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Quantitative Analysis of Prewar and Wartime Exchange Rate Systems in Japan and China

明治・昭和前期為替制度の計量分析

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第 1 章　An Exception that Proves the Rule: Japanese Monetary Policy under the Classical Gold Standard, 1897–1914
金本制下の金融政策（1897～1914 年）

Abstract

The paper explores Japanese monetary policy under the classical gold standard (1897–1914), while providing a succinct exposition of the distinguishing features of the Japanese gold standard regime. The paper, explaining how the Bank of Japan conducted monetary policy, finds that, as a general practice, (i) it used fiduciary issues to offset movements in monetary gold so as to stabilize the supply of currency; (ii) it moved the discount rate in the same direction as the government moved the extra issue tax rate; and (iii) it raised the discount rate in response to an increase in gold outflows. The rules-of-the-game-like behavior of discount rate policy, motivated by the central bank's mandate to preserve gold convertibility, was robust and consistent, challenging the semi-consensual view that violations of the rules were frequent and pervasive under the classical gold standard.

要旨

本論文は、金本位制下における日本銀行の金融政策を計量的に分析する。我が国の金本位制に関しては、膨大な文献が存在するが、計量分析は皆無だといってもよい。欧米では、金本位制下の「ゲームのルール」に関する実証研究が多くある。本論文は、この溝を埋めることを目的とする。「ゲームのルール」とは、戦間期に考案された事後的な概念で、以下のような発想である。「金本位制が世界規模で持続するためには、金を一方的に失う国があってはならない。したがって、金を失う国は緊縮的な金融政策をとり、金を得る国は緩和的な金融政策をとったはずである。」ところが、実証文献では、欧米の中央銀行は「ゲームのルール」を遵守しなかったという合意が形成されている。本論文では、日本銀行が、金の流出時には公定歩合を上げ、金の流出が収まると公定歩合を下げたことを示し、日本が学問的合意に反する例外であったと結論する。

第 2 章　Building a Potemkin Village in Occupied China: Japan's Wartime System of Linked Trade, 1939–43

日本占領下中国華北地域の為替制度（1939～1943 年）

Abstract

The paper discusses the little-known exchange rate system of Japanese-occupied North China during the Second Sino-Japanese War, whereby exporters were given the right to import in the form of a piece of yellow paper, which could be sold in the secondary market. In an environment of rapid inflation where North China's yuan was pegged to the Japanese yen and devaluation was not politically feasible, the system incentivized exports by allowing the exporters to offset their losses with the profits from selling goods imported, or the right to import goods, at the overvalued exchange rate. Following the start of the Pacific War, the system evolved to become a major scheme of facilitating trade between North and Central China under Japanese occupation. The paper, utilizing archived classified documents, reconstructs analytically how the system operated. Further, our analysis based on monthly average data confirms that the secondary market pricing of yellow paper broadly mimicked the operation of a flexible exchange rate. The system died a natural death when exploding inflation in Central China eliminated the export disincentive in North China.

要旨

本論文は、東京大学所蔵の横浜正金銀行資料に基づき、日本占領下中国華北地域における「為替集中制」の仕組みを明らかにする。日中戦争期、日本は占領下中国を華北地域と華中地域に分離して統治した。華北地域では、中国聯合準備銀行を設立し、早くから円ブロックに 1 聯銀元＝1 円の交換比率をもって編入させた。為替集中制とは、聯銀元が円に固定化された状況で、物価高騰が輸出に与えるマイナス効果を軽減するため、輸入権を輸出商社に与える制度であった。すなわち、高物価の華北地域から低物価の第 3 国に固定相場で輸出することによる損失を、第 3 国から固定相場で輸入した物資を華北地域で売ることから得られる利益で相殺させたのである。輸入権は、第 3 者に売ることもできたので、輸入権を取引する流通市場が形成された。本論文では、輸入権の流通価格を分析することにより、本制度が、表面上は固定相場制であっても、実質的な変動相場制として機能したことを示す。

第1章

An Exception that Proves the Rule:

Japanese Monetary Policy under the Classical Gold Standard, 1897–1914

Abstract:

The paper explores Japanese monetary policy under the classical gold standard (1897–1914), while providing a succinct exposition of the distinguishing features of the Japanese gold standard regime. The paper, explaining how the Bank of Japan conducted monetary policy, finds that, as a general practice, (i) it used fiduciary issues to offset movements in monetary gold so as to stabilize the supply of currency; (ii) it moved the discount rate in the same direction as the government moved the extra issue tax rate; and (iii) it raised the discount rate in response to an increase in gold outflows. The rules-of-the-game-like behavior of discount rate policy, motivated by the central bank's mandate to preserve gold convertibility, was robust and consistent, challenging the semi-consensual view that violations of the rules were frequent and pervasive under the classical gold standard.

Keywords: classical gold standard; rules of the game; Japanese monetary policy; Japan under the classical gold standard; Bank of Japan discount rate policy

JEL classification: F33, F55, E42, E58

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1. *Introduction*

This paper explores Japanese monetary policy under the classical gold standard (1897–1914). It is largely a descriptive study in the sense of explaining *how* monetary policy was conducted. It does not assess whether the policies pursued achieved the intended objectives or whether policies were conducted optimally (cf. Giovannini 1986). Japan was on the gold standard twice: from October 1, 1897 to September 12, 1917 and from January 11, 1930 to December 13, 1931. Our focus is on the classical period. The outbreak of World War I prompted major European countries to suspend the export of gold, which explains our choice of July 1914 as the terminal date for this study, though Japan remained on gold for three more years.[1] Little information is available in the English language on Japan's experience with the gold standard. A subsidiary purpose of this paper is to provide a succinct exposition of the distinguishing features of the Japanese gold standard regime.

Part of our discussion addresses the question of whether the Bank of Japan followed the rules of the game. The presumed rules are an invention of the interwar period to describe an idealized working of the classical gold standard. There is therefore no presumption that the Bank of Japan knew, much less followed, such rules. As generally interpreted (Keynes 1931; Bloomfield 1959; Triffin 1964; Eichengreen et al. 1985),[2] the rules of the game relate to the supposed practice of central banks to amplify the impact of a gold flow on the monetary base, so as to subordinate domestic stability to external balance. In an idealized working of the classical gold standard, it was assumed that a central bank losing (gaining) gold (i) raised

[1] Because Japan could no longer import gold, the yen–sterling exchange rate routinely moved outside the presumed gold import point during World War I.

[2] McKinnon (1993) offers an unconventional interpretation that highlights how central banks managed the gold standard as a monetary arrangement.

(cut) the discount rate to encourage a capital inflow (outflow) or (ii) sold (purchased) domestic securities to contract (expand) the monetary base further.

The rest of the paper is organized as follows. Section 2 describes the legal underpinning of the Japanese gold standard and how the money supply rule was specified. Section 3 discusses the unique manner in which Japan's monetary authorities stabilized the exchange rate around the gold parity, while section 4 highlights the operation of the specie (specie-convertible foreign exchange) balances kept abroad for that purpose. Sections 5 and 6 provide an empirical analysis of how the Bank of Japan conducted monetary policy, with the latter focusing on the question of whether it followed the rules of the game. Section 7 explains how the central bank's discount rate policy produced a rules-of-the-game-like pattern. Finally, section 8 presents a conclusion.

2. *The money supply rule*

The Coinage Law (*Kahei Hō*) of 1897 defined one yen as 0.75 gram of pure gold. The British pound was the Bank of Japan's reference currency. The yen's exchange rates against other currencies, including the U.S. dollar, were derived as cross rates from their values against the pound. Because a pound was valued as equivalent to 113 grains of pure gold, the yen's parity was approximately ¥9.7632 per pound; likewise, with a dollar valued as equivalent to 23.22 grains of pure gold, the parity was approximately ¥2.0062 per dollar. By convention, the yen–pound rate was expressed in terms of shillings per yen, and the yen–dollar rate in terms of dollars per ¥100, so the parities were approximated as 2s 0.582d (or 24.582d) and $49.846, respectively.

A range of estimates were given by contemporary observers for gold points (e.g., Kimura 1926; Fujita 1929; Mimata 1929). Against the dollar, the estimates ranged between $50.1875 and $50.375 (per ¥100) for the import point and between $49.3125 and $49.5 for the export point, suggesting a margin of up to 1 percent on either side. A somewhat wider

margin of around 1.2 percent was suggested for the yen–pound rate, reflecting the longer time required for gold to travel to and from London.[3] Shipping gold involved the costs of freight, insurance, and interest, which varied considerably across time and individuals, meaning that the actual gold points were highly variable. Even though very little private shipment of gold took place in practice, the presumed gold points, and the real threat of gold shipment, dictated how foreign exchange rate policy was conducted.

Stipulated by the Convertible Bank Notes Ordinance (*Dakan Ginkōken Jōrei*) of 1884, as revised in connection with the Coinage Law, the money supply rule was called the "elastic fiduciary issuance limit method (*hoshō hakkō kusshin seigen hō*)." The supply of bank notes consisted of (i) "specie issues" (*seika hakkō*), (ii) "fiduciary issues" (*hoshō hakkō*), and (iii) "extra issues" (*hoshōgai hakkō*). The Bank of Japan was, first and foremost, required to hold specie equivalent in value to the balance of notes outstanding. Second, fiduciary note issues, unbacked by specie, were permitted up to a statutory limit against the security of government or high-quality commercial securities, in order to accommodate the public's variable demand for currency. The initial fiduciary limit of ¥85 million, inherited from the silver standard era, was raised to ¥120 million in March 1899. This amount remained unchanged until 1932, following Japan's permanent departure from gold.

Third and finally, the central bank, under extraordinary circumstances, could issue additional notes by obtaining approval from the minister of finance and by paying a tax of not less than 5 percent per year, as determined by the minister. The purpose of the extra issue tax was to serve as a warning signal to prompt the central bank to take remedial action (Tanaka

[3] These may be compared to the average margins of about 0.42 percent (exports) and 0.31 percent (imports) during 1901–10 for U.S.-based London–New York arbitrageurs, as estimated by Officer (1996).

1929). Implicit was the idea that (i) the supply of notes must ideally be anchored in the stock of specie, so that extra issues should be withdrawn as soon as practical; and (ii) the Bank of Japan, as a joint stock company, was not free from a profit motive. The intent was to induce the Bank of Japan to raise the discount rate whenever the government raised the extra issue tax in order to reduce the public's demand for currency. The contemporary statement of senior officials indicates that the extra issue tax was binding on their decisions.[4]

3. *The mechanism of fixing the exchange rate*

Japan's experience with the gold standard was not a textbook case. Gold coinage saw limited circulation, in part owing to the large minimum denomination of ¥5, when Japan's annual per capita GNP in 1900 was about ¥55 (Ohkawa et al. 1974). The public's confidence in the central bank's pledge of gold convertibility was such that almost all cash transactions took place in the form of currency notes. Externally, the monetary authorities (comprising the ministry of finance, the Bank of Japan, and, in some cases, their agent, the Yokohama Specie Bank) did not maintain the gold parity through the free private movements of gold. Instead, they managed the gold standard largely by selling and buying foreign exchange held abroad at a fixed rate, which they typically set below the parity but above the presumed gold export point ostensibly to encourage exports and discourage imports (Furuya 1928).

[4] Eigo Fukai (1938, p. 268), whose long and distinguished central bank career included tenures as deputy governor (1928–) and governor (1935–37), states that it was "painful" for the Bank of Japan as a private, for-profit institution to purchase foreign exchange when the fiduciary limit was reached. Unless the government allowed the foreign exchange to be counted as part of the monetary gold reserve, purchases of foreign exchange under such circumstances would entail a considerable cost as the extra issue tax was greater than any rate of return it could expect to earn from investing the funds in liquid assets abroad.

The practice of using foreign exchange to maintain the peg emerged as experience was gained and proved to be an efficient arrangement for traders and financiers located far away from each other.[5] It took gold at least 20 days to travel between Yokohama and London or New York. On top of the costs of transportation and insurance, an annual interest of 6–7 percent, typically, was charged during the transshipment (Inouye 1931; Kojima 1981). Central bank pegging of the yen with the use of foreign exchange deliverable in London or New York made sense, both for the authorities who wanted to avoid a physical outflow of gold, and for market participants who wanted to minimize transactions costs. The system itself was established in 1904 but the practice of determining the selling rate in relation to the gold export point may have started in 1909 (Kojima 1981).

Japan was by no means unique in this regard. Under the classical gold standard, little gold movement took place generally (Cassel 1936). Instead of shipping gold, bills of exchange drawn on London were typically used as a means of international payment. Although New York, Berlin, and Paris had emerged since 1890 to challenge London's dominance, London maintained "her supremacy" in the financing of world trade at least until the middle of World War I (De Cecco 1984, pp. 105–06). Even Japanese export bills drawn against Chinese, Indian, or American importers were made payable in London, and Japanese importers paid for their imports in sterling bills drawn against them payable in London (Furuya 1928). The receipts for silk exports to the United States might be made in sterling in

[5] The Bank of Japan remained committed to honoring the obligation to convert currency notes into gold. Private bankers continued to obtain gold from the Bank of Japan's gold window for shipment to Shanghai (Nochi 1981). Of the ¥320 million of gold sold by the Bank of Japan between 1906 and 1912, about ¥132 million came from the gold window and about ¥188 million from the overseas specie balances (Kitsukawa 1969).

London, which might then be used to pay for the imports of machinery and chemical products from Germany (Fukai 1929).

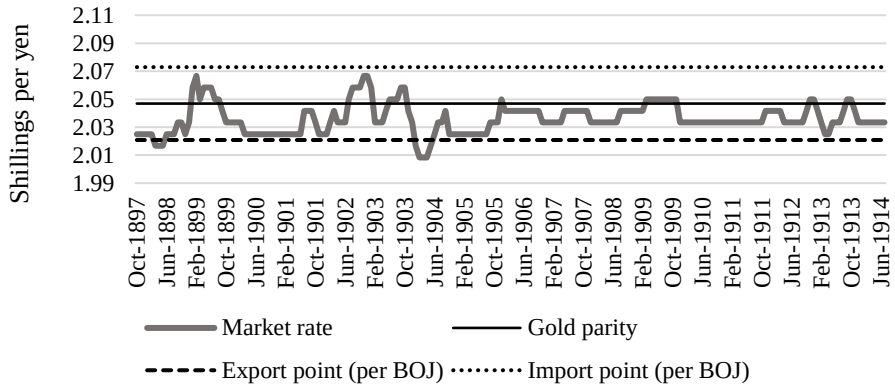
The official balances of interest-bearing assets denominated in gold-convertible currencies (often referred to simply as specie) played a central role in this system. Initially, these assets were held by the government, with the Bank of Japan acting as a custodian. In early 1903, the central bank for the first time owned its own foreign assets when it purchased part of the ¥50 million proceeds the government had obtained in September 1902 from selling bonds in London. The central bank kept the funds as a pound deposit amounting to about ¥26 million (Taira 1984). In June 1904, it signed a formal agreement with the ministry of finance, authorizing it to own foreign balances; the agency agreement was finalized with the Yokohama Specie Bank in December. The central bank accumulated foreign assets whenever it purchased them from the government or foreign exchange banks.

Overseas specie balances became a distinguishing feature of the working of Japan's classical gold standard. Part of this reflected the government's need to earmark a portion of the foreign exchange to the import of weaponry (Nochi 1981). The balances were replenished from time to time by external borrowing. The government kept in London and other financial centers the portion of the proceeds it did not immediately use. When it wanted to use the funds in Japan, it sold part of the foreign exchange to the central bank. This is how the Bank of Japan typically came to acquire foreign assets on its own accounts. These government and central bank balances were held in liquid but safe assets, normally government securities, central bank deposits, or deposits with commercial banks of high credit standing.

Given the way the exchange rate was fixed, the yen was more likely on the depreciated side of the gold parity (Figure 1). Because the pound was the reference currency, the margins for the yen–pound rate were somewhat smaller than for the yen–dollar rate. Even so, the difference between the maximum and the minimum in any month never exceeded 1.3

percent for either exchange rate from October 1897 to June 1914. With sterling being the reference currency, the yen–pound rate could be fixed for a prolonged period of time. Based on monthly average data, for example, it was pegged at 2s $^{4}/_{10}$d for 23 consecutive months (December 1909–October 1911) and 2s $^{3}/_{10}$d for 16 consecutive months (March 1900–June 1901). The yen–pound rate, therefore, was a policy rate. Japan was by no means unique, as Cassel (1936, p. 3) observed: no country let "gold movements necessarily influence" the exchange rate, which "depended entirely on the policy of the central bank."

Figure 1. The Yen's Monthly Average Exchange Rate against the Pound, October 1897–July 1914



Notes: the presumed gold export point of 2.0208 shillings and import point of 2.0729 shillings are based on Fukai (1941). These are for illustrative purposes only. There is no reason to expect the gold points to have remained constant throughout the period.
Source: Bureau of Statistics, *Teikoku Tōkei Nenkan*, annual issues.

4. *The management of the overseas specie balances*

A change was introduced to the money supply rule in December 1903, when the government authorized the Bank of Japan to count part of its sterling deposits in London as the backing for specie issues. Additional assets were counted as eligible for backing specie issues in subsequent years, including British, U.S., and French government securities (Kitsukawa 1969; Kojima 1981). From 1904, the official overseas specie balances therefore consisted of three components: (i) assets held in the government account; (ii) assets counted as part of the Bank of Japan's monetary gold reserve; and (iii) assets held in the Bank of Japan's nonmonetary gold account. A question arises as to how each of the three accounts

was used by the authorities to transact in foreign exchange, which had different implications for their impacts on the monetary base.

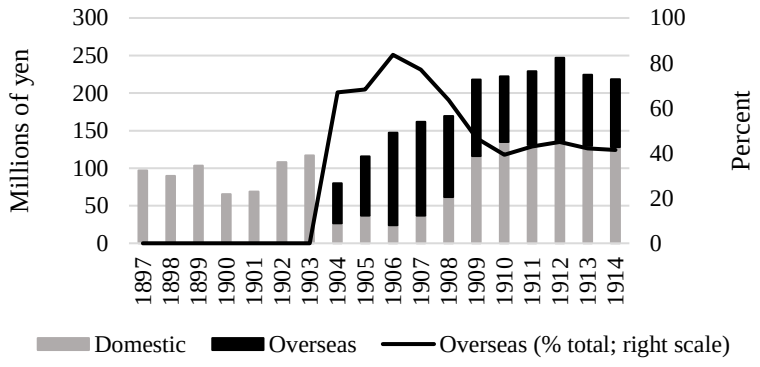
Government transactions would not change the monetary base when they involved external borrowing or payments. A government purchase of export bills by means of funds raised from domestic borrowing amounts to sterilized intervention in which the central bank purchases foreign exchange while simultaneously selling government securities in the open market. How much the government could accumulate the specie balances was limited by the availability of funds at its disposal, while it could only run down the balances until they were depleted. The government could therefore lack the flexibility to respond quickly if it needed to raise funds through domestic or foreign borrowing. In contrast, the Bank of Japan could be flexible in purchasing foreign exchange, but its foreign exchange transactions, irrespective of whether they involved sales or purchases or whether they operated through the monetary or nonmonetary gold account, directly affected the monetary base.

The Bank of Japan mainly used the nonmonetary specie balances to conduct foreign exchange transactions as if to protect the assets set aside as the monetary gold reserve. In order to move funds from the nonmonetary to the monetary gold account, it needed special authorization from the ministry of finance in each instance (Fukai 1938). When foreign exchange was purchased, it was normally added to the nonmonetary balances, which was reflected as an increase in fiduciary issues. If the fiduciary limit was binding, it needed to request the government to authorize the assignment of the foreign exchange to the monetary gold account. Otherwise, it had to resort to extra issues, which it was generally reluctant to do because the extra issue tax was higher than any rate of return it could expect to earn by investing the funds in liquid assets abroad.

The overseas specie balances were held predominantly in London, with small balances in Berlin, New York, and Paris. At the end of FY1914, for example, the majority

(63.1 percent) was owned by the Bank of Japan, with the predominant portion of it (90.3 percent) in London; no monetary gold was held outside London (Matsuoka 1936). The government deposits in Berlin, New York, and Paris were meant to facilitate the payment of interest on bonds raised in those markets or to pay for the import of weapons from those countries (Nochi 1981). Between 1916 and 1917, the war in Europe prompted the Japanese authorities to shift more of the specie balances to New York, while consolidating in London the small balances held in Berlin and Paris (Tomaru 1932).

Figure 2. Components of Japan's Monetary Gold Balances, 1897–1914 (In millions of yen; percent of total)



Note: “Domestic” reserves were held in gold and “overseas” reserves in gold-convertible foreign exchange.
Source: Bank of Japan (1986), pp. 332–34.

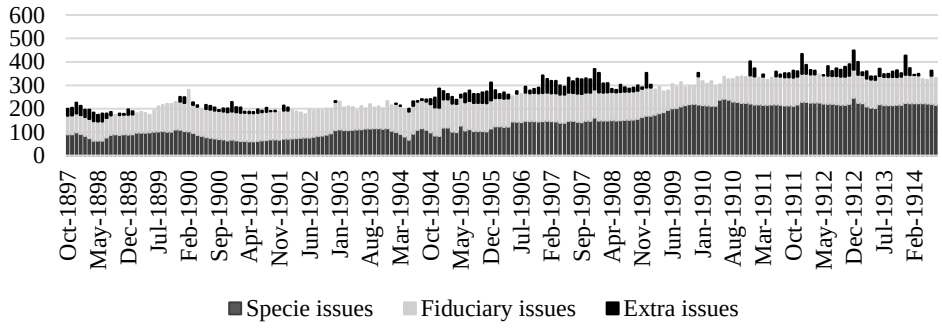
Japan’s gold standard was often characterized as a gold-exchange standard, in which the central bank uses foreign exchange to manage the system (Matsuoka 1936; Ishibashi 1936), a practice that became wide-spread following the Genoa Conference of 1922. The uniqueness of this practice under the classical gold standard should not be exaggerated. League of Nations (1944) noted that, in 1913, fifteen European central banks held about 12 percent of gold reserves in the form of foreign exchange. If there was any sense in which the Japanese system was unique, it was the considerably higher share of foreign exchange in Japan’s “gold” reserves compared to other countries (Figure 2). At its peak in 1906, the share was as much as 83.7 percent. The same publication classified Japan, along with Argentina, India, and Russia, as uniquely practicing a sterling exchange system.

Fukai (1941) did not share such a view. Referring to Keynes's (1913) description of the Japanese system as "virtually the same in practice" as the one in India (pp. 33, 35–36), Fukai argued that the Bank of Japan was obligated to, and did in practice, convert bank notes into specie, for which it maintained a large domestic stock of gold, and that the gold points (which presupposed the shipment of gold) dictated the terms at which the central bank transacted. The use of foreign exchange was a target of constant criticism as a violation of the spirit of the Coinage Law (Ishibashi 1932), which caused the authorities to become opaque about the overseas balances (Kitsukawa 1969). The government did not disclose, even to the Diet, the breakdown that would allow the amount of central bank nonmonetary gold to be known. The central bank predominantly used nonmonetary gold to conduct foreign exchange operations, at least in part, to conceal the volatility of specie movements (Kojima 1981).

5. *Aspects of Monetary policy under the gold standard*

Rules vs. discretion

Figure 3. The Growth of the Components of Convertible Note Issues, October 1897–July 1914 (In millions of yen)



Source: Asakura and Nishiyama (1974), pp. 291–313.

During the classical period, the balance of convertible notes expanded by 1.7 times; specie-backed issues increased by 2.4 times, with the specie cover ratio rising from 45.2 to 65.4 percent. The average ratio was 50.7 percent, with the maximum of 78.5 percent (May 1910) and the minimum of 29.2 percent (December 1904). The statutory limit for fiduciary issues remained unchanged from March 1899 even though the size of the economy grew by

about 40 and 140 percent, respectively, in real and nominal terms. This explains why the limit frequently was almost fully utilized (Figure 3), with the average utilization of 95.2 percent. The supply of convertible notes was augmented by extra issues in 117 out of the 202 months, making the sum of fiduciary and extra issues to average 111.5 percent of the fiduciary limit. The Bank of Japan liberally used the fiduciary and extra issue provisions to supply currency beyond the stock of available gold.

Table 1. Monthly Standard Deviations and Correlations of Components of the Monetary Base, October 1897–July 1914

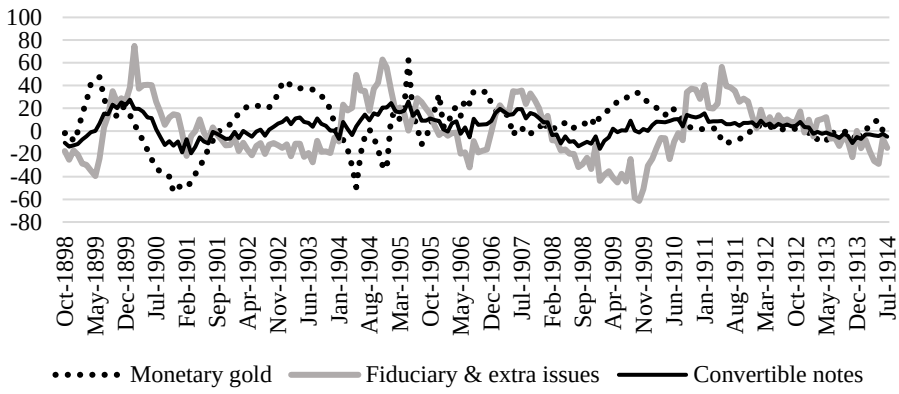
	October 1897 (1898)–December 1904 (N=87/75)		January 1905–July 1914 (N=115)		June 1909-July 1914 (N=62)		October 1897 (1898)–July 1914 (N=202/190)	
	Log	Log diff.	Log	Log diff.	Log	Log diff.	Log	Log diff.
Standard deviations:								
Notes	0.097	0.112	0.129	0.085	0.093	0.059	0.251	0.097
Specie issues	0.202	0.281	0.253	0.129	0.039	0.117	0.426	0.205
Fiduciary & extra issues	0.180	0.257	0.238	0.244	0.248	0.253	0.229	0.249
Extra issues	4.775	6.927	4.549	5.186	4.946	5.661	4.762	5.918
Correlations:								
Notes/specie issues	0.438**	0.358**	0.742**	0.163*	0.350**	0.097	0.961**	0.290**
Notes/fiduciary & extra issues	0.609**	0.572**	0.301**	0.677**	0.946**	0.562**	0.480**	0.615**
Specie/fiduciary & extra issues	-0.401**	-0.503**	-0.401**	-0.549**	0.041	-0.696**	0.088	-0.493**
Specie/extra issues	-0.474**	-0.660**	-0.404**	-0.479**	-0.029	-0.685**	-0.036	-0.571**

Notes: log difference=12-month difference in natural logarithm, roughly interpreted as annual percentage change; **(*) indicates that the correlation coefficient is significant at 1(5) percent; when the balance of extra issues is zero, it is set to equal one (so that its logarithmic value is zero).
Source: author's calculations based on Asakura and Nishiyama (1974), pp. 291–313.

In exploring factors that may have influenced the Bank of Japan's conduct of monetary policy, we divide the sample into two periods: October 1897–December 1904 and January 1905–July 1914. The break point is somewhat arbitrary but informed by the fact that, as previously noted, the Bank of Japan started to manage its own overseas specie balances sometime during 1904. Calculating the standard deviations and correlations of various components of the convertible note issue (expressed in level and as a year-on-year percentage

change to remove seasonality),[6] we observe two important patterns (Table 1). First, the standard deviations of overall convertible notes were about half the size of those of either specie issues or fiduciary plus extra issues (the large size of the standard deviations of extra issues reflects the fact that they could take the value of zero).

Figure 4. Annual Growth in the Components of Convertible Notes, October 1898–July 1914 (In percent, yoy)



Note: obtained as 12-month differences in natural logarithm.
Source: author's calculation based on Asakura and Nishiyama (1974), pp. 291–313.

Second, as a corollary to the first, specie issues had a significantly negative correlation with fiduciary plus extra issues. The negative correlation was more pronounced when expressed as an annual percentage change (Figure 4). Combined with the previous observation, this implies that the Bank of Japan used fiduciary plus extra issues to offset movements in monetary gold (called "neutralization" policy in the literature). From around June 1909,[7] specie issues became a stable part of the note issue and the specie cover ratio never fell below 50 percent. The Bank of Japan almost entirely used fiduciary plus extra

[6] Natural logarithms are used to ensure that the statistics are independent of scale.

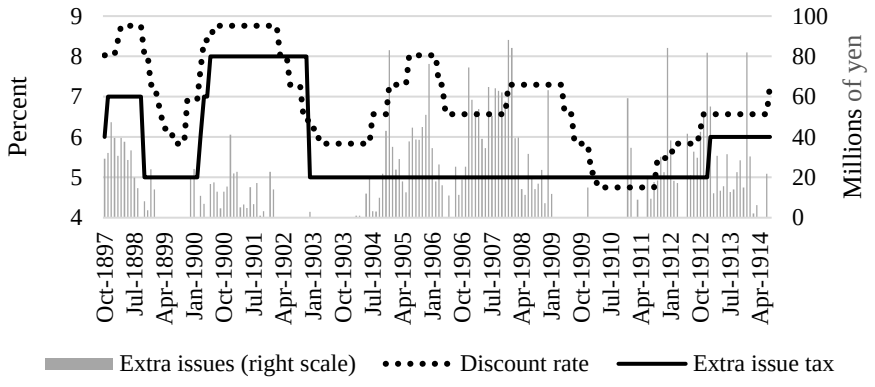
[7] The balance of monetary gold reached ¥200 million and the specie cover ratio peaked at 78.5 percent in the previous month, intimating that the central bank might have been purposely accumulating monetary gold up to that point.

issues to accommodate changes in the demand for currency while keeping the balance of monetary gold stable during the rest of the classical period.

Extra issue tax

As initially designed, extra issues were an extraordinary measure that needed to be withdrawn as soon as practical. In order to induce the Bank of Japan to do so, the minister of finance was supposed to raise the extra issue tax whenever the public's demand for currency increased beyond the fiduciary limit. This was thought to prompt the central bank to raise the discount rate, which would in turn reduce the public's demand for currency. A change in the extra issue tax rate did not always precede a change in the discount rate. The government sometimes raised the tax rate to incentivize the central bank to maintain the discount rate at an elevated level. The Bank of Japan, on its part, sometimes raised the discount rate preemptively when the fiduciary limit was about to be reached (Tanaka 1929).

Figure 5. The Discount Rate, the Extra Issue Tax Rate, and Extra Issues, October 1897–July 1914 (Percent per year; millions of yen)



Sources: Asakura and Nishiyama (1974), pp. 291–313; Bank of Japan (1986), pp. 356, 374; Goto (1970), p. 6.

The system clearly functioned as envisioned through 1902 (Figure 5), with a correlation coefficient of 0.72 between the extra tax rate and the discount rate. The relationship subsequently weakened as the tax rate remained unchanged at 5 percent. The relationship reemerged on January 6, 1913, when a tax rate increase (from 5 to 6 percent)

reenforced the increase in the discount rate. The weaker relationship after 1903 may mean that the Bank of Japan was adjusting the discount rate in response to the direction of change in the balance of extra issues (Tanaka 1929), so as to minimize the payment of the tax. That is, it cut (raised) the discount rate when the balance of extra issues was declining (increasing). If so, the tax was binding on discount rate policy even when the tax rate was not changed.

6. ***Did the Bank of Japan Follow the Rules of the Game?***

The influential works of Ragnar Nurkse and Arthur Bloomfield likely contributed to the semi-consensual view that violations of the rules of the game were pervasive under the gold standard (League of Nations 1944; Bloomfield 1959). For the interwar period (1922–38), Nurkse came to this conclusion by finding a negative correlation, in annual data, between foreign and domestic assets in central bank balance sheets about 60 percent of the time in 26 countries, which included Japan.[8] Bloomfield, applying Nurkse's methodology to the classical period (1880–1914), found the failure to follow the rules not specific to the interwar period: the correlation was negative about 60 percent of the time in 11 countries. A replication by Teranishi and Uchino (1986) yielded a similar finding for Japan during 1897–1914, namely, foreign and domestic assets were negatively correlated 65 percent of the time.

Some have questioned why a negative correlation between foreign and domestic assets in and of itself should be taken as conclusive evidence (Yeager 1966).[9] When a loss of gold leads to a contraction of currency, it is difficult to imagine that the central bank would

[8] Japan was on the gold standard during only two years (1930–31) of the sample period. The correlation for Japan was found to be negative from 1927 to 1933 and for 1923 and 1936.

[9] Yeager (1966, p. 288) notes: "the apparent neutralization may often have been 'automatic' … Mere passive response to credit demands … could have made a central bank's domestic and international assets move in opposite directions."

be so unwilling to accommodate at least part of the existing demand for currency that it would not allow the holding of domestic assets to increase even by a small amount. Such a presumption is similar, though not identical, to the operation of Bagehot's Rule, which McKinnon (1993) considers to be part of the rules of the game.[10] At least in the short run, it makes more sense to think of the rules of the game as implying that a change in foreign assets is *not fully* offset by an opposite change in domestic assets (Jeanne 1995). In the longer run, when a higher discount rate could reduce the demand for currency, the rules of the game could be consistent with a positive correlation between foreign and domestic assets.

In view of the endogenous nature of domestic assets, the present study uses the discount rate as a less ambiguous measure of central bank action. Recent empirical literature, by estimating a discount rate reaction function, shows that central banks in the European periphery adjusted the discount rate to keep the gold cover ratio (Morys 2013). Evidence for central banks in the European core is mixed. A discount rate was raised in response to a decline in monetary gold in Britain and Germany (Giovannini 1986; Davutyan and Parke 1995), but not in France (Bloomfield 1959). Discount rate policy in Britain, Germany, and France may have been used more to stabilize the exchange rate (Morys 2013). The Bank of England's discount rate policy was nuanced, given that it was also responding to domestic economic conditions (Jeanne 1995).

The present study does not follow this literature to estimate a discount rate reaction function by postulating a set of explanatory variables. As discussed in the following section, the contemporary writings of senior central bankers, and the government's instructions to the

[10] McKinnon (1993, p. 9–10) states: "Nurske's supposed 'rule' conflicts directly with Bagehot's well-established operating principle … But this positive association is not itself a 'rule' [but] an endogenous response to an increase in the domestic demand for money."

central bank, make it clear that the Bank of Japan used discount rate policy almost exclusively to preserve gold convertibility: it raised the discount rate when there was an increase in gold outflows. We simply test this hypothesis. The remaining issue is to determine which measure of gold movements (monetary gold alone vs. monetary and nonmonetary gold combined) discount rate policy was targeting (government-owned specie movements are excluded because they largely reflected foreign borrowing or purchases of foreign goods). We maintain that the Bank of Japan was more likely responding to monetary gold movements, which it considered to be a permanent component of its specie holdings.

The hypothesis that the Bank of Japan followed the rules of the game is formally tested by regressing a percentage-point change in the discount rate over a percentage change in the balance of monetary gold, with a constant and possibly one or two additional explanatory variables (Table 2). The percentage change is approximated as an annual logarithmic difference to remove any seasonality and to ensure scale independence. We use period-end monthly, quarterly, and annual data (specifications 1, 2, 3 in Table 2). In the monthly and quarterly specifications (1, 2), the one-period lagged dependent variable is included, both to correct serial correlation and to account for the initial value (on which the decision concerning an incremental change in the discount rate must have depended).

Two specifications (1* and 2*) include the Bank of England's Bank Rate (expressed as an annual percentage-point change). Literature suggests evidence that the Bank of England's Bank Rate typically led the discount rates in other countries (Eichengreen 1987), that discount rates in the European periphery were significantly influenced by the British or German rate (Morys 2013), and that the discount rates of virtually all central banks tended to move together (Bloomfield 1959). This is not to presume that Japan was part of this financially integrated world, but only to account for the possible influence of Bank Rate on global gold movements. In annual data, specification 3* uses the central bank's total

(monetary and nonmonetary) gold holdings as a measure of gold movements. The breakdown of the overseas specie balances by location and ownership was only available annually.

Table 2. Ordinary Least Squares Estimates of the Discount Rate Reaction to Monetary Gold Movements, 1897–1914 [1]

Specifications[2]		1	1*	2	2*	3	3*	4	5
Dependent variable (Dep. var.)		Bank of Japan discount rate, percentage-point change							
Independent variable of interest		Monetary gold, current and lagged values							
Change		Annual (12-month; 4-quarter)						Monthly	Quarterly
Data frequency		Monthly	Monthly	Quarterly	Quarterly	Annual	Annual	Monthly	Quarterly
Ind. var.[3]	Current	-0.004* (0.002)	-0.004* (0.002)	-0.019** (0.005)	-0.018** (0.006)	-0.041** (0.011)	-0.038** (0.010)	-0.006* (0.003)	-0.011 (0.005)
	Lag 1	-	-	-	-	-	-	0.000 (0.003)	-0.012** (0.005)
	Lag 2	-	-	-	-	-	-	-0.006* (0.003)	-
	Lag 3	-	-	-	-	-	-	-0.009** (0.003)	-
	Bank Rate	-	-0.037 (0.034)	-	-0.077 (0.080)	-	-	-	-
	Bank Rate (-1)	-	0.075* (0.033)	-	-	-	-	-	-
	Dep. var. (-1)	0.922** (0.027)	0.932** (0.028)	0.648** (0.085)	0.643** (0.085)	-	-	-	-
NOB		189	189	62	62	17	17	198	65
R-squared (Adjusted)		0.92 (0.92)	0.93 (0.92)	0.75 (0.74)	0.75 (0.74)	0.46 (0.42)	0.51 (0.48)	0.09 (0.08)	0.12 (0.10)
F-statistic[4]		1131.97** (0.000)	577.93** (0.000)	88.19** (0.000)	59.03** (0.000)	12.81** (0.003)	15.78** (0.001)	5.04** (0.001)	4.37* (0.016)
DW		1.560	1.600	1.563	1.497	2.404	1.954	1.877	1.689

Notes: [1]- indicates "not available," **(*) indicates statistical significance at the 1(5) percent level; [2] 3* uses movements in total gold, not just monetary gold; [3] standard errors in parentheses; [4] p-values in parentheses.
Source: author's estimates based Asakura and Nishiyama (1974), pp. 291–313; Bank of Japan (1986), pp. 356, 374, supplemented by www.boj.or.jp; Federal Reserve Bani of St. Louis (https://fred.stlouisfed.org).

We are only interested in the sign of the coefficient of gold movements (the discussion of the impact of Bank Rate is deferred to the following section). In all specifications, the sign is negative and statistically significant at the 1 or 5 percent level. In annual frequency, the use of monetary gold alone or total gold holdings makes no difference. The goodness of fit is high, with the R-squared of 0.92 in monthly data and 0.75 in quarterly data. As a robustness check, we ran the same regressions using monthly and quarterly percentage changes (appropriated by logarithmic differences) and replacing the lagged dependent variable with lagged monetary gold movements (to account for the likelihood that, in higher frequency, the central bank reacted to both current and lagged gold movements).

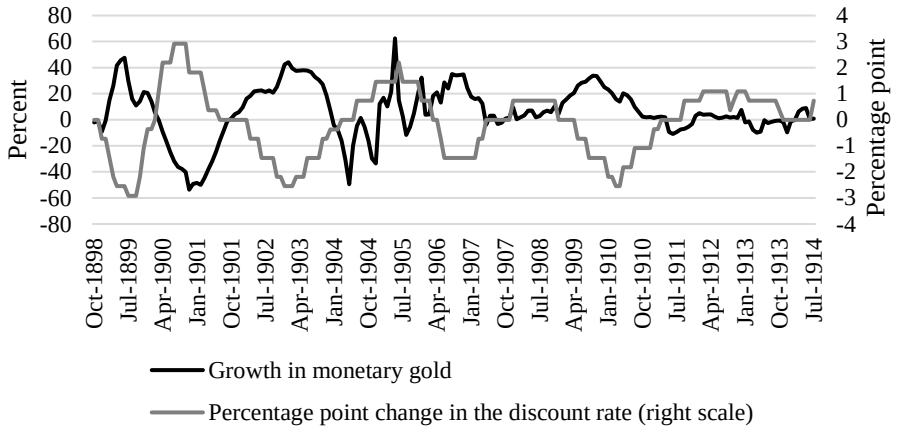
The goodness of fit worsens, but the sign of the coefficient(s) remains negative and statistically significant at the 1 or 5 percent level (specifications 4–5).

Table 3. Granger Causality Tests of Monetary Gold Movements and the Discount Rate, 1897–1914

Specification	Data frequency	Causality		Lag length	F-statistic (p-value)
		From	To		
1	Monthly	Gold movements	Discount rate	6	2.36* (0.033)
2	Quarterly			5	4.35** (0.003)
3	Monthly	Discount rate	Gold movements	6	4.11** (0.001)
4	Quarterly			5	3.13* (0.016)

Notes: annual percentage changes in monetary gold approximated as 12-month differences in natural logarithm; 12-month percentage-point change in the discount rate; leg length obtained by AIC; **(*) indicates that the null hypothesis of no causality is rejected at the 1(5) percent level.
Sources: author's estimates based on Asakura and Nishiyama (1974), pp. 291–313; Bank of Japan (1986), pp. 356, 374.

Figure 6. Monetary Gold and the Discount Rate, October 1898–July 1914 (In changes over 12 months)



Notes: annual percentage changes in monetary gold approximated as 12-month differences in natural logarithm; 12-month percentage-point change in the discount rate.
Sources: author's calculations based on Asakura and Nishiyama (1974), pp. 291–313; Bank of Japan (1986), pp. 356, 374.

In order to ascertain that causality runs from monetary gold movements to discount rate changes, we have performed Granger causality tests using both monthly and quarterly data (Table 3). We find evidence of Granger causality in the right direction, confirming that the discount rate was responding to monetary gold movements. At the same time, there was also evidence of reverse causality. This is to be expected. A change in the discount rate was supposed to reverse the direction of gold movement. When the underlying data for specification 1 (in Table 2) are depicted (Figure 6), we see that the Bank of Japan typically

raised the discount rate when the balance of monetary gold was declining, and vice versa, but the negative relationship between the two evidently weakened after 1911.

7. *Explaining Bank of Japan Discount Rate Policy*

The central bank discount rate policy that appeared to follow the rules of the game can be explained by the overriding objective of monetary policy, that is, to preserve gold convertibility. In June 1897, just prior to the institution of the gold standard in October, the Bank of Japan was instructed by the minister of finance to take various measures, including an increase in the discount rate, "when an adverse turnaround in the trade balance leads to an outflow of gold" (Bank of Japan 1984, pp. 24–25). Junnosuke Inouye (1925, 1926), two-time governor of the Bank of Japan (1919–23; 1927–28) whose central bank career had begun in 1896, stated that the central bank's monetary policy had the twin objectives of (i) preserving gold convertibility and (ii) moderating domestic credit conditions, and that the discount rate was the only available policy tool.

Rarely did these objectives conflict with each other. An overheating economy, for example, was generally associated with easy money, which caused imports to rise and gold to flow out. A typical response in such cases was to raise the discount rate. There is no evidence that the Bank of Japan cut the discount rate in response to a gold inflow (which seldom happened). The observed negative relationship between gold movements and discount rate changes was generated by a reversal of tight monetary policy, not necessary a cut in the discount rate in response to a gold inflow.[11] A detailed, episode-by-episode analysis of discount rate changes show that the central bank typically raised the discount rate when a

[11] Such asymmetric response was observed in other central banks (Bloomfield 1959), including the Bank of England (Davutyan and Parke 1995).

trade deficit caused an outflow of gold and reversed the action when the outflow dissipated (Takizawa 1912; Ishibashi 1936; Takesawa 1968).

The negative relationship between discount rate changes and monetary gold movements is, in part, reflective of the negative relationship we have observed between the discount rate and the extra issue tax rate, given the negative correlation between specie and extra issues (see Table 1, bottom row). This can be understood in the following way. Suppose that a trade deficit causes gold to flow out, contracting the balance of specie issues. Suppose also that the Bank of Japan is operating at close to the fiduciary issue limit. Then, the central bank must either retire loans or resort to extra issues. Given that, in the very short run, it cannot retire loans quickly, it must accommodate at least part of the existing demand for currency by supplying extra issues. This is the mechanism by which a trade deficit, through a gold outflow, could increase extra issues. In order to minimize the payment of the extra issue tax, the Bank of Japan raised the discount rate to reduce the demand for its credit.

Japan's central bankers held the view that a change in the discount rate influenced gold movements primarily through its impact on trade, unlike the case in the U.K. where capital flows constituted the primary channel (Bank of Japan 1984). Inouye (1926) emphasized that the Bank of Japan, in raising the discount rate, did not expect to retain, much less attractive, foreign capital, but expected the impact to work through discouraging imports. Inouye (1925), in his exposition of monetary policy, went so far as to say that the Bank of Japan, in fulfilling its mandate to preserve gold convertibility, raised the discount rate whenever imports surged and reversed the policy when the trade deficit narrowed.

A robust relationship between trade and gold movements is corroborated in monthly data from 1898 to 1914: monetary gold movements typically followed changes in the trade balance with a lag of 2–6 months (Table 4). The negative relationship between discount rate changes and monetary gold movements found in Table 2 could be replicated by regressing

the discount rate on the trade balance, where both are expressed as annual changes (Table 5). The sign of the coefficient of the trade balance (current and 3-month lagged) is negative and statistically significant at the 1 or 5 percent level.

Table 4. Monthly Correlations of Changes in the Trade Balance and Monetary Gold, October 1898–July 1914 (N=190)

	Change in monetary gold						
	t	t+1	t+2	t+3	t+4	t+5	t+6
Change in trade balance (t)	0.02	0.10	0.14*	0.23**	0.23**	0.23**	0.20**

Notes: **(*) indicates statistical significance at the 1(5) percent level; annual percentage changes approximated as 12-month natural logarithmic differences; the trade balance rescaled by adding a constant to make the minimum equal to +1.
Sources: author's calculations based on Tōyō Keizai Shinpōsha (1935); Asakura and Nishiyama (1974), pp. 291–313.

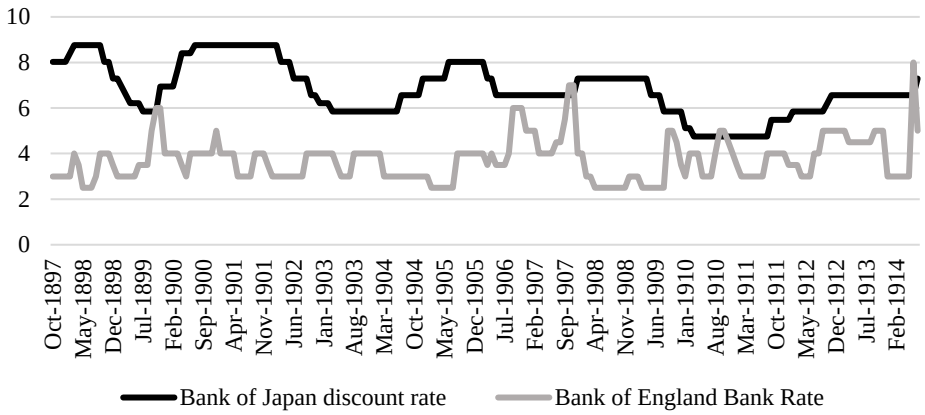
Table 5. Ordinary Least Squares Estimates of the Discount Rate Reaction to Changes in the Trade Balance, October 1898–July 1914 [1]

Specifications		1	2
Ind. var. [2]	Current trade balance (t) [3]	-0.0016** (0.0006)	-0.0018** (0.0005)
	Lagged trade balance (t-1) [3]	-0.0006 (0.0006)	-
	Lagged trade balance (t-2) [3]	+0.0007 (0.0007)	-
	Lagged trade balance (t-3) [3]	-0.0013* (0.0006)	-0.0011* (0.0005)
	Lagged dep. Var. (t-1)	+0.936** (0.020)	+0.936** (0.020)
NOB		187	187
R2 (adjusted-R2)		0.933 (0.932)	0.933 (0.932)
F-statistic [4]		506.9 (0.000)	844.3 (0.000)
DW		1.665	1.682

Notes: [1] – indicates "not available"; [2] standard errors in parentheses; [3] the trade balance rescaled by adding a constant to make the minimum equal to +1; [4] p-values in parentheses.
Source: author's estimates based on Tōyō Keizai Shinpōsha (1935); Bank of Japan (1986), pp. 356, 374.

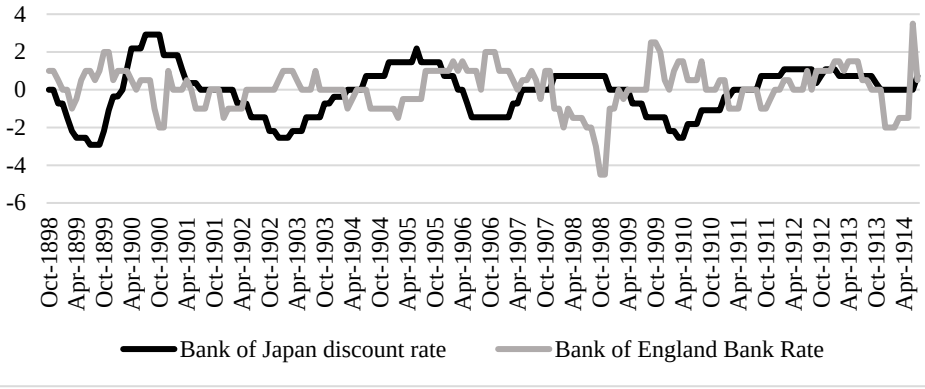
There is no episodic evidence that the Bank of Japan systematically responded to the Bank of England Bank Rate. The Bank of Japan discount rate was perennially higher, on average by 3.1 percentage points, than Bank Rate (Figure 7). Even in terms of rate changes, the relationship between the two policy rates did not appear close (Figure 8). The coefficient of correlation was -0.140 in level and -0.295 in annual percentage change. Yet, a formal test (see Table 2) suggests that the Bank of Japan's discount rate responded to the one-month lagged Bank of England Bank Rate (at the 5 percent level of significance), though a similar response cannot be identified in quarterly data, irrespective of whether the current or lagged value of Bank Rate is used. The sum of gold and capital flows is identically equal (in absolute value) to trade flows. What appears to be a systematic response to Bank Rate may well be an artifact of the systematic response to trade flows.

Figure 7. The Bank of Japan Discount Rate and the Bank of England Bank Rate, October 1897–July 1914



Source: Bank of Japan (1986), pp. 356, 374 and Federal Reserve Bani of St. Louis (https://fred.stlouisfed.org).

Figure 8. The Bank of Japan Discount Rate and the Bank of England Bank Rate, October 1898–July 1914
(In annual percentage-point changes)



Source: author's calculation based on Bank of Japan (1986), pp. 356, 374 and Federal Reserve Bani of St. Louis (https://fred.stlouisfed.org).

We can only offer a conjecture as to why the relationship between discount rate changes and monetary gold movements weakened. In 1911, the Japanese government had a sense of crisis about the sustainability of the gold standard, given the large and persistent trade deficit. On August 10, a formal agreement was reached between the ministry of finance and the Bank of Japan (Bank of Japan 1983; Kojima 1981), stipulating that the discount rate should be changed in response to monetary gold movements caused by "natural" economic forces. It gave an indicative "normal point (*heijunten*)" of ¥200 million, suggesting that the central bank should raise the discount rate when the balance of monetary gold fell below this level. At the same time, it also gave an indicative "minimum limit (*saitei gendo*) of ¥180

million, suggesting that the government would replenish monetary gold by “unnatural” means (i.e., government borrowing) when the balance fell below this level.

The relationship between discount rate changes and monetary gold movements weakened because the Bank of Japan, in an attempt to observe this agreement, kept the discount rate high. It raised the rate steadily over the coming years, from 4.75 percent initially to 5.48 percent in September 1911 and in several steps to 7.3 percent in July 1914. No longer were the discount rate changes during this period divergent from the Bank of England’s Bank Rate changes (see Figure 8). The weakened relationship also mirrored the similarly weakened relationship between the discount rate and the extra issue tax. It was no less indicative of the central bank’s commitment to preserving gold convertibility.

8. Conclusion

This paper has explored Japanese monetary policy under the classical gold standard (1897–1914), while providing a succinct exposition of the distinguishing features of Japan’s gold standard regime. From around 1904, the monetary authorities, instead of maintaining the gold parity through the free private movements of gold, did so largely by selling and buying foreign exchange held abroad at a fixed rate. For this purpose, they maintained financial assets denominated in gold-convertible currencies. These overseas “specie” balances were kept in major foreign financial centers, especially in London, and part of the funds were counted as part of the Bank of Japan’s monetary gold reserve.

The Bank of Japan initially used fiduciary issues to offset movements in monetary gold so as to stabilize the supply of currency but, from around 1909, almost entirely used fiduciary issues to accommodate changes in the public’s demand for currency. The incentive mechanism of the extra issue tax functioned as intended, that is, the Bank of Japan moved the discount rate in the same direction as the government moved the tax rate. Finally, the Bank of Japan raised the discount rate when there was a gold outflow. This rules-of-the-game-like

behavior of the Bank of Japan, which was motivated by its mandate to preserve gold convertibility, was consistent and robust, challenging the semi-consensual view that violations of the rules of the game were frequent and pervasive under the gold standard.

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第 2 章

Building a Potemkin Village in Occupied China:

Japan’s Wartime System of Linked Trade, 1939–43

Abstract:

The paper discusses the little-known exchange rate system of Japanese-occupied North China during the Second Sino-Japanese War, whereby exporters were given the right to import in the form of a piece of yellow paper, which could be sold in the secondary market. In an environment of rapid inflation where North China’s yuan was pegged to the Japanese yen and devaluation was not politically feasible, the system incentivized exports by allowing the exporters to offset their losses with the profits from selling goods imported, or the right to import goods, at the overvalued exchange rate. Following the start of the Pacific War, the system evolved to become a major scheme of facilitating trade between North and Central China under Japanese occupation. The paper, utilizing archived classified documents, reconstructs analytically how the system operated. Further, our analysis based on monthly average data confirms that the secondary market pricing of yellow paper broadly mimicked the operation of a flexible exchange rate. The system died a natural death when exploding inflation in Central China eliminated the export disincentive in North China.

JEL classification codes: F31, F33, E42, N25

Keywords: linked trade, Japanese-occupied China, yen bloc, special yen, Second Sino-Japanese War

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1. *Introduction*

This paper explores the novel but little-known exchange rate system of Japanese-occupied North China during the Second Sino-Japanese War.[1] Although we find fragments of information in the extant economic history literature (e.g., Kuwano 1965; Shimazaki 1989; Shibata 1999), no scholar has yet provided a convincing economic analysis of this wartime institution. The Sino-Japanese war remains a politically sensitive subject, which may in part explain the scholarly reluctance. The paucity of publicly available information is likely an even greater deterrent to scholarly research. In this study, we use contemporary sources, especially the archived internal documents of the Yokohama Specie Bank (YSB),[2] to reconstruct the system analytically. To aid our quantitative understanding of how the system operated, we compile an unbroken monthly timeseries of relevant market data by fetching

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[1] Japan used the term North China to designate a geographical area broadly corresponding to the five provinces of Chahar, Hebei, Shandong, Shanxi, and Suiyuan, including the cities of Beijing (Beiping) and Tianjin. Beijing was called Beiping from 1928 when it ceased to be the capital, but the Japanese military used the former name after occupying the city in 1937.

[2] The YSB was a semi-public institution founded in 1880 (Tamaki 1995). It played a critical role in supporting Japanese colonialism in China and, as such, was principally responsible for technically managing the system we describe in this study. The YSB was liquidated at the end of World War II as an institution responsible for the financing of the war. The YSB's internal documents, including inter-office memoranda, communications from the regulatory authorities, and miscellaneous notes prepared by its staff, from the 65 years of its existence are archived on microfilm at the University of Tokyo Library as the Yokohama Shōkin Ginkō Collection (YSGC). In the following pages, documents are referred to by identifying the reel in which they are found (e.g., YSGC: R0847).

scattered numbers from various sources.[3] The passage of more than 80 years since the demise of the system makes possible the dispassionate investigation of an economic institution whose unique features invite a scholarly inquiry.

Japan's aggression in China needs to be understood in the context of a country weakened by 20 years of civil war and the unwillingness of Chiang Kai-shek to engage in an open conflict with the "Japanese military machine," which he thought would be "disastrous" for his country and himself (Coble 1991, p. 1). His policy of appeasement lasted until late 1936 when it became nearly impossible to contain the intensifying public sentiment against Japan. Coincidentally, in early 1936, a failed coup (in which a group of young army officers assassinated several prominent politicians, including two former prime ministers) all but eliminated moderate elements in Japanese politics. Given that the Boxer Protocol of 1901 permitted Japan to station troops in China to protect its interests, an open conflict was waiting to happen. In July 1937, there occurred sporadic skirmishes between Chinese troops stationed near the Marco Polo Bridge outside Beijing and Japanese troops staging a military exercise without Chinese consent. After several failed attempts at diplomacy, on July 28, an all-out military conflict between the two sides ensued.

Japanese troops quickly advanced to various parts of China, where they established a series of puppet governments. In North China, the Japanese military completed tactical

[3] We are not aware of any single source that provides an unbroken monthly timeseries of relevant market variables in occupied China covering the period 1939–43. Accordingly, we consulted multiple sources to compile monthly timeseries of various continuous lengths, including, for some months, by averaging reported daily numbers fetched from market commentary in contemporary business periodicals published in Tianjin. See the data appendix for details.

operations within a few months and, in December, consolidated territorial control by establishing the Provisional Government of the Republic of China. In Central China,[4] it likewise consolidated power in March 1938 by establishing the Reformed Government of the Republic of China, as the Nationalists relocated to Chongqing. In March 1940, the two Japanese-installed governments merged to form the Reorganized National Government of the Republic of China in Nanjing. Thus, Japanese-occupied China south of Inner Mongolia and Manchuria was nominally placed under a single Japanese-sponsored government headed by a prominent former Nationalist politician, who had parted ways with Chiang Kai-shek. Even so, the Japanese military continued to administer the two areas separately. The Beijing-based Provisional Government remained as the semi-autonomous North China Political Committee.

Japan's early military gains turned into a stalemate. Japanese historians often characterize the territory under Japanese occupation in terms of "points" and "lines" that connect them, largely confined to major cities and surrounding areas along the railway lines in the eastern part of the country (Lieu 1939). Japan never possessed the resources required to conquer, much less occupy, China's vast territory. Even so, the land Japan controlled, amounting to about 16 percent of the total, constituted the more developed and fertile regions of China. According to a Japanese military report of February 1941 (Nakamura 1983), it accounted for 42 percent of the population and 54 percent of the cultivated land, and, in terms of agricultural production, 40 percent of rice and wheat and 66 percent of seed cotton. In mining and manufacturing, it was even more significant, producing 83 percent of coals, 92 percent of iron ores, 98 percent of flour, cotton yarn, and machinery, 99 percent of cotton

[4] Japanese control was patchy in Central China and even more so in South China. Unless otherwise noted, the geographical name Central China is used in this paper as a convenient shorthand for Central China and pieces of South China.

cloth, and 100 percent of cement. The *Finance & Commerce*, Shanghai's business weekly, estimated that the Japanese-controlled area of China accounted for 75 and 88 percent, respectively, of China's total exports and imports in 1938 and 1939 (F&C, July 12, 1939).[5]

In the occupied areas of China south of Inner Mongolia and Manchuria, Japan used military script for various lengths of time before establishing two semi-permanent note-issuing banks, one in North China and the other in Central China.[6] Japan's occupation currency policy, going beyond meeting the need to finance the local costs of the war, should be understood in the light of the Chinese currency reforms of 1933 and 1935. In March 1933, Nationalist China began to unify the fragmented monetary system in an attempt to establish a modern silver standard by abolishing the tael in favor of the yuan (Young 1931; Ma and Zhao 2020). Soon thereafter, China experienced an exodus of silver, precipitated by the enactment in June 1934 of the Silver Purchase Act and subsequent actions in the United States (U.S.) that caused the price of silver to rise. Faced with a depleting stock of silver, China in early November 1935 terminated the silver standard, nationalize silver, and peg the yuan to the pound sterling (Young 1965; Rothwell 1975).

At this time, Nationalist China adopted the national currency notes issued by three government banks (the Central Bank of China, the Bank of China, and the Bank of Communications) as legal tender known as *fa-pi* (*fa-bi*). In January 1936, the Farmers' Bank, established in June 1935, was added to the list, thus creating the designation "four

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[5] The estimates are based on the January–May figures for both years.

[6] Japan established two other note-issuing banks in occupied China: The Central Bank of Manchuria (June 1932) and the Bank of Mengkiang (December 1937). Mengkiang (*Mōkyō* in Japanese reading) was a term Japan invented as the geographical name for western and central Inner Mongolia and its border region. These institutions are not part of our discussion.

government banks" (Seki 1959; Ji 2003). Japan, concerned that a successful currency unification might help facilitate a unification of the divided country, sought to disrupt the reform. The Japanese military directed Japanese banks in China not to surrender their holdings of silver to the Chinese government,[7] and used force to prevent Chinese banks in North China from doing so. This is the additional context in which the decision was made to create competing currencies to challenge the emerging dominance of the *fa-pi*.

The rest of this paper discusses the operation of the scheme that facilitated trade between the two monetary areas of occupied China, in the following sequence. Section 2 reviews how the currency arrangements of North and Central China evolved under Japanese occupation, which ultimately introduced two separate occupation currencies each officially pegged to the Japanese yen. Section 3 provides an overview of how rapid inflation in North China created a disincentive to export goods at a fixed exchange rate, how "linked trade" eliminated that disincentive, and how exploding inflation in Central China led to the system's eventual demise. The subsequent two sections develop an analytical framework to reconstruct the system of linked trade and uses the unbroken monthly timeseries of market data compiled from various sources to analyze the operations of the U.S. dollar–based system (section 4) and the special yen–based system (section 5). Section 6 presents a conclusion. Finally, a data appendix is provided to document the original data from which the continuous monthly timeseries were compiled.

2. *Currency developments in Japanese-occupied China*

In February 1938, the Provisional Government established the United Reserve Bank of China (URB), which opened for business on March 10, with the United Reserve (UR)

[7] In March 1937, Japan, as part of a diplomatic negotiation, unconditionally released the silver bullion held by Japanese banks in Central China, but not in North China (BOT 1982).

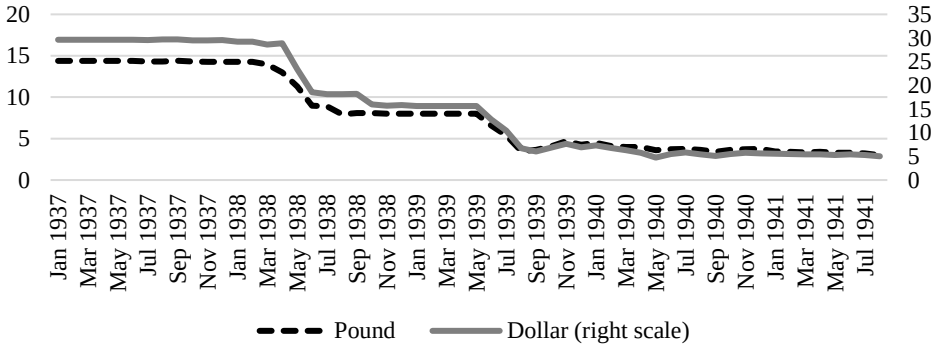
yuan set at par with the yen.[8] Practical considerations, however, dictated that it should also be kept stable against the *fa-pi*. The Chinese national yuan (CNY), officially pegged at 1s 2½d, was slightly more valued relative to the pound than the yen, which was officially pegged at 1s 2d. From right after the outbreak of the war, the Nationalists defended the official exchange rate by using the foreign exchange reserves replenished by periodic sales of silver to the U.S. Just a few days after the URB's opening, on 14 March, they ceased to intervene in the market, in part to prevent the Japanese military from using the *fa-pi* notes brought in from North China to obtain foreign currencies at the official rate (Young 1965; King 1979).

The subsequent depreciation of the Chinese national yuan (Figure 1) occurred in the context of a large influx of *fa-pi* notes into Shanghai following the URB's establishment. As these notes were exchanged for foreign currencies, the *fa-pi* was subjected to downward pressure. The Nationalists, in response, not only scaled down their foreign exchange market intervention, as noted, but also, from 18 March, rationed foreign exchange at the official rate (Saito 1942) and, from 26 March, restricted the withdrawal of *fa-pi* deposits in order to

[8] The bank's English name that appeared in the first printing of banknotes (printed from March 1938 to January 1939) was the *Federal* Reserve Bank of China, and this is the name used in contemporary and postwar U.S. government documents and in some academic works (e.g., Young 1965; Banyai 1974). The English name was no longer used from the second printing, and the banknotes bearing the English name were almost entirely withdrawn from circulation within five years (URB 1944). The English word federal is a mistranslation of the Chinese word *lianhe* (*rengō* in Japanese reading), and *lianhe* can only mean union or alliance. There is nothing federal about the bank's constitution or sponsoring political entity. In order not to perpetuate the error, we use the word "united" as a more appropriate English name of the bank, as in the United Kingdom (*Lianhe Wangguo*) or the United Nations (*Lianhe Guo*).

preempt capital flight, an action formalized on 21 June by the enactment of a law (King 1979; Iwatake 1990). This is when the *fa-pi* started falling sharply in the free market before reaching 8d in August 1938. At this time, North China allowed the market value of the UR yuan to fall with the *fa-pi*. Stability against the yen was sacrificed in favor of stability against the *fa-pi*, in view of the reality that, in order to obtain foreign currencies, UR yuan first needed to be exchanged for *fa-pi*.

Figure 1. The the *Fa-Pi*'s Monthly Average Exchange Rates against the British Pound and the U.S. Dollar in Shanghai, January 1937–August 1941



Notes: Pence per *fa-pi*; dollars per 100 *fa-pi*; Shanghai's free market closed on September 7, 1941.
Source: Data appendix.

The one-year period of mandatory currency exchange ended on March 10, 1939 and the circulation of non-UR banknotes was in principle prohibited. Even so, in the vast rural areas of North China, *fa-pi* notes continued to circulate widely, and where UR notes also circulated, they (UR notes) traded at a discount. The discount remained until July 1941 when the Anglo-American freezing of Chinese assets caused the *fa-pi* to collapse.[9] Beyond the initial deadline of March 10, 1939, the URB continued to accept *fa-pi* notes for currency exchange though at a progressively larger discount that reached 90 percent in June 1941. The shortage of *fa-pi* notes, however, prompted British city officials in the Tianjin concession to

[9] The freezing of Chinese assets was done at the request of the Chinese authorities who sought to exercise tighter control over foreign exchange transactions (Young 1965).

allow tax and public utilities to be paid in UR yuan from December 1, 1938, an action soon replicated by French city officials (NSTS 1939). After March 10, 1939, the Hong Kong and Shanghai Banking Corporation (HSBC) and possibly other foreign banks "secretly" established UR yuan–denominated accounts.[10] By early 1940, foreign banks in Tianjin may have held about 70 percent of their commercial accounts in UR yuan. By the spring of 1941, the UR yuan had become the principal currency of occupied North China (Young 1965).

The fact that the Japanese military's grip was weaker in Central China, compared to North China, may explain why it took until December 1940 to establish its own note-issuing bank in Nanjing. The greater anti-Japanese sentiment may also have contributed to the hesitancy, on the part of the Japanese military, to challenge openly the dominant status of the *fa-pi*. The large International Settlement in Shanghai, along with its large port and financial market, posed another challenge to Japan's ambition to circulate its own currency. The International Settlement was a protected area where foreign nationals enjoyed extraterritorial privileges and the *fa-pi* held a virtual monopoly. For the time being, the Japanese military had little choice but to use military notes, which they exchanged for *fa-pi* notes before purchasing goods in the interior.

The formation of the Reorganized Government in March 1940, by a merger of the Nanjing-based Reformed Government and the Beijing-based Provisional Government, presented an occasion to create a bona fide central bank, the Central Reserve Bank of China (CRB). On December 15, the regulation for the new bank was enacted, and senior officers were appointed and a memorandum of understanding was signed between Japan and the Reorganized Government on December 17. The Nanjing head office opened for business on January 6, 1941, followed by the Shanghai Branch on January 20 (Miyashita 1943). The

[10] YSB Qingdao Branch, August 2, 1939, YSGC: R0845.

Central Reserve (CR) yuan was fixed at par with the *fa-pi*, but CR notes were not convertible into specie. The CRB did not displace the URB. The North China Political Committee, the successor to the Provisional Government, did not relinquish its central bank.

The implicit understanding was that CR notes would be used in areas where *fa-pi* notes were predominantly in circulation so as not to challenge the military yen. For this reason, the CR yuan was not used for trade with Japan, Manchuria, or North China, and there was not to be an exchange rate between the yen and the CR yuan (BOT 1982). There was an exchange rate, however, between the UR yuan and the *fa-pi* in Tianjin's *Hui Shen* market. *Hui Shen*, referring to a market where exchange bills payable in Shanghai were traded, served as a popular means of making financial transfers from North to Central China (Iwatake 1990). The *Hui Shen* rate was originally expressed in a common currency (such as tael), with the difference between Tianjin and Shanghai acting like a transfer fee. With the introduction of the UR yuan, the *Hui Shen* rate could refer to the exchange rate (i) between the *fa-pi* in Tianjin and the *fa-pi* in Shanghai;[11] or (ii) between the UR yuan and the *fa-pi* in Shanghai.

The most common *Hui Shen* rate was quoted against Shanghai's *Hui Hua* yuan (URB 1940). *Hui Hua* (often transliterated as *Wei Wah* in Shanghai) was a clearing system for exchange bills, promissory notes, and cheques that originated toward the end of the Qing dynasty among a group of traditional Chinese banks known as *qianzhuang*. A guild-like institution, it emerged in response to the collapse of centralized state authority and the

[11] Each *fa-pi* note had an inscription indicating the branch of issue, a practice carried over from the silver-standard era when banks limited the issue of their banknotes to the amount of silver available in each area (Young 1965). Legal-tender notes issued by bank branches located in North China were designated as Northern Notes and those issued by branches located in Central and South China as Southern Notes.

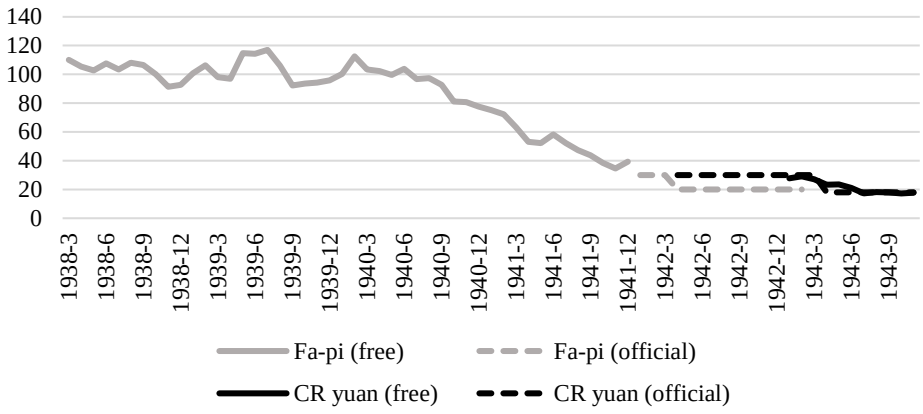
resulting weak enforcement of property rights. Given the importance of Shanghai as a center of commerce and international trade, the *Hui Hua* system was devised as a way of enabling financial transactions by means of personal relationships (Togame 1939; Kojima 1941). *Hui Hua* assumed particular importance as a means of economizing on the use of *fa-pi* when the Nationalist government imposed strict restrictions on the withdrawal of *fa-pi* deposits in the aftermath of the outbreak of the all-out war. Depositors were allowed to withdraw funds beyond a statutory limit only in *Hui Hua* yuan, credit instruments serving as "transfer money" good for interbank settlement only.

Both traditional and modern banks participated in the expanded *Hui Hua* system that came into being following the start of the hostilities. By its nature, the *Hui Hua* yuan was not supposed to be convertible into cash (*fa-pi*), but practicality led to the spontaneous emergence of a market in which it was exchanged for *fa-pi* at a discount. The discount, initially small at 0.4 percent, increased to 18.8 percent in August 1939. In June 1939, *Hui Hua* instruments were collateralized (for example by real properties), which caused the discount to narrow gradually until it disappeared altogether in June 1940 (Chu 1939; King 1979). Following the outbreak of the Pacific War in December 1941, the *Hui Hua* system as such was dissolved (at which time *Hui Hua* yuan became convertible into cash subject to a withdrawal limit) and was replaced by an alternative clearing system in which the distinction between cash and transfer money was greatly diminished. Kojima (1943) explains that limiting the cash convertibility of the *Hui Hua* yuan became unnecessary because the *fa-pi* itself was no longer convertible into foreign currencies, with the purpose of the withdrawal limit having been to prevent capital flight.

The American and British governments froze Japanese and Chinese assets toward the end of July 1941. In response, on August 11, North China issued an exchange control order to unify the *Hui Shen* market on the basis of the UR yuan. The attempt failed as Western banks

based in Tianjin refused to cooperate. Unification needed to wait until after the start of the Pacific War in December, when the Japanese military seized foreign bank assets in Tianjin. Following a brief closure, the *Hui Shen* market reopened in January 1942 in order to ease the hardships experienced by Chinese nationals who needed to make legitimate transactions with Central China, such as sending remittances home.[12] Trading commenced under heavy supervision on January 5.[13] All transactions were made subject to approval, and an allocation system for *fa-pi* exchange was introduced at the rate of 30 UR yuan (URY) per CNY100. The black-market rate, however, might have been URY34–39,[14] suggesting that the official exchange rate overvalued the UR yuan. The *Hui Shen* rate exclusively became, for a time, the exchange rate of the UR yuan in Tianjin against the *fa-pi* in Shanghai (Figure 2).

Figure 2. Tianjin's Monthly *Hui Shen* Rate against the *Fa-pi* and the Central Reserve Yuan in Shanghai, March 1938–November 1943



Notes: For free market rates, the monthly average for December 1938–November 1943, and the average of maximum and minimum rates for March–November 1938; the *Hui Shen* rate is expressed as units of United Reserve yuan per 100 *fa-pi* or Central Reserve yuan; from March 1938 to December 1941, the rate was formed against the Shanghai *Hui Hua* yuan.
Sources: Data appendix.

[12] YSB Tianjin Branch, December 24, 1941, YSGC: R0860.

[13] YSB Tianjin Branch, December 31, 1941, YSGC: R0860.

[14] YSB Tianjin Branch, January 12, 1942, YSGC: R0860.

In Central China, the start of the Pacific War caused the Nationalists to lose the support of Shanghai's foreign community. As the *fa-pi* retreated into the interior, the room was created for CR notes to circulate more widely. In March 1942, the Japanese military took a series of measures to elevate the status of the CR yuan, including by making its use compulsory and prohibiting the use of *fa-pi* for trade payment purposes. On March 5, it terminated the exchange of military notes for *fa-pi* at the official rate, and on March 7 delinked the CR yuan from the *fa-pi* and pegged it to the military yen, an action formalized at the end of the month by a revision of the law. From March 9, the YSB ceased to quote the military yen against the *fa-pi*. It only quoted the official exchange rate of the military yen (ML¥) against the CR yuan (CRY) at ML¥20=CRY100.

The *fa-pi* depreciated in Shanghai as the Japanese military suspended its use. In response, on April 8, the *fa-pi* was devalued against the UR yuan, to take effect from April 10.[15] The new rate of CNY100=URY20, when the CR yuan was set at CRY100=URY30, meant that the CR yuan was priced 50 percent above the *fa-pi* (see Figure 2). From April 28, the exchange rate for the *fa-pi* was no longer quoted and the *fa-pi* was entirely replaced by the CR yuan (with the official exchange rate of CRY100=URY30). At this time, the *Hui Shen* rate became exclusively the exchange rate between the UR yuan in Tianjin and the CR yuan in Shanghai. On May 22, the CR yuan was devalued against the military yen from ML¥20 to ML¥18 per CRY100.

On May 27, 1942, the Reorganized Government announced that it would prohibit the circulation of *fa-pi* notes and offered to exchange them for CR notes from June 8, starting with the provinces of Anhui, Jiangsu, and Zhejiang, and the cities of Nanjing and Shanghai. From June 21, the mandatory exchange proceeded in stages to other areas, a process that was

[15] YSB Tianjin Branch, April 10, 1942, YSGC: R0860.

not completed until early 1943 in parts of South China. In the meantime, the use of *fa-pi* notes was prohibited in Nanjing and Shanghai from June 25, and their possession was banned in Nanjing, Shanghai, and the provinces of Anhui, Jiangsu, and Zhejiang from December 1 (BOT 1983). The *fa-pi* notes obtained from the currency exchange were used by the Japanese military to procure goods in the interior that remained under Nationalist control (Kuwano 1965). Following agreement reached between the two banks on March 1, 1943, the official exchange rate (and the *Hui Shen* rate) of CRY100=URY18 became effective from March 8. On April 1, the new issue of military notes was terminated, making the CR yuan the sole occupation currency in Central China.

3. *Outlining the system of linked trade*

Table 1. Annual Wholesale Price Inflation in Japan and Occupied China, 1938–1943
(In percent)

	North China (Tianjin)	Central China (Shanghai)	Japan (Tokyo)
1938[1]	29.02	23.92	5.35
1939	49.21	61.53	10.44
1940	76.17	118.86	12.15
1941	12.80	115.71	6.07
1942	72.81	215.26	7.52
1943	192.97	311.30	6.02
Cumulative, Jan. 1938–Dec. 1943	2,486.96	19,007.14	59.21

Note: [1] Relative to the base period before the Marco Polo Bridge Incident of July 1937: June 1937 for North China, January–June 1937 for Central China and Japan.
Sources: Kuwano (1965), p. 253; Young (1965), p. 357; www.boj.or.jp.

The Japanese authorities were confronted with the trade implications of rapid inflation in North China, which reached 29.0 and 49.2 percent, year-on-year, in 1938 and 1939, respectively, in terms of wholesale prices (Table 1). The higher prices meant that, given the fixed official exchange rate between the UR yuan and the yen (which in turn was pegged to the pound and the dollar), merchants had little incentive to export goods. Within the yen bloc, the Japanese government introduced a system of “retained money” in the summer and fall of 1940. The system involved adjusting export and import prices by taxing exports to a high-inflation area and using the “retained” tax to subsidize the imports. The system of retained money was first used in August 1940 for trade between Manchuria (including the Kwantung

Leased Territory) and North China (Manshūkoku Shi 1971), under which a tax was levied on exports to North China and a subsidy paid on imports from North China.

For trade involving Japan, the scheme of price adjustment was based on the Adjustment Order for Trade with Kwantung, Manchuria, and China of September 1940. The system was used to discourage Japanese exports to and encourage Japanese imports from occupied China. Initially, it covered 235 export items, as designated in August 1940, and managed by the Japan–East Asia Federation of Export and Import Associations; the coverage was expanded to include 33 import items from November 1940. The tax rate was adjusted as circumstances warranted. Lower rates were applied to food, other critical supplies, and those exported by Japanese firms investing in North China (Shibata 1999).

In March 1939, North China's trade with other trading partners, including Central China, was placed on an alternative export incentive scheme whose origin can be traced to the system of linked trade introduced earlier on August 7, 1938. To strengthen the system, on October 5, 1938, the Foreign Exchange Revolving Fund was established with ¥5 million to provide funds for the financing of exports linked with imports. Unlike the namesake fund at the Bank of Japan, which linked the export of finished products with the import of the raw materials used as inputs, exports and imports under North China's system could be unrelated.[16] The initial idea was to promote imports by linking them to exports, thus giving the UR yuan a degree of exchange convertibility. Perhaps because of its limited size, the Foreign Exchange Revolving Fund proved ineffective in making the UR yuan a trade

[16] For example, the YSB might purchase a dollar export bill for peanut oil linked with the import of used tires or a pound export bill for frozen eggs linked with the import of rubber. The first linked trade is documented by YSB Qingdao Branch, December 15, 1938, and the second by YSB Qingdao Branch, September 28, 1939. YSGC: R0847.

currency. North China took a further step on March 11, 1939 when the circulation of *fa-pi* notes was in principle prohibited.

Thus, the Centralized Foreign Exchange System was created. This was a culmination of the intensification of foreign exchange controls since October 1938 to weaken the dominant position of the *fa-pi* in Tianjin. With the primary purpose of endowing the UR yuan with exchange convertibility, the system required exporters to surrender, though their foreign exchange banks, sterling- and dollar-denominated export bills to the URB, initially for 12 export items accounting for about 40 percent of North China's exports.[17] Trade with Japan and Manchuria was also covered, but the currency of denomination was the Japanese yen.[18] The scheme was conceived because, even though the Provisional Government had no authority over foreign banks in Tianjin, the Japanese military had full control over the customs house. For these goods, customs could refuse export clearance unless proof of the surrender of export bills was presented. On July 17, 1939, the system was made applicable to all exports.[19]

The centralized system led to a stagnation of trade through the port of Tianjin while promoting overland trade. In response, in July 1939, North China either prohibited or restricted the transportation by land of designated export items to Central China, effective

[17] The 12 items were (1) eggs and egg products, (2) walnuts, (3) groundnut (peanut) oil, (4) groundnuts (peanuts) (5) apricot seeds, (6) cotton seeds, (7) leaf tabaco, (8) vermicelli and macaroni, (9) coal, (10) woolen carpets, (11) straw braids/plaits, and (12) salt (URB 1942a).

[18] YSB Foreign Exchange Department, June 18, 1939, YSGC: R0843.

[19] Perishables, such as fish, fresh vegetables, and fruits, as well as transactions not exceeding URY100, were exempted. Asia Development Board, North China Liaison Office, June 28, 1939, YSGC: R0845. The URY100 exemption was removed in January 1940 (URB 1942a).

August 2.[20] From December 7, the system required authorization to ship all remaining goods not already subject to control.[21] In order to enforce these regulations, a land transportation checkpoint was placed in Xuzhou (URB 1944). Given the vast stretch of land supposedly dividing North and Central China, however, it is unrealistic to believe that these measures were effective in preventing a large volume of exports from crossing the imaginary boundary. Japanese officials were aware that a large volume of goods was smuggled through Tianjin's foreign concessions, especially to and from Shanghai.[22]

The trade incentive scheme introduced for North China in March 1939 superimposed the newly created centralized foreign exchange system on the existing system of linked trade. The exporter, after surrendering the foreign exchange at the official rate, obtained the right to import valued at 90 percent of the surrendered amount. The loss incurred by exporting goods at the official rate was thus offset by the profits from selling goods imported at the official rate. The 10-percent withholding rule was introduced on July 17, 1939 when the coverage of the system was extended to all exports. The rule was waived for six items of critical importance, such as flour, nonferrous metals, and petroleum (Ozawa 1943) as well as to yen-intermediated trade with Japan and Manchuria.[23] It was meant to allow the URB to build up

[20] An export ban was placed on five items (cowhide, sheepskin, wool, linen, and horses), while 12 export items were made subject to approval (URB 1944).

[21] Asia Development Board, North China Liaison Office, August 2, 1939; YSB Beijing Branch, December 13, 1939, YSGC: R0847.

[22] YSB Qingdao Branch, February 5, 1939, YSGC: R0847.

[23] Asia Development Board, North China Liaison Office, June 28, 1939, YSGC: R0845.

foreign exchange reserves (mainly to finance the payment for invisibles, including remittances),[24] while also discouraging imports by raising the price of imports (see below).

Except for trade with Japan and Manchuria, the system began with the pound sterling as the reference currency at the rate of 14d per UR yuan. In practice, pounds and dollars were equally used as a currency of invoice. The system applied to all trading partners, including Central China, which was treated as a third country (Matsuzaki 1942). After the dollar transferability of the pound was restricted following the outbreak of war in Europe, on October 25, 1939, the U.S. dollar became the reference currency at the rate of $\$23^{7}/_{16}$=URY100.[25] The right to import took the form of a certificate of foreign exchange sale ("Certificate of Selling Exchange") written on a yellow piece of paper. Unlike the original system it replaced, the new linked system permitted the exporter to transfer the right to anyone, so a secondary market spontaneously developed in which "yellow paper" was traded. There was no import control as such, but a preferential list of 95 items was announced when the system was expanded to all exports, and more items were subsequently added to the list. From June 1940, foreign exchange was preferentially allocated to foodstuffs, and from February 1941, the list included other essential commodities, such as nonferrous metals, oil, and steel (Kuwano 1965).

Following the Anglo-American freezing of Japanese and Chinese assets, on July 31, 1941, the special yen replaced the U.S. dollar, and the 10-percent withholding rule was removed. The special yen (SP¥), an accounting unit set equal to the yen, was designed to assume the trade-intermediating role previously played by pounds, dollars, or gold. For this purpose, the YSB maintained deposit accounts denominated in special yen with the yen-

[24] Asia Development Board, North China Liaison Office, June 28, 1939, YSGC: R0845.

[25] On this day, the U.S. dollar formally became the Bank of Japan's reference currency.

bloc's note-issuing banks, through which bilateral trade was cleared. For this reason, the system was renamed the Special-Yen Centralized Foreign Exchange System. Because the access to world markets was effectively lost, Central China became virtually the only trading partner. To be sure, the system also became applicable to North China's trade with French Indochina and Thailand,[26] but the volume of trade was small and exports and imports, typically conducted by the same few designated firms, were internally matched. The market for yellow paper for imports from these areas therefore did not fully develop (BOJ 1943).

Except for the replacement of the dollar by the special yen, the working of the system largely remained the same for a few months. The outbreak of the Pacific War in December 1941, however, terminated the market exchange rate of the *fa-pi* against the dollar in Shanghai and the free *Hui Shen* rate in Tianjin. In March 1942, the CR yuan was delinked from the *fa-pi* and pegged to the military yen at the rates of CRY100=ML¥18 (selling) and 18⅛ (buying), which were unified in June at CRY100=ML¥18. When military notes were withdrawn from circulation, in April 1943, the military yen was replaced by the ordinary yen, and the official exchange rate was set at CRY100=¥18. As for the UR yuan, when the *Hui Shen* market was reopened in January 1942 after a brief closure, the official rate was set at CRY100=URY30, though the parity between the yen and the UR yuan would have dictated the rate of CRY100=URY18. It was only on March 8, 1943 that the UR yuan was priced against the CR yuan at the same rate as the Japanese yen.

The pegging of the CR yuan to the military yen in March 1942 fundamentally changed the way North China's special yen system operated in an environment of increasingly explosive inflation in Central China (see Table 1). Previously, inflation in

[26] Actual trade with Indochina and Thailand commenced following the start of the Pacific War. URB Foreign Exchange Department, Tianjin Branch, March 18, 1943, YSGC: R0861.

Central China was a secondary issue for North China because, with trade conducted through the intermediation of pounds or dollars, the overriding concern was the real exchange rate of the UR yuan against the pound or the dollar. With the Anglo-American freezing of Japanese and Chinese assets, North China could only trade with other yen-bloc areas, but trade with Japan and Manchuria was placed under the system of retained money. With Central China virtually the only trading partner, to which the system of linked trade applied, inflation in Central China directly affected North China's trade through its impact on the real exchange rate between the UR yuan and the CR yuan.

Given the timeline of these developments, there were two distinct phases to the operations of North China's system of linked trade. In the first phase, which ended with the Anglo-American freezing of Japanese and Chinese assets in July 1941, the scheme was based on British pounds or U.S. dollars and applied to trade with all non-yen-bloc trading partners. In the second phase, which commenced in March 1942, it was based on the special yen and applied almost exclusively to trade with Central China. The intervening period, July 1941–March 1942, was one of fluidity when normal trade was disrupted but an interim system operated (see below). As things transpired, the North China special yen system did not last very long. It died a natural death, so to speak, when Central China's accelerating inflation eliminated the disincentive in North China to export and Central China's inability to supply goods diminished the value of yellow paper. From August 1, 1943, foreign exchange banks ceased issuing yellow paper, an action formalized on September 15, when it was officially announced that existing yellow paper would cease to be valid at the end of October (URB 1943b). For trade with Indochina and Thailand, no new yellow paper was issued from October 1. The market for yellow paper disappeared entirely from November 1943.

4. *The operation of the U.S. dollar-based system*

To understand the logic of how the system actually operated, think of the following well-crafted example presented in the central bank's internal document (BOJ 1943), where no transactions costs are considered. Without loss of generality, we use, as the reference currency, the U.S. dollar, which was in use as such for 21 out of the 28 months of the system's existence under the first phase. Suppose that an exporter in North China sells merchandise costing URY142,857.14 for $10,000 in the U.S. This exporter is required to sell the export bill of $10,000 to a foreign exchange bank to obtain the UR yuan equivalent at the official exchange rate of URY100=23^{7}/_{16}$ (or URY4.267 per dollar), that is, URY42,666.66. The exporter incurs a loss of URY100,190.48. Assume that the 10-percent withholding rule is in place. Then, in order for this exporter to offset the loss, he or she must sell the right to foreign exchange worth $9,000 (or sell the imported merchandise valued $9,000) at least for URY100,190.48. Ultimately the exporter obtains URY142,857.14 for $10,000, at the implicit exchange rate of URY14.29 per dollar or $7.00=URY100. This breakeven exchange rate was called the linked rate.

Suppose that there is an importer who is willing to pay URY100,190.48 to obtain the right to import merchandise valued $9,000. In order actually to obtain $9,000 in foreign exchange, he or she must additionally pay to the foreign exchange bank the UR yuan equivalent of $9,000 converted at the official exchange rate, that is, URY38,400. This means that he or she must sell the imported merchandise costing $9,000 at least for URY138,590.48 (=100,190.48+38,400.00). The breakeven rate for this importer is therefore URY15.4 per dollar or $6.49=CRY100. The importer's linked rate is more depreciated than the exporter's, by virtue of the 10-percent withholding rule, which had the effect of discouraging imports by raising the prices of imported goods. Without the 10-percent withholding rule, the linked rate would be identical for the exporter and the importer, provided that there was no spread

between the selling and buying rates. Otherwise, the “negotiated” rate between the two parties would be bounded between $6.49 and $7.00.

In general, the (exporter’s) linked rate (L), defined for ease of mathematical exposition as units of UR yuan per dollar, can be expressed algebraically as:

$$L = P/P^* = (\bar{E}P^*+Y)/P^* = \bar{E} + (Y/P^*) \quad (1)$$

where $\bar{E}$=the official (fixed) exchange rate, expressed as units of UR yuan per U.S. dollar, P is the domestic price, P* is the foreign price, and Y is the price of yellow paper. Equation (1) states that the linked rate appreciates (i.e., L goes down) as the foreign price rises and depreciates (i.e., L goes up) as the price of yellow paper rises. Once the linked rate is given, it is straightforward to derive the price of yellow paper for any value of P*. To see this, we obtain from equation (1) the price of yellow paper as follows:

$$Y = (L-\bar{E})\, P^* \quad (2)$$

This explains why pieces of yellow paper with variable face values could be priced uniformly and conveniently in terms of the linked rate. The linked rate provided a scale-independent means of setting the price of yellow paper with any face value.

If we set $Y=P-\bar{E}P^*$, that is, if yellow paper is priced exactly to cover the loss from exporting the merchandise at the official exchange rate, equation (1) transforms to:

$$L= \bar{E} + (P-\bar{E}P^*)/P^* \quad (3)$$

Equation (3) states that the linked rate converges to the official rate as the domestic and foreign price levels become equalized in terms of a common currency, that is, if purchasing power parity ($P-\bar{E}P^*=0$) holds. In this example, the domestic and foreign prices (P and P*) are assumed to have been given. In practice, these as well as the price of yellow paper (Y) and, by implication, the linked rate (L), are all endogenous variables subject to negotiation. The above result suggests that relative price developments, among other things, are an

important factor influencing the pricing of the linked rate. By convention, the market linked rate (L^m) was quoted as units of the reference currency per 100 UR yuan, that is:

$$L^m=(1/L) \times 100 \quad (4)$$

Arbitrage is another factor influencing the pricing of the linked rate. North China had a considerable trade deficit for the few years preceding the Anglo-American freezing of Chinese assets; in 1940, for example, the deficit with countries outside the yen bloc was almost 300 million national yuan (Table 2). Given that trade under the linked system was, by design, broadly balanced, this means that North China financed a large volume of imports outside the system. Much of this was done through the *Hui Shen* market.[27] Because the linked system and the *Hui Shen* market were two alternative means of financing imports, one might expect the linked rate (between the UR yuan and the U.S. dollar) to have somehow been associated with the arbitrage rate between the UR yuan and the U.S. dollar, derived from the *Hui Shen* rate in Tianjin and the market rate of the *fa-pi* against the U.S. dollar in Shanghai (there was no market in which UR yuan was traded directly for U.S. dollars).

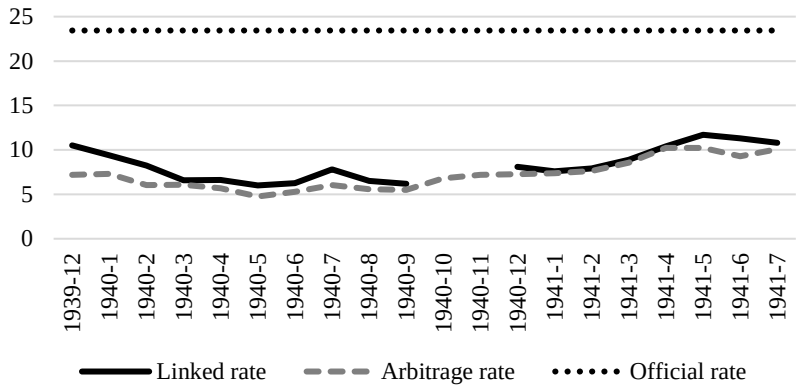
Table 2. North China's Balance of Trade, 1933–41 (In millions of Chinese national yuan)[1]

	North China total			Yen bloc areas			Third countries		
	Exports	Imports	Trade balance	Exports	Imports	Trade balance	Exports	Imports	Trade balance
1933	152.3	202.7	-50.4	53.9	83.5	-29.6	98.4	119.2	-20.8
1934	135.8	161.8	-26.0	47.4	75.5	-28.1	88.4	86.3	2.1
1935	159.6	150.1	9.5	47.4	76.9	-29.5	112.2	73.3	39.0
1936	191.1	140.9	50.2	67.6	68.1	-0.5	123.5	72.8	50.7
1937	215.7	145.8	70.0	60.7	62.2	-1.5	155.0	83.6	71.4
1938	254.5	320.0	-65.5	145.4	206.2	-60.8	109.1	113.8	-4.6
1939	200.9	574.5	-373.7	83.4	354.8	-271.4	117.4	219.8	-102.3
1940	327.5	985.0	-657.6	142.6	503.9	-361.2	184.9	481.2	-296.3
1941[2]	237.0	558.7	-321.7	106.2	239.6	-133.5	130.8	319.1	-188.2

Notes: [1] Based on customs data, almost entirely intermediated through the ports of Longkou, Qingdao, Qinhuangdao, Tianjin, Wei-hai-wei, and Zhifu; [2] Through the end of June.
Sources: Author's estimates based on SMRC (1937–40) and Qingdao Branch, Yokohama Specie Bank, October 1941, YSGC: R0847.

[27] For example, it is estimated that, in 1939, 25 percent of petroleum imports was financed through the linked system, while the remaining 75 percent was intermediated by the *Hui Shen* market (YSB Tianjin Branch, March 11, 1940, YSGC: R0845).

Figure 3. The Monthly Average Linked and Arbitrage Rates, December 1939–July 1941 (U.S. dollars per 100 UR yuan)



Notes: All variables are expressed as units of UR yuan per U.S. dollar, such that an increase indicates an appreciation of the UR yuan; October and November 1940 numbers are missing for the linked rate; the arbitrage rate is derived from the *Hui Shen* rate in Tianjin between the UR yuan and Shanghai's *Hui Hua* yuan and the market exchange rate between the *fa-pi* and the U.S. dollar in Shanghai.
Sources: Data appendix; author's estimates.

Table 3. The Monthly Average Deviations of the Linke Rate from the Arbitrage Rate under the System of Linked Trade in Occupied North China[1]

Period	Reference currency	The linked rate minus the arbitrage rate	
		Average difference per 100 UR yuan	Average percent of the arbitrage rate
(1) December 1939–July 1941	U.S. dollar	1.15	17.01%
(2) December 1942–November 1943	Special yen	-7.88	-9.80%

Note: [1] For the first period, the arbitrage rate is derived from the *Hui Shen* rate (between the UR yuan and the *fa-pi*) in Tianjin and the market rate between the *fa-pi* and the U.S. dollar in Shanghai; for the second period, it is derived from the *Hui Shen* rate (between the UR yuan and the CR yuan) and the official rate of CRY100=SP¥18.
Source: Author's calculation based on appendix data.

In fact, this is what we broadly observe in practice. From December 1939 to July 1941, the monthly average linked rate moved in parallel with the monthly average arbitrage rate (Figure 3, where, by convention, both are expressed in terms of U.S. dollars per URY100). Moreover, the linked rate was somewhat higher (i.e., less depreciated) than the arbitrage rate, especially during the early months. For the entire period, the deviation was on average 1.15 dollars per URY100 or 17 percent in favor of the linked rate (Table 3, row 1). The spread in favor of the linked rate is consistent with the URB's supposed practice, at least in Tianjin, of setting an official linked rate 10 percent above the arbitrage rate (BOJ 1948). For instance, if the *Hui Shen* rate in Tianjin was CNY100=URY90 and the Shanghai rate was

CNY100=$6.00, the arbitrage rate would have been $6.67=URY100. In this case, the URB presumably set the official linked rate at $7.33=URY100 (or URY13.63 per dollar).

Setting an official linked rate may have served the purpose of facilitating the discovery process for other prices. At the same time, unless the official linked rate was updated frequently to reflect the evolving economic reality, it could become overvalued quickly in the presence of accelerating inflation. The YSB's Qingdao (Tsingtao) Branch in August 1939 observed that, in Tianjin, the URB was enforcing the official linked rate of 8¼d per UR yuan.[28] When the reference currency was switched on October 25, 1939, the official linked rate was quoted as $13⅞ per URY100, which was a straightforward transformation of the previous pound-referenced rate.[29] In February 1940, the Tianjin Branch noted that the URB, in enforcing the official link rate, was not allowing exports to be linked with imports, by refusing to issue a certificate of foreign exchange sale to the exporter or to provide foreign exchange to the importer, unless the official rate was observed.[30]

The enforcement of an official linked rate created difficulty in the late spring of 1940. In May 1940, the Tianjin Branch informed the head office in Japan that, because of the overvalued linked rate for the UR yuan, trade was being diverted from Tianjin to Qingdao or Zhifu (Chefoo) where no official linked rate was set.[31] The Japanese Navy, recognizing that the overvalued linked rate was choking off exports, condoned a black market to emerge.[32]

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[28] YSB Qingdao Branch, August 2, 1939, YSGC: R0845.

[29] YSB Tianjin Branch, February 26 and YSB Foreign Exchange Department, February 28, 1940, YSGC: R0845.

[30] YSB Tianjin Branch, February 16, 1940, YSGC: R0845.

[31] YSB Tianjin Branch, May 15, 1940, YSGC: R0845.

[32] YSB Tianjin Branch, March 11, 1940, YSGC: R0845.

With hardly anyone observing the official rate, the URB changed course. On May 11, the URB, in a meeting of branch managers, made a decision, without prior consultation with the Asia Development Board in Tokyo, to abolish the official linked rate "quietly" by not scrutinizing the documents before issuing certificates of foreign exchange sale.[33]

From the way the official linked rate was quietly shelved, we may surmise that secondary trading in yellow paper was not part of the original design of the system. In the previous linked system (introduced in August 1938), exports and imports needed to be internally matched. Allowing yellow paper to be sold to a third party was in response to the criticism that the previous system favored larger trading firms over smaller ones (Iwatake 1990). Allowing the transfer of yellow paper to a third party was likely the extent of the official innovation in March 1939. Nishio (1941) states that trading of yellow paper was a spontaneous development. It is possible that the authorities' initial intention was to allow yellow paper to be sold by the exporter at an official linked rate, which might be adjusted from time to time. Secondary trading at market prices may have originated in Qingdao, Zhifu, or some other port city where the URB's official presence was weak.

Left to market forces, the pricing of the linked rate reflected both the relative price levels and arbitrage with the *Hui Shen* market, as previously noted. Additionally, it was also influenced by forces specific to the yellow paper market. In an environment of trade and exchange restrictions, obtaining the right to foreign exchange did not automatically guarantee that it could actually be used to import desired goods in desired amounts. In early 1941, the linked rate appreciated in favor of importers (see Figure 3), as exporters, fearful of an impending asset freeze by enemy nations, hurriedly disposed of yellow paper while the shortage of merchant ships made it difficult to import, reducing the demand for yellow paper

[33] YSB Tianjin Branch, May 15, 1940, YSGC: R0844, R0845.

(Matsuzaki 1942). The price of yellow paper was therefore influenced by export volume (which determined the supply of yellow paper) and trade controls (which determined the demand for yellow paper), in addition to the forces of price and market arbitrage.

5. ***The Special-Yen Centralized Foreign Exchange System***

The U.S. dollar was replaced by the special yen following the Anglo-American freezing of Japanese and Chinese assets. In the interim, the linked rate was set equal to the arbitrage rate, derived from the official rate of the *fa-pi* against the dollar quoted by the HSBC in Shanghai, the Japanese yen's official rate against the dollar (¥100=23^{7}\!/_{16}$ or ¥4.267 per dollar), and the *Hui Shen* rate in Tianjin (BOJ 1948). For example, if the exchange rate quoted by the HSBC in Shanghai was CNY100=$5.40 and the *Hui Shen* rate in Tianjin was CNY100=URY60, the linked rate would have been URY100=¥38.40=SP¥38.40 (or URY2.60 per special yen). In this example, the arbitrage rate between the *fa-pi* and the special yen would have been CNY100=¥23.04=SP¥23.04 (or CNY4.34 per special yen).

The outbreak of the Pacific War in December 1941 caused the free *Hui Shen* market in Tianjin temporarily to disappear and, in March 1942, the CR yuan was pegged to the military yen with the selling rate of ML¥18 and the buying rate of 18⅛ (per CRY100),[34] which were unified in June at ML¥18. To see how the new system worked, consider an exporter in North China who sells merchandize costing URY10,000 in Central China for SP¥5,000. Given the official rate of CRY100=ML¥18=SP¥18 (or CRY5.56 per special yen), the importer in Central China would pay CRY27,777.78 (=100 x [5,000/18]). Given the official parity of URY1=¥1=SP¥1, the exporter in North China would receive URY5,000 plus yellow paper with the face value of SP¥5,000. To break even, the exporter must sell the yellow paper for URY5,000, and the breakeven (linked) rate would be SP¥50=URY100. The

[34] The initial rate set on March 9, 1942 was CRY100=ML¥20. This lasted until March 22.

realized exchange rate for this transaction is URY36.00 (per CRY100). The UR yuan is more depreciated than the official rate of URY30, which is why trade takes place.

With the 10-percent withholding rule eliminated, one might think that the linked rate was identical for the exporter and the importer. That was not the case, by virtue of the fact that banks charged a spread between the selling and the buying rates for special yen (e.g., SP¥17 for buying and SP¥18 for selling). Following another example offered by the central bank document (BOJ 1943), consider a North Chinese exporter who sells in Shanghai merchandise costing URY30 for CRY100. The export bill this exporter must surrender through his or her bank to the URB is valued at SP¥17 (=CRY100 converted at the special yen's buying rate of SP¥17), for which he or she receives URY17 (given the official parity of SP¥1=¥1=URY1) for a loss of URY13. To offset the loss, the exporter must sell the yellow paper at least for URY13. The linked rate is therefore SP¥0.5667 (= [17/30]) per UR yuan, which is, by convention, expressed as SP¥56.67 per URY100.

From the point of view of a North Chinese importer willing to pay URY13 for the right to import merchandise worth SP¥17, the total payment is URY30 (=the price of yellow paper [13] plus the cost of obtaining 17 special yen at the official rate [17]). However, the maximum value of merchandise this importer can purchase with 17 special yen in Shanghai is not CRY100, but CRY94.44, given that the special yen's selling rate is SP¥18=CRY100. The importer thus faces the rate of CRY100=URY31.76, even though the rate faced by the exporter is CRY100=URY30. If there is a spread, therefore, the UR yuan's realized rate becomes more depreciated for the importer.

The start of the Pacific War and the intensification of Japan's wartime economy changed the scope and purpose of linked trade in North China. First, as noted, Central China became virtually the only trading partner to which the special yen system applied. Second, a substantial portion of trade in key commodities between occupied North China and occupied

Central China was placed under heavy state control in the form of an annual bilateral agreement.[35] After a disruption of trade that followed the outbreak of the Pacific War, in March 1942, the authorities from both sides met to restore the normal flow of trade. Under the provisional agreement reached on March 28, commodities were classified into special goods—those critical for subsistence and industrial needs—and general goods. An important difference between the two is that the agreed quantities for special goods *must* be supplied, whereas the quantities specified for general goods were indicative.

Trade in special goods was placed on barter, that is, the exports and imports of designated commodities were in principle matched. Moreover, the payment for the barter portion of bilateral trade was made by military yen, while the payment for general goods was made by special yen, with the *Hui Shen* market playing a supplementary role. When the 1942 agreement was renewed and revised in March 1943 for the new fiscal year that started in April, it was agreed that the payment for special goods would be made either by special yen or direct clearing between UR and CR yuan (now that, from April, military notes would be withdrawn from circulation), while the payment for general goods would be made by special yen or through the *Hui Shen* market. Thus, the special yen system was one of several alternative means of settling trade between North and Central China under Japanese occupation: (i) special yen through the linked system; (ii) direct clearing between military

[35] Product-based barter was conducted at least from mid-1939. A comprehensive barter agreement specifying key commodities between North and Central China was reached for the first time on June 13, 1940. Retroactive to April 1, barter commenced on July 1 involving "about" ¥60 million in each direction. Asia Development Board, North and Central China Liaison Offices, June 13, 1940, YSGC: 0864.

yen and UR yuan at the official rate (until March 1943); (iii) direct clearing between UR and CR yuan at the official rate (after April 1943); and (iv) the free *Hui Shen* market.

The special yen system differed from the previous dollar-based system in another respect. Under the U.S. dollar system, the linked rate broadly mimicked the operation of a flexible exchange rate between the UR yuan and the reference currency, subject to factors uniquely impacting the secondary market for yellow paper. In contrast, the linked rate under the special yen system mimicked a flexible exchange rate, not between the UR yuan and the reference currency, but between the UR yuan and the CR yuan, that is, the free *Hui Shen* rate, even though the linked rate was expressed in relation to the reference currency. To see this, consider that the free *Hui Shen* rate is CRY100=URY40 (cf. the official *Hui Shen* rate of URY30) and that an exporter in North China sells merchandise in Central China for CRY10,000. Ignoring transactions costs, the exporter obtains URY4,000 at the free *Hui Shen* rate, URY3,000 at the official *Hui Shen* rate, and URY1,800 by exchanging CR yuan into special yen (at CRY100=SP¥18) and then exchanging the special yen into UR yuan at par. If the linked rate was SP¥45 (per URY100), the export proceed increases to URY4,000, the same as the amount obtainable through the free *Hui Shen* market.

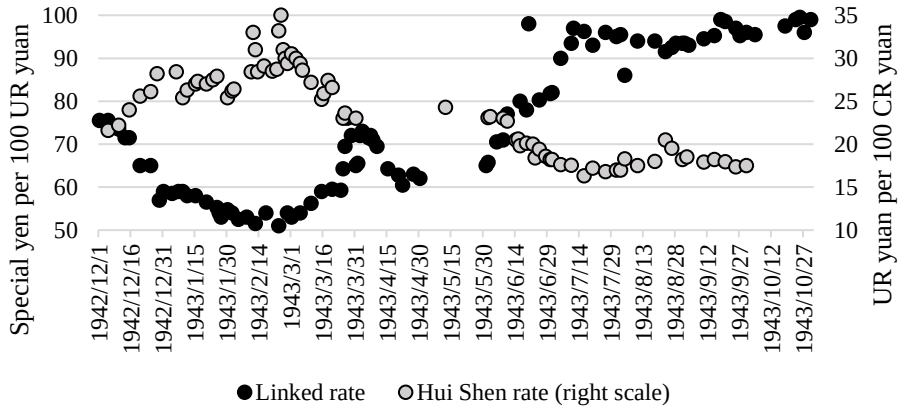
Given that the market linked rate (L^m) and the free *Hui Shen* rate (H) were alternative ways of financing imports, the no-profit condition is given by:

$$L^m = (S/H) \times 100 \qquad (5)$$

where L^m is defined, by convention, as units of special yen per URY100, H is likewise defined, by convention, as units of UR yuan per CRY100, and S is the official exchange rate expressed as units of special yen per CRY100. In the example above, if we take the black-market *Hui Shen* rate as given, the no-profit condition requires that the market linked rate is 45 (=[18/40]x100).

Equation (5) suggests that the market linked rate was inversely related to the free *Hui Shen* rate. This is in fact what we observe from December 1942 to November 1943 (Figure 4). To the extent that there were transactions costs, there is no expectation that the no-profit condition (equation [5]) should hold exactly. From December 1942 to November 1943, we find that the deviation between the linked rate and the arbitrage rate, given by the right-hand side of equation (5), was 7.9 special yen per URY100 or 9.8 percent in favor of the arbitrage rate (Table 3, row 2).

Figure 4. Reported Daily Linked and *Hui Shen* Rates in Tianjin, December 1, 1942–October 31, 1943

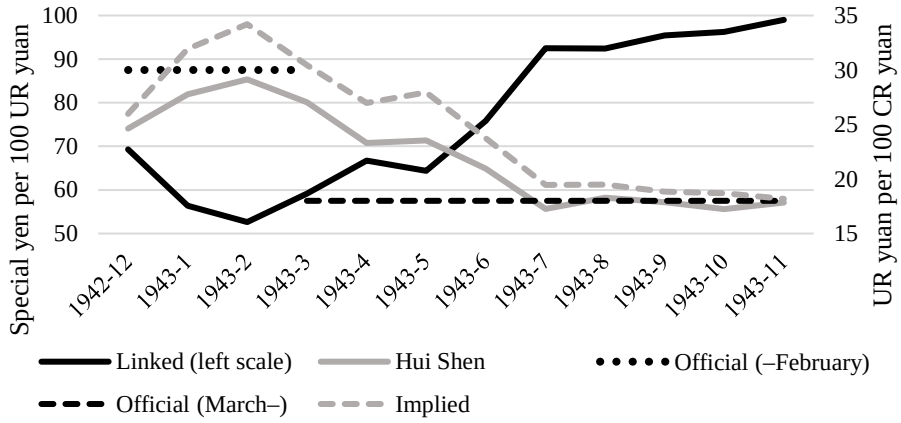


Note: All available daily rates from all sources are plotted.
Source: Data appendix.

The Special-Yen Centralized Foreign Exchange System had a reason to exist as long as the UR's exchange rate against the CR yuan obtainable through the special yen was overvalued relative to the UR yuan's *Hui Shen* rate. For this condition to hold, the *Hui Shen* rate needed not be a free-market rate. If the official *Hui Shen* rate of URY30 (per CRY100) had been strictly enforced, the linked rate would have been fixed at 60 ([18/30]x100). In practice, the *Hui Shen* rate fluctuated, and so did the linked rate. In March 1943, the authorities considered the official *Hui Shen* rate to be broadly reflective of the price differential between North and Central China (Ozawa 1943), suggesting that the equilibrium linked rate was approximately 60. Around the same time, a separate market report stated that the equilibrium linked rate was approximately 75 (URB 1943b). Assuming that these were

both well-informed opinions, we would expect the market linked rate to have been in the neighborhood of 60–75 in the spring of 1943. Indeed, we broadly observe that the market rate fluctuated between 60 and 75 (see Figure 4).

Figure 5. The Special Yen Linked Rate and Central Reserve Yuan Rates for the United Reserve Yuan, December 1942–November 1943 (Monthly averages)



Notes: The implied rate means the exchange rate of the UR yuan against the CR yuan implied by the linked rate, given the fixed exchange rate of CRY100=SP¥18; on March 8, 1943, the official *Hui Shen* rate was revised in favor of the UR yuan (given the higher rate of inflation in Central China) from URY30 to URY18 per CRY100.
Source: Data appendix; author's estimates.

In view of escalating inflation in Central China, on March 8, 1943, the authorities devalued the CR yuan by setting the new official *Hui Shen* rate at URY18=CRY100 (see the downward shift of the black dotted or broken line in Figure 5). Even so, the free *Hui Shen* rate (the light gray line), as well as the *Hui Shen* rate implied by the linked rate (the light gray dotted line), remained well above the new official *Hui Shen* rate for some time. In July, however, the market and implied *Hui Shen* rate both approached the official *Hui Shen* rate as inflation in Central China accelerated, pushing the linked rate toward 100. On July 17, the *Hui Shen* rate, declining below the official rate, reached the range of CRY100=URY16;[36] on July 13, the linked rate reached 97 (see the data appendix). The linked rate was quoted at 99.5 on October 25. The steadily higher rate of inflation in Central China, coupled with the

[36] YSB Beijing Branch, July 17, 1943, YSGC: R0860.

increasing inability of Central China to supply goods, spelled the end of North China's special yen system. The official exchange rate no longer overvalued the UR yuan, and yellow paper, having no value, had no takers. Any outstanding yellow paper was pronounced null and void on the last day of the month, but this was only a formality.

6. ***Conclusion***

We have discussed the novel but little-known exchange rate system of Japanese-occupied North China during the Second Sino-Japanese War, whereby exporters were given the right to import in the form of a piece of yellow paper. The system came into being in March 1939 when the existing system of linked trade (introduced in August 1938) was superimposed on the newly created Centralized Foreign Exchange System, which required exporters to surrender export bills to the United Reserve Bank. As an innovation of the system, the right to import could be exercised by exporters themselves, as in the past, or sold to willing importers, so a secondary market in "yellow paper" spontaneously developed. To the extent that there was competition among potential importers, this aspect of the system likely promoted a more efficient pricing of the right to import than under the old system.

In an environment of rapid inflation where the United Reserve (UR) yuan was pegged to the yen and devaluation was politically not feasible, linking exports to imports incentivized exports by allowing the exporters to offset their losses with the profits from selling goods imported, or the right to import goods, at the overvalued exchange rate. At the same time, the centralized aspect of the system, with surrender requirements, gave a degree of exchange convertibility to the UR yuan by securing foreign exchange with which imports could be made. From the point of view of importers, this system was not unlike a foreign exchange allocation system under which rationed foreign exchange could be sold in the secondary market, except that the availability of foreign exchange was not rationed but set in relation to the value of exports. We have utilized the archived classified wartime documents of the

Yokohama Specie Bank and the monthly data compiled from multiple sources to reconstruct how the system of linking exports to imports worked in practice.

North China's system of linked trade had two distinct phases. In the first phase, which ended with the Anglo-American freezing of Japanese and Chinese assets in July 1941, the scheme was based on British pounds or U.S. dollars and applied to trade with all trading partners. In the second phase, which commenced in March 1942, it was based on the special yen and applied almost exclusively to trade with Central China. Our analysis has shown that the UR yuan's linked rate mimicked a hypothetical flexible exchange rate that responded predominantly to relative price level developments but also to factors influencing the demand for and supply of yellow paper.

Figure 6. Channels of arbitrage

- Under the U.S. dollar–based system:

  Direct: UR yuan → [linked rate] → U.S. dollar

  Indirect: UR yuan → [*Hui Shen*] → CNY (Shanghai) → U.S. dollar
- Under the special yen–based system:

  Direct: UR yuan→ [*Hui Shen*] → CR yuan

  Indirect: UR yuan → [linked rate] → Special yen → CR yuan

Linked trade was not the only mechanism of financing trade. Under the U.S. dollar–based system, UR yuan could be exchanged for dollars indirectly through Tianjin's *Hui Shen* market and Shanghai's foreign exchange market. Under the special yen–based system, the *Hui Shen* market provided a more direct way of exchanging UR yuan for Central Reserve (CR) yuan, whereas the linked system was an indirect way of doing so through the intermediation of the special yen. In both cases, there was arbitrage between the linked rate and the alternative market rate (Figure 6). Arbitrage was far from perfect, given the wartime restrictions on what could be traded and by whom. Monthly data show that these rates moved broadly in parallel fashion, but the monthly average deviation was 17 percent under the dollar system and 10 percent under the special yen system.

The system of linked trade had a reason to exist as long as the UR yuan was overvalued. The secondary market in yellow paper allowed linked trade to mimic a flexible exchange rate system while preserving the façade of a Potemkin world in which all currencies were irrevocably fixed to the Japanese yen. This layer of complexity, of course, was unnecessary if the occupation currencies could be devalued against the yen, but this was politically not feasible. North China's linked trade system died a natural death when escalating inflation in Central China eliminated the UR yuan's overvaluation. As the price of yellow paper fell to zero, the linked rate converged to the official rate. Thereafter, both North and Central China were incorporated into the Japanese empire's system of retained money as an alternative scheme of trade facilitation.

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Data Appendix

1. The Monthly Average Exchange Rates of the *Fa-Pi* against the British Pound and the U.S. Dollar in Shanghai, January 1937–August 1941

Exchange rate	*Fa-pi* against the pound (pence per yuan)			*Fa-pi* against the dollar (dollars per 100 yuan)		
Data source	SKNKK (1938) [1]	SMRC (1940a, 1942)[2]	SMKS (1940–41)[3]	SKNKK (1938) [1]	SMRC (1940a, 1942)[2]	SMKS (1940–41)[3]
1937-1[a]	14.375	--	--	29.625	--	--
1937-2[a]	14.375	--	--	29.625	--	--
1937-3[a]	14.375	--	--	29.625	--	--
1937-4[a]	14.375	--	--	29.625	--	--
1937-5[a]	14.375	--	--	29.625	--	--
1937-6[a]	14.375	--	--	29.625	--	--
1937-7	14.300	--	--	29.570	--	--
1937-8	14.320	--	--	29.670	--	--
1937-9	14.400	--	--	29.710	--	--
1937-10	14.290	--	--	29.530	--	--
1937-11	14.250	--	--	29.530	--	--
1937-12	14.250	--	--	29.540	--	--
1938-1	14.250	14.250	--	29.690	29.250	--
1938-2	14.250	14.250	--	29.720	29.250	--
1938-3	--	13.954	--	--	28.613	--
1938-4	--	12.978	--	--	28.905	--
1938-5	--	11.298	--	--	23.387	--
1938-6	--	8.970	--	--	18.515	--
1938-7	--	8.883	--	--	18.172	--
1938-8	--	7.933	--	--	18.154	--
1938-9	--	8.082	--	--	18.233	--
1938-10	--	8.073	--	--	15.979	--
1938-11	--	8.000	--	--	15.738	--
1938-12	--	8.000	--	--	15.825	--
1939-1	--	8.000	--	--	15.625	--
1939-2	--	8.000	--	--	15.625	--
1939-3	--	8.000	--	--	15.625	--
1939-4	--	8.000	--	--	15.625	--
1939-5	--	8.000	--	--	15.625	--
1939-6	--	6.587	--	--	12.813	--
1939-7	--	5.363	--	--	10.414	--
1939-8	--	3.500	--	--	6.724	--
1939-9	--	3.640	--	--	6.060	--
1939-10	--	4.080	--	--	6.818	--
1939-11	--	4.700	--	--	7.655	--
1939-12	--	4.271	--	--	6.900	--
1940-1	--	4.479	--	--	7.333	--
1940-2	--	4.108	--	--	6.770	--
1940-3	--	4.000	--	--	6.288	--
1940-4	--	4.000	--	--	5.793	--
1940-5	--	3.597	--	--	4.743	--
1940-6	--	3.734	--	--	5.495	--
1940-7	--	3.750	3.877	--	5.853	6.074
1940-8	--	3.639	3.677	--	5.440	5.647

1940-9	--	3.418	3.517	--	5.085	5.305
1940-10	--	3.625	3.733	--	5.514	5.774
1940-11	--	3.728	3.788	--	5.790	5.949
1940-12	--	3.740	3.653	--	5.633	5.759
1941-1	--	--	3.464	--	--	5.533
1941-2	--	--	3.400	--	--	5.497
1941-3	--	--	3.343	--	--	5.441
1941-4	--	--	3.394	--	--	5.439
1941-5	--	--	3.277	--	--	5.323
1941-6	--	--	3.307	--	--	5.397
1941-7	--	--	3.225	--	--	5.27
1941-8	--	--	2.996	--	--	5.012

Note: [a] Prior to the Marco Polo Bridge Incident, the *fa-pi* was tightly pegged to the pound at 1s2p⅜ and to the dollar at $29⅝. See SKNKK (1938), p. 156.

Sources: [1] SKNKK (1938), pp. 157–58; [2] SMRC (1940a), p.22; SMRC (1942), p. 33; [3] SMKS (1940–41), 40-11, p. 76; 41-2, p. 76; 41-4, p. 79; 41-7, p. 100; 41-9, p. 100.

2. The Monthly *Hui Shen* Rate in Tianjin, March 1938–November 1943 (United Reserve yuan per 100 Shanghai or United Reserve yuan)

Free or official	Free rate (Max)	Free rate (Min)	Free rate (Average)	Official rate	Free rate (Average)	Free rate (Average)[a]
Data source	URB (1940)[1]		Kuwano (1965)[2]	N.A.	Kuwano (1965)[3]	URB (1942b; (1943a,b)[4]
1938-3	125.0	95.0	--	--	--	--
1938-4	130.0	81.0	--	--	--	--
1938-5	114.5	91.0	--	--	--	--
1938-6	112.0	103.1	--	--	--	--
1938-7	108.0	99.0	--	--	--	--
1938-8	117.0	99.0	--	--	--	--
1938-9	112.3	100.7	--	--	--	--
1938-10	103.5	96.5	--	--	--	--
1938-11	97.0	85.7	--	--	--	--
1938-12	98.5	87.0	92.75	--	--	--
1939-1	101.3	100.1	100.70	--	--	--
1939-2	112.0	100.8	106.40	--	--	--
1939-3	98.3	97.7	98.00	--	--	--
1939-4	98.2	95.5	96.85	--	--	--
1939-5	120.0	109.5	114.75	--	--	--
1939-6	118.2	110.5	114.35	--	--	--
1939-7	--	--	117.03	--	--	--
1939-8	--	--	106.07	--	--	--
1939-9	--	--	92.35	--	--	--
1939-10	--	--	93.70	--	--	--
1939-11	--	--	94.20	--	--	--
1939-12	--	--	95.92	--	--	--
1940-1	--	--	100.30	--	--	--
1940-2	--	--	112.43	--	--	--
1940-3	--	--	103.38	--	--	--
1940-4	--	--	102.30	--	--	--
1940-5	--	--	99.71	--	--	--
1940-6	--	--	103.97	--	--	--
1940-7	--	--	96.66	--	--	--
1940-8	--	--	97.49	--	--	--
1940-9	--	--	92.70	--	--	--
1940-10	--	--	81.10	--	--	--
1940-11	--	--	80.62	--	--	--
1940-12	--	--	77.52	--	--	--
1941-1	--	--	75.10	--	--	--
1941-2	--	--	72.15	--	--	--
1941-3	--	--	63.46	--	--	--
1941-4	--	--	53.19	--	--	--
1941-5	--	--	52.14	--	--	--
1941-6	--	--	58.18	--	--	--
1941-7	--	--	52.32	--	--	--
1941-8	--	--	47.34	--	--	--
1941-9	--	--	43.87	--	--	--
1941-10	--	--	38.44	--	--	--
1941-11	--	--	34.60	--	--	--
1941-12	--	--	39.32	--	--	--

1942-1	--	--	--	30	--	--
1942-2	--	--	--	30	--	--
1942-3	--	--	--	30	--	--
1942-4	--	--	--	30	--	--
1942-5	--	--	--	30	--	--
1942-6	--	--	--	30	--	--
1942-7	--	--	--	30	--	--
1942-8	--	--	--	30	--	--
1942-9	--	--	--	30	--	--
1942-10	--	--	--	30	--	--
1942-11	--	--	--	30	--	--
1942-12	--	--	--	30	--	24.62
1943-1	--	--	--	30	27.76	26.91
1943-2	--	--	--	30	29.14	29.88
1943-3	--	--	--	30	27.02	26.70
1943-4	--	--	--	18	23.30	23.30
1943-5	--	--	--	18	23.55	23.40
1943-6	--	--	--	18	20.97	20.58
1943-7	--	--	--	18	17.25	17.24
1943-8	--	--	--	18	18.29	18.43
1943-9	--	--	--	18	17.88	17.90
1943-10	--	--	--	18	17.24	--
1943-11	--	--	--	18	17.84	--

Note: [a] Obtained from averaging available daily rates for each month.
Sources: [1] URB (1940), appendix; [2] Kuwano (1965), pp. 56, 90; [3] Kuwano (1965), p. 185; [4] selective daily data obtained from URB (1942b), December; URB (1943a); URB (1943b), January–September.

3. The Monthly Average Linked Rate in Tianjin, December 1939–July 1941 and December 1942–November 1943

Reference currency	U.S. dollar (dollars per 100 UR yuan)			Special yen (yen per 100 UR yuan)		
Data source	SMRC (1940b)[1]	SMRC (1941)[2]	Kuwano (1965)[3]	Kuwano (1965)[4]	URB (1942b; (1943b)[5 a]	SMKS (1943)[6 a]
December 1939–July 1941						
1939-12	10.5000	--	--			
1940-1	9.3750	--	--			
1940-2	8.2500	--	--			
1940-3	6.5625	--	--			
1940-4	6.6250	--	--			
1940-5	6.0000	--	--			
1940-6	6.2500	--	--			
1940-7	7.8125	--	--			
1940-8	6.5000	--	--			
1940-9	6.1875	--	--			
1940-10	--	--	--			
1940-11	--	--	--			
1940-12	--	8.1	--			
1941-1	--	7.6	7.592			
1941-2	--	7.9	7.879			
1941-3	--	8.9	8.889			
1941-4	--	10.4	10.386			
1941-5	--	11.7	11.739			
1941-6	--	11.3	11.257			
1941-7	--	--	10.842			
December 1942–November 1943						
1942-12				--	69.29	66.75
1943-1				56.37	57.00	56.44
1943-2				52.63	52.25	--
1943-3				59.14	62.52	--
1943-4				66.75	67.25	--
1943-5				64.38	65.50	--
1943-6				75.85	74.89	--
1943-7				92.50	92.25	--
1943-8				--	92.43	92.50
1943-9				--	95.46	96.92
1943-10				96.27	97.40	99.50
1943-11				99.00	--	--

Note: [a] Obtained from averaging available daily rates for each month.
Sources: [1] SMRC (1940b); [2] SMRC (1941); [3] Kuwano (1965), p. 90; [4] Kuwano (1965), p. 185; [5] selective daily data obtained from URB (1942b), December; URB (1943b), January–September; [6] daily data obtained from SMKS (1943), February 11, September 1, September 21, October 11.

4. Daily *Hui Shen* and Linked Rates in Tianjin, December 1, 1942–October 30, 1942

Hui Shen or linked rate		*Hui Shen* rate (free)		Linked rate		
Data source		URB (1942b; (1943b)[1]	BOT (1983)[2]	URB (1942b; (1943b)[1]	SMKS (1943)[3]	BOT (1983)[2]
1942	1-Dec	--	--	75.50	75.50	--
	5-Dec	21.60	--	75.50	--	--
	10-Dec	22.20	--	73.50	--	--
	13-Dec	--	--	--	71.50	--
	15-Dec	240	--	71.50	--	--
	20-Dec	25.60	--	65.00	--	--
	25-Dec	26.10	--	65.00	63.00	--
	28-Dec	28.20	--	--	--	--
	29-Dec	--	--	--	57.00	--
	31-Dec	--	--	59.00	--	--
1943	4-Jan	--	--	58.50	59.50	--
	6-Jan	28.40	--	--	--	--
	7-Jan	--	--	--	59.00	--
	9-Jan	25.40	--	59.00	--	--
	11-Jan	26.30	--	--	58.00	--
	15-Jan	27.00	--	58.00	57.00	--
	16-Jan	27.30	--	--	--	--
	20-Jan	27.00	--	56.50	56.50	--
	23-Jan	27.50	--	--	--	--
	25-Jan	27.90	--	55.25	54.50	--
	26-Jan	--	--	--	54.00	--
	27-Jan	--	--	--	53.00	--
	30-Jan	25.40	--	54.75	--	--
1943	1-Feb	26.20	--	54.00	--	--
	2-Feb	26.40	--	--	--	--
	4-Feb	--	--	52.50	--	--
	8-Feb	--	--	53.00	--	--
	10-Feb	28.40	--	--	--	--
	11-Feb	33.00	--	48.00	--	48.00
	12-Feb	31.00	--	51.50	--	--
	13-Feb	28.40	--	--	--	--
	16-Feb	29.10	--	--	--	--
	17-Feb	--	--	54.00	--	--
	20-Feb	28.50	--	--	--	--
	22-Feb	28.70	--	--	--	--
	23-Feb	33.20	--	51.00	--	--
	24-Feb	35.00	--	--	--	--
	25-Feb	31.00	--	--	--	--
	26-Feb	30.00	--	--	--	--
	27-Feb	29.40	--	54.00	--	--
1943	1-Mar	30.50	--	53.00	--	--
	3-Mar	30.00	--	--	--	--
	5-Mar	29.40	--	54.00	--	--
	6-Mar	28.60	--	--	--	--
	10-Mar	27.20	--	56.25	--	--
	15-Mar	25.20	--	59.00	--	--
	16-Mar	25.90	--	--	--	--
	18-Mar	27.40	--	--	--	--

	20-Mar	26.60	--	59.50	--	--
	24-Mar	--	--	59.25	--	--
	25-Mar	23.00	--	64.25	--	--
	26-Mar	23.60	--	69.50	--	--
	27-Mar	--	--	76.00	--	76.00
	29-Mar	--	--	72.00	--	--
	31-Mar	23.00	--	65.00	--	67.00
1943	1-Apr		--	65.50	--	--
	2-Apr		--	72.00	--	--
	3-Apr		--	73.00	--	--
	5-Apr		--	--	--	--
	6-Apr		--	71.50	--	--
	7-Apr		--	72.00	--	--
	8-Apr	Max:24.00 Min: 22.60 Ave:23.30	--	71.00	--	--
	9-Apr		--		--	--
	10-Apr		--	69.50	--	--
	15-Apr		--	64.25	--	--
	20-Apr		--	62.75	--	--
	22-Apr		--	60.50	--	--
	27-Apr		--	63.00	--	--
	30-Apr		--	62.00	--	62.00
1943	May	Max:24.20 Min:22.90 Ave:23.40	-	Max: 66.75 Min: 64.25 Ave: 65.50	--	--
1943	1-Jun	23.10	23.10	65.75	--	65.75
	2-Jun	23.20	--	--	--	--
	5-Jun	--	--	70.50	--	--
	8-Jun	23.00	--	71.00	--	--
	10-Jun	22.70	22.70	77.00	--	77.00
	14-Jun	20.50	--	--	--	--
	15-Jun	20.60	--	--	--	--
	16-Jun	19.80	19.80	--	--	80.00
	19-Jun	20.10		78.00	--	--
	20-Jun	--	20.10	--	--	98.00
	22-Jun	20.00	--	--	--	--
	23-Jun	18.40	--	--	--	--
	25-Jun	19.40	--	80.25	--	--
	28-Jun	18.60	--	--	--	--
	30-Jun	18.20	18.20	81.75	--	81.75
1943	1-Jul	18.20	--	82.00	--	--
	5-Jul	17.60	--	90.00	--	--
	10-Jul	17.55	17.55	93.50	--	93.50
	13-Jul	--	--	--	--	97.00
	16-Jul	16.30	--	96.25	--	--
	20-Jul	17.20	17.20	93.00	--	93.00
	26-Jul	16.80	--	96.00	--	--
	31-Jul	17.00	17.00	95.00	--	95.00
1943	2-Aug	17.00	--	95.50	--	--
	4-Aug	18.30	--	86.00	--	--
	10-Aug	17.50	--	94.00	--	--
	18-Aug	18.00	--	94.00	--	--
	23-Aug	20.50	--	91.50	91.50	--

	26-Aug	19.50	--	92.50	--	--
	28-Aug	--	--	--	93.50	--
	31-Aug	18.20	--	93.50	--	--
1943	1-Sep	--	--	93.50	--	--
	2-Sep	18.50	--	--	--	--
	3-Sep	--	--	93.00	--	--
	10-Sep	17.90	--	94.50	--	--
	15-Sep	18.20	--	95.25	--	--
	18-Sep	--	--	99.00	--	--
	20-Sep	17.95	--	--	98.50	--
	25-Sep	17.35	--	97.00	97.00	--
	27-Sep	--	--	--	95.25	--
	30-Sep	17.50	17.60	96.00	--	96.25
1943	4-Oct	--	--	--	95.50	--
	18-Oct	--	--	--	97.50	--
	23-Oct	--	--	--	99.00	--
	25-Oct	--	16.80	--	--	99.50
	27-Oct	--	--	--	96.00	--
	30-Oct	--	--	--	99.00	--

Sources: [1] URB (1942b), December; URB (1943b), January–September; [2] BOT (1983), pp. 265, 415, 426, 489; [3] SMKS (1943), February 11, September 1, September 21, October 11.

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明治・昭和前期為替制度の計量分析

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