An Exception that Proves the Rule: Japanese Monetary Policy under the Classical Gold Standard, 1897–1914

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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).

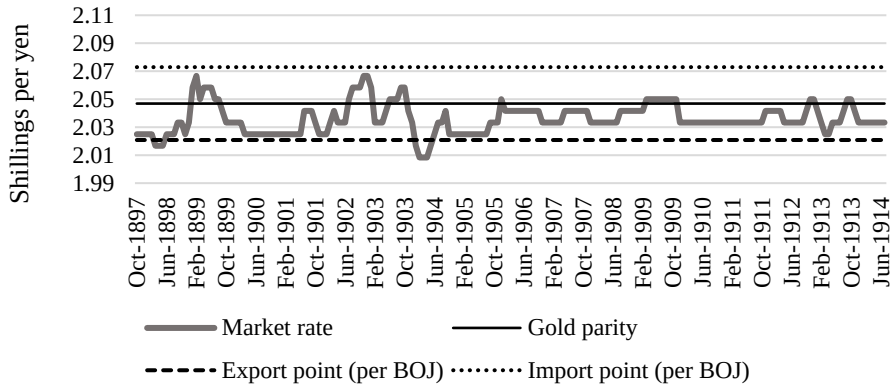
The official balances of interest-bearing assets denominated in gold-convertible currencies (often referred to simply as specie) played a central role in this system. Initially, these assets were held by the government, with the Bank of Japan acting as a custodian. In early 1903, the central bank for 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 4⁄10d for 23 consecutive months (December 1909–October 1911) and 2s 3⁄10d 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.

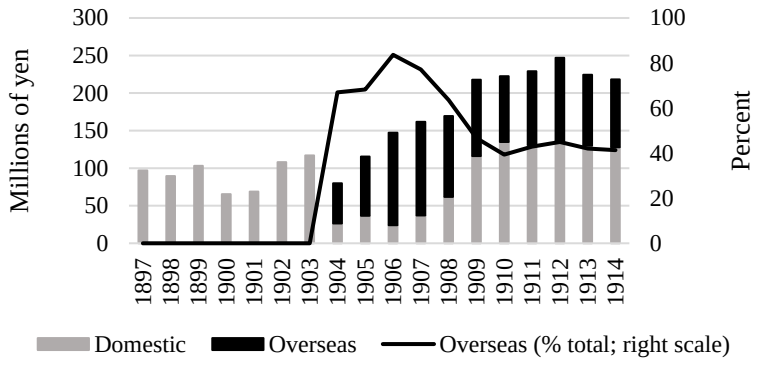
Government transactions would not change the monetary base when they involved external borrowing or payments. A government purchase of export bills by means of funds raised from domestic borrowing amounts to sterilized intervention in which the central bank purchases foreign exchange while simultaneously 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.

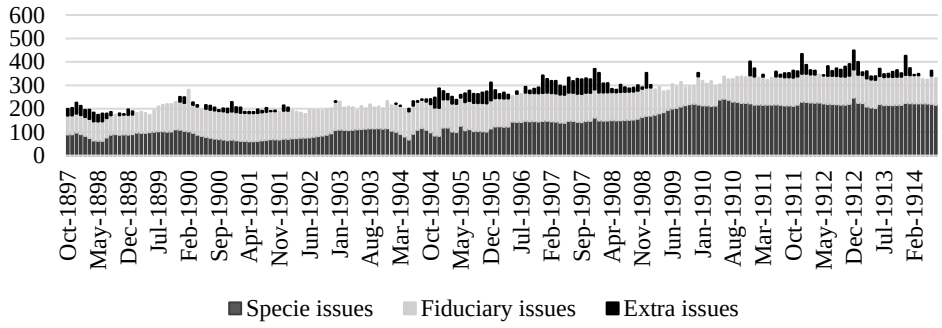
Japan’s gold standard was often characterized as a gold-exchange standard, in which the central bank uses foreign exchange to manage the system (Matsuoka 1936; Ishibashi 1936), a practice that became wide-spread following the Genoa Conference of 1922. The uniqueness of this practice under the classical 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

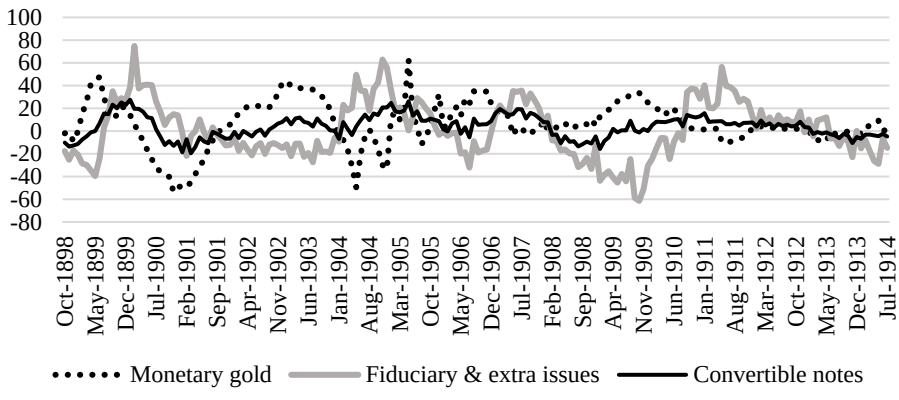
	October 1897 (1898)–December 1904 (N=87/75)		January 1905–July 1914 (N=115)		June 1909-July 1914 (N=62)		October 1897 (1898)–July 1914 (N=202/190)	
	Log	Log diff.	Log	Log diff.	Log	Log diff.	Log	Log diff.
Standard deviations:								
Notes	0.097	0.112	0.129	0.085	0.093	0.059	0.251	0.097
Specie issues	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.

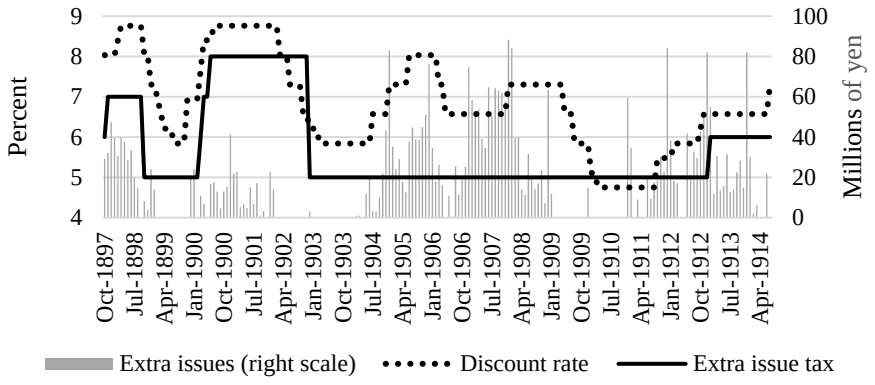
[7] The balance of monetary gold reached ¥200 million and the specie cover ratio peaked at 78.5 percent in the previous month, intimating that the central bank might have been purposely accumulating monetary gold up to that point.

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).

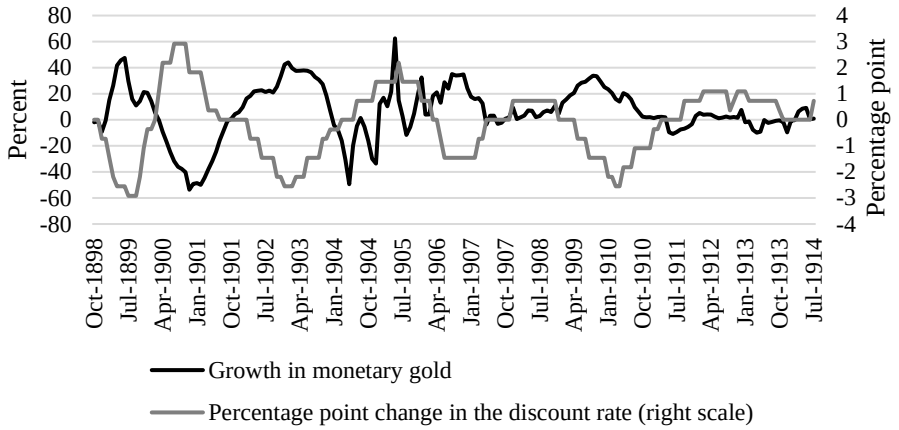
The goodness of fit worsens, but the sign of the coefficient(s) remains negative and statistically significant at the 1 or 5 percent level (specifications 4–5).

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.

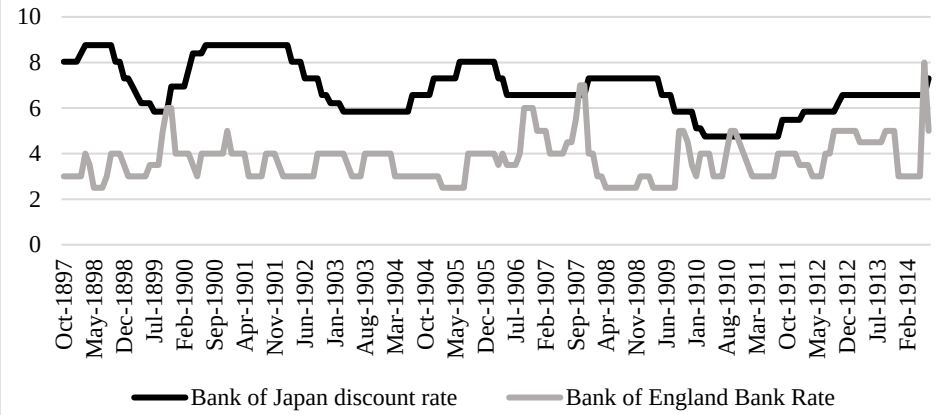
Table 5. Ordinary Least Squares Estimates of the Discount Rate Reaction to Changes in the Trade Balance, October 1898–July 1914 [1]

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.

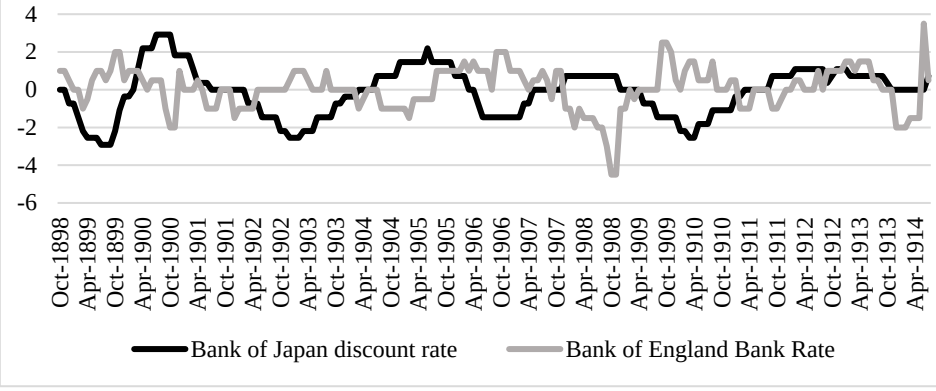
There is no episodic evidence that the Bank of Japan systematically responded to the Bank of England Bank Rate. The Bank of Japan discount rate was perennially higher, on average by 3.1 percentage points, than Bank Rate (Figure 7). Even in terms of rate changes, the relationship between the two policy 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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