Why did Countries Adopt the Gold Standard?
Lessons from Japan

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Abstract

Why did policymakers adopt the gold standard? Although previous research has identified *ex post* effects of gold standard adoption on trade and bond yields, few studies have sought to understand whether these were the actual outcomes of interest to policymakers at the time of adoption. We examine Japan's adoption of the gold standard in 1897 to understand both the *ex ante* motives policymakers gave for wanting to go onto the gold standard and the ex post effects of gold standard adoption. By focusing on multiple outcome variables that were of interest to contemporaries, we are able to shed light on the political economy of the adoption of fixed exchange rates. In contrast to previous studies examining bond yields, we find little evidence that joining the gold standard reduced Japan's country risk or that it resulted in a domestic investment boom. On the other hand, we find that membership in the gold standard increased bilateral trade flows. The boost in trade appears to have been largest between Japan and its trading partners on the silver standard, suggesting that the depreciation of gold against silver from 1897-1914 increased the competitiveness of Japanese exports.

Why did Countries Adopt the Gold Standard?
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Why did countries join the gold standard? Recent research in economic history has generally focused on two explanations. Bordo and Rockoff (1996) argue that adherence to the monetary rule was "a good housekeeping seal of approval," which signaled to international capital markets that countries were committed to pursuing prudent monetary and fiscal policies.[1] Investors rewarded countries that joined the gold standard by lowering their cost of capital in financial markets by approximately 30 basis points (Obstfeld and Taylor, 2003). Another explanation for joining the gold standard focuses on the importance of fixed exchange rates in facilitating international trade. Flandreau and Maurel (2005) and Meissner and Lopez-Cordova (2003) provide evidence that the gold standard increased bilateral trade flows between 50 and 100 percent during the period 1870-1913. These studies argue that the hard peg promoted international trade perhaps by reducing transaction costs or exchange-rate volatility.[2]

To date, most empirical studies have analyzed the effects of gold standard adoption on a single outcome variable, such as trade or government borrowing costs.[3] While partial equilibrium studies allow one to correlate economic outcomes with the adoption of a hard peg, they fail to give insight into why a country chose to go on the gold standard. *Ex post* evidence of lower borrowing costs or increased trade suggests

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[1] Flandreau and Zumer (2005) and Ferguson and Schularick (2006a, 2006b) provide evidence that the gold standard did not reduce the cost of capital during the gold standard period using a large sample of countries along with additional control variables in their regressions.

[2] The precise mechanism is not specified.

[3] Meissner (2005), is an exception, in that he considers multiple factors that affected a country's decision about when to adopt the gold standard. However, he is primarily concerned with the process of gold standard diffusion rather than the political economy of adoption, and does not explicitly consider why countries adopted and how the decision to adopt then impacted economic outcomes such as borrowing cost, investment, and trade flows.

correlation, but not motivation. To understand why countries would willingly choose to tie the hands of their monetary authorities and join the gold standard, it is necessary to examine the policy debates at the time of adoption, and then test whether adoption had the intended effect or unintended consequences.

In this paper, we argue that examining countries on a case-by-case basis can provide better insight into understanding why countries adopt hard pegs such as the gold standard. By focusing on the experience of a single country, we are able to link contemporaneous policy arguments to multiple outcomes and avoid the *post hoc ergo propter hoc* fallacy that plagues the cross-country literature. We focus on Japan's adoption of the gold standard in 1897 for three reasons. First, late nineteenth-century Japan has many of the characteristics of today's emerging market economies: it was a small open economy with an expanding trade sector and a desire to borrow in international capital markets. Examining Japan's experience may help us better understand the decision making of countries that adopt hard pegs today. Second, Japan's historical archives provide detailed information on the political economy of gold standard adoption and the role of special interest groups in the decision making process. Furthermore, primary source materials from the nineteenth century also permit us to collect high frequency price and yield data on domestic stocks and bonds as well as annual data on bilateral trade flows that can be used to test the economic effects of gold standard adoption. Third, previous researchers have argued that Japan is the canonical case of an emerging market borrower benefiting from lower borrowing costs after adoption of a hard peg. For example, Sussman and Yafeh's (2000, 2006) find that sovereign risk fell by approximately 200 basis points when Japan joined the gold club.

Using a more complete database of Japanese sovereign debt and domestic debt issues, we are able to re-assess whether borrowing rates actually fell after adoption.

Our empirical analysis suggests a revised interpretation for why Japan adopted the gold standard and what effects its adoption had on the economy. Although some participants in the parliamentary debates suggested that Japan would benefit from lower rates of borrowing, we find that, after Japan adopted the gold standard, its rates of borrowing in both international and domestic capital markets did not fall. Nor do we find evidence of a domestic investment boom in the wake of gold standard adoption.

Japanese policymakers of the nineteenth century also suggested that going onto gold would affect trade, but they were decidedly mixed as to whether it would increase it or reduce it. We find that both the opponents of adopting (who argued that Japan was receiving large benefits from being on silver) and proponents (who argued Japan would benefit from lower transactions costs and exchange rate volatility) were correct. Estimates from a gravity model of bilateral trade suggest that Japan received a large boost in trade when Japan and its partners were on the silver standard. However, gold standard adoption also significantly boosted trade, even after controlling for other factors. As it turns out, Japan was lucky. It went onto gold at precisely the time when the rate of silver depreciation against gold began to significantly decline.

The next section of the paper provides a brief discussion of the events leading up to Japan's decision to go on the gold standard and the debates among Japanese policymakers over the adoption of the gold standard. Section III examines evidence from bond markets in both London and Tokyo to analyze the impact of gold-standard adoption on sovereign yield spreads. Section IV employs a gravity model to assess the impact of

adopting the gold standard on bilateral trade flows. Section V explores whether Japan experienced an investment boom after gold standard adoption. Section VI discusses the implications of our results for hard pegs and for the financial history of the Meiji period.

II. The Decision to Adopt Gold

During the Meiji period, Japan parted ways with its feudal past and began to forge a new national identity for its economy. It turned outward in its orientation (initially induced by the "gunboat diplomacy" of Western powers), developing industries and trading companies that sold products such as silk in overseas markets and borrowing internationally to fund internal improvements that would facilitate the movement of goods and people.[4]

At the same time Japan was forging a national economy, it was experimenting with institutions that would foster economic growth and stability. It introduced a national currency, the yen, in 1871. It imported the U.S. model of a national banking system in 1872, and in 1876, allowed these national banks to issue paper notes backed by government bonds. These early monetary institutions resulted in unsustainably high inflation rates in the late 1870s and early 1880s, and paved the way for the Japanese government to centralize control over the money supply. The Bank of Japan was founded in 1882, and thereafter, it began issuing convertible notes that hastened the demise of commercial bank note issuance. Japan adopted the silver standard in May 1885 and had made all yen-denominated paper money issued by the government convertible to silver by January 1886. The country stayed on the silver standard for eleven years.

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[4] Its first national debt, issued in London in 1870 financed railway construction.

Beginning in 1893, the government began preparation to join the gold standard. The veteran finance minister, Count Masayoshi Matsukata, initiated the program[5]. The government formed the Committee on the Monetary System to explore what monetary system would be best for Japan's economy in the long run. The committee was charged with determining the global causes of gold-silver price fluctuations and their consequences on the Japanese economy and recommending the monetary standard that would be best suited for Japan. As finance minister, Kunitake Watanabe, stated in setting up the committee, "Fluctuations in the price of gold and silver are having significant effects on the Japanese economy and fiscal conditions. I propose to set the committee on the monetary system…and the government will refer to it for building its strategy on monetary matters."

After seven general meetings and 41 task force meetings, the committee submitted its final report to the returning and reappointed finance minister Matsukata, on July 3, 1895. Only one of the seven task force members, the protégé of Matsukata, insisted on an immediate move to the gold standard. Of the 15 members on the main committee (composed of government officials, business leaders, and academics), seven wanted to retain silver, six suggested moving to gold at some point in the future, and two desired a bimetallic standard. Most of the supporters of gold standard adoption were bureaucrats and politicians with close relationships to Matsukata whereas opponents were largely business leaders and academics. Despite the tepid response by the committee, Matsukata continued to press for monetary reform, and was emboldened to do so once China was forced to pay a large indemnity to Japan at the conclusion of the Sino-

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[5] Matsukata played a central role in implementing the monetary and financial reforms of the Meiji era. As an official of Ministry of Finance, he helped to engineer the fiscal stabilization program of the 1870s. As Finance Minister, he also initiated the movement to establish the central bank, the Bank of Japan.

Japanese War in 1895. Matsukata's strategy was to request that China pay the indemnity in pound-sterling in London even though the original treaty stated it would be paid in silver taels. The pound sterling would then enable Japan to acquire gold reserves so that it could move onto the gold standard.

After two years' preparation for introducing the gold standard, including acquisition of gold reserves in overseas markets, in March of 1897, the ruling government (led by Matsukata, who had been both Prime Minister and Finance Minister since September 1896) officially submitted legislation to the Imperial Diet authorizing a gold standard.

Once the bill was introduced, fierce debate erupted in the legislative branch of the Japanese government. Although a relatively new political institution, the Japanese Imperial Diet of the 1890s served as a counterweight to the Prime Minister-led positions of the Emperor's ruling government (Muramatsu, Ito, and Tsujinaka, 2001, p.82).[6] During the 1890s, the Diet routinely rejected and cut the budget prepared by the ruling government, including military projects. In contrast, the military was not a major political player until at least the end of the Russo-Japanese War (1904-5).[7]

National legislators such as Atsushi Kawashima, a member of *Giin Kurabu* [Assembly Members' Club], a political faction that supported the ruling government backed Matsukata's position, and made spirited arguments in favor of adoption.[8] For

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[6] Under the Meiji Constitution of 1889, the first national election of House of Representatives (the Lower House) was held in July 1890. The first Diet session was in November 1890. Prime Ministers were appointed by the Emperor with the consultation to Senators (*Genro*), or veterans of Meiji Restoration of 1868.

[7] Harada [2007], pp.34-42.

[8] Atsushi Kawashima (1847-1911) was a member of House of Representatives. His career demonstrates close ties with Matsukata. He was born in Kagoshima, the same prefecture as Matsukata. He had served in the Ministry of Finance before being elected from his home region in the first national election in 1890. He was a member of the previous Committee on the Monetary System, and. he supported the gold standard

example, Kawashima argued that the "financial credibility would be improved." He opined that it would not only enhance Japan's military power and domestic economy, but it would stabilize Japanese finances. Japan's yen-based payments would not be subject to exchange-rate risk. Kawashima suggested that adopting gold would enhance foreign investors' credit on Japanese government debts and help Japan attract foreign capital at reduced rates. He argued cheap and affluent foreign capital could be used to build up a stronger military and promote domestic business activities.[9]

Legislative proponents also argued that going on gold would enhance trade. For example, Kawashima commented that "to compete with other countries in the trade sphere, we must have the common world currency as others do…The gold standard is beneficial for the development of commerce and industries. Japan's main trading partners are the gold-standard countries."[10] Ministry of Finance officials had drawn similar conclusions in the 1895 report, arguing that "many of the once-famous silver standard countries such as Mexico…have already moved to the gold standard. These trends indicate the natural course for Japan in financial and economic spheres" (Sakatani, Appendix to Final Report of the Committee).[11]

In addition to the benefits arising from what are now referred to as network externalities, Kawashima suggested that gold standard adoption would reduce exchange rate volatility for countries sharing the same monetary standard as well as currency risk.

upon the voting on the committee's final report. During the debate in the Diet in 1897, he belonged to a political fraction named Assembly Members' Club (*Giin Kurabu*), which supported the ruling government. In June 1897, two months after the passage of the bills introducing the gold standard, he resigned to become the first Governor of Japan Hypothec Bank (*Nihon Kangyo Ginko*), which was also established under Matsukata's leadership.

[9].Imperial Diet (1897), reprinted in Bank of Japan (1960 pp.133-134). Other policymakers, however, suggested this was unnecessary as Japan could simply issue debt denominated in gold.

[10] Imperial Diet (1897} reprinted in Bank of Japan (1960, p.135).

[11] Committee on the Monetary System (1895) reprinted in Bank of Japan (1957, p.901).

"Japan has suffered from fluctuations in domestic prices induced by exchange rate fluctuations. The price fluctuations induced by exchange rate fluctuations will disappear under the gold standard. Foreign banks have got substantial premium on foreign exchange transactions of Japanese companies. The Japanese companies do not have to pay such premium once we introduce the gold standard. Foreign buyers of Japanese products will request the products more if the prices of the products are stable under the gold standard." [12] Similarly, Juichi Soeda, Counselor of the Ministry of Finance, concluded: "Unless we could remove the exchange rate risk, we could not expect proper development of Japanese foreign trade."[13]

Proponents of the gold standard suggested that adoption might also lead to an investment boom: "If we introduce the gold standard, foreign capital will invest in the Japanese markets and buy Japanese government bonds and private securities, and the Japanese commerce and industries will be booming."[14]

In introducing the authorizing legislation, Matsukata summed up the Cabinet's position: "First, fluctuations of prices will be smaller under the gold standard than under the silver standard. Second, the introduction of the gold standard will promote trade, especially with other gold standard countries. Third, the introduction of the gold standard will reduce exchange rate risk with gold standard currencies. Fourth, the gold standard will connect the Japanese financial market to overseas markets. As our country has been

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[12] Imperial Diet (1897) reprinted in Bank of Japan (1960, p.135).
[13] Imperial Diet (1897)reprinted in Bank of Japan (1960, p.158).
[14] Comments of Atsushi Kawashima. Imperial Diet (1897), reprinted in Bank of Japan (1960, p.136).

developing, we need more communication with overseas financial markets. Fifth, the introduction of the gold standard will benefit public finance."[15]

While the proponents of going onto the gold standard had the powerful backing of Matsukata and the Ministry of Finance, many other legislators believed that adopting the gold standard would hurt the Japanese economy and that the timing was not propitious. They noted that the majority opinion of the 1895 report had concluded that recent fluctuations in the gold-silver price (while Japan was on the silver standard) had increased the volume of exports, reduced the burdens of debtors and fixed-tax payers, created a boom in agriculture, and led to prosperity in commerce and industry. As Eiichi Shibusawa, one member of the 1895 committee and a prominent business leader, wrote: "The exports to gold standard countries increased by more than 260 percent from 1878 to 1893 while the imports from these countries only increased by 70 percent over the same period. This is because the price of exports has fallen while the price of imports has risen. This has promoted the development of industries, technical progress, and growth in the demand for labor. These benefits exceed the costs of being a silver standard country." (Shibusawa, Appendix to Final Report). [16]

In the late 19th century, Emperor Meiji set national goals of "bringing more wealth to the nation, and building a stronger military (*fukoku kyouhei*)." Business leaders

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[15] Speech of Finance Minister Court Masayoshi Matsukata. Ministry of Finance (1905, pp.182-183). Matsukata may have also believed that adopting gold would increase the prestige and standing of Japan internationally, and that it was broadly consistent with the national goals of modernizing Japan's economy and military.

[16] Eiichi Shibusawa (1840-1931) was born into a family that was involved in sericulture located near Tokyo. After the Meiji Restoration, he joined Ministry of Finance and drafted the legislation to introduce a single unit of currency, the yen, and to establish the National Banking system. When he left the government in 1873 he established and/or run a number of Japan's leading companies, including First National Bank, Oji Paper, Osaka Spinning, Kanegafuchi Spinning, Tokio Marine Insurance, Nippon Yusen (NYK Line), Japan Railway, and the Tokyo Stock Exchange. He chaired Tokyo Chamber of Commerce from 1878 to 1905 and often represented the viewpoints of the business community in national political debates. In Japan, he has been referred to as "Father of Japanese Capitalism."

such as Eiichi Shibusawa argued that staying on silver would be consistent with those goals. Shibusawa wrote, "The effects of the recent fluctuation in parity of gold and silver are quite beneficial to our economy in general under the current monetary system. Japanese exports to gold standard countries have increased more than imports from them. This is because the price of exported goods falls, while the price of imported goods increases. This has promoted development of industries, import substitution of many products, technical progress, growth in the demand for labor, and expanded national wealth. These benefits exceed the costs of being a silver standard country. If Japan introduces the gold standard, prices would fall, and business conditions would deteriorate, affecting the economy and society badly." (Shibusawa, Appendix to Final Report).

Based on data from the 1890s, Japan's exports were concentrated in a few key commodities and industries. 41 percent of Japanese exports were silk products, and 27 percent were tea, rice, and matches.[17] The value added of these commodities was almost entirely domestic, and Japanese producers of these goods had realized significant benefits from the depreciation of the silver yen against gold-standard currencies. Indeed, the majority of industrial and commercial sector lobbied to stay on a silver standard. Writing in the *Quarterly Journal of Economics* in 1898, economist Garrett Droppers wrote the following about the business community's view on Japan's monetary standard: "From 1886 to 1897, a period of over a decade, it is doubtful whether there was the slightest demand for return to the gold standard. On the contrary, every so-called decline of silver was hailed with general satisfaction by those engaged in industrial and commercial pursuits."[18]

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[17] Figures are average shares of exports based on data from 1893-1897.
[18] Droppers (1898, p.164)

In contrast to exports, there was no single import that accounted for a large portion of total imports. Raw cotton accounted for 19 percent, sugar for 10 percent, machinery for 9 percent, and petroleum for 4 percent. Given that imports were used as inputs into a variety of products or were final goods sold to consumers, it may have been more difficult for policymakers to drum up support from the business community to jettison the silver standard, since no one industry was experiencing a disproportionate rise in input prices (due to the depreciation of silver).

Political opponents of the gold standard allied themselves with the business community to attack the government's plan. For example, Kungoro Shigeoka of the opposition Liberal Party argued that Japan's export industries would be hurt since the price of silver had been declining relative to gold while Japan was on the silver standard. He reasoned that the increase in exports outweighed the costs of exchange-rate volatility: "Although fluctuations in gold-silver exchange rates might induce some inconvenience for foreign trade, the advantages in competitiveness for the silver standard surpass the inconvenience effect."[19] Shigeoka also maintained that adoption of gold would commit Japan to persistent trade deficits driven by cheap imports and expensive exports (due to gold's appreciation relative to silver). Ironically, it was the export boom during the silver standard that may have enabled Japan to go onto the gold standard. According to Miller (2007), export revenues during the period of silver deflation enabled the Imperial Navy of Japan to purchase British cruisers, defeat China in the Sino-Japanese War of 1894-5, and acquire the indemnity payable in gold, which enabled Japan to go onto the gold standard.

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[19] The great Meiji era entrepreneur Shibusawa Eiichi also argued that Japanese businesses had benefited immensely from cheaper exports during the silver standard; he became the flag bearer of the business community's opposition to gold standard adoption (Metzler, 2006, p.30). In contrast, the Ministry of Finance argued that the benefits to trade and industry were only temporary.

In addition, Shigeoka argued the time was not right because Japan had no tariff autonomy. The so-called "unequal treaties" it was forced to sign with European powers and the U.S. in the 1860s limited its ability to set tariff rates on imports. He also argued that, even if going on gold would allow Japan to borrow at lower rates, these rates would only be temporary: the fall in exports to gold countries (due to leaving silver) would cause foreign investors to lower their assessment of Japan's growth rate and, in the end, result in Japan having to borrow at higher rates.[20]

Despite this opposition, Matsukata and his allies prevailed by forging strategic alliances with other political parties. In particular, when Matsukata formed the cabinet in September 1896, he offered the post of Foreign Minister to Shigenobu Okuma, the leader of the Progressive Party (another large political party in Japan). While not all Progressive Party members agreed with the government's position, Matsukata and his coalition government brokered a narrow majority that proved sufficient to carry the legislation forward.[21] The House Committee that was handling the legislation narrowly passed the authorizing legislation (14 to 12). The bill then cleared the House of Representatives and the House of Lords and was proclaimed law on March 29th.[22] The new currency act took effect on October 1, 1997.

Section III. Did Gold Standard Adoption affect Interest Rates?

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[20] Imperial Diet [1897] reprinted in Bank of Japan [1960], pp.129.
[21] For example, Ukichi Taguchi, a famous free market economist and a member of Progressive Party had insisted that Japan should move toward the bimetallic standard. He made speeches opposing to the gold standard and voted against it.
[22] Droppers (1898, pp.171-2) suggests that once the legislation came to the floor of the parliament, there was inadequate time to debate it, and legislators likely only had a hazy conception of the legislation's importance for the economy.

A. Hard Pegs and Sovereign Borrowing

The legislative and committee debates provide an understanding of why some policymakers looked favorably upon gold standard adoption for Japan. Many of the arguments made by policymakers in the 1890s are quite similar to those who advocate fixed exchange rates today: the ability to tap international capital markets at lower rates of borrowing, reduced exchange-rate instability, and greater trade. We now turn to assessing the consequences of gold standard adoption in order to examine whether policymakers' *ex ante* beliefs about the effects of the gold standard are consistent with realized outcomes. We begin with an assessment of the effects of gold standard adoption on sovereign bond yields.

Bordo and Kydland (1995) provided an interpretation of the role of the gold standard as it relates to the literature on rules for policymakers. They argue that joining the gold standard tied the hands of the fiscal and monetary authorities of a country, and that such a monetary rule can serve as a credible commitment mechanism to solve the classic time-inconsistency problem (Kydland and Prescott, 1985). Government policy is said to be time inconsistent when a policy plan that is determined to be optimal and to hold indefinitely into the future is subsequently revised. For example, suppose that a government sells debt to finance a war. From an *ex ante* perspective, it is optimal for the government to service its debt obligations. However, once the bonds have been sold, it is optimal for the government to default unless there is a commitment mechanism that ties the hands of the fiscal and monetary authorities. In the absence of a commitment mechanism, it is time inconsistent for the government to repay its debt obligations.

Private agents will anticipate the government's incentive to default and they will not buy bonds, forcing the government to rely on taxes or money creation. Overall, the existence of an enforcement mechanism, such as a credible threat to deny the government access to borrowing in the future, means that a socially optimal, but time inconsistent policy of borrowing can be supported as an equilibrium outcome.

Bordo and Kydland (1995) also argue that the gold standard had an escape clause. Countries could suspend specie convertibility in the event of a war or a fiscal emergency; however, after the war or extraordinary event, it was well understood that a country would return to specie convertibility at the pre-war parity. Generally, resumption occurred after a "reasonable" delay period during which a country would impose deflationary policies to retire fiat currency printed for war finance. The United States and France, for example, fought wars in the 1860s and 1870s and issued large amounts of irredeemable paper currency and debt. Following the end of the war, both countries imposed deflationary policies to restore convertibility following the cessation of hostilities, and both had returned to a specie standard by 1880. Bordo and Kydland (1995) conclude that the gold standard was a contingent rule with an escape clause.

B. Evidence on Japanese Sovereign Debt from International Capital Markets

One testable implication of committing to a policy rule such as the gold standard is that it should lower the cost of capital in international capital markets. Indeed, Japan's adoption of the gold standard has been frequently cited as a canonical case of the potential beneficial effects of joining the gold standard. Sussman and Yafeh (2000), for

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example, find that country risk of Japanese debt on the London market, defined as the current yield on a long-term Japanese bond minus the yield on the risk-free British consol declined more than fifty percent (or approximately 200 basis points) when the country joined the monetary rule in September 1897. They conclude that "the gold standard did significantly reduce the perceived risk associated with Japanese bonds (Sussman and Yafeh, 2000, p. 442)."

To carry out the empirical analysis of sovereign yield spreads, Sussman and Yafeh (2000) spliced the seven percent Japanese sterling bond issued in 1873 and paid off in 1897 with an unspecified long-term bond issued in 1897 or thereafter. They argue that this is the best approach for testing the effect of adopting the gold standard on Japanese yield spreads since "data on domestic bond yields do not exist for Japan until the beginning of the twentieth century" (Sussman and Yafeh, 2000, fn 9, p. 446). Their unspecified debt series that begins in 1897 is most likely the Imperial Japanese five percent bond of 1897 (fully redeemed by 1950) since it was the only debt issue actively traded on the London market that fits the time series plot shown in their paper. Figure 1 graphs these two bond series, where we have spliced them together as in their article. Using the current yield on the seven percent sterling loan and the five percent bond issue that appeared on the London market in October 1897, there appears to have been a dramatic fall in interest rates.

Unfortunately, there are several problems with splicing the two different bond series that cast doubt on using these to infer the behavior of interest rates pre and post gold standard adoption. First, the Japanese government retired the seven percent sterling issue in the first half of 1897 through a drawing and then sold new long-term five percent

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bonds that would be completely redeemed by 1950 in the second half of the year.[23] Japan

had long planned to retire the bond issue in 1897, which means that the drawing had no

connection with the country's decision to join the gold standard except for the fact that

the two events coincidentally took place in the same year (Ministry of Finance, 1904).

Importantly, the redemption provisions of the seven percent debt issue placed a floor on

interest rates of seven percent because investors knew that the bonds would be redeemed

at par (where par=100) by April 1897. This means that the current yield provides little

evidence about the Japanese cost of capital since bond market investors would

necessarily take a capital loss if they purchased the seven percent bond at a price above

par.

Second, the *Economist* and *IMM*, two of the most important financial newspapers

in London, reported very little trading activity in Japanese bonds between July 3 and

October 23, 1897, the period when Japan joined the gold standard. This is because the

holders of this bond issue were able to obtain a higher yield relative to short-term market

interest rates given that the debt issue was so close to maturity. They had little incentive

to sell the bond in the market. This again implies that little information can be gained by

examining the yields of these two bond series at this time. In summary, combining two

bonds with different maturities, one with a duration of less than a year and another with a

duration as long as 53 years, is simply not an accurate method for measuring the effect of

the gold standard on the cost of capital. It is particularly problematic when the bonds are

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[23] Bond markets investors were clearly aware ahead of time that the Japanese government intended to
redeem the bond issue by April 1897. In the original contract at the primary issue in 1873, the Japanese
government announced it would redeem the bond issue at par by 1897 (Ministry of Finance 1904, p.621).
This information was reported in the Official Stock Exchange Intelligence (see Official Stock Market
Intelligence, 1896, p. 215).

spliced together in the same year that Japan was adopting the gold standard – i.e., the year in which we want to identify the "event."

An alternative to relying on flawed data is simply to use a single bond issue that was trading both before and after gold standard adoption. If one examines the *Investors' Monthly Manual,* the five percent Consolidated Loan bond was traded on the London Stock Exchange around the time of adoption.[24] Not only is this bond quoted in London, but contrary to Sussman and Yafeh's assertion that there were no relevant domestic bond issues, this bond was originally issued in Tokyo and actively traded on the Japanese market. It began trading in London July 1896 and had terms similar to the other bonds sold by the Japanese government on the British market in 1897. The Consolidated Loan bonds had a maturity length of 50 years and were callable after five years. The only significant difference between the Consolidated Loan and bonds sold by the Japanese government immediately after gold standard adoption was that some of the post-adoption bond was endorsed to be paid in sterling.[25] Matsukata's (1899) book on gold standard adoption confirms the existence of this domestic Consolidated Loan bond (Table L, p.378). Figure 2 shows that, contrary to the assertion that yields fell after adoption, country risk *increased*. In March 1897, the Consolidated Loan Bond traded at the average price of 105.5 pound with par value of 100 pounds. After the proclamation of the gold standard, the price dropped month by month to 95.875 pounds in August. In October, the price rebounded a little to 99.25 pound, but then continued its decline. It traded at 97 pound in December 1897.

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[24] This bond listed in the *IMM* as the "92-3-5 red" bond.
[25] *Financial History of Meiji-Era, vol.8, National Debts* (1904, p.837).

C. Evidence on Japanese Sovereign Debt from the Domestic Bond Market

As we have indicated, previous scholarship has denied the existence of domestic bond issues during our sample period. Contrary to this assertion, this section presents evidence that an active and liquid market for domestic government bonds existed, and that prices and yields of these bonds can be used to clarify further whether Japan's adoption the gold standard had any effects on its borrowing costs.

From 1870-1896, the Japanese government issued seventeen bonds in the domestic market and two in the London Market. Although the Japanese government issued its first sovereign bond in London in 1870, it issued bonds in the domestic markets beginning as early as 1872. Beginning in the early 1870s, traditional money changers and pawnbrokers intermediated trades of government bonds over the counter, and as early as 1874-75, informal multilateral trading markets emerged in Tokyo.[26] At this point, the government decided to establish official stock exchanges in financial centers such as Tokyo and Osaka, and in 1878, stock exchanges in these two cities opened. The organizational structures of the Tokyo and Osaka exchanges were imported from Western exchanges, but many elements of day-to-day operational procedures were adopted from the long-standing rice trading market based in Dojima.[27] From their inception, the Osaka and Tokyo stock exchanges listed both government bonds and company stocks. In the late 1880s and early 1890s, the Japanese securities markets grew in volume and trading activity. Non-financial private investors more than doubled their securities holdings from

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[26] Shimura (1980, p.29).
[27] For example, they introduced three-month futures based on what had been developed in trading rice futures (Tokyo Stock Exchange, 1928, pp.2-3).

1886 to 1896. Japanese non-financial private sector ownership of financial assets increased from 265 million yen to 536 million yen between 1886 and 1896.[28]

The holdings of Japanese securities were widespread during our sample period. Private investors, including merchants and landowners, actively invested in domestic securities, and held large portions of government bonds and company stocks. As of the end of 1896, non-financial private investors owned 160-million-yen of government bonds (44 percent of the total outstanding) and 354-million-yen of company stocks (93 percent of total outstanding), while financial institutions owned 84-million-yen of government bonds and 27-million-yen in equities (Fujino and Teranishi, 2000). Anecdotal evidence also suggests that merchants and landowners in the countryside as well as in the cities traded securities on an over the counter basis.[29]

The Tokyo Stock Exchange (TSE) served as the central market in Japan. This market appears to have been well integrated with the rest of the world. Comparing the quotations for the Consolidated Loan bond in the London and Tokyo markets in Figure 2, we observe that the movements between the debt series are nearly identical. The minor differences between the interest rates probably reflect the fact that yields from the domestic Japanese market are computed from the average monthly bond price, while the yields for the London series are calculated from end-of-month prices reported in the *IMM*. Nevertheless, the Johansen Maximum Likelihood Procedure indicates that the null hypothesis of no cointegration can be rejected at the five-percent level of significance for

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[28] In this section, figures of financial assets are from Fujino and Teranishi (2000).
[29] For example, see Nakamura (2007).

the two interest rate series.[30] The two Japanese bond price series share a common

stochastic trend, suggesting that the London and Tokyo markets were integrated.

As of December 1896, TSE listed six government bonds, one municipal bond and

80 company stocks. Included in these domestically listed issues were two long-term

bonds that traded actively on the Tokyo exchange before and after the country adopted

the gold standard: (1) the previously mentioned five percent Consolidated Loan of 175

million yen that was sold at various dates between 1887 and 1895 and (2) the five percent

War Loan of 125 million yen that was issued to help pay for the Japanese War with

China in 1894-95. The two debt issues were to be redeemed in 1951 and 1910,

respectively. Both issues paid interest in silver yen before the country adopted the gold

standard in September 1897. After joining the monetary rule, the Japanese government

began making interest payments on its domestic debt obligations in gold yen. This means

that joining the gold standard could have also reduced exchange-rate risk, the risk

associated with changes in the value of the currency, in addition to country or political

risk.

Figure 3 shows the current yield for the two Japanese bond series from 1887-1910.

The two series are highly correlated and do not seem to significantly decline with the

introduction of the gold standard. Indeed, Figure 3 suggests that domestic interest rates in

Japan may have actually increased after the adoption of the gold standard.[31] Simple

summary statistics show that Japanese interest rates increased by approximately 30 basis

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[30] The estimated values for the λ_{MAX} and λ_{TRACE} test statistics were 15.20 and 17.12, respectively.
[31] Both the lambda max and lambda statistics indicate that the null hypothesis of no cointegration for yields of the Consolidated loan on the London and Tokyo markets can be rejected at the five percent level of significance.

points in the six months after the country adopted the gold standard.[32] As a robustness check, Figure 4 shows the interest-rate differential between Japanese bonds and the "risk-free" British consol. The interest-rate differential should help control for the effect of gold inflation that began in 1897-98. Again, the Japanese yield spread does not appear to decline with the adoption of the gold standard.

The time-series graphs suggest that joining the gold standard did not reduce sovereign risk for Japan. To formally test this hypothesis, we use structural break analysis and follow the procedure developed by Zivot-Andrews (1992). This allows us to test whether adopting the gold standard lowered the level, trend, or level and trend of Japanese interest rates and yield spreads. We specify a ten-year window around September 1897, the date Japan joined the gold standard, to test if the adoption of the gold standard reduced domestic interest rates. We do not specify a breakpoint *a priori*, given that the pre-selection of a change point biases the results towards finding a structural break (Christiano, 1992). The null hypothesis of the Zivot-Andrews structural break model, H_0, for a given time series process y_t can be written as:

(1) $y_t = \mu + y_{t-1} + e_t,$

where μ is the mean of a given time series and e_t is a white noise disturbance term. The three different alternative hypotheses, H_1, can be written as follows:

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[32] Japanese interest rates increased by about 15 basis points in the six months prior to Japan joining the gold standard.

$$(2) \quad \Delta y_t = \mu + \beta t + \theta DU_t + \alpha y_{t-1} + \sum_{j=1}^{k} c_j \Delta y_{t-j} + e_t$$

$$(3) \quad \Delta y_t = \mu + \beta t + \gamma DT_t + \alpha y_{t-1} + \sum_{j=1}^{k} c_j \Delta y_{t-j} + e_t$$

$$(4) \quad \Delta y_t = \mu + \beta t + \theta DU_t + \gamma DT_t + \alpha y_{t-1} + \sum_{j=1}^{k} c_j \Delta y_{t-j} + e_t$$

Equation (2) is a "crash" model that allows for a one-time change in the intercept at a break date denoted by TB. This specification captures a large drop in sovereign risk similar to the dramatic decline in Japanese interest rates found by Sussman and Yafeh (2000). Equation (3) is used to test for stationarity around a broken trend at TB. This specification allows for a gradual decline in sovereign risk if the "good housekeeping" effect of the gold standard is incorporated into interest rates over a long period of time. Equation (4) is the most general specification that allows for a change in the intercept and trend at TB.

DU_t is a dummy variable that captures the shift in the intercept and takes a value of 1 if t>TB. DT_t is another indicator variable that represents the shift in the deterministic trend at time TB. DT_t is equal to (t-TB) if (t>TB) and zero otherwise. To control for serial correlation, we also included lagged differences of the dependent variable as covariates in the three models. The number of lagged differences employed in the break tests is selected on the basis of the Akaike Information Criteria (AIC). In each of the three alternative hypotheses, y_t is assumed to be a stationary process with one structural break. The null hypothesis is rejected if the α_t coefficient is significantly different from zero.

The empirical results for the structural break tests of Japanese domestic interest rates and yield spreads are shown in Table 1. In all six regressions, the structural break test is not statistically significant at the five- or ten-percent level of significance. The absence of statistically significant results holds regardless of whether we allow for a change in the intercept, the trend, or the intercept and trend of interest rates and yield spreads. Only one of the breakpoints identified with the Zivot-Andrews test occurs within a few months of the introduction of the gold standard. Overall, and in contrast to what supporters of gold standard adoption argued, the empirical evidence suggests that the introduction of the gold standard did not lead to a significant decline in Japanese interest rates.[33]

Finally, if adopting the gold standard was meant to improve Japan's reputation in capital markets and allow it to issue more debt, the period directly after adopting gold is very revealing. Confident with the victory of the Sino-Japanese war and the introduction of the gold standard, the government floated a new ¥100 million bond issue in London in 1899, but the debt issue met with tepid response from foreign investors. Less than 10 percent of the primary issue was purchased in the London market. The Japanese government (with assistance from the Bank of Japan) responded by purchasing nearly 45 percent of the issue, with the underwriters having to absorb the remainder. Japan had believed its credit rating, after adopting gold was "between Germany and Italy," but according to Suzuki (1994) and Metzler (2006), it had overestimated its creditworthiness in foreign markets and later additional attempts to engage foreigners in purchasing these

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[33] We also tested Japanese interest rates and yield spreads for a structural break over the entire sample period 1887-1910. The results are reported in the Statistical Appendix. Again, we do not find evidence that the gold standard significantly reduced interest rates. We also are not able to reject the null hypothesis of a unit root in favor of a structural break model.

bonds (including attempts by J.P. Morgan and Co., Baring Brothers, and the Rothschilds) were rebuffed by investors.

Furthermore, archival evidence suggests that if, anything, the reason why Japan issued little debt in the 1880s and early 1890s had more to do with fear of being colonized by foreign creditor governments than it did with not being on gold. For example in July 1880, Former Finance Minister Shigenobu Okuma and former Internal Minister Hirobumi Ito jointly proposed the establishment of "the specie bank," which would be the Japanese equivalent of the Bank of England or the Bank of France. To this end, they proposed to issue a government bond which would be salable to foreign investors.[34] Internal Minister Matsukata strongly opposed this idea, writing in September, "We are now in a vulnerable position without having the independence of tariff and justice. If we depended on capital of foreigners, who are superior in knowledge and financial power, we should be in a big trouble even though we might see temporary inflow of specie. We would have nothing to do when Japan should be a country like Egypt, Turkey or India."[35] Matsukata turned down the proposal, and two years later, as finance minister, he established the Bank of Japan, which was purely domestic.

Section IV. How did Gold Standard Adoption affect Trade?

As identified by the parliamentary debates and the Committee on the Monetary System, policymakers also believed that trade would be impacted by the adoption of the gold standard, but there was considerable disagreement as to how it would affect trade.

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[34] Okuma (1880).
[35] Matsukata (1880).

Some believed that maintaining the silver standard was beneficial to trade as it enabled Japan to sell its exports more cheaply to gold standard countries. Others argued that adopting gold would be beneficial for trade as it would lower exchange-rate volatility and transaction costs. Other policymakers noted that the gains from being on silver were transitory, based on a favorable silver-gold price that would not persist, and that going on gold would at least permit Japan to trade among a global trade network that was organized around gold and not silver.

To test these three hypotheses, we estimate a gravity model of Japan's bilateral trade flows during the late nineteenth and early twentieth centuries. We collected data on bilateral trade flows between Japan and other countries from the *Principal Trade of Foreign Countries of the British Board of Trade Statistics* and from Japan's *Ministry of Finance, Annual Return of the Foreign Trade of the Empire of Japan*. These two primary sources contain more than 800 observations on Japanese bilateral trade flows with twenty-six of its main trading partners for the years 1877-1912. The sample contains data on bilateral flows between Japan and countries from Asia, Europe, North and South America including: Australia, China, French Indochina, Hong Kong, India, Korea, New Zealand, Philippines, Siam, Straits Settlement, Austria, Belgium, Denmark, France, Germany, Italy, Netherlands, Portugal, Spain, Switzerland, Russia, Turkey, Hawaii, United States, Canada, and Peru.

A gravity model is a very simple empirical relationship meant to capture the main effects of trade: mass and distance. As in a standard gravity equation, mass (measured here by the size of countries) is proportional to trade whereas distance should vary inversely. Given that we do not have GDP estimates for many of the dyadic trade pairs in

our sample, we use population as a proxy for mass which has been shown to have a correlation of nearly ninety percent with output estimates for the classical gold standard period (Mitchener and Weidenmier, 2007).

We augment the gravity equation with additional covariates which are meant to capture other influences on bilateral trade. We include railroad track miles to proxy for the importance of transportation infrastructure in promoting bilateral trade flows. We include a dummy variable to indicate whether Japan's trading partner is landlocked. Since some studies have indicated that war negatively impacts trade flows (Glick and Taylor, 2006), a war indicator variable is included to take into account the fact that Japan fought in two wars during our time period. The indicator variable takes on a value of 1 when Japan was at war with China (1894-95) or Russia (1904-05). We also include a dummy variable to capture differences in trade policy. In the 1860s, the United States and most European countries forced Japan to sign "unequal trade treaties," which in effect gave their exports the lowest tariff rates prevailing in Japan; but these countries did not reciprocate and grant Japanese exports the lowest prevailing rates in their markets. Hence, we code a Most Favored Nation (MFN) dummy variable two ways, depending on the dependent variable. If we are examining total bilateral trade, then the MFN dummy takes on a value of one for countries that forced Japan to sign a unilateral MFN agreement.[36] If our outcome variable is Japan's exports, then the MFN dummy takes on a value of one in cases where Japan has a reciprocal MFN arrangement (or in Korea and China where it imposed unilateral agreements during our sample period).

The basic estimation equations take two forms:

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[36] These unequal treaties were renegotiated during our sample period, and the unilateral MFN provisions were changed to bilateral agreements. (See Murase, 1976).

(5) $\ln(BITRADE_{ijt}) = \beta_0 + \beta_1\ln(RR_iRR_j)_t + \beta_2\ln(Pop_iPop_j)_t + \beta_3\ln(Dist)_{ij} + \beta_4Gold_{ij}$

$+ \beta_5Silver_{ij} + \beta_6GoldSilver_{ij} + \beta_7SilverGold_{ij} + \beta_7War_{ij,t-k} + \beta_7MFN1_{ij} + \beta_8Lndlck_{ij} + \varepsilon_{ijt},$

(6) $\ln(EXPORTS_{ijt}) = \beta_0 + \beta_1\ln(RR_iRR_j)_t + \beta_2\ln(Pop_iPop_j)_t + \beta_3\ln(Dist)_{ij} + \beta_4Gold_{ij}$

$+ \beta_5Silver_{ij} + \beta_6GoldSilver_{ij} + \beta_7SilverGold_{ij} + \beta_7War_{ij,t-k} + \beta_7MFN2_{ij} + \beta_8Lndlck_{ij} + \varepsilon_{ijt},$

where i denotes a trade partner of Japan, j denotes Japan, t denotes time, k denotes lags, and other variables are defined as:

- $BITRADE_{ijt}$ denotes the bilateral trade between Japan and country i at time t;
- $EXPORTS_{ijt}$ denotes Japanese exports to country i at time t;
- RR is railroad track miles;
- Pop is population;
- Dist is distance between Japan and country i;
- Lndlck is a binary variable which is unity if Japan's trade partner is landlocked;
- Gold is a binary variable which is unity if country i and Japan are both on the gold standard;
- Silver is a binary variable which is unity if country i and Japan both are on the silver standard;
- GoldSilver is a binary variable which is unity if Japan is on the gold standard and country i is on the silver standard.
- SilverGold is a binary variable which is unity if Japan is on the silver standard and country i is on the gold standard.
- War is a binary variable which is unity if Japan is at war with China or Russia
- MFN1 is a binary variable that takes a value of 1 if a trade power has imposed a unilateral most favored nation treaty on Japan and that is in effect at time t.
- MFN2 is a binary variable that takes a value of 1 if Japan has negotiated a reciprocal most favored nation treaty with a trade partner or if it has imposed a unilateral MFN on a trade partner that is in effect at time t.
- and ε is a well-behaved error term capturing other influences on bilateral trade.

The coefficients of interest in equations (5) and (6) are β_4-β_7, and measure the network externality and competitiveness effects of monetary standards on Japanese bilateral trade flows. The gold and silver dummy variables, $Gold_{ij}$ and $Silver_{ij}$, capture the

network externalities associated with two countries belonging to the same monetary standard. If membership in the same monetary standard reduces transactions costs or exchange rate volatility, then the coefficients on the gold and silver dummy variables should be large and statistically significant. On the other hand, $SilverGold_{ij}$ and $GoldSilver_{ij}$ measure the competitiveness effect between Japan and its trading partner when the two countries have different monetary standards (i.e., Japan is on silver and the other country is on gold or Japan is on gold and the other country is on a silver standard). The baseline for comparison for all dummies is paper or bimetallic standards. This relative price effect could be an important determinant of bilateral trade flows during the period 1885-1896 when silver depreciated more than 50 percent against gold.

Coding the monetary standards in this manner is important for two reasons. First, it enables us to provide empirical estimates for the three political economy hypotheses described above. Second, some of Japan's most important trading partners (China and Korea) were on silver, so understanding both the impact of being on silver and on gold is relevant for the political economy arguments as well as for properly quantifying the nature of Japanese trade in the late nineteenth and early twentieth centuries.

We estimate equations (1) and (2) with both fixed and random effects panel techniques, and include year dummies to control for annual shocks such as global financial crises and recessions. The fixed-effects or within estimator is equivalent to adding a complete set of country pair-specific intercepts to the estimating equation. While fixed-effects ensures that the estimation of the betas are consistent, they may not be efficient. The random effects estimator can yield more efficient estimates, but it does not apply in as wide a range of circumstances as the fixed-effects estimator.

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The empirical results for total bilateral trade are presented in Table 2. We first examine the arguments for network externalities – that being on the same monetary standard potentially reduced transaction costs and exchange rate volatility. Conditioning on other variables, when both Japan and its trade partners were both on the silver standard, bilateral trade received a boost of over 1,600 percent $((e^{2.850}-1)*100)$ relative to being on a bimetallic or paper standard. The silver-standard effect is statistically significant at the one-percent level in both the fixed and random effects model. When Japan and its trade partners were both on the gold standard, bilateral trade flows increased by approximately 83 percent. The effect is statistically significant at the ten-percent level in the fixed effects models and at the five-percent level in the random effects specification. Hence, policymakers who believed that Japan's trade would benefit from moving to gold, since other countries were also adopting gold, were in part correct; the network externalities of being on gold significantly boosted trade. However, the effect was considerably smaller than the benefit that Japan had previously received from being on the same monetary standard as silver countries.

The competitiveness effects of monetary standards can be assessed by examining the coefficients for the silver-gold and gold-silver variables. Both of these coefficients have large positive and statistically significant effects on bilateral trade flows. When Japan was on the silver standard and its trade partner was on gold, total trade increased by 213 percent.[37] When Japan was on the gold standard and its trade partner was on silver, total trade increased by 542 percent. Hence, advocates of the silver standard were correct in emphasizing that Japan had received an enormous boost in its trade due to the

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[37] Metzler (2006) also suggests Japan saw an increase in trade when it was on the silver standard, although he does not provide a formal test as we do here.

depreciation of silver when it was on the silver standard, but proponents of going to gold were also correct, although perhaps more out of luck than out of perfect foresight. Gold began to depreciate against silver at about the same time that Japan joined the gold standard. If Japan had remained on silver until 1913, it would not only have seen its competitiveness deteriorate, but it would also have lost out on the enormous gain in competitiveness from being on gold. Indeed, the point estimate for the gold-silver variable is also significantly larger than the gold dummy suggesting that the relative price effect was much more important than the network externality effect for stimulating Japanese trade.

Contrary to the view that the timing of the adoption was pure coincidence, in the year following Japan's adoption of gold, Droppers (1898, p.174) suggested that "there was a general belief in Japan that silver had reached its lowest point in terms of gold, and that…the chances of a further fall were at least slight, as compared to a rise. Therefore, it was urged, that if the yen could be fixed in gold at near its existing exchange value, Japan, having exhausted all the benefits of the silver standard, would crystallize them into a permanent advantage…From this point of view, Japan's adoption of the gold standard was rather a shrewd attempt to solidify all the advantages she had derived from the silver standard, a form of insurance against future dangers, than any objection to the silver standard itself." Droppers acknowledges, however, that if this were the chief motive of the Japanese government, they were incredibly secretive about it, as advocates of the gold standard did not mention it in policy debates. And, in contrast to foreign press and foreign financial investors which believed this might have been the motive, the Japanese did not write about this as a reason for gold standard adoption.

The concern over relative prices in the parliamentary debates was made with respect to export industries. That is, policymakers were concerned that fluctuations in the gold-silver price directly impacted the competitiveness of exporters. They were less concerned with how they influenced the quantity of imports. Hence, in Table 3, we present gravity models where the dependent variable is Japanese exports to its trading partners (rather than total trade).[38] The coefficients for the gold-silver and silver-gold dummy variables both show large, positive effects on exports. This is consistent with what policymakers believed was occurring prior to 1897: Japan's manufacturing exports were benefitting from the decline in the relative price of silver. With respect to the gold standard, the competitiveness effect (gold-silver dummy) has a much larger effect on exports than the network externality effect (gold dummy) – 700 percent versus 117 percent, although the network effect is only marginally statistically significant (at the 13 percent level). With respect to the silver standard, the network externality effect has a substantially larger impact on exports than the relative-price effect (1608 versus 322 percent).

In terms of our other covariates, distance from Japan has a strong negative impact on both total trade and exports while transportation networks (proxied by railways) seem to matter more only for Japan's exports. Although population has a negative and statistically significant effect on exports, the unconditional correlation between (log) exports and population is positive, but not statistically significantly different from zero.[39] The war variables did not significantly reduce trade in the different specifications. The

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[38] We also estimated tobit models for the export models to control for the fact that there were some observations with values of zero for exports. The basic tenor of the results for the gold and silver coefficients remains unchanged.

[39] When use a median regression model for exports, we find that population has a positive sign, but is insignificant at conventional levels of statistical significance.

MFN treaties substantially boosted total trade by roughly 433 percent, but the effect on exports is not statistically significantly different from zero. Given the way we have coded MFN1 and MFN2, we can interpret these findings in the following way. The "unequal treaties" that Japan was forced to sign in the 1860s raised total trade by increasing imports, but the reciprocal agreements that Japan signed, and the unilateral treaties it forced Korea and China to sign, had little impact on its exports.

V. Did the Gold Standard Create an Investment Boom?

As mentioned in the legislative debates over gold standard adoption, one consequence of adoption might have been to facilitate industrialization and spur a domestic investment boom. Since we have already shown that bond spreads did not move in the direction that would support lower borrowing costs overseas, this section explores whether domestic investment increased after gold standard adoption. To examine the investment-boom hypothesis, we first gathered new monthly data on Japanese stock prices around the time of gold standard adoption from the archives of the Tokyo Stock Exchange. Based on data for stocks listed and actively traded on the Tokyo exchange, we calculated a monthly capitalized market index of 13 companies for the period 1895-1899. The index represents approximately 70 percent of the capitalized market value of the Japanese stock exchange.[40] If expected profitability of Japanese companies improved with gold standard adoption, then this should have been capitalized into stock prices, and our composite index should show an increase after the time of adoption.

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[40] Although it is possible that the increase in bilateral trade flows might have led to a surge in domestic investment, most of the firms included in our stock sample were involved in domestic finance and transport – railway companies building passenger railways.

However, as Figure 5 shows, the pattern does not support the idea that the gold standard would cause an investment boom that would lead to higher profitability of Japanese firms. The Japanese stock market index increased in the beginning of the sample before declining more than 35 percent in the one-year period before Japan joined the gold standard. The stock market index then fell by an additional ten percent in the year after Japan joined the gold standard. As a robustness check, we also calculated an unweighted stock market index for the period. As shown in Figure 6, the unweighted stock market index declined more than 30 percent after gold standard adoption. Commentators noted that the decline in security prices reflected a general feeling of uncertainty in the business community following gold standard adoption.[41]

To more directly assess whether an investment boom occurred after gold standard adoption, we collected data on the investment-GNP ratio. We compared the average investment-GNP ratio for the five-year period before Japan (1893-1897) joined the gold standard with the five-year period after Japan joined gold (1898-1902). We chose to end the "gold standard effect" in 1902 since some scholars have noted that the Russo-Japanese War (1904-05) enhanced the country's international standing and credibility (Metzler, 2006; Sussman and Yafeh, 2000). The average investment-GNP ratio was actually higher in the five-year period before Japan joined the gold standard (17.1 to 16 percent). As a robustness check, we dropped the value of the ratio for 1897 from the pre-gold period (since Japan voted to join gold in March but did not formally adopt the monetary rule until September) and recomputed the investment-GNP ratio in the five-year period before and after 1897. The investment-GNP ratio is slightly higher when Japan was on the silver standard than after it went on gold: 16.3 versus 16 percent.

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[41] Droppers (1898, p.177).

Overall, the empirical evidence suggests that joining the gold standard did not stimulate a boom in the Japanese equity market or in investment spending.

VI. Conclusion

This paper argues that in order to understand the reasons why countries adopted monetary standards and the consequences they had on their economies, it is helpful to begin the analysis by considering the political economy of the adoption decision. Interest groups may not be aligned (as their objective functions may differ) and outcomes may be uncertain. Examining countries adoption decisions on a case-by-case basis, as we do in this paper, enables the researcher to design empirical tests that are based on the *ex ante* beliefs of policymakers and to measure the effects of adoption on multiple outcome variables.

Our examination of the historical record suggests that *a priori* policymakers were split over of Japan's decision to join the gold standard in 1897. Many influential business leaders, academics, and government officials emphasized that adopting gold as the monetary standard would significantly impact trade, but they disagreed over whether it would be beneficial or detrimental. Some, like Matsukata, argued that it would increase exports because other countries were moving to gold and that Japan would have less exchange-rate volatility and lower transaction costs if it too were on gold. Others argued that it would prematurely terminate the benefits of being on silver: the declining price of silver since 1870 had been lowering the relative price of Japanese exports and many of Japan's most important trading partners were on the silver standard. Other policymakers encouraged Japan to adopt the gold standard for different reasons – that it would be

perceived by markets as a move towards better institutions and would hence lower Japan's borrowing costs.

Using newly assembled data on interest rates, we show that Japan's adoption of the gold standard did not lower Japan's borrowing costs nor lead to a surge in domestic investment. Based on evidence from both international and domestic capital markets, if anything, there was a slight *increase* in the rates of borrowing after adoption. These findings suggest a major reinterpretation of Meiji financial history since previous studies had associated a reduction in borrowing costs with gold standard adoption. We show that Sussman and Yafeh (2000) not only used a flawed data series, but that they ignored evidence from other Japanese sovereign bonds that actively traded in financial markets. While it is theoretically possible that a hard peg can serve as a mechanism for solving the time inconsistency problem, the case of Japan does not appear to be the canonical case study of such a mechanism.

Instead, Japan's experience suggests that metallic standards had a much more significant effect on trade flows. Estimates from gravity models show that bilateral trade increased when Japan went onto gold. When we decompose this effect, we find that the largest boost in trade came from the competitiveness effect (the decline in the gold-silver price ratio) rather than from network externalities (the reduction in transaction costs associated with being on the same monetary standard as many other countries). Previous scholarship has not attempted to disentangle these two channels, so this finding helps to clarify precisely how Japan's trade increased as a result of gold standard adoption.

Our results also suggest that Japan received a large boost to its bilateral trade when it was on the silver standard. The effect appears to have been even larger than what

was realized for Japan when it went onto gold. Nevertheless, Japan's adoption of the gold standard proved to be fortuitously timed as the decline in silver prices reversed course at around the same time Japan made the switch to gold. Hence, one can conclude that if Japan had remained on the silver standard it would have necessarily foregone a large gain in the competitiveness of its exports (something that was not known to policymakers *ex ante*), and may have faced a declining benefit via network externalities as more and more countries adopted gold. The political economy approach that we have used to study Japan's adoption decision has shed new light on the reasons for and consequences of adoption, and suggests a robust alternative to the cross-country approach that could be employed to examine the adoption of gold for other countries during the classical gold standard era.

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Table 1: Zivot-Andrews Structural Break Tests, 1892-1902

Panel A: Interest Rates

Break Test	Consolidated Loan Minimum T-test	Break Date	War Loan Minimum T-test	Break Date
Intercept	-3.612	1894/10	-4.339	1899/3
Trend	-3.354	1899/6	-3.463	1894/3
Intercept and Trend	-4.247	1894/6	-4.348	1898/7
Observations	275		175	

* significant at 10%; ** significant at 5%; *** significant at 1%

Panel A: Yield Spreads

Break Test	Consolidated Loan Minimum T-test	Break Date	War Loan Minimum T-test	Break Date
Intercept	-4.309	1894/6	-4.365	1899/3
Trend	-3.522	1897/8	-3.9	1898/1
Intercept and Trend	-4.541	1894/6	-4.365	1899/3
Observations	275		175	

* significant at 10%; ** significant at 5%; *** significant at 1%

Critical Values of Zivot-Andrews

Test	1%	5%	10%
Intercept	-5.34	-4.8	-4.58
Trend	-4.93	-4.43	-4.11
Intercept and Trend	-5.57	-5.08	-4.82

Table 2: The Effects of Monetary Standards on Japanese Bilateral Trade, 1877-1912

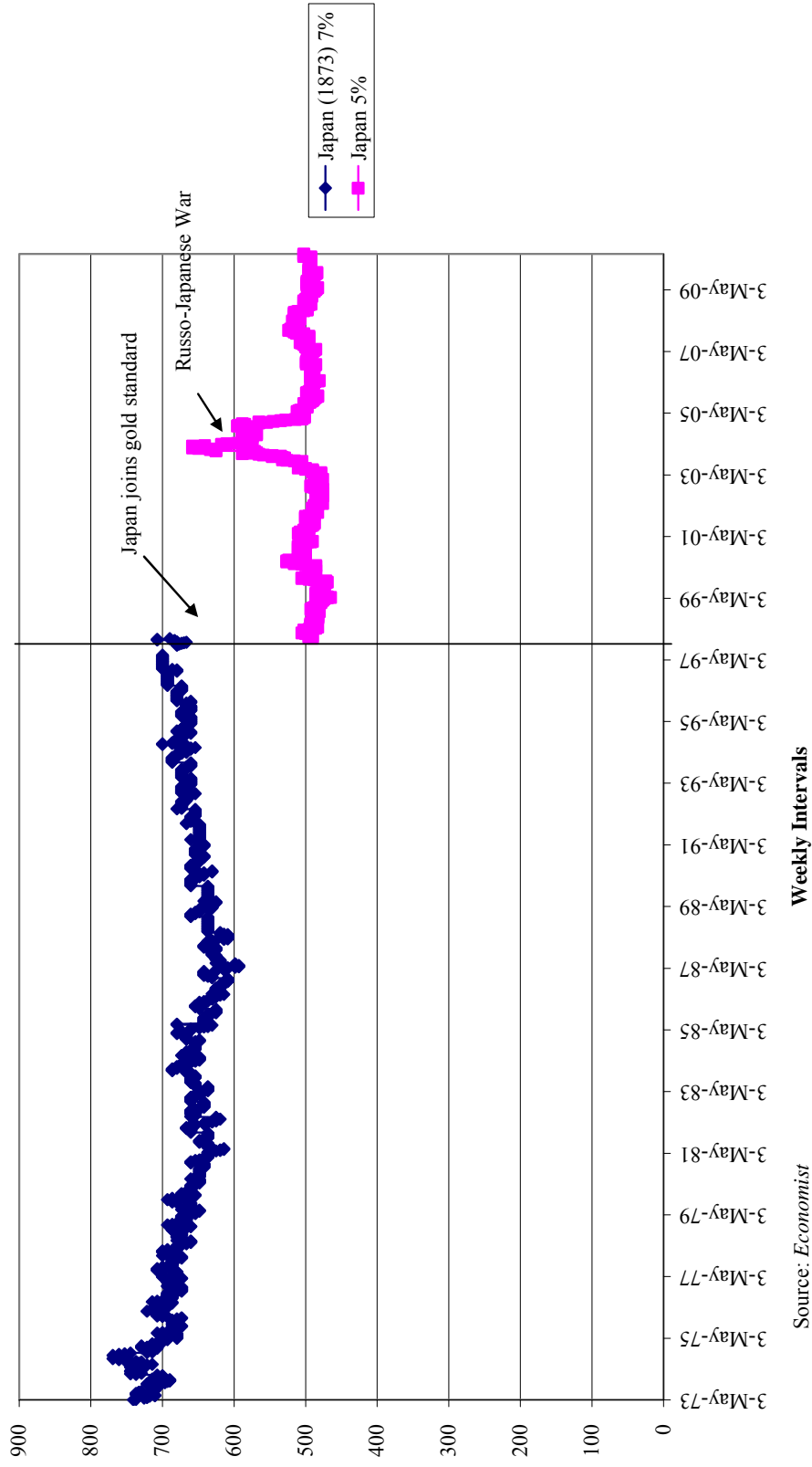| Independent Variables	Fixed Effects	Random Effects
Silver	2.819***	2.760***
	(0.52)	(0.52)
Gold	0.604*	0.729**
	(0.36)	(0.36)
Silver*Gold	1.142***	1.245***
	(0.34)	(0.34)
Gold*Silver	1.861***	1.872***
	(0.48)	(0.48)
MFN1	1.737***	1.674***
	(0.42)	(0.39)
Distance		-1.395**
		(0.57)
Landlock		0.531
		(1.72)
Railroad	0.028	0.011
	(0.06)	(0.06)
Population	-0.054	0.011
	(0.15)	(0.15)
War	-0.198	-0.152
	(1.24)	(1.27)
War(-1)	-0.106	-0.097
	(1.57)	(1.60)
War(-2)	-0.671	-0.601
	(1.79)	(1.83)
War(-3)	-0.237	-0.214
	(1.81)	(1.85)
War(-4)	-0.6	-0.567
	(1.78)	(1.82)
War(-5)	-0.21	-0.182
	(1.57)	(1.61)
War(-6)	-0.914	-0.89
	(1.23)	(1.26)
Year Dummies	YES	YES
Observations	801	801
R-squared	0.42	

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 3: The Effects of Monetary Standards on Japanese Exports, 1877-1912

Independent Variables	Fixed Effects	Random Effects
Silver	2.891***	2.838***
	(0.65)	(0.65)
Gold	0.776	0.938*
	(0.52)	(0.51)
Silver*Gold	1.440***	1.586***
	(0.47)	(0.47)
Gold*Silver	2.079***	2.054***
	(0.66)	(0.65)
MFN2	0.407	0.345
	(0.37)	(0.37)
Distance		-2.053**
		(0.87)
Landlocked		-0.793
		(2.66)
Railroad	0.168**	0.138*
	(0.08)	(0.08)
Population	-0.832***	-0.706***
	(0.21)	(0.20)
War	-2.720*	-2.647
	(1.63)	(1.65)
War(-1)	0.921	0.937
	(2.06)	(2.09)
War(-2)	-1.581	-1.491
	(2.34)	(2.37)
War(-3)	0.203	0.243
	(2.37)	(2.41)
War(-4)	-1.254	-1.193
	(2.33)	(2.36)
War(-5)	-0.113	-0.063
	(2.06)	(2.09)
War(-6)	-1.244	-1.218
	(1.62)	(1.64)
Year Dummies	YES	YES
Observations	790	790
R-squared	0.42	

* significant at 10%; ** significant at 5%; *** significant at 1%

Figure 1
Japanese Interest Rates on the London Market, May 1873-July 1910
(Basis Points)

Japan (1873) 7%
Japan 5%

Japan joins gold standard

Russo-Japanese War

Source: *Economist*

Weekly Intervals

44

Figure 2
5% Consolidated Loan in London and Tokyo, 1896-1902
(Basis Points)
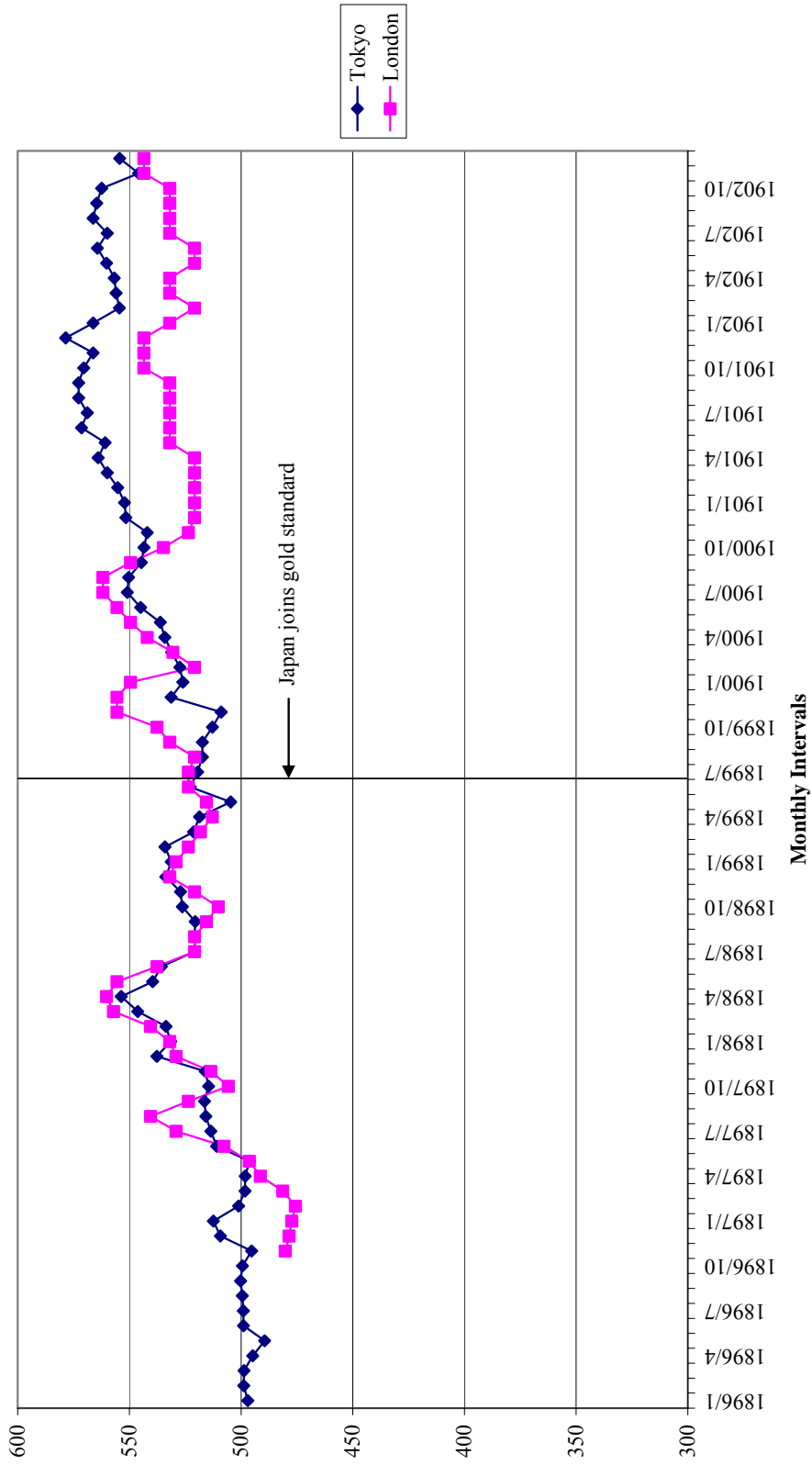
Figure 3
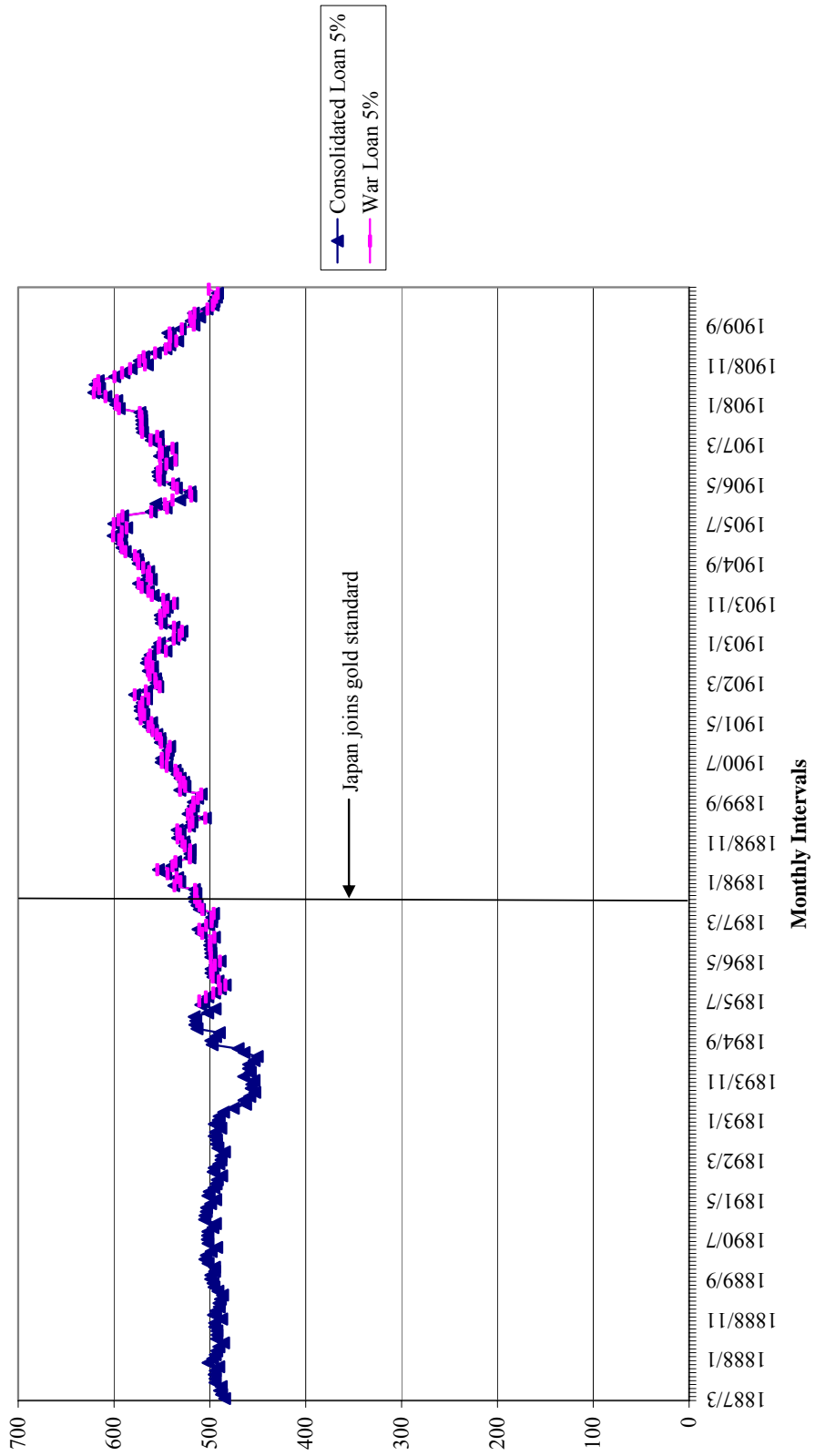**Domestic Japanese Interest Rates, March 1887- June 1910**
(Basis Points)

Consolidated Loan 5%
War Loan 5%

Japan joins gold standard

Monthly Intervals

46

Figure 4
Domestic Japanese Yield Spreads March 1887-June 1910
(Basis Points)

Consolidated Loan 5%
War Loan 5%

Japan joins gold standard

Monthly Intervals

1887/3 1888/1 1888/11 1889/9 1890/7 1891/5 1892/3 1893/1 1893/11 1894/9 1895/7 1896/5 1897/3 1898/1 1898/11 1899/9 1900/7 1901/5 1902/3 1903/1 1903/11 1904/9 1905/7 1906/5 1907/3 1908/1 1908/11 1909/9
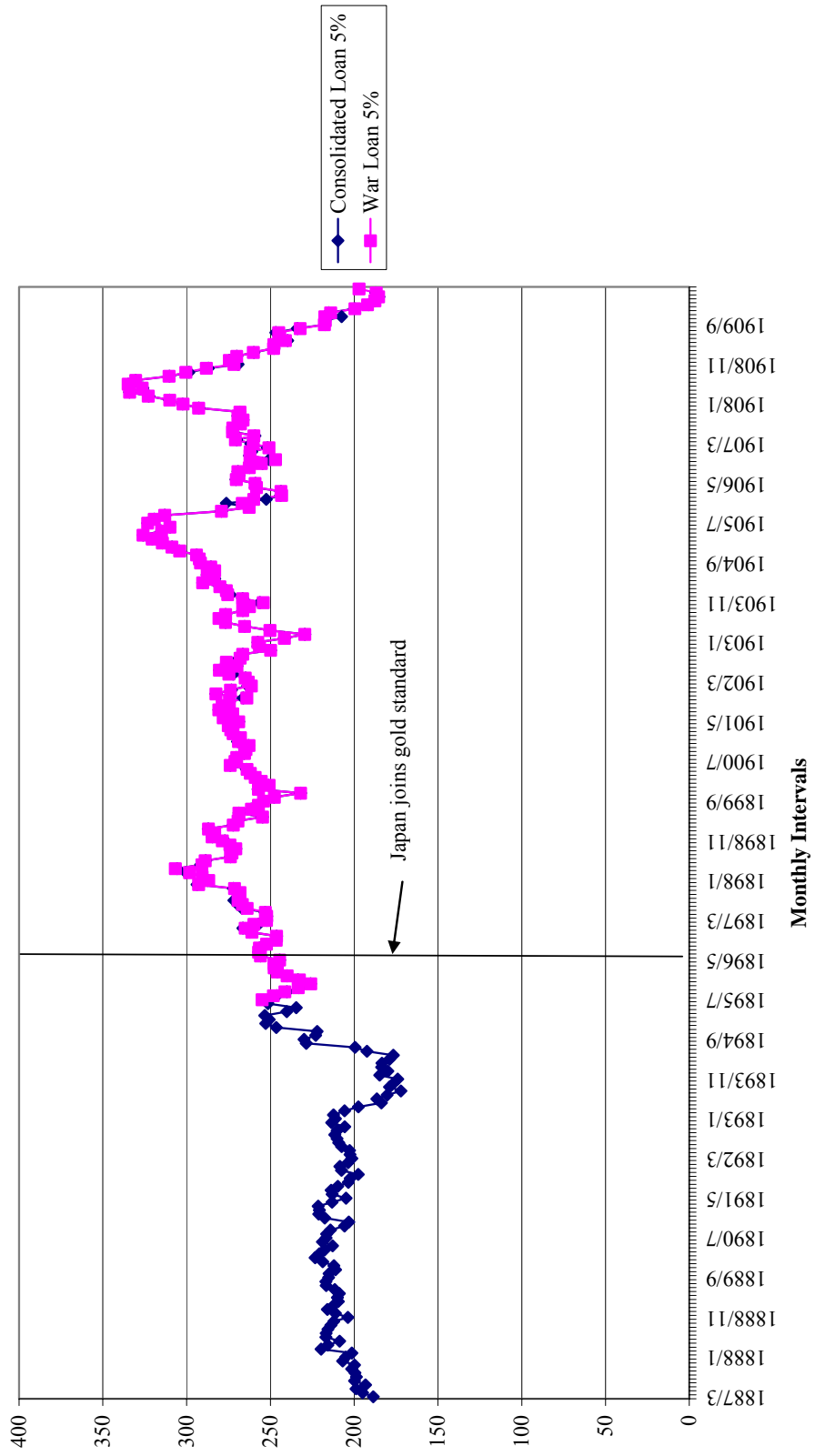
Figure 5
Japanese Stock Market Index, 1895-1899
(January 1895=100)

Japan joins gold standard

Monthly Intervals
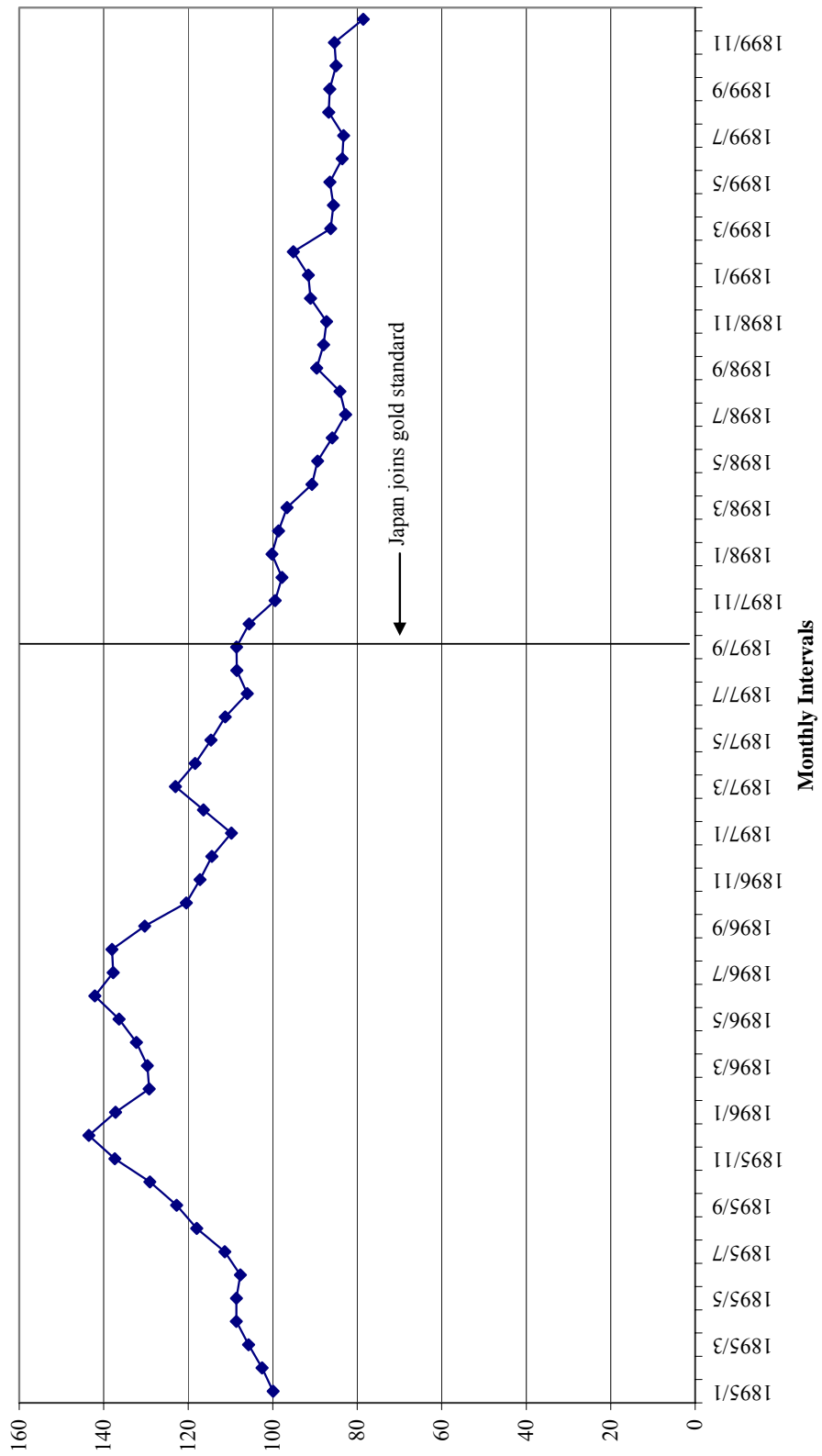
Figure 6
Japanese Stock Market Index, 1895-1899

Japan joins gold standard

Index Value (Jan. 1895=100)

Monthly Intervals

49
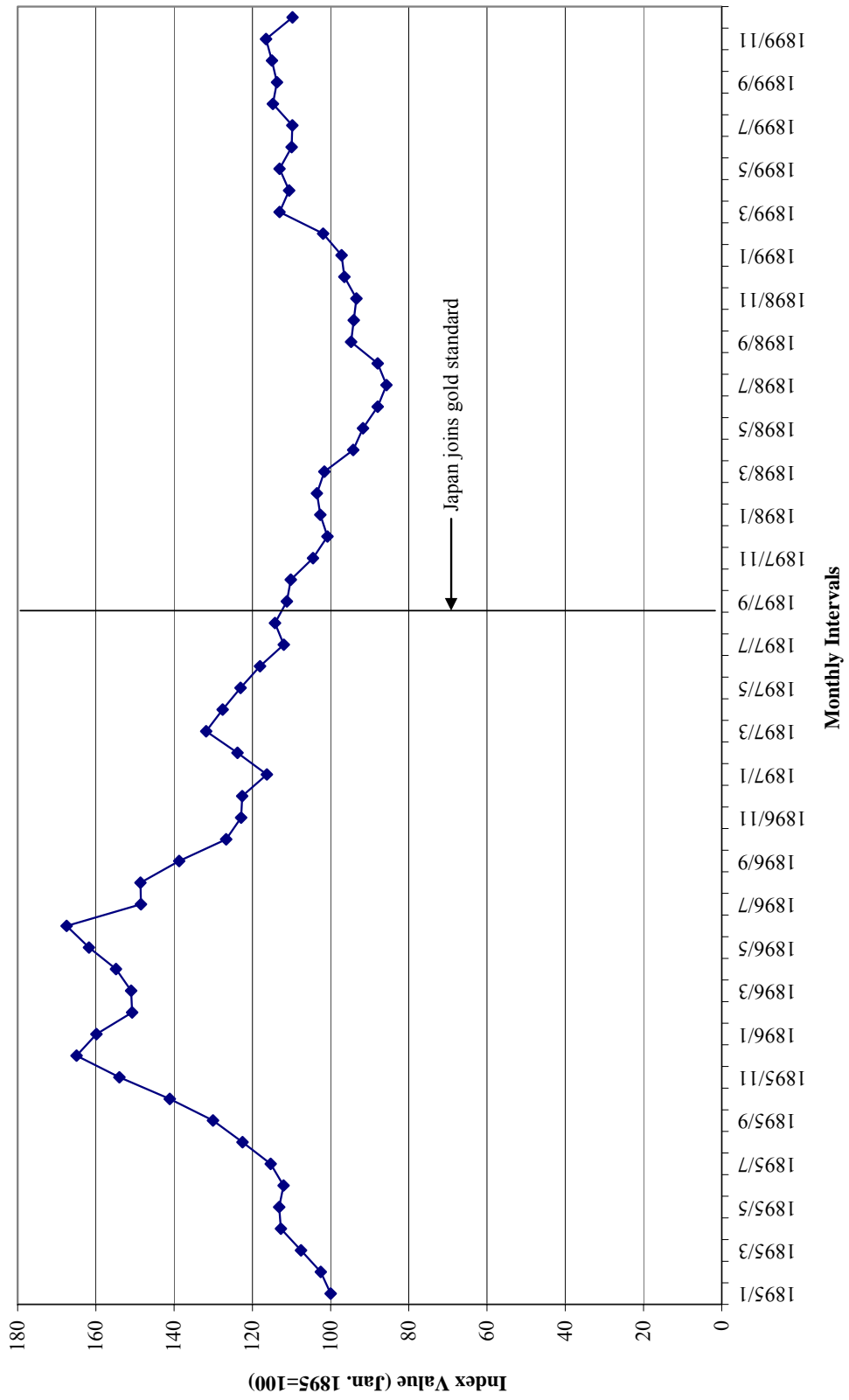
Statistical Appendix: Zivot-Andrews Structural Break Tests, 1887-1910

Panel A: Interest Rates

Break Test	Consolidated Loan		War Loan	
	Minimum T-test	Break Date	Minimum T-test	Break Date
Intercept	-2.665	1897/6	-2.511	1897/6
Trend	-2.933	1907/1	-3.356	1908/3
Intercept and Trend	-3.346	1906/12	-3.884	1907/12
Observations	275		175	

* significant at 10%; ** significant at 5%; *** significant at 1%

Panel A: Yield Spreads

Break Test	Consolidated Loan		War Loan	
	Minimum T-test	Break Date	Minimum T-test	Break Date
Intercept	-3.024	1894/6	-2.574	1895/12
Trend	-3.074	1907/1	-3.685	1908/3
Intercept and Trend	-3.199	1907/1	-4.741	1907/12
Observations	275		175	