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The Silver Standard in Prewar China, A Blessing or A Curse?

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Abstract: When the rest of the world sank deeper into the mire of gold shortage and the Great Depression, China, a country still adhered to the silver standard, maintained a relative independent connection to the global economy. In the initial stage of the Great Depression, Chinese economy under relative inflation benefited from the blessing of the silver standard. However, with international silver prices artificially being pushed up especially after the U.S. silver purchase act in 1934, the price of silver surged twice merely in two years. Millions of silver currency was exported from China to invest in financial speculation. Acute silver reserves shortage put a curse on Chinese economy and forced the Nanking government to abandon the silver standard in 1935. Contemporary observers recorded prewar Chinese economy dropping to serious downward spirals while macroeconomic indicators did not show obvious decreases. To figure out whether prewar China suffered from exorbitant silver price, quantitative analysis was carried out based on trusty adjusted trade indexes, separating the cause of aggregate trade fluctuations into price and quantity factors. The general conclusion is that the Chinese economy developed from 1929 to 1931 and then experienced sharp contraction from 1932 to 1935. OLS regression results further verified that widespread speculation had motivated silver flight in prewar China.

Key words: the silver standard, silver flight, the U.S. silver purchase act, Chinese monetary reform

Contents

Illustrations

Figures

Tables

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1

Introduction

The U.S. silver program is a dramatic illustration of how a course of action, undertaken by one country for domestic reasons and relatively unimportant to that country, can yet have far-reaching consequences for countries if it affects a monetary medium of those countries. China was most affected.

—Friedman and Schwarz (1963)[1]

1.1. History Background

If France's stabilization (1926) marked the beginning of reestablishment process of the gold standard, Britain's deprecation of sterling (1931) represented the prelude of going off the gold standard, which followed by Japan, the United States and other major economic entities. When the rest of the world sank deeper in the mire of gold shortage and the Great Depression, China, a country still adhered to the silver standard, maintained a relative independent connection to the global economy. In the initial stage of the Great Depression, most of countries experienced competitive currency depreciation, deterioration in international trade, wide fluctuations in exchange market and large-scale economic down turns, but Chinese economy developed.

Thanks to the benefit from the silver standard, Chinese economy spared from the recession from 1929 to 1931. Adhering to silver standard means silver not only functioned as common commodity like what occurred in other countries under the gold standard, but also acted as metallic money and reserves in prewar China. Relatively low silver price against gold brought down the exchange rate of Chinese currency. Devalued domestic currency offset the combined influence of appreciated foreign currencies and deflationary foreign price index, which resulted in real depreciation in China. During this time period, Chinese trade situation and economy condition were developing compared to other countries suffering from the wide-scale depression.

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[1] Milton Friedman, and Anna J. Schwartz, Monetary History of the United States, 1867-1960 (Princeton: Princeton Univ. Press, 1963), 515.

In 1931, when Britain suspended gold convertibility and among the first depreciated sterling of own accord, growth prospective of Chinese economy stopped due to increasing exchange rate caused by foreign currencies competitive depreciation. The next year, when Franklin D. Roosevelt successfully defeated Hoover and became the President in the United States, "Do something for silver" turned into an essential component of the New Deal as a reward for the election support from the silver bloc in the congress. "Do something for silver"-the slogan induced a series of federal acts issued for increasing silver price. From the "Thomas Amendment" of May 1933 to the agreement assigned among the World Monetary and Economic Conference in London in June 1933, and the climax U.S. silver purchase act in June 1934, all these bills targeted at one common goal- keeping the world silver price to 1.29$ per ounce, which tripled the current price level. Although they were merely U.S. domestic policies concerning a common commodity, their impacts profoundly influenced the economy growth of China. Surging silver prices drained silver out of China in an unpredictable rate. In 1932, the silver net exports amounted to Ch$ 10 million. In 1933 the figure reached up to Ch$ 14 million. While in 1934 the figure boomed at Ch$ 256 million, which was almost 20 times compared to the level in previous year. Merely in August, two months after the United States announced the silver purchase act, net silver exports from Shanghai peaked at Ch$ 80 million. Large-scale silver flight seriously decreased Chinese silver reserves and impaired China's fragile banking and monetary system. Contemporary records and historical accounts illustrated large reduction in output, widespread unemployment and economic contraction.

In face with severe economic situation, Chinese central government conducted a series of policies such as exposing export tax on silver, charging equalization fees or issuing silver exports licenses to confine silver exports. However, the governmental capital control could barely fundamentally hold back the profit-orienting nature of silver capital when overvalued nominal Chinese silver price created space for speculation. The only option for the Nanking Government was to depart from the silver standard and nationalize the silver reserves. In November 1935, the Chinese central government announced to conduct monetary reform that suspended silver convertibility, adhered to fiat standard and centralized money issuing right to three government-controlled commercial banks. Since then, the silver standard which had prevailed in China for over 600 years became history.

1.2. Mainstream Theories

Most of historians and economists hold different attitudes toward the effects of rising silver price on prewar Chinese economy. The most general accepted explanation is from Friedman and Schwarz. In their book *Monetary History of the United States, 1867-1960* they claimed that in the outset of the Great Depression, Chinese economy indeed benefited from the silver standard as it isolated depression from other gold standard countries through financial transmission effects. Improvements in trade situation reflected improvement in Chinese real economy. Then the exorbitant silver price mainly induced by the federal government seriously enhanced Chinese

trade deficits which stimulated silver outflow as a counterpart of trade balance. In sum, Friedman's main points were the silver standard initially benefited the economic growth of China and later dragged the economic condition into downturn spirals.

However, some macro-economic indicators did not show obvious decreases as indicators of depression. Aggregated estimates of China's GDP showed that output merely contracted by 9% in 1934. Industrial index fluctuated differently by industries. Cotton-spinning, silk and cigarettes experienced a considerable shrink while tea, flour and cement industrials performed favorable[2]. Hence these controversial figures stimulated the view of Chinese economy escaped the curse of high silver price and experienced gradual development. A representative economist who held this view is Thomas Rawski. He utilized quantity monetary theory to estimate monetary velocity in China. Then based on the "U-Shape" monetary velocity development theory, he concluded China had hardly suffered from depression after 1934. In order to show his theory, he recalculated Chinese monetary stock by three components- monetary metal, banknotes and bank deposits. Then he compared the data from China proper[3] and Manchuria[4] to illustrate the relative relationship of monetary velocity in these regions. Since the degree of industrialization in Manchuria was much higher than the national average level, and based on the "U-shape" theory (in the beginning stage of industrialization, the faster velocity decreasing rate means the higher industrial level), the faster calculated velocity decreasing rate of China proper obeyed the theory above. Hence Rawski believed the velocity of China proper was underestimated. According to quantity money theory, velocity equals to the quotient of PT and M, where P, T, and M represents Price Index, Real GDP and Monetary Stock respectively. If the national velocity was more than the actual data, the only reason could be the Real GDP was understated. His detailed Monetary stock data gathering process and trusty Price Index guaranteed the certainty of undervaluing Real GDP, which verified Chinese economy had not experienced great depression.[5]

The third main explanation of Chinese economy during the 1930s comes from Chang Pang, he supported Friedman's view of the silver standard protected Chinese economy from exogenous shock from 1929 to 1931. But he disagreed with Friedman on the explanation of the reason why silver flight happened in China. Friedman attributed silver outflow to enhance Chinese trade deficits, while Chang supported international silver speculation stimulated silver exports.

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[2] Central Bank of China, An Economic Survey of China for 1934 (Shanghai: Central Bank of China,1935)

[3] China proper: a term used by western researchers to express the core regions of China. The contents of this concept changed through dynasties changing. In this paper, China proper represents the regions controlled by the Nanking government.

[4] Manchuria, collectively known as Manchouguo, was a puppet state in the northeast China and Inner Mongolia. In 1931, Japan conquered the place and installed a pro-Japanese government one year later. After Japan was defeated at the end of World War II (1945), Manchoukuo was transferred to Chinese administration in the following years. Under the administration of imperial Japan , economic condition of Manchoukuo experienced rapid growth. Its industry system was among the world industrial powerhouses and many Manchurian cities were modernized during Manchukou era.

[5] Thomas G. Rawski, Economic Growth In Prewar China (California : University of California Press,1989), 179

1.3. Aim and Outline

One of the main factors caused controversial opinions of prewar China's economic performance was the accuracy of prewar economic statistics data. Due to frequent warfare and unstable political situation, statistics gathering work was underdeveloped in prewar China. Furthermore, before the 1935 currency reform, Chinese monetary system did not utilize uniformed unit of currency and most business centers circulated their own prevailing currencies. All these factors blurred the accuracy of gross economic indicators.

In order to show the real economy situation in prewar China under the silver standard, trusty raw data and quantitative methods were utilized in this paper. Based on the author's previous research and carefully data flittering process, the author chose the Quantity Index Number and Price Index Number of exports and imports (1867-1936) from Ho Lian because he compiled these indexes in 1930s and published them for research purpose. The original data all generated from *China Customs Trade Yearbook* and *China Customs Trade Report.* He used *Fisher's* Formula for Index Numbers to calculate quantity and price index number of Chinese trade. Then he modified these indexes by long-term economic growth trend (quadratic polynomial) and deduced Adjusted Quantity Index Number and Price Index Number of exports and imports in prewar China.

Based on his precious original data, a modified long-term economic trend line was calculated through comparing R squares of polynomial in different orders. Finally the modified long-term economic trend adopted quartic polynomial. After calculating new adjusted index data, the general conclusion of trade condition in prewar China was drawn based on the theory that if the adjusted index data above the long-term economy growth line, the trade condition was better than predicted. Combined with detailed analysis of imports and exports, a general conclusion of prewar Chinese economy was in favor of the view from Friedman. The silver standard indeed benefited Chinese economy from 1929 to 1931, while after the U.S. silver purchase act, the performance of adjusted trade index went bad which means the Chinese economy suffered from economic down turn.

However, were these changes caused by rising international silver prices? In order to figure the question out, the author conducted OLS regression of silver price to adjusted trade index in four comparative time periods. The regression results in the last two periods (1921-1936, 1927-1936) showed the same significant results in Adjusted Quantity Index number of Exports and Adjusted Price Index number of Imports. And the coefficient level increased in the second period which means the silver price had a higher impact in the 1930s. Adjusted Price Index number of Imports had a negative correlation with silver price, which was easy to understand. As price index represented nominal price annually, rising silver price did not contribute to increase in silver purchase power but offset by decreases in nominal price. However, in Adjusted Quantity Index

number of Exports part, it was positive correlation with silver price, which obeyed the rules that increases in exports price depresses cost advantages and lowers exports quantity. A possible explanation of this was the Adjusted Quantity Index number of Exports contained contributions from silver exports. In order to answer this question, the author conducted OLS regression of silver outflow amount to Adjusted Quantity Index number of Exports and Unadjusted Quantity Index number of Exports. The regression results showed acceptable correlation between silver outflow and Unadjusted Quantity Index number of Exports, the indicator not presents long-term economy growth trend but short-term shock. The opinion supported the view from Chang that Chinese silver flight was not caused by trade deficits as Freidman said, but by the international silver speculation.

Then the paper had a detailed introduction to silver speculation situation of China from 1932 to 1936. As U.S. silver purchase act in June 1934 planned to triple the silver price, Chinese silver outflow started to surge after that. Pattern of silver exports transformed from legal method to illegal smuggling because of a series of capital control policies announced by government since October 1934. The main export ports changed from Shanghai to boundary ports like Canton or Tientsin where conducted relative loosened governmental supervisions. Japan and the United Kingdom functioned as the main intermediaries transporting Chinese silver to America. And eventually Chinese 1935 monetary currency stopped silver flight.

The main contribution of this paper to previous work was to analyze prewar trade condition separately in price and quantity data. It was inaccurate to utilized gross export and import trade data to analyze a country's trade situation. Since each commodity had its own price and the price was fluctuating with time, especially when the currency exchange rate experienced dramatic changes like prewar China, the gross trade data may diminish the influence of real price changes on trade situation. In the same way, price trade data could not represent changes in quantity sector because the components of trade framework were not unchangeable. Dividing the analyze angle into price and quantity was necessary and impetrative.

The general conclusion of this paper was that the prewar Chinese economy indeed benefited from the silver standard from 1929-1931, then since the Britain abandoned the gold standard especially due to the U.S silver purchase act, Chinese economy was seriously impaired by international silver price and experienced economic downturn spirals. The considerable silver outflow was attributed to international silver speculation instead of trade deficits.

This paper will be organized as follows: Section II reviews previous research methods and mainstream views of prewar Chinese economy. Section III introduces theory background, data gathering process, quantitative research model combined with analyses. Section IV explains the quantitative results in historical background-Chinese banking system, monetary system and further analyzes silver speculation in China. Section V draws a general conclusion, research limitation and further research directions.

2

Literature Review

2.1. Friedman's Theory

Until now, the most influential interpretation of the Chinese economic performance under the silver standard was from Friedman and Schwartz. To start the argument, Friedman claimed that the silver standard benefited the Chinese economy at the beginning years of the Great Depression, but Britain and the United States went off the gold standard stopped China's growth trend by competitive devaluation. True, prices in terms of dollars or other prevailing currencies were rising, which offset the impact of China's currency appreciation. But U.S. silver purchase act accelerated Chinese exchange rate to rise much faster than price index, resulting in continuous downturn spirals of Chinese exports and increasing trend of silver capital flight. Large-scale exports of silver, which they thought as a counterpart to an increase in Chinese trade deficit, directly drained Chinese money stock. Compared to other countries began to recover from the shallow of depression, Chinese economy entered into the phase of internal depression because of the silver currency shortage in the late 1930s. When the Chinese central government could hardly maintain silver convertibility, the government had to give it up and conducted a fiat standard in 1935.[6]

There were other contemporary observers offering primary materials that supported the idea above. The U.S. financial adviser to China (1929-1947) Arthur N. Young reported to the federal government that "China passed from moderate prosperity to deep depression."[7] In February 1934, Chinese Nanking government negotiated with the federal government to dispatch an observer to China, who could authentically deliver the information of Chinese serious economic condition back. Sir Ar-thur Salter, who was assigned and visited China, reported that:

> There are great dangers and difficulties in any departure from the present silver basis of the Chinese dollar. Without that, however, China can only escape the injury of further deflation if silver ceases to rise substantially in relation to the foreign currencies and to the world prices of commodities. The principal factor is the U.S.'s silver policy. It seems important, therefore, that China (whose real interest in silver is overwhelmingly greater than that of any other country) should make her position clear to the Government of that country. [8]

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[6] Milton Friedman, and Anna J. Schwartz, *Monetary History of the United States, 1867-1960* (Princeton: Princeton Univ. Press, 1963), 461-489

[7] Arthur N. Young, *Chin's Wartime Finance and Inflation, 1937-1945* (Cambridge: Harvard Univ. Press, 1965), 209

[8] Sir Arthur Salter, *China and Silver* (New York: Econ. Forum, 1934), 108-9.

American mainstream media also mentioned depressed situation of Chinese economy. The New York Times reported that China, as a country adhered to the silver standard, was not benefit from the increasing silver prices as the congress previously promised. On the contrary, inflated silver price did not boost the purchasing power of Chinese buyers but reduce it. Predictable future silver price prompted international speculation and further promoted smuggling of silver from China. At this stage, Chinese economy was suffering from massive depression[9].

Other observers expressed the same opinions. In December 12, 1934, Sir A. Cadogan (Shanghai) wrote a telegraphy to Sir J. Simon[10], which said:

> Managers of Hongkong and Shanghai Bank and Secretary of Messers. Liming Chan Chaiao and Tsu Yee-pei of Bank of China and Mr. Sing Loh-hus of National Commercial Bank have all approached me in regard to monetary situation here. They all agree that the present state of affairs gives cause for grave anxiety for the stability of the currency. Chinese bankers hold that flexible duty system has failed in its object and has even encouraged outflow of silver by artificially maintaining differences between rate of exchange here and price of silver abroad…There have also been large shipments to South China and … and that considerable shipments have gone abroad from the Colony. Anxiety of Chinese Government on this point is shown by their request for an embargo upon export from Hongkong. Native bank interest rates here recently rose as high as 14.6 percent per annum and there is a general shortage of silver in circulation and contraction of credit.[11]

Except for these contemporary records, researchers also conducted lots of academic work on this issue. Greenwood and Wood calculated the macro-economic data of China during the time period from 1926 to 1933. They stated that Chinese price index of agricultural production shrank from 100 in 1926 to 57 in 1933. High exchange rate reduced the cost advantage of Chinese exports. Without sound revenues, Chinese industries came to a halt with a low level of economic activates. Higher financial cost and fixed-interest loans hindered domestic industrials to maintain manufacturing, which contributed to high unemployment and proletarian resists.[12]. The banking system in China was challenged as well. The failure of 148 native banks nationally reflected severe economic situation in 1935. Most of Chinese banks preserved strong links with industries and issued real-state based loans. Falling real estate values created knotty problems in maintaining bank liquidity. Leavens observed that since many banks held high proportions of loans mortgaged on real estates, devaluating value of rest estates forced banks to get rid of old loans early and raised the interest rate of new loans as the price of default risks. Without efficient

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[9] Milton Friedman, "Franklin D.Roosevelt, Silver and China," *Journal of Political Economy* 100, no.1.(1992): 74

[10] Sir A. Cadogan was the Ambassador from the United Kingdom to the Republic of China; Sir J. Simon worked as Lord High Chancellor of Great Britain.

[11] W.N. Medlicott and Douglas Dakin, ed., *Documents On British Foreign Policy, 1919-1939* (London: Her Majesty' Stationery Office, 1984), 366-367.

[12] John G. Greenwood and Christoper J.R Wood, "The Chinese Hyperinflation : Pary 1. Monetary and Fiscal Origins of the Inflation, 1932-45," *Asian Monetary Monitor* 1, no.1. (Sept.-Oct. 1977): 32

cash flow, individuals and banks found themselves possess frozen assets on hands, which were precipitated by the financial difficulty.[13]

2.2. Rawski's Theory

However, recent researches on prewar China's economy had demonstrated a series of reasoning that was inconsistent with the above views. Their disagreements focused on whether high silver price acted as a disaster to Chinese economy and whether Chinese economy experienced depression in the 1930s. Rawski believed that China had hardly experienced prolonged depression after the U.S. silver purchase act and Chinese currency reform in 1935 indeed promoted the real economy development. Although silver outflow happened in prewar China, increasing circulation of banknotes that were redeemable for silver offset the impact of silver flight and replenished monetary supply. But this over-issued paper money later contributed to the hyperinflation during the Sino-Japanese War. He drew the above conclusions based on his calculation of Chinese monetary velocity from 1918 to 1936. He compared related data in two geographical scales- China proper and Manchuria. He found that the velocity curve of Manchuria experienced continuously decline, which matched the typical feature of velocity in newly developing industrial counties- the faster economy developments, the sharper curve declines. However, the curve of China proper showed a 'U-shape' bottomed at the year of 1934, and then it had a slight increase afterwards (Appendix B).

The "U-shape" theory could be explained as follows: many industrialized countries have a well-defined pattern of velocity behavior. The development curve of money velocity is "U-shaped" (illustrated in figure 2.1. below). In the initial industrialization process, the curve represented a declining trend, then an intermediated flat segment and finally followed by a rising tendency. In the early period of economic development, most countries experienced decline of money velocity because of institutional changes involving the increasing usage of money in transactions, assisted by the geographical spread of bank subsidies network and rising bank credits. Economy participators gradually accepted the liquidity of paper currencies and using bank accounts to hold large deposits. Then after an adjustment process, money velocity started to go up as monetization process eventually completed. A relative stable economic condition enabled rising permanent incomes, which stimulated the public or businessmen to hold less currency at hand and invest more in real economy because the financing channel was effective and available. The final stage represented financial sophistication and improved economic stability.

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[13] Dickson H. Leavens, Silver Money (Bloomington,Ind.: Principia, 1939),59.
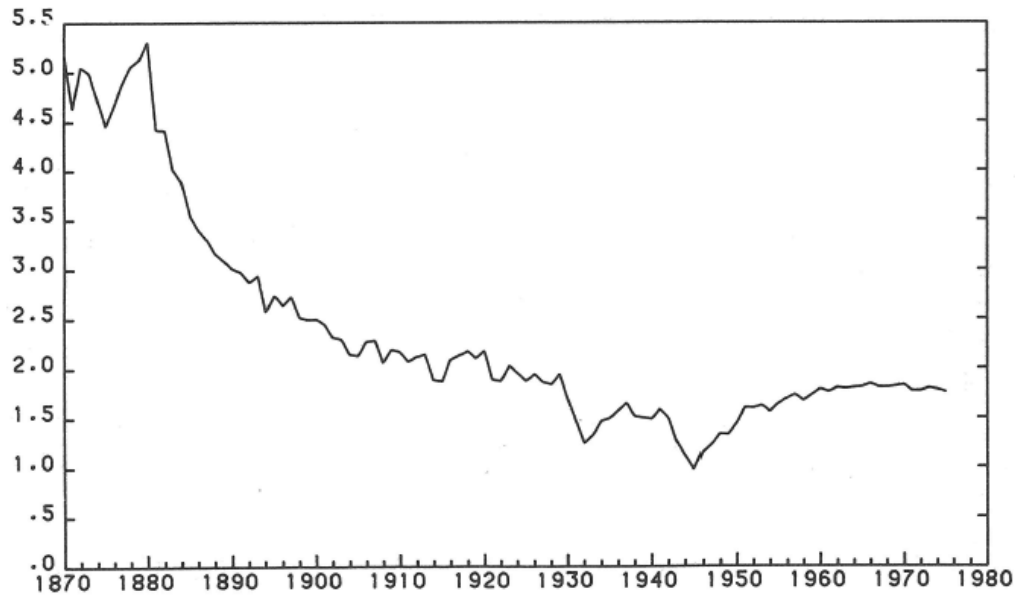
Figure 2.1. Income Velocity of Money (M2) in the United States, 1870-1975
Source: Data from Michael D. Bordo and Lars Jonung, *The long-run behavior of the velocity of circulation: the international evidence* (Cambridge: Cambridge Univ Press, 1987) 5.

If as suggested by "U-shape" theory, velocity declined because of economic and financial development, why does Manchuria, an region where the industrialization level was more sophisticated compared to the national average level, showed substantially higher velocity than the nation as a whole? The answer was the decreasing trend of national velocity curve should be less sharp. The national velocity value was understated. According to the quantity money theory, monetary velocity can be calculated as:

$$\text{Monetary Velocity} = \frac{Real\ GDP \times Price\ Index}{Monetary\ Stock}$$

If the actual national velocity should be more than the calculated data, the reasons could be the Real GDP was undervalued, Price Index was undervalued or Monetary Stock was overvalued. But Rawski's detailed Monetary stock data gathering process and trusty Price Index guaranteed the only possible reason was the undervaluing Real GDP, which testified Chinese economy had not experienced great depression.[14]

However, Friedman rejected Rawski's theories based on following points. Firstly, the initial data were hardly creditable for underdeveloped country as China, let alone the credibility of final compiled data. Second, in Rawski's data gathering process, he had not mentioned the amount of currency circulated in domestic nonfinancial activities, which influenced the calculation of monetary velocity. Finally, the M2 decline was overstated because Rawski did not consider a

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[14] Thomas G. Rawski, Economic Growth In Prewar China (California: University of California Press, 1989),179.

decrease in silver reserves held behind bank notes. These reasons represented the Chinese real GDP had not been understated as Rawski predicted.[15] One year later, Rawski rewrote another small paper to defend his theory. He said even though Friedman criticized he did not classify money stock between bank sector and non-bank sector, which resulted their final money stock data were incredible, it was hard to define "what is a 'credible' composition for national monetary aggregates.". And he further criticized validity of Friedman's empirical data, which he said " although the Chinese ratio of currency to M2 for the 1930s is lower than the figures that Friedman cites for a grab bag of nations (Nepal, Chad, Yeman, Zaire, etc.[77]), it is hard remarkable in the East Asian context." [16] Against the view from Friedman that China's economy experienced sharp reductions in money supply, prices and output during the 1930s, Rawski restated the reality of Chinese economic life during the 1930s was resilience of free market, in which economic entities could hold free selecting rights.

 Brandt (1985) interpreted the deflation of Chinese currency was not duo to the monetary contraction as Rawski states, but to the international silver speculation. The prices in China were not fixed but very flexible. So as silver, which worked as commodity in international market, its price fluctuation may result in price changing as China adhering to silver standard.[17] There years later, Brandt and Sargent (1988) further developed their theory and offered an alternative explanation. The massive exports of silver were not as a consequence of a sudden decrease in the trade balance, but as expenditure of a windfall gains because of silver appreciation. Chinese central bank did not need previous amount of silver reserves to support an unchanged real balanced level as the silver price increased. There was no deflation, no economic depression at all. The reason why Nanjing government conducted currency reform in 1935 is to increase their share of capital gain resulting from silver's appreciation.[18]

2.3. Chang's Theory

Chang explained that the reason behind Chinese large silver outflow neither due to a growing trade deficits nor a windfall gain, but because of speculative sales of silver, which caused the Chinese silver standard to collapse. As he stated, even though silver prices started to rise early in 1931, it was not until 1934, when the federal government issued the silver purchase act that promised speculators a predictable increasing price growth trend. Besides, Chinese government planned to take drastic actions if the international silver price continued to surge. On one hand, predicable speculative profits were ensured by series of American bills which were authorized to

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[15] Milton Friedman," Franklin D.Roosevelt, Silver and China," *Journal of Political Economy* 100, no.1 (Feb., 1992): 77.nn.18.

[16] Thomas G. Rawski," Milton Friedman, Silver, and China," *Journal of Political Economy* 101, no.4 (Aug., 1993): 756.

[17] Loren Brandt," Chinese Agriculture and the International Economy, 1870-1930s: A Reassessment," *Explorations in Economic History,* no.22 (1985): 168-193.

[18] Loren Brandt and Sargent Tomas J. "Interpreting New Evidence about China and U.S. Silver Purchases," *Journal of Monetary Economics*23, no.1 (1989): 31-51.

increase international silver price, on the other hand, nationalization of silver reserves threatened the interests of silver holders, especially foreign banks. These factors stimulated domestic silver holders to export silver. Hence, foreign banks and native banks tried to seek opportunities to export silver abroad, at first through legal channel but later they try to take smuggling method. When Chinese government conducted tighter capital controls, foreign banks even took use of military warship to evade tax. Rumors of silver shortage stimulated the public incentive to redeem paper for silver. In face of the danger of bankruptcy, Chinese central government had to curry out monetary reform to stabilize the domestic monetary system.

As for whether exorbitant silver price did damage to Chinese real economy, Chang believed that China' economy indeed was hurt during the year from 1933-1935. However, to some extent the damage was not fully caused by increasing silver prices. For instance, certain key industries like cotton spinning and silk reeling experienced adverse price. These damages were mainly led by impacts from Japanese mills within China. And the reason why Chinese government conducted the currency reform later in the November 1935(one and half year later than the U.S. silver act) was the Nanking government should wait for an opportunity when the silver price climbed up to a point where the public could no longer bear. Then they could take some dramatic measures like nationalizing all silver reserves and establishing the fiat system to unify currency system. And he believed that large silver outflows from China were caused by speculative sales of silver instead of trade deficit or a windfall gain.[19]

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[19] Pang H.K. Chang," Commodity Price Shocks and International Finance"(Ph.D. dissertation, Massachusetts Institute of Technology, 1983),2-151.

3

Empirical Analysis

3.1. Theoretical Background

According to Ho Lian's theory, it was necessary to distinguish the difference between fluctuations in quantity data and price data when precisely analyzing a country's trade condition[20]. Every bulk commodity owned its specific price and the price was changing with time. Hence, quantity data could not reflect changes in price. In a similar way, components of China's foreign trade were not unchangeable, which means quantity trade data should be analyzed separately. Besides, as prewar China adhered to the silver standard, fluctuations in silver purchasing power may influence the interpretation of Chinese trade situation. For instance, the purchasing power of one silver *dollar* in 1931 merely equaled to 0.62 silver *dollar* in 1913. The situation could be more complex when considering exchange rates between countries using the silver standard and the gold standard. In sum, differentiating quantity data and price data was essential and imperative.[21]

Thanks to Ho's hard work; he calculated the Quantity Index number and Price Index number of imports and exports in China from 1867 to 1936. The original resource was collected from *China Customs Trade Yearbook* and *China Customs Trade Report*. He set the beginning year as 1867 because the China Customs Offices uniformed unit of account as *haikwan tael* since then. Before 1867, statistics data compiled from each province were recorded in different currencies such as Mexico silver *dollar*, Shanghai silver *dollar,* etc.

3.2. Data Collection

3.2.1. Unadjusted Index Number

The chosen commodities can be divided into two groups- directly included goods and indirectly included goods. In *China Customs Trade Yearbook* and *China Customs Trade Report,* most of foreign trade goods were illustrated precisely by price and value. However, certain special goods lack clear unit of measurement. Hence, these commodities should be grouped separately. The percentage of directly included goods' value to the gross trade value was presented in the

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[20] Daye Wu, "Reasons and effects of Gold and Silver Price Fluctuations." *Nan-k'ai chih shu tzu liao hui pien, 1913-1952[Compendium of Nan-k'ai index number material*s] (Peking: China Social Sciences Press, 1988): 634.

[21] Lian Ho, " Zhongguo liu shi nian jin chu kou wu liang zhi shu wu jia zhi shu ji wu wu jiao yi zhi shu [Quantity Index Number and Price Index Number of Chinese trade, 1967-1936]," in *Nan-k'ai chih shu tzu liao hui pien, 1913-1952[Compendium of Nan-k'ai index number materials]* (Peking: China Social Sciences Press, 1988), 552-572.

Appendix D.1. Generally speaking, the value of directly included goods accounted for over two thirds of gross trade value. There were also special treatments. First, indirectly included goods lack precise price and quantity data; it was necessary to make assumptions to track their growth trends. The primary assumption was the growth rates of indirectly included goods equal to those of directly included goods. Second, among directly included goods there were certain commodities whose prices fluctuated more than 50 percent annually. Those goods should be excluded when calculating the growth rates of directly included goods.

The index compiling method was based on *Fisher's* Formula for Index Numbers, which combined the *Laspeyres* Index Numbers and *Paasche* Index Numbers. The aggregates combined then quantities and prices of trades in a given year with those in a base year. Ring Price Index was used. Ho's modified index calculating formulas and a calculation instance were illustrated in Table 3.1.

$$\text{Quantity Index Number}_0 = \sqrt{\frac{\sum q_1 p_0}{\sum q_0 p_0} \times \frac{\sum q_1 p_1}{\sum q_0 p_1}}$$

$$\text{Price Index Number}_0 = \sqrt{\frac{\sum q_0 p_1}{\sum q_0 p_0} \times \frac{\sum q_1 p_1}{\sum q_1 p_0}}$$

When p_1 = the price of any commodity in the given year

q_1 = the quantity of amy commodity in the given year

p_0 = the price of that commodity in the base year

q_0 = the quantity of that commodity in the base year

Table 3.1. Calculation Instance of Quantity Index Number and Price Index Number

	The Value of Imports	(*Hankwan Tael*, MM)
	Year 0	Year 1
Directly Included Goods		
Actual Value	$\sum q_0 p_0$	$\sum q_1 p_1$
Total Value	845	795
Drastically Value-fluctuating Goods	2	2
Other Goods	843	793
Value Calculated by P_0	$\sum q_0 p_0$	$\sum q_1 p_0$
Total Value	845	721
Drastically Value-fluctuating Goods	2	1
Other Goods	A843	B720
Value Calculated by P_1	$\sum q_0 p_1$	$\sum q_1 p_1$
Total Value	875	795
Drastically Value-fluctuating Goods	2	2
Other Goods	a873	b793
Indirectly Included Goods		
Actual Value	130	120
Value Calculated by P_0	130	109[*]
Value Calculated by P_1	135[#]	120
Total Value of Imports		
Value Calculated by P_0	$\sum q_0 p_0$	$\sum q_1 p_0$
Drastically Value-fluctuating Goods	2	1
Directly Included Goods	843	720
Indirectly Included Goods	130	109
Total	975	830
Value Calculated by P_1	$\sum q_0 p_1$	$\sum q_1 p_1$
Drastically Value-fluctuating Goods	2	2
Directly Included Goods	873	793
Indirectly Included Goods	135	120
Total	1010	915

Notes: *:$109 = 120 \times \frac{B}{b} = 120 \times \frac{720}{793}$ #: $135 = 130 \times \frac{a}{A} = 130 \times \frac{873}{843}$

14

Quantity Index Number of Imports $= \sqrt{\dfrac{\sum q_1 p_0}{\sum q_0 p_0} \times \dfrac{\sum q_1 p_1}{\sum q_0 p_1}} = \sqrt{\dfrac{830}{975} \times \dfrac{915}{1010}} = 0.8782$

Price Index Number of Imports $= \sqrt{\dfrac{\sum p_1 q_0}{\sum p_0 q_0} \times \dfrac{\sum p_1 q_1}{\sum p_0 q_1}} = \sqrt{\dfrac{1010}{975} \times \dfrac{915}{830}} = 1.0686$

The ratio of actual value of imports $= \dfrac{915}{975} = 0.9385$

Quantity Index Number of Imports $\times$ Price Index Number of Imports $= 0.8782 \times 1.0686 = 0.9385$

Table 3.2. Quantity Index Number and Price Index Number of Chinese Trade, 1867-1936   (1913=100)

Year	Quantity Index		Price Index		Year	Quantity Index		Price Index	
	Imports	Exports	Imports	Exports		Imports	Exports	Imports	Exports
1867	24.7	31.9	46.9	45.1	1902	70.9	65.1	78	81.7
1868	25.4	33.7	46.9	51.7	1903	65.1	59.8	88.3	89
1869	26.4	35.4	47.9	47.8	1904	69.2	64	87.2	92.7
1870	25.9	33.3	46.7	46.1	1905	96.6	62.5	81.2	90.4
1871	28.1	39.4	47.4	47.2	1906	95.3	64.6	75.4	90.6
1872	27.9	43.3	45.8	48.7	1907	88.7	67.1	82.3	97.6
1873	27.3	39.1	46.3	49.6	1908	72.7	73	97.4	94.1
1874	31.5	40.1	38.5	45.9	1909	77.1	92.9	95.1	90.5
1875	33.8	42.2	35.3	40.6	1910	79.2	102.9	102.5	91.8
1876	36.3	42.8	33.8	47.1	1911	80.9	102.1	102.2	91.5
1877	36.1	40.8	35.5	40.8	1912	82.8	103.8	100	88.5
1878	34.9	41.4	35.7	40.2	1913	100	100	100	100
1879	40.8	43.2	35.2	41.3	1914	91.6	83.8	108.9	105.4
1880	36.4	47.2	38.3	41.1	1915	70.3	96.5	113	107.8
1881	40.8	43.5	39.6	40.5	1916	73.7	102.3	122.4	117
1882	36.4	45.9	37.6	36.2	1917	73.4	108.3	131	106.2
1883	35	47.2	37.1	36.8	1918	66.1	105.5	147	114.5
1884	34.5	50.6	37.1	32.9	1919	75.4	140	150.2	112
1885	40.5	47.6	38.1	33.9	1920	75.9	119.3	175.7	122.9
1886	35.3	54.2	43.3	35.3	1921	94.7	126.9	167.4	117.8
1887	41.6	41.2	43	51.8	1922	112.6	130.5	146.8	124.7
1888	50.3	43.6	43.6	52.4	1923	108.5	137.3	148.7	136.3
1889	44	45.2	44.3	53.3	1924	119.6	136.6	148.8	141.2
1890	54.8	42	40.7	51.5	1925	109.9	132.9	151	145.9
1891	60.8	47.9	38.7	52.3	1926	130.5	141.1	150.8	152.9
1892	59.9	49.8	39.6	51.4	1927	109.8	154.1	161.7	148.9
1893	59.4	57.2	44.7	50.8	1928	131.5	156.1	159.1	158.4

Year	Quantity Index		Price Index		Year	Quantity Index		Price Index	
	Imports	Exports	Imports	Exports		Imports	Exports	Imports	Exports
1894	45.3	60.1	62.8	52.8	1929	139.9	149.2	158.1	169.8
1895	45.8	66.3	66.1	53.5	1930	131	131.1	174.7	170.4
1896	53.2	56.4	67.1	57.7	1931	129.9	136.5	192.9	166.3
1897	49.7	61.6	71.8	66.1	1932	106	100.8	180.1	140
1898	51.3	63.4	71.9	62.3	1933	97.5	124.7	173.2	121.4
1899	69.2	62.5	67.2	78	1934	85.1	118.6	151.9	111.6
1900	49.5	54.9	74.8	72.1	1935	83.6	126.7	138.1	110.4
1901	62.5	59.8	75.3	70.6	1936	77.9	125.6	152.3	139.2

Source: Data from *Nan-k'ai chih shu tzu liao hui pien, 1913-1952[Compendium of Nan-k'ai index number materials]* (Peking: China Social Sciences Press, 1988), 375.

3.2.2. Adjusted Index Number

According to the theory from Ho, economy development followed a pattern which he named as long-term economic growth curve. Technology creation, population booming, banking system stretching and nature resources utilization all contributed to improvement in social productivity, which resulted in permanent influence on real economy. For example, if actual imports data in two continuous years declined but both above the predicted economic growth curve, it represented better economic situation instead of bad performance. Hence, predicting economic growth trend was critical to reevaluate economic performance and trade statue of China, especially during the time period from the Great Depression to the Sino-Japanese war. To revise the index calculated above, Ho utilized quadratic polynomial curve to predict long-term economic growth trend of China. Then he defined the points on the curve equal to 1, and utilized deviation from the trend to adjust the original index. The polynomial long-term economic growth trend he used was illustrated as follows, together with the example of the figure of Adjusted Quantity Index number of Imports, 1867-1927.

Table 3.3. Polynomial Long-term Economic Growth Curve

	Coefficient			Formula
	X^2	X	Constant	
Quantity Index Number of Imports	0.0148	1.1112	46.0806	$Y=0.0148 X^2+1.1112X+46.0806$
Price Index Number of Imports	0.0040	0.7637	64.7682	$Y=0.0040 X^2+0.7637X+64.7682$
Quantity Index Number of Exports	0.0118	0.8896	58.8746	$Y=0.0118 X^2+0.8896X+58.8746$
Price Index Number of Exports	0.0105	0.8490	64.0926	$Y=0.0105 X^2+0.8490X+64.0926$

Source: Data from *Nan-k'ai chih shu tzu liao hui pien, 1913-1952[Compendium of Nan-k'ai index number materials]* (Peking: China Social Sciences Press, 1988), 557.

Notes: all the formula above fit for index data using 1867 as base period
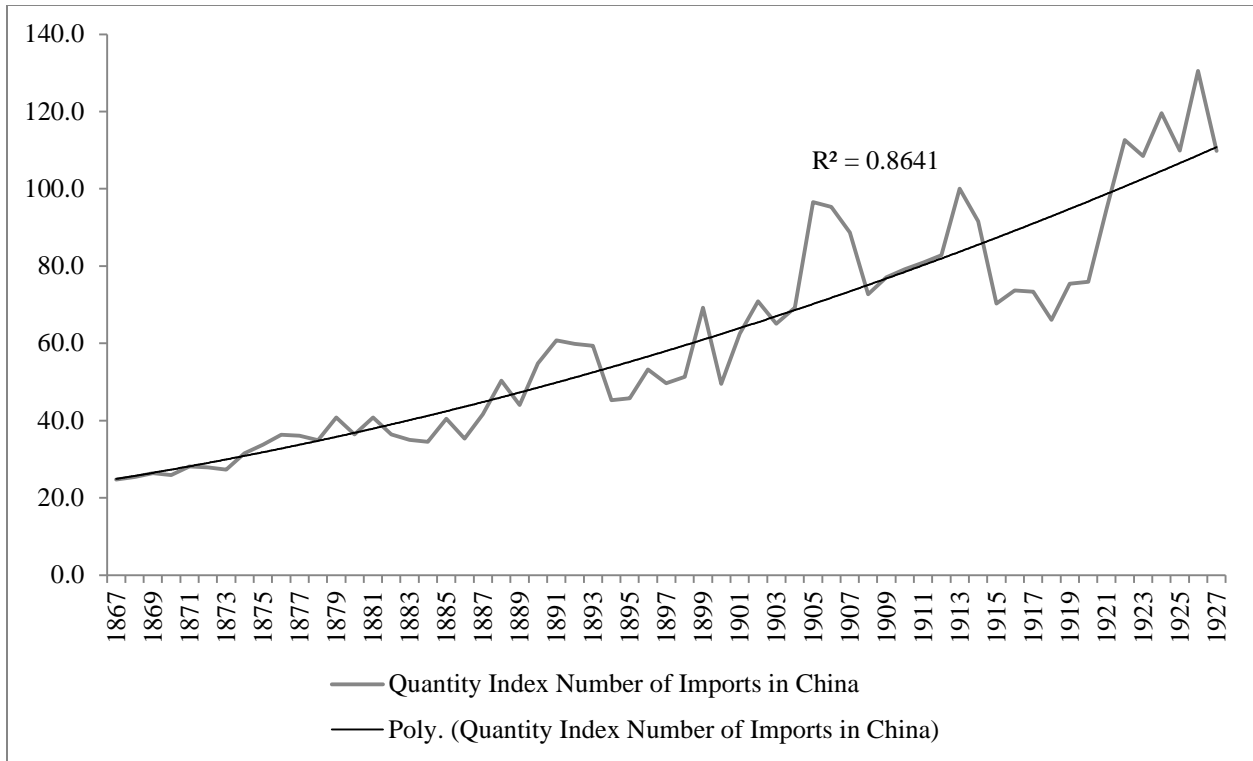
R² = 0.8641

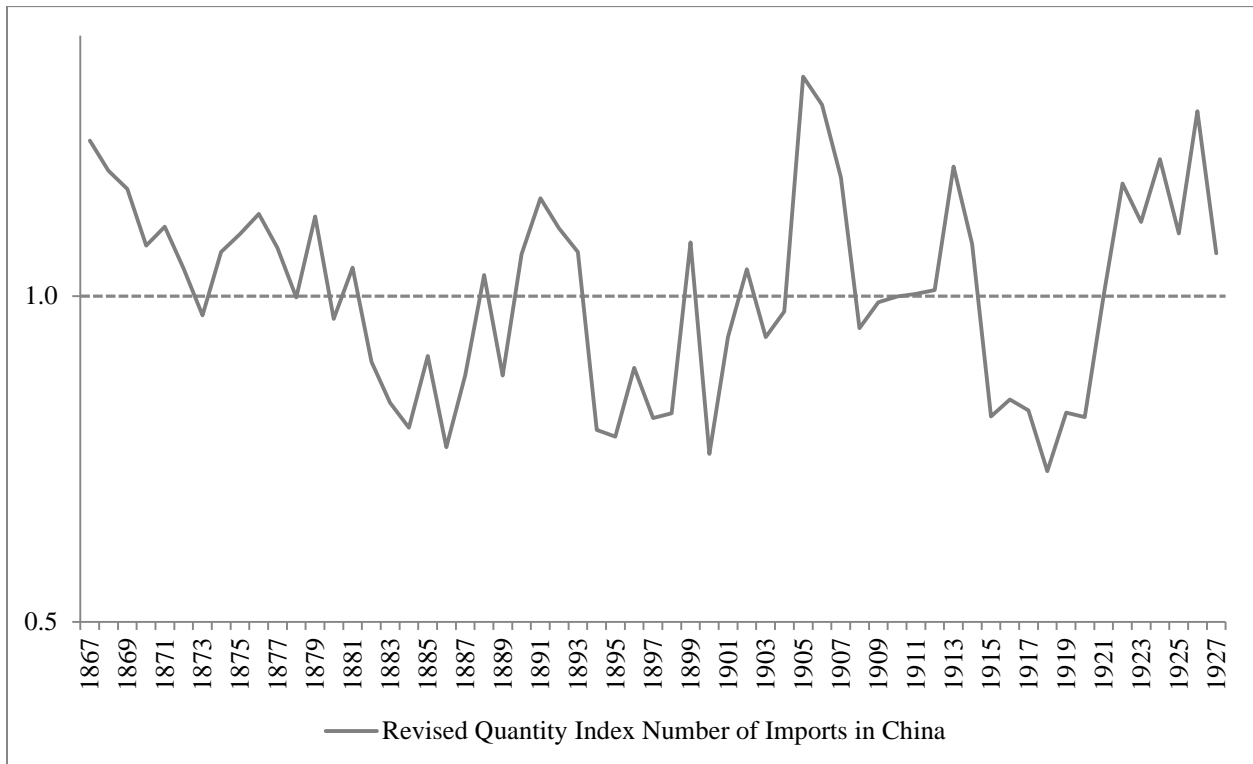Figure 3.1. Unadjusted Quantity Index Number of Imports in China, 1867-1927

Figure 3.2. Adjusted Quantity Index Number of Imports in China, 1867-1927

3.3. Research Method and Analysis

The primary research question of this paper is to evaluate whether Chinese economy experienced depression from 1927-1936, which expanded previous Ho's research time span (1867-1927). However, in the prewar China, data statistics work were undeveloped especially due to frequent wars and unstable political conditions. Hence, Ho's Quantity Index Number and Price Index indeed Number contributed a lot to the following researches. Based on these previous original data, I used a modified polynomial trend line to predict long-term economic growth line of China. After lone-term analysis, a general conclusion of Chinese economic condition from 1927 to 1936 could be reached. And then I calculated OLS regression of silver price, quantity of silver outflows and trade indexes to further analyze the exact reason of Chinese silver flight after 1934.

3.3.1. Modified Polynomial Trend Line

Ho's long-term economic growth trend was calculated in form of quadratic polynomial. However, based on my calculation of R squares of different orders, quadratic polynomial was not the best fitted curve to predict long-term economic growth. I chose quartic polynomial. The R square increasing rates between quartic polynomial and quintic polynomial were less than 0.5 percent in data of Price Index Number of Imports and Quantity Index Number of Exports. But the calculation amount of quantic polynomial was much more than that of quartic polynomial. Hence, quartic polynomial was an acceptable revising curve. The relative R square data of each index were illustrated in Table 3.4.

Table 3.4. R Square of Polynomial Curve in Different Orders

	Order	R^2	R^2 IR	Formula
QII	2	0.8089		$y = 0.0004x2 + 1.3619x + 18.577$
	3	0.8259	2.10%	$y = -0.0006x^3 + 0.0672x^2 - 0.5509x + 30.294$
	4	0.8430	2.07%	$y = -4E-05x^4 + 0.0045x^3 - 0.1659x^2 + 3.1891x + 16.171$
	5	0.8656	2.68%	$y = -2E-06x^5 + 0.0004x^4 - 0.0219x^3 + 0.5432x^2 - 4.2121x + 35.429$
PII	2	0.9191		$y = 0.0294x^2 + 0.176x + 34.016$
	3	0.9566	4.08%	$y = -0.0015x^3 + 0.1857x^2 - 4.2926x + 61.388$
	4	0.9635	0.72%	$y = -4E-05x^4 + 0.0036x^3 - 0.0484x^2 - 0.5375x + 47.208$
	5	0.967	0.36%	$y = -1E-06x^5 + 0.0002x^4 - 0.0125x^3 + 0.3862x^2 - 5.0729x + 59.009$
QIE	2	0.8844		$y = 0.0166x^2 + 0.5456x + 31.417$
	3	0.9090	2.78%	$y = -0.0009x^3 + 0.1139x^2 - 2.2367x + 48.459$
	4	0.9492	4.42%	$y = -7E-05x^4 + 0.0085x^3 - 0.3175x^2 + 4.6831x + 22.329$
	5	0.9523	0.33%	$y = -1E-06x^5 + 0.0001x^4 - 0.0033x^3 - 0.0011x^2 + 1.3808x + 30.922$

	Order	R^2	R^2 IR	Formula
	2	0.8815		$y = 0.0193x^2 + 0.4404x + 35.878$
PIE	3	0.9278	5.25%	$y = -0.0013x^3 + 0.1601x^2 - 3.5852x + 60.537$
	4	0.9355	0.83%	$y = -3E\text{-}05x^4 + 0.003x^3 - 0.0395x^2 - 0.3833x + 48.447$
	5	0.9432	0.82%	$y = -2E\text{-}06x^5 + 0.0003x^4 - 0.0165x^3 + 0.4875x^2 - 5.8835x + 62.758$

Notes: QII: Quantity Index Number of Imports in China

   PII: Price Index Number of Imports in China

   QIE: Quantity Index Number of Exports in China

   PIE: Price Index Number of Exports in China

   R^2 IR: R Square Increasing Rate

   Based on these new modified polynomial trend lines, I recalculate the Adjusted Quantity Index Number of Imports, Adjusted Price Index Number of Imports, Adjusted Quantity Index Number of Exports and Adjusted Price Index Number of Exports in China. The detailed data are in table 3.5., and the following figures represent the results of modified quartic polynomial long-term growth trends and adjusted indexes. Then the final figure 3.3 to figure 3.10. focus on the revise data from 1927-1936.

Table 3.5. Adjusted Quantity and Price Index Number in China, 1867-1936

Year	Imports		Exports		Year	Imports		Exports	
	RQII	RPII	RQIE	RPIE		RQII	RPII	RQIE	RPIE
1867	1.2865	1.0059	1.1946	0.9391	1902	1.1125	1.0477	1.0100	1.1137
1868	1.1587	1.0203	1.1052	1.0874	1903	0.9915	1.1331	0.8922	1.1674
1869	1.0836	1.0584	1.0490	1.0166	1904	1.0229	1.0697	0.9175	1.1702
1870	0.9755	1.0493	0.9121	0.9921	1905	1.3858	0.9528	0.8605	1.0988
1871	0.9858	1.0836	1.0147	1.0283	1906	1.3270	0.8469	0.8539	1.0610
1872	0.9223	1.0656	1.0626	1.0741	1907	1.1989	0.8858	0.8514	1.1019
1873	0.8583	1.0962	0.9241	1.1073	1908	0.9542	1.0054	0.8893	1.0249
1874	0.9487	0.9271	0.9207	1.0366	1909	0.9831	0.9426	1.0870	0.9518
1875	0.9811	0.8638	0.9479	0.9268	1910	0.9816	0.9766	1.1571	0.9332
1876	1.0205	0.8393	0.9460	1.0856	1911	0.9751	0.9372	1.1043	0.9000
1877	0.9867	0.8930	0.8915	0.9481	1912	0.9714	0.8838	1.0808	0.8431
1878	0.9304	0.9077	0.8978	0.9402	1913	1.1428	0.8529	1.0036	0.9239
1879	1.0636	0.9024	0.9325	0.9702	1914	1.0207	0.8976	0.8116	0.9455
1880	0.9296	0.9872	1.0166	0.9676	1915	0.7646	0.9015	0.9032	0.9402
1881	1.0224	1.0230	0.9364	0.9533	1916	0.7832	0.9465	0.9267	0.9935
1882	0.8958	0.9701	0.9885	0.8497	1917	0.7632	0.9835	0.9512	0.8792
1883	0.8466	0.9525	1.0175	0.8590	1918	0.6733	1.0732	0.9000	0.9256
1884	0.8204	0.9443	1.0919	0.7615	1919	0.7535	1.0681	1.1623	0.8854
1885	0.9469	0.9576	1.0276	0.7759	1920	0.7454	1.2191	0.9659	0.9517
1886	0.8112	1.0706	1.1694	0.7965	1921	0.9154	1.1353	1.0041	0.8951
1887	0.9394	1.0419	0.8872	1.1491	1922	1.0732	0.9750	1.0116	0.9315
1888	1.1154	1.0316	0.9353	1.1396	1923	1.0216	0.9690	1.0453	1.0027
1889	0.9574	1.0199	0.9639	1.1334	1924	1.1147	0.9533	1.0241	1.0249
1890	1.1691	0.9088	0.8882	1.0681	1925	1.0162	0.9530	0.9839	1.0472
1891	1.2706	0.8357	1.0018	1.0555	1926	1.2000	0.9396	1.0348	1.0875
1892	1.2250	0.8247	1.0272	1.0072	1927	1.0066	0.9969	1.1231	1.0518
1893	1.1876	0.8958	1.1603	0.9647	1928	1.2052	0.9729	1.1347	1.1140
1894	0.8846	1.2086	1.1954	0.9701	1929	1.2857	0.9613	1.0858	1.1920
1895	0.8726	1.2196	1.2892	0.9496	1930	1.2111	1.0590	0.9593	1.1973
1896	0.9880	1.1853	1.0692	0.9882	1931	1.2125	1.1692	1.0090	1.1730
1897	0.8990	1.2130	1.1355	1.0912	1932	1.0028	1.0947	0.7566	0.9946
1898	0.9030	1.1609	1.1335	0.9906	1933	0.9391	1.0592	0.9561	0.8717
1899	1.1845	1.0363	1.0814	1.1939	1934	0.8386	0.9380	0.9350	0.8130
1900	0.8235	1.1016	0.9175	1.0619	1935	0.8476	0.8644	1.0349	0.8194
1901	1.0100	1.0590	0.9636	1.0004	1936	0.8178	0.9705	1.0727	1.0576

Notes: RQII: Adjusted Quantity Index Number of Imports in China
RPII: Adjusted Price Index Number of Imports in China
RQIE: Adjusted Quantity Index Number of Exports in China
RPIE: Adjusted Price Index Number of Exports in China

$$y = -4E\text{-}05x^4 + 0.0045x^3 - 0.1659x^2 + 3.1891x + 16.171$$
$$R^2 = 0.843$$

Figure 3.3. Quantity Index Number of Imports in China, 1867-1936

Figure 3.4. Adjusted Quantity Index Number of Imports in China, 1867-1936

Figure 3.5. Quantity Index Number of Exports in China, 1867-1936

Figure 3.6. Adjusted Quantity Index Number of Exports in China, 1867-1936

22

$$y = -4E-05x^4 + 0.0036x^3 - 0.0484x^2 - 0.5375x + 47.208$$
$$R^2 = 0.9635$$

Figure 3.7. Price Index Number of Imports in China, 1867-1936

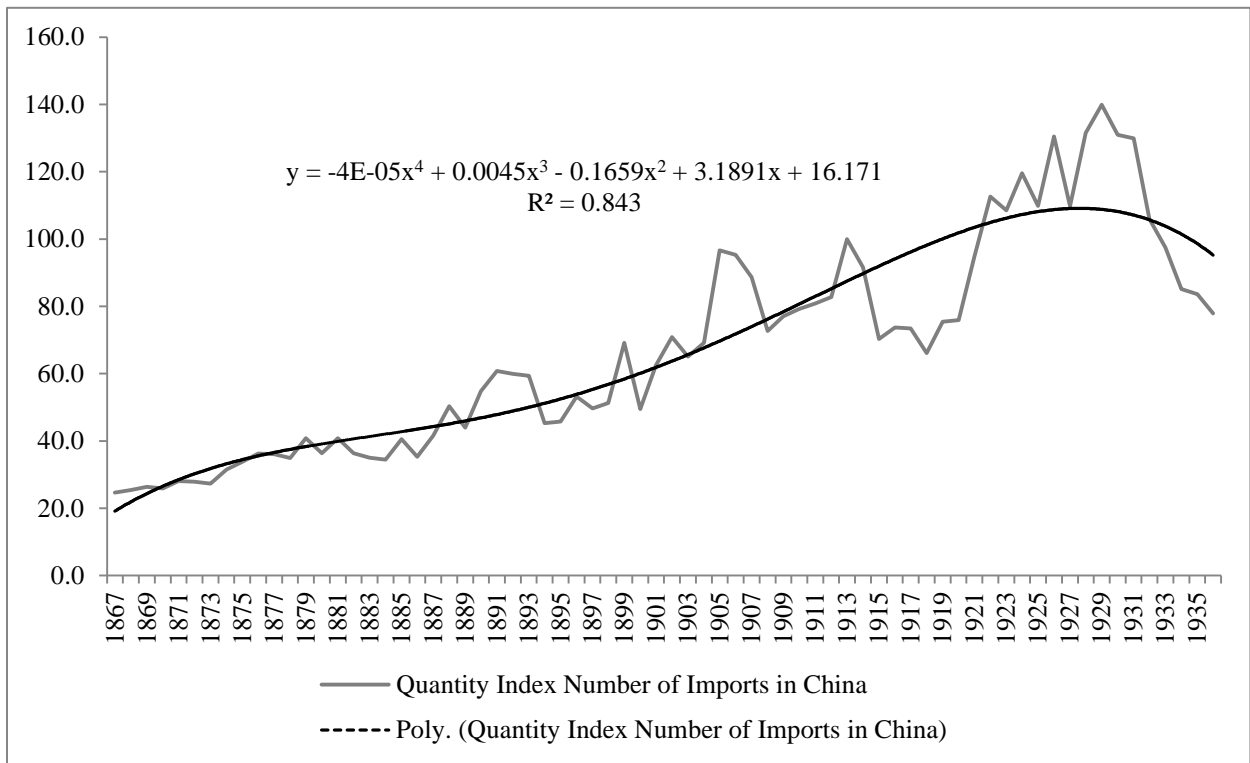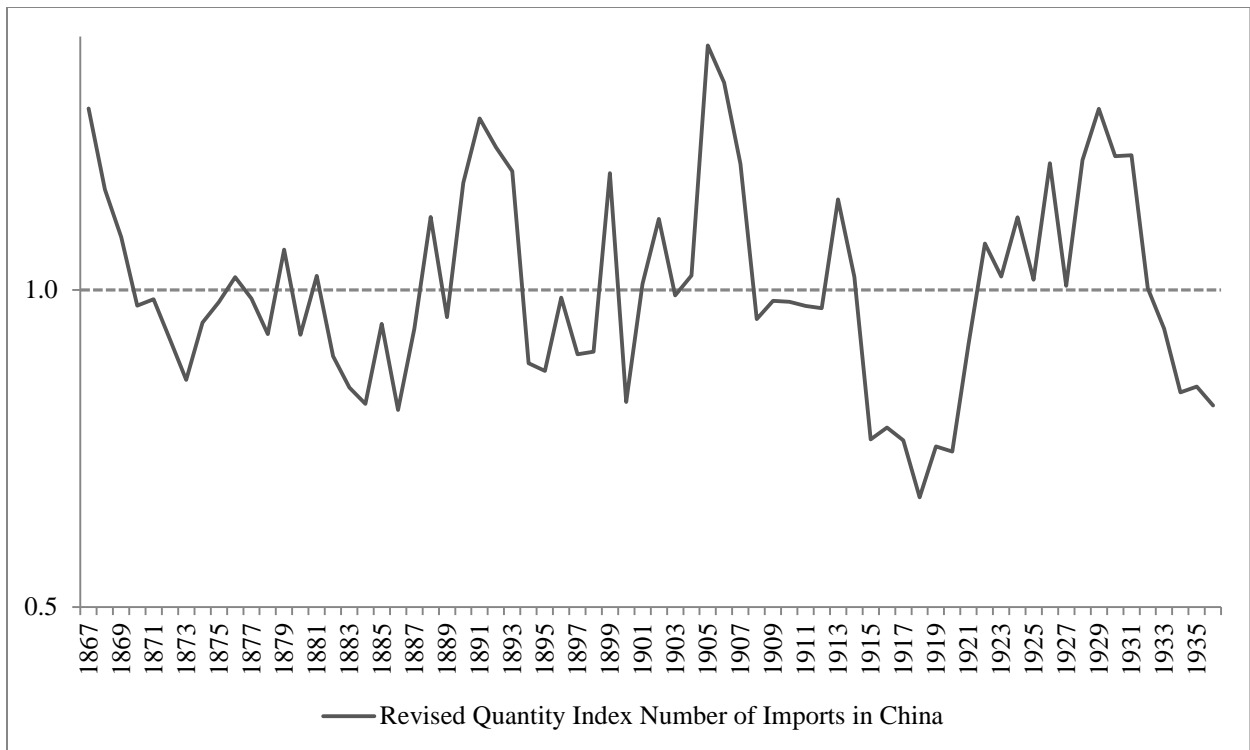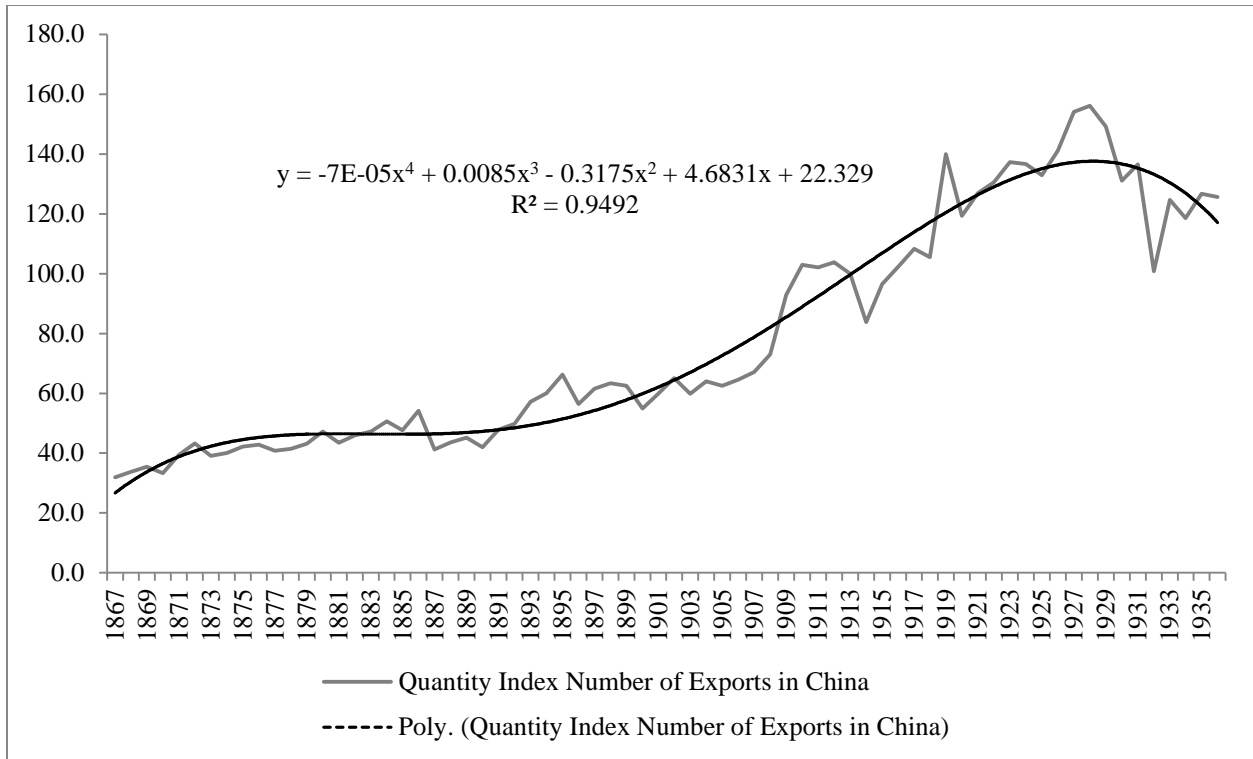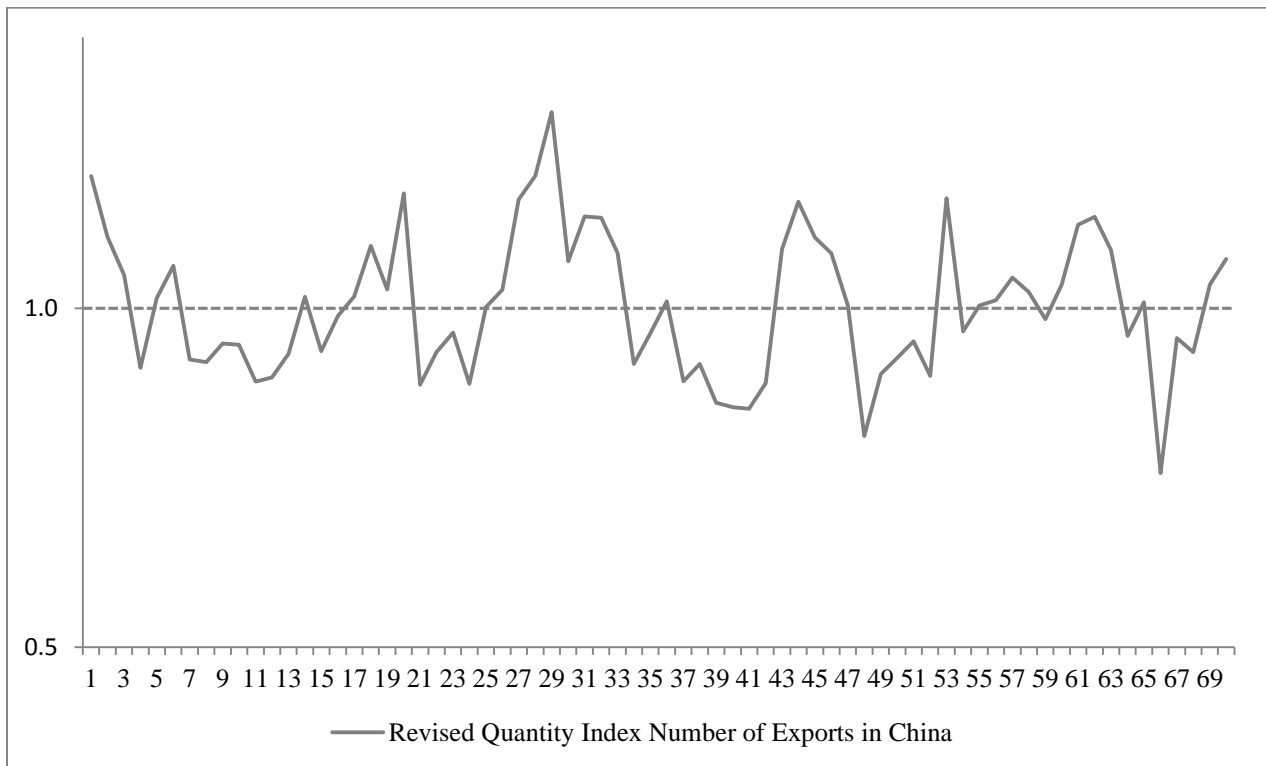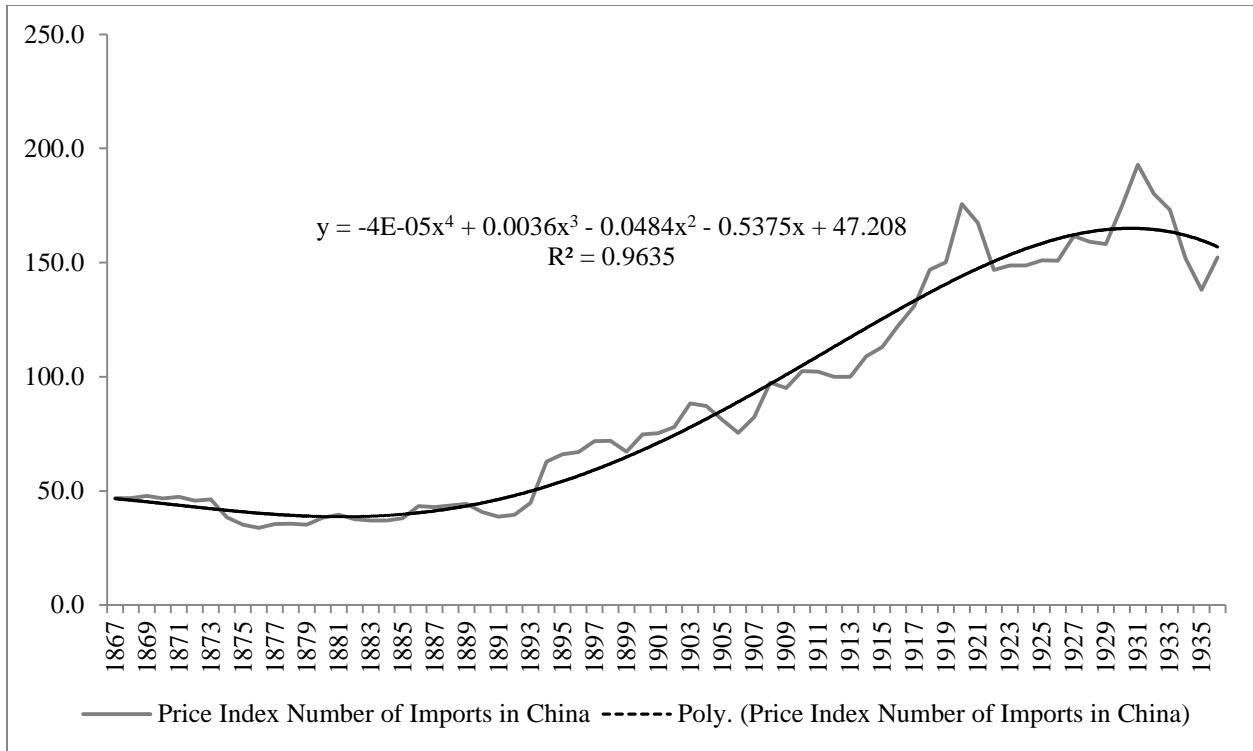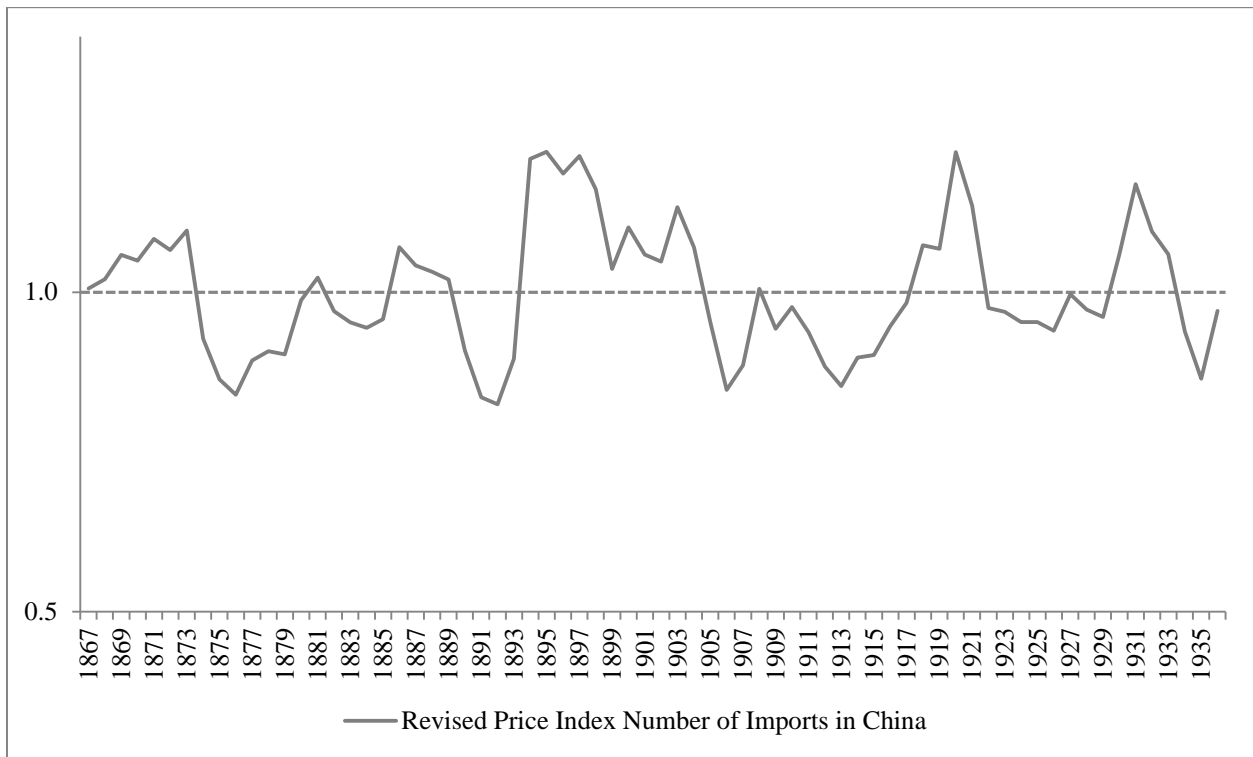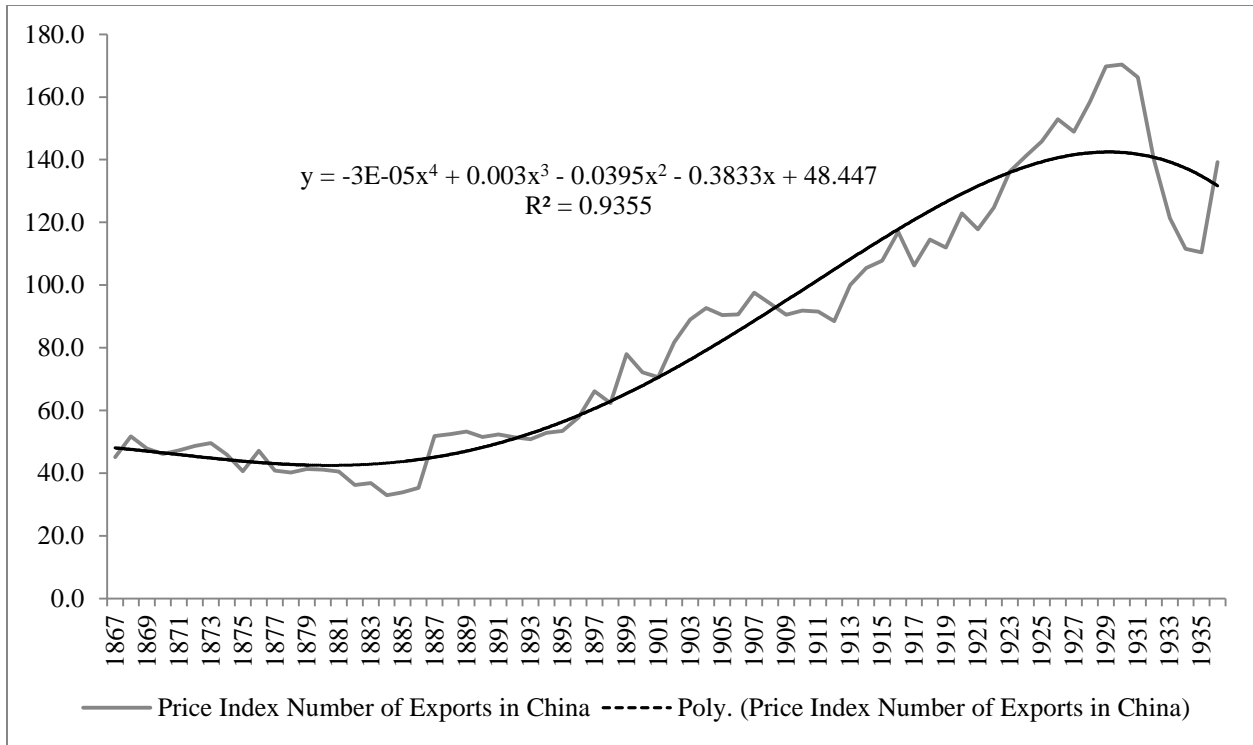Figure 3.8. Adjusted Price Index Number of Imports in China, 1867-1936

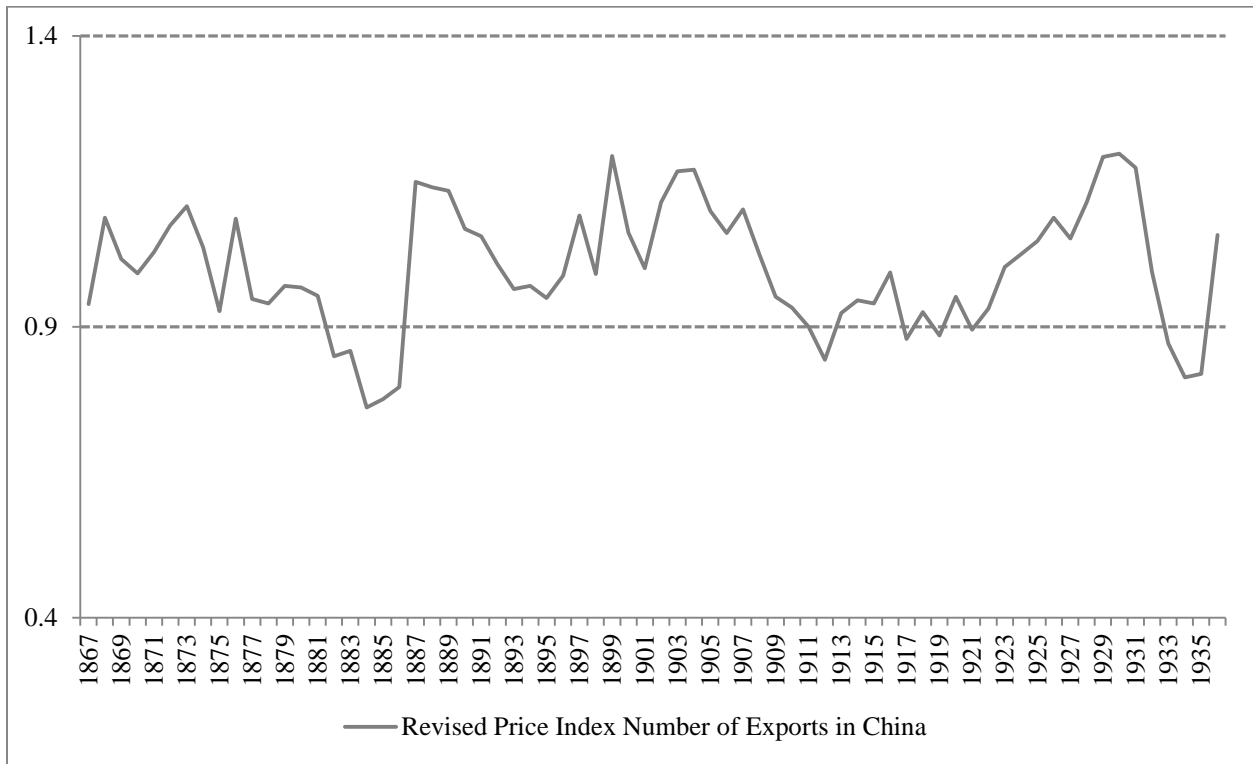Figure 3.9. Price Index Number of Exports in China, 1867-1936

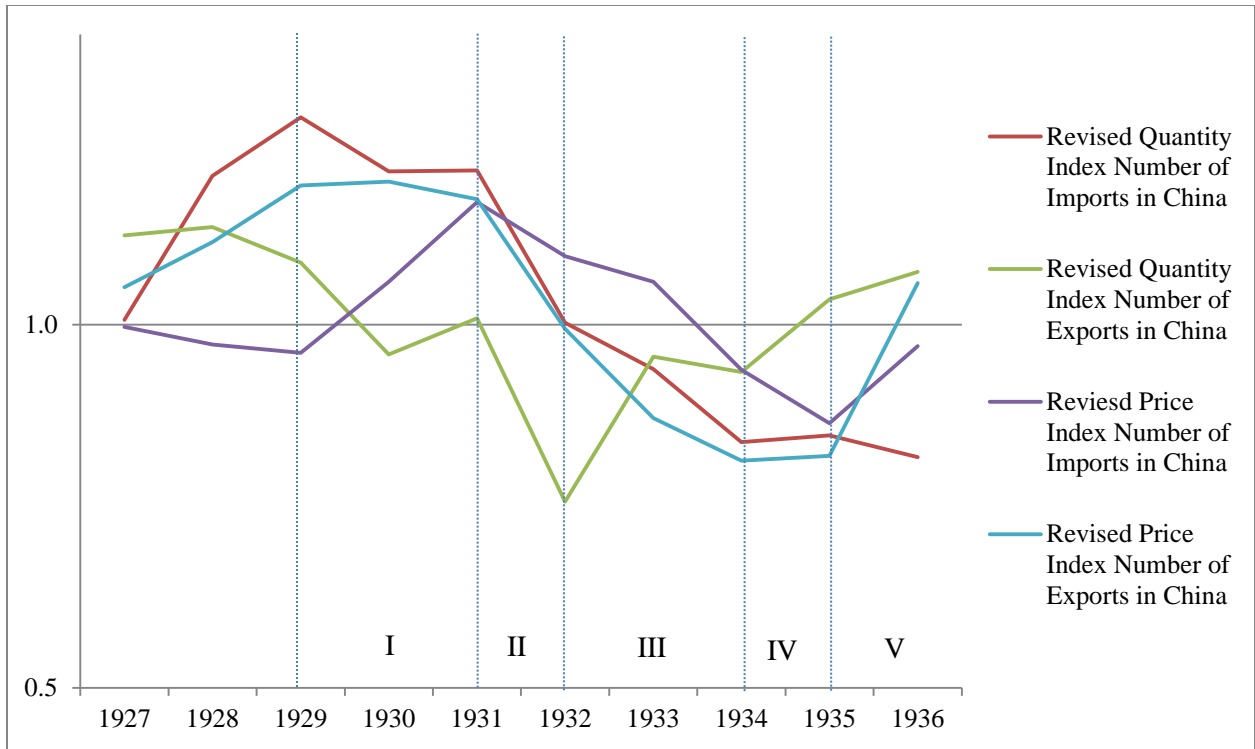Figure 3.10. Adjusted Price Index Number of Exports in China, 1867-1936

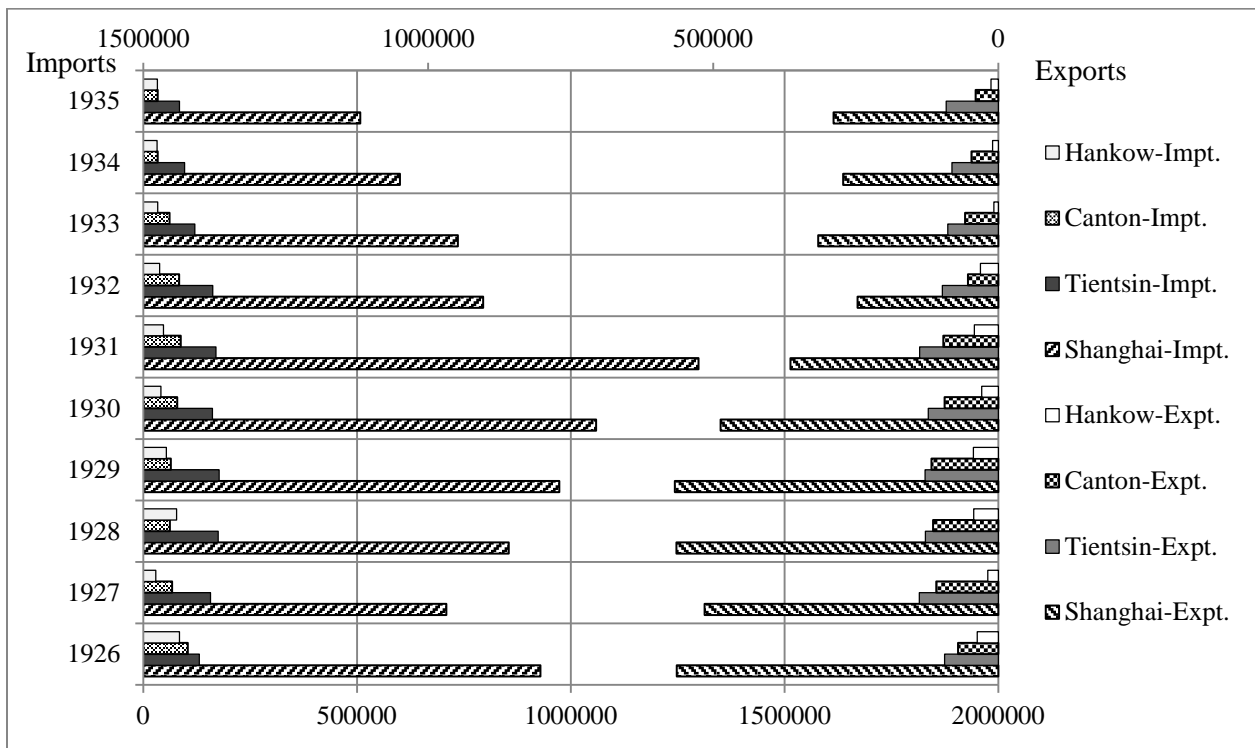Figure 3.11. Adjusted Quantity and Price Index Number in China, 1927-1936

Figure 3.12. Value of China's Imports and Export, Classify by Ports, 1926-1935
Sources: Appendix D.3

Period I (1929-1930): China's real economy indeed benefited from the silver standard at the outset of the Great Depression as Friedman stated. Most of trade index curves in figure 3.11. were above the long-term economic growth trend. Severe depression weakened other golden standard countries' real economy. The price of silver in New York silver market declined sharply from 0.53 cents per ounces (1929) to 0.29 cents per ounces (1931)[22]. As China adhered to the silver standard, falling silver price led to a decline in the exchange rate of the Chinese *dollar*. From 1929 to 1931, the exchange rate fell by 48% against the U.S. dollar and 41 % against the pound. Meanwhile, American price index fell by 23%， British fell by 30%，implying the decline in Chinese currency was greater than the combined influence of foreign exchange rate and domestic price index increase, which means China experienced a real depreciation.[23] Depreciation promoted Chinese exports even though the gross value of exports declined as illustrated in figure 3.12. First, Adjusted Price Indexes of Exports were 19.2, 19.7 and 17.3 percent higher than the long-term predicted values in the year of 1929, 1930 and 1931 respectively. This presented the nominal price of Chinese exports almost stayed the same during these three years. Meanwhile, real depreciation of Chinese currency combined with the same nominal price led to the real price of Chinese exports decreased against foreign currencies, which created cost advantage of Chinese exports. Second, Adjusted Quantity Index of Exports in China fluctuated around the long-term economic growth line. This illustrated Chinese exports volume was not seriously hurt by international depression but followed regular economy development pattern. Compared with the world average industrial activity which declined by 25 percent, Chinese exports indeed escaped from the Great Depression at the mercy of the silver standard. Then, for the imports sector, the gross import value experienced a rise as shown in figure 3.12. The Adjusted Price Index of Imports in China increased from 0.96 to 1.17, which might offset the advantages of real currency depreciation. But if we combined the factors of falling exchange rate and rising nominal imports price together, the real cost of import goods almost stayed the same as well. Together with the falling Adjusted Quantity Index of Imports data, the real gross exports value declined in this time period. All these analyses show the view of Friedman that in the early years of the Depression, China was spared the economic downturn spirals suffered by other countries.

Period II (1931): Chinese economy started to decline. British departure from the gold standard reversed the growth trend of Chinese economy. British central government officially suspended gold convertibility and conducted currency depreciation in September 1931. Three months later, Japan left the gold standard together with other countries in the sterling bloc. This preluded the abandons of gold standard globally and the battle of competitive depreciation. Silver prices started to increase, companied with the exchange rate of Chinese currency. From 1931 to 1932, Chinese currency appreciated 23.7% against the pound and 70.1 % against yen. But the prices

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[22] Appendix D.3

[23] Pang H.K. Chang," Commodity Price Shocks and International Finance"(Ph.D. dissertation, Massachusetts Institute of Technology, 1983), 93.

abroad were falling or constant. Hence Chinese currency experienced real appreciation.[24] For export part, gross export value fell about 45%, the Adjusted Quantity Index of Exports fell about 25% and Adjusted Price Index of Exports fell about 15.4. Real appreciation weakened competitiveness of Chinese exports. What's worse, in 1931 Japan conquered Manchuria, a region contributed about one third of Chinese exports further impaired domestic economy. For import part, Adjusted Quantity Index illustrated a decreasing trend, which means appreciated Chinese currency did not transform into purchasing power. And real appreciation led to decline in nominal import price. Combing these factors together, gross import value of China declined sharply as illustrated in figure 3.12.

Period III (1932-1933): Chinese economic performance continued to decline. In the 1932 U.S. presidential election, Franklin D. Roosevelt criticized Hoover's defense of the gold standard which proponed overdue recovery process of U.S. economy in the Great Depression. One of his new plans was to suspend gold convertibility and devaluate dollars to curry out inflationary policy. In order to win the election, two groups of political powers could not be ignored by Roosevelt. They are the silver bloc and farm bloc. Milton Friedman stated in his journal that:

> Before the election, the 14 senators from the seven states producing the bulk of the silver were evenly divided: seven Republicans and seven Democrats. The Roosevelt sweep left only two Republicans versus 12 Democrats, and one of the Republicans, William E. Borah of Idaho, has long been a staunch supporter of silver… Similarly, the farm state allies of the silver bloc gained strength and could hardly be ignored by the president.[25]

These seven states were major U.S. silver primary origins- Utah, Idaho, Arizona, Montana, Nevada, Colorado, and New Mexico. One-seventh of the votes were controlled by senators from these regions.[26] Roosevelt never forgot his campaign promise -"do something for the silver." After winning the election, Roosevelt paid off the voting support from the silver and the farm states by issuing a series of commodity prices rising polities. On May 12th 1933, *Thomas Amendment* was passed. It was aimed at restricting agricultural production by providing subsidies to farmers, increasing Federal Reserve notes and doubled the amount of high-powered currency. On December 21, 1933, the President ratified the Pittman London Silver Amendment, which commanded the U.S. mints to purchase the entire domestic newly mined silver at 64.5 cents per ounce, the price equaled to half of statutory price but 20 cents more than market price. This act played as the first step to reduce the amount of private owing silver. And it enabled Treasury took the balance of statutory price as a book profit for monetizing the silver. American a series of silver price rising policies further worsen Chinese international trade. Declines in adjusted imports price, adjusted imports quantity and adjusted export price show the downturn. Adjusted Quantity Index Number of Exports in China showed a sharp increase in 1932. One

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[24] Pang H.K. Chang," Commodity Price Shocks and International Finance"(Ph.D. dissertation, Massachusetts Institute of Technology, 1983), 45.

[25] Milton Friedman, "Franklin D.Roosevelt, Silver and China," *Journal of Political Economy* 100, no.1.(1992): 65

[26] Theodore J. Kreps," The Price of Silver and Chinese Purchasing Power," *Quarterly Journal of Economics* 48 (Feb. 1934): 246.

possible explanation was the falling export price stimulates foreign demands of Chinese exports. But the real appreciation of Chinese currency may offset price advantage. Another explanation was the rising international silver price stimulated speculation, which contributed to the quantity of exports. But whether silver outflow contributed to increase in the Adjusted Quantity Index needs further analysis.

Period IV (1934): Chinese economy became even worse. In spite of Adjusted Quantity Index Number of Exports above the long-term economic growth line, all the other trade indicators bellowed the predicted points. This situation effectively testified that Chinese economy experienced depression later in the 1930s, which objected Rawski's theory. Booming international silver price was mainly caused by the U.S. silver purchase act on June 19, 1934. As the climax of these series of expansionary polities, *Silver Purchase Act* was signed by President Roosevelt and the contents of *Silver Purchase Act* were claimed as follows:

> The Silver Purchase Act "directed the Secretary of the Treasury to purchase silver at home and abroad until the market prices reached $1.29+ an ounce, or until monetary value of the silver stock held by the Treasury reached one-third of the monetary value of the gold stock. The Secretary was given wide discretion in carrying out that mandate.[27]

In 1933 the market price of silver is 45 cents, while the silver bloc successfully lobbied the congress to accept the arbitrary purchase value ($1.29 an ounce) by asserting that increased silver price could promote purchase power in silver standard counties like Mexico and China. This in turn created a massive trade market for American exports which stimulated U.S. economy recovery. Actually, obligatory federal purchase at $1.29 offered a considerable governmental subsidy to silvering industry. What's more, another tricky part of this act was to maintain the fixed ratio between gold and silver revers. At the time silver purchase act was passed, purchasing 1.2 million ounces of silver was enough to satisfy the fixed ratio requirement. But with federal gold stocks climbing up, at the end of 1934 another 125 million ounces of silver should be brought by Treasury. [28]

American silver purchase act actually caused the international silver price from 0.35 cents per ounce to 0.48 cents per ounce, which increased by 37% in a year. Correspondingly, Chinese Adjusted Price Index of Imports decreased about 7.9% while the Adjusted Price Index of Exports remained the same. For the import part, declining nominal import prices were offset by real appreciation. The relative stable imports volume together with stable real imports price means the real gross imports value of China remained the same. For the export part, the stable adjusted nominal export prices combined with real appreciation means the real price of exports remained the same. Together with increasing adjusted quantity index of exports, the real gross exports of

[27] Milton Friedman, and Anna J. Schwartz, Monetary History of the United States, 1867-1960 (Princeton: Princeton Univ. Press, 1963), 127.nn.6

[28] John Morton (M.) Blum, *From The Morgenthau Diaries: Years of Crisis, 1928-1938* (Boston: The Riberside Press Cambridge, 1959),189.

China in 1934 should be increased. Increased real exports revenue and stable real imports cost should narrow the balance of payment in China. This analysis rejected Friedman's theory of silver outflow was caused trade deficits. So why did massive of silver outflow from China?

Period V (1935): Chinese trade situation started to recovery. As the massive silver flight drained Chinese silver reserves, Chinese government announced to conduct currency reform in November 1935, which aimed to suspend silver convertibility and unified monetary system. Instead of using the silver standard, China started to adhere to the fiat standard. Rising in adjusted export price and quantity boosted gross export values. And decline in gross import values as illustrated in figure 3.12 showed the recovery process of Chinese economy, especially the Adjusted Quantity Index of Exports and Adjusted Priced Index od Exports above the long-term growth line, which means they performed better than predicted. However, all the above analyses based on the assumption that international silver price has a significant impact on adjusted trade data. In order to show their correlation and coefficient, OLS regression analysis should be further analyzed.

3.3.2. OLS Regression Analysis

To start, it was better to review major indexes of silver price globally. There were two primary silver price indexes- London silver price and New York silver price. From 1870 when most of countries in the world started to utilize the gold standard, silver prices were impacted by relative fluctuations in gold prices. As the United Kingdom and the United States were all gold standard countries, their domestic economic situations especially their treatment of gold standard could influence their currency value, which further impacted the accuracy of silver price recorded in this currency. For example, London silver price started to be recorded since 1833.[29] From 1915 to 1918, British government conducted capital control policy which suspended gold convertibility and forbidden gold exports. The U.K domestic gold prices were higher than the level abroad; hence its silver price indexes could not accurately represent silver price in international market. After the World War I, Britain experienced inflation; London silver price lost its representativeness during this time period as well. For New York silver price, since the United States continuously adhered to the gold standard during the World War I, hence its data could more precisely influence the silver prices fluctuations. But the influence of the U.S domestic economy to the silver price recorded in U.S. dollars could not be completely adjusted.

Appendix D.2 illustrated the New York silver price. And the table 3.6. represented the regression results of New York silver price to these four series of trade indexes. The independent variable was New York silver price and independent variables were adjusted trade indexes.

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[29] Pang H.K. Chang," Commodity Price Shocks and International Finance"(Ph.D. dissertation, Massachusetts Institute of Technology, 1983),634.

Table 3.6.: OLS Regression Results of New York Silver Price and Adjusted Trade Indexes, 1867-1936

Independent Variable	NYSL$_{1867-1936}$	NYSL$_{1867-1936}$	NYSL$_{1867-1936}$	NYSL$_{1867-1936}$
Dependent Variable	RQII $_{1867-1936}$	RPII $_{1867-1936}$	RQIE $_{1867-1936}$	RPIE $_{1867-1936}$
Regression Statistics				
Multiple R	0.0112	0.1319	0.0112	0.1996
R Square	0.0001	0.0174	0.0001	0.0399
Observations	70	70	70	70
F	0.0086	1.2044	0.0086	2.8228
Significance F	0.9265	0.2763	0.9265	0.0975
Coefficients	0.0004	-0.0484	0.0004	-0.0776
Standard Error	0.0457	0.0441	0.0457	0.0462
t Stat	0.0926	-1.097	0.0926	-1.6801
P-value	0.9265	0.2763	0.9265	0.0975
Significant	Reject	Reject	Reject	Reject
Independent Variable	NYSL$_{1913-1936}$	NYSL$_{1913-1936}$	NYSL$_{1913-1936}$	NYSL$_{1913-1936}$
Dependent Variable	RQII $_{1913-1936}$	RPII $_{1913-1936}$	RQIE $_{1913-1936}$	RPIE $_{1913-1936}$
Regression Statistics				
Multiple R	0.518	0.1071	0.2615	0.3703
R Square	0.2684	0.0115	0.0683	0.1371
Observations	24	24	24	24
F	8.0698	0.2551	1.6143	3.4951
Significance F	0.0095	0.6185	0.2172	0.0749
Coefficients	-0.4433	0.0471	0.1167	-0.1922
Standard Error	0.1561	0.0932	0.0919	0.1028
t Stat	-2.8407	0.5051	1.2705	-1.8695
P-value	0.0095*	0.6185	0.2172	0.0749
Significant	Accept	Reject	Reject	Reject

Independent Variable	NYSL$_{1921-1936}$	NYSL$_{1921-1936}$	NYSL$_{1921-1936}$	NYSL$_{1921-1936}$
Dependent Variable	RQII$_{1921-1936}$	RPII$_{1921-1936}$	RQIE$_{1921-1936}$	RPIE$_{1921-1936}$
Regression Statistics				
Multiple R	0.0401	0.6344	0.523	0.2055
R Square	0.0016	0.4025	0.2735	0.0422
Observations	16	16	16	16
F	0.0225	9.4322	5.2702	0.6174
Significance F	0.8828	0.0083	0.0377	0.4451
Coefficients	-0.042	-0.3593	0.3235	-0.1786
Standard Error	0.2797	0.117	0.1409	0.2273
t Stat	-0.1502	-3.0712	2.2957	-0.7858
P-value	0.8828	0.0083*	0.0377*	0.4451
Significant	Reject	Accept	Accept	Reject
Independent Variable	NYSL$_{1927-1936}$	NYSL$_{1927-1936}$	NYSL$_{1927-1936}$	NYSL$_{1927-1936}$
Dependent Variable	RQII$_{1927-1936}$	RPII$_{1927-1936}$	RQIE$_{1927-1936}$	RPIE$_{1927-1936}$
Regression Statistics				
Multiple R	0.1313	0.8855	0.7127	0.1856
R Square	0.0172	0.7841	0.508	0.0345
Observations	10	10	10	10
F	0.1404	29.0484	8.2592	0.2855
Significance F	0.7176	0.0007	0.0207	0.6076
Coefficients	-0.1831	-0.6069	0.6268	-0.2168
Standard Error	0.4887	0.1126	0.2181	0.4057
t Stat	-0.3747	-5.3897	2.8739	-0.5344
P-value	0.7176	0.0007*	0.0207*	0.6.76
Significant	Reject	Accept	Accept	Reject

Notes: NYSL: New York Silver Price
RQII: Adjusted Quantity Index Number of Imports in China
RPII: Adjusted Price Index Number of Imports in China
RQIE: Adjusted Quantity Index Number of Exports in China
RPIE: Adjusted Price Index Number of Exports in China
*$p<.05$

As we can see from the regression results above, in the long-term (1867-1936) all the regression results were rejected. The situation was almost the same in time period from 1913-1936, only the result for Adjusted Quantity Index Number of Imports was accepted. The reason for it was mostly because of the World War I, when most countries seek for silver as military usage. The silver price experienced surge increase sharply, booming from 0.51 cents per ounce in 1915 to 1.12 cents per ounce in 1919, the increasing rate was 119.61%. The sharp rise should be viewed as extreme situation. And more advanced statistical analysis could be used to modify data in the World War I and further evaluate long-term silver price' influence on Chinese trade performance.-limitation.
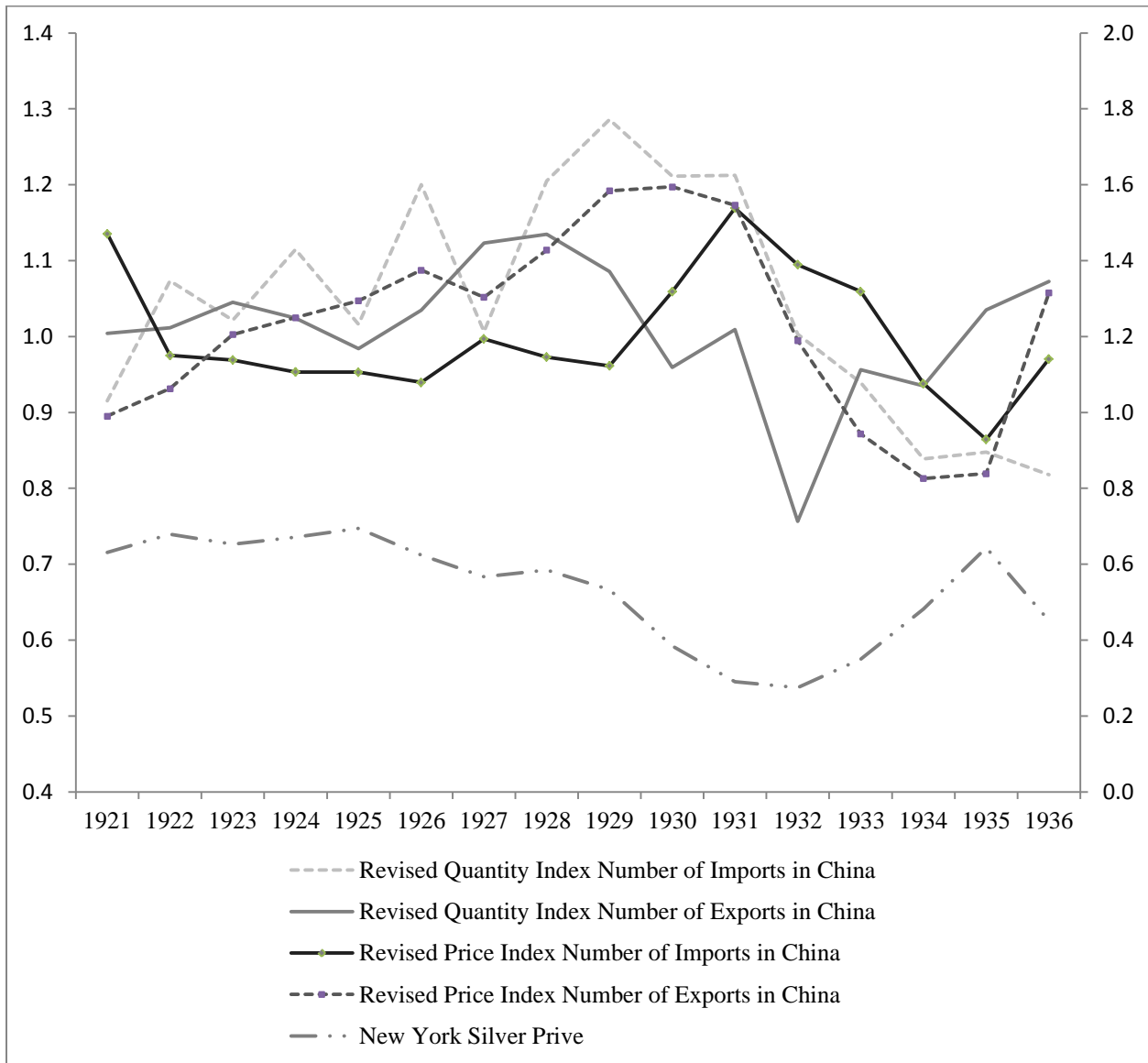

Figure 3.13. New York Silver Price and Adjusted Quantity and Price Index Number in China, 1921-1936

In the time period after the World War I, OLS regression showed the same results. The figure 3.13. represents the growth pattern of silver price and trade indexes. The Adjusted Price Index Number of Imports and Adjusted Quantity Index Number of Exports were both significantly influenced by global silver price. What's more, the absolute coefficients values of these two dependent variables were increased when comparing the time period from 1921 to 1936 and from 1927 to 1936. For Adjusted Price Index Number of Imports, coefficients changes from -0.36 to -0.61, which means the rising silver prices enhanced the Chinese silver purchasing power with decline in imports prices. But the coefficient data for Adjusted Quantity Index Number of Exports changed from 0.32 to 0.63. The increasing silver price promoted Chinese exports, which was not corresponding with the view that rising silver price reduces exports' cost advantages. Another possible explanation was the silver outflow after the silver purchase act contributed to the exports quantity. Hence, it was necessary to analyze the different influence of silver outflow on Adjusted Quantity Index Number of Exports and Quantity Index Number of Exports. The table 3.7. represented the regression results of these research question.

Table 3.7. OLS Regression Results of Silver Outflow, RQIE and QIE, 1927-1936

Independent Variable	$SO_{1927-1936}$	$SO_{1927-1936}$
Dependent Variable	$RQIE_{1927-1936}$	$QIE_{1927-1936}$
Regression Statistics		
Multiple R	0.287	0.6322
R Square	0.0824	0.3996
Observations	10	10
F	0.7182	5.3249
Significance F	0.4214	0.0499
Coefficients	2.1099	0.0001
Standard Error	2.4897	0.0003
t Stat	0.8475	2.3076
P-value	0.4214	0.0498
Significant	Rejected	Accept

Notes: SO: Silver Outflow
RQIE: Adjusted Quantity Index Number of Exports in China
QIE: Quantity Index Number of Exports in China

According to the regression results in Table 3.7., silver outflow had a significant impact on unadjusted exports quantity index but no significant influence on adjusted exports quantity index. This represented the Chinese silver flight in the late 1930s were less linked to long-term economic growth, which was illustrated in adjusted exports quantity index. If silver outflow did not follow the economic growth trend, there was another explanation- short-term economic

shock, which was international silver speculation. The silver outflow in the 1930s, especially after the U.S. silver purchase act, promoted international silver speculation. Combined with historical archive documents; Chinese silver flight was motived more by speculation in domestic and international markets. This view was coincidence with Chang's theory.

4

Historical Analysis

Before the author started the discussion of silver outflow situation of China from 1932 to 1936, it is necessary to go over the banking system and monetary system in prewar China. Generally speaking, prewar Chinese banking system mainly consisted of native banks, foreign banks and commercial banks. And the Chinese monetary system mainly consisted of monetary coins, like silver or copper, banknotes and bank deposits.

4.1. Chinese Banking System

In the prewar time period, Chinese banking system mainly consisted of three different but complementary parts: native banks, foreign banks and commercial banks. Extensive links between different types of banking institutions integrated the domestic market and stimulated the national to prosper. Owing entrenched social networks and long-term history of financing agrarian economy, native banks dominated prewar banking system. They offered foreign banks and commercial banks potential useful information about financial demand from Chinese customers. In return, they borrowed in short-term ready cash from the other two institutions and these inter-bank borrowing solved native banks' cash shortage problem. The foreign banks mainly undertook bank services concerning international trade and exchange transactions. They cooperated with native banks by issuing banknotes and also worked together with commercial banks, which contacted more closely with central government. With the establishment of central banks in 1928, the China's banking system formed a comprehensive and efficient framework combining rural areas and urban places together, which formed a solid institutional foundation for currency reform in 1935.

4.1.1. Native banks

Chinese agrarian economy created its own banking system prior to the modern banks emerged in the late nineteenth century. This traditional banking system consisted of *ch'ien-chuang* (native banks) and the Shanxi banks. The latter did not survive the Republication revolution of 1911 while the former became the major component of prewar China's banking system. This traditional Chinese banking system adapted to the agrarian economy well. Unlike industrial economy which appeared in the early twentieth century, China's agrarian economy owned its instinct features. Individual owners were engaged in small-scale farming; the costs and returns of agricultural products were seriously influenced by governmental policies and climatic conditions; seasonal production called for financial support intensively during the seeding and

harvest periods, and individual peasant household had little financial risk resistance capacity. Hence, in order to cater these needs, *ch'ien-chuang* offered various financial services through its interregional branches dispersing among major farming regions and commercial centers. Generally speaking, most of the native banks (*ch'ien-chuang)* were private owned. Individuals, partnership or small groups of shareholders undertook unlimited liability for the discharge of bank obligation. As Rawski Stated in his book that:

> The *ch'ien-chuang* accepted deposits, extended loans and undertook direct investments in business ventures, conducted interregional transfers, prepared and accepted bills of exchange, issued banknotes and orders (promises to pay specific sums on specified future dates). Transferred funds among depositors, and preformed other functions associated with these services. Although free of government supervision, the *ch'ien-chuang* were subject to self-regulation through their own field, which also performed some central banking functions, including the provision of interbank clearing facilities in the largest commercial centers.[30]

Compared to modern banks, *ch'ien-chuang* depended more on regional social networks and personal credits. It also maintained close links with industrial sector by direct investments and indirect personal connections. Direct investments often contained venture capitals, exchange of deposits and the granting of loans. Indirect personal connections usually happened between native bankers and industrialists. Bankers and entrepreneurs held shares of native bank and some firms employed former employees from native banks. Although foreign banks and commercial banks strongly challenged the deposit and loan business of native banks in treaty ports, *ch'ien-chuang* still had a vital influence in interior areas. The following figure 4.1. illustrates the trend of total number of *ch'ien-chuang* and its capital storage from 1912 to 1936.

As we can see from the figure 4.1., since the middle 1920s, *ch'ien-chuang* market experienced an integrating process- the total number of native banks was declining while the capital per unit continuously increased. Especially during the time period from the Great Depression to 1933, the operations of foreign banks were seriously impacted by their domestic economic recession. Native banks seized the opportunities and rapidly expanded capital. Until 1933, when the gold standard ultimately was abandoned by most countries, their economy recovery and international competitive depreciation slowed down the rate of silver inflows to China which further hampered the capital gathering process of national banks. Rise in silver price, especially the U.S. silver purchase act aggravated silver flight and lowered the total amount of capital storage back to the level almost 10 years ago.

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[30] Thomas G. Rawski, Economic Growth In Prewar China (California: University of California Press, 1989),127.
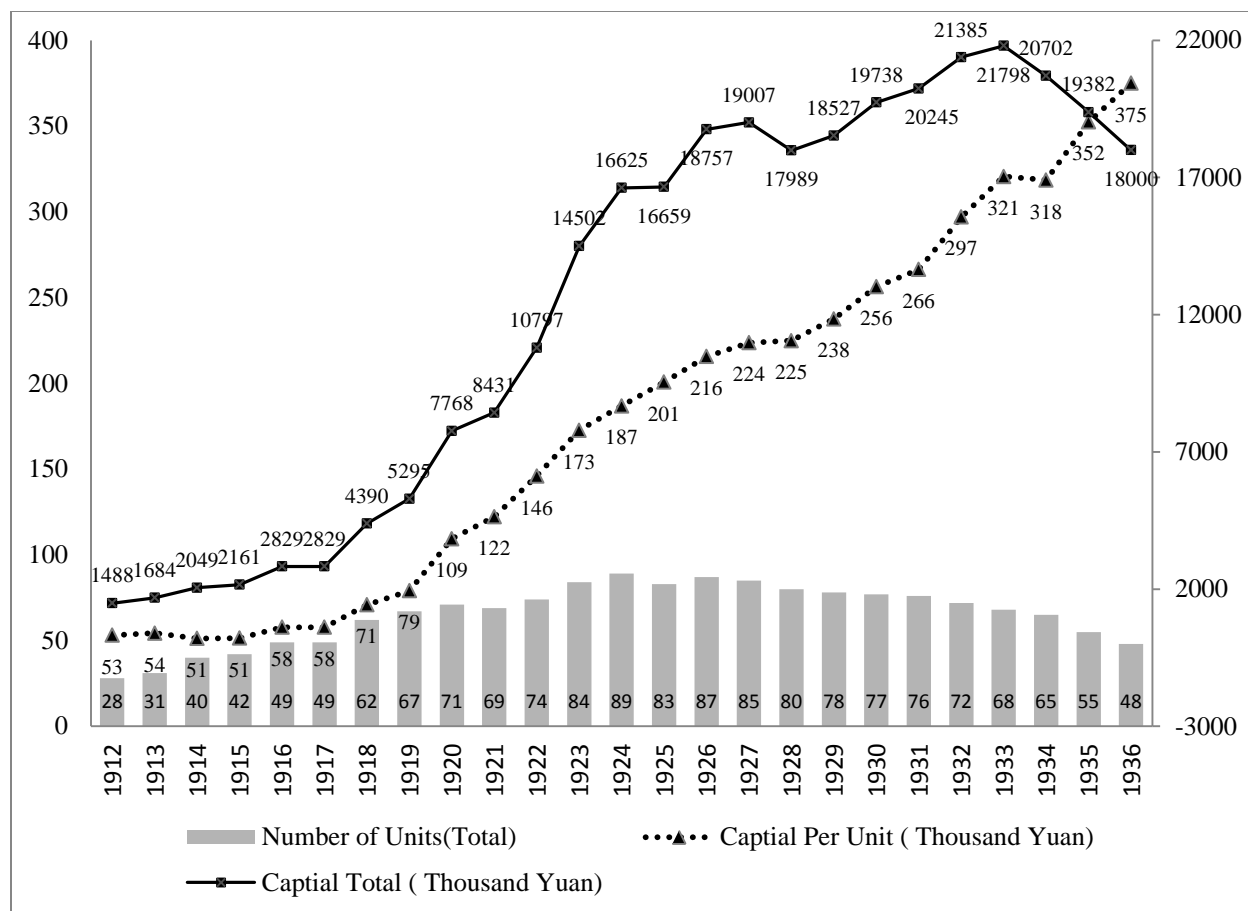
Figure 4.1. Shanghai Native Banks, 1912-1936
*Source*s: Data from Appendix D.5

4.1.2. Foreign banks

In the wake of treaties that were designed to establish trade association with China, foreign banks penetrated into Chinese financing market initially functioned as intermediates for overseas exports and imports in treaty ports. The Hong Kong and Shanghai Bank, formed in 1864, was the first foreign bank set up to provide financial services to British merchants. With Chinese economy gradually involved in international trade market, more and more foreign countries opened up banks along China's coastal trading regions. Until the Sino-Japanese war, fifty-three firms owned over 150 offices including overseas headquarters and local branches in China.[31]

In spite of ordinary banking services like absorbing deposits, issuing bank notes, granting loans and transferring monetary assets, foreign banks conducted several special services. First of all, they monopolized currency exchange services. Owing irreplaceable advantages, foreign banks not only earned fees from currency exchange services, but also made substantial profits through

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[31] Thomas G. Rawski, Economic Growth In Prewar China (California: University of California Press, 1989),130.

arbitrage in exchange rate fluctuations between Chinese silver standard and global gold standard. Their working capitals also generated from another four channels: a) Wealthy Chinese people deposited their surplus assets in foreign banks which provided a steady silver inflow. Because deposits in foreign banks undertook lower political risk and owned higher security against Chinese government unstable policies. b) A more important source was their roles in servicing China's foreign debt and indemnity payments. c) They played as bankers to the foreign-controlled Chinese customs system, which brought them an endless inflow of customs tax and salt receipts, which were used as reserves to offer loans to European lender. d) They also undertook intermediates of Chinese government overseas borrowing, and this enabled foreign banks to maintain an intimate contact with the central government.

Foreign banks mostly concentrated in treaty ports and owned geographical proximity with native banks and commercial banks. In spite of spatial proximity, business cooperation enabled them to set up an extensive links among them. Native banks possessed wide-spread social network and valuable information that were essential to potential Chinese borrowers. However, they lacked enough ready cash which could be perfectly offset by short-term unsecured credits provided by foreign banks. What's more, most of Chinese *tael* was controlled by native banks. In order to exchange Chinese *dollar* for *tael,* foreign banks had to deposits certain amounts of capital in accounts of native banks. Inter-bank borrowing was common during this time period. However, since Japan attacked Shanghai in January 1932, fearing of silver removal conducted by foreign banks resulted in native banks suspending silver convertibility. They confined their business to 'paper' service without any negotiations. Despite these difficulties, foreign banks were viewed more stable and trustworthy than competing commercial banks.

4.1.3. Commercial banks

The financial impacts of the Republication revolution were not only terminated operation of Shanxi Banks as illustrated above, but also contributed to the spring tide of Chinese domestic industry. In the early 1910s, many famous entrepreneurs like Zhang Jian (the founder of Chinese modern oil industry) and Rong Zongjing (the founder of Chinese modern textile and flour industries) took an active part in penetrating financial sector to open up new capital channels for their companies. Is spite of entrepreneurs, blocs of vented interests like warlords and politicians also tried to pursue profits through capital operation. *Northern Four Banks* and *Southern Three Banks*[32] were typical representatives of successful commercial banks during the prewar interval. The establishers of these banks all had strong political and business backgrounds. To some extent, Chinese commercial banks were born with intimate contact with central government. More than 100 new institutions were set up during the 1910s. And in the following two decades, the total number of Chinese commercial banks reached up to over 1600 units, covering 14

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[32] *Northern Four Banks* represents Gold City bank, Salt Industry Bank, Middle-of-south Bank and Mainland Bank. *Southern Three Banks* means Chekiang Industrial banks, Chekiang First Banks and the Shanghai Commercial & Saving Banks.

provinces. Most of subsidies were concentrated in treaty ports along coastal lines like Shanghai, Tientsin, Nanking and Canton. There were also some located in political center- Peking and Chungking (Appendix D.6, D.7). According to the Figure 4.2., certain provinces have high density of Chinese Commercial banks like Kiangsu, Hopei, and Chekiang and they represents commercial banks already achieved relative high degree of branches distribution. While, some provinces like Kwangtung, Hupei, Szechwan, Shantung and Hunan owned smaller number of offices but high density. This means most of subsidies concentrated on treaty ports in each province. As far as Shanghai was concerned, there were approximately 500 branches gathered here, which accounted for one third of the sum subsidies nationally in 1936.Their network distribution had not stretched to rural areas in prewar China.
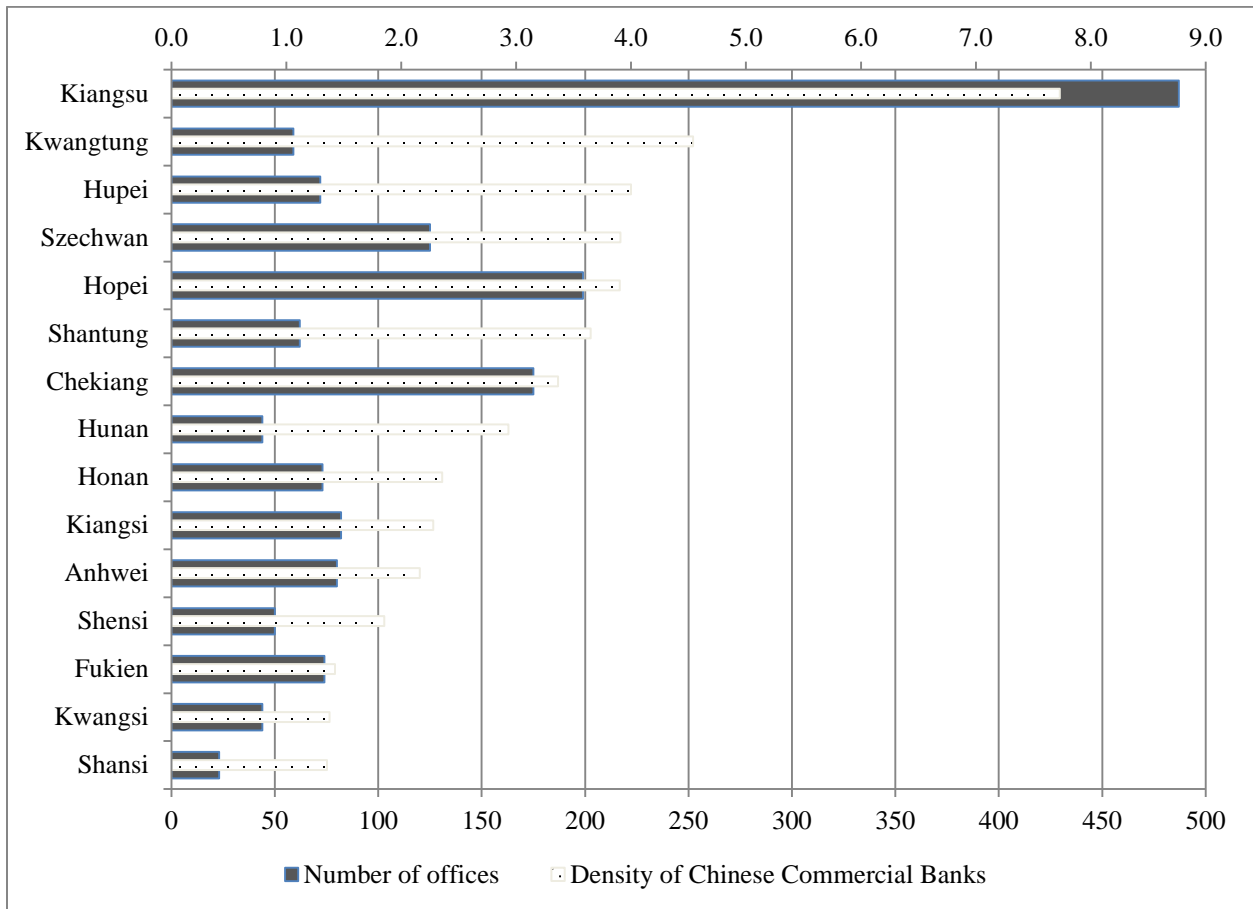
Figure 4.2. Number and Density of Chinese Commercial Banks, 1936
Source: Data from Thomas G. Rawski, Economic Growth In Prewar China (California: University of California Press, 1989),136.

Expect for small-scale banks financed by private capitals, there were four state-owned commercial banks. *Bank of communications* functioned as the first currency issuing commercial bank, which was set up in 1908. At that time, the Ch'ing dynasty needed a financial institution specialized in undertaking cashing managements of steamships, railways, telegraphs and postal

services departments. In order to achieve better capital operation and raise more railway construction funding, they established *Bank of communications* in Peking. In 1909 the bank began to issue banknotes, and in 1922 Zhang Jian (as introduced above) was resigned as bank manager, who transformed the deficits situation of the bank and gained surplus. After the Chinese republic became the official central government in 1928, the *Bank of communications* was moved to Shanghai and mainly offered financial services to administrative institutions in agriculture, mining, industry and trade sectors. The second government- controlled bank was *the Bank of China*. It was established in 1912 and its major business was to provide foreign exchange transactions. In 1929 it opened branches in London. And until now, *the Bank of China* is still the only official institution undertaking foreign exchange services in mainland China. The third bank was the *Central Bank of China*, which was organized in 1928. And the forth one was the *Farmers Bank of China* (1935). These four commercial banks acted as the currency issuing institutions in the monetary reform of 1935.

Unlike foreign banks and traditional native banks, commercial banks invested large flows of funds into government bonds. Compared to private-sector loans, government loans owned lower investment risks but higher revenues. Commercial banks regarded the government as their chief customer and government fiscal revenue became major source of fund. However, due to their extensive links with the Nanking government, commercial bank ethics was harmed by unstable monetary policies and turbulent political scenes. Governmental suspension of silver convertibility and excessive note issue shook public confidence in commercial banks in the late 1930s.

4.2. Chinese Monetary System
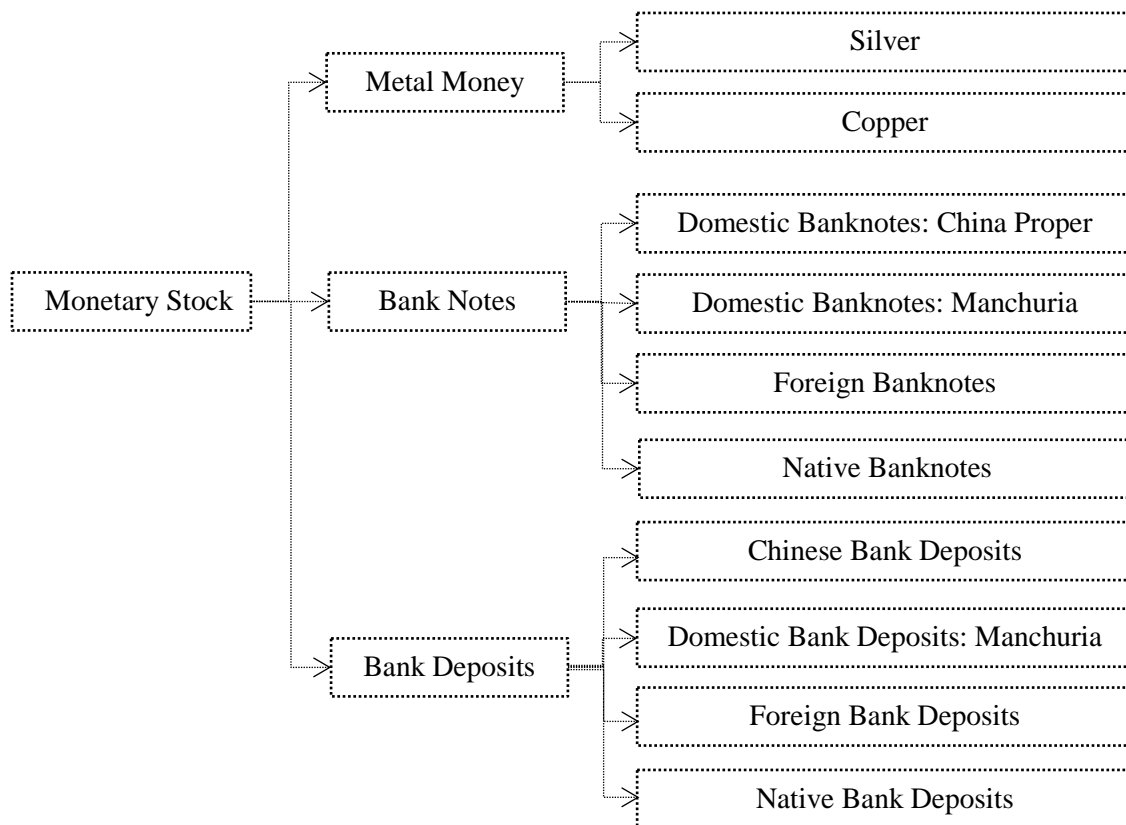
Figure 4.3. Components of Chinese Monetary System

As is illustrated in figure 4.3., China's monetary supply system could be divided into three parts-monetary metals, bank notes and bank deposits.

4.2.1. Monetary Metals

Monetary Metals consist of Silver and Copper. Before the 1935 monetary reform, Chinese monetary system utilized silver standard. Silver *tael* and silver *dollar* in together with copper token dominated monetary supply in the early 1910s.[33] However, China lacked nation-wide uniformed currency system. Different commercial centers formed their own local units of account through long-time economic developments. Without effective and convenient medium of exchange, on one hand, interregional wholesale transactions were hindered and confined. For example, as Rawski described in his book, if a Shanghai merchant planned to purchase goods from Hankow (another important treaty port along the Yangzi River), he had to exchange

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[33] Thomas G. Rawski, Economic Growth In Prewar China (California: University of California Press, 1989),157.

Shanghai currency because the seller would prospect payment denominated in local unit of account-Hankow *tael*. [34]   In order to acquire Hankow *tael* from Hankow local financial intermediaries, the buyer would have to take delivery of silver or bank credits denominated in Shanghai *tael*. Shifts in demand and supply of two currencies led to fluctuations in relative prices between them, which added exchange rate risks to large-scale wholesale trade. What's more, since the Warlord Era, different military cliques issued their own currencies, which further disintegrated domestic market. On the other hand, the coexistence of silver *dollar* and silver *taels* caused inconvenience in the transaction and clearing processes. In actual receipts and payments processes traders utilized silver *dollar*. However, they used silver *taels* as bookkeeping accounts. Fluctuating exchange rates between silver *taels* and *dollars* resulted in unnecessary complexity and transaction costs. Besides, as most of major economies conducted the gold standard, overseas traders were faced with both changes in gold-silver exchange rate and fluctuations in silver dollar-tale relative prices. Hence, currency disunity slowed down the expansion of Chinese economy.

As silver currency were usually used by large traders, financiers and industrialists, copper coins and notes demonetized in copper served residents of cities or peasants in their daily lives. Copper coins penetrated into social and economic activities more deeply. As Yang and Hu described that:

> Trade has been encumbered, and prices of many small articles have gone up rapidly because of shortage of copper coins. In rural markets, where coppers were more popular than [silver] yuan…rapid movement of prices in copper caused serious maladjustments in the rural price structure and made…economic condition[s] unstable. [35]

The mining process of copper coins often utilized used existing copper coins and added impurities when the silver prices relatively weakened. Hence, statistic figures on the number of copper induced uncertainty, which had caused debated among historians. However, the problem is not so serious when conducting research in monetary system of prewar china. Although copper acted as an important role in Chinese people's living standards, their relatively small values per unit exerted negligible impacts on real economy compared to the influence from silver coins. Bloch evaluated that:

> At 100 actual copper cents (in principle equivalent to 1,000 of the traditional copper cash) to the silver dollar, the combined value of these coins would reach 9 billion silver dollars. However, by the mid-1930s, it took more than 300 copper cents to buy a silver dollar in Shanghai. In Szechwan, where the mints poured out huge numbers of inferior copper coins with high nominal values, 1560 copper cents were needed to obtain a silver dollar in 1931. [36]

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[34] Thomas G. Rawski, Economic Growth In Prewar China (California: University of California Press, 1989),127.nn.6

[35] W.Y Yang and Kwoh-hwa Hu, "Problem of Copper Death," *Economic Facts* 12(1939): 562,570.

[36] K. Bloch," On the Copper Currencies in China," *Nankai Social and Economic Quarterly* 8,no.3 (1935): 620-23.

4.2.2. Bank Notes and Bank Deposits

Most of Chinese native banks owned the rights to issue banknotes, later the foreign banks started to issue banknotes as well. However, after the Chinese currency reform, bank notes in circulation were mainly issued by three commercial banks-the Bank of China, the Bank of Communication, and the Central Bank of China.

According to the calculation from Rawski, Chinese monetary supply was illustrated in figure 4.4.
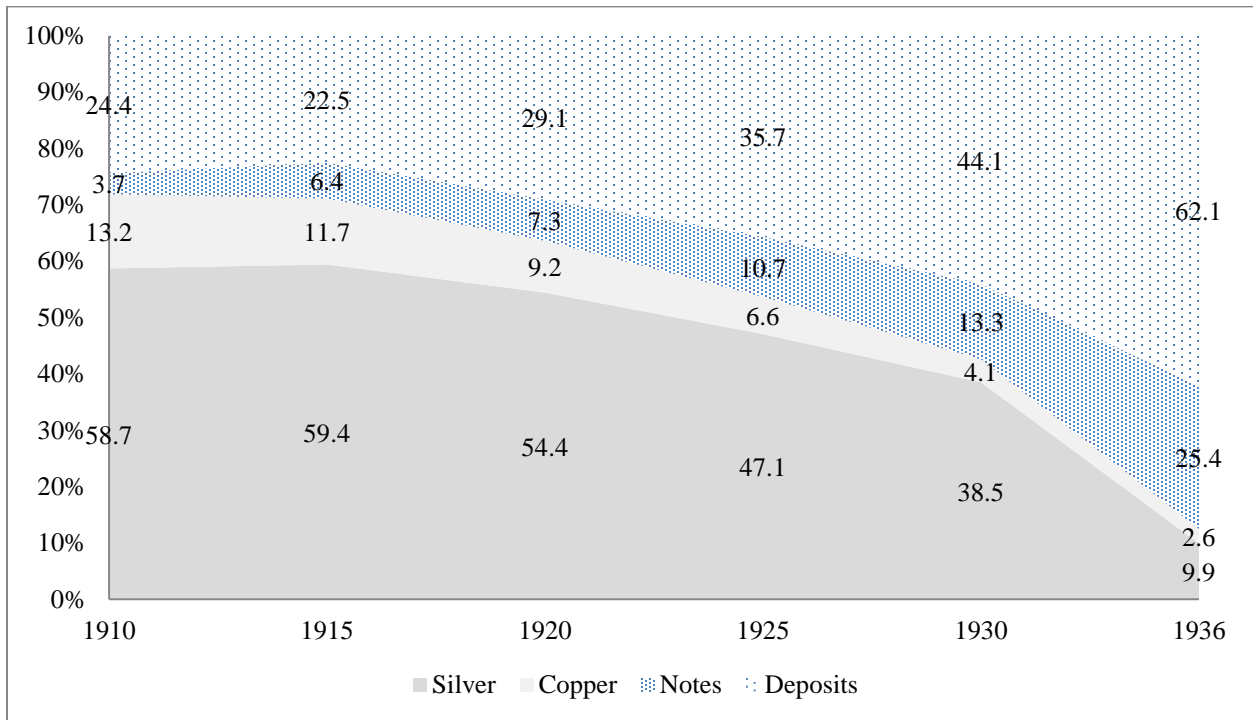
Figure 4.4. Chinese Monetary Supply, 1910-1936
Source: Thomas G. Rawski, Economic Growth In Prewar China (California: University of California Press, 1989),157.

4.3. Silver Speculation from China
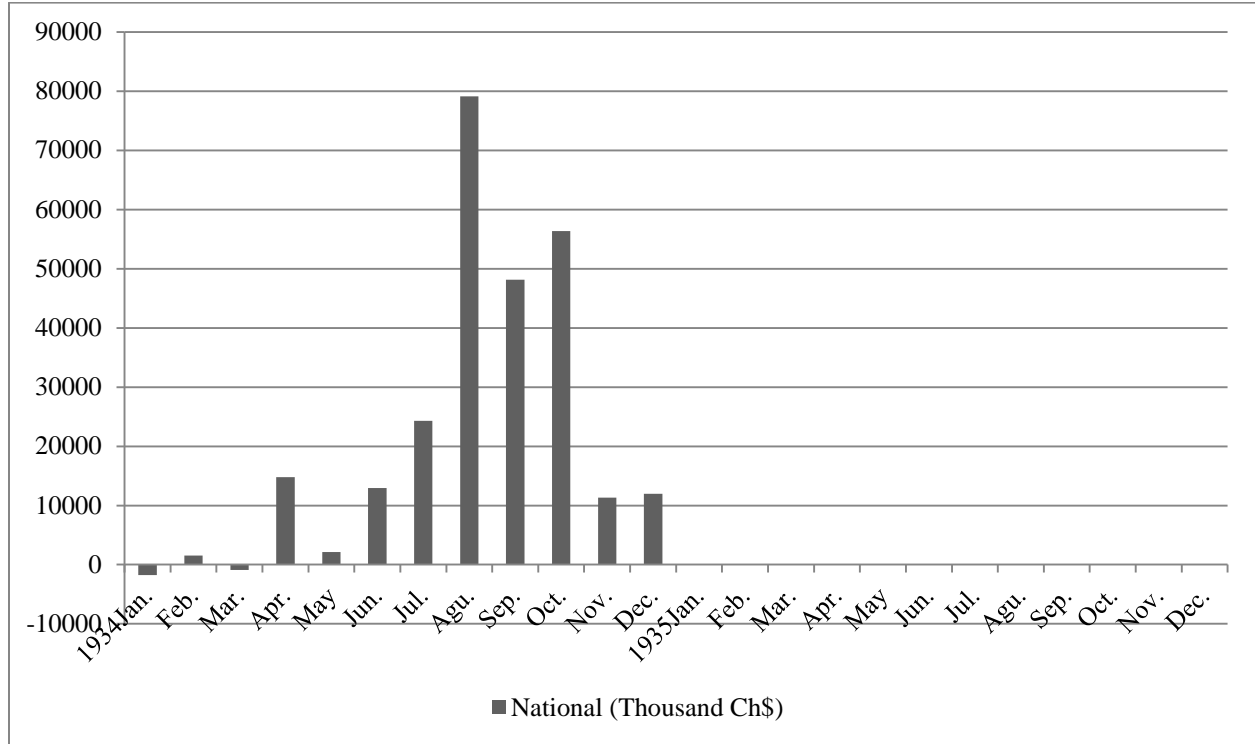
Figure 4.5. Silver Net Exports from China, 1934-1935
Sources: Appendix D.4

China's silver started to outflow since 1932, when the silver exports amounted to Ch$ 10 million. In 1933, the figure climbed to Ch$ 14 million, but the situation did not become truly serious until the mid-1934, when the Federal government issued the U.S. silver purchase act. As shown in the figure 4.5., silver net exports peaked at Ch$ 80 million at August and the yearly total amount (excluded smuggling silver) reached Ch$ 256 million in 1934, which almost equaled to 20 times the amount in 1933. Although Chinese government conducted a series of policies to control silver flight, such as raising export duty on silver to 10 percent in October, the situation did not fundamentally improve. Instead of legal way to export silver, most of foreign banks and individuals started to choose smuggling silver abroad under the political pressure. And the main silver exports port changed from Shanghai to boundary treaty ports like Canton (to HongKong) and Tiansing (to Manchuria then to Japan). Government policies could not fundamentally prevent smuggling silver outflow without suspending silver convertibility. Hence in November 1935, the Chinese government announced currency reform which altered the silver standard to the fiat standard, which marked the end of monetary silver usage in China for over 600 years since Ming Dynasty.

Most of silver exported in 1934 attributed to silver destocking by foreign banks[37] during the time period from 1929 to 1932. In these three years, low silver price in the international market discouraged foreign banks to convert silver to foreign currencies. Silver reserves in foreign banks shank from Ch$ 275.7 million (1933) to Ch$ 221 million, and the annual decline rate reached 85%. Meanwhile, Chinese commercial banks, especially "Central Bank Group"[38] absorbed silver reserves released by foreign banks Ch$ by 35.5 million. Large amount of silver flowed in Chinese domestic market further contributed to domestic deflation situation caused by low silver price international.

However, with the U.S. silver purchase act taking into reaction in June 1934, the silver price growth trend became predictable and exploitable. American target silver price is 1.29 dollar per ounce, while the spot silver price in New York market merely 0.454 cents per ounces in June. Tripling silver price gave international speculators confidence to take long positions. These speculators mainly consisted of foreign banks in China and individual silver holders. They transformed their silver assets in exchange for foreign currencies and made great profits. However, the trend of silver outflow not only promoted merely by predictable silver price, the fear of government capital control also stimulated silver holders to transform their money for safety. Although the Chinese Nanking government assured to maintain silver convertibility in case of massive bank run, industrialists and businessmen stack to their own judgments especially with stricter control methods gradually issued by central banks. Regardless of whether they expected increase or decrease in future silver price, they would opt to transform their silver assets abroad for safety. The third group of investors lack confidence in realization of the U.S. target silver price and they believed silver price might experience another down turn spiral if the U.S. domestic economy could not afford the cost of maintaining the target silver price in international market. For them, the optical potion was to transform silver to foreign currencies. They would do the exchange business with foreign banks, who took the main actor in silver exporting, or selling silver in the international market themselves. The last group of participants was Chinese public citizens, they were influenced by rumor prevailing in markets that large-scale bankruptcy might occur and silver shortage might harm their rights to convert paper notes they holding on hand. Converting paper notes to silver then sell silver for foreign currencies or only reserve silver on hand both drained silver reserves of Chinese monetary system.

In face with severe situation, Chinese government had to take measures to control the risky domestic economy. Within china, they conducted export restriction on silver since October 1934. These series of policies included export tax on silver raised to 10% and variable equalization charge was imposed. Individuals could not carry more than Ch$ 50 silver when travelling abroad. And licenses were required for coastal shipment of silver. The only legal silver exporters

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[37] Pang H.K. Chang," Commodity Price Shocks and International Finance"(Ph.D. dissertation, Massachusetts Institute of Technology, 1983),47.

[38] Central Bank Group consists of Central Bank of China, Bank of China, Bank of Communications and Farmers Bank of China.

confined to banks intermediaries. However, these restrictions all based on maintaining silver convertibility, which could not effectively stop the silver exports but resulted in two results. On one hand, legal silver exports turned into underground. On the other hand, previous main silver export port- Shanghai lost its advantages to many boundary treaty ports where loosen supervision conducted. Japan and Britain, the two countries acted as mainly silver transporters from China to the United States, their basements in China-Manchuria and Hong Kong became primary transmit pots for smuggling silvers. As we can see from the figure 4.6., the volume of silver exported from Shanghai gradually declined from October 1934 then a sharp decline in the beginning of 1935. While the national figures experienced a sudden drop in November, exactly after the Chinese government announced the export constrains policies. These figures seem peculiar and abnormal. If the national net silver export lowered than the value of Shanghai, one explanation was imports value in November largely surpassed export value. However, due to our analysis of Chinese trade situation in the previous chapter, in 1934 Chinese trade deficit was narrowed because of relative increase in exports. Hence, there was only one explanation, which was the legal net silver exports data illustrated in the figure were seriously understated the illegal silver amount. But how to verify whether Shanghai lost its previous advantage as we discussed above.
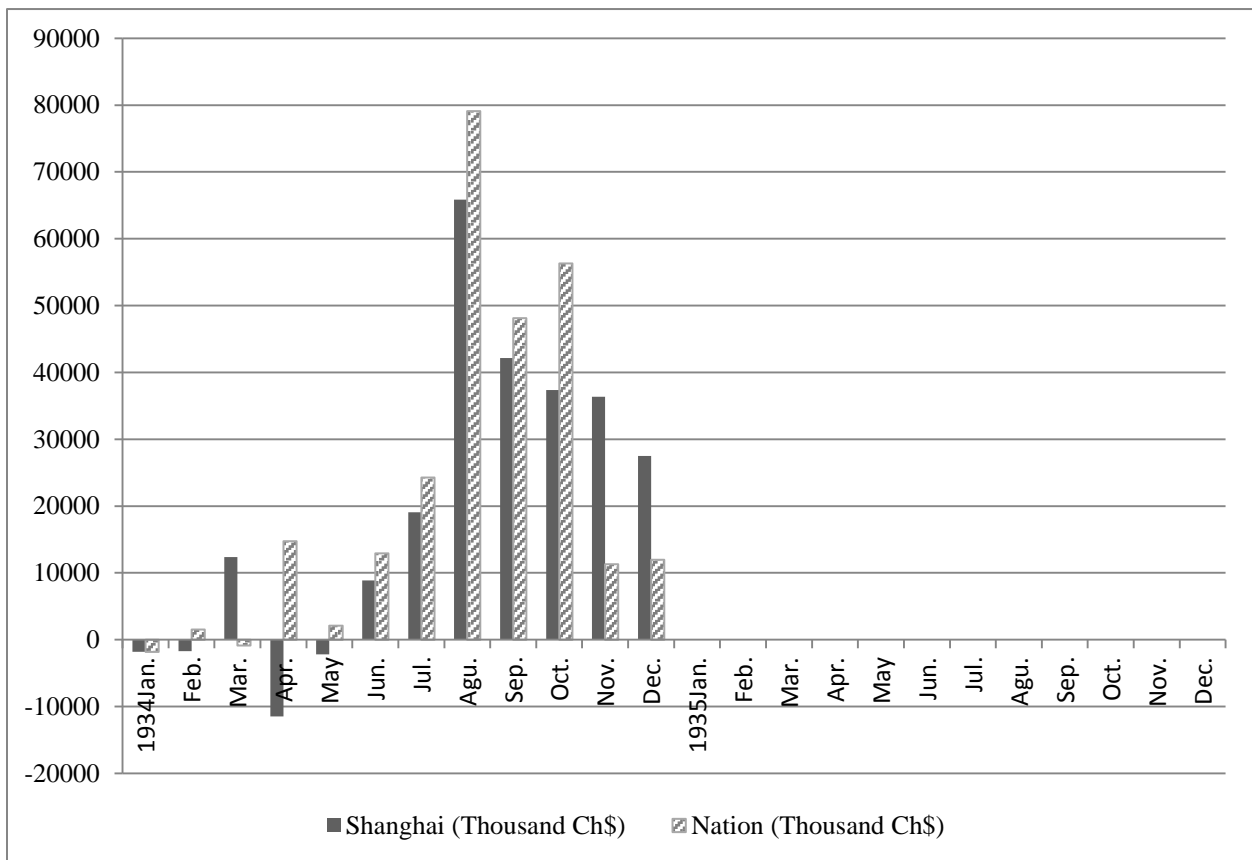
Figure 4.6. Silver Net Exports from Shanghai and Nation, 1934-1935
Sources: Appendix D.4

A possible way to show this view was to compare silver price in each treaty ports. Statistics on internal silver inflow showed that monthly net silver exports from Shanghai to non-shanghai areas increased from Ch\$ 0.7 million in September to C\$ million in October , Ch\$43 million in November and Ch\$ 35 in December. [39] This massive silver transported to other interior treaty ports to further export abroad. An example was Canton, a treaty port near Hong Kong, where the prevailing currency Canton *Tael* contained less silver compared to Shanghai *Tael*, the relative price of the former should be less than the latter. However, after mid-October 1934, Canton *Tael* started to appreciate against Shanghai *Tael*, and by May 1935, Canton *Tael* even worth more than Shanghai *Tael*. [40] This irregular appreciation exactly explained silver smuggling discrepancy. As Canton *Tael* was only convertible in Canto and Shanghai *Tael* was only convertible in Shanghai, the fluctuation in their relative price showed changes in demand of silver in each region. Strict government capital control lowered demand for silver in Shanghai and more silver smuggled in Canton illustrated increased demand for silver. In sum, the place where more silver smuggling conducted the higher price of local silver.

When the fears of silver shortage finally stimulated the Chinese central government made up their minds to suspend silver convertibility and issued paper currency as a new monetary system, in 2 November 1935, the first large-scale monetary reform conducted in China. All silver reserves were nationalized, and three commercial banks had the right to issue new currency. All previous circling banknotes stopped to be used and the new currency exchange rate did not peg with any foreign currency. This is the first time Chinese monetary system utilized a uniform currency which had a profound impact in Chinese monetary history. Since then Chinese silver flight had been effectively confined.

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[39] Leang-Li T'ang, *Chinese's New Currency System* (Shanghai: Chinese United Press,1936), 71.
[40] Pang H.K. Chang," Commodity Price Shocks and International Finance"(Ph.D. dissertation, Massachusetts Institute of Technology, 1983),56.

5

Conclusion

The main research question of this paper is to investigate whether prewar Chinese economy experienced economic down turn under the silver standard. Based on the adjusted trade data and historical archive documents, the general conclusions of these paper are illustrated as follows.

From the long-term economy growth analysis, prewar Chinese economy indeed benefited from the silver standard from 1929 to the beginning of 1931, then with the Britain going off the gold standard in mid-1931 followed by most of countries during the following two years, relative rising silver price changed Chinese trade condition. Especially after the U.S. silver purchase act issued in 1934, high silver price seriously dampened Chinese economy.

In period I (1929-1930), Chinese real economy indeed benefited from the silver standard at the outset of the Great Depression as Friedman stated. Falling silver prices led to decreases in exchange rate of Chinese currency, which was more than the combined effect of appreciation in foreign currency and price index fall. This means China experienced a real appreciation. In the exports part, adjusted nominal price level remained the same together with a real appreciation, Chinese exports' real price decreased which turned into exports' cost advantage against foreign competitors. The reserved export quantity data fluctuated around the long-term economic growth line which means the growth of Chinese exports followed the predicted economic growth pattern instead of being seriously hurt by international depression like other countries under the gold standard. In the imports part, although the nominal import price increased, it could be offset by currency appreciation. Together with falling adjusted import quantity, the total import value was declining. Both import sector and export sector were improved in these years, which supported the view from Friedman that the silver standard helped Chinese economy escape from depression.

In period II (1931), Chinese economy started to decline. Britain went off the gold standard followed by other countries increased silver price which led real appreciation in China. Adjusted exports quantity and price data both declined. And Japan conquered Manchuria where contributed one third exports from China in this year. Decreasing adjusted import quantity reflected appreciation in Chinese currency did not bring in improvement in silver purchasing power. Together with decline in adjusted import price, Chinese import endured sharply decline in 1931.

In period III (1932-1933), Chinese economy condition continued to decline. Roosevelt's "do something for silver" led to a series of policies aimed at rising silver price. Chinese currency kept on appreciating, and declines were shown in adjusted import prices, import quantity and

adjusted export price. And in the same year, Chinese started to have net silver outflow, which contributed to the increase in adjusted export quantity data.

In period IV (1934), Chinese economy became even worse. Except for revise export quantity data, all the other adjusted trade data lie far below the long-term economy line, which means their actual figures were much worse than the predicted values of healthy economy growth. In the June 1934, the federal government issued the U.S. silver purchase act caused massive silver outflow from China. The annual net silver outflow amount was Ch$ 256 million, which was almost 20 times compared to the data in previous year. Silver flight contributed to increase in adjusted export quantity data but if excluded this factor, Chinese export and import situation went bad.

In period V (1935): Chinese economy started to recover due to the currency reform in November. Adjusted export price data and adjusted export quantity data both above the long-term economic growth line in the next year. Nominal gross export value increased and nominal gross export value decreased, which means a narrow gap in trade deficits.

In order to verify the influence of silver pressure on adjusted trade data, four groups of comparative regression analysis were carried out. The latter two groups showed the same statistics results. Silver price had a significant negative correlation with adjusted import price index. And it also had a significant positive correlation with adjusted export quantity index, which is against the general rule that appreciation in a country's currency may harm its export amount due to loss in cost advantage. Hence, the following OSL regression testifies the correlation between adjusted export quantity index, unadjusted quantity index and silver net exports amount. The regression results showed the silver outflow had a significant correlation with unadjusted quantity index, which did not represent long-term economic development. Hence, silver flight had no significant correlation with long-term economic development but with short-term economic shock- speculation. This analysis process verified Chang's theory that prewar Chines silver outflow was not due to gap in trade deficits as Friedman said but to the international speculation.

For the short-term analysis of speculation in Chinese silver, there were four groups of participants. Firstly, pure speculators, such as foreign banks, they arbitraged between international silver market and Chinese domestic silver market. Predictable silver growth trend promised by the U.S. target silver price $ 1.29 per ounce strengthened their confidence of holding a position. The second group of silver holders was the ones who were afraid of gradually stricter governmental capital control methods, especially possible policies like nationalizing silver reserves, suspending silver convertibility or issuing paper money without enough reserves to back up. They transported their silver asset abroad for the sake of safety. The third group of people was the ones who lack confidence in the continuous rise in silver price. They preferred foreign currencies which were less risky. They sold silver to bank intermediates which also contributed to silver outflow. The final group of participants was public citizen stirred up by

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rumors in markets. They were worried about shrinking silver reserves could not afford the convertibility of paper notes. Hence, they swarmed into banks for silver, which was hold on hand or sold to foreign banks for foreign currencies. Their behavior accelerated the draining process of Chinese silver reserves and speculation was the primary factor.

Another conclusion of silver flight in China was the way of transforming silver abroad changed from legal exports to illegal smuggling. This was due to the strict policies issued by the Chinese government such as exposing tax and equalization charge on exports or issuing export licenses within bank intermediates. Silver export port changed from Shanghai to boundary treaty ports like Canton and Tientsin, where next to the smuggling silver transmission pots of Hong Kong and Manchuria. And the official legal silver net export data underestimated the actual silver export amount of China.

Since the lack of trusty statistic data in prewar Chinese economy, this paper offered a series of trade indexes which could be further utilized by following researchers. And the major contribution of this paper to previous researches was the analysis of Chinese trade performance in price data and quantity data separately. Compared with gross trade data, price and quantity trade data may offer more detailed information about Chinese trade situation, especially during the 1930s when Chinese currency exchange rate fluctuated a lot due to the silver price increase. The main limitation of this paper is the lack of the significant regression results of long-term silver price's influence on adjusted trade data. Because the World War I increased the silver demand for military usage, international silver prices increased from 0.51 cents per ounce in 1915 to 1.12 cents per ounce in 1919. This striking situation distorts long-term regression results. Then, further analysis should eliminate the influence of high silver price in the World War I and analyze the general rigidity of Chinese trade indicators.

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Appendix

Appendix A: Breakdown of the Gold Standard

After five years of floating exchange rate, major economic entities reset to the gold standard in the late 1920s. The figure 1 illustrates the numbers of countries on the gold standard briefly. If France's stabilization (1926) marks the beginning of this reestablishment process, the British's deprecation of sterling (1931) represents the prelude of massively going off the gold standard. By 1932 the international monetary system was spilt into tri-polars: the sterling bloc (Britain and other countries pegged to sterling); the Central and Eastern countries which led by Germany and conducted capital control; the residual gold-standard bloc, led by the United States and other unclassified countries like Japan and Canada. In the same year, Franklin D. Roosevelt defeat Herbert Hoover in the presidential election and carried out several monetary policies that induced the U.S. economy to give up the gold standard. Competitive currency depreciation, deterioration in international trade, wide fluctuations in exchange market and large-scale depression characterize the interval of early 1930s.
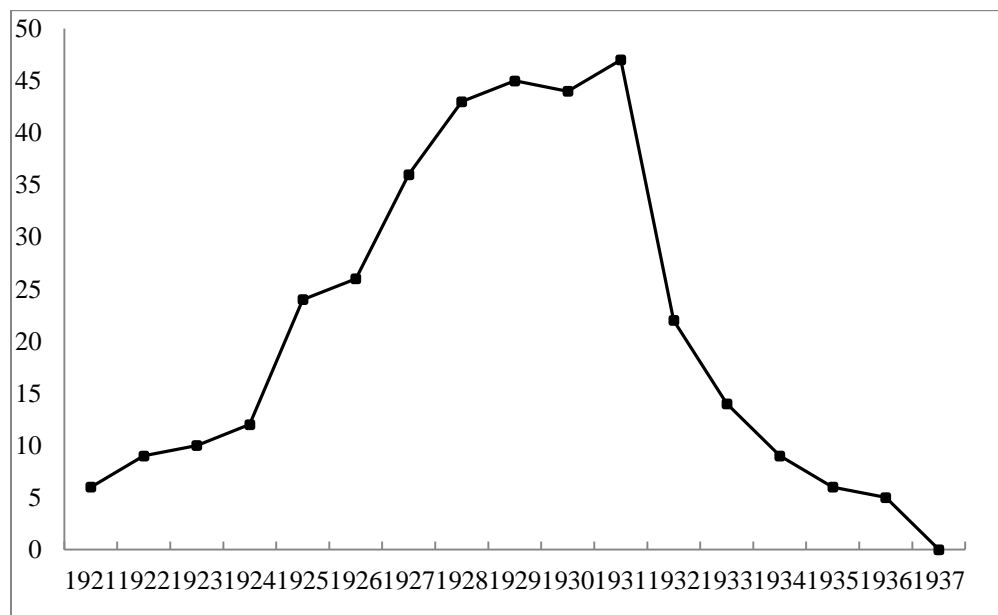
Figure 1: Number of Countries on the Gold Standard, 1921-37.
Source: Data from Barry Eichengreen, *Globalizing Capital: A History of the International Monetary System* (Princeton: Princeton University Press,2008) 63.

   The breakdown of the gold standard attributes to its instinctive flaws. The rate of international gold supply could hardly catch up with the rate of economy development, especially in the economic recovery process. Gold shortage constrains central banks to augment money stock to stimulate economy, which is due to the principal of maintaining gold reserves to note ratios

under the gold standard. Besides, the World War I enabled the United States replace Britain becoming the world's leading creditor. In the beginning of the Great Depression, the Federal central banks held more than 40 percent of global gold reserves and postwar reparations and European reconstruction accelerated this gold concentration process. Gold and foreign exchanges flowed into the vault of Fed strengthened balance of payment but weakened that of other counties, especially the ones continuously suffering from deficits like Britain.
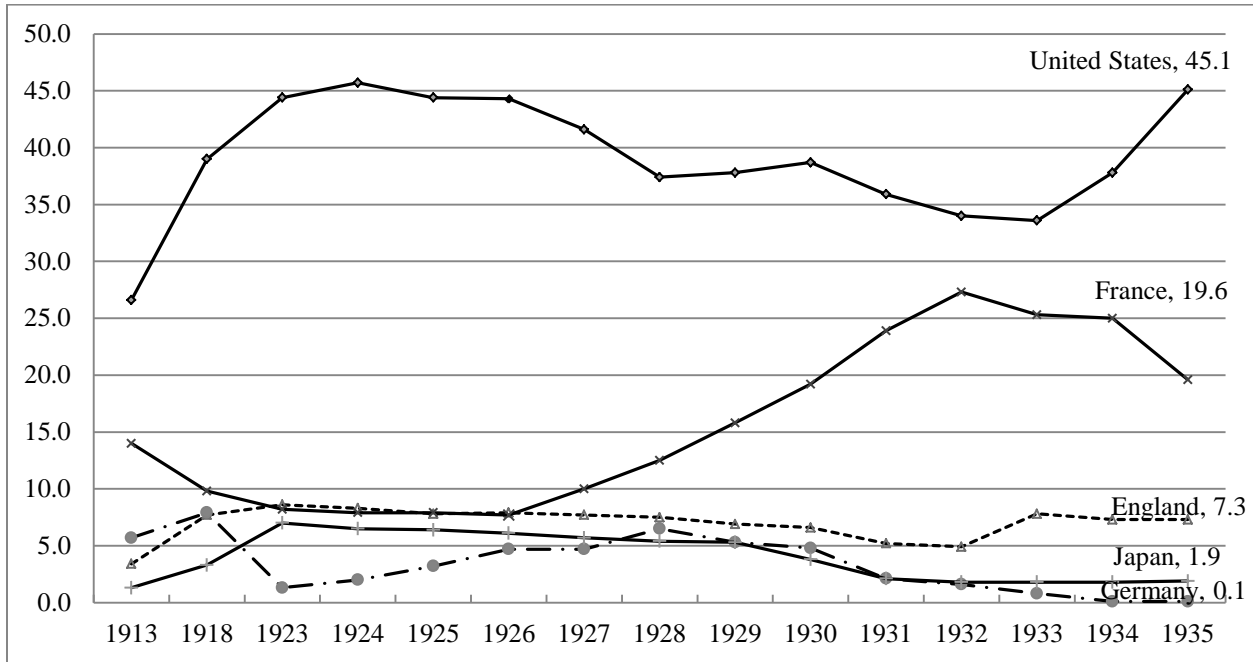
Figure 1 Gold Reserves of Central Banks and Governments, 1931-1935 (percent of total)

Source: Data from Barry Eichengreen, *Globalizing Capital: A History of the International Monetary System* (Princeton: Princeton University Press,2008) 46.

Britain once owned imperial overseas markets. And its economic growth largely depended on international trade. Unlike Germany, whose banking system formed a tight connection with industry, the banking revenues of Britain were mostly generated from foreign investments, earnings from shipping or financial services rendered to foreign trade.[41] According to the data in the above Figure 1, gold reserves of British central bank (Bank of England) started to decline in the late 1920s and fell to a trough at 4.9 percent in 1932. This result is due to several reasons. Firstly, since 1930 capital control and trade embargo had been conducted by most countries to protect domestic industries and insulate foreign competitors. With the shrinking revenue from abroad, the British central bank found it tough to maintain gold exchange rate. What's worse, in order to absorb economic bubble arose from the Wall Street, the federal government increased interest rates to prevent the capital flight since 1928. On one hand, tighter monetary policy

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[41] Source: Data from Barry Eichengreen, Globalizing Capital: A History of the International Monetary System (Princeton: Princeton University Press,2008) 78.

indeed slowed down the gold outflow, however, on the other side, it not only reduced the pace of economy recovery in the United States but also aggravated strains on other countries who stick to the gold standard. Correspondingly, higher interest rates enhanced the attraction of foreign investments in U.S. fixed-interest securities while raised the costs of other countries borrowing money from the United States. All these factors drained the gold reserves of Britain, and in 1931 when the British central government could hardly maintain the fixed exchange rate of sterling, it announced to suspend gold convertibility and depreciate the sterling, which marked the ending of gold standard in Britain.

   After countries in the sterling bloc followed the steps of Britain, investors gradually lost confidence in Sterling and other major currencies. Central banks converted foreign currencies especially dollars into gold, which further aggravated reserve base globally and imposed burden on residual gold standard countries. In countries giving up the gold standard, depreciating enhanced cost advantages of their exports. Expansionary monetary policy injected liquidity into real economy and promoted economy recovery. Their account -of-payment balance attracted gold and foreign investments to domestic markets. For countries still insisted on the gold standard, it became more and more expensive to maintain convertibility. Hence, during the year of 1932 and 1933, 31 countries (two thirds compared to the original data in 1931) responded to the pressure by depreciating currencies and suspending convertibility. Since then, the gold standard became a history.

Appendix B: Rawski's Research Method

Rawski claimed that China's economy had hardly experienced prolonged depression because of widely used bank notes. In his analysis framework of evaluating Chinese economic performance in the 1930s, he utilized two different but complementary research methods.

Table 1 Economic Fluctuation in China and the United States, 1928-36

	Annual Percentage Change from Previous Years)							
	1929	1930	1931	1932	1933	1934	1935	1936
1.Real GNP								
A. U.S	+6.3	-13.7	-5.9	-14.6	-2.9	+8.9	+13.1	+10.4
B. China	…	…	…	+3.2	0.0	-8.7	+8.1	+6.4
2. Manufacturing Output								
A. U.S	+11.5	-17.2	-19.8	-23.1	+20.0	+8.3	+17.9	+19.6
B. China								
National	…	…	…	+9.1	+1.8	+5.4	+8.1	+15.3
China Proper	…	…	…	+6.2	-1.0	+5.1	+7.7	+9.2
3.Railway Activity								
A. U.S	+3.2	-14.3	-19.4	-24.4	+6.5	+7.8	+4.9	+20.3
B. China	+7.0	…	…	0.0	+7.0	+31.4	+3.5	0.0
4. Investment Volume								
A. U.S	…	-32.6	-36.4	-74	+2.6	+85	+118	+30.4
B. China								
National	+19.7	-5.0	-0.6	+2.6	+19.5	+22.9	+1.2	+8.6
China Proper	+22.4	-0.8	+11.1	+3.4	+5.2	0.0	+2.7	+14.7
5. Money Wages								
A. U.S	+0.2	-7.1	-10.2	-18.3	-1.9	+10.0	+9.4	+8.2
B. China	…	+16.8	-3.5	-0.7	+0.4	-4.2	-1.7	-2.0
6. Urban Retail Prices								
A. U.S	0.0	-2.6	-9.0	-10.2	-5.3	+3.4	+2.6	+1.0
B. China	…	+14.0	+0.7	+0.2	-13.1	-6.6	+7.5	+5.6
7. Urban Wholesale Prices								
A. U.S	-1.6	-9.4	-15.5	-11.2	+1.7	+13.8	+6.8	+1
B. China	+3.9	+7.8	+7.2	-11.8	-8.5	+0.6	+4.4	+15
8. Prices Received by Farmers								
A. U.S	0.0	-15.6	-30.4	-25.3	+7.7	+28.6	+21.1	+4.6
B. China	+15.9	+11.9	-18.0	-7.0	-23.7	+21.1	+12.8	+4.1
9. Money Stock								
A. U.S	+0.7	-1.3	-3.0	-14.2	-9.3	+8.3	+10.9	+13.2
B. China	+11.5	+20.2	+5.9	+8.0	+10.6	+7.7	+18.2	+17.1
10. Bank Deposits								
A. U.S	+0.2	+3.6	-5.3	-20.3	-8.5	+11.5	+10.3	+13.2
B. China	+14.4	+20.2	+5.9	+8.0	+10.6	+7.7	+18.2	+17.1

Source: Thomas G. Rawski, Economic Growth In Prewar China (California: University of California Press, 1989),179.

   The first one was to compare the macroeconomic data between the United States and China during the time period from the Great Depression to Sino-Japanese war. The data of economic fluctuations in China and the United States, 1928-36 were listed in the Table 1. Unlike the United States, which suffered a lot in the sectors of manufacturing, railway activity, investment, money wages and whole sale prices, Chinese economy kept a continuous growth trend expect for transitory down turns. Even though the indexes of the growth of Chinese Real GDP and Money wages were minus after 1934, they were relatively small in contrast with data of the United States. For example, as Rawski stated, manufacturing output figures of national China showed a continuous growth trend throughout the whole time period. Although the national level included Manchuria, where was conquered by Japan in 1931 and owned faster development rate by receiving massive investments from Japanese government, the China proper data also reflected robust growth trend. Except for minus decreases in 1933, the manufacturing sector of China continuously blossomed. In contrast with the United States, the Federal Reserve index of industrial production shrank by over 36 percent between 1929 and 1933. Besides, for the figures of unban retail prices and urban wholesale prices, the U.S economy data indicated that it was not until the 1932 that they finally got rid of the shadow of depression. While the year to year prices index of China rarely became minus even during the toughest time of the early 1930s and after the American Silver Purchase Act executed. Compared with the economic performance of the United States, Chinese deflation started later and less severe.

   Another method used to evaluate China's real economy is based on the *quantity theory of money*, which focuses on money velocity. The theory involves four valuables- money supply (M), velocity (v), price level (P) and real output (T). The measurement of velocity equals to the quotient of PT and M (v=PT/M). Since the data of price level (P) and real output (T) could be collected from archive documents like statistic yearbooks, Rawski on purpose calculated money supply (M) himself to verify the velocity.
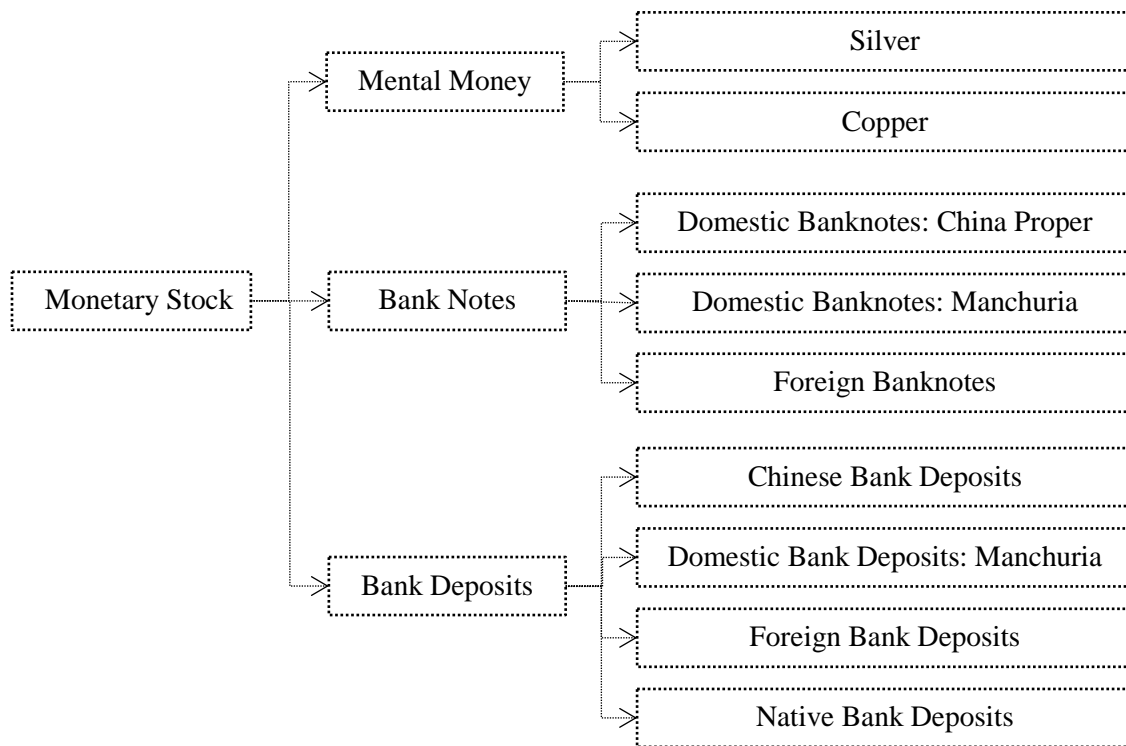
Figure 3: Rawski monetary stock data gathering framework

The money supply data gathering process was illustrated in figure 3. First of all, he categorized China's monetary supply system into three parts- monetary metals, bank notes and bank deposits. A) Monetary metals consist of Silver and Copper. Silver data gathered from official documents such as "China's Foreign Trade Statistics, 1864-1949" and "Bank of China, Report of the General Manager to the Annual Meeting of Shareholders, March 30,1935", etc. The figures illustrated in Table 2 involved net imports of silver coin and bullion into Manchuria from foreign countries, which to some extent extorted massive silver flight in the China proper. The adjusted data of silver stock in 1932, 1935 and 1936 were $29 million, -$3 million and -$22 million respectively. He used two variants of the time series generated from two researches-E.Kann (Version A) and Tang (Version B). But confined to data shortage problem, Rawski had to neglect possible transfers of silver between monetary and nonmonetary uses. For stock of copper, its data contain more uncertainties because copper's massive usage in residents' daily small transactions and its regionally various mining standards. Hence, aggregate conclusions about China's copper currencies do not rely critically on the accuracy of these weak estimates.

Table 2: Composition of Chinese Monetary Aggregates, 1910-36

	Composition of Chinese Monetary Aggregates, 1910-36 (Percentage shares)				
Year	Silver	Copper	Notes	Deposits	Total
M1, Version A					
1910	43.3	22.1	6.1	28.5	100
1915	45.2	19	10.4	25.5	100
1920	42.8	14.2	11.4	31.6	100
1925	37.7	9.5	15.4	37.4	100
1930	32.3	5.6	18.1	44	100
1936	-1.1	3.8	36.9	60.4	100
M1, Version B					
1910	63.4	14.3	3.9	18.4	100
1915	63.7	12.6	6.9	16.9	100
1920	59.6	10	8	22.3	100
1925	52.3	7.3	11.8	28.6	100
1930	43.6	4.7	15	36.6	100
1936	12.5	3.3	31.9	52.3	100
M2, Version A					
1910	38.6	19.7	5.4	36.3	100
1915	40.7	17.1	9.4	32.8	100
1920	37.7	12.5	10	39.8	100
1925	33	8.3	13.5	45.2	100
1930	27.8	4.9	15.6	51.7	100
1936	-0.8	2.9	31.9	69.5	100
M2, Version B					
1910	58.7	13.2	3.7	24.4	100
1915	59.4	11.7	6.4	22.5	100
1920	54.4	9.2	7.3	29.1	100
1925	47.1	6.6	10.7	35.7	100
1930	38.5	4.1	13.3	44.1	100
1936	9.9	2.6	25.4	62.1	100

Source: *Nan-k'ai chih shu tzu liao hui pien, 1913-1952[Compendium of Nan-k'ai index number materials]*(Peking: China Social Sciences Press, 1988):157.

B) Banknotes contain three components- the note issue of domestic banks: China proper, the note issue of domestic banks: Manchuria and foreign banknotes. The figures of banks in China proper were trustworthy, but only involved data from commercial banks. "The figures omitted important China's traditional banking institutions that were native banks, exchange shops and merchants; and modern-style financial intermediaries such as minor commercial banks and institutions sponsored by provincial and county governments." as Rawski admitted.(^9) The second part- banknotes from Manchuria were comprehensive because official statistics like " The Manchuria Yearbook" were available. And currencies exchange rate between *yin-p'iao*

(prevailing in Manchuria) and Shang *tael* were also concerned. The estimated convertible ratio at 1:1 was based on widely acceptable research method introduced in Kann's work- "*Currencies of China*". The last part was foreign banks. Rawski not utilized the previous data representing the total note issue of foreign banks but the portion calculating in China. He modified the estimate method used by Hsien K'o:

Total note issue of foreign banks in China	=	2/3 of the global issue of three British banks: Hong Kong and Shanghai, Chartered Bank, and Mercantile Bank of India
	+	total note issue of three U.S. banks: International Banking Corp., American Oriental Banking Corp. and Asia Banking Corp.
	+	total issue of the Yokohama Specie Bank together with 1/3 of the total issue of the Bank of Chosen and the Bank of Taiwan
	+	total issue of the Banque de L'Indochine
	+	total issue of several minor institutions of Dutch, Belgian, or mixed sino-foreign ownership.

He thought 2/3 of the global issue of three British banks circulated in China was too high. He adjusted it into 60 percent for the Hong Kong and Shangai Bank, 25 percent for the Chartered Bank and 10 percent for the Merchtile Bank based on research from a Japanese historian. The data of U.S. banks and Japanese banks were reliable, but the Banque de L' Indochine did their largest portion of business in Vietnam. Hence, Rawski left out the last two components in the calculation. Rawski modified foreign banknotes issuing statistic method:

Total note issue of foreign banks in China	=	three British banks: 60 percent of Hong Kong and Shanghai, 25 percent of Chartered Bank, and percent of Mercantile Bank of India
	+	total note issue of three U.S. banks: International Banking Corp., American Oriental Banking Corp. and Asia Banking Corp.
	+	total issue of the Yokohama Specie Bank together with 1/3 of the total issue of the Bank of Chosen and the Bank of Taiwan

Until now, the estimated circulation of foreign banknotes in China is reached. However, one possible double counting problem may exist in the sector of Japanese banks in foreign banks notes issue and banknotes in Manchuria, where the central bank also established by Japanese government. Rawski's explanation of this problem was that the figures of Manchuria banknotes contained the institutions operating exclusively in the northeast China, regional branches of

Chinese intermediaries with offices elsewhere in China (like the Bank of Communication)and foreign-controlled institutions the operated only in Manchuria. On principle clear classification may reduce the double counting possibility. But due to the hard-obtained original data, it is inevitable to calculate certain data twice such as noted issued by Manchurian branches of the Banks of China and other commercial banks.

The finial component is bank deposits. Because of lacking systematic data that separately recorded demand deposits and savings deposits. Rawski focused initially on broadly money supply (M2). Then he utilized the estimated share of current deposits to the total deposits to deduce M1. In this calculation process, he included native banks data instead of omitting their silver reserves data as discussed above. The deposits of Native banks used a deposit-capital ratio of 9:1 to obtain a rough approximation of the national deposit total. The other three parts of bank deposits, which were deposits of Chinese commercial banks-China proper, Manchuria and deposits from foreign banks, were compiled systemically. Combined the deposits of all banks, bank notes and monetary metals, the estimates of China's money supply (M2) can be reached. The statistical calibers of different variables are summed as follows:

Table 3: The Statistical Calibers of Different Variables

Monetary Stock	NB^{α}	Foreign Banks		Commercial Banks		$JPsB\text{-}MCR^{\alpha}$
		$N\text{-}JPsB^{\alpha}$	$JPsB^{\alpha}$	CP	MCR^{α}	
Monetary Metal						
(*Silver)	v	v	v	v	v	v[#]
(*Copper)	v	v	v	v	v	v
Bank Notes						
(Domestic Banknotes: China Proper)				v	v	
(Domestic Banknotes: Manchuria)					v	v
(Foreign Banknotes)		v	v			
Bank Deposits						
(Chinese Bank Deposits)				v	v	
(Domestic Bank Deposits: Manchuria)						v
(Foreign Bank Deposits)		v	v			
(Native Bank Deposits)	v					

Notes:
* The national Silver and Copper data are generated directly without considering subsections.
[#] Manchurian silver imports data are only involved in 1932, 1935 and 1936.
[α] Abbreviations: NB: Native Banks; N-JPsB: Non-Japanese Banks; CP: China Proper; MCR: Manchuria

Table 4 Velocity Implications of Chinese National Product Estimates (&8)

Year	Real GDP (1)	Price Index (2)	Nominal GDP (3)	Money Stock (M2) (4)		Velocity (5)	
				A	B	A	B
1914/18	24.25	0.737	17.87	2.22	3.24	8.05	5.52
1931	28.57	1.213	34.66	6.14	7.16	5.64	4.84
1932	29.47	1.118	32.95	6.43	7.45	5.12	4.42
1933	29.46	1.000	29.46	6.82	7.84	4.32	3.76
1934	26.90	0.914	24.59	6.92	7.95	3.55	3.09
1935	29.09	0.946	27.52	7.57	8.59	3.64	3.20
1936	30.94	1.095	33.88	8.57	9.10	3.95	3.53
1931-36 average	29.07	1.048	30.46	7.08	8.10	4.30	3.76

Sources: Thomas G. Rawski, Economic Growth In Prewar China (California: University of California Press, 1989),166.

Table 5 Regional Product, Money Supply and Velocity in Manchuria, 1934-41 (&9)

Year	Real GDP (1)	Price Index (2)	Nominal (3)	Money Stock (4)	Velocity (5)
1934	2.677	1.000	2.677	0.677	3.95
1936	3.289	1.146	3.768	0.967	3.90
1939	4.175	1.958	8.175	2.161	3.78
1941	4.733	2.680	12.684	3.529	3.59

Sources: Thomas G. Rawski, Economic Growth In Prewar China (California: University of California Press, 1989),166.

   After gating all the date, Rawski obtained the money velocity rate of the whole nation and Manchuria separately. The final tables are illustrated above, and based on the tables we could draw the curve of national velocity and Manchuria velocity as follows.
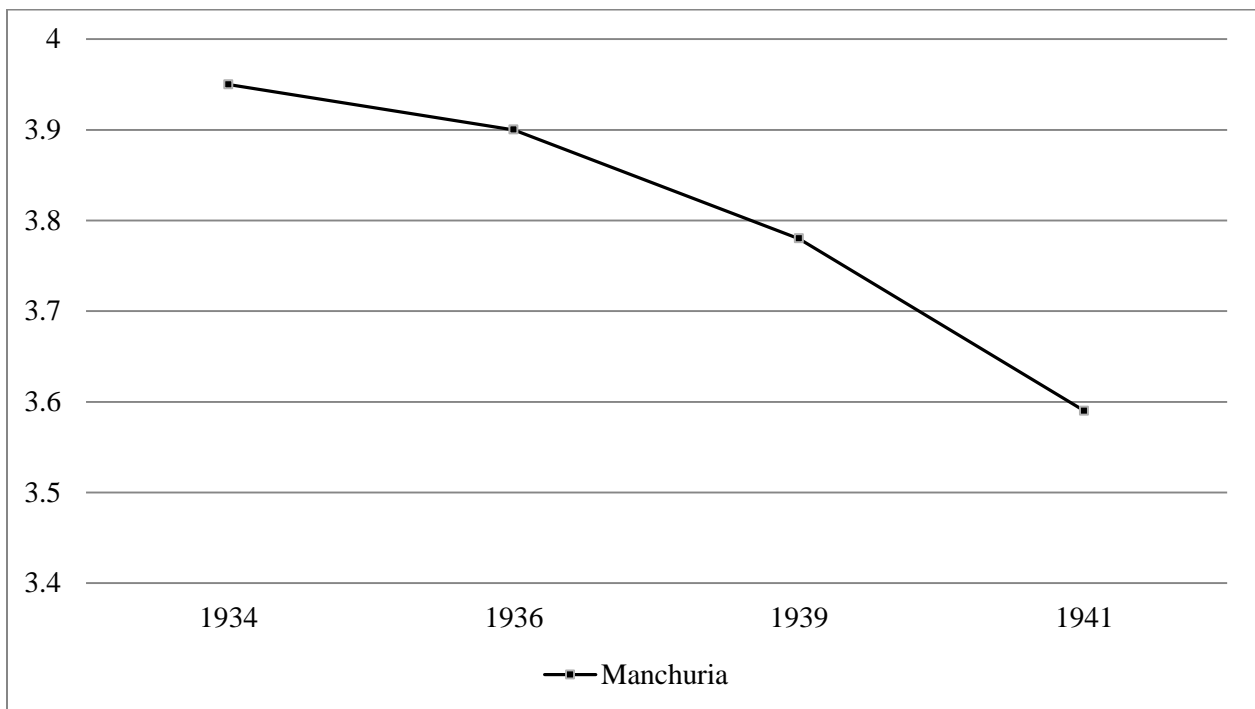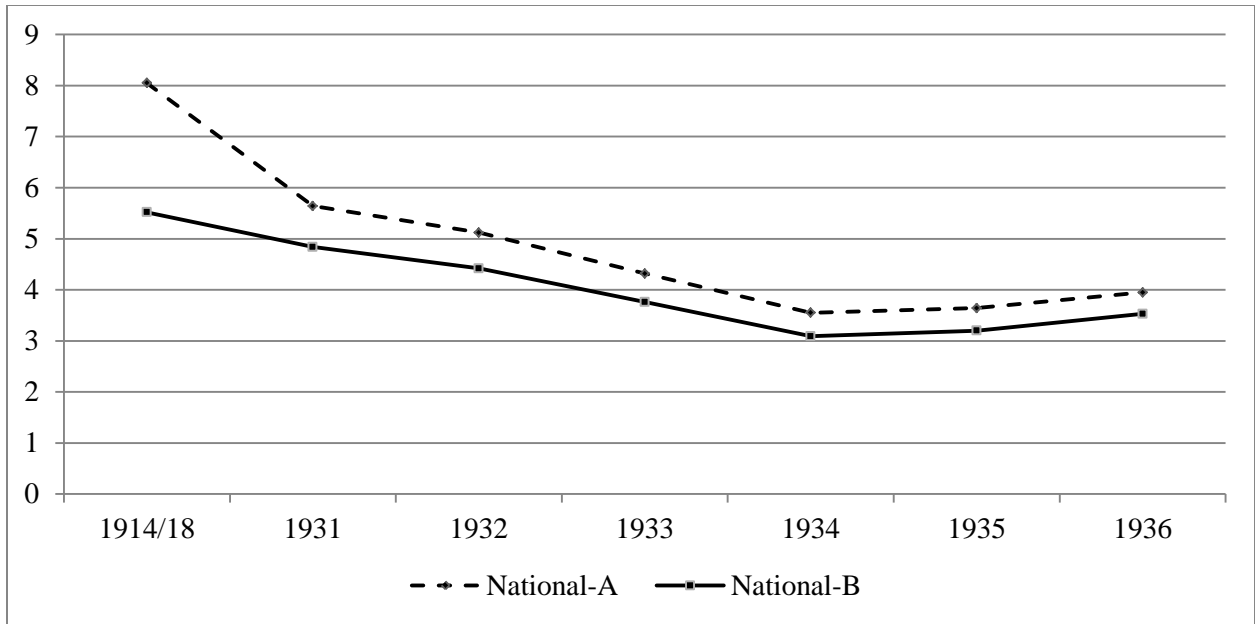
Figure 4 Velocity Implications of Chinese National & Manchuria Product Estimates (&8,&9)
Sources: Thomas G. Rawski, Economic Growth In Prewar China (California: University of California Press, 1989),394-400

Appendix C: Chinese Monetary Reform, 1935

The general timeline of critical events in the process of Chinese monetary reform are illustrated as follows, together with brief description of different roles the United States and the United Kingdom played.

- 1933.3.1
  The Chinese central government officially abandoned Silcer t*aels* and utilized Silver *dollar* as legal tender. This silver-based currency reform could not solve the Silver Crisis fundamentally.
- 1933.12
  The U.S. silver purchase act was first authorized and caused the silver price more than doubled in the next two years, which seriously influenced Chinese monetary and banking system.
- 1934.6.19
  The Chinese central government started to impose tax on silver exports. This method did not slow down the substantial outflow of silver from China.
- 1934.8.20
  K'ung Hsiang-hsi (the Minister of Finance of the Republic of China) sent a telegram to Present Roosevelt and announced Chinese representative had signed the London Agreement which aimed to maintain the stabilization of global silver price. But due to the U.S. silver purchase act (1934), Chinese national interest had been seriously threatened and the outflows of silver had caused damage to the currency system. For the common sake of maintain the stabilization of currency, Chinese government wanted to be informed of the US future silver purchase plan [42]
- 1934.9.24
  K'ung Hsiang-hsi sent another telegram to the federal government. In this telegram, he emphasized the importance of silver to China, urged the federal government to stop overseas silver purchasing and maintained the silver price at the current level. Besides, China was considering adhering to the gold standard instead of the silver standard. To meet this target, the Chinese government wanted to exchange silver for gold from the United States. [43] This is the first time the Nanjing government informed the federal government that China planned to carry out currency reform and sought for help from the United States. However, C.Hull (Secretary of State) rejected Chinese requirement without critique of undertaking gold standard of China in the late October, 1934.
- 1934.10.12
  In a public telegram sent to Sao-ke Sze (the Chinese ambassador to the United States), Hull noted that the United States would continue to purchase silver from abroad and promised to considering the interest of China when deciding the silver purchasing place,

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[42] *Foreign Relations of the United States* 3(1934) : 440-441.
[43] Ibid. 445.

time and volume. Each country owned the right to buy silver or gold in the global market; hence, the federal government would not consider the inter-governmental currency exchange.[44]

- 1934.12.1

  K'ung Hsiang-hsi sent a telegram to the State financial consultant A.N.Young and advised the federal government maintain the global silver price at the level of 45 cents, which might contribute to Chinese currency reform. [45]

- 1934.12.12

  Cadogan (Ambassador from the United Kingdom to the Republic of China) reported to J.Simon (Secretary of State for Foreign and Commonwealth Affairs) that large quantities of silver had been shipped overseas. There was no double that smuggling to Hong Kong was being carried out on a large scale and native bank interest rates here recently rose as high as 14.6 per cent per autumn. There was a general shortage of silver in circulation and contraction of credit. These would lead to serious economic crisis and political outcome. If efficient measures did not conduct in time, the British interest in China would be impacted. If economic assistance was not forthcoming from British banks it might be offered by American interests.[46]

- 1935.1.2

  Cadogan conveyed the loans requirement (2 million Pounds) from China to the United Kingdom China Silver Committee, which felt enable to recommend the Chancellor of the Exchequer to consent to the flotation of the proposed loan because it did not fall under either of the two classes for which consideration was promised, namely, a) sterling issued by a country within the sterling bloc, and b) issued of which the proceeds were calculated mainly to product direct benefit to British industry. They felt unable to regard the proposal put forward as like to afford any real or lasting remedy to China's monetary difficulties[47].

- 1935.2.5

  K'ung Hsiang-his wanted to receive loans from the United States and pegged Chinese currency to American dollars. More specifically, Chinese monetary system would give up the silver standard and use American dollars as exchange standard system. The Nanjing government planned to sell 20 million ounce silver to the Unite States within one year and the federal government need to lend Chinese government at least 10 million dollars in together with standby credit in the same value. [48]At the end of February, the U.S. Treasury rejected Chinese loan requirement and refused to help Chinese government curry out the currency reform.

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[44] lbid. 449-450.
[45] lbid. 457-458.
[46] *Documents on British Foreign Policy* 20, no.2 (1919-1939):. 367,369.
[47] lbid. 339
[48] *Documents on British Foreign Policy* 20, no.2 (1919-1939):.535-537.

- 1935.2.19

  Cadogan noted to the Chinese government whether they planned to peg new legal tender to British sterling. Soong Tzu-wen responded to Cadogan that Chinese government would give up the silver system and the only way out was to peg new currency to certain foreign exchange, which might by British sterling. In order to promote the development of Chinese trade, it was necessary maintained the Chinese foreign exchange rate at the relative low level. Hence, the British government should offer the Chinese government loans (20- 25 million pounds) and credits in the same value.[49]

- 1935.9

  Frederick Leith Ross (the chief economic adviser to the British government) arrived China in the late September. The main goal of his trip was to help the Nanjing government get rid of the current financial difficulties and monetary problem. However, the premise of British assistance was the Chinese government should officially admit the legalization of Manchuria, which could not be accepted by both the Chinese central government and Japanese government. Without the help of other countries (like Japan, the United States or France), the British government would not take the risk of granting Chinese government loans by themselves, which finally resulted in the failure of pegging *Fabi* (new legal tender) to British Sterling.

- 1935.10.28

  K'ung Hsiang-his noted to H.Morgenthau (Secretary of the US Treasury) that the Chinese government wanted the federal government brought 100 million ounce silver from China. Chinese government was going to conduct the currency reform which required foreign currency reserves to stabilize foreign exchange rate. In order to get plenty of foreign currency reserves, the Chinese government had to sell silver reserves in a large amount to the United States or in the global silver market.

- 1935.11.4

  Without the official feedback of offering loans from the Britain and the United States, the Chinese central government conducted the currency reform. This wider-ranging reform aimed at nationalization of silver, centralization of issuing legal tender notes and control of foreign exchange system. Meanwhile, Chinese government first announced the foreign exchange rate between *Fab*i and Sterling (1:1.25) and the British government officially ordered British banks in China could not redeem note with silver.

- 1935.11.6

  The federal government became angry at the Chinese government conducting the currency reform without informing them first. Morgenthau claimed that the premium for their currency loan was to announce Chinese *Fabi* pegged with American dollar. After the Chinese ambassador promised him that Chinese new legal tender would not peg to any foreign currency (especially British Sterling), the federal government agreed to purchase 50 million ounce silver from China. However, all the American dollars should

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[49] *Documents on British Foreign Policy* 20, no.2 (1919-1939): 462.

be reserved in the American Bank located in New York and the federal government owned the right to supervise its usage. The federal government also changed their channel of silver purchasing from the London silver market to silver producing countries directly, which caused dramatic decrease in silver price in the London market. This action marked the federal government not only warned the Chinese government not to peg its currency to British Sterling but also challenged the financial center status of Britain.

- 1935.12.21
  The British Foreign Office and the Ministry of Finance officially suspended their loans to China because of tensions from Japan accelerating aggregation toward the North China. The Chinese government gave up the plan to get loans from Britain and became member of the sterling bloc.

- 1936.6
  The federal government took the advantage of situation that the United States was the only buyer of Chinese silver. It promised Chinese government to further offer 20 million dollars loan which should be mortgaged by 50 million ounce silver.

- 1936.7
  When Leith Ross went back to London, he reported to the parliament that in the Chinese Government Notice (November 4th 1935) they did not announce to peg *Fabi* to any foreign currency. The Chinese government planned to peg *Fabi* to British Sterling but they did not receive any British loans. In this situation, the Chinese central government had to sell silver in exchange for foreign currency reserves. Because the United States acted as the only buyer, they controlled the Chinese government and influenced its process of currency reform.

Appendix D: Illustrations

1. The percentage of indirectly included goods' value to the gross trade value- Imports

Year	VDII (HT MM)	GIV (HT MM)	%	Year	VDII (HT MM)	GIV (HT MM)	%
1867	68	69	98.6	1898	176	210	83.8
1868	70	71	98.6	1899	222	265	83.8
1869	71	75	94.7	1900	173	211	82.0
1870	68	71	95.8	1901	215	268	80.2
1871	75	78	96.2	1902	262	315	83.2
1872	71	75	94.7	1903	278	327	85.0
1873	70	74	94.6	1904	293	344	85.2
1874	68	71	95.8	1905	369	447	82.6
1875	64	68	94.1	1906	332	410	81.0
1876	66	70	94.3	1907	383	416	92.1
1877	68	73	93.2	1908	318	395	80.5
1878	65	71	91.5	1909	330	418	78.9
1879	74	82	90.2	1910	363	463	78.4
1880	70	79	88.6	1911	390	472	82.6
1881	80	92	87.0	1912	379	473	80.1
1882	67	78	85.9	1913	461	570	80.9
1883	64	74	86.5	1914	471	569	82.8
1884	63	73	86.3	1915	387	454	85.2
1885	74	88	84.1	1916	419	516	81.2
1886	72	87	82.8	1917	457	550	83.1
1887	65	192	33.9	1918	444	555	80.0
1888	82	125	65.6	1919	499	647	77.1
1889	70	111	63.1	1920	602	762	79.0
1890	86	127	67.7	1921	666	906	73.5
1891	91	134	67.9	1922	675	945	71.4
1892	92	135	68.1	1923	735	923	79.6
1893	96	151	63.6	1924	809	1018	79.5
1894	139	162	85.8	1925	765	948	80.7
1895	141	172	82.0	1926	899	1124	80.0
1896	174	203	85.7	1927	793	1013	78.3
1897	170	203	83.7				

Source: Nan-k'ai chih shu tzu liao hui pien, 1913-1952[Compendium of Nan-k'ai index number materials](Peking: China Social Sciences Press, 1988):555.
Notes: VDII : Value of Directly Included Imports
GIV: Gross Imports Value
HT: Haikwan *Tael*

The percentage of indirectly included goods' value to the gross trade value- Exports

Year	VDIE (HT MM)	GEV (HT MM)	%	Year	VDIE (HT MM)	GEV (HT MM)	%
1867	55	58	94.8	1898	135	159	84.9
1868	68	69	98.6	1899	168	196	85.7
1869	65	67	97.0	1900	131	159	82.4
1870	59	62	95.2	1901	133	166	106.6
1871	73	75	97.3	1902	177	214	81.3
1872	82	84	97.6	1903	174	214	97.2
1873	76	78	97.4	1904	208	239	81.2
1874	72	74	97.3	1905	194	228	94.3
1875	67	69	97.1	1906	215	236	102.5
1876	78	81	96.3	1907	242	264	95.5
1877	64	67	95.5	1908	252	277	112.3
1878	64	67	95.5	1909	311	339	101.5
1879	69	72	95.8	1910	344	381	90.8
1880	75	78	96.2	1911	346	377	89.4
1881	69	71	97.2	1912	337	371	101.9
1882	62	67	92.5	1913	378	403	82.9
1883	65	70	85.7	1914	334	356	111.5
1884	62	67	106.0	1915	397	419	105.3
1885	60	65	120.0	1916	441	482	89.0
1886	71	77	103.9	1917	429	463	96.3
1887	78	86	98.8	1918	446	486	121.4
1888	80	92	81.5	1919	590	631	74.0
1889	85	97	90.7	1920	467	542	100.4
1890	75	87	101.1	1921	544	601	99.0
1891	88	101	97.0	1922	595	655	105.3
1892	88	103	106.8	1923	690	753	93.2
1893	98	117	105.1	1924	702	772	91.7
1894	110	128	84.4	1925	708	776	103.2
1895	123	143	97.2	1926	801	864	97.8
1896	108	131	82.4	1927	845	919	91.9
1897	139	164	84.8				

Source: Nan-k'ai chih shu tzu liao hui pien, 1913-1952[Compendium of Nan-k'ai index number materials](Peking: China Social Sciences Press, 1988):554.
Notes: VDIE : Value of Directly Included Exports

GGV: Gross Exports Value

HT: Haikwan *Tael*

2. New York Silver Price, 1867-1936

Year	NYSP	UNYSP	Year	NYSP	UNYSP	Year	NYSP
1867	1.2484	100	1891	0.9313	74.6	1915	0.5106
1868	1.2484	100	1892	0.8240	66	1916	0.6715
1869	1.2484	100	1893	0.7353	58.9	1917	0.8400
1870	1.2484	100	1894	0.6017	48.2	1918	0.9845
1871	1.2484	100	1895	0.6242	50	1919	1.1209
1872	1.2422	99.5	1896	0.6417	51.4	1920	1.0194
1873	1.2072	96.7	1897	0.5718	45.8	1921	0.6310
1874	1.1972	95.9	1898	0.5555	44.5	1922	0.6793
1875	1.1660	93.4	1899	0.5693	45.6	1923	0.6524
1876	1.0824	86.7	1900	0.5843	46.8	1924	0.6711
1877	1.1236	90	1901	0.5618	45	1925	0.6941
1878	1.0861	87	1902	0.4969	39.8	1926	0.6243
1879	1.0549	84.5	1903	0.5106	40.9	1927	0.5668
1880	1.0724	85.9	1904	0.5443	43.6	1928	0.5849
1881	1.0611	85	1905	0.5743	46	1929	0.5331
1882	1.0711	85.8	1906	0.6342	50.8	1930	0.3846
1883	1.0224	81.9	1907	0.6217	49.8	1931	0.2901
1884	1.0462	83.8	1908	0.6342	50.8	1932	0.2749
1885	1.0012	80.2	1909	0.6217	49.8	1933	0.3501
1886	0.9401	75.3	1910	0.5031	40.3	1934	0.4817
1887	0.9213	73.8	1911	0.6342	50.8	1935	0.6432
1888	0.8876	71.1	1912	0.6217	49.8	1936	0.451
1889	0.8814	70.6	1913	0.6124	40.3		
1890	0.9912	79.4	1914	0.5633	39.3		

Souces: NYSP- *Source: Nan-k'ai chih shu tzu liao hui pien, 1913-1952[Compendium of Nan-k'ai index number materials]*(Peking: China Social Sciences Press, 1988):485; NYSP- *Source: Nan-k'ai chih shu tzu liao hui pien, 1913-1952[Compendium of Nan-k'ai index number materials]*(Peking: China Social Sciences Press, 1988):636-637.

Notes: 1.NYSP: New York Silver Price; UNYSP: Unadjusted New York Silver Price
  2. NYSP is from 1915 to 1936, which is recorded in cents. UNYSP is from 1867 to 1915, which is silver price index. The conversion formula:

$$NYSP_{1867-1914} = UNYSP_{1867-1914} \times \frac{NYSP_{1915}}{UNSP_{1915}} = UNYSP_{1867-1814} \times \frac{0.5106}{40.9} = 0.0124$$

3. Value of China's Imports and Export, Classify by Ports, 1926-1935

Year	Shanghai Imports	Shanghai Exports	Tientsin Imports	Tientsin Exports	Canton Imports	Canton Exports	Hankow Imports	Hankow Exports
1926	929433	563849	131533	94437	104659	70467	84629	36839
1927	709384	514928	157190	138520	67734	109030	29494	18676
1928	854731	564339	175484	127750	62452	114259	78536	43244
1929	973198	567176	177720	128278	65059	117001	53915	43636
1930	1059038	487137	162320	122691	79709	94052	41508	29058
1931	1298699	364588	170370	138196	87578	96302	47854	42251
1932	795161	246669	162887	97962	84373	53151	38558	31637
1933	736220	315758	120778	88472	62009	58404	34259	7649
1934	600483	272305	96670	81051	33848	47128	32214	9848
1935	507695	288874	85160	91202	33761	39936	33216	12599

Source: Nan-k'ai chih shu tzu liao hui pien, 1913-1952[Compendium of Nan-k'ai index number materials](Peking: China Social Sciences Press, 1988):88.

4. Net Silver Exports from China, 1934-1935

Year	Shanghai (Thousand Ch$)	National (Thousand Ch$)	Year	Shanghai (Thousand Ch$)	National (Thousand Ch$)
1934Jan.	-1789	-1783	1935Jan.	3895	-2709
Feb.	-1696	1566	Feb.	1046	-550
Mar.	12385	-867	Mar.	-1434	-986
Apr.	-11454	14763	Apr.	-6042	-2429
May	-2178	2147	May	1737	1043
Jun.	8875	12936	Jun.	2378	-48
Jul.	19058	24308	Jul.	4200	-98
Aug.	65845	79094	Aug.	-800	-229
Sep.	42168	48139	Sep.	890	-736
Oct.	37378	56332	Oct.	1700	-55
Nov.	36356	11327	Nov.	400	-110
Dec.	27518	11974	Dec.	35371	66542

Source: Data from *Nan-k'ai chih shu tzu liao hui pien, 1913-1952[Compendium of Nan-k'ai index number materials]* (Peking: China Social Sciences Press, 1988), 485-6; Pang H.K. Chang," Commodity Price Shocks and International Finance"(Ph.D. dissertation, Massachusetts Institute of Technology, 1983),109.

5. Shanghai Native Banks, 1912-1916

Year	Number of Units			Capital (Thousand Yuan)		Volume of Clearing
	New	Failed	Total	Total	Per Unit	(Thousand yuan)
1912	4	27	28	1488	53	…
1913	3	0	31	1684	54	…
1914	9	0	40	2049	51	…
1915	2	0	42	2161	51	…
1916	10	3	49	2829	58	…
1917	0	0	49	2829	58	…
1918	19	6	62	4390	71	…
1919	7	2	67	5295	79	…
1920	4	0	71	7768	109	…
1921	4	6	69	8431	122	…
1922	10	5	74	10797	146	…
1923	15	5	84	14502	173	…
1924	7	2	89	16625	187	6459*
1925	5	11	83	16659	201	11255
1926	6	2	87	18757	216	15274
1927	2	4	85	19007	224	12365
1928	0	5	80	17989	225	14776
1929	1	3	78	18527	238	16858
1930	3	4	77	19738	256	21457
1931	4	5	76	20245	266	26982
1932	1	5	72	21385	297	18018
1933	3	7	68	21798	321	13990
1934	2	5	65	20702	318	14561^
1935	0	10	55	19382	352	13581
1936	0	7	48	18000	375	16482

Sources: Data from Thomas G. Rawski, Economic Growth In Prewar China (California: University of California Press, 1989),141.

Notes : * Figure is for April-December only
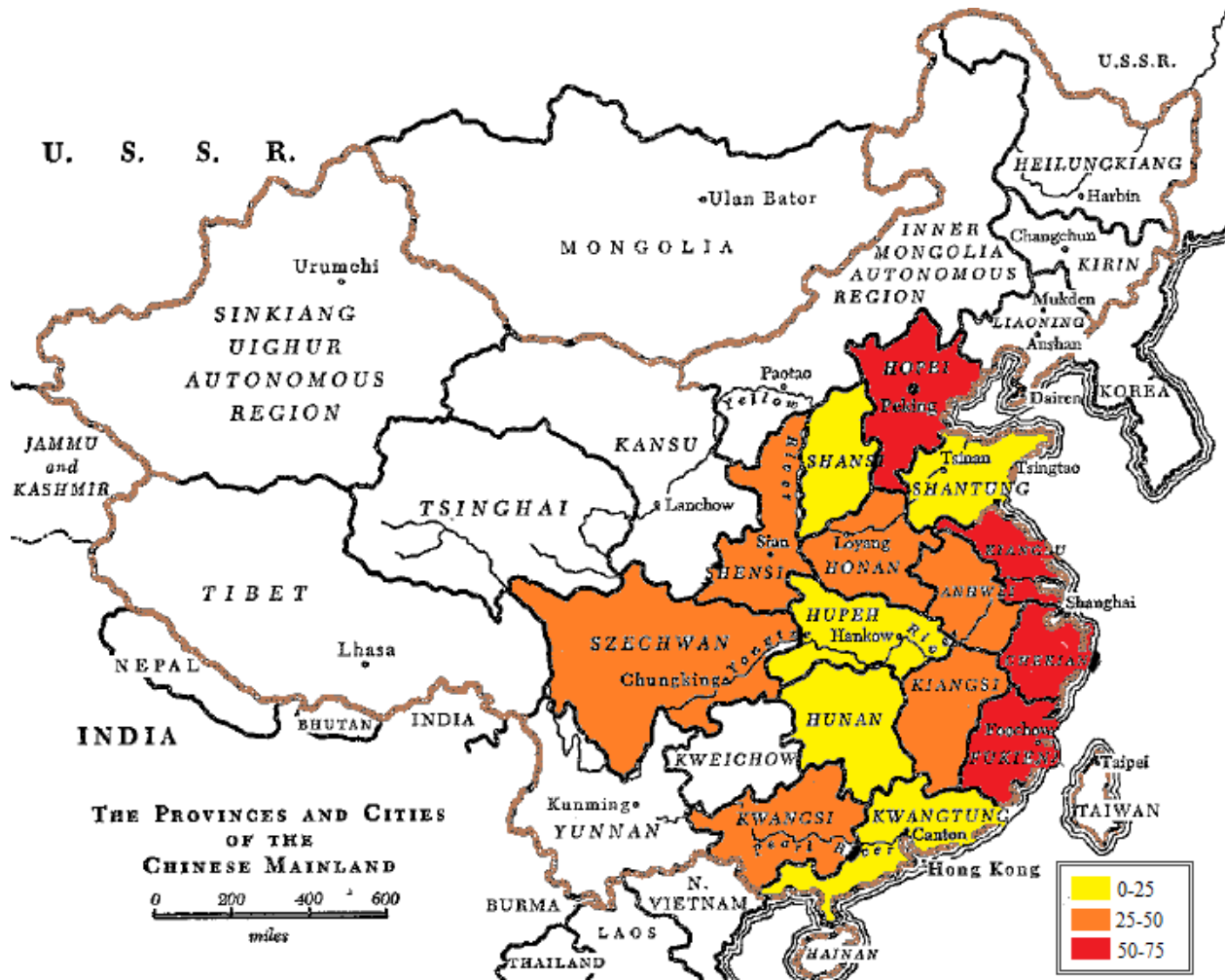^ Modern bankers' clearing house opened in this year

6: Number of Chinese Commercial Banks Offices, 1936
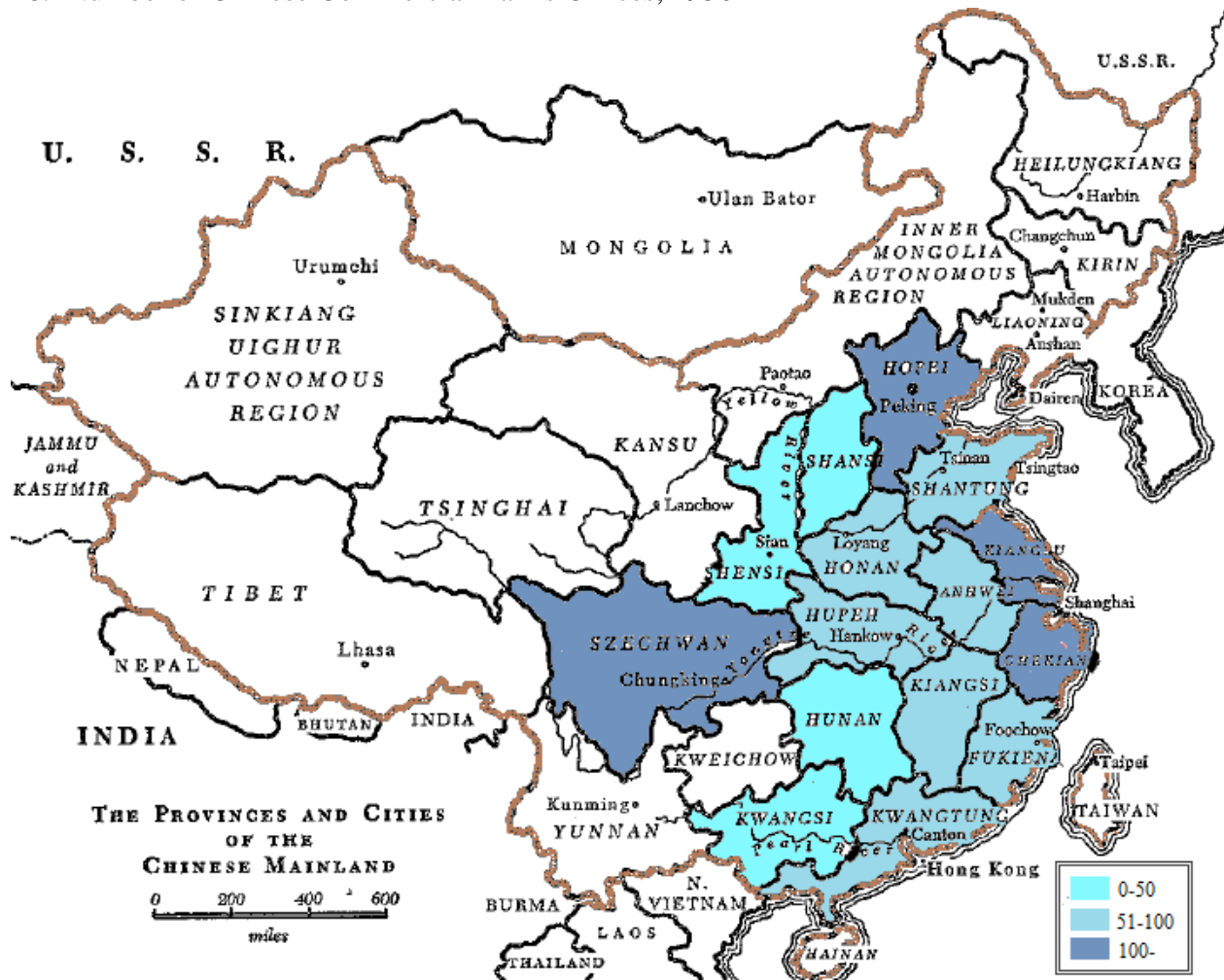
Source: Thomas G. Rawski, Economic Growth In Prewar China (California: University of California Press, 1989),136.

7: Location Distribution of Chinese Commercial Banks, 1936

Source: Thomas G. Rawski, Economic Growth In Prewar China (California: University of California Press, 1989),136.