

Institutions, Reforms, and Country Risk: Lessons from Japanese Government Debt in the Meiji Era

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We investigate the effect of the establishment of modern institutions on the risk premium associated with Japanese government bonds traded in London between 1870 and 1914. While most institutional innovations failed to elicit an immediate market response, the adoption of the gold standard did significantly reduce the perceived risk associated with Japanese bonds. In addition, some geopolitical events, especially the military victory over Russia, improved Japan's debt capacity. We conclude that well-understood monetary rules and military achievements matter more for foreign investors' perception of a country than do modern state institutions, at least in the short run.

Much has been written about the role of institutions in promoting economic growth. The establishment of a modern judicial, economic, governmental, and parliamentary structure can change the way a country is perceived by foreign investors, thus lowering the cost of foreign borrowing, facilitating capital inflow and thereby fostering growth. We will test this theory by correlating various political events of the Meiji period (1868 to 1912)—surely one of the most dramatic cases of institutional change in modern history—with the risk premium associated with Japanese government debt traded in London. Most reforms, including the establishment of a central bank and the promulgation of a modern constitution, did little to affect the way Japan was perceived by British investors, at least in the short run. The only institutional reform that clearly led to an immediate improvement in Japan's "credit rating" was the adoption of the gold standard, which

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can be viewed as a commitment to modern, stable macroeconomic policy.¹ In addition, one geopolitical event—Japan’s victory over Russia in 1905—did more to establish Japan’s image as a trustworthy borrower than did most institutional reforms.

This study evaluates the effect of major reforms on bond yields using a newly constructed dataset on sovereign debt traded in London between June 1870 and August 1914. We focus on sovereign debt because governments often play an important role in capital accumulation in the early stages of development.² The “risk premium” on Japanese government debt is defined as the yield differential between Japanese government bonds traded in London and British Consols. Our monthly data allow us to estimate the magnitude of the market response to major reforms and to the establishment of “modern” state institutions.

We find that the risk premium on Japanese government debt declined during the period, and that Japan’s debt capacity increased. Interest rates declined despite the fact that the volume of debt issued abroad increased substantially, relative both to total debt and to government revenues. Despite these overall trends, our results suggest that the establishment of state institutions was rarely perceived as “news” with an immediate effect on the risk premium. The great majority of the Meiji reforms—including the establishment of the Bank of Japan and the introduction of “modern” monetary policy, the promulgation of the Meiji Constitution, and the introduction of parliamentary elections—produced no quantitatively significant market response in London. This suggests that the establishment of western institutions in a developing country such as Meiji Japan need not be interpreted as credible signs of development or of the government’s ability to repay its foreign debt.

While most reforms mattered little to British investors, two institutional changes were associated with a substantial decline in Japanese bond yields. The first was the agrarian and fiscal reform that accompanied the abolition of the feudal system in 1873; the second was the adoption of the gold standard in 1897. The 1873 reform occurred early in our period of observation, and it is not clear whether this in fact caused the ensuing decline in yields. The gold standard, however, led to a dramatic decline in yields and an increase in volume of Japanese foreign debt.

Certain geopolitical events affected borrowing far more than did the introduction of new institutions. For example, Japan’s victory in the 1904/05 war with Russia was followed by a small decline in yields and, more importantly, by a substantial increase in Japan’s ability to raise capital abroad. It therefore seems that some “certification of quality” can

¹ See Eichengreen, *Gold Standard*; and Bordo and Rockoff, “Gold Standard.”

² Regarding nineteenth-century Japan in particular see Rosovsky, *Capital Formation*.

be achieved more quickly through military victories than by means of a modern constitution.³

We complete the analysis of market responses to institutional change by examining the *long-term* changes in the Japanese risk premium and the volume of foreign debt. This analysis supports our finding that most institutional reforms, with the exception of the gold standard, had little effect on the perception of Japan in foreign capital markets.

Our historical analysis is relevant to the discussion of country risk and foreign capital flows into modern emerging markets. For example, in a recently published advertisement the government of Kazakhstan has attempted to attract foreign investors by emphasizing the democratic institutions recently established in the country.⁴ Our results on the Japanese experience suggest that institutional reforms in a developing country may be a necessary condition for foreign capital inflows, and yet they are not always sufficient. Of course this does not imply that “institutions do not matter” for economic development, but rather that they need not generate an immediate reduction in the cost of foreign capital.

This study is part of a growing literature on institutions and their economic significance, including Douglass North and Barry Weingast’s 1989 contribution to this JOURNAL.⁵ Methodologically, it is in line with recent studies applying econometric techniques to evaluate market responses to historical events. Of special relevance is Kristen Willard, Tim Guinnane, and Harvey Rosen’s work on the gold price of “greenbacks,” a currency issued by the Union during the American Civil War, to examine the effect of war-time events on financial markets. The methodology they develop, designed to determine if a price change is “long-term” or just a “blip,” is similar in spirit to our own. This study also relates to the literature on country risk in more recent periods, notably the work of Sebastian Edwards, and to the literature on the gold standard and its impact on borrowing constraints.⁶ We have benefited also from Toshio Suzuki’s comprehensive historical study of Japanese bond issues in London during the Meiji period, even though his methodology and objectives are quite distinct.⁷

AN OVERVIEW OF THE MEIJI ERA (1868–1912)

The symbol of Japan’s social and economic modernization is the Meiji Restoration of 1868. Following more than 200 years of isolation under the

³ This evidence supports the view that Japanese militarism did not “crowd out” private investment, because successful wars led to cheap foreign credit. See Yamamura, “Success Ill-Gotten?”

⁴ *International Herald Tribune*, 11 December 1998.

⁵ North and Weingast, “Constitutions.”

⁶ Edwards, “Pricing”; Bordo and Rockoff, “Gold Standard”; and Eichengreen and Flandreau, “Geography.”

⁷ Suzuki, *Japanese Government Loans*.

Tokugawa shogunate, the new regime embarked upon an ambitious modernization plan. Massive imports of technology, heavy public investment in infrastructure, and the establishment of a Western-style state structure were all accomplished within a few decades. Rapid economic growth during this period enabled Japan to emerge as an economic and military power by the turn of the century. Although a detailed historical review of the Meiji period is beyond the scope of this article, this section provides a brief outline of the major reforms and historical events which will serve as a background for the empirical analysis which follows.⁸

The upheaval following Commodore Perry's forced opening of Japan brought about the demise of the shogunate and of the old feudal system it had epitomized. This led to a *de jure* restoration of the emperor's authority, and a *de facto* revolution under a new government, one eager to narrow the economic and military gap between Japan and the West. The abolition of feudal domains began in 1869 and was completed two years later. As early as 1871, a government mission headed by Prince Iwakura left Japan to "learn from the West." Telegraphy, railroads, and a modern postal service were introduced in the early 1870s, at about the same time that the government began to import "model" textile and other industrial plants. Compulsory elementary education for both sexes was introduced in 1872, eight years before its introduction in England, and students were sent to study in Europe and the United States. Major agrarian and tax reforms took place in 1873, when rice was replaced by currency as the means of tax payment. General conscription and a modern army replaced the traditional samurai warriors in 1873. The early 1880s witnessed the consolidation of the banking system, the establishment of a modern central bank (the Bank of Japan, 1882), and, later on, the introduction of convertible-to-silver yen notes. Under Matsukata, the Ministry of Finance restrained inflation (which resulted mainly from the 1877 Satsuma Rebellion) and began to privatize the industrial plants constructed by the government earlier. Also during the 1880s, a Western-style cabinet system was installed. Possibly the most important institutional reform, the Meiji Constitution, was promulgated in 1889, after nine years of deliberation and many attempts to incorporate the best features of the constitution of Germany and of various other European constitutions. The Meiji Constitution, which remained unchanged through the end of World War II, guaranteed the rule of law, property rights, some freedom of speech, as well as occupational freedom for citizens. It also established an independent judiciary and the bicameral parliamentary system existing in Japan to this day. The first parliament convened in 1890, following the first elections.

Major political events of the Meiji period include the counterreformist Satsuma Rebellion of 1877, led by discontented samurai. Japanese ambitions

⁸ For further historical background on Japan in the Meiji period see Beasley, "Rise."

in Korea led to the 1894/95 war with China. Japan's decisive victory resulted in the annexation of Taiwan and an extremely large Chinese indemnity. In 1900 Japan cooperated with the Western powers in suppressing the Boxer Rebellion in China. In 1902 a British-Japanese military alliance was formed, England's first-ever alliance with a non-European power. The struggle for hegemony over Korea and Manchuria led to the war with Russia, which ended in a major Russian defeat, the first time a modern European power had lost a war to a non-European race. Indeed, the Russo-Japanese War is often described as a watershed in the histories of both Japan and Russia. In 1909 a Korean nationalist in Manchuria assassinated Ito Hirobumi, one of the most prominent statesmen of Meiji Japan. In retaliation, Japan formally annexed Korea the following year. The Meiji Emperor died in July 1912, two years before the outbreak of World War I.

THE DATASET

Data on the prices and yields of Japanese government bonds traded in London have been calculated from the *London Times*, using the coupon interest rate and the actual closing price on the London market at the end of each month. Our focus on foreign debt implies that the series of yields used is independent of Japan's domestic monetary policy.⁹ Furthermore, because coupons on Japanese bonds were payable in sterling in London, no exchange-rate risk was attached to their yields. Data on British Consol yields have been obtained from the NBER *Macroeconomic History* dataset.

In our benchmark calculations, yield equals the ratio of interest payments to market price (for alternative estimates see the Appendix); this is a reasonable approximation for long-term bonds such as these, which carried a maturity of 13 to 25 years prior to 1897, and about 60 years thereafter.¹⁰ The issue of bond maturity is discussed again in relation to the impact of the Sino-Japanese War and the gold standard on yields. In addition to monthly bond-return data, daily data are used around the promulgation of the constitution and the adoption of the gold standard. Annual data on the volume of Japa-

⁹ Moreover, data on domestic bond yields do not exist for Japan until the beginning of the twentieth century.

¹⁰ The first bond issue, in 1870, carried a maturity of 13 years and was to be redeemed in ten annual drawings starting in 1873. Beginning in 1873, the Japanese government issued 25-year bonds, which could also be redeemed before maturity. Indeed, Japan withdrew much of the 1873 debt by 1897 through a series of "lotteries" in which a fraction of the outstanding bonds was redeemed. Post-1897 bonds were mostly long-term, carrying maturities of up to 60 years, although during the war with Russia short-term bonds were issued as well. The Japanese government could (and did) retire some of its debt before maturity, but only with "adequate" advance notice. In any case, bonds could not be redeemed earlier than five (and in some cases ten) years after the issue. The fact that some fraction of the bonds could be "called" by the government before maturity implies that calculating yield to maturity is not straightforward and should, in principle, incorporate also the probability of early redemption.

nese government debt, as well as on government revenues and other macroeconomic variables, are drawn from the Bank of Japan's *Hundred Year Statistics of the Japanese Economy*, supplemented by data on long-term capital flows and GNP from Brian Mitchell's *International Historical Statistics*. It should be noted that GNP data are not available for Japan before 1885.

To supplement the statistical information, every report on Japanese political or economic events appearing in the *London Times* between 1870 and 1899 has been recorded. These data, as well as articles from the *Economist*, are used to gauge British investors' information on reforms in Japan and on other events that could affect the riskiness of Japanese government bonds. Before Japan was connected to the international telegraph system in 1876, it took news two months to reach England by mail steamers.

METHODOLOGY

Several statistical procedures are used to determine if a particular reform or event caused an immediate change in the risk premium associated with Japanese debt.¹¹ We then investigate long-run trends in Japanese foreign borrowing. This part of the analysis focuses mainly on the volume of Japanese foreign debt (that is, on "quantities" rather than "prices"). Together, the two parts provide both a short- and a long-run view of the effect of institutional reform and other important events on Japanese foreign borrowing.

Basic Regression Specification

Our basic specification, based on the work of Philip Perron, is designed to test statistically whether *known* historical events (for instance, the establishment of a central bank) caused a significant change in the risk premium associated with Japanese government bonds.¹² First, an eighteen-month "window" is constructed around the month in which a single major historical event took place, so as to minimize confounding influences.¹³ The time frame of each "window" enables the identification of effects lasting about one year. For example, the "window" for the Meiji Constitution, which was promulgated in February 1889, begins in June 1888 and ends in November 1889; the parliamentary elections of

¹¹ An alternative approach is that of Calomiris ("Greenback Resumption"), who relies on case studies to analyze how certain institutional changes affected the United States' credit risk in the nineteenth century.

¹² Perron, "Great Crash."

¹³ It is, of course, possible that other events, which Japanese historiography has not deemed important, are also included in the "window." A division of the sample into short "windows" is part of Willard, Guinnane, and Rosen's approach as well ("Turning Points").

1890 are thus excluded. Using the data contained in each “window,” the following regression equation is estimated

$$\ln RP_t = \beta_0 + \beta_1 \ln RP_{t-1} + \beta_2 \Delta \ln RP_{t-1} + \beta_3 \Delta \ln RP_{t-2} + \beta_4 \text{TREND} + \beta_5 \text{EVENT}_{long} + \beta_6 \text{EVENT}_{short} \quad (1)$$

where RP_t is the risk premium on Japanese government debt at time t , and the event's impact on the risk premium is measured by two dummy variables. The first, EVENT_{long} , takes the value zero at all times prior to the event and the value one from the time of the event onwards. The second, EVENT_{short} , takes the value one at the date of the event investigated and zero at all other times. For example, a permanent one-time break in a trend-stationary series would be reflected in $\beta_1 < 1$, $\beta_4 \neq 0$, $\beta_5 \neq 0$, and $\beta_6 = 0$. Other right-hand-side variables include the logarithm of the risk premium lagged one year, and increments in the risk premium lagged one and two months, to correct for various forms of serial correlation. A time trend is included only in “windows” where it is significant.

A possible drawback of this approach is that the “windows” may be too narrow, either containing too few observations or covering too short a period. In addition, Lawrence Christiano and Eric Zivot and Donald Andrews have criticized the Perron methodology on two main grounds.¹⁴ First, Christiano shows that the Perron test will tend to reject the null hypothesis of no breaks “too easily”; that is, the critical values for the significance of the dummy variables are higher than are ordinary F - or t -values. In our case, this means that the statistical significance of political events may be overestimated. Second, both Christiano and Zivot and Andrews argue that Perron's identified breaks (in the U.S. GNP series) are “endogenous,” in the sense that they are based on preliminary observation of the data and an informal search for breaks. This second critique is irrelevant for the study of institutional reform, where possible break-dates are exogenously given historical events. Nevertheless, because events may have been anticipated prior to their actual date, two alternative test specifications (suggested by Christiano and Zivot and Andrews), in which no break-date is assumed *a priori*, are used as well.

Iterative Search for Breaks

This test uses the entire 40-plus years of risk-premium data for repeated estimation of equation 1 while moving the break-date and the corresponding EVENT dummy variables one month at a time and recording their statistical significance. The sample is then split in two at the point where

¹⁴ Christiano, “Searching”; and Zivot and Andrews, “Further Evidence.”

the statistical significance of the $EVENT_{long}$ dummy is highest; the process is repeated within each sample segment until no break points are detected in any subsample.

“Moving Windows” Approach

An alternative method for searching for breaks in the risk-premium series is by “moving the windows” one month at a time, estimating equation 1 within each “window,” and recording the dates that yield $EVENT_{long}$ dummies with the highest statistical significance.¹⁵

“Long-Run” Analysis

In order to search for “long-run” effects, changes in the risk premium and the volume of foreign debt are investigated using annual data as well. Following the literature on present-day country risk, we estimate a cointegration equation designed to establish the long-run relationship between the risk premium on Japanese government debt and macroeconomic variables such as the fiscal deficit or the ratio of government debt to GNP.¹⁶ The relation between the Japanese risk premium and the nature of British newspaper reports on events in Japan is also estimated.

Much of the “long-run” analysis focuses on “quantities” rather than “prices,” that is, on the mix of foreign and domestic debt chosen by the Japanese government. This is done by estimating (using cointegration) the relation between the ratio of foreign to total debt and the risk premium, as well as by examining (graphically) the evolution of Japanese foreign borrowing in the Meiji period. This analysis enables an assessment of the relative importance of demand and supply shifts in the London market for Japanese government bonds. A negative relation between the ratio of foreign to total sovereign debt and the risk premium (whereby increases in the “quantity” of capital borrowed are accompanied by declines in its “price”) are consistent with movements along the Japanese capital-demand curve in response to outward shifts in the British supply curve. A positive relation implies that outward shifts in the Japanese demand for foreign capital resulted in an increased risk premium.

PRELIMINARY RESULTS

Japanese debt was first issued in London in April 1870. The *London Times* described this relatively small issue of £1 million as follows:

¹⁵ As in Willard, Guinnane, and Rosen, “Turning Points.”

¹⁶ Edwards, “Pricing.”

The radical changes which have recently taken place in Japan and their important effects, not only on the Japanese themselves, but upon the commercial relations with foreign countries, have been recognized by all who have knowledge of the vast resources and the productive power of that Empire. The natural result of this improved state of things has been the desire on the part of the government of Japan to develop the resources of that Empire by the introduction of railways, and to the accomplishment of that object the present loan is mainly designed.¹⁷

Table 1 displays the dates, volume, and coupon interest rates for Japanese government debt issued in London. From 1870 to the early 1900s, coupon rates on newly issued Japanese government bonds declined from 9 percent (or about 200 percent higher than Consol yields at the time), to about 4 percent. Fast capital accumulation in Japan during the period, as well as the increased integration of world capital markets, may have led to a lower risk premium in the long run.¹⁸ It is also evident that the volume of Japanese debt issued in London (as well as in other markets) increased dramatically around the turn of the century, after the adoption of the gold standard.

Figure 1 describes the risk premium on Japanese government debt from June 1870 to August 1914. Again, observe that the risk premium decreased from about 6 percentage points in the early 1870s to slightly more than 2 percentage points at the turn of the century. Not all developing countries enjoyed a decline in their cost of capital at that time, despite the improved integration of global capital markets. For example, yields on Russian and Turkish bonds did not fall during the period. In fact, we argue elsewhere that although interest rates on the sovereign debt of countries “on” the Gold

TABLE 1
JAPANESE BOND ISSUES IN LONDON

Year	Value (£ million)	Interest Rate (percentage)	Maturity (years)	Use of Proceeds
1870	1.000	9	13	railways
1873	2.400	7	25	miscellaneous
1897	4.390	5	53	military
1899	10.000	4	55	railways, telephone
1902	5.104	5	55	military, telephone
1904	22.000 ^a	6	7	military
1905	60.000 ^a	4.5	25	military
1905	25.000	4	25	miscellaneous
1907	23.000	5	40	miscellaneous
1910	11.000	4	60	miscellaneous

^a denotes total proceeds raised in two separate issues of similar terms.

Note: The Bank of Japan's historical figures on the maturity of some bond issues differ slightly.

Source: Suzuki, *Japanese Government Loans*.

¹⁷ *London Times*, 26 April 1870, p. 8.

¹⁸ On Japan, see Rosovsky, *Capital Formation*. On world markets, see Bordo and Rockoff, “Gold Standard.”

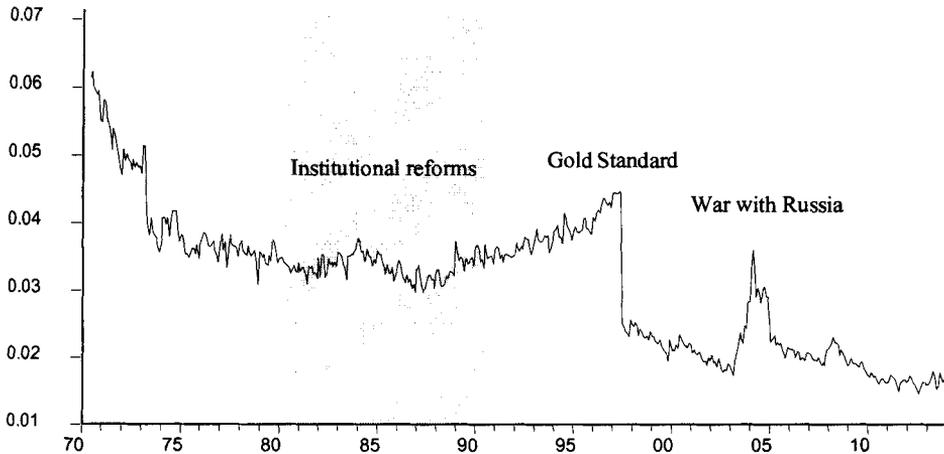


FIGURE 1
INTEREST-RATE DIFFERENTIAL, 1870–1914:
JAPANESE GOVERNMENT BONDS vs BRITISH CONSOLS

Sources: See the text.

Standard moved together, changes in world interest rates cannot explain short-term changes in the Japanese risk premium.¹⁹ Fluctuations in the Japanese risk premium should therefore be explained by Japan-specific events, and not by events in England or in global capital markets that should have affected all developing countries equally. For example, the decline in Japan's risk premium cannot be accounted for by an increase in the amount of British capital seeking high returns abroad, because such an increase would have affected premiums in all "emerging markets."

It is clear from Figure 1 that the decline in the Japanese risk premium was not smooth. While it fell in the 1870s, it remained flat (or even increased moderately) from the early 1880s until the mid-1890s. Although the decline of the 1870s coincided with some important changes (including the abolition of feudalism, consolidation of the banking system, and the suppression of the Satsuma rebellion), the 1880s witnessed the establishment of some of Japan's most important state institutions. Apparently these changes were difficult to evaluate at the time, and therefore had no effect on the London market's perception of Japanese debt.

Institutional reform's weak impact on the London capital market is echoed in the data on the volume of foreign borrowing and the composition of the Japanese government debt. Figure 2 shows the development of capital flows and the ratio of foreign to total sovereign debt. With the exception of two debt issues floated in London during the early 1870s, the period of institu-

¹⁹ See Sussman and Yafeh, "Gold Standard," for a discussion of the co-movement of Japanese debt yields and yields on sovereign debt of other contemporary developing countries.

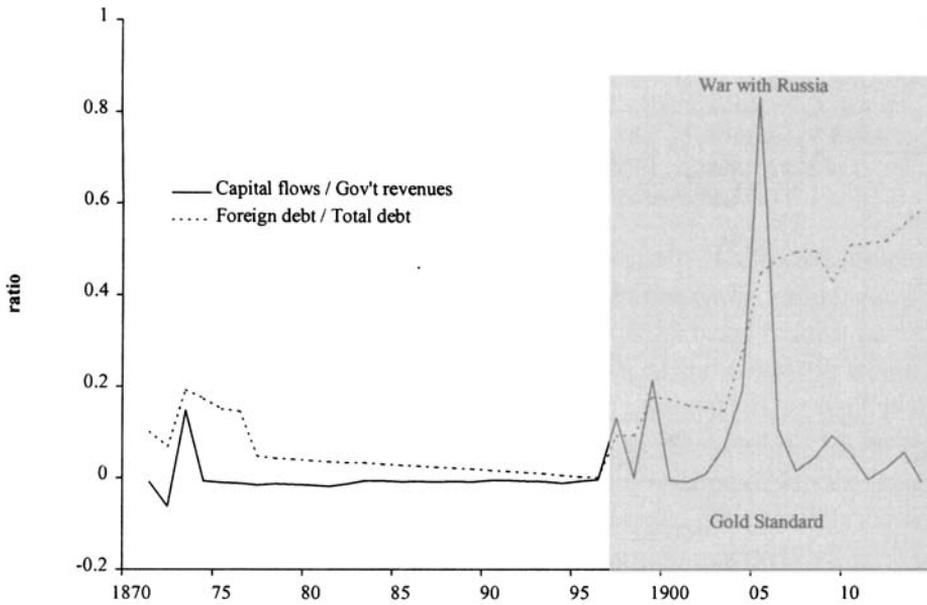


FIGURE 2
JAPANESE FOREIGN BORROWING, 1871–1914

Note: Shaded area indicates Gold-Standard era.
Sources: See the text.

tional reform was characterized by *negative* capital flows, in part because of payments to service and retire foreign debt. This outflow of capital is reflected in the ratio of foreign to total debt, which *declined* steadily until 1897. The trends of both capital flows and the foreign debt ratio were reversed following the adoption of the gold standard, each leaping to unprecedented heights during the war with Russia.

To clarify how well informed the market participants in London were, articles on Japan in the *London Times* may be classified into several categories: those dealing with political instability and wars; those dealing with economic and commercial news; those dealing with diplomacy and foreign policy (for example, treaties with foreign countries); and those dealing with reforms and institutional change (see Table 2). During the 1870s the majority of these reports addressed political instability and wars, most notably the Japanese navy's attack on Taiwan in 1874 and the Satsuma Rebellion of 1877. Against this unfavorable backdrop, the few reports on institutional change were apparently not enough to affect the high risk premium associated with Japanese government bonds in that decade. The 1880s saw fewer reports of instability (mostly dealing with political unrest around the promulgation of the Meiji Constitution), and far more on the Japanese economy and

TABLE 2
ARTICLES ON JAPAN IN THE LONDON TIMES, 1871 TO 1899

Year	Topic			
	Internal Instability and Wars	Commerce and Economics	Foreign Relations	Institutions and Reforms
1871	3	5	2	1
1872	4	14	4	1
1873	5	8	6	3
1874	20	11	3	0
1875	1	6	6	3
1876	0	4	13	0
1877	23	3	2	0
1878	6	16	6	1
1879	4	14	2	5
1880	4	10	6	5
1881	1	3	5	0
1882	3	5	4	0
1883	0	4	3	0
1884	0	2	3	0
1885	0	2	3	2
1886	0	1	5	3
1887	2	2	9	3
1888	3	9	3	3
1889	15	12	10	9
1890	4	13	10	6
1891	7	5	3	2
1892	2	8	3	7
1893	1	4	1	1
1894	19	5	3	2
1895	18	9	12	0
1896	3	8	1	0
1897	1	10	11	1
1898	1	4	7	0
1899	0	5	6	1

Note: This classification is based on our own reading of the articles. Articles which could not be classified into one of the four categories (for example, articles dealing with miscellaneous news on Japan or with Japanese culture) have been excluded.

Source: See the text.

on institutional change. In the 1890s reports emphasized the war with China (1894/95) and the gold standard. Overall, the risk premium on Japanese government debt reflected the nature of British investors' information on Japan. An increasing number of articles on economic modernization, diplomatic initiatives, and institutional reforms coincided with the trend of declining risk premiums. Nevertheless, the reforms of the 1880s do not seem to have been as thoroughly covered as the instability of the 1870s or the gold standard and the Sino-Japanese War in the 1890s. Consequently these events did not win the appreciation of British investors.²⁰

²⁰ Note that the picture emerging from the *Economist* is similar: Many of the articles focused on political instability and macroeconomic conditions, whereas relatively little attention was paid to institutional reforms.

INTERPRETATION: DID INSTITUTIONS LOWER THE COST OF FOREIGN
CAPITAL?

Table 3 reports estimates of significant coefficients on $EVENT_{long}$ and $EVENT_{short}$ for various significant events of the Meiji era. What follows is a discussion of those results.

The 1870s

Consider first the agrarian and fiscal reform of 1873. The negative and significant coefficient on $EVENT_{long}$ suggests a dramatic “permanent” decline (that is, a decline lasting at least until the close of this “window” in March 1874) in the Japanese-British yield differential of about 1.5 percentage points (of a total of about 4 percent). This may well be due to the fact that the reforms were quite promising—after all, the new tax system did go on to provide a large part of government revenues—but it is difficult to assert this with confidence. The risk premium associated with the first Japanese bonds issued in London (in 1870) may have been especially high, just as the risk premiums are on initial stock offerings today (“IPO underpricing”). It is therefore quite possible that the institutional changes of the early 1870s were not the reason why the 1873 bond issue carried a coupon rate of 7 percent, compared to 9 percent on the first issue in 1870.

To further shed light on the events of 1873, it is interesting to examine British consular reports from Japan around that time. For example, it was reported that the first official report on public finance (June 1873) was issued to counteract rumors that the government would run a major deficit. But since Japan was “as yet neither endowed with nor fit for parliamentary institutions, there is no public body which has the power to look into or control the national accounts. The public has therefore no guarantee . . . that the figures . . . are correct.” In addition to indicating that institutions mattered for British investors, this report suggests that the decline in Japanese bond yields may have been a response to the improvements in official data, rather than to the agrarian and fiscal reforms themselves. The provision of information by the Japanese government was probably of great importance during the early 1870s, because Japan was not connected to the international telegraph network until 1876. Another explanation for the declining yields of the 1870s is provided in a later consular report that the Japanese government was about to intervene in the bond market after previous issues had been substantially discounted.²¹

²¹ British Parliamentary Papers, Embassy and Consular Commercial Reports - Japan, Vol. 6, pp. 11, 13, 187. The *Economist* of 18 January 1873 strongly criticized the lack of adequate information on Japanese public finance.

TABLE 3
TESTS FOR STRUCTURAL BREAKS AROUND HISTORICAL EVENTS

Date (yyyy.mm)	Event	$EVENT_{long}$ ("break")	$EVENT_{short}$ ("blip")
1873.06	Agrarian reform	-0.35	None
1877.12	Suppression of the Satsuma Rebellion	None	None
1880.11	Privatization of government plants	None	None
1882.10	Establishment of the Bank of Japan	None	None
1885.06	Introduction of yen notes convertible to silver	-0.05	None
1889.02	Meiji Constitution	None	None
1890.07	First Parliamentary elections	None	None
1894.07	Outbreak of the Sino-Japanese War	None	+0.10
1895.04	End of the Sino-Japanese War	None	None
1897.06	Adoption of the Gold Standard	-0.50	—
1902.06	British-Japanese Treaty	-0.07	None
1904.02	Declaration of war on Russia	None	+0.17
1905.01	Russian surrender in Port Arthur	-0.09	None
1910.08	Annexation of Korea	None	None
1912.07	Death of Meiji Emperor	None	None

Notes: Coefficients on the event dummy variables are reported only if their impact is statistically significant at the 5 percent level, and should be interpreted as percentage change in existing yields. Because the entire stock of outstanding bonds was redeemed with the adoption of the gold standard, we do not apply the test to this event. The estimated impact is based on the difference between the newly issued 5-percent bonds and the outstanding 7-percent ones. Note also that June 1897 is the month in which the old bonds were replaced, but the legal process leading to the formal adoption of the gold standard ended in October 1897.

Source: See the text.

An event that might be expected to have caused risk premiums to decline in the later 1870s was the suppression of the Satsuma Rebellion in late 1877, which could have proved to investors that proreform forces were indeed powerful in Japan. The suppression of the Rebellion, however, did not cause a significant market response (Table 3). This suggests that the declining risk premiums of the 1870s were not necessarily due to institutional reforms, although the important changes that took place in Japan during this decade may have had a cumulative effect.

Institutional Reforms, 1880–1896

We will now examine in detail the series of major institutional changes of the last two decades of the nineteenth century. As is apparent from Figure 1 and Table 3, no institutional change occurring before 1897 was associated with a major break in Japanese risk premiums. Even the establishment of the Bank of Japan in 1882 (described in detail by the *Economist*), the promulgation of Meiji Constitution of 1889, and the first parliamentary elections of 1890 did not lead to a significant reduction in the risk premium associated with Japanese debt.

It is perhaps unsurprising that British investors were not impressed by the establishment of the Bank of Japan, which followed several unsuccessful attempts to reform the banking system in the late 1870s. However, the irrelevance of the Meiji Constitution of February 1889 is more intriguing. As is evident from Table 3, monthly data indicate that the constitution was not associated with a significant change in the risk premium. Contemporary press reports help explain this surprising result. British investors were clearly well informed of the ongoing changes in Japan. For example, there are five detailed articles describing the Meiji Constitution in the *London Times* in February and March of 1889. It was described as a major step forward, one granting Japanese citizens substantial liberties and, more importantly, establishing an independent judicial system. At the same time, the Emperor's divine status and the cabinet's limited accountability to the parliament were criticized. The overall verdict on the constitution was mixed, a fact which may account for the lukewarm market response.²²

In order to examine further the impact of the constitution, our dataset is supplemented by daily bond-yield data from January to April 1889. Breaks in the daily yield series can be identified using the "iterative search" method for estimating equation 1 without assuming break-dates *a priori*. However, no major changes in yields are detected around the dates when the constitution was discussed in the *London Times* (although the daily data exhibit a very moderate decline in yields during February and March of 1889, captured by the trend variable in the regression). It seems that British investors were not convinced that the constitution would prove a major turning point, and did not modify their perception of the Japanese government following its promulgation.

The only event of the 1880s for which some impact is suggested was the introduction of yen notes convertible to silver in 1885. This was associated with a relatively small—though statistically significant—decline in the risk premium (see Table 3), a finding which can be viewed as evidence that while the credibility of institutional reform in general was hard to evaluate, the adoption of well-known economic "rules of the game" did elicit a positive market response.²³

²² Some historians have argued that the Meiji Constitution did not prove to be as big a change as anticipated, because politicians prevented the judicial system from attaining complete independence. We nevertheless focus on the constitution because it is often described as a major historical landmark and as the main symbol of change in Meiji Japan. It is also clear from contemporary news articles that it was considered an important event not only in retrospect, but also around the time of its promulgation.

²³ When using yield to maturity or the *Economist's* yield series (instead of the ratio of interest payments to price), the effect of silver convertibility appears to be somewhat bigger (see Appendix Figure 1).

The Gold Standard

Judging from the risk premium, the most dramatic reform of the Meiji period was the adoption of the gold standard in 1897. In its aftermath, the risk premium halved from approximately 4 percentage points to just 2 points. The observed decline was due to the complete retirement of the 7 percent bonds of 1873, and the issuance of new 5 percent bonds. Moreover, the newly issued bonds were of much longer maturity: over 50 years (with restrictions on early redemption), compared to 25 years on previous issues. This suggests that part of the post-adoption decline in yields could be attributed to investors' expectations of continued decline in interest rates. Stated differently, to the extent that the gold standard was interpreted as evidence of future macroeconomic stability in Japan, the Japanese government could issue long-term debt without having to pay a maturity premium.²⁴

Judging by reports in the *Economist*, the Japanese government was well aware of the impact of the gold standard on her borrowing ability:

Japan is very much in earnest over the adoption of the gold standard. The principal motive for this change, however, is . . . because the [Japanese] government find[s] it necessary to borrow money abroad, and the opinion prevails that Japan as a gold standard country would command higher credit, and be able to borrow on more favourable terms in foreign countries than she would as a silver-standard country. There is also an idea that as Japan now considers that she has the right to be regarded as a first-class Power, she ought to adopt for her currency the same standard of value as other first-class Powers.²⁵

Norio Tamaki also argues that the reason Japan wanted to go “on” the gold standard was because “London . . . could supply resources to any country . . . albeit on the Gold Standard.” Indeed, Matsukata, the Minister of Finance, had been advocating the gold standard since the mid-1880s.²⁶ The importance of the gold standard is reflected also in a number of reports in the *London Times* in the spring of 1897 describing its expected adoption later

²⁴ Because the entire stock of old Japanese government bonds was redeemed, we do not formally estimate the impact of the gold standard on yields using the Perron method. This is because when the bonds approached maturity their yield approached the short-term risk-free interest rate (or prices approached the coupon redemption value), see Appendix Figure 1. The decline from 7 to 5 percent is therefore likely to be an over-estimate of the impact of the gold standard, since market yields in the early 1890s (before the approaching redemption began to drive them upwards) were already around 6 percent. The *Economist's* yield series also suggests that yields were approximately 6 percent before increasing close to the 1897 redemption date (also in Appendix Figure 1). In this case, the Gold-Standard-induced decline in the risk premium is close to one-third. In addition, note that the 1897 issue was essentially a conversion of domestic debt.

²⁵ *The Economist*, 24 April 1897, p. 603. Suzuki (*Japanese Government Loans*) cites Finance Minister Matsukata's memoirs on this issue as well. Note that the same article in the *Economist* refers also to “political economists” who warned Japan against possible adverse effects of the gold standard on her foreign trade.

²⁶ Tamaki, *Japanese Banking*, p. 82.

that year. Historical documents examined by Suzuki also indicate that the 1897 bond issue (which coincided with the adoption of the gold standard) commanded such interest that it was oversubscribed more than sixfold.²⁷

In addition to a decline in yields and increased interest, the adoption of the gold standard was accompanied by an increase in the volume of debt issues by the Japanese government in London, as is evident in Figure 2 (and also in Table 1). Figure 2 clearly indicates that within a few years following the adoption of the gold standard, foreign obligations increased to around 20 percent of the total Japanese sovereign debt. The adoption of the gold standard resulted in a substantial inflow of capital at a much lower cost than ever before. Unlike the establishment of a modern state structure, the gold standard was apparently interpreted as evidence of significant development in Japan.²⁸

While the discussion so far suggests that the gold standard was the most important break during the entire Meiji period, it is important to bear in mind that its adoption was the culmination of a series of economic reforms and political changes. For example, a central bank and “modern” monetary policy were prerequisites for the gold standard, as was the accumulation of substantial gold reserves, which Japan obtained in indemnity from China in the aftermath of their war. What needs to be emphasized, however, is that the London bond market responded strongly to the adoption of the Gold Standard itself, but not to the necessary changes that preceded it. It is also possible that yields declined in response to the adoption of the gold standard because it represented a form of collateral for Japanese government debt.

It is interesting to note that the effect of the gold standard on the ability of the Japanese government to raise capital abroad resembles its effect in other countries. Paul Gregory documents a massive capital inflow into Russia following its adoption of the gold standard at about this same time.²⁹ Nevertheless, while Japan enjoyed a reduction in the cost of capital as well, no such reduction occurred in the Russian case. Michael Bordo and Hugh Rockoff find that countries committed to the gold standard as a “good house-keeping seal of approval” (for example, Canada and Australia) enjoyed lower risk premiums in the period from 1870 to 1914 relative to countries that went “on” and “off” gold (for example, Brazil).³⁰ Our results indicate not only that the gold standard was important for Japanese foreign debt, but also that other more dramatic institutional reforms were not.³¹

²⁷ Suzuki, *Japanese Government Loans*.

²⁸ In Sussman and Yafeh, “Gold Standard,” we explore the post-Gold-Standard integration of Japan into world capital markets in more detail.

²⁹ Gregory, “Russian Balance of Payments.”

³⁰ Bordo and Rockoff, “Gold Standard.” This view is challenged by Flandreau, Le Cacheux, and Zumer (“Stability?”), who argue that interest-rate convergence enabled the adoption the gold standard rather than the other way around.

³¹ The promulgation of the Civil Code in 1896 (three chapters) and 1898 (two more chapters), could have also affected the risk premium in the period around the adoption of the gold standard. We believe,

Geopolitical Events

The financial impact of the Sino-Japanese War (ending in dramatic Japanese victory and a 38-million-pound indemnity) is described in Figure 3.³² The outbreak of the war caused an immediate 10-percent spike in yields (Table 3), but this quickly subsided and the risk premium returned to “normal,” as did the volume of Japanese debt issued in London. The market, it seems, could not make much out of these internal Asian affairs, and did not view Japanese success in this war as a sign of economic modernization.³³

Another geopolitical event that affected the risk premium was the British-Japanese military alliance of 1902. The London market welcomed the treaty enthusiastically, and the Japanese risk premium fell by 7 percent (see Table 3).

The geopolitical event that had the strongest impact on the cost of raising capital in the London bond market was the Russo-Japanese War, as shown in Figure 4.³⁴ In the historiography of modern Japan, this war is often described as a major watershed. Not only did the war prove Japan’s military might, it also proved its capacity to produce armaments, and was followed by a “boom” for Japan’s heavy industries.³⁵ In terms of Japanese debt, the war with Russia seems to have had both a short- and a (relatively) long-term effect: Before the war, Japan was perceived as the “underdog,” and yields on Japanese government bonds rose dramatically, reaching the highest level of the decade in early 1904. Subsequent Japanese victories led to a decline in the bonds’ perceived risk; the risk premium returned to its prewar levels in 1905 and continued to decline, albeit slowly, until about 1910 (see Figure 1).³⁶ The

however, that this is highly unlikely because the Civil Code was never discussed in the British press, and also because its promulgation is barely mentioned in *any* history of Meiji Japan of which we are aware. In addition, the risk premium may have declined if the increase in Japanese borrowing made the bonds a more “liquid” asset, although there is no evidence of illiquidity prior to the gold standard. Finally, the adoption of the gold standard was accompanied by restrictive monetary policy by the Bank of Japan that may have contributed also to the decline in the risk premium.

³² In this case the short-run impact of the war is estimated using a dummy variable that equals one only in the month in which the war broke. The long-run effect of the war is measured using a dummy variable that equals one from the end of the war through the end of the “window.”

³³ This was despite an interesting report in the *Economist* (26 January 1895), in which the results of the war with China were described as evidence that Japan’s military might was comparable to that of a European power. A possible reason for the absence of long-term impact may be the approaching maturity of the 1873 bonds, which may have prevented bond yields from declining in response to the victory over China.

³⁴ Because of the war’s length, the “window” around it is two years wide. As in the war with China, the short-run impact of the war is estimated using a dummy variable that equals one only in the month in which the war broke out. The long-run effect of the war is measured using a dummy variable that equals one starting from the battle of Port Arthur (which established Japan’s victory in the war about half a year prior to its formal conclusion) through the end of the “window.”

³⁵ Yamamura, “Success Ill-Gotten?”

³⁶ Our statistical test confirms that the war had both short-term effects (an initial increase in perceived risk) and a long-term “certification of quality” effect which led to further decline in the risk premium

war with Russia was followed by an increase in the Japanese government's ability to borrow abroad that was much more important than the relatively small decline in yields. Sovereign debt increased from about 200 percent of government revenues around 1900 to over 400 percent in 1905. Most of the new debt was issued abroad: foreign debt accounted for about half of total outstanding Japanese debt after the end of the war with Russia, compared to about one-fifth around 1900 (see Figure 2). Foreign debt could now be issued in foreign bond markets other than London, such as Paris, New York, Hamburg, and Berlin; and indeed, the Japanese government launched five issues within a period of nineteen months. Japanese bonds accounted for about one-fifth of new sovereign debt issues in London during this period. New long-term bonds at low interest rates quickly replaced the costly, short-term bonds issued during the war. Moreover, following the victory over Russia, foreign debt was issued not only by the Japanese government itself, but also by quasi-governmental institutions (such as Tokyo Harbourworks, Osaka Electric Tramway, the South Manchurian Rail Company, and the Imperial Industrial Bank of Japan), municipalities, and even some private Japanese companies (such as Kanegafuchi Spinning). And there is yet more evidence of the war's impact. Underwriting commissions on Japanese bonds, another measure of risk, declined by an extraordinary one-third after the victory over Russia; furthermore, the Japanese government was no longer required to back its debt with securities (such as future customs receipts) deposited in London.³⁷

The fact that military victory over Russia improved Japan's credit rating was stated explicitly in many news articles. For example, after 1905 there was concern in Britain over the burden of Japan's war expenditures. The *Economist*, however, advised its readers not to worry because "the sagacity with which the finances of Japan have been administered during a period of stress and anxiety is a good augury. . . ." A later article, titled "Japan as a Borrower," explained the "phenomenal success" of Japan's loan operations as "due about equally to the enhanced reputation of Japan by reason of her military and naval exploits, and the skillful manner in which her loan flotations have been conducted . . ."³⁸ It seems

associated with Japanese debt. It should be noted, however, that the analysis of the Russian war "window" overestimates the true effect of the war on yields. Table 3 suggests a long-run decline in the risk premium of about 9 percent from the end of the war onwards, yet Figure 1 indicates that much of the postwar decline reflects a return to prewar levels not captured by the relatively short war "window." The fact that the risk premium stopped falling around 1910 was probably due to poor market conditions (even for British issues), or due to a failed bond floatation that resulted in undersubscription (Suzuki, *Japanese Government Loans*). Another possible reason is the increase in the Japanese government's budget deficit towards the end of the Meiji period.

³⁷ Suzuki, *Japanese Government Loans*; and Tamaki, *Japanese Banking*.

³⁸ *The Economist*, 23 February 1905, p. 2072, and 20 July 1907, p. 1212.

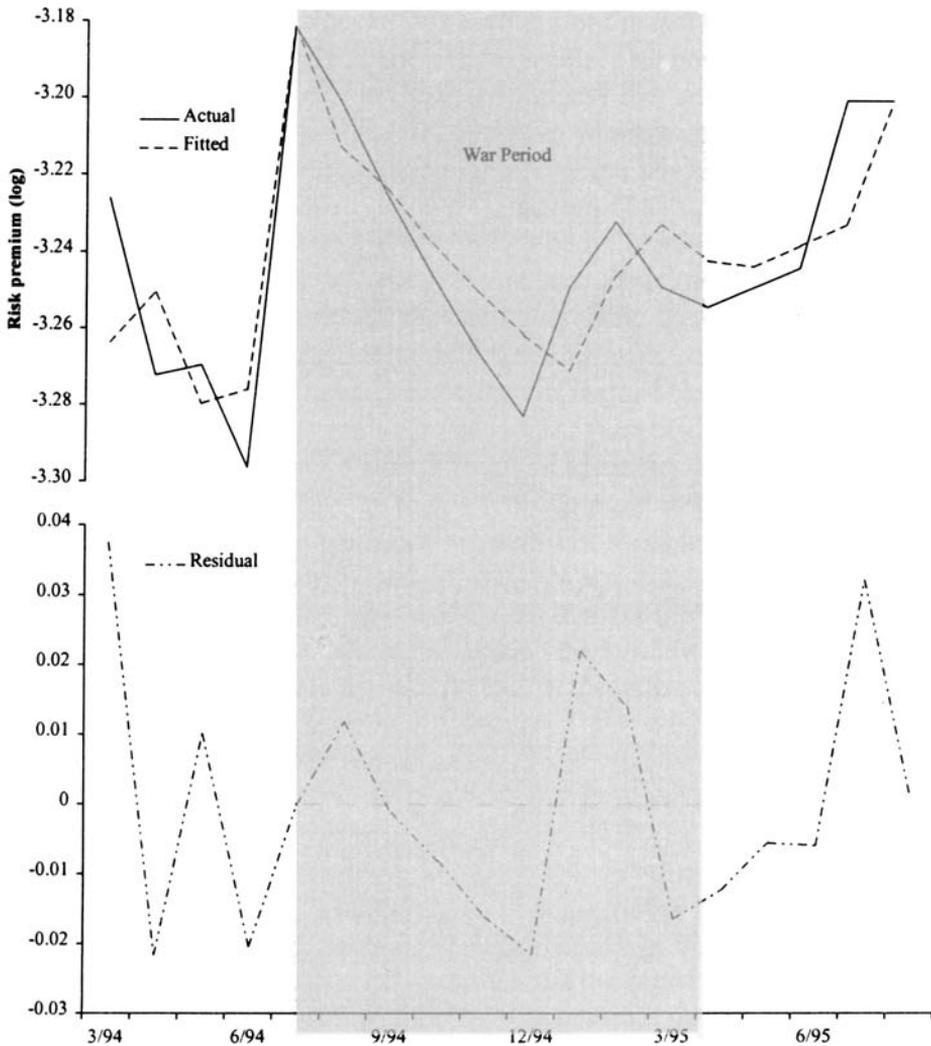


FIGURE 3
SINO-JAPANESE WAR, JULY 1894–APRIL 1895

Sources: See the text.

that Japan could withstand investors' concerns (expressed in many news articles) regarding its increasing fiscal deficit after 1905 because of the reputation acquired during the war with Russia.³⁹

³⁹ In addition to the political events examined in this section, it is also possible to investigate the effect of political assassinations (as indicators of internal stability) on the risk premium. We find that the most important political murder of the period, the assassination of Prime Minister Ito Hirobumi in 1909, had a positive effect on yields, albeit this effect was of only slight statistical significance.

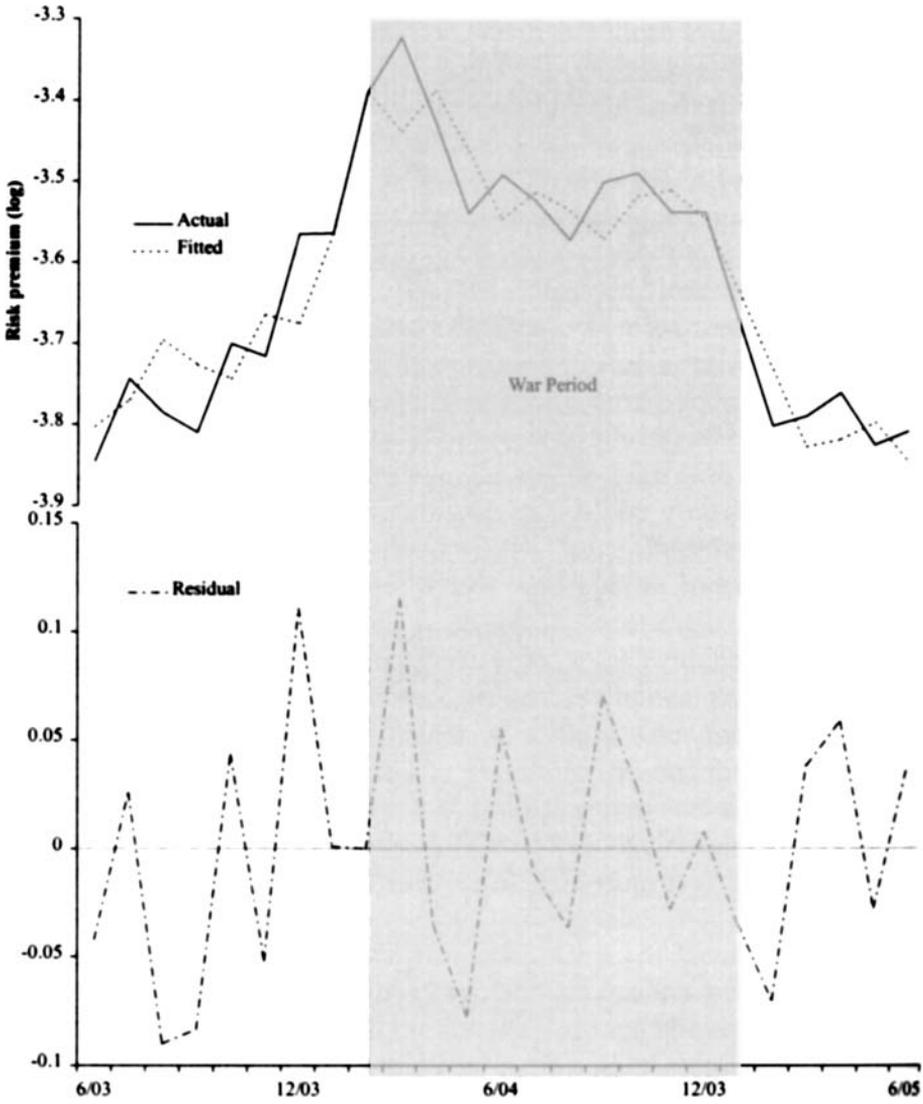


FIGURE 4
RUSSO-JAPANESE WAR, 1904–1905

Sources: See the text.

Robustness Tests

How sensitive are our results to alternate specifications? First, recall that Perron-style tests tend to accept breaks too easily. Despite this, among the many institutional reforms after 1873 only the gold standard is associated

with a major break. Can expectations account for the fact that the reforms of the 1880s had such a small impact on debt yields? Did breaks occur at dates prior to official announcements of major changes? We have sought out other dates during the institutional reform period in which a major change in the risk premium occurred, and have found none. First, it is clear from Figure 1 that the entire period of institutional reform from 1881 to 1891 was characterized by stable yields, and there seems to be no break prior to the major reforms. More formally, following Christiano, Zivot, and Andrews, it is possible to search for breaks in the yield data using the “iterative-search” and the “moving-windows” methods.⁴⁰ Both methods confirm that institutional reforms had little impact on yields. No major breaks (other than the introduction of silver-convertible notes in 1885) can be detected during the reform period. The “iterative-search” method identifies the outbreak of the war with Russia as a (relatively minor) turning point in the Gold-Standard period; the “moving-windows” method identifies short-term “blips” around both the Sino-Japanese and Russo-Japanese Wars, but overall conclusions remain unchanged.⁴¹ Finally, no breaks (other than the introduction of silver-convertible notes) are detected in the 1880s when yield-to-maturity data or the *Economist*’s yield series are used instead of the ratio of interest payments to price (see Appendix Figure 1).

Long-Run Analysis

Table 4 focuses on factors determining the risk premium and the composition of Japan’s sovereign debt (foreign and domestic) in the long run. First, it establishes that the risk premium on Japanese debt was “rational.” The positive relation between the risk premium and the ratio of debt to GNP, as well as the government deficit (Column 1) suggest that the effects of macroeconomic factors on Japan’s risk premium in the Meiji period were similar to those estimated by Edwards for the late twentieth century.⁴² Column 2 describes the relation between the risk premium and the information British investors had on Japan: The higher the fraction of *London Times* articles reporting on political instability and wars in Japan, the higher was the risk premium demanded by investors.

As for the composition of Japan’s sovereign debt, Column 3 indicates the existence of a negative relation between the ratio of foreign to total debt and the risk premium.⁴³ Although there are many factors that could affect the choice between foreign and domestic debt, this finding clearly shows that

⁴⁰ Christiano, “Searching”; and Zivot and Andrews, “Further Evidence.”

⁴¹ As explained in note 12, we choose not to use a formal test in the case of the gold standard itself, but instead divide the sample into the pre- and post-adoption periods.

⁴² Edwards, “Pricing.”

⁴³ The data on foreign debt probably also include yen-denominated bonds sold abroad.

TABLE 4
LONG-RUN CO-INTEGRATION RESULTS, 1871–1913:
ANNUAL DATA ON THE RISK PREMIUM AND JAPANESE FOREIGN DEBT

Variable	Risk Premium, 1885–1913 (1)	Risk Premium, 1871–1889 (2)	Foreign Debt/ Total Debt, 1871–1913 (3)
Constant			-1.24
Debt-to-GNP Ratio	0.00015 (0.000016)		
Government Deficit	0.00015 (0.000024)	0.0004 (0.0001)	
Newspaper Articles on Instability		0.004 (0.0008)	
Government Debt		0.0000001 (0.00000002)	
Interest-Rate Differential			-36.71 (8.49)
<i>N</i>	26	27	37
Likelihood ratio	40.02	46.70	20.07
1%-critical value	29.75	45.58	20.04

Notes: Standard errors are in parentheses. The risk premium is defined as the annual average of the difference between Japanese bond yields and the yield on British Consols. "Newspaper Articles on Instability" is defined as the number of articles dealing with political instability and wars in a given year, expressed in ratio to total number of Japan-related articles published in that year.

Sources: The ratio of foreign debt to total debt, the government deficit, and GNP, available only starting in 1885, are adapted from Bank of Japan, *Hundred Year Statistics*. Newspaper articles are drawn from the *London Times*.

when interest rates in London declined, the Japanese government borrowed more abroad and less domestically.⁴⁴ The fact that the Japanese government borrowed more at a lower cost implies that it was responding rationally to changes (such as the gold standard) that lowered the cost of foreign capital. If interest rates were to respond to "exogenous" changes in composition of Japanese debt, one would expect a positive relation between the risk premium and foreign borrowing: as Japanese debt increased, so would its cost.

Figure 5 sheds more light on the development of foreign and domestic borrowing. During the period of institutional reform, the Japanese government preferred to borrow at home and to liquidate much of its foreign debt.

⁴⁴ One possible reason for the Japanese government's reluctance to issue foreign debt before 1897 could be the weakness of the yen (the value of which declined with the world price of silver) in the 1880s (Okazaki, *Kogyouka*). The desirability of foreign debt could also have been influenced by political considerations, such as fear of foreign intervention in domestic affairs. In addition, the cost and availability of domestic debt may have impinged on the decision to borrow abroad: Lockwood ("Economic Development") argues that domestic resources were no longer sufficient to finance Japan's investment needs in the 1890s. Finally, Calomiris ("Motives") cites other factors that could affect the choice between domestic and foreign debt. The relative importance of these considerations is hard to evaluate. The market for government bonds in Tokyo during the Meiji period was "thin," and not much information is available on domestic bond yields before the twentieth century.

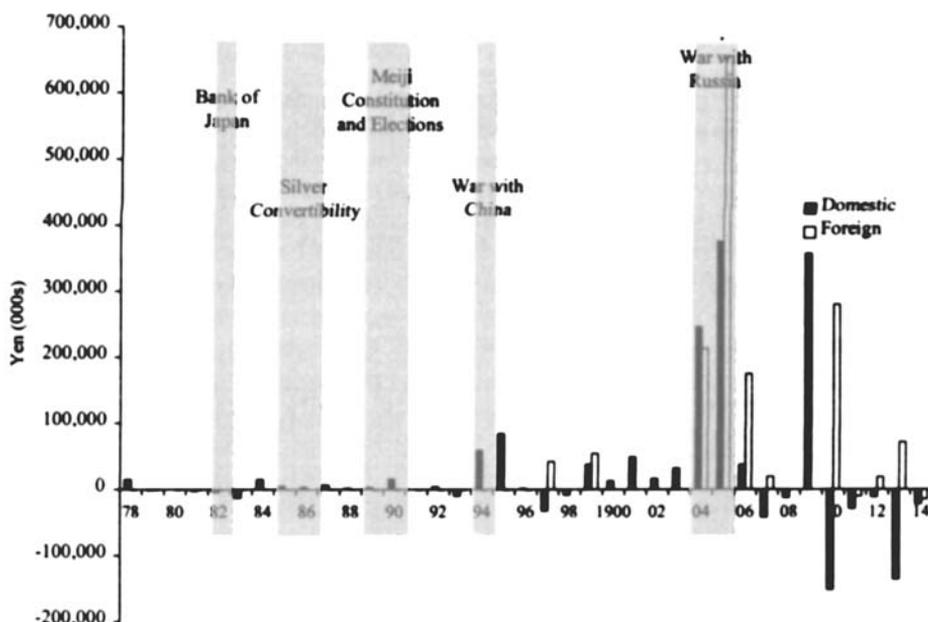


FIGURE 5
JAPANESE GOVERNMENT BORROWING, 1878–1914

Sources: See the text.

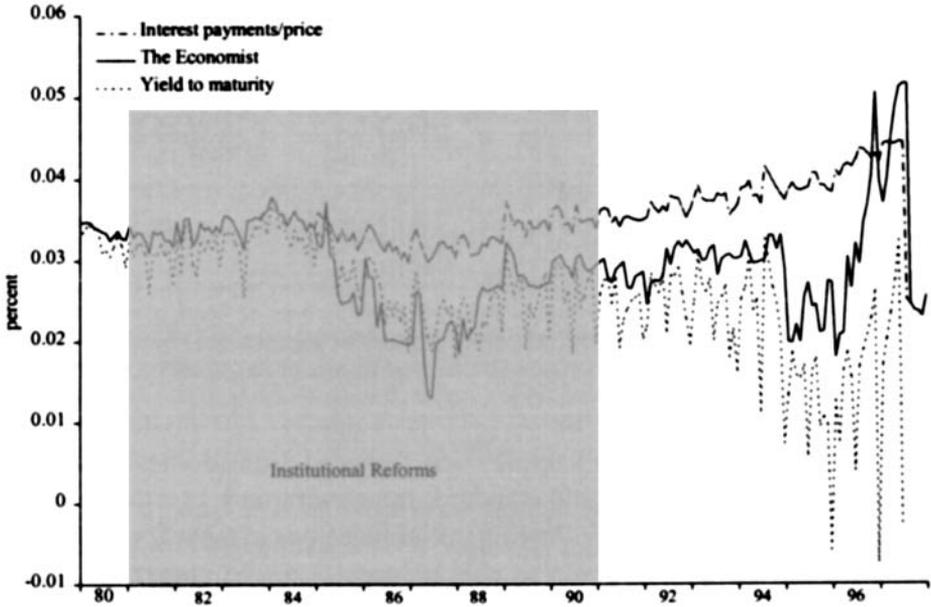
The war with China, for example, was financed from domestic sources. After the adoption of the gold standard, the government borrowed abroad and retired domestic debt. Following initial successes in the war with Russia, in particular, the government was able to increase the volume of its foreign debt, and eventually to retire the domestic debt it had incurred during the war. This analysis of “quantities”—the volume of debt—confirms that institutional reforms prior to the gold standard were not sufficient to enable the Japanese government to raise substantial amounts of capital abroad.

CONCLUDING REMARKS

Institutional reforms in developing countries are difficult to evaluate. This is why nineteenth-century investors relied on credible “summary indicators,” in this case the gold standard and the military victory over Russia, to evaluate the creditworthiness of faraway Japan. This suggests that institutional reforms are important for economic growth, but that they only affect the cost of foreign capital when incorporated into well-understood “indicators.” A similar pattern seems to exist today. Moody’s rating or agreements with the IMF have replaced the gold standard as symbols of sound economic policy and creditworthiness.

Appendix: Alternative Yield Estimates

An alternative estimate of bond yields for the pre-1897 period is yield to maturity (“buy and hold” returns). In addition, contemporary issues of the *Economist’s Investors’ Monthly Manual* also include yield data which differ somewhat from the other two calculations, and appear to be more volatile. Although the method of calculation was never made explicit, we examine this series as well, as it may have reflected the views of contemporary investors. The three series are identical before 1880 and after 1897, and are closely correlated in the 1880s, but they differ in the years before the bond redemption of the mid-1890s (see Appendix Figure 1). Nevertheless, the method of calculation does not affect qualitatively any of the conclusions reported in the text.



APPENDIX FIGURE 1
 ALTERNATIVE ESTIMATES OF THE JAPANESE RISK PREMIUM, 1880–1897:
 JAPANESE GOVERNMENT BONDS vs BRITISH CONSOLS

Sources: See the text.

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