase the exchange rate between silver and copper *cash* (the tael-*wen* ratio). The implications of these direct consequences on the economy are profound, if not long-lasting. First, the increased money supply would break the possible deflationary tendency, re-inflate the rural economy and encourage output. Second, an increase in rural money supply would also lead to a certain increase in the commodity price (not necessarily proportionate to the increase in the money supply, given the increase in output and the effect of re-monetisation), and therefore would encourage farmers to sell more of their products. Third, the increase in price of silver against copper coins indicates in effect a restoration of silver/copper *cash* ratio to its previous high level. This means a drop in the commodity price when expressed in wholesale trading with silver, and thus encourages long-distance trade and exports.

Descriptions in documents by contemporary writers are in accord with these theoretical consequences.

Ideally, in order to statistically disentangle the history, the following economic information is needed: local prices and wages quoted in copper *cash*; output in rural areas; exchange rates between silver and copper *cash*; information on domestic and international trade. However, the quality of most of the available data is far from ideal for rigorous statistical tests.

2.4.1.2 Data availability

Economic information from rural areas of the time is not well preserved. There are virtually no records of agricultural output in this period. The government gathered systematic information on grain prices in local markets, but these are quoted in silver (this dataset will be discussed in detail in the next section). Local prices and wages quoted in copper *cash* are the most direct barometer of interest, but records of them are also scarce, and are barely comparable.[426]

Information on exchange rates between silver and copper *cash* is also scant: it fluctuated constantly and varied from place to place.[427]

[426] Another problem with the historical price information is that for the purposes of book-keeping, the unit of account in the book is often different from the money used in real transactions. For example, although daily transactions were carried out in copper cash and copper coins, silver tael (later silver dollars) were usually the money of account in account books, and transactions were recorded in terms of silver price according to the silver/copper exchange rate at the time. Therefore what the account books could have revealed is nevertheless still a distorted picture of the market price information.

[427] In Beijing for instance, the exchange rates were decided daily at the meeting of the money market, but no record of the daily exchange has remained. T.P. Meng and S.D. Gamble, *Prices, Wages, and the Standard of Living in Peking, 1900-1924*, Special Supplement to the Chinese Social and Political Science Review (Peking Express Press, 1926), 73-4.

Figure 2-7 (p.128) presents the recovered regional series on both North and South China, based on records of several counties in the same region.[428] The figures show that the silver/copper *cash* exchange ratio is generally higher in North China than in the South, and that since the 1870s, the ratio kept sliding. Within thirty years, from 1871 to 1900, the ratio dropped by 38% (from 1812 *wen*/tael to 1227 *wen*/tael) in the North and by 23% (from 1558 *wen*/tael to 1222 *wen*/tael) in the South. However, as with local price series, systematic silver/copper ratios across time and space are not available.

2.4.1.3 The indirect approach

Given the scarcity of systematic economic indicators, the empirical strategy therefore adopts a rather indirect way to test the theoretical speculations. The purpose is to test the impact of the technological shock – copper coinage minted by steam power – on the real economy: did it mitigate the problem of money stringency in rural areas? Because the timing for adopting the new coinage technology varied from province to province, Difference In Differences (DID) estimations can be used here to estimate the effect of this technological shock.

It is argued that, with the increase in the money supply, the silver/copper exchange rate would adjust (i.e. increase) quickly, while the commodity price quoted in copper would not rise in proportion to the increase in the supply of copper coins. Two reasons support this argument: first, because, apart from price rigidity, remonetisation and an increase in output would offset the inflationary pressure; second, because the money market (in trade centres in particular) usually reacts much quicker than the commodity market (especially because many of the commodities are farm products for which changes in production may require considerable delay). Therefore when agricultural produce was collected by middlemen from the farm and traded in the market, its wholesale price expressed in silver tael would tend instead to decline. We therefore expect a decline in the wholesale grain price after the adoption of the new technology. The increase in output and decline in regional wholesale prices would naturally be followed by a possible rise in long distance trade (measured in terms of exports to both domestic and foreign destinations).

[428] Acknowledgements to Professor Kaixiang Peng for the data compilation and his generous offer of the data set.

2.4.2 Data description

Panel datasets of grain prices are used for the test. The timing of adopting the coinage is used as the proxy of the external shock variable. Summary statistics are presented in Appendix B 2-1. The sections below discuss the panel datasets and the coinage diffusion data.

2.4.2.1 Grain prices

Grain price series (both wheat and rice) are used as the proxy of rural economic activities; they are both collected at prefecture level and at a monthly frequency from 1881 to 1910 - a time span long enough to capture the difference in activities before and after the institutional shock.

The grain price data come from the grain price reports of the Qing Court. The grain price report system in the Qing dynasty dates back to 1693. There are monthly reports containing the prices (in the form of tael/picul) of staples (including highest price and lowest price for each kind of grain) in the local markets.[429] The reports were compiled in each prefecture and submitted to the central government each month. Some of the original reports were lost; the rest are kept in the First Historical Archive in Beijing and the National Palace Museum in Taipei. The data were collected, digitized and made available online by Wang Yeh-chien at the Academia Sinica.[430]

The types of grain varied from place to place and in particular from North to South. As wheat and rice are the two most widely produced and consumed types of grain across the country, this paper composes prefecture-level monthly silver price panels of ordinary rice and ordinary wheat from 1880-1910, covering a total of 199 prefectures from 15 provinces. Rice and wheat price datasets cover slightly different areas; therefore the wheat price and the rice price panels will be tested separately.

[429] *Picul* is a measure of weight, equivalent to 100 *catties* (or around 60.48 kg). They are usually retail prices at local markets and were originally quoted in the copper *cash* price (*wen/catty*). The government grain reports did not specify whether the price they used were wholesale prices. They may well have been retail prices later converted into equivalent silver prices in the documents. This is one of the drawbacks of this dataset: the original report did not specify the norms of data collecting and it is not certain whether the units used in each prefecture were uniform.

[430] Yeh-chien Wang, "Database of Grain Price in the Qing Dynasty (Qing Dai Liang Jie Zi Liao Ku)," Academia Sinica, http://140.109.152.38/DBIntro.asp

2.4.2.3 New coinages: diffusion and magnitude

The timing of the adoption of the new silver and copper coinage comes from *Selected archives in modern Chinese monetary history, Vol. I. Late Qing Period.* The volume examines relevant government memorials and compiles information on all the provincial mints including the dates of their establishment, and suspension.[431] All dates are converted from the Chinese calendar to the Gregorian calendar.[432] There was normally one mint (normally in the prefecture where the provincial government resided) in each province.[433] The new coins mainly circulated within the province (in particular before 1905 when copper coins were prized). I took the month when the coinage was introduced as the time of adoption, and I assumed that once the coins were minted, all the prefectures within the same province would be affected by this technological shock. For details in the dates of coinage introduction please see Appendices A 2-1 and A 2-2.

It is worth mentioning that although small value coins enjoyed wide acceptance and circulation, these new copper coins circulated mostly within their administrative boundaries (province). Traditionally copper *cash* travelled typically from the mint to adjacent area, from higher level markets (where they were minted) to lower level markets. But they were less likely to travel long-distance and across regions. It was particularly the case during the period of our discussion. At the beginning of the new coinage: the circulation of the copper coins was more regionalised with the introduction of new copper coins for four more reasons (beside the former reason on high transaction cost). During the first few years, copper coinage was in high demand and they were considered important and precious. The provincial governments banned the outflow of new copper coins. Later on with more provinces starting minting new coins (around 1905-10) competitive minting (sometimes with depreciation) started, and provincial governments banned the use of coins minted from other province in order to protect its own seigniorage interest.

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[431] Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 917-22.

[432] Academia Sinica Computer Center, "Mapping of Chinese and Western Calendars " http://sinocal.sinica.edu.tw/

[433] There are some exceptions. For example the Jiangsu Province had three mints located in three different prefectures: Nanjing (Nanking), Suzhou (Soochow) and Qingjiangpu (Chingkiangpu). However, once Jinagning started minting, copper coins started to circulate throughout the province.

2.4.2.4 Other data information

Other data series are employed as controls. The control variables consist of data on economic conditions such as prefecture population data in 1820, 1851, 1880, and 1910[434] and land tax in 1820;[435] the area of each prefecture during the Qing Dynasty,[436] annual weather data collected from 120 observation stations at prefecture level;[437] and natural endowment data for rice and wheat production areas, including: dummies of whether each area was mainly rice or wheat producing, and the approximate rice/wheat acreage of each province during 1914-18.[438]

2.4.3 Identification strategy with grain prices

2.4.3.1 Baseline identification strategy

The method of measuring the effect of new coinage is a generalised differences-in-differences estimation. Below is the basic specification for testing the effect of technological shock on grain prices:

$$G_{it} = \alpha_i + \gamma_t + \beta_1 Coinageit \quad + \sum_{j=2}^{15} \delta_j province_j * trend_t + \varepsilon_{it} \ (1)$$

where α_i and γ_t are prefecture and time (month) fixed effects. G_{it} is log grain price and takes values of two types: rice price in prefecture i in month t; (2) wheat price in prefecture i in month t. $Coinage_{it}$ is a dummy variable equal to 1 if the new coinage is introduced in prefecture i at time t. Provincial time trends are added to capture the possible different time trends between provinces (t = 1, 2, …, 120).

The impacts of silver and copper coinages are tested separately. The dummy variable $Coinage_{it}$ therefore also takes dummies of two types: one is the timing for silver coinage and the other is the timing for copper coinage. For the impact of silver coinage, Equation (1) can therefore be rewritten as:

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[434] Cao, *Population History of China: Qing Period (Zhongguo Renkoushi: Qing Shiqi)* 691-701.
[435] Fangzhong Liang, *Statistics on China's Historical Population, Cultivated Land and Land Tax (Zhongguo Li Dai Hu Kou Tian Di Tian Fu Tong Ji)*, 1st ed.(Shanghai: Shanghai People's Press, 1980), 401-11.
[436] Cao, *Population History of China: Qing Period (Zhongguo Renkoushi: Qing Shiqi)* 708-18.
[437] China State Meteorological Society, ed. *Yearly Charts of Droughts/Floods in China for the Last 500-Year Period (Zhongguo Jin Wu Bai Nian Han Laofen Bu Tu Ji)*(Beijing: Atlas Press, 1981).
[438] Dwight H. Perkins, *Agricultural Development in China, 1368-1968*(Edinburgh: Edinburgh University Press, 1969), 249-50.

$$G_{it} = \alpha_i + \gamma_t + \beta_1 Silvermint_{it} + \sum_{j=2}^{15} \delta_j province_j * trend_t + \varepsilon_{it} \text{ (2);}$$

And for copper coinage:

$$G_{it} = \alpha_i + \gamma_t + \beta_1 Coppermint_{it} + \sum_{j=2}^{15} \delta_j province_j * trend_t + \varepsilon_{it} \text{ (3)}$$

The coefficient of interest is β_1. Under the assumption that the silver coinage added unwanted liquidity to the market and would lead to inflation, Coefficient β_1 for Equation (2) is expected to be positive. However, the new copper coinage will stop the deflation trend in rural areas without necessarily generating inflation (in terms of price quoted in *wen*), while the adjustment in the currency market would more quickly capture the increase in the silver/copper *cash* ratio (silver became more expensive than copper *cash* did), which would result in a decline in the silver price of the grain. Coefficient β_1 for Equation (3) is therefore expected to be negative.

The main results are presented in

Table 2-1 and Table 2-2. Regressions are carried out at prefecture level. Column (1) is the OLS results for whether there is any impact of the coinage adoption; column (2) is the fixed effects results; column (3) is the fixed effect results, controlling for different provincial time trends.

The baseline tests show that the introduction of silver coinage exerted an inflationary impact on the economy and the results are stable across different specifications. This may also suggest that the increase in the silver dollar supply further lowered the silver/copper *cash* ratio and therefore aggravated the issue of copper *cash* scarcity in rural areas, discouraging the output of rural produce and commodity trading.

In terms of the impact of copper coinage, when controlling for fixed effects, it seems that the adoption of the coinage exerted a negative impact on the pricing of rice; while its impact on the pricing of wheat remains ambiguous. The results are not stable across different specifications. Further tests are therefore needed to disentangle the relationship between the monetary injection and commodity pricing.

Table 2-1 Baseline test: impact of silver coinage (prefecture level)

Dependent variables	**Wheat**			**Rice**		
	OLS	Fixed Effects	Fixed Effects	OLS	Fixed Effects	Fixed Effects
	(4)	(5)	(6)	(1)	(2)	(3)
Silvermints	0.456***	0.047*	0.099**	0.384***	0.097***	0.128***
	(0.003)	(0.027)	(0.322)	(0.002)	(0.022)	(0.016)
Prefecture fixed effects		Y	Y		Y	Y
Time fixed effects		Y	Y		Y	Y
Time trends			Y			Y
Observations	64248	64248	63308	64864	64864	64864
R-squared	0.119	0.723	0.770	0.137	0.794	0.875

Table 2-2 Baseline test: impact of copper coinage (prefecture level)

Dependent variables	**Wheat**			**Rice**		
	OLS	Fixed Effects	Fixed Effects	OLS	Fixed Effects	Fixed Effects
	(4)	(5)	(6)	(1)	(2)	(3)
Coppermints	0.391***	-0.120***	-0.015	0.291***	-0.286***	-0.183***
	(0.003)	(0.038)	(0.045)	(-0.003)	(0.039)	(0.030)
Prefecture fixed effects		Y	Y		Y	Y
Time fixed effects		Y	Y		Y	Y
Time trends			Y			Y
Observations	64248	64248	63308	64864	64864	64864
R-squared	0.094	0.725	0.768	0.055	0.807	0.877

[a]: a dummy for the wheat producing area is used when the wheat price is the dependent variable; and a dummy for the rice producing area is used when the rice price is the dependent variable.

2.4.3.2 Controlling for local specific characteristics

More regional economic variables are introduced into the baseline equation to control for local specific characteristics.

$$G_{it} = \alpha_i + \gamma_t + \beta_1 Silvermint_{it} + \beta_2 Mainproduce_i + \sum_{t=1}^{360} \nu_t X_i * trend_t + \varepsilon_{it} \quad (4)$$

$$G_{it} = \alpha_i + \gamma_t + \beta_1 Coppermint_{it} + \beta_2 Mainproduce_i + \sum_{t=1}^{360} \nu_t X_i * trend_t + \varepsilon_{it} \quad (5)$$

Equations (4) and (5) are the development of the baseline specification stated in Equations (2) and (3). Here I replace provincial time trends with a set of prefecture-specific characteristics interacted with time fixed effects (X_i**trend*$_t$). X_i includes a set of controls including size of prefecture, land tax of each prefecture in 1820, population in 1820, 1851, 1880 and 1910, as well as the approximate acreage of wheat and rice.[439] I also include in the equation a dummy (*Mainproduce*$_i$) to show whether this prefecture belongs to a wheat (or rice) producing province (I use a dummy of a wheat producing area when the wheat price is the dependent variable and another dummy for a rice producing area when the rice price is the dependent variable). The coefficient of interest is β_1.

The results are presented in Table 2-3 and Table 2-4: columns (1)-(3) report the results for the log price of wheat and columns (4)-(6) report the results for the log price of rice. Columns (1) and (4) show the results with time and prefecture fixed effects; columns (2) and (5) show the results with fixed effects as well as a dummy of a wheat or rice producing area; Columns (3) and (6) present results with fixed effects, dummy and other control variables. Standard errors are clustered at prefecture level.

The tables show that there was a rise in commodity prices after the silver coinage; and a general drop in the commodity price quoted in silver at the time when the new copper coinage was introduced in the area. The results are stable across different specifications.

[439] Approximate acreages of wheat and rice are available on provincial level only for the years 1914-18. I therefore only use this control variable in tests on provincial level (shown in Table 2-5 and Table 2-6).

Table 2-3 With local controls: impact of silver coinage (prefecture level)

Dependent variables	**Wheat**			**Rice**		
	(1)	(2)	(3)	(4)	(5)	(6)
Silvermints	0.050**	0.144***	0.144***	0.097***	0.160***	0.160***
	(0.028)	(0.033)	(0.033)	(0.022)	(0.027)	(0.027)
Prefecture and time FE	Y	Y	Y	Y	Y	Y
Main produce dummy [a]		Y	Y		Y	Y
Controls*Time FE			Y			Y
Observations	60418	32682	32682	64864	43940	43940
R-squared	0.706	0.679	0.679	0.794	0.811	0.811

Table 2-4 With local controls: impact of copper coinage (prefecture level)

Dependent variables	**Wheat**			**Rice**		
	(1)	(2)	(3)	(4)	(5)	(6)
Coppermints	-0.129***	-0.140***	-0.558***	-0.286***	-0.303***	-0.343***
	(0.040)	(0.041)	(0.069)	(0.039)	(0.040)	(0.046)
Prefecture and time FE	Y	Y	Y	Y	Y	Y
Main produce dummy [a]		Y	Y		Y	Y
Controls*Time FE			Y			Y
Observations	60418	59478	32682	64864	63741	43940
R-squared	0.709	0.710	0.720	0.807	0.809	0.824

[a]: a dummy for the wheat producing area is used when the wheat price is the dependent variable; and a dummy for the rice producing area is used when the rice price is the dependent variable.

2.4.3.3 Robustness check I: regression on provincial level data

In most provinces there was only one copper mint in a province, and once the mint was established the whole province would be affected. Therefore the test at prefecture level might yield biased results due to different province sizes (some provinces had more than 20 prefectures while others had fewer than 10). A similar test at provincial level was therefore carried out as a robustness check.

The specifications are identical to Equations (4) and (5). Only α_i and γ_t are now provincial and time (month) fixed effects. G_{it} is the log of the mean of grain prices in province i at time t. Dummy variables $Silvermint_{it}$ and $Coppermint_{it}$ are equal to 1 if the new coinage is introduced in province i at time t (t = 1, 2, …, 120). Standard errors are clustered at the provincial level. Tables 7 and 8 show the results, which do not differ from the results shown in Table 2-5 and Table 2-6.

Table 2-5 Robustness check: impact of silver coinage (provincial level)

Dependent variables	**Wheat**			**Rice**		
	(1)	(2)	(3)	(4)	(5)	(6)
Silvermints	0.050**	0.144***	0.144***	0.097***	0.160***	0.160***
	(0.028)	(0.033)	(0.033)	(0.022)	(0.027)	(0.027)
Province and time FE	Y	Y	Y	Y	Y	Y
Main produce dummy [a]		Y	Y		Y	Y
Controls*Time FE			Y			Y
Observations	60418	32682	32682	64864	43940	43940
R-squared	0.706	0.679	0.679	0.794	0.811	0.811

Table 2-6 Robustness check: impact of copper coinage (provincial level)

Dependent variables	**Wheat**			**Rice**		
	(1)	(2)	(3)	(4)	(5)	(6)
Coppermints	-0.127	-0.448*	-0.448*	-0.302**	-0.302**	-0.352**
	(0.140)	(0.264)	(0.264)	(0.141)	(0.141)	(0.151)
Province and time FE	Y	Y	Y	Y	Y	Y
Main produce dummy [a]		Y	Y		Y	Y
Controls*Time FE			Y			Y
Observations	72583	49305	49305	65397	65397	56099
R-squared	0.778	0.755	0.755	0.833	0.833	0.840

[a]: a dummy for the wheat producing area is used when the wheat price is the dependent variable; and a dummy for the rice producing area is used when the rice price is the dependent variable.

2.4.3.4 Robustness check II: introducing weather shocks

Weather conditions have a strong impact on the commodity pricing, in addition to all the other monetary and economic causes. However, although there were around 120 historical weather stations in China, many of them were located in remote areas from which agricultural and price information are not available. After merging weather data with the commodity price data, the number of observations were reduced to only around 40 prefectures. The weather information was therefore included in a separate test as a robustness check.

The original weather data information was split into five types, in which types 1 and 5 denote bad weather (exceptional drought and flooding), 2 and 4 denote fair weather (limited drought and flooding), and 3 means good weather.[440] Like Keller and Shiue (2007) and Jia (2011), I take the deviation of local weather from 3 to measure the size of weather shocks. A drought dummy (equalling 1 when the weather rank is 1; and equalling 0 otherwise) and a flood dummy (equalling 1 when the weather rank is 5; and equalling 0 otherwise) were also constructed. The three indicators were tested separately and the results are presented in Table 2-7 and Table 2-8. The results remain stable and robust with both linear weather information and shock dummies: under all conditions the introduction of silver coinage significantly increased the commodity price while new copper coinage significantly reduced the price.

[440] State Meteorological Society, *Yearly Charts of Droughts/Floods in China for the Last 500-Year Period (Zhongguo Jin Wu Bai Nian Han Laofen Bu Tu Ji)*, preface and illustration.

Table 2-7 Robustness check with weather shocks: impact of silver coinage (prefecture level)

Dependent variables	**Wheat**			**Rice**		
	(1)	(2)	(3)	(4)	(5)	(6)
Silvermints	0.147***	0.179***	0.179***	0.121***	0.119***	0.119***
	(0.058)	(0.056)	(0.056)	(0.048)	(0.046)	(0.046)
Weather deviation	Y			Y		
Drought dummy		Y			Y	
Flood dummy			Y			Y
Prefecture and time FE	Y	Y	Y	Y	Y	Y
Main produce dummy [a]	Y	Y	Y	Y	Y	Y
Controls*Time FE	Y	Y	Y	Y	Y	Y
Observations	9621	11253	11253	12512	15234	15234
R-squared	0.730	0.701	0.701	0.850	0.834	0.834

Table 2-8 Robustness check with weather shocks: impact of copper coinage (prefecture level)

Dependent variables	**Wheat**			**Rice**		
	(1)	(2)	(3)	(4)	(5)	(6)
Coppermints	-0.353**	-0.399***	-0.398***	-0.202***	-0.293***	-0.293***
	(0.142)	(0.136)	(0.136)	(0.074)	(0.067)	(0.067)
Weather deviation	Y			Y		
Drought dummy		Y			Y	
Flood dummy			Y			Y
Prefecture and time FE	Y	Y	Y	Y	Y	Y
Main produce dummy [a]	Y	Y	Y	Y	Y	Y
Controls*Time FE	Y	Y	Y	Y	Y	Y
Observations	9621	11253	11253	12512	15234	15234
R-squared	0.742	0.715	0.715	0.854	0.846	0.846

[a]: a dummy for the wheat producing area is used when the wheat price is the dependent variable; and a dummy for the rice producing area is used when the rice price is the dependent variable.

2.4.4 Findings and limitations of the empirical strategy

The empirical findings show that there was a rise in commodity prices after the silver coinage; and a general drop in the commodity price quoted in silver at the time when the new copper coinage was introduced in the area. The results are stable across different specifications.

There are certain limitations in the current empirical strategy: the test itself can be more robust if more control variables (such as the size of mint output) can be added into the regression. Also the current studies only look at the price panel data; the study will be more convincing if panel datasets of other macroeconomic condition (agricultural output or local export) can be applied.

2.4.4.1 Proxy on mint output

Apart from the timing of the shock, it would be better to also capture the different sizes of the shock (mint output) and to link them with the magnitude of the impact. The provincial mint records were not preserved and the exact figures of annual mint output are unknown. One possible proxy is the mint capacity (number of furnaces of each mint). The mint capacity was available by a survey of 1905-07, conducted by Imperial Commissioner sent by the government before a programme of centralising the provincial mint production. The problem with the survey information is that it only concerns the most prominent mints, and that the information is cross-sectional.[441]

Another possible proxy of the mint output is the number of raw materials used in the mint. China had relied on foreign copper for coinage since as early as the 1870s, and the Customs reports recorded in great detail the imports of various types of copper (for instance, copper slabs and ingots) each year. The problem is that part of the 'copper slabs and ingots' were also imported for manufacturing purpose (though quite a small part). Also the amount of copper imported for minting purpose might not be used in the same year. Working through the original customs reports from port to port, picking up the statistics and calculating the net import of each port will be an onerous job, but if

[441] The survey took two years to complete, and it contains the mint capacity information of the day when the commissioner made his visit to the particular mints. Memorial of Bi Chen, Imperial Commissioner. Financial Archive Division, *Selected Archive in Modern Chinese Monetary History, Vol. I.*, 917-22.

this job can be carefully carried out, net foreign copper ingots imported into each province each year can be taken as a relatively good proxy of the mint output.

2.4.2.2 Indicator of macroeconomic condition

Good economic indicators of this period are rare, but the customs statistics are one exception. The Imperial Maritime Customs Service published a series of comprehensive and detailed reports each year, containing not only trade statistics at national and local (for each port) levels,[442] but also addressing wide economic issues over every region of China. These publications provide the most invaluable information about China, though the sheer size and the detailed nature of the published volumes often intimidate their users.

Publications of the Imperial Maritime Customs Service provide annual export information of each port such as: the tonnage and ships passed through the specific port, the volume and unit price of every single item that entered the port.[443] If successfully compiled into comparable datasets, the information would be invaluable for an entire body of new literature on early modern Chinese economic history.[444]

2.4.4.1 Impact of coinage adoption on output and export – export indicators as the dependent variable

The specification for the test with trade statistics as the dependent variable is only slightly different:

$$Export_{it} = \alpha_i + \gamma_t + \beta_1 Coppermint_{it} + \sum_{j=2}^{14} \delta_j province_j * trend_t + \varepsilon_{it} \quad (4)$$

where $Export_{it}$ is the logged figure of export statistics; α_i and γ_t are the port and time (year) fixed effects, $Coppermint_{it}$ is a dummy variable equal to 1 if copper coin officially circulated in port *i* at time *t*. Y_{it} denotes the export duty at port *i* in year *t*. The coefficient of interest is β_1. The assumption would predict a relative drop in the silver price of the local produce, which would in turn encourage exports and would be

[442] The name was changed to China Maritime Customs Service (CMC) after 1911.
[443] The volume information include import, export, and re-export. And items are classified as foreign goods and local produces.
[444] One drawback of the dataset would be that it is of annual frequency only.

reflected in the increase of exports; therefore the coefficient β_1 here is expected to be positive.

Two measures of exports – export value and export duty regarding both domestic and foreign destinations – were employed as dependent variables. The main results are presented in Table 11. The copper coinage had a positive impact on export value; and up to 1903, the technological shock also had a positive impact on export duty (the proxy for export volume). It seems that the impact of coinage adoption on exports was less significant than the level of grain prices, which is understandable, since the total export value and duty could not distinguish the type of export. A better estimation would distinguish agricultural produce from products of other sectors such as modern industry. However, the feasibility is questionable since export items varied greatly from port to port, which makes it almost impossible to compare a group of items between one port and another.

2.5 Concluding Remarks

This paper examines reports of the Imperial Maritime Customs Service and discovers that towards the end of the nineteenth century, the Chinese economy suffered from a shortage of money for daily use and rural production, despite the phenomenon of 'cheap silver' and a silver inflow into China. It proposes that cheap silver or silver inflow did not necessarily encourage trade or increase money supply. The paper demonstrates that under the traditional monetary system, copper *cash* played an important role not only in domestic economy but also in China's foreign trade. Chinese economy was dominantly a rural economy and most Chinese exports were goods produced in small rural households; all local goods were first collected by middlemen who paid with copper *cash*, before they could be shipped elsewhere. Silver facilitated the inter-regional trade but copper *cash* in fact determined the export pricing.

The paper then constructs a prefecture-level dataset consisting of information on grain prices, population, economic endowments, climate as well as data on the timing in each province of adopting the new copper coinage. DID estimations are carried out to compare the level and changes in grain prices before and after the introduction of the new minting technology. A placebo test using the timing of the introduction of silver coinage is also carried out. At current stage, the estimation is only tested on grain prices. If, in the future, good quality data on regional output and export can be assembled, the test of the positive institutional effect can be extended to broader aspects of the economy. This exercise finds that the introduction of new copper coinage helped to ease monetary stringency in the countryside without necessarily generating inflation. The introduction of silver coinage, however, did not exert positive effect on the rural economy.

Both contemporary reports and statistic exercises show that contrary to the conventional judgement that regional mints were purely profit driven and added to the monetary chaos, the introduction of new coinage minted with steam power technology helped to ease rural monetary stringency without necessarily generating inflation, and thereby encouraged output and trade.

In term of intrinsic value, the new copper coins were no better than the big *cash* (the debased coin which brought about monetary chaos during the Xianfeng inflation during 1853-61). However the new copper coinage was, initially at least, a huge success while the introduction of big *cash* was an instant failure. This paper believes that the success of the new copper coinage should be attributed to two factors: it correctly responded to the market needs and it embraced technological innovation. First, the minting of small copper coins instead of large silver coins correctly tackled the market need. The new copper coinage was in fact a debasement which brought the silver/copper ratio (ratio between tael and *wen*) to the original level, and partially solved the monetary instability caused by 'cheap silver'. Second, coins with smaller denominations are better to be token coins in order to prevent a chronic shortage of them, and steam power technology ensured the provision of token coins without inviting private counterfeiting.

The widespread use of new copper coin was an epochal event in China's monetary history: it was the first time that the Chinese market widely acknowledged and accepted a token (i.e. highly debased) coin at their face value, under a normal market condition (i.e. not under unusual circumstances such as a city under siege). The imperial government had long established a reputation of being an absolute power with zero credibility. For a long time in history, the credibility of the money provided by the government therefore could only come from its intrinsic value. For the first time, the credibility of the money came not only from the metallic value, but also from the endorsement of the new technology, which provided standardized coins with reliable quality and thereby greatly reduced the transaction cost.

Introduction of a publically accepted token coin was the first step towards a monometallic standard. A fully-fledged token-coinage policy should include the following features: first, the metallic value of the token should be far below its face value; second, private parties should not be allowed to mint the token; third, the mint authority should issue small and legally limited amounts of them, and fourth, tokens had to be accepted as legal tender (maybe only up to a legally specified maximum sum). With these four rules in place, the coinage could be insulated against changes in the

relative price of copper, silver, or gold.[445] By the end of the nineteenth century, these rules were fully established in many European states, which practically meant that these countries adopted the gold standard.

In China only the first two rules were observed – they were satisfied by the introduction of steam power minting technology. The remaining two features, however, took a long time to accomplish. As a local initiative, the copper coinage lacked inter-provincial coordination and the mint output was never effectively controlled. The link between copper coins and the silver dollar was never legally established, or supported by financial institutions. The value of copper coins eventually depreciated.[446] In 1910, the central government passed new legislations on currency regulation, including articles on putting all provincial copper mints under central supervision, imposing limited minting quota as well as linking copper coins with silver dollars (100 copper coins can be exchanged with 1 silver dollar) ensured by banks.[447] However, before the legislation could be implemented, the Qing Dynasty was overthrown in 1911. The first decade of the Republican China (1912-49) only witnessed a period of prolonged domestic warfare and a deepened regionalisation in which all provincial governors (or warlords to be more accurate) sought to increase their sources of revenue. The seigniorage revenue from copper coinage was one of them and the depreciation of copper coin accelerated.[448] Once an innovation and an originally important step towards monetary evolution, the copper coinage turned to be another disappointment. Keynes once said that the commodity money was the 'last barbarian relic' of the human society. However the question is when the government would be eventually civilised.

[445] 'Yearbook for Legislation, Administration and Economics In the German Reich', kindly translated by Prof. Oliver Volckart. G. Schmoller, "Über Die Ausbildung Einer Richtigen Scheidemünzpolitik Vom 14. Bis 19. Jahrhundert.," in *Jahrbuch Für Gesetzgebung, Verwaltung Und Volkswirtschaft Im Deutschen Reich 24*(1900), 1249.

[446] From 1902 to 1911, the retail price quoted in copper coins doubled. Ho, "From Cheap Silver and Copper Famine to Depreciation of the Copper Coinage," 472-4.

[447] 'Regulations on currency consolidation (1910)' (*zheng dun yuan fa zhang cheng*). The regulations were detailed and carefully planned. Although whether or not the legislation was motivated by the central government desire to take the seigniorage revenue from the hand of provincial governments, we would never know. Zhang, *History of Chinese Currency System (Zhonghua Bi Zhi Shi)*, 69-71.

[448] During the 1920s, daily exchange rates between the silver dollar and the copper coin were recorded in Tianjin and Shanghai.

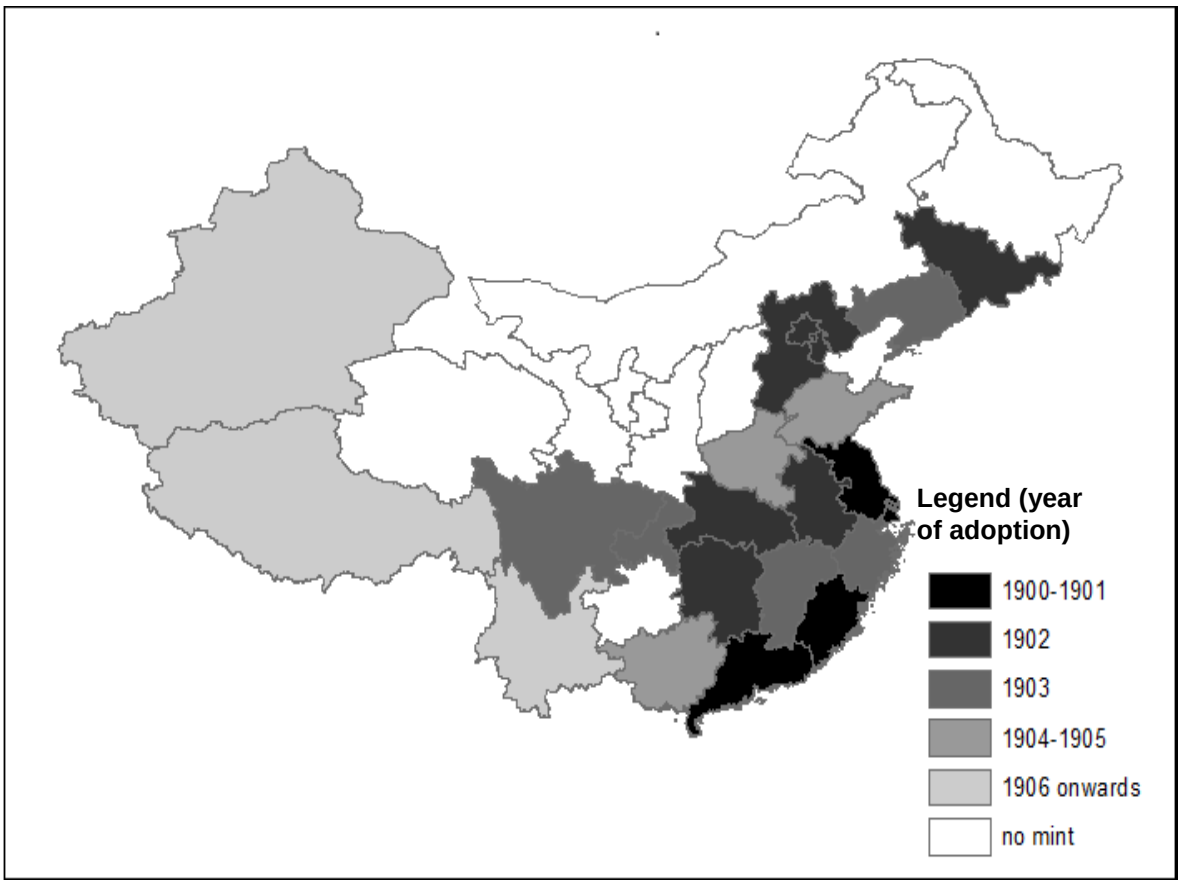
2.6 Appendices

Appendix A 2-1 Dates of new coin issues

Mint location	Province name	Silver coinage	Copper coinage
Guangzhou	Guangdong	1890.05	1900.07
Wuchang	Hubei	1896.07	1902.09
Shengyang (Mukden)	Fengtian	1896.10	1903.09
Tianjin	Zhili	1897.01	1902.07
Changsha	Hunan	1897.07	1902.07
Dihua	Xinjiang	1897.07	1908.11
Jilin	Jilin	1897.08	1908.00
Fuzhou	Fujian	1898.01	1900.10
Nanjing	Jiangsu	1898.01	1902.06
Chongqing	Sichuan	1898.07	1903.08
Anqing	Anhui	1898.08	1902.05
Hangzhou	Zhejiang	1899.03	1903.03
Xi'an	Shaanxi	1899.04	n/a
Harbin	Heilongjiang	1900.00	n/a
Jinan	Shandong	1901.10	1904.08
Kunming	Yunnan	1906.04	1908.01
Lhasa	Tibet	1910.08	n/a
Suzhou	Jiangsu	No coinage	1901.08
Qingjiangpu (Huaiyin)	Jiangsu	No coinage	1905.02
Nanchang	Jiangxi	n/a	1903.04
Kaifeng	Henan	n/a	1904.11
Nanning	Guangxi	n/a	1905.02
Guiyang	Guizhou	n/a	1905.05

Source: *Selected Archives in Modern Chinese Monetary History, Vol.1* (1964), 823-4, 914, 917-23.

Appendix A 2-2 Spread of new coinage since 1900.



Appendix B 2-1 Summary statistics

Panel A: Prefecture by month data (306 prefectures*360 months)				
	Mean	Standard Dev.	Min	Max
Price of wheat	221.077	138.441	41	1960
Price of rice	266.693	168.336	57	6477
Average weather deviation from 3 (good weather)	-0.178	1.028	-2	2
Drought dummy	0.292	0.455	0	1
Flood dummy	0.388	0.487	0	1
Wheat as main produce dummy	0.702	0.457	0	1
Rice as main produce dummy	0.596	0.491	0	1
Silver mint dummy	0.027	0.162	0	1
Copper mint dummy	0.016	0.126	0	1
Panel B: Province by month data (21 provinces*360 months)				
	Mean	Standard Dev.	Min	Max
Price of wheat (provincial mean)	234.362	132.736	73.5	1698
Price of rice (provincial mean)	268.331	174.406	96.75	6477
Wheat as main produce dummy	0.692	0.462	0	1
Rice as main produce dummy	0.569	0.495	0	1
Silver mint dummy	0.286	0.452	0	1
Copper mint dummy	0.174	0.379	0	1

Appendix C 2-1 Image of copper coin (Qing dynasty, issued around AD 1905-1908)

Source: online sources [449]

Front inside (reading from top to bottom, then from right to left): *guang xu yuan bao* ('heavy treasure of Xianfeng');
Front outside top (reading from right to left): *guang xi sheng zao* ('manufactured by Guangxi Province'); front outside bottom (reading from right to left): *mei yuan dang zhi qian shi wen* ('each coin should be taken as 10 *wen* of standard *cash*')
Back top: KWANG-HSI;[450] back bottom: TEN *CASH*.

[449] Copper coin during Guangxu's Reign (1875-1908) [date of access: 27 Mar 2015] (http://collection.sina.com.cn/auction/ppsx/20140522/1455152547.shtml)
[450] Kwang-hsi is the old spelling (Wade-Giles system) of Guangxu.

Chapter 3 The Second World War and Chinese Money Holders (1937-1945):

How did the wartime situation affect people's money-holding behaviour?

3.1 Introduction

The previous two chapters have discussed the parallel development of two movements that contributed to the collapse of the traditional monetary system of imperial China: a continued process of monetary decentralisation and the monetary modernisation. On one hand, the power of the central government kept collapsing, leaving provincial governments with more freedom for tax autonomy and with more responsibilities in terms public goods provision (including the provision of money). The regional provision of monies increased liquidity but also gave rise to problems of monetary chaos and competitive coinage between regions. On the other hand, fragmented political situation (thus allowing certain area to change first[451]) also greatly pushed forward the modernisation of the monetary system. The regional minting activities since the late 19th century made way for a wide acceptance of token coins (for the first time in history the Chinese money holders were ready to accept token coins and used them with their face value), facilitating the transition from the silver-copper bimetallic system to a monometallic system (i.e. pure silver standard) which is arguably a necessary step towards further institutional evolution. The early period of Republican China (1911-49) witnessed a continued development of both trends. Political power continued to decentralise and the control of coinage became an important source of regional government revenue. At the same time, the transition to a de facto silver standard facilitated the development of banking sector in issuing banknotes linked to silver.[452]

Besides these two movements, the formation of a new unified monetary system was taking place along with the process of state formation. The early Republican era (warlord period) saw the coinage and wide use of the Chinese silver dollar (Yuan Shikai silver dollar) minted by the Republican government. The Chinese silver dollars gradually dominated the market and became the primary bank reserve upon which various banknotes were issued.[453] During the period between 1911 and early 1930s, China's monetary system resembled a free banking system: it was a silver standard under which all kinds of banks could issue freely their own convertible banknotes;

[451] This happened to be the same underlying logic of Deng's economic opening policy in the 1980s.
[452] China was a de jure silver standard only for a very brief period, from March 1933 to November 1935.
[453] Kuroda, "The Collapse of the Chinese Imperial Monetary System ".

although the government centralised the minting of silver dollar, other forms of silver (foreign dollars and silver ingots) still circulated, and no effective central bank was established during the warlord period. In 1927, the Nationalist Government led by Chiang Kai-shek, reunified the country (by defeating some warlords and teaming with the others) and underwent ambitious programmes of modern state formation, including a series of steady currency reform. In 1935, China abandoned its centuries' use of silver and adopted a managed, foreign-exchange-backed currency system. The value of the money moved from metallic value to the credibility of the state (and also to a harder currency - foreign exchange).

This reunification of the monetary system was sweet but short: China was soon dragged into a major warfare of eight years. The country split into several regimes issuing their own currencies competing with each other. Hence between 1911 and 1945, monetary evolution went through periods of further decentralisation (1911-27), then re-centralisation (1928-37), and decentralisation (1938-45) again. Many interesting and important issues are worth discussing. However, the period of 1911-27 happened to be the most decentralised time in modern Chinese history and during this period economic data information is extremely scarce. The period of 1928-37 during which the major currency reform took place, on the other hand, receives much more attention and the topic has been frequently treated in many great works. Based on these reasons, this chapter skips the two sub-periods (a succinct history of monetary development will be provided in section 3.2), and focuses instead on the monetary development since 1937. This is the period when the value of money no longer resided within metal, but more within the credibility of its issuer – the state. The chapter therefore discusses source of credibility of fiat money, by investigating the value of currencies in competing regimes through the eyes of contemporary money holders.

In September 1939, when the Second World War broke out in Europe, the Chinese state had already been seriously torn apart. China had entered into war with Japan in 1937, and by 1939, the country was divided into several autonomous regimes, all claiming to be the 'only legitimate government' in China. Representing distinctively different political interests, each regime scrambled for larger spheres of influence not only militarily but also economically. Each regime issued its own currency, and pushed the notes onto the population in the hope of getting more seigniorage revenue.

Although the currencies each had their main area of circulation, they travelled much further across their 'borders' because of inter-regional trade and because borders changed so constantly with the progress of war. Consequently, besides the daily worry of having their hometown flattened or letting inflation eat up half of their monthly salaries, the ordinary Chinese people sometimes had to consider which notes they needed to hold. Most of the wartime currencies were more or less fiat money (with limited or suspended convertibility to foreign exchange), which experienced inflation to certain degree. What determines people's preference for which currency and how much of it they should hold? Is it the relative quality of money linked to the fiscal behaviour of the note issuing authority, or to progress in the domestic battlefield, or rather to people's faith in a specific regime?

This paper applies structural breaks analysis to examine changes in the real demand for money as reflections of money holders' behaviour. It focuses on a regional comparison, and provides a new perspective in examining the wartime economy and Chinese wartime inflation. The paper examines two major currencies during the war, one issued in Free China by Nationalist Government led by Chiang Kai-shek, and the other issued in occupied China by the Reorganized National Government of China led by Wang Jingwei and supported by the Japanese government. These were the two major political regimes situated at the heart of the Chinese territory, both claiming to be the only legitimate government of the Republic of China. By examining and comparing these two currencies, the paper tackles two questions: what events were considered important in the eyes of contemporary Chinese? Did the events exert same impacts across the country?

A great amount of literature has studied the wartime events by examining information from the financial markets during the US Civil War and the Second World War. Willard, Guinnane and Rosen (hereafter WGR 1996) study the greenback market (inconvertible paper money issued by the 'Union' states in the North from 1862) during the US Civil War,[454] while Weidenmier examines the grayback market (paper money issued by the

[454] Kristen Willard, Timothy Guinnane, and Harvey Rosen, "Turning Points in the Civil War: Views from the Greenback Market," *The American Economic Review* 86, no. 4 (1996).

Southern Confederacy after 1861).[455] A comparison of the two studies shows that major events such as the battle at Antietam and the battle of Gettysburg are reflected in both greenback and grayback markets, but at other occasions, Northern and Southern investors reacted differently and had different concerns. It seems that war events did not always have symmetrical effects on the two money markets. The paper by Frey and Waldenström (2004) studies bond prices traded in two geographically separate markets (in Zurich and Stockholm) and suggests that there appears to be asymmetric information between the two markets, because some of the events result in significant breaks in only one of them.[456] Oosterlinck (2003) compares two identical long-term bonds (one issued by the Third Republic and the other by the Vichy government) traded on the Paris Bourse (Stock Exchange) from 1942 to 1944.[457] By calculating the price differential, they explain the new series no longer by macroeconomic factors but in terms of the 'political risk of default'.[458] Ho and Li (2010) use Chinese domestic bond yields to analysis events during 1921-42.

This paper contributes to several strands of research. First, it contributes to the abovementioned literature of wartime event analysis by offering a case study in China. Previous research of historical 'turning points' mostly deals with information on financial markets of the United States or Europe, while Ho and Li's paper on domestic bond yields stops in 1942, which was in the middle of the war. Second, this study applies the structural break methods to time tables of money holding, which provided a more comprehensive analysis in terms of the time span. There are several advantages to using this indicator compared to other indicators, such as bond prices, in the Chinese context. The Chinese bond market is underdeveloped and not much traded especially after 1937.[459] It could be asked what the bond yields could reflect about people's expectations. The bond yield data stops in 1942, right in the middle of the war. The foreign exchange market, although it endured the war period, was subject to government

[455] Marc Weidenmier, "Turning Points During the Us Civil War: Views from the Grayback Market," *Southern Economic Journal* 68, no. 4 (2002).
[456] Bruno S. Frey and Daniel Waldenström, "Markets Work in War: World War Ii Reflected in the Zurich and Stockholm Bond Markets," *Financial History Review* 11, no. 1 (2004).
[457] Kim Oosterlinck, "The Bond Market and the Legitimacy of Vichy France," *Explorations in Economic History* 40(2003).
[458] Ibid., 333.
[459] Chun-Yu Ho and Dan Li, "A Mirror of History: Chinese Bond Market from 1921 to 1942," *working paper series for the Project 'Reconstructing the National Income of Britain and Holland, c.1270/1500 to 1850'* (April 2010): 27.

manoeuvring and therefore could not be used as accurate reflection of public expectations. Third, by comparing the monetary series of both Free China and Occupied China, this paper provides a more panoramic view of the wartime history, as most of the works of the Chinese wartime monetary issues focus on the currency (*fabi*) issued by the Nationalist Government, and is therefore limited to the study in Free China in the Southwest. Finally, historians in recent years (since the 1990s) have focused strongly on issues of perception. Much of this appears to be part of the culturalist turn of historiography.[460] This paper contributes to this strand of research from a completely different point of view: it employs economic data and methods from the economic history perspective to address the question of how people perceived military and political events.

The rest of the paper is organised as follows: Section 3.2 provides the historical background of the competing regimes and various currencies; Section 3.3 provides the steps of the structural break methodology; Section 3.4 presents the empirical results and provides a brief discussion on the findings; Section 3.5 concludes the paper.

[460] For example Mohanty (1988) and Klein (2000), Chandra Talpade Mohanty, "Under Western Eyes: Feminist Scholarship and Colonial Discourses," *Feminist Review* 30(1988). Kerwin Lee Klein, "On the Emergence of Memory in Historical Discourse," *Representations* 69(2000).

3.2 Two Nationalist Governments and two currencies

Since its late imperial period, China has been a state with limited monetary unity. The Xianfeng Crisis (1853-61) kick-started the process of monetary modernisation as well as its regionalisation. The monetary system at the beginning of Republican China (1911-49) was even more fragmented and complex, not least because of the warlord politics and the increasingly weakened central power. Hence between 1911 and 1945, monetary evolution went through periods of further decentralisation (1911-27), then re-centralisation (1928-37), and decentralisation (1938-45) again. This section first provides a succinct history of the relevant monetary evolution along with the parallel development of the state. It then examines the two major competing currencies under two different regimes.

3.2.1 Historical Context: change of regimes: political and monetary

3.2.1.1 From Warlord China to Nationalist China

The Republic, soon after its establishment by various military and revolutionary groups, fell into the hands of Yuan Shikai (former pro-reform official of the Qing court) and his Beiyang military government in Beijing. The real political power was decentralised to a group of military warlords and the central government was extremely weak in all senses: militarily, politically and financially. This period was known as the Beiyang period (1912-1927) and it witnessed a series of chaotic civil wars between warlords.

Disappointed by the military government, Dr. Sun Yat-sen, founder of the Republic of China, formed the Nationalist Party (KMT)[461] in South China and led several campaigns in order to overthrow the military rule and to re-install a democratic republic. After Sun Yat-sen's death, Chiang Kai-shek the continued the North Expedition. At the same time, Wang Jingwei (another prominent revolutionist figure inside the KMT) led an independent military campaign against Beiyang and set up a separate government body

[461] The Nationalist Party is called 'Kuomintang' in Chinese pronunciation, and often referred to as KMT.

in Wuhan. Chiang's crusade put down the regional warlords one by one and finally the Beiyang government was forced to step down. The Nationalist Party established its own government in Nanjing in 1927, and Chiang managed to merge the Nanjing government with the one in Wuhan established by Wang. The Nationalist regime (1927-1949) thus started.

By the 1930s that the Nationalist rule was consolidated, comprehensive programmes were undertaken to centralise the power and to develop state capitalism. The first ten years of the Nationalist rule (the 'Nanjing Decade' from 1927 to 1937) saw tremendous progress in terms of modern state building: government consolidated its fiscal income;[462] it set up the first central bank in 1928, carried out a series of currency reform and established the new fiat money system; it also actively engaged in industrial policies and designed the first five-year plan of industrial development. By 1936, there was among the Chinese population a genuine mood of 'optimism and national unity'.[463] Unfortunately this optimism did not last long as the Second Sino-Japanese War broke out in 1937: development policies were interrupted and the newly adopted fiat currency system became very handy for inflationary finance.

3.2.1.2 Monetary decentralisation and recentralisation

Beiyang Government (1911-27) centralised state silver coinage and encouraged the market to the use of silver dollar (Yuan Shikai dollar minted since 1914). Chinese dollar did not enjoy the sole legal tender status and the market use of silver took various forms from foreign silver coins (for example, Mexican silver dollars were used for daily transactions in the South-eastern coastal areas and treaty ports, while Japanese dollars were popular in Fujian Province) to silver ingot.[464] Convertible banknotes were issued

[462] Consistent fiscal budget reporting started from 1928.
[463] The achievement of the Nationalist regime is a subject of debate. Many argued due to the emphasis of the centralised state, level of free speech and also market liberalisation was limited compared to the Baiyang era. The Beiyang era, with the absence of absolute state power, witnessed the start of modern industrialisation, and was regarded as the 'Golden Age of Chinese capitalism'. For detailed arguments please refer to: John K. Fairbank and Albert Feuerwerker, *The Cambridge History of China. Vol. 13, Part 2 Republican China, 1912-1949*(Cambridge: Cambridge University Press, 1986), 147-60.
[464] Kuroda, "The Collapse of the Chinese Imperial Monetary System " 104-05, 14-15.

by foreign banks, Chinese modern banks and native banks.[465] In the early days of the Republic almost half the banknotes were actually issued by foreign banks.[466] Among the modern Chinese banks, the most influential were two semi-official banks (Bank of China and the Bank of Communications) and their banknotes were well accepted. However, circulation of the banknotes had a regional pattern. Some of the notes circulated only within the borders of the place where a branch of a bank had issued them.[467]

In 1927 when the Nationalist Government replaced Beiyang Government to be the only legitimate government of China, the currency system was still 'a complicated mixture of silver coins and weights, fluctuating copper coins and paper money, all varying from place to place'.[468] The Nationalist Government was more committed to the monetary reform: the Central Bank of China was established in Nanjing in 1928 and a supervision committee was founded to ensure that banks maintained adequate reserves behind their note issues. The Bank of China and Bank of Communications became government banks. In 1933, the use of tael as unit of account was abolished and the silver dollar became the only legal unit of account. In 1935, China abandoned its traditional silver standard and adopted a managed currency system. The Chinese Yuan (*fabi*) became the sole legal tender in Republic of China. Private banknotes were still allowed to circulate, but with much diminished importance. By 1936 the notes issued by foreign banks had shrunk to 8% of the total number of notes circulating.[469] The provincial and local banks had some issues, too, the number being limited to a fifth of the total.[470]

3.2.1.3 The 1935 Fabi Reform

There are many possible driving forces behind the currency reform of 1935. One possibility (which also occurred frequently in official publications) is the economic

[465] Banknotes were denominated with various unit of account: in some cases the notes were denominated in tael (and there were different taels) and in other cases in silver dollars. Rawski, *Economic Growth in Prewar China* 130.
[466] Ibid., 134-35.
[467] Kuroda, "The Collapse of the Chinese Imperial Monetary System " 156.
[468] Young, *China's Wartime Finance and Inflation*, 3.
[469] Rawski, *Economic Growth in Prewar China* 135.
[470] Young, *China's Wartime Finance and Inflation*, 135.

deflation in China in the wake of the global depression of the 1930s[471] Western countries abandoned the Gold Standard (Great Britain went off the Gold Standard in 1931 and other countries followed suit) and their currency depreciated. By this time China was on a pure silver standard. China's link to silver made the Chinese dollar appreciate against foreign exchanges, resulting in exports decline and silver outflow.[472] The US government's Silver Purchasing Act in 1934 further bid up the international silver price.[473] Many scholars considered that the silver outflow led to a shrinking of the monetary base, resulting in deflation and financial crisis.[474] Another driving force behind the abandoning of silver is the Chinese government strategy to escape the 'silver fetter' and to increase the government ability to extract seigniorage revenues.

In November 1935, the Chinese government officially introduced its currency reform: the government decree stated that notes issued by the four government banks (Central Bank of China, Bank of China, Bank of Communications and the Farmers Bank of China) were the nation's sole legal tender. It was a managed, foreign-exchange-backed currency system. The new Chinese dollar had a fixed exchange rate with the British pound as well as with US dollar. It was anchored at 1 CHD = 0.3 USD = 14 ½ d.[475] Banks, firms and all private and public institutions were to hand over their silver holdings to the Currency Reserve Board in exchange for the legal tender. The notes of other banks were to be gradually retired. The government banks were to keep the exchange value of the currency at the present level and to this end they would buy and sell foreign exchange in unlimited quantities. This new Chinese National Currency is often referred to as *fabi*, the Chinese equivalent of 'legal tender'.[476]

The reform was successful at the beginning: it encouraged foreign trade and stimulated the economy. There was mild inflation but it was needed for reflating the economy. By

[471] Friedman gives a vivid illustration of the relationship between the Great Depression and the Chinese currency reform, and Chiang's eventual defeat in the war with the Communists. Friedman, "Franklin D. Roosevelt, Silver, and China," 62-83.
[472] The worldwide currency depreciation implies a price rise of international commodities such as silver and thus a real exchange rate appreciation of the Chinese currency.
[473] The aim of Roosevelt government was to add silver to the reserves of the US Treasury until it reached a ratio of 1:3 with gold reserves. Friedman, "Franklin D. Roosevelt, Silver, and China," 66-67.
[474] Contemporaries observed that in Shanghai, commodity prices fell, bank reserves were depleted and bank credit halted. Business failures increased. The real estate and stock market were frozen. "The China Year Book (Chung-Hua-Nien-Chien)," ed. H. G. W. Woodhead(Shanghai: North-China Daily News & Herald, 1929-38), 201-03
[475] King, *A Concise Economic History of Modern China*, 138.
[476] Chang, *The Inflationary Spiral*, 3-4.

nationalizing silver holdings, the government also received a windfall of monetary reserves. Part of the silver reserve was used to purchase foreign currencies, in order to stabilise the exchange market. The Chinese public were 'exchange-minded to an unusual degree'[477] and speculative attempts to force a break in the exchange rates were frequent. But the government did well to stabilise foreign exchange market with its foreign reserve.

The currency reform proceeded successfully for the first twenty months and then the Sino-Japanese War broke out. The managed monetary system requires a prudent fiscal condition, but during the war the government could no longer maintain its already delicate fiscal balance and the monetary system became inflationary. The area of fabi's circulation also shrank. Soon after the outbreak of the war, the Nationalist Government, as well as four government banks, moved to the interior (Free China). In occupied China puppet regimes were established and they started to issue puppet notes. The monetary regime disintegrated again with the split of the country. The major antagonising regimes were the Nationalist government in Chongqing (led by Chiang Kai-shek) in the interior (Free China) and the other Nationalist government in Nanjing (led by Wang Jing-wei) in Occupied China. They both claimed to be the only legitimate government of China and issued currencies competing with each other. The following section provided some stylised facts about this situation.

3.2.2 Two Nationalist Governments and two currencies

3.2.2.1 The Free China regime and the New Nanjing Regime

China's political landscape was completely changed during the Second World War. Even before the war, Manchuria had been effectively controlled by Japan since the early 1930s. The central government was greatly impeded by further Japanese aggression in 1937. By the end of 1937, the Chinese capital Nanjing was captured. The legitimate Chinese government, the Nationalist Government, retreated to the interior in the west (the 'Free China') and settled in Chongqing. The Japanese-occupied area was divided into several main regions, each with an autonomous government. These regions include Manchuria (turned into Manchukuo in 1931), Mongol Border Land (Mengjiang, a

[477] Young, *China's Wartime Finance and Inflation*, 131-33.

puppet regime under Japanese control since 1936), North China (since 1937, including the cities of Beijing and Tianjin) and Central China (since 1938, including the cities of Nanjing and Shanghai).

In the eyes of the Nationalist Government, the most threatening puppet regime was the puppet government of Central China. This regime controlled a vast land from Central China to the East Coast. The government had effective control over the economically most advanced areas (including Shanghai, Jiangsu and Zhejiang), and maintained Nanjing as its capital. In 1940, the government was renamed the 'National Government of China', with Wang Jingwei as the president (hereafter referred to as the New Nanjing Regime).[478] Wang Jingwei was a famous revolutionist and a member of the Nationalist Party with very senior ranking (below only Chiang Kai-shek).

Established in the original capital city, led by a respectable politician, this government sounded very much like the 'real' National Government that was now situated in Chongqing. This regime was established for the purpose of being the only legitimate government in China and to replace Chiang Kai-shek's Nationalist Government in Chongqing. The New Nanjing Regime also issued its own paper money that drove the Chinese legal tender out of circulation in Central China.

3.2.2.2 Fabi and the Central Reserve Bank notes

China's currency was unified in 1935 with the introduction of the new Chinese dollar (also called *fabi*, which means 'legal tender' in Chinese[479]) which became the only legal currency in China. *Fabi* was a managed, foreign-exchange-backed currency: it had a fixed exchange rate with the British pound as well as with US dollar.[480] *Fabi* were issued by government banks (Central Bank of China, Bank of China, Bank of Communications and the Farmers Bank of China) with branches all over the country. This monetary unity was maintained for twenty months, until the outbreak of the Sino-

[478] The New Nanjing regime claimed for almost all the Japanese occupied area (North China, Central and South China, and Inner Mongolia), although its actual area of influence included only Anhui, South Jiangsu, Zhejiang, Nanjing and Shanghai.

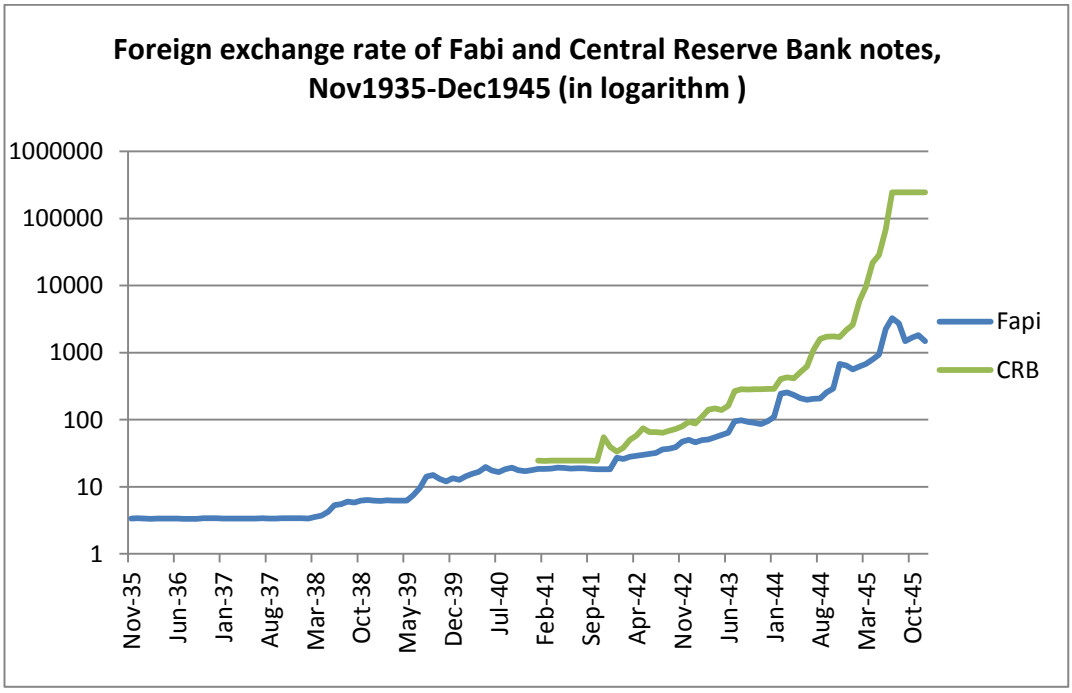
[479] The currency is often referred to as '*fapi'* (spelling with the Wade–Giles system) in contemporary literature.

[480] The exchange rate of *fabi* was anchored at 1 CHD = 0.3 USD = 14 ½ d (pre-decimal British pence). The government banks were to keep the exchange value of the currency at the present level and to this end they would buy and sell foreign exchange in unlimited quantities. King, *A Concise Economic History of Modern China*, 138.

Japanese War. With the gradual establishment of puppet regimes and puppet notes, *fabi* played a diminished role in occupied areas.

Following the capture of the Chinese capital Nanjing in December 1937, the Japanese military decided to set up a puppet government to manage Central and South China. The new puppet government in Nanjing was called the 'Reorganized National Government of China'. A puppet central bank solely for Central and South China, the Central Reserve Bank, was also established. On 8 January 1941, the Central Reserve Bank opened in Nanjing, and on 20 January a branch opened in Shanghai. The Central Reserve Bank notes (CRB notes) were at par with *fabi*, and competed for area of circulation.[481][482]

Figure 3-1 Foreign exchange rate of *Fabi*, and Central Reserve Bank (CRB) notes, in logarithm (against US dollars)



[481] Zhaojin Ji, *A History of Modern Shanghai Banking: The Rise and Decline of China's Finance Capitalism* (Armonk, N.Y.: M.E. Sharpe, 2003), 214-5.

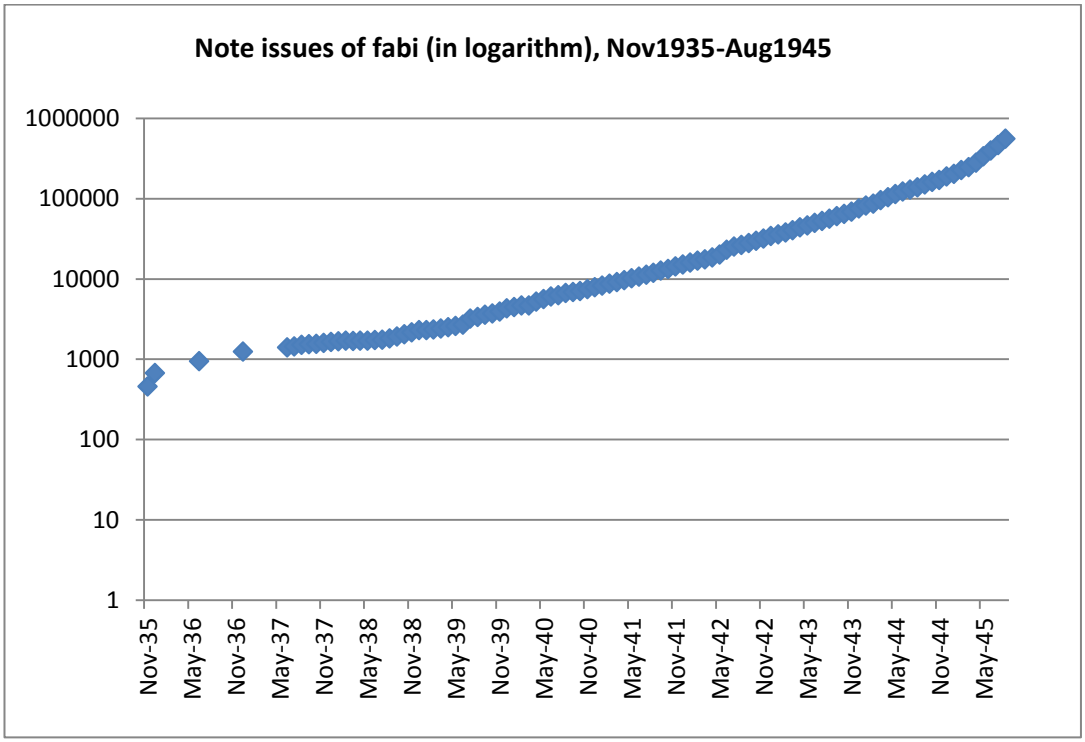
[482] During the course of the Sino-Japanese War, the Japanese troops set up several puppet regimes and each regime set up their own central banks and issue their own currencies. CRB is only the most prominent one that posed a threat to the Nationalist government. Central banks of other puppet regimes included the Mengcheng Bank in Inner Mongolia, the Federal Reserve Bank in North China, and the Kwangtung Provincial Bank in Guangdong Province. To complete the picture, there were still other currencies such as the Japanese military yen (*gunpyo*, its formal name is, by the way, 'China Incident Military Notes') and various communist currencies issued by scattered communist bases. All these currencies had experienced inflations of different magnitudes (except for those of Manchukuo and Taiwan). Young, *China's Wartime Finance and Inflation*, 165-88.

Source: *Global Financial Data*.

Because of the existence of the foreign concessions in Shanghai and the foreign recognition of Chiang's Free China,[483] *fabi* remained a major currency of circulation in Shanghai during the first four years of Japanese occupation. However, after the attack on Pearl Harbour and the outbreak of the Pacific War, Japan claimed a full control of the city of Shanghai including the foreign concessions. The CRB notes were therefore forced into market circulation. On May 1942, the New Nanjing Regime announced that CRB notes would be the only legal tender notes in circulation in Jiangsu, Zhejiang, Anhui, Nanjing and Shanghai. After the adoption of the CRB notes, the market was relatively stable compared with the *fabi* area. However, when the Japanese troops retreated in defeat in the latter part of the war, CRB note areas experienced even higher inflation than *fabi* areas, and in Shanghai the price rise had surged into hyperinflation by the end of the war in 1945.

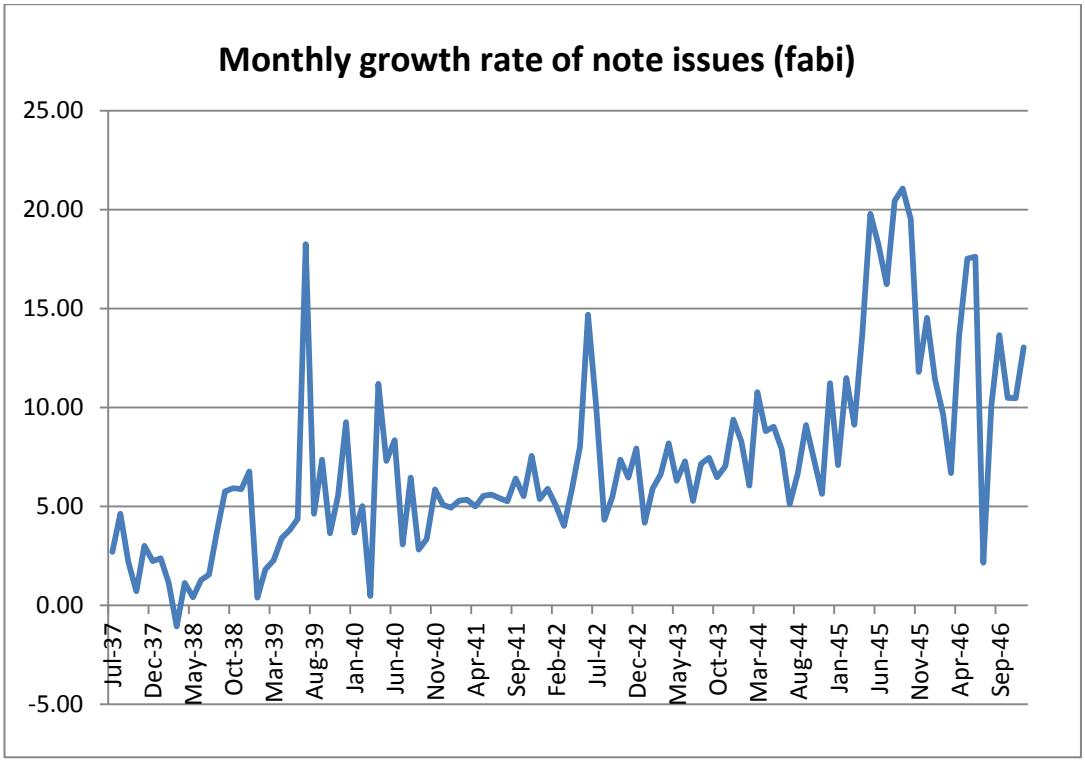
[483] International Settlement and the French Concession remained independent of the Japanese military rule (until 1942), and within foreign concessions, branches of the four government banks still operated.

Figure 3-2 Note issues of *fabi* (millions, in logarithm), Nov 1935–Aug 1945



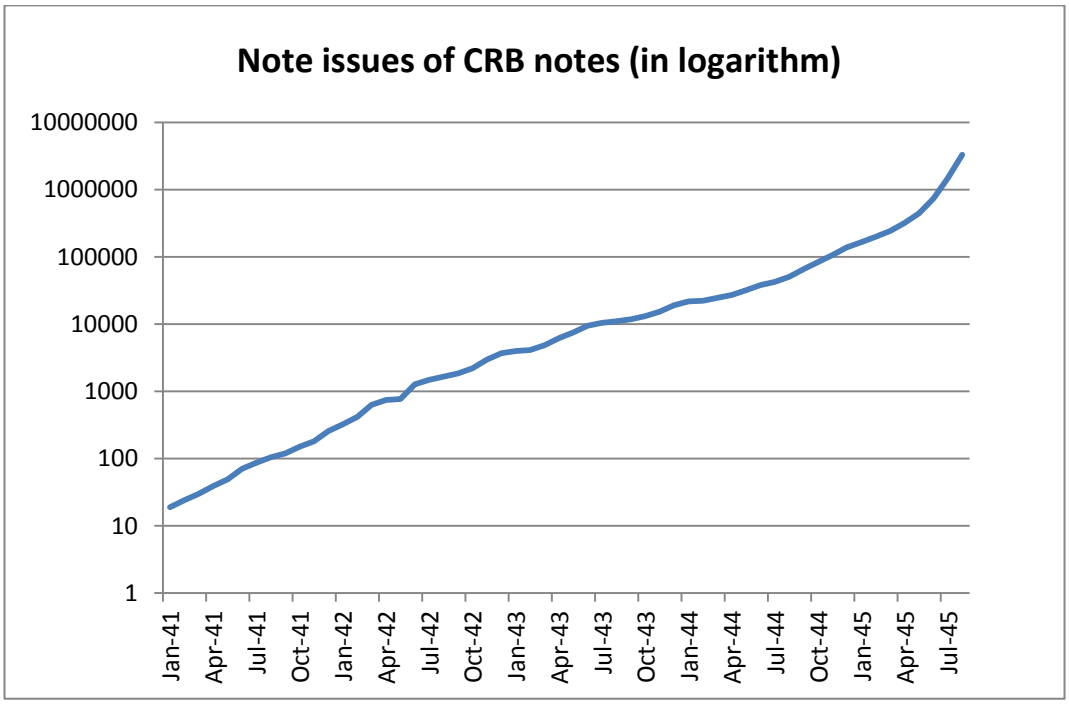
Sources: Young (1965), pp. 363-5; Wu (1958), pp. 61-2, 85.

Figure 3-3 Monthly growth rate of *fabi*, Jul 1937–Dec 1946



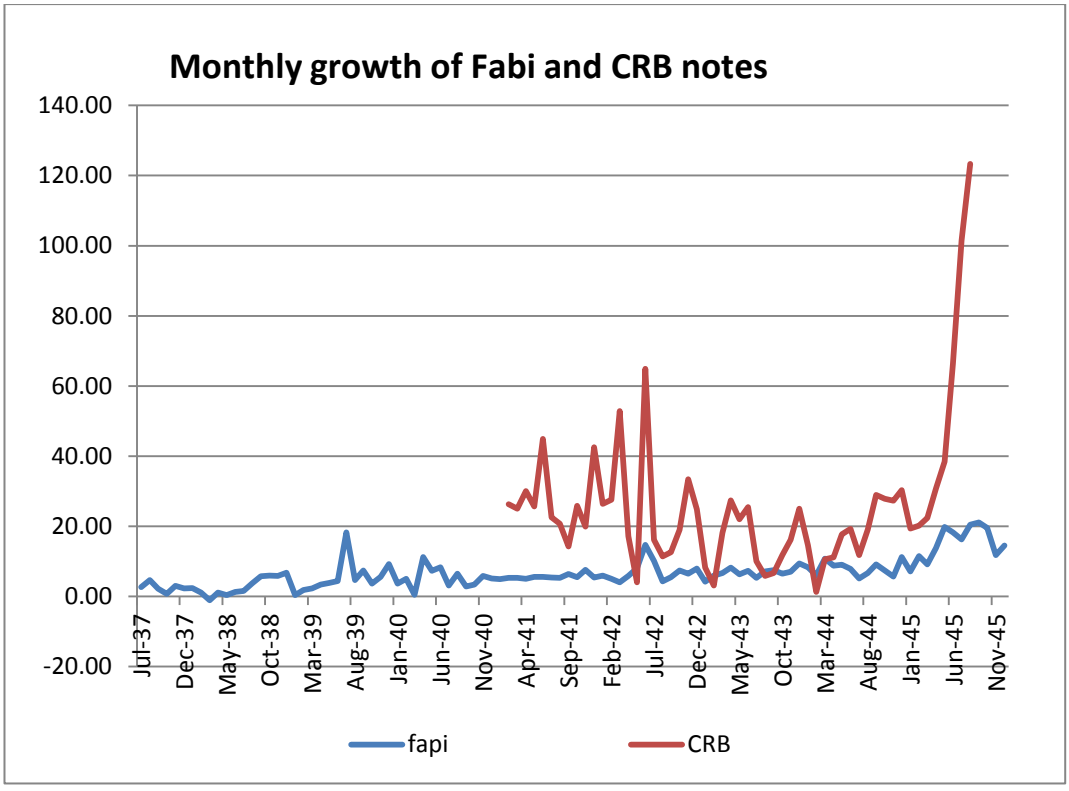
Source: ibid.

Figure 3-4 Note issues of (puppet) Central Reserve Bank (millions, in logarithm), Jan 1941–Aug 1945



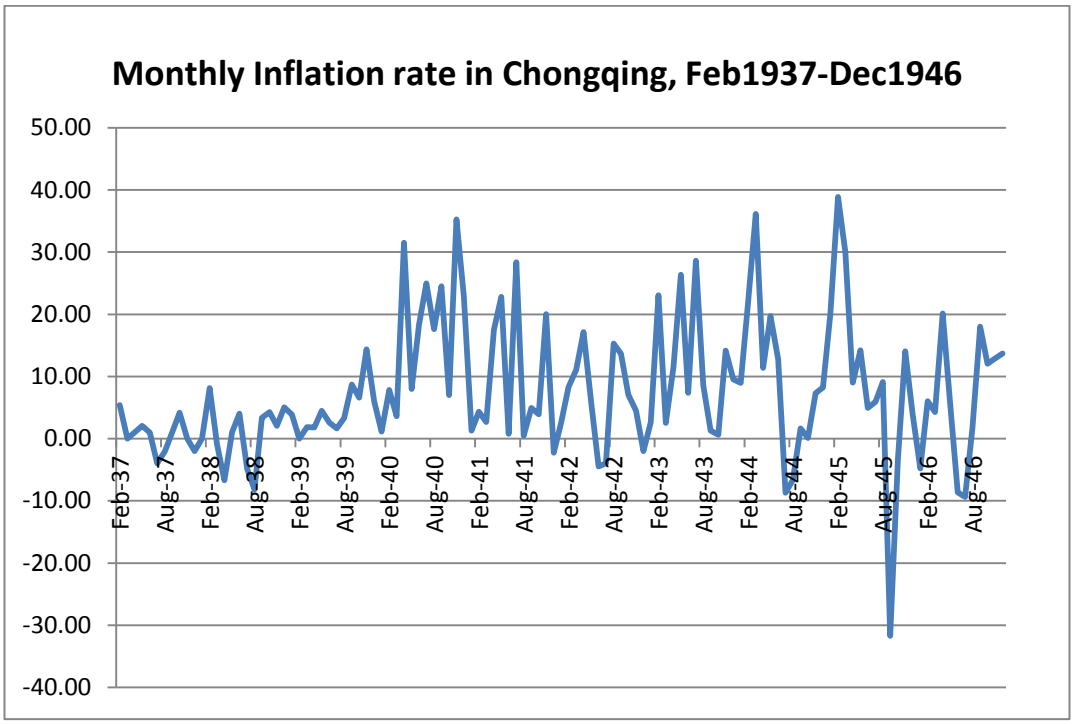
Source: Young (1965), p. 366.

Figure 3-5 Monthly growth rate of CRB notes (with comparison of *fabi*), Jan 1941–Aug 1945



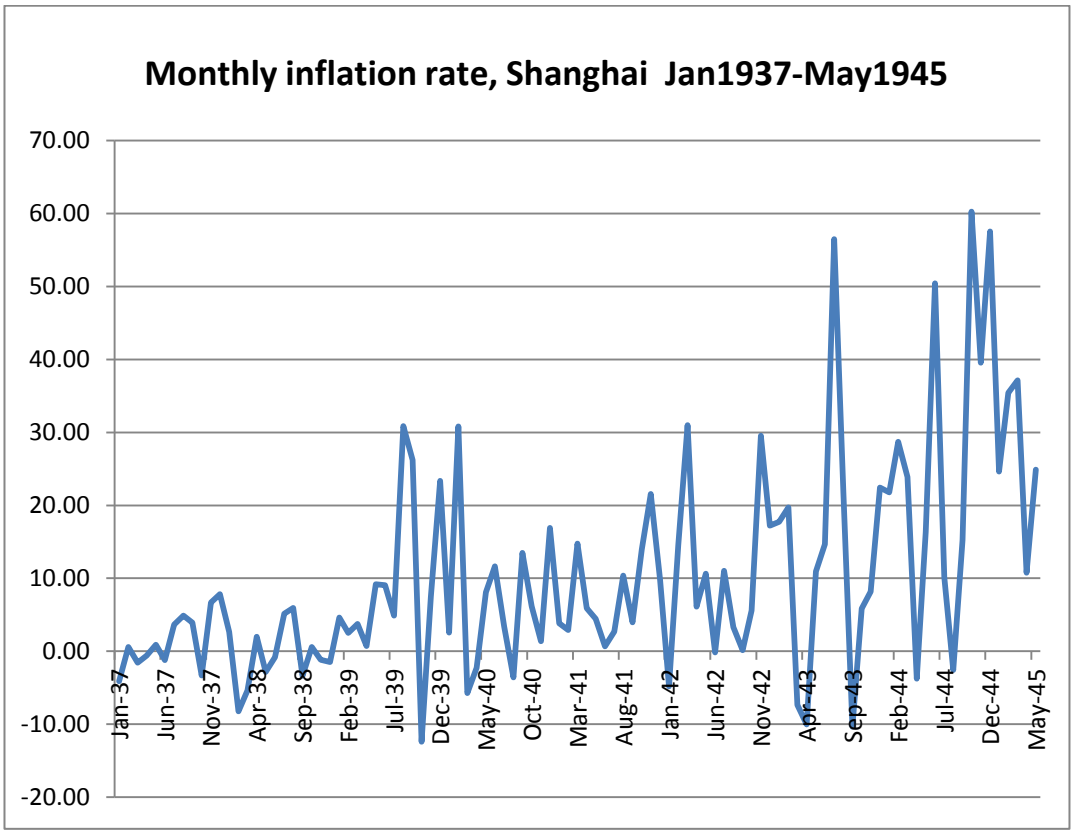
Sources: Young (1965), pp. 363-6; Wu (1958), pp. 61-62, 85

Figure 3-6 Monthly inflation rate (WPI) in Chongqing, Feb 1937–Dec 1946



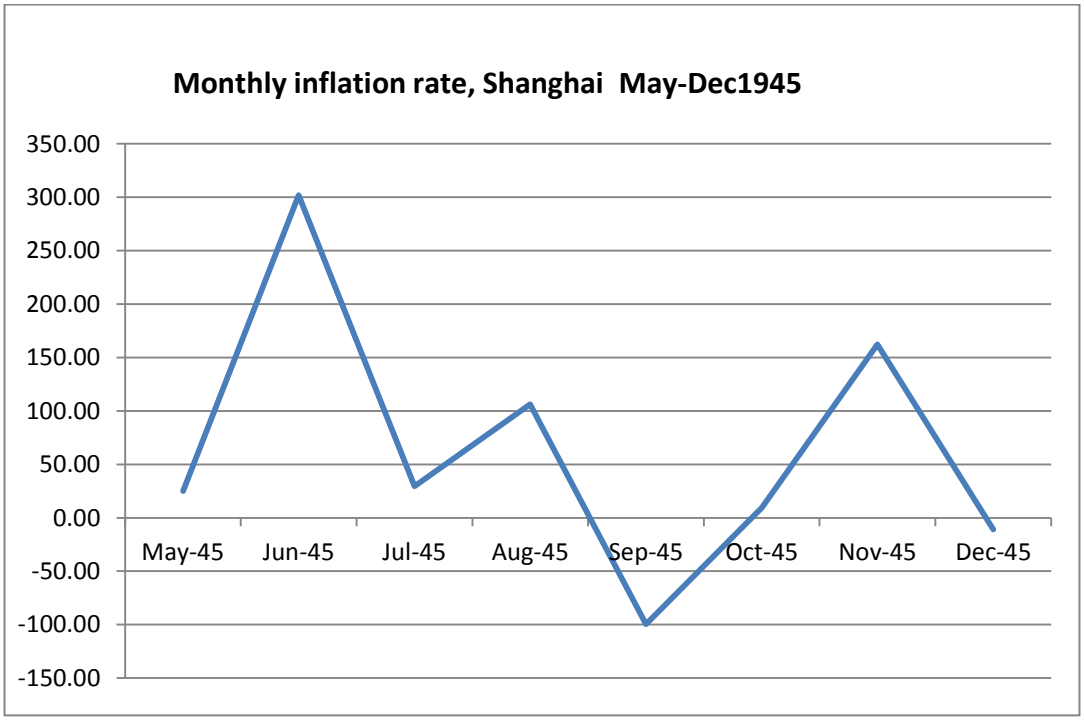
Source: *Global Financial Data*.

Figure 3-7 Monthly inflation rate (WPI) in Shanghai, Jan 1937–May 1945



Sources: *Collection of Shanghai Price Index before and after the Liberation 1921-1957*, pp. 163-70.

Figure 3-8 Monthly inflation rate (WPI) in Shanghai, May–Dec 1945



Source: ibid.

3.3 Data and methodology: real demand for money and structural breaks analysis

3.3.1 Data description: a focus on Chongqing and Shanghai

Records of the central bank note issue for both regimes are well preserved. The series of monthly issues of *fabi* are taken from Young for figures from June1937 to August 1945,[484] and from Wu for figures from September 1945 to June 1949 (see Figures 3-2 and 3-3). [485] The lists by Young and Wu are compatible because their materials are both taken from the records of the Central Bank of China. Data on monthly note issues of the Central Reserve Bank are also taken from Young (see Figures 3-4 and 3-5).[486]

Complete price information, however, proves difficult to find. The price information is usually collected at municipal level, and now consistent wartime price indices could be found only for Chongqing and Shanghai. This paper therefore takes the Chongqing price information as representative of the Free China, and the Shanghai price information as representative of the New Nanjing Regime. Chongqing was the wartime capital and Shanghai was China's financial centre. These are the centres where information travelled fast and where currency speculation took place. Price data from these two cities will therefore be relatively representative (see Figure 3-6, Figure 3-7, and Figure 3-8).[487]

The Chongqing wholesale price index is obtained from Global Financial Data.[488] The Shanghai wholesale price index is gathered from the Collection of Shanghai Price Indices before and after the Liberation, 1921-1957.[489] It needs to be noticed that while in Chongqing the major currency was dominantly *fabi*, there was a change in major currency in Shanghai from *fabi* to CRB notes in the summer 1942.

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[484] Young, *China's Wartime Finance and Inflation*, 363-5.
[485] Gang Wu, *Historical Data on Chinese Inflation (Jiu Zhong Guo Tong Huo Peng Zhang Shi Liao)* (Shanghai: People's Press, 1958), 61-2, 85.
[486] Young, *China's Wartime Finance and Inflation*, 366.
[487] Chongqing, Shanghai and Tianjin are the only three cities that have preserved consistent price records of the wartime period.
[488] "Global Financial Data." [Date of data access: 15 November 2010].
[489] *Collection of Shanghai Price Index before and after the Liberation 1921-1957 (Shanghai Jie Fang Qian Hou Wu Jia Zi Liao Hui Bian 1921-1957)*, ed. Shanghai Academy of Social Sciences(Shanghai: People's Press, 1958), 163-70.

3.3.2 Series of the real demand for money

The series for testing consist of monthly observations on the real demand for money *D (M/P)* in Chongqing and Shanghai from June 1937 to March 1949. As an indicator *(M/P)* captures the demand of money holders for precaution and transaction needs. It also captures the market speculation in anticipating inflation or deflation, and therefore shows the public's confidence in the government responsible for issuing the currency. The real demand for money is calculated upon the data series in wholesale price indices and note issues.

The money demand (in logarithm) in Chongqing ($\ln D_{cq}$) is calculated by:

$$\ln D_{cq} = \ln M_{fapi} - \ln WPI_{ck} \quad (1)$$

WPI_{ck} is the wholesale price index in Chongqing; M_{fabi} is the note issue of *fabi*. Both are index series with July 1937 as their base month (July 1937=100).

In Shanghai, as there was a switch of major currencies from fabi to CRB notes, analysis of the price-currency ratio movements in Shanghai thus naturally falls into two periods following the switch of currency: from June 1937 to June 1942 and from July1942 to the end of the war. Two money demand series ($\ln D_{sh1}$ and $\ln D_{sh2}$) are produced. The first series of ($\ln D_{sh1}$) is calculated by:

$$\ln D_{sh1} = \ln M_{fapi} - \ln WPI_{sh} \quad (2)$$

WPI_{sh} is the wholesale price index in Shanghai; M_{fabi} is the index of note issues of *fabi*. Both are index series with June 1937 as their base month (June 1937=100). The log real demand is therefore zero in June 1937. The series cover a period from June 1937 to March 1949, of which the values of observations from June 1942 to August 1945 may be useless since *fabi* was no longer the legal currency. Figure 14 shows the series from June 1937 to June 1942.

The second series, $\ln D_{sh2}$, is computed by:

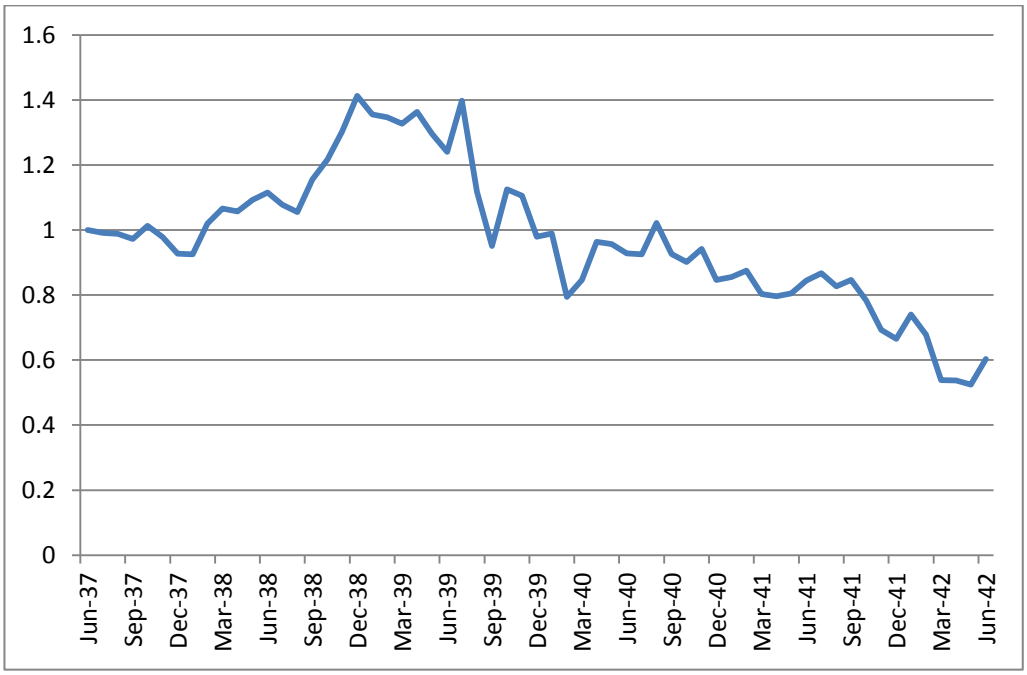
$$\ln D_{sh2} = \ln M_{CRB} - \ln WPI_{sh} \quad (3)$$

WPI_{sh} is the wholesale price index in Shanghai; M_{CRB} is the real number of note issues of CRB notes instead of indices. The series cover the period from January 1941 to August 1945. However, observations before 1942 hardly reflect reality, as the volume of note issues was trivial at the beginning (under the name of the Hua Hsing Bank) and it was *fabi* that still dominated the market. Figure 15 therefore presents the $\ln D_{sh2}$ series from June 1942 to August 1945.

Figure 3-9: Real money demand, Chongqing Jul 1937-Apr 1949

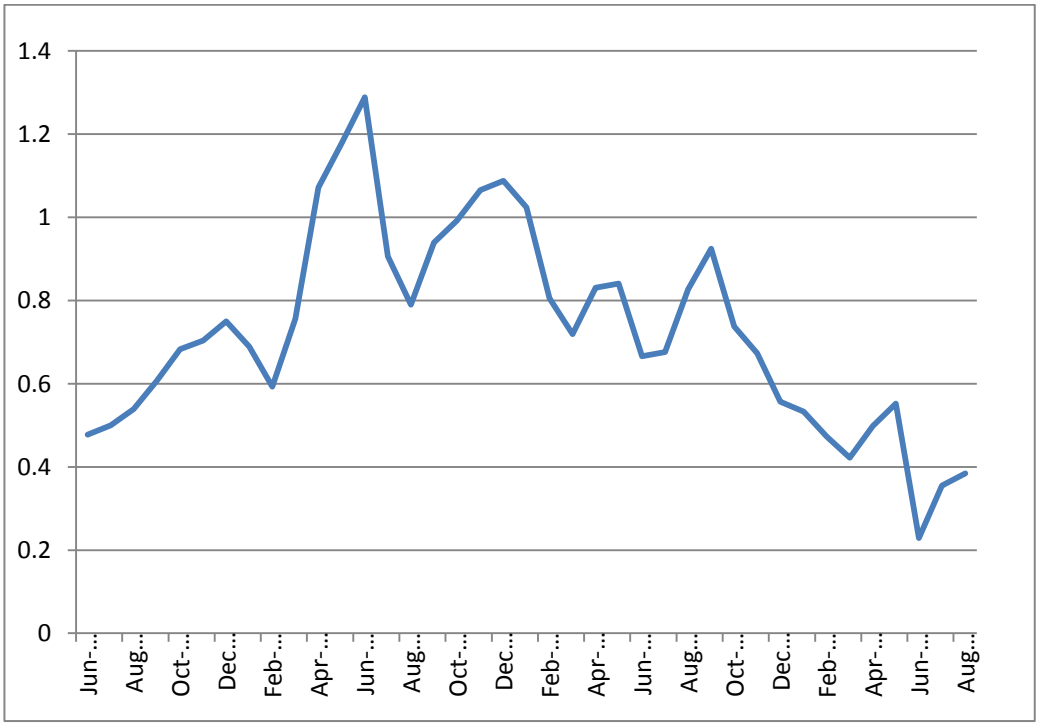
Sources: *Global Financial Data* https://www.globalfinancialdata.com/Platform/Login.aspx ; Young, pp. 363-65; Wu, pp. 61-62, 85.

Figure 3-10: Real money demand in logarithm, Shanghai Jun 1937-Jun 1942 (Money = *Fabi*)



Sources: *Collection of Shanghai Price Index before and after the Liberation 1921-1957*, pp. 163-70; Young, pp. 363-65; Wu, pp. 61-62, 85.

Figure 3-11: Real money demand in logarithm, Shanghai Jun 1942-Aug 1945 (Money = CRB notes)



Sources: *Collection of Shanghai Price Index before and after the Liberation 1921-1957*, pp. 163-70; Young, p. 366.

3.3.3 Structural breaks analysis: Sequential search technique with rolling windows

This paper uses a sequential search technique to find unknown structural breaks endogenously. The method was first developed by Banerjee, Lumsdaine and Stock (1992),[490] and was put into empirical studies by Willard et al. The steps of this paper resemble mostly those in the paper of Frey and Waldenström (2004).

Step 1-basic idea and window size:

The steps of this paper resemble mostly those in the paper of Frey and Waldenström (2004). The first step starts with the following equation:

The main idea of the method is to break the time series into windows of shorter time span.[491] Here we use a time span of 36 months, while the total length of time series is 141 months. If window no.1 is defined from July 1937 to June 1940, then window no.2 will be one month forward, i.e. from August 1937 to July 1940. This process will be repeated until the whole period is covered and this results in a total of 106 windows. For each window, a linear regression is performed to test the possibility of a break (the significance and the magnitude of a change in the mean).

This is the basic equation for each window:

$$\ln D_t = \beta_0 + \sum_{t=1}^{k} \beta_i \ln D_{t-i} + \varepsilon_t \qquad (4)$$

Here lnD_t is the logarithm form of real demand for money at time t and ε_t is the white noise error term. The lag length $k = 1$.[492]

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[490] Anindya Banerjee, Robin L. Lumsdaine, and James H. Stock, "Recursive and Sequential Tests of the Unit-Root and Trend-Break Hypotheses: Theory and International Evidence," *Journal of Business & Economic Statistics* 10, no. 3 (1992): 271-87.

[491] Frey and Waldenström, "Markets Work in War: World War Ii Reflected in the Zurich and Stockholm Bond Markets," 60.

[492] The lag length k also requires some specification. It is chosen by the backward selection procedure suggested by Perron (1989) under the assumption of no break. The determination of the value of k depends on the significance of the estimated coefficients β_i and is quite a liberal procedure: if the absolute value of the t statistic on β_{k*} is greater than 1.60 and if the absolute value of the t statistic on β_l is less than 1.6 ($l > k*$), then k equals $k*$. If there are too many lags, the power of the estimation will decrease. In the present paper, the Perron procedure is also carried out and the result is $k* = 1$, for both

Step 2-linear estimation of equation:

This step carries out the linear estimation on equation (4) for the first window. A Wald test for a structural break is carried out (by assuming a change in the constant in the middle of the window) and the *F*-statistic is recorded. The equation for estimation can be written as:

$$\ln D_t = \beta_0 + \beta_1 \ln D_{t-1} + \gamma Dum + \varepsilon_t \quad t = 2,\ldots,37. \tag{5}$$

Dum is a dummy variable which equals 0 when $t \leq 19$ and 1 otherwise. A high *F*-statistic indicates that the null hypothesis of no breaks ($\gamma = 0$) is strongly rejected and therefore suggests a high possibility of a structural break in this window. We then move the window one month forward and carry out the same estimation and the Wald test. This is repeated until all the windows are estimated and all the *F*-statistics noted. Windows with the greatest likelihood of a break will be picked up and each of the 36 months within this window will be checked.

Step 3-selection of windows with potential breaks:

In this step, the *F*-statistics which have been collected are plotted on a time line. In this diagram, the peaks will be picked up manually. Windows which contain one of the peaks in the middle are candidate windows with potential breaks.

Appendix A 3-1 shows the *F*-diagram for the real money demand in Chongqing from January 1939 to October 1947. Eight candidate windows are picked up for further investigation: from March 1938 to February 1941, from October 1938 to September 1941, from January 1939 to December 1941, from July 1939 to June 1942, from November 1941 to October 1944, from January 1943 to December 1945, from March 1944 to February 1947 and from August 1945 to July 1948. Some of the windows may overlap others for a few months.

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the Chongqing and Shanghai data. Perron, Pierre, 'The Great Crash, the Oil Price Shock, and the Unit Root Hypothesis', *Econometrica*, Vol. 57, No. 6 (Nov., 1989), pp. 1382-84.

Appendix A 3-2 is the *F*-diagram for real money demand in Shanghai from January 1939 to October 1947. Six candidate windows are isolated: from February 1938 to January 1941, from June 1938 to May 1941, from April 1940 to August 1942, from May 1941 to April 1944, from March 1944 to February 1947 and from July 1944 to June 1947.

For Shanghai, another series of the real money demand is estimated, by calculating equation (3). For this series from January 1941 to August 1945, seven windows are identified as candidate windows as well: from January 1941 to March 1942, from March 1941 to August 1942, from September 1942 to February 1943, from June 1942 to November 1943, from October 1942 to March 1944, May 1943 to October 1944 and from March 1944 to August 1945 (in Appendix A 3-3).

Step 4-dating breaks in candidate windows:

Since any of the 36 months within a window might be the cause of the high *F*-statistic, each date is statistically checked for the possibility of a break. Due to the fact that the sequential test cannot identify breaks around the beginning and the end of a time interval,[493] six additional observations are therefore appended into the original window, making it an extended 48-months window (as the paper of Frey and Waldenström does[494]). In this way all 36 dates can be tested. All the selected candidate windows are estimated by an augmented equation, Equation (6), for statistically significant structural breaks within them:

$$\ln D_t = \beta_0 + \beta_1 \ln D_{t-1} + \gamma_s Dum_{st} + \varepsilon_t \qquad s = t+6, t+7, \ldots, t+41 \tag{6}$$

Here Dum_{st} is the rolling dummy variable. It takes the value of zero for the months before s and the value of 1 otherwise. For a candidate window, 36 estimations will be carried out for 36 dummies. Therefore the dummy D_{st} itself indicates the date of the break. The coefficient γ_s shows the magnitude and sign of the break. It can be

[493] Willard, Guinnane, and Rosen, "Turning Points in the Civil War: Views from the Greenback Market," 1010.
[494] Frey and Waldenström, "Markets Work in War: World War Ii Reflected in the Zurich and Stockholm Bond Markets," 61.

interpreted as the change of the mean in the price-currency ratio index. The percentage of the change in the mean can be calculated by the following equation:

$$\%ofChange = \left(Exp(\gamma_s) - 1\right) \times 100\% \tag{7}$$

The long-run effect can also be computed by:[495]

$$LongRun\%ofChange = \left(Exp[\gamma_s /(1 - \beta_1)] - 1\right) \times 100\% \tag{8}$$

[495] Willard, Guinnane, and Rosen, "Turning Points in the Civil War: Views from the Greenback Market," 1009. Equation (15) however works only when β<1, i.e., when the series do not contain a unit root.

3.3.4 Further discussion on methodology

This section discusses the logic behind the 'forward looking approach' used for event study, as well as the merits and potential problem of the statistical method (structural break analysis).

From data to events: the forward looking approach

There are generally two ways of studying historical events with the help of time series data. The first is listing a number of events which are considered important in history and testing their significance in the time series. This method reassesses the importance of historical events which are already known to later observers[496] and can therefore be called the *ex-post* checking method, or the 'backward looking' method. This method is often used to assess the relative importance of various historical events across time and space, in order to compare the magnitude and consequence of different events.[497]

This method examines historical data information without previous knowledge of the dates of important events: it picks up the time slots that appear 'abnormal', and then makes historical inquiries to see what might have happened in history that have triggered this issue. As this method lets the economic statistics speak for themselves without preconceptions, it is useful in identifying history which might be overlooked by socio-political historians but nonetheless important in economic history. It is also useful to investigate the historical events which appeared to be important to people at the time, as many financial and economic indicators capture market perceptions of the time.[498]

This paper falls into the second category called the *ex-ante* method, or the 'forward looking' method. This particular piece of history (Sino-Japanese War as well as the subsequent Civil War) was written and rewritten by various hands to serve different

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[496] Ibid., 1001.

[497] Neal and Weidenmier's (2003) paper is a good example of fully assessing and comparing different historical events with all dimensions. Larry; Neal and Marc Weidenmier, "Crisis in the Global Economy from Tulips to Today: Contagion and Consequences," in *Globalization in Historical Perspective*, ed. Michael D.; Bordo, Alan M.; Taylor, and Jeffrey G. Williamson(Chicago and London: The Univesity of Chicago Press, 2003).

[498] Some studies, for instance Mauro et al (2000) combine both approaches in order to further explore the data information and to reach a more comprehensive understanding of history. Paolo; Mauro, Nathan; Sussman, and Yishay Yafeh, "Emerging Market Spreads: Then Versus Now," *IMF Working Paper*, no. 00/190 (2000).

political interest. And I am curious to see whether there are events that had been ignored and less remembered during the various 'repainting' of history.

Sequential search technique with rolling windows

This paper uses a sequential search technique to find unknown structural breaks endogenously. The method was first developed by Banerjee, Lumsdaine and Stock (1992),[499] and was put into empirical studies by Willard et al. The steps of this paper resemble mostly those in the paper by Frey and Waldenström (2004).

The graphs have already shown a lot of information about the change of income velocity: there are quite many sharp increases or decreases. However, with the naked eye it is difficult to tell whether this month is more like a short-term fluctuation or a 'turning point' which would affect the velocity movement in the long run (which changes the trend of the time series). We call a point a 'break' when the impact of the change persists for a long time (18 month for example); and we call a point a 'blip' when its impact persists for only one or two months.

This method of sequential testing suffers from some limitation. The quality of the dataset is not good enough in terms of length as well as frequency. The datasets for both Chongqing and Shanghai run from June 1937 until March 1949, while the main period of investigation is from July 1937 to September 1945 (the wartime inflation period). It would be better to have more observations before the period of investigation. Unfortunately, although the price series for Chongqing and Shanghai are relatively good and consistent, the monthly note issue information is available only from June 1937. The information on velocity starts therefore from June 1937, which is only one month before the outbreak of the Sino-Japanese War. As the sequential test method cannot detect breaks at the beginnings and the ends of time series, the rise in velocity and people's expectation of future warfare (whether optimistic or pessimistic) cannot be captured in the test, although a small upward trend is noticeable in the graph. The problem of data length is even more aggravated because, in the Shanghai case, the second velocity dataset (logarithm of price over puppet note issue) runs from January

[499] Banerjee, Lumsdaine, and Stock, "Recursive and Sequential Tests of the Unit-Root and Trend-Break Hypotheses: Theory and International Evidence."

1941 to August 1945. Information concerning the first half of 1941 and several months before August 1945 is therefore also lost.

The frequency of the dataset is far from satisfactory, too, for it affects the selection of the window length. For a time series analysis, it is better to include more observations for the sake of greater explanatory power. For historical data, it is usually difficult to obtain series other than monthly data. Although there are papers using shorter time intervals, such as 18 months for monthly data,[500] i.e. only 18 observations for a time series estimation, a more common practice is to use a window length of 36 months, following Frey and Kucher (2002) and Frey and Waldenström (2004). However, the definition of the window length also defines what 'long-lasting' means. As mentioned in previous sections, the definitions of a 'long-lasting' break vary from around three months (100 days in Willard et al.) to three years. A break with an effect of three years must be an important turning point. However, with a time span of three years, many smaller (not very long-lasting) events may be overlooked. This paper struggles to keep a balance between taking a reasonable length for the time series and selecting more events with a reasonably large impact: for the longer series (the Chongqing series and the first Shanghai series) it uses a 36-month window but, at the same time, it looks at more than one possible break in a window. The dates with the highest *F*-statistic will of course be chosen as the 'break' points; but other dates with relatively lower *F*-statistics in the same window will also be investigated. If these dates are also statistically significant enough, they will also be listed as 'blips' and their corresponding historical events also discussed. For the second Shanghai series (with puppet note issues as the denominator) this is too short: it has total observations for only 56 months starting from January 1941 and ending in August 1945. Thirty-six months may be too big a window for a time series of such length. Moreover, with the usual 36-month window technique, six observations at the beginning and the end of the series will again be lost. Therefore, for this series only, the paper adopts a window size of 18 months.

[500] Frey and Waldenström, "Markets Work in War: World War Ii Reflected in the Zurich and Stockholm Bond Markets," 60.

A problem associated with the algorithm is that this test is basically 'mean-shift-oriented'.[501] If an upcoming event is perceived gradually by money holders, i.e. if the structural change is gradual, our test may not be able to detect the change.

[501] Ibid., 61.

3.4 Empirical findings and discussion

Three series (one in Chongqing and two in Shanghai) of real money demand are estimated and the results are listed in the Appendices (

Appendix B 3-1, Appendix B 3-2, Appendix B 3-3), including both breaks and blips. The difference between a break and a blip is the impact of the event; if it is long enough, it does not depend on whether the event triggers the biggest change in demand within a single month.

The table below summarises the findings and lists fifteen events that are reflected as breaks or blips in either or both real demand series in two political regimes. The statistics shows the percentage change in real demand series caused by this break. The positive sign indicates an increase in real demand, so that people perceive the event as good news for holding more money; while the negative sign indicates a decrease in real demand, in which people perceived the event as bad news for holding money.

Table 3-1 Major events and their reflection in real demand series in Chongqing and Shanghai series

Dates	**Events**	**Chongqing**	**Shanghai**	
			M *(Fabi)*	**M (CRB)**
1939.08-11	Military developments in European theatre	-8.90%	-7.77% *	
1939.12	News from Japanese government		-9.08% *	
1940.04	Puppet Chinese government in Nanjing	-15.85% *		
1940.07	Battle of Zaoyang-Yichang	-21.99% *		
1941.01	Hundred Regiments Offensive	+17.01%		
1941.08	US oil embargo on Japan	+10.88%		
1941.12	Pearl Harbour Attack			+19.40% *
1942.02	News from Japanese government		-13.33%	
1942.06	Abolishment of *fabi*			+24.34% *
1943.03	Handover of foreign concession			+17.64% *
1943.05	Battle of West Hubei	-12.65% *		
1944.06-07	D-Day, Battle of Saipan	+11.56%*		-16.00%
1944.10	Battle of Leyte Gulf			-20.38% *
1944.12	Bombing in Tokyo			-34.28% *
1945.06-09	Japanese surrender	+48.38% *		-33.67%

N.B. Breaks are denoted with (*); ** Germany officially surrendered on 8 May, and Japan on 15 August, 1945.
Source: Guo (1979); Appendices B.

3.4.1 Free China (Chongqing series)

Analysis of real money demand in Free China generates many surprises. Many important events (such as the beginning of the Second World War in Europe) are either insignificant or exert only minor influence (blips) compared to some local news.

3.4.1.1 Breaks

April 1940 (decrease in demand by 15.85%) – establishment of a puppet government in Nanjing

On 29 March 1940, the 'Reorganized National Government of China' was set up in Nanjing, headed by Wang Jingwei and supported by Japanese troops.[502] It was not the first puppet regime in China. Officially, Central China, the North China puppet government, and the Menjiang government were all under Wang's government in Nanjing. In reality, this regime controlled only certain areas in Central China (including Jiangsu, Zhejiang, Anhui, Shanghai and Wuhan).

However, the Nationalist Government in Chongqing was particularly worried about the establishment of this puppet regime. Although he had split with Chiang and been expelled from the Nationalist Party, Wang Jingwei had previously been vice director general of the Nationalist Party and was ranked number two in the Nationalist Government. His open rapprochement with Japan and the 'restoration' of the National Government of China in Nanjing made people doubt whether his government in Nanjing or the government under Chiang in Chongqing should be the real legitimate government.

The Axis countries (Germany, Italy, Hungary, Romania, Denmark, Spain, Croatia, Slovakia, Bulgaria and Vichy France) quickly acknowledged the legitimacy of Wang's government, while the attitude of the Allied forces (except for the US State Secretary, Cordell Hull, who immediately supported Chiang's government on 30 March[503]) was ambiguous to begin with. Britain made clear its support for Chiang only almost two months later, on 10 May 1940.[504] A British diplomat commented, 'Let us see how much genuine Chinese support her new regime in China can command before we take an attitude towards it.'[505]

It seems that from the start, the emergence of Wang's government seriously undermined the legitimacy of Chiang's government, both internationally and domestically. There

[502] Ting-Yi Guo, *Chronology of the Republic of China Vol. 4 (Zhonghua Minguo Shi Shi Ri Zhi)*(Taipei: Department of Contemporary History, Academia Sinica, 1979), 132.
[503] Ibid.
[504] Ibid., 134.
[505] Fairbank and Feuerwerker, *The Cambridge History of China. Vol. 13*, 526.

was a genuine anxiety in Chongqing as it tried to reaffirm its diplomatic relationships with the major Allies.

July 1940 (decrease in demand by 21.99%) – Battle of Zaoyang-Yichang and closure of the Burma Road

The outbreak of the Second World War and the German advance in Europe stimulated the Japanese military progress in Asia. In early 1940, Japanese troops launched a new wave of military offensives aiming to annihilate the Nationalist Government and ending the warfare in China, so that Japan could concentrate its troops in Southeast Asia.

Japan decided that the quickest way was to capture Chongqing and force China to surrender. For this purpose, the Japanese launched the Zaoyang-Yichang Campaign in May. Yichang is a strategically critical town in western Hubei; and, after capturing it, the Japanese troops could move directly up the Yangtze River to Chongqing. The Nationalist Government employed its best troops to defend Yichang, but Japanese troops finally took it on 18 June 1940. Luckily the Chinese army, under the command of Li Zongren, encircled the Japanese troops in Yichang so that they could not press their attack on to Chongqing.[506] However, this battle depleted the best troops in the 5th War Area.

After the Chinese strategic victory (albeit at huge cost) in the Battle of Zaoyang-Yichang, Japan did not abandon its original plan of finishing Chongqing quickly. The Japanese troops succeeded in occupying the area to the north and west of Hubei, a vast area producing agricultural produce for Free China. At the same time, the Japanese troops used Yichang as an airbase and started air raids on Chongqing.[507] At the same time, Japan exerted diplomatic pressure on France and Britain, urging them to cut off the trade route from Southeast Asia to Free China. The Vichy Government of France sealed the route from Vietnam to Yunnan in late June. Britain also signed an agreement with Japan to close the Burma Road (from Burma to Yunnan) for three months from 18th July 1940.

[506] Long-Hsuen Hsu and Ming-Kai Chang, *History of the Sino-Japanese War (1938-1945)* (Taipei: Chung Wu Publishing Co., 1972), 334-9.
[507] Chongqing was bombed on 5, 16, 22, 31 July. The University of Chongqing and the Central University were also bombarded. Guo, *Chronology of the Republic of China*, 137-38.

This was the most difficult time for the Nationalist Government since the start of the war. Although the war around Chongqing moved into a stalemate, with intensified siege conditions (from the cutting of foreign aid from Vietnam and Burma to China) and constant bombardment, Chongqing would have been captured, had there not been incidents elsewhere. The incidents include the Hundred Regiments Offensive, which diverted Japanese attention from Free China to the North Jiangsu area.

May 1943 (decrease in demand by 12.65%) – Battle of West Hubei

In 1943, with the adverse situation in the Pacific theatre, Japan turned its attention back to China. The scale of the Battle of Hubei (early May-mid June 1943) was not particularly large,[508] but once again the aim was to invade Chongqing and destroy Chinese morale. The condition of the campaign was once again acute in late May. This situation was ended by a major Chinese victory in June.

July 1944: (increase in demand by 11.56%) – turn of the tide in the European and Pacific theatres

Several critical events occurred in this period. First, with the deterioration of the Pacific theatre, the Japanese troops launched Operation Ichi-Go in 1944. This operation consisted of a series of battles in North China (Henan), Central China (Hunan) and South China (Guangxi), aiming to unify three Japanese military bases and capture US airbases in South China, to secure a route for its military supplies in Southeast Asia and thus support the Japanese defences against the US in the Pacific.[509] It was the largest offensive since the Battle of Wuhan in 1938. After a series of devastating struggles from April to December, the Japanese marked a decisive victory.

However, Chinese people seemed not to be too dispirited. For one thing, despite their victory, the Japanese troops were not numerous enough to maintain an effective occupation and therefore later withdrew from many occupied territories. Another (and much more important) factor was that the tide in European and the Pacific theatres had completely turned by the summer of 1944.

[508] Hsu and Chang, *History of the Sino-Japanese War*, 390-5.
[509] Ibid., 416-33.

In the European theatre, the Allied forces had gained remarkable momentum since the spring of 1944. On 6 June (D-Day), the Allied forces invaded Normandy in Northern France and the German units in France were soon defeated. On the other side of the European battlefield, the Soviet Union also launched strategic offensives in Belarus, Western Ukraine and Eastern Poland. At the time, people expected optimistically that the war would be over by the end of 1944.

In the Pacific theatre, the US won two decisive battles in June: the Battle of Saipan and the Battle of the Philippine Sea. These two Japanese defeats pushed the Japanese Prime Minister, Hideki Tōjō, to resign. In particular, after the victory of Saipan in early July, the US removed its air forces from the bases in China (which had been destroyed by Japan) to Saipan and carried out intensive heavy bomber attacks on the Japanese home islands.

September 1945 (increase in demand by 48.38%) – Japanese surrender and the end of the war

At the beginning of 1945, Japanese troops launched another wave of offensives (in west Hunan, north Hubei and west Henan) as its last desperate attempt to crush China. But the offensives were quickly rolled back by the Chinese counteroffensive. The Chinese forces recovered the three provinces.

The German surrender in May 1945 was a blow to the Japanese. In June, US forces came nearer Japan and took Iwo Jima, Okinawa, by the end of the month. In August, the US dropped two atomic bombs on metropolitan Japan. The Soviet Union also invaded Manchuria and the Korean Peninsula. The Pacific War ended on 15 August 1945 (Victory over Japan Day). The formal Instrument of Surrender was signed on 2 September on a US battleship in Tokyo Bay. The Instrument of Surrender to China was signed in Nanjing on 9 September 1945. The Chinese territories which had been occupied by the Japanese, including Manchuria and Taiwan, were returned to China. The Sino-Japanese War formally ended.

3.4.1.2 Blips

November 1939 (decrease in demand by 8.90%) – Reaction to developments in Europe

No single particular event could be found (either domestically or internationally) for this blip. This blip may have been induced by the news from the European front, which took the people in Free China a longer time to realise the severity of the situation.

January 1941 (increase in demand by 17.01%) – Hundred Regiments Offensive

This increase in money demand accompanied the Chinese victory in the Hundred Regiments Offensive. This offensive was led by the Communist divisions of the Nationalist Army in Japanese-occupied North China. This offensive was more like a guerrilla war, and did not acquire much importance in terms of how many cities or towns the Communist army recovered. However, it was a critical event that to some extent raised the siege of Chongqing. The Battle of Zaoyang-Yichang resulted in a stalemate. Large numbers of Japanese troops were stationed in the city of Yichang and in Hubei province. The Hundred Regiments Offensive diverted Japanese attention from Hubei back to its occupied territory in North China. China's capital, Chongqing, was therefore temporarily safe from immediate Japanese threat.

August 1941 (increase in demand by 10.88%) – US oil embargo on Japan

With the stalemate in China, Japan turned its attention to Indochina and Vietnam. Although one of the reasons for the Japanese expedition in Southeast Asia was to seal Free China's trade route, the deployment of major Japanese forces to outside China was nevertheless good news for the war-torn Chongqing government. The Japanese quickly occupied Saigon and South Vietnam. The Japanese aggression in Southeast Asia harmed the Western powers' interests. The United States, United Kingdom and other Western powers reacted with a freeze on Japanese assets. On 1st August 1941, the United States announced an oil embargo against all 'aggressors'.[510] Since U.S. supplied more than 80% of Japan's oil, this policy was widely perceived as a declaration of war on Japan, and thus greatly raised people's morale in Free China.

[510] "World War Ii Timeline," in *World War II Database*.

3.4.2 Occupied China (Shanghai series)

As noted above, the case of the puppet Nanjing Regime is a little complicated: *fabi* was the major currency in circulation even after the occupation of the area in late 1937. The CRB notes appeared in the market in January 1941 and began to be issued in large quantities only by the latter part of 1941. From January 1941 to June 1942, *fabi* and CRB notes co-circulated in Shanghai. After June 1942, *fabi* ceased to circulate and CRB notes became the only dominant money in the market.

The structural analysis considers both demand series $\ln D_{sh1}$ and $\ln D_{sh2}$ (by using *fabi* and CRB notes as denominators respectively) as investigated in their full lengths. However, since the *fabi* was replaced by CRB notes after June 1942, the structural breaks of $\ln D_{sh1}$ which occur after June 1942 are not discussed. Likewise, the structural breaks of $\ln D_{sh2}$ which occur before June 1941 are not explored (we simply assume that after six months of circulation, the CRB notes in the market became as least as important as the *fabi*).

3.4.2.1 Breaks

August 1939 (decrease in demand of *fabi* by 7.77%) – Pre-WWII events

In Shanghai the turning points of real money demand emerged a month before the start of the European War. Although the European War formally broke out on 1st September 1939, the pre-war developments in early 1939 were intense: in March Germany annexed Austria and in August it occupied the whole of Slovakia. A series of European events would have made people expect that important events were going to happen sooner or later and that, with these events, global attention and international aid to China would be reduced. China's chance of winning therefore seemed dimmer.

Domestically, the condition of the financial market in Shanghai was shaky at the time, perhaps not least because of the military developments in Europe. As noted above, at this time the foreign exchange market was still maintained in the International Settlement of Shanghai, and the Sino-British Stabilisation Fund was founded in March 1939 to maintain the official exchange rates of *fabi*. However, the fund was quickly

depleted. Foreign exchange controls were imposed on 18 July and on the same day the exchange rate of the *fabi* on the black market jumped. The market instability in Shanghai even attracted Chiang's attention, and on 30 July he contacted the US government, requesting American aid to stabilise the market.[511]

December 1939 (decrease in demand of *fabi* by 9.08%) – news from Japanese Government

No particular events took place in China, except for the Battle of South Guangxi (mid November 1939-late February 1940). The increase in real money demand was more likely to be caused by the unstable financial market in Shanghai, as well as by international news. In late November, Nobuyuki Abe, the newly elected Japanese Prime Minister, acknowledged that the 'China Incident' was too complicated and could only be resolved in five to ten years. As Shanghai was already under Japanese control, news from Japan and about the Japanese Prime Minister's speech should have easy to know about.[512] Abe's speech was probably perceived as a signal that the Japanese control of Shanghai would not be temporary, and that in the long run, the holding of *fabi* would not be secure.

December 1941 (increase in demand of puppet notes by 19.40%) – Pearl Harbour Attack

Estimations of $\ln D_{sh2}$ (the demand series with puppet note as the denominator) shows a significant decrease. It seems that the outbreak of the Pacific War strengthened people's belief that the Japanese control over Shanghai (and China) would be long, and therefore it would be wise to hold notes issued by the Central Reserve Bank (never to be confused with the 'Central Bank of China', which is the real Central Bank of the Nationalist Government). This consideration seems to be confirmed by subsequent actions by the Japanese. After the Pearl Harbour Attack on 8 December 1941, the Japanese troops gradually took control of the international settlements and concessions in Shanghai.

June 1942 (increase in demand of puppet notes by 24.34%) – abolition of *fabi*

In the months following the Pearl Harbour Attack, Japan quickened the pace of its invasion both the Pacific and Southeast Asia. In a short time the Japanese Army swept

[511] Guo, *Chronology of the Republic of China*, 106-7.
[512] Ibid., 115.

through large areas. For a time it appeared that the Japanese 'Pan-Asia economic zone' slogan was going to be realised soon. In Shanghai, the Japanese troops also finalized their monetary move by setting 25 June 1942 as the final date for the 'abolition of *fabi*'. The approach of this deadline for *fabi* suddenly caused puppet notes to be favoured in the market.

March 1943 (increase in demand of puppet notes by 17.64%) – handover of foreign concessions to the puppet regime in Nanjing

For China, Pearl Harbour had its own positive impact: it finally drew the United States into the war. The United States recognized the importance of China in holding back Japan's major military strength. The last thing that the United States wanted to see in China was a rapprochement between Japan and the Chongqing government, in which case, Japan could deploy its full strength in the Pacific theatre while at the same time benefiting from China's abundant resources. The United States, therefore, became the main source of foreign aid starting from 1942. The Nationalist Government was no longer fighting the war alone and China was again back to the world stage. In October 1942, both the United States and Britain relinquished their rights of extra-territoriality in China, and new treaties were signed in January 1943.[513]

In response to this diplomatic move, and in order to build up a 'legitimate' image of Wang's puppet regime, Japan and the puppet government in Nanjing signed the joint declaration which stated that Japan was going to return its foreign concession to the Chinese government in Nanjing (in January 1943).[514] In late February, the Vichy Government in France declared that it would hand over the sovereignty of its foreign concessions to the puppet Chinese government in Nanjing. In March, Hideki Tōjō took the time to fly from Tokyo to Nanjing to sign the agreement for returning Japanese concessions.[515] Thereafter, the puppet government in Nanjing assumed the exercise of sovereignty over the French and Japanese concessions in Shanghai, Beijing and Tianjin. These diplomatic measures seemed to strengthen the position of Wang's puppet regime and its puppet notes. However, people's confidence in the puppet regime (or rather in Japan) was not to last long.

[513] Ibid., 215-6, 24.
[514] Ibid., 223.
[515] Ibid., 229, 32.

October 1944 (decrease in demand of puppet notes by 20.38%) – turn of the tide

Since the summer of 1944, the tide of the war had turned against the Axis countries. In the European theatre after the D-Day in June, the Allied troops entered Belgium and liberated Brussels and Antwerp in September. Luxembourg was also liberated and France was cut in half. On the other side of the theatre, Soviet Union entered Yugoslavia.

In the Pacific theatre, the Allied forces also made significant progress (the Battle of Saipan in June enabled the U.S army to bombard Japan proper). People's confidence in the existence of the puppet regime in Nanjing (and therefore in the puppet money) was already shaken in June 1944 (reflected as a blip in the series).

A heavy blow for Japan in October was defeat in the Battle of Leyte Gulf (23-26 October). This is the second battle of the Philippine Sea, and is generally considered to be the largest naval battle of World War II. The Imperial Japanese Navy suffered its greatest loss of ships and crew in this battle. Within the same month, the US air forces also attacked the Ryukyu Islands and Taiwan.[516]

In China, the Japanese Army launched the Operation Ichi-Go, during which Japan drew in its best troops and a lot of resources. Since Japan had implemented a policy of 'sustaining the war by war itself', resources to finance the war were extracted from the occupied areas, and the economic strain could be easily felt in the market. Meanwhile on 14 October, the Japanese Prime Minister, Fumimaro Konoe, sent his delegate to Shanghai in the hope of negotiating a ceasefire with the Nationalist Government. The negotiation reached no agreement. However, news of this talk should have rather disturbed Shanghai market.

December 1944 (decrease in demand of puppet notes by 34.28%)

By the end of the year 1944, the tide of the war was clear irreversible. In Europe, the Allies launched their winter invasion. In the Pacific, having lost the Philippines Campaign, the Japanese moved the Japanese South Army headquarters from Manila to

[516] Ibid., 311-4.

Saigon in Vietnam. In Southeast Asia, however, things were not going on well for Japan either. The Allied South East Asia Command also launched offensives in Japanese-occupied Burma. Besides, US forces carried out a series of bombing raids on Japan and Nanjing, the seat of Wang's puppet government.[517]

On 23 November, Wedemeyer, the newly appointed U.S. Chief Commander in South East Asia, told journalists that his military campaign plan was already approved by Chiang and that he was confident in defeating the Japanese troops in China. The impact of the news in the occupied area was huge.[518]

3.4.2.2 Selected blips

February 1942 (decrease in demand of *fabi* by 13.33%) – News from Japanese government

The months between the Pearl Harbour and the summer of 1942 were the heyday of the Japanese Imperial Army. Japanese troops made rapid advances in both the Pacific and Southeast Asia. By February 1942, Japan had already conquered Hong Kong, Macao, Singapore, Manila, and Java. On 16 February, the Japanese Prime Minister, Hideki Tōjō (the one who launched the Pearl Harbour Attack), claimed that Japan 'was going to liberate the whole Asia'.[519]

June 1944 (decrease in demand of puppet notes by 16.00%) – D-Day, Battle of Saipan

The inflation rate reached 50.46% monthly. On 6 June 1944 (the D-Day), Western Allies landed in France, and had reached Germany by September. Also in June, the US Army won decisive victory in the Battle of Saipan and the Battle of Philippines, and the Japanese navy was driven back to the islands of Japan.[520]

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[517] And supporters (no matter hearty or not) of the puppet regime would not deny that the death of Wang in November was not a blow to them. Ibid., 318.
[518] Ibid., 317-21.
[519] Ibid., 197.
[520] Ronald H. Spector, *Eagle against the Sun: The American War with Japan*(New York: Free Press, 1985), 208-301.

June 1945 (decrease in demand of puppet notes by 33.67%) – The Japanese Surrender

Germany surrendered on 7 May. In June the Battle of Okinawa ended in a decisive US victory. The US Army started bombing Japanese cities and cut off Japanese imports. In Shanghai, inflation reached 301.96% in June. In August 1945, the US military dropped two atomic bombs on Hiroshima and Nagasaki. The Soviet Union kept its promise made at Yalta and invaded the Japanese-held Manchuria. In Shanghai the price level rose by 106.29% in this month. The Japanese surrendered on 15 August (V-J Day). People in China had already expected this event as early as June, and the exact date was just a matter of a little more time. Compared with eight years of severe battle and heavy losses, two more months is nothing, really, nothing.

3.4.3 Discussion

From Table 3-1 we can see that in Chongqing, events that had a long-term impact in the demand trend are the establishment of the Puppet government in Nanjing, the Battle of Zaoyang-Yichang, the Battle of West Hubei, D-Day (when the tide of the European battlefield is reversed) and the Japanese surrender. Most of the breaks are events that directly endangered the very existence of the Nationalist Government, either militarily or diplomatically. Events such as the outbreak of the Second World War in Europe and the Pearl Harbour Attack were not that significant in the eyes of the people at that time.

Events that had caused breaks in the Shanghai series are all related to one concern: whether the Japanese rule in the occupied areas would be permanent, (would the progress of the Japanese military operation in the Pacific continue). For example: in September the European War broke out; in December 1939, no particular events took place in terms of the progress of the war. However, in November 1939, the newly elected Japanese Prime Minister acknowledged that the 'China Incident' was too complicated and could only be resolved in five to ten years. All these news seems to suggest that the Japanese rule in China would be long term, and these news would cause panic among *fabi* holders.

One striking feature of the table is the apparent diversity of interest among the money holders of the two cities. Nevertheless, three events caused statistically significant reactions in both cities (though sometimes caused real money demand movements in opposite directions): the outbreak of the Second World War in Europe, D-Day and the Battle of Saipan, and finally the surrender of Germany and Japan. All these three cases are important international events during the Second World War. It could probably be inferred that the people's expectations of the Sino-Japanese War largely depended on the development of the war in other parts of the world.

Besides, in all three cases, reactions in the Shanghai series preceded those of the Chongqing series. The Shanghai market seemed to react (and sometimes anticipated) more quickly to international news than Chongqing did, and therefore the problem of asymmetric information probably existed.

3.5 Concluding remarks

The result of the study sheds light on three major issues. First, military, political and economic events have significant impact on the behaviour of money holders. When a piece of news came that was generally perceived as unfavourable to a regime (for example, the defeat of its army in a major battle, or a disruption of diplomatic relations with foreign countries), the credibility of the government would be undermined. People who held the money issued by this particular regime would then adjust their money holdings: if the regime kept losing in the war, money holders would prefer to spend the money as quickly as possible, or to exchange the money for other 'harder' currencies. These behaviours would increase the real demand of this particular currency. On the other hand, when the regime defeated its enemies and gained international support, money issued by this regime would be regarded as 'safe', and the demand would fall. The series on money demand can therefore also be used to detect historical events. In the Chinese context, it probably works better than conventional indicators like bond price or asset price (in foreign exchange market) in China.

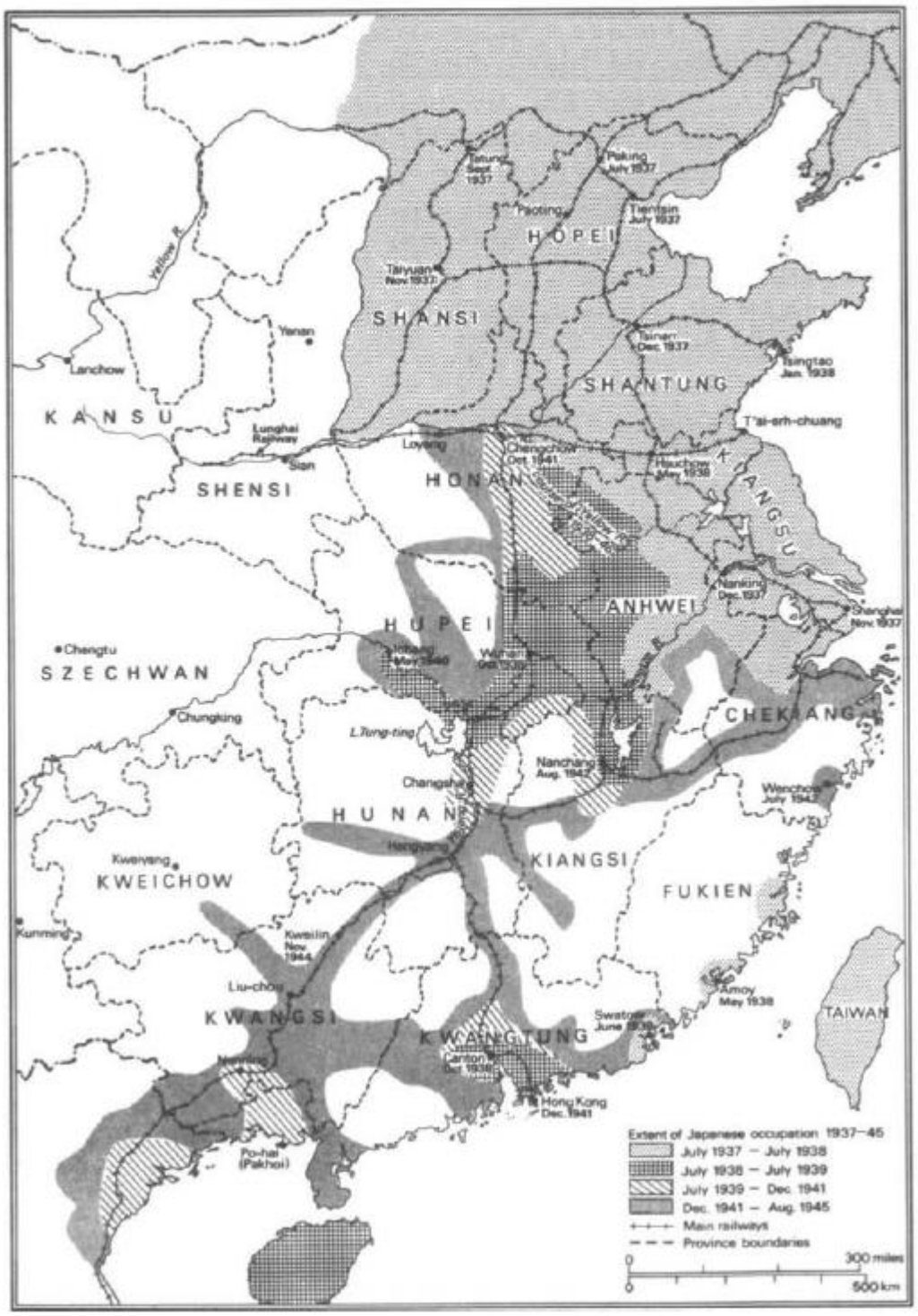
Second, the findings suggest a problem of asymmetrical information across different monetary regimes during the war. It also reveals a divergence of interests and priorities between Free China and the Japanese-occupied China. Before the attack on Pearl Harbour in December 1941, the inflationary processes in Shanghai and Chongqing presented a similar pattern. After 1941, people in Free China were affected by domestic news (especially news that impinged upon the existence of the Nationalist Government). In Shanghai, however, people's expectation was more tied up with the Japanese military advance, especially in the Pacific theatre.

Finally, the paper seeks to determine how the wartime events also triggered inflation by influencing the note issue (although the paper does not claim the magnitude of events would overrun that of note issue). The study of the real demand series shows that people's expectation and money-holding behaviour, as expressed in the real demand, are closely linked with the development of war both at home and abroad. It seems to suggest that besides the problem of runaway note issue, the progress of the war also had

a great impact in the progress of velocity of circulation (almost the reverse of real money demand) and therefore on the wartime inflation.

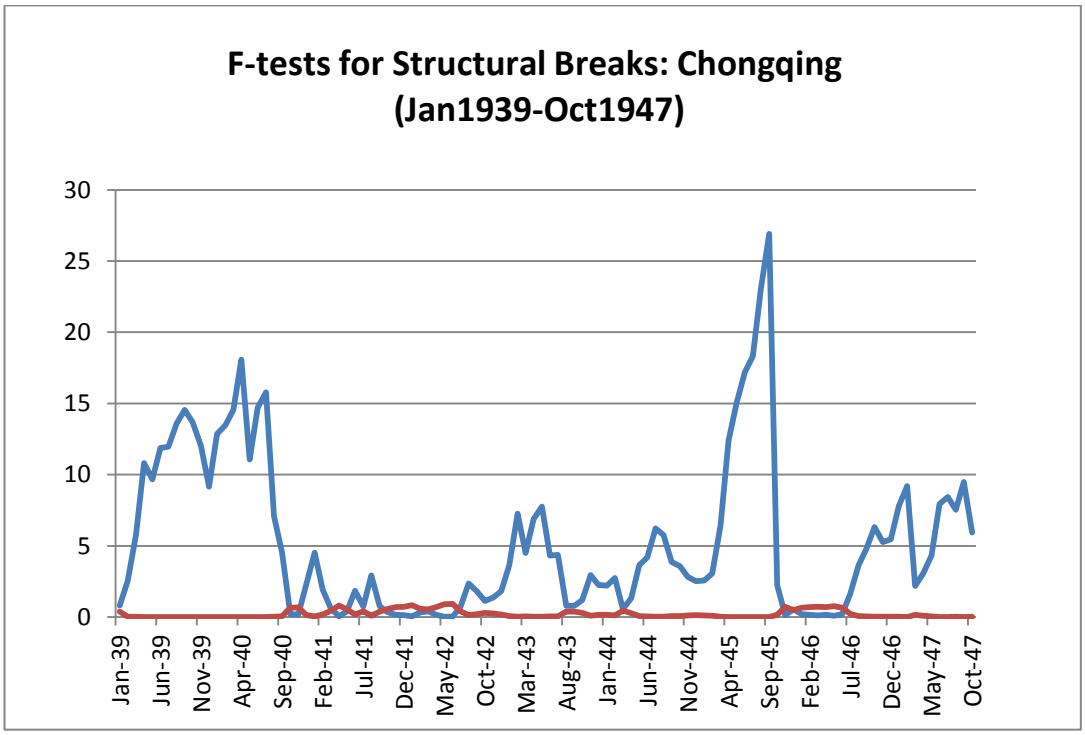
3.6 Appendices

Map 3-1 Map of China – Japanese advances and occupation

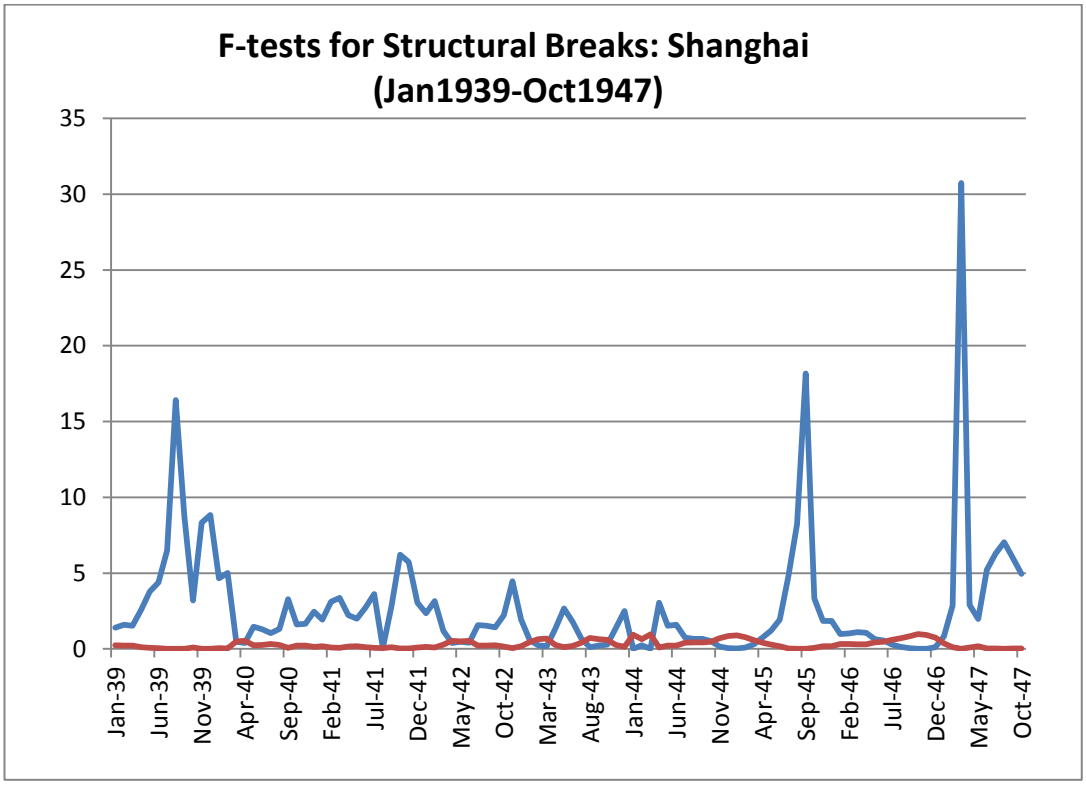


Source: The Cambridge History of China, Vol. 13, p. 549.

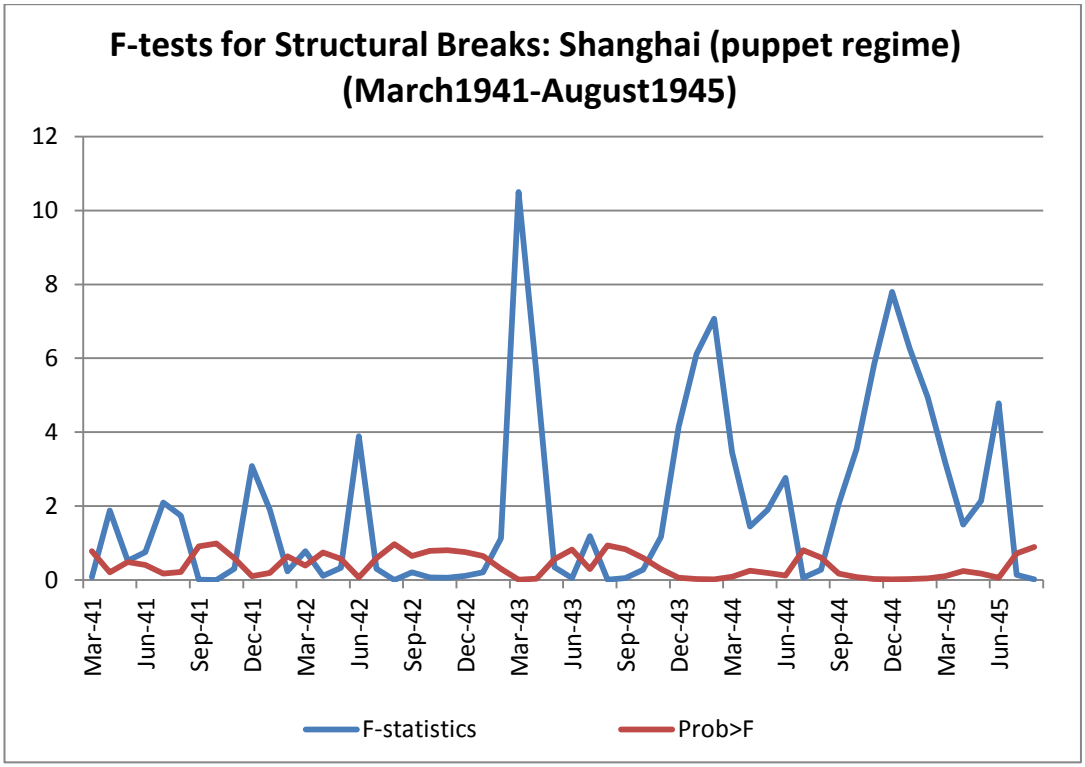
Appendix A 3-4 *F*-tests for structural breaks in real money demand (LnM_{fabi} - LnP_{ck}): Chongqing, January 1939-October 1947



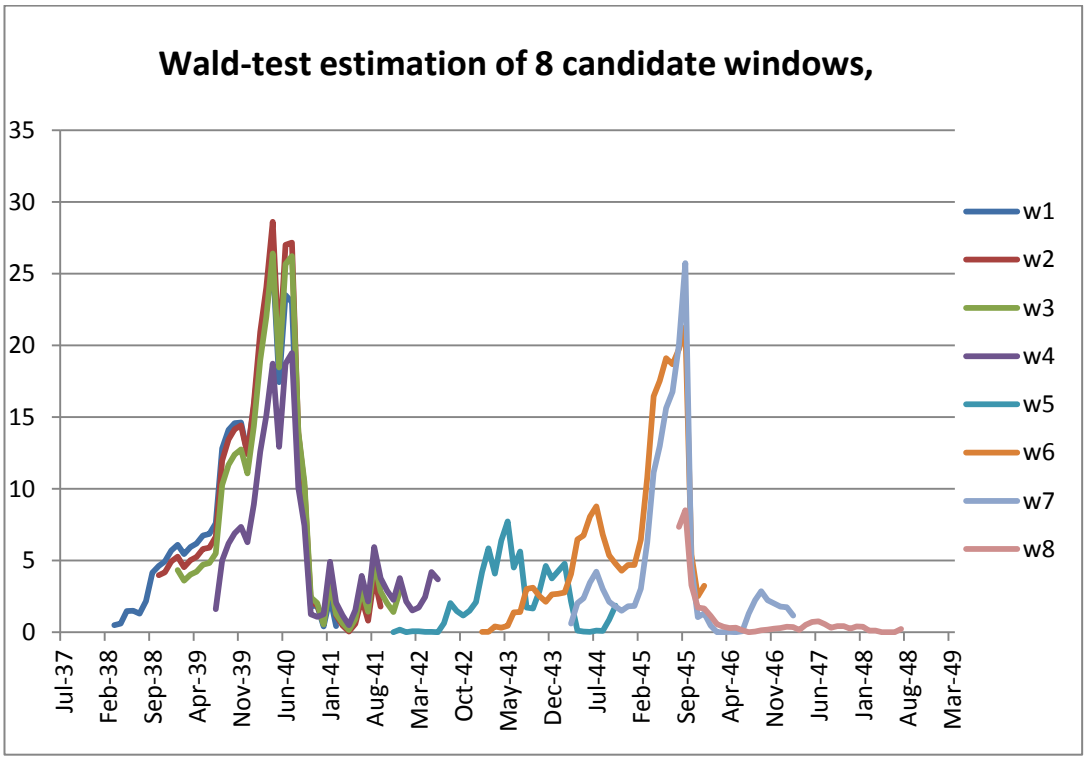
Appendix A 3-5 *F*-tests for structural breaks in real money demand (LnM_{fabi} – LnP_{sh}): Shanghai, January 1939-October 1947



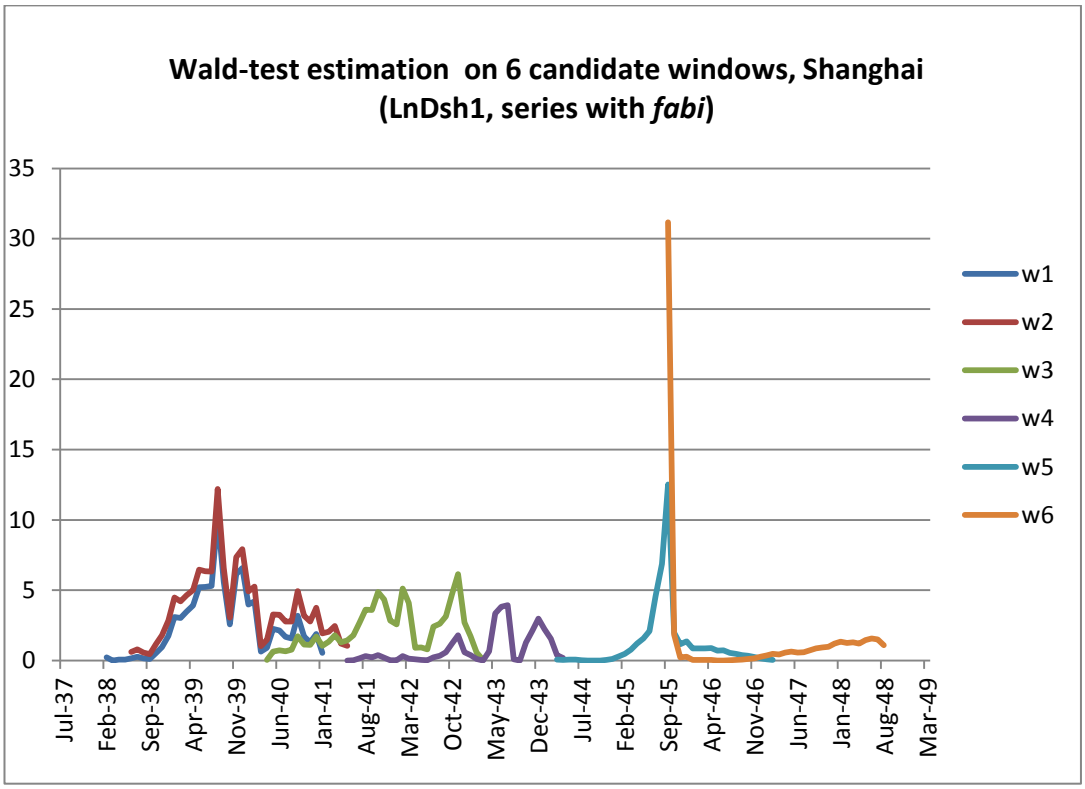
Appendix A 3-6 *F*-tests for structural breaks in real money demand (LnM_{CRB} - LnP_{sh}): Shanghai, January 1941-August 1945



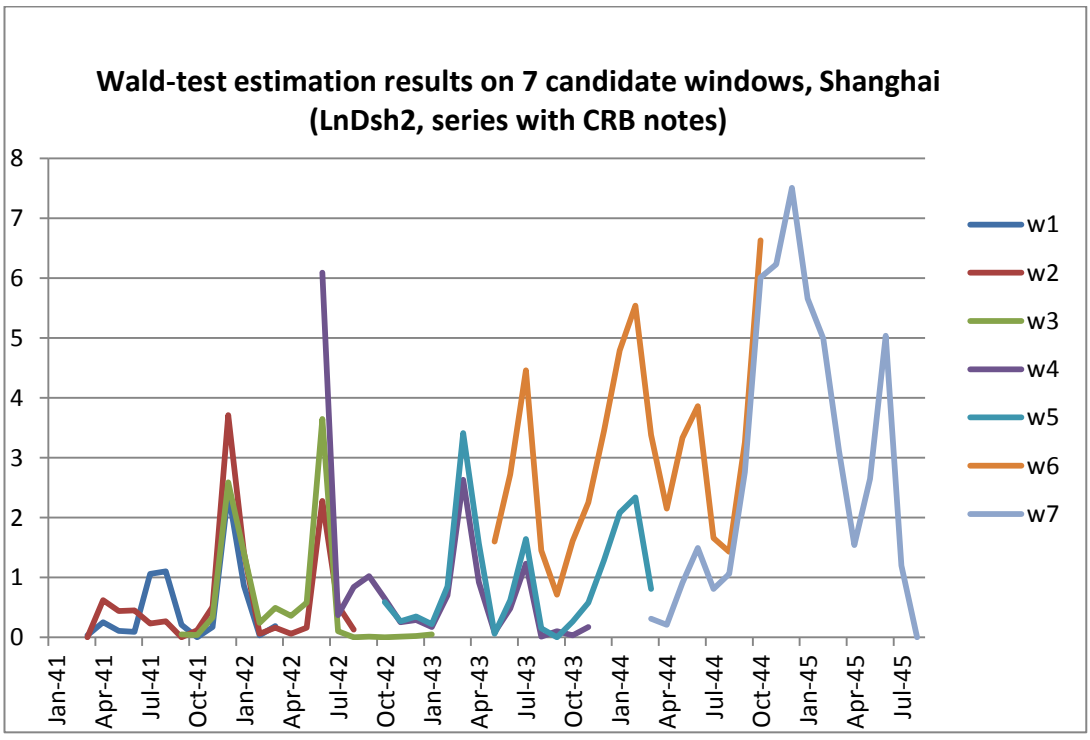
Appendix A 3-7 Wald-test estimation results on 8 candidate windows, Chongqing



Appendix A 3-8 Wald-test estimation results for 6 candidate windows, Shanghai (LnDsh1)



Appendix A 3-9 Wald-test estimation results on 7 candidate windows, Shanghai (LnDsh2)



Appendix B 3-1 Breaks and blips in real money demand in Chongqing

Date (1)	Beta (2)	Lamda (3)	F-statistics (4)	Prob>F (5)	ST % change (6)	LT % change (7)
Apr-40	0.9024	-0.1725	28.61	0.0000	-15.85	-17.25
Jul-40	0.8306	-0.2484	26.24	0.0000	-21.99	-24.84
May-43	0.7897	-0.1352	7.74	0.0079	-12.65	-13.52
Jul-44	1.0208	0.1094	8.79	0.0048	11.56	10.94
Sep-45	0.7183	0.3946	25.75	0.0000	48.38	39.46
blips						
Nov-39	0.9908	-0.0932	14.63	0.0004	-8.90	-9.32
Jan-41	1.0950	0.1571	4.92	0.0317	17.01	15.71
Aug-41	1.0428	0.1032	5.94	0.0188	10.88	10.32

Appendix B 3-2 Breaks and blips in real money demand in Shanghai (M= note issue of *fabi*)

Date (1)	Beta (2)	Lamda (3)	F-statistics (4)	Prob>F (5)	ST % change (6)	LT % change (7)
Aug-39	0.7476	-0.0808	10.27	0.0025	-7.77	-27.41
Dec-39	0.7282	-0.0952	7.91	0.0073	-9.08	-29.55
Nov-42	0.8392	-0.1430	6.13	0.0171	-13.33	-58.90
Jul-43	0.9326	-0.1458	3.93	0.0535	-13.57	-88.51
Sep-45	0.5703	-0.9145	12.51	0.0010	-59.93	-88.09
blips						
Sep-40	0.8153	-0.0710	4.93	0.0315	-6.85	-31.91
Oct-41	0.8415	-0.1143	4.86	0.0326	-10.80	-51.38
Feb-42	0.8151	-0.1309	5.11	0.0286	-12.27	-50.74
Dec-43	0.9583	-0.1296	2.98	0.0913	-12.16	-95.53
Jun-48	0.7020	-0.4683	1.57	0.2167	-37.40	-79.23

Appendix B 3-3 Breaks and blips in real money demand in Shanghai

(M= note issue of Central Reserve Bank)

Date (1)	Beta (2)	Lamda (3)	F-statistics (4)	Prob>F (5)	ST % change (6)	LT % change (7)
Dec-41	0.8886	0.1773	3.71	0.0692	19.40	391.04
Jun-42	0.8383	0.2179	3.65	0.0697	24.34	284.56
Mar-43	0.5467	0.1624	3.41	0.0789	17.64	43.09
Oct-44	0.6234	-0.2279	6.63	0.0176	-20.38	-45.39
Dec-44	0.3456	-0.4198	7.51	0.0134	-34.28	-47.35
blips						
Jul-41	1.0592	-0.1431	1.06	0.3199	-13.33	1022.21
Aug-41	1.0623	-0.1412	1.10	0.3131	-13.17	863.66
Apr-41	0.9521	0.0859	0.62	0.4392	8.97	501.74
Sep-42	0.7219	0.1434	1.02	0.3233	15.42	67.48
Jul-43	0.8546	-0.0938	1.64	0.2144	-8.95	-47.53
Feb-44	0.5898	-0.1657	5.54	0.0284	-15.27	-33.23
Jun-44	0.6614	-0.1744	1.49	0.2379	-16.00	-40.26
Jun-45	0.5343	-0.4105	5.04	0.0376	-33.67	-58.58

Notes: Column (1) shows the break (or blip) point dates determined by the algorithm described in section 3.4.2. Column (2) is the coefficient β_1 calculated by equation (11). Column (3) γ is the change in the conditional mean. Column (4) is the *F-statistics* that shows the probability of a break at the specific date (the higher the *F-statistic* the higher the possibility of a break). Column (5) is the significance of the break. Column (6) is the percentage change in demand, based on equation (13). Column (7) is the long-run percentage change in demand, based on equation (14); this column is only indicative when the series does not contain a unit root (i.e., only works when β<1).

Thesis Conclusion

The first main chapter examines the monetary policies during the reign of Xianfeng (1851-61) and offers a new explanation for the mechanism behind the Xianfeng inflation (1853-61) in early modern China. By reconstructing systematic historical data on government income and expenditure, the amount of money created as well as the annual money stock in Beijing, the chapter shows that the monetary policies introduced in this reign did not cover the military outlay. The government paper notes were used in government salary payments but they could barely buy anything. In fact the monetary policies during this period only temporarily relieved the fiscal crisis of the central government, and their function was more of a fiscal nature. The inflation was caused by the plethora of debased coins and by the official banknotes issued to exchange for government paper notes. With the debasement of the coinage, price levels rose and the unit of account depreciated. Since banknotes were linked to the copper *cash* (and later to big *cash*), their purchasing power depreciated as well. Official banknotes were over-issued and had no proper backing. Serious inflation occurred in 1860 and 1861, not due to any further creation of money by the government, but due to runs on real metal against banknotes.

Monetary policies were never been more active during the entire Qing dynasty than in this particular period. A run of money creation ensued, consisting of both traditional methods (debasement) and modern elements (paper money and banknotes). However, with the limited monetary knowledge among officials and even more limited resources, the monetary policies of Xianfeng's reign were ill designed and far from a monetary reform. Predictably, these policies, which were imperfectly implemented in different regions, prompted a gradual collapse of the traditional monetary system; nonetheless, they set in motion monetary regionalisation, and incidentally accelerated the monetary evolution.

The second main chapter identifies the problem of the shortage of small money in China which is common in a bimetallic monetary system. In the late 19th century, the shortage of copper *cash* aggravated the fall in the price of silver and therefore provoked a

permanent change in the silver/copper price ratio in the commodity market. With difference-in-differences estimations on regional grain price changes, the chapter demonstrates how the introduction of new coinage minted using steam technology helped to ease rural monetary stringency without necessarily generating inflation, and thereby encouraged output and trade. It also shows that the province-initiated monetary reform was a progressive measure, contrary to the conventional judgement that regional mints were purely profit driven and only added to the monetary chaos. The population started to accept copper coins as token money. This development prepared for the evolution of the monetary system from a bimetallic standard to a silver standard (during Republican China) in which copper coins became subsidiary currency to the silver dollar. The research therefore echoes theories on commodity money which claim that coins with smaller denomination are better accepted as token coins in order to prevent a chronic shortage of them, and that steam technology ensured the provision of token coins without opening the door to private counterfeiting.

The third main chapter studies the behaviour of fiat money holders during the war. During this period, paper currency became the only commonly used money in the market and, when the war started, governments (legitimate or puppet) all rushed to speed up their printing presses so as to increase the revenues from seignorage. The chapter applies structural break tests on time series of the real demand of money in different monetary regions to see what, given a choice, makes them hold a currency and what makes them renounce it. It identifies the timing of the breaks with historical events and shows that in wartime, the soundness of the fiat currencies lies in the survival of the governments that issue them.

This thesis traces the odyssey of the monetary evolution in China, which occupied a span of almost a century (from the 1850s to the 1940s); and the three main chapters examine three episodes from three different angles. The evolution started from a commodity money system, in which the state had very limited control over the money supply, and advanced to a fiat money system by which the government was able to carry out an inflationary monetary policy which sustained arduous warfare for eight years. Throughout history, the monetary authority has struggled between its fiscal needs and the obligation to provide a sound means of exchange. Along with the collapse of the old regime and the gradual building of the modern state, the credibility of money

migrated from its intrinsic value to the endorsement of modern technology, and eventually to the state as a monetary institution. During wartime, however, a fiat money system is understandably subject to state manipulation, and the soundness of the money depends on the life or death of the state.

Bibliography

Atwell, William S. "Notes on Silver, Foreign Trade, and the Late Ming Economy." *Late Imperial China (Ch'ing-shih wen-t'i)* 3, no. 8 (1977): 1-33.

Banerjee, Anindya, Robin L. Lumsdaine, and James H. Stock. "Recursive and Sequential Tests of the Unit-Root and Trend-Break Hypotheses: Theory and International Evidence." *Journal of Business & Economic Statistics* 10, no. 3 (1992): 271-87.

Bordo, Michael D. "History of Monetary Policy." In *The New Palgrave Dictionary of Economics Online*, edited by Steven N. Durlauf and Lawrence E. BlumePalgrave Macmillan, 2008. http://www.dictionaryofeconomics.com/article?id=pde2008_H000180.

Bordo, Michael D. ;, and Hugh Rockoff. "The Gold Standard as a "Good Housekeeping Seal of Approval"." *The Journal of Economic History* 56, no. 2 (1996): 389-428.

Brandt, Loren. *Commercialization and Agricultural Development: Central and Eastern China, 1870-1937*. Cambridge: Cambridge University Press, 1989.

Brandt, Loren, Debin Ma, and Thomas G. Rawski. "From Divergence to Convergence: Re-Evaluating the History Behind China's Economic Boom." *Department of Economic History Working Paper Series, LSE* 158, no. 12 (2012).

Brickers, R. A. . "Purloined Letters: History and the Chinese Maritime Customs Service ". *Modern Asian Studies* 40, no. 3 (2006): 691-723.

Broadberry, Steve, Guan Hanhui, and Li Daokui. "China, Europe and the Great Divergence: A Study in Historical National Accounting." *Working paper series for the Project 'Reconstructing the National Income of Britain and Holland, c.1270/1500 to 1850'*, no. F/00215AR (2013).

Cao, Shuji. *Population History of China: Qing Period (Zhongguo Renkoushi: Qing Shiqi)* [in Chinese]. Shanghai: Fudan University Press, 2001.

Chang, Kia-ngau. *The Inflationary Spiral: The Experience in China, 1939-1950* Cambridge: Technology Press of Massachusetts Institute of Technology, 1958.

Chen, Feng. *Papers on the History of Qing Public Finance (Qing Dai Cai Zheng Shi Lun Gao)*. Beijing: The Commercial Press, 2010.

Chen, Jerome. "The Hsien-Feng Inflation." *Bulletin of the School of Oriental and African Studies* 21 (1958): 578-86.

Cheng, Yu-kwei. "Change in Silver and Copper Cash Prices and Their Relationship with Price and Foreign Trade in China in the Late 19th Century (Shi Jiu Shi Ji Hou Qi Yin Jia Qian Jia De Bian Dong Yu Wo Guo Wu Jia Ji Dui Wai Mao Yi De Guan Xi) ". *Research In Chinese Economic History (Zhong guo jing ji shi yan jiu)* 1, no. 2 (1986): 1-27.

Cheung, Sui-wai. "Copper, Silver and Tea - the Quesiton of Eighteenth-Century Inflation in the Lower Yangzi Delta." Chap. Academia Sinica on East Asia In *The Economy of Lower Yangzi Delta in Late Imperial China : Connecting Money, Markets, and Institutions*, edited by Billy K. L. So, xiv, 309 p. : ill. ; 25 cm. London: Routledge, 2013.

"The China Year Book (Chung-Hua-Nien-Chien)." (1929-38).

Chou, Shun-hsin. *The Chinese Inflation, 1937-1949* New York: Columbia University Press, 1963.

Cipolla, Carlo M. . *Money, Prices, and Civilization in the Mediterranean World: Fifth to Seventeenth Century*. Princeton: Princeton University Press 1956, 1956.

Collection of Shanghai Price Index before and after the Liberation 1921-1957 (Shanghai Jie Fang Qian Hou Wu Jia Zi Liao Hui Bian 1921-1957). edited by Shanghai Academy of Social Sciences Shanghai: People's Press, 1958.

Computer Center, Academia Sinica. "Mapping of Chinese and Western Calendars " http://sinocal.sinica.edu.tw/

"Copy of the Imperial Treasury Records ". edited by CASS Social research division. Beijing, 1930.

Dai, Jianbing, and Ke Xu. "Brief Account of Copper Cash Policy in Qing Dynasty (Qing Dai Tong Zheng Lue Shu) ". *Jiangsu Numismatics* 36, no. 03 (2007).

Dernberger, Robert F. "The Role of the Foreigner in China's Economic Development, 1840-1949." In *China's Modern Economy in Historical Perspective*, edited by Dwight H. Perkins, 19-48. Stanford, California: Stanford University Press, 1975.

Fairbank, John K., and Albert Feuerwerker. *The Cambridge History of China. Vol. 13, Part 2 Republican China, 1912-1949*. Cambridge: Cambridge University Press, 1986.

Financial Archive Division, People's Bank of China, ed. *Selected Archive in Modern Chinese Monetary History, Vol. I. Late Qing Period (1840-1911) (Zhong-Guo Jin Dai Huo Bi Shi Zi Liao 1840-1911)* Beijing: Zhonghua Book Company, 1964.

Flandreau, Marc *The Glitter of Gold: France, Bimetallism, and the Emergence of the International Gold Standard, 1848-1873* Oxford: Oxford University Press, 2004.

Frey, Bruno S., and Daniel Waldenström. "Markets Work in War: World War Ii Reflected in the Zurich and Stockholm Bond Markets." *Financial History Review* 11, no. 1 (2004): 51-67.

Friedman, Milton "Franklin D. Roosevelt, Silver, and China." *The Journal of Political Economy* 100, no. 1 (1992): 62-83.

Gamble, Sidney D. "Daily Wages of Unskilled Chinese Laborers 1807-1902." *The Far Eastern Quarterly* 3, no. 1 (1943): 41-73.

Glassman, Debra, and Angela Redish. "Currency Depreciation in Early Modern England and France." *Explorations in Economic History* 25, no. 1 (1988): 75-97.

"Global Financial Data." Online historical database.

Guo, Ting-Yi. *Chronology of the Republic of China Vol. 4 (Zhonghua Minguo Shi Shi Ri Zhi)*. Taipei: Department of Contemporary History, Academia Sinica, 1979.

Hamashita, Takeshi. "Financial Structure of the East Asian Economic System with Special Reference to Hong Kong and Singapore ". In *The Evolving Structure of the East Asian Economic System since 1700*, edited by A. J. H. Latham and Heita Kawakatsu. London & New York: Routledge, 2011.

———. *Studies on Economic History of Modern China: Public Finance of Late Qing Maritime Customs and Treaty Port Market Network (ChūGoku Kindai Keizaishi Kenkyū : Shinmatsu Kaikan Zaisei to KaikōJō ShijōKen, Chinese Edition)* Nanjing: Jiangsu People's Press, 2006.

Ho, Chun-Yu, and Dan Li. "A Mirror of History: Chinese Bond Market from 1921 to 1942." *working paper series for the Project 'Reconstructing the National Income of Britain and Holland, c.1270/1500 to 1850'* (April 2010).

Ho, Hon-wai. "From the Cheap Silver and Copper Famine to the Depreciation of the Copper Coinage - the New Currency Issue and Its Consequence in Late Qing (Cong Yin Jian Qian Huang Dao Tong Yuan Fan Lan - Qing Mo Xin Huo Bi De Fa Xin Ji Qi Ying Xiang)." *Bulletin of the Institute of History and Philology*

Academia Sinica (Zhong Yang Yan Jiu Yuan Li Shi Yu Yan Yan Jiu Suo Ji Kan) 62, no. 3 (1993): 389-494.

Hsiao, Liang-lin. *China's Foreign Trade Statistics, 1864-1949* [in English]. Cambridge, Mass.: East Asian Research Center, Harvard University : distributed by Harvard University Press, 1974.

Hsu, Long-Hsuen, and Ming-Kai Chang. *History of the Sino-Japanese War (1938-1945)* Taipei: Chung Wu Publishing Co., 1972.

Iwai, Shigeki. *A Study of the Fiscal System in Late Imperial China*. Beijing: Social Sciences Academic Press (Chinese translation of the 2004 edition published by Kyoto University Press), 2004.

Jansen, Marius. "Japan and the Chinese Revolution of 1911." Chap. 6 In *The Cambridge History of China*, edited by John K.; Fairbank and Kwang-Ching Liu, 339-74. Cambridge: Cambridge University Press, 1980.

Ji, Zhaojin. *A History of Modern Shanghai Banking: The Rise and Decline of China's Finance Capitalism* Armonk, N.Y.: M.E. Sharpe, 2003.

Jia, Ruixue. "The Legacies of Forced Freedom: China's Treaty Ports." *IIES working paper, Stockholm University* (2010).

———. "Weather Shocks, Sweet Potatoes and Peasant Revolts in Historical China." *HiCN Working Paper* 93 (2011).

Kann, Eduard. *The Currencies of China: An Investigation of Silver & Gold Transactions Affecting China with a Section on Copper* London: P. S. King & Son, Ltd., 1928.

Kaske, Elisabeth. "Silver, Copper, Rice and Debt: Monetary and Office Selling in China During the Taiping Rebellion " In *Money in Asia (1200-1900): Small Currencies in Social and Political Contexts*, edited by Jane Kate Leonard and Ulrich Theobald, Forthcoming.

Kindleberger, Charles Poor. *A Financial History of Western Europe*. London: George Allen & Unwin, 1984.

King, Frank H. H. *A Concise Economic History of Modern China (1840-1961)*. Bombay: Vora, 1968.

King, Frank H. H. *Money and Monetary Policy in China, 1845-1895* [in English]. Cambridge, Mass: Harvard University Press, 1965.

Kishimoto-Nakayama, Mio. "The Kangxi Depression and Early Qing Local Markets." *Modern China* 10, no. 2 (1984): 227-56.

Kishimoto, Mio. "Foreign Silver and China's Domestic Economy During the First Half of the 19th Century." In *Asian Historical Economics Conference*, 13-15 September, 2012. Hitotsubashi University, Tokyo, Japan, 2012.

Klein, Kerwin Lee. "On the Emergence of Memory in Historical Discourse." *Representations* 69 (2000): 127-50.

Kuroda, Akinobu. "The Collapse of the Chinese Imperial Monetary System ". In *Japan, China, and the Growth of the Asian International Economy, 1850-1949*, edited by Kaoru Sugihara. Oxford; New York: Oxford University Press, 2005.

———. "Concurrent but Non-Integrable Currency Circuits: Complementary Relationships among Monies in Modern China and Other Regions ". *Financial History Review* 15, no. 1 (2008): 17-36.

Latham, A. J. H.;, and Larry Neal. "The International Market in Rice and Wheat, 1868-1914 ". *The Economic History Review* 36 no. 2 (1983): 260-80.

Li, Bozhong. "Investigation of the Early Modern Chinese Economy: From the Gdp Estimation of Huating-Louxian Area in the 1820s." *Journal of Tsinghua University (Philosophy and Social Sciences)* 14, no. 3 (2009): 14-6.

Liang, Chen. "Research on Copper Coin (1900-1935)." Nankai University, 2010.

Liang, Fangzhong. *Statistics on China's Historical Population, Cultivated Land and Land Tax (Zhongguo Li Dai Hu Kou Tian Di Tian Fu Tong Ji)* [in Chinese]. 1st ed. Shanghai: Shanghai People's Press, 1980.

Liang, Qichao. "Concise History of the Excessive Provincial Copper Coinage (Ge Sheng Lan Zhu Tong Yuan Xiao Shi)." In *Collected Works of Yinbingshi, with Annotation (Yin Bing Shi Wen Ji: Dian Jiao)*, edited by Song Wu, 1179-85. Kunming: Yunnan Education Press, 2001.

Lin, Man-houng. "China Upside Down: Currency, Society, and Ideologies, 1808-1856." 2006.

———. "Latin America Silver and China During the Daoguang Reign." In *Asian Historical Economics Conference*. Hitotsubashi University, Tokyo, Japan, 2012.

Liu, Ti. "An Estimation of China's Gdp from 1600 to 1840 (1600-1840 Nian Zhongguo Guonei Shengchan Zongzhi De Gusuan)." *Economic Research Journal (Jingji Yanjiu)* 55, no. 10 (2009): 144-55.

Ma, Debin. "Money and Monetary System in China in the 19th-20th Century: An Overview ". *Economic History Working Paper Series, London School of Economics* 159/12 (2012).

———. "Why Japan, Not China, Was the First to Develop in East Asia: Lessons from Sericulture, 1850-1937." *Economic Development and Cultural Change* 52, no. 2 (2004): 369-94.

Ma, Junya. "Traditional Finance and China's Agricultural Trade, 1920-1933." *Modern China* 34, no. 3 (2008): 344-71.

Mauro, Paolo;, Nathan; Sussman, and Yishay Yafeh. "Emerging Market Spreads: Then Versus Now." *IMF Working Paper*, no. 00/190 (2000).

Mayhew, Nick J. "Coinage and Money in England, 1086-C.1500." In *Medieval Money Matters*, edited by Diana Wood. Oxford: Oxbow, 2004.

Meng, T.P., and S.D. Gamble. *Prices, Wages, and the Standard of Living in Peking, 1900-1924*. Special Supplement to the Chinese Social and Political Science Review. Peking Express Press, 1926.

Mohanty, Chandra Talpade. "Under Western Eyes: Feminist Scholarship and Colonial Discourses." *Feminist Review* 30 (1988): 61-88.

Munro, John H. "Deflation and the Petty Coinage Problem in the Late-Medieval Economy: The Case of Flanders, 1334-1484." *Explorations in Economic History* 25, no. 4 (1988): 387–423.

Neal, Larry. *The Rise of Financial Capitalism: International Capital Markets in the Age of Reason*. Cambridge: Cambridge University Press, 1991.

Neal, Larry;, and Marc Weidenmier. "Crisis in the Global Economy from Tulips to Today: Contagion and Consequences." Chap. 10 In *Globalization in Historical Perspective*, edited by Michael D.; Bordo, Alan M.; Taylor and Jeffrey G. Williamson, 473-514. Chicago and London: The Univesity of Chicago Press, 2003.

Nugent, Jeffrey B. . "Exchange-Rate Movements and Economic Development in the Late Nineteenth Century." *Journal of Political Economy* 81, no. 5 (1973): 1110-35.

Officer, Lawrence H. "Bimetallism." In *The New Palgrave Dictionary of Economics Online*, edited by Steven N. Durlauf and Lawrence E. Blume.: Palgrave Macmillan, 2008.

Oosterlinck, Kim. "The Bond Market and the Legitimacy of Vichy France." *Explorations in Economic History* 40 (2003): 326-44.

Peng, Kaixiang. "Price and Wage Change in Contemporary Beijing: From the Early 19th to Early 20th Centuries (Jindai Beijing Jiage Yu Gongzi De Bianqian: 19 Shiji Chu Zhi 20 Shiji Chu)." *Seminar on Chinese Financial History Working Paper* (2011).

———. "Research on the Currency and Prices of Beijing, 1830s-1920s: Focusing on the Account Book of the Fire-God Society (1835-1926) (Jindai Beijing Huobi Xingyong Yu Jiage Bianhua Guankui: Jiandu Huoshenhui Zhangben 1835-1926)." *Forum of Economic Development Working Papers Series* No. FC20080161 (2008).

Peng, Xinwei. *A Monetary History of China (Zhong-Guo Huo Bi Shi)* [in Chinese]. Shanghai: People's Press, 1958.

Peng, Zeyi. *Public Finance and Economic Condition of Late 19th Century China (Shijiu Shiji Houbanqi De Zhongguo Caizheng Yu Jingji)* Beijing: People's Press, 1983.

Perkins, Dwight H. *Agricultural Development in China, 1368-1968* [in English]. Edinburgh: Edinburgh University Press, 1969.

Rawski, Thomas G. *Economic Growth in Prewar China* Berkeley: University of California Press, 1989.

Redish, Angela. *Bimetallism: An Economic and Historical Analaysis*. Cambridge: Cambridge University Press, 2000.

———. "The Persistence of Bimetallism in Nineteenth-Century France." *The Economic History Review, New Series* 48, no. 4 (1995): 717-36.

Remer, C. F. "International Trade between Gold and Silver Countries: China, 1885-1913." *The Quarterly Journal of Economics* 40, no. 4 (1926): 597-643.

Ren, Zhiyong. "A Study of the Silver Vault of the Ministry of Revenue in the Late Qing and Its Reform after the Boxer Uprising (Lun Shu Wan Qing Hu Bu Yin Ku Zhi Du Yu Gen Zi Zhi Hou De Bian Ge)." *Studies in Qing History (Qing shi yan jiu)*, no. 2 (2005): 44-50.

Ringrose, David R. "Towns, Transport and Crown: Geography and the Decline of Spain." In *Geographic Perspectives in History: Essays in Honor of Edward Whiting Fox*, edited by E. D. Genovese and L. Hochberg, 57-80. Oxford: Blackwell, 1989.

Rolnick, Arthur J., and Warren E. Weber. "Gresham's Law or Gresham's Fallacy?". *Journal of Political Economy* 94, no. 1 (1986): 185-99.

Sargent, Thomas J., and François R. Velde. *The Big Problem of Small Change* [in English]. Princeton, N.J. ;Oxford: Princeton University Press, 2002.

Schmoller, G. "Über Die Ausbildung Einer Richtigen Scheidemünzpolitik Vom 14. Bis 19. Jahrhundert.". In *Jahrbuch Für Gesetzgebung, Verwaltung Und Volkswirtschaft Im Deutschen Reich 24*, 1247-74, 1900.

Selgin, George A. *Good Money: Birmingham Button Makers, the Royal Mint, and the Beginnings of Modern Coinage, 1775-1821 : Private Enterprise and Popular Coinage* Ann Arbor: University of Michigan Press, 2008.

Shi, Zhihong. *Statistics on the Income, Expenditure and Stocks of the Treasury under Board of Revenue in Qing Dynasty (Qingdai Hubu Yinku Shouzhi He Kucun Tongji)*. Fuzhou: Fujian People's Press, 2009.

Skinner, William G. "The Structure of Chinese History." *The Journal of Asian Studies* 44, no. 2 (1985): 271-92.

Spector, Ronald H. *Eagle against the Sun: The American War with Japan*. New York: Free Press, 1985.

Spufford, Peter, Wendy Wilkinson, and Sarah Tolley. *Handbook of Medieval Exchange* edited by Royal Historical Society London: Boydell and Brewer 1986.

State Meteorological Society, China, ed. *Yearly Charts of Droughts/Floods in China for the Last 500-Year Period (Zhongguo Jin Wu Bai Nian Han Laofen Bu Tu Ji)*. Beijing: Atlas Press, 1981.

Tang, Xianglong. "The Fiscal System in Pre-Opium War China (Yapian Zhanzheng Qianxi Zhongguo De Caizheng Zhidu)." In *Selected Thesis on Modern Chinese Fiscal and Economic History (Zhongguo Jindai Caizheng Jingjishi Lunwenxuan)*, 49-83. Chengdu: Southwest University of Finance and Economics Press, 1987.

Treaty of Peace, Friendship and Commerce between Her Majesty the Queen of Great Britain and Ireland and the Emperor of China. 26 June 1843.

Velde, François R. "Government Equity and Money: John Law's System in 1720 France." *Federal Rserve Bank of Chicago Working Paper Series*, no. 2003-31 (2003): 1-53.

Velde, François R., and Warren E. Weber. "Commodity Money " In *The New Palgrave Dictionary of Economics Online,* edited by Steven N. Durlauf and Lawrence E. BlumePalgrave Macmillan, 2008. http://www.dictionaryofeconomics.com/article?id=pde2008_C000235.

Vogel, Hans Ulrich. "Chinese Central Monetary Policy, 1644-1800 ". *Late Imperial China* 8, no. 2 (1987): 1-52.

Volckart, Oliver. "'The Big Problem of the Petty Coins', and How It Could Be Solved in the Late Middle Ages." *Economic History Working Papers* 22310 (2008): 1-55.

———. *The Monetary Policy in German Teutonic States and the Duchy of Prussia from 1370 to 1550 (Die Münzpolitik Im Deutschordensland Und Herzogtum Preußen Von 1370 Bis 1550)* Wiesbaden: Harrassowitz, 1996.

Von Glahn, Richard. "Monetary Demand and Silver Supply in 19th Century China." In *Asian Historical Economics Conference*. Hitotsubashi University, Tokyo, Japan, 2012.

———. "Myth and Reality of China's Seventeenth-Century Monetary Crisis." *The Journal of Economic History* 56, no. 2 (1996a): 429-54.

Wakeman Jr., Frederic "Chapter 4 - the Canton Trade and the Opium War." Chap. 4 In *The Cambridge History of China Volume 10: Late Ch'ing 1800-1911, Part 1*, edited by John K. Fairbank. Cambridge: Cambridge University Press 1978.

Wang, Yeh-chien. "Database of Grain Price in the Qing Dynasty (Qing Dai Liang Jie Zi Liao Ku)." Academia Sinica, http://140.109.152.38/DBIntro.asp

Wei, Wen Pin. *The Currency Problem in China*. New York: Columbia University, 1914.

Weidenmier, Marc. "Turning Points During the Us Civil War: Views from the Grayback Market." *Southern Economic Journal* 68, no. 4 (2002): 875–90.

Willard, Kristen, Timothy Guinnane, and Harvey Rosen. "Turning Points in the Civil War: Views from the Greenback Market." *The American Economic Review* 86, no. 4 (1996): 1001-18.

"World War Ii Timeline." In *World War II Database*.

Wu, Gang. *Historical Data on Chinese Inflation (Jiu Zhong Guo Tong Huo Peng Zhang Shi Liao)* Shanghai: People's Press, 1958.

Xu, Chenggang. "The Fundamental Institutions of China's Reforms and Development." *Journal of Economic Literature* 49, no. 4 (2011): 1076-151.

Yan, Hongzhong. "Economic Growth and Fluctuation in the Early Qing from the Perspective of Monetary Circulation (Cong Huobi Liutongliang Kan Qingdai Qianqi De Jingji Zengzhang Yu Bodong)." *Studies in Qing History (Qing Shi Yan Jiu)* 24, no. 3 (2008): 24-43.

Yan, Zhongping. *Selected Statistics in the Economic History of Modern China*. Beijing: Science Press, 1955.

Yang, Yinpu. *A History of Public Finance in Republican China (Min Guo Cai Zheng Shi)*. Beijing: Finance and Economics Press of China (Zhong guo cai zheng jing ji chu ban she), 1985.

Ye, Shichang. *Chinese Monetary Theories before and after the Opium War (Ya Pian Zhan Zheng Qian Hou Wo Guo Di Huo Bi Xue Shuo)* [in Chinese]. Shanghai: Shanghai People's Press, 1963.

Ye, Shichang, Baojin Li, and Xiangcai Zhong. *History of Chinese Monetary Theory Vol. 2 (Zhongguo Huobi Lilun Shi: Xia Bian)*. Beijing: China Finance Press, 1993.

Young, Arthur N. *China's Wartime Finance and Inflation, 1937-1945*. Cambridge: Harvard University Press, 1965.

Zelin, Madeleine. *The Magistrate's Tael: Rationalizing Fiscal Reform in Eighteenth-Century Ch'ing China* London: University of California Press, 1984.

Zhang, Dechang. *Life of a Qing Mandarin in Beijing*. Hong Kong: Chinese University of Hong Kong Press, 1970.

Zhang, Jiaxiang. *History of Chinese Currency System (Zhonghua Bi Zhi Shi)*. Reprint of the 1925 ed. Beijing: Intellectual Property Publishing House Co., Ltd., 2013.