Contagion and Capital Market Integration in Asia: Historical and Contemporary Evidence

Nathan Sussman and Yishay Yafeh*

We compare sovereign debt yields in the nineteenth century and today. Using data on nineteenth century Japanese government bonds, and on Korean sovereign debt today we show that foreign investors both then and now use summary indicators to evaluate country risk (the Gold Standard then, IMF packages today). However, "contagion" today is more common than in the past. Events in nineteenth century China hardly caused fluctuations in Japanese yields although capital markets were highly integrated. By contrast, minor events in Asia or Latin America had significant effects on Korean yields in recent years. (*JEL* Classification: F21, G15, N20)

I. Introduction

Reforms and institutional changes can make a country appealing to foreign investors, thereby attracting capital inflows and alleviating constraints on investment imposed by domestic savings. Yet a

*Lecturer, Economics Department, The Hebrew University, Mt. Scopus, Jerusalem 91905, Israel, (Tel) +972-2-588-3139, (E-mail) msussman@mscc.huji.ac.il; Lecturer, Economics Department, The Hebrew University, Mt. Scopus Jerusalem 91905, Israel, (Tel) +972-2-588-3246, (Fax) +972-2-581-6071, (E-mail) msyafeh@mscc.huji.ac.il, respectively. This paper was prepared for presentation at the SJE-KIF International Symposium on "Structural Adjustments after the Asian Financial Crisis," Seoul, August 1999. We thank Lilach Weiss for excellent research assistance and the Department of East Asian Studies at the Hebrew University for financial support. We are also grateful to Jeffrey Wichmann from Deutsche Bank (New York) for kindly providing us with the data on contemporary sovereign bonds. Keunkwan Ryu and participants of a CEPR conference held in Oxford provided helpful comments and suggestions.

[**Seoul Journal of Economics** 1999, Vol. 12, No. 4]

country's image in the eyes of foreign investors may be strongly affected by events taking place in neighboring countries. In this paper we examine these issues by investigating the determinants of country risk using two very different data sets on sovereign debt. The first data set contains monthly information on Japanese (and other developing countries') sovereign debt traded in London between 1870 and World War I. The second data set contains contemporary daily information on Korean (and other developing countries') sovereign debt traded in New York between late 1996 and mid 1999. The comparison is interesting because the last part of the nineteenth century is very often described as the "golden age" of high international financial integration with unparalleled capital flows (e.g. Bordo *et al.* 1998). The comparison is also interesting because of the dramatic reforms and institutional changes that took place in Japan during that period, as well as the structural changes that are taking place in present-day Korea.

The analysis of the two data sets yields two main results. The first is that, much like investors in the nineteenth century, foreign investors today rely on "summary indicators" to evaluate a country's credit risk, so that "nothing has changed" in this respect. In the nineteenth century the Gold Standard was the most important indicator of a country's stability and the soundness of its economic policies. We show both in this paper and, in more detail in Sussman and Yafeh (1999a), that the adoption of the Gold Standard was *the* major turning point in Japan's ability to access foreign capital markets, leading to lower interest payments and high capital inflows. By contrast, institutional changes and reforms in Japan were perhaps hard to evaluate and did not help British investors update their views. This is despite the fact that reforms in Japan during the Meiji period were unprecedented in scope and included major changes such as the abolition of feudalism, the formation of a modern central bank, the promulgation of a modern constitution, and the establishment of an elected parliament. Other authors (cited below) also argue that the Gold Standard was instrumental for many developing countries' access to global capital markets. Today, IMF-backed loans, as well as international credit rating agencies perform a role for Korean debt that is similar to that of the Gold Standard a hundred years ago. Much like in Meiji Japan, reforms and domestic events in present-day Korea have little effect on the country's risk premium until they are "certified" by a

credible signal, such as an agreement with the IMF, or an upgrade by S&P or Moody's. This similarity exists even though investors today have access to state of the art information technology, and despite the fact our historical data cover over forty years of Japanese debt, whereas our modern data cover only two and a half years of Korean debt.

Our second result is that while capital flows between 1870 and World War I were of very large magnitudes, "contagion" was less prevalent in the past than it is today. We show that although the Japanese and Chinese risk premium series were correlated even in the nineteenth century major events in China, a developing country close to Japan, had a negligible immediate impact on the risk premium on Japanese government bonds in the Meiji period. On the other hand, we find that some of the most dramatic changes in the risk premium on Korean debt in recent years were driven by events in Thailand, Indonesia, or even Russia and Brazil. These events caused sharp changes in Korea's cost of capital, even though they had little to do with the risk of Korean default. These findings are very much in line with Kaminsky and Schmukler (1999) who argue that events in neighboring countries are crucial for understanding "jitters" in East Asian stock markets. There are a number of possible explanations for this result. One could simply be the data: we have long-term monthly series for the nineteenth century and a much shorter daily series for modern country risk. However, we will argue later that when our modern data set is converted into monthly frequency, the results become even more pronounced than they are when using daily data. Another possible explanation is that product markets today are better integrated so that "contagion" is spread across countries that trade a lot with each other (e.g. Glick and Rose 1998). We will argue that this explanation too cannot account for our findings because (as a fraction of total trade) Meiji Japan traded with China far more than Korea does with Indonesia or Thailand. It is, of course, possible that nineteenth century investors were more sophisticated than today's but there is another explanation which we find more plausible: Investors in the past had to incur more costs in order to re-balance their portfolio and consequently did so less frequently. Stated differently, the technology available a hundred years ago forced investors to "take a breath" before acting and thus led to less volatility and fewer imported shocks.

The paper is part of a growing literature that investigates capital flows and financial markets in the nineteenth century and that of today (e.g. Bordo *et al.* 1998). Our interest in the Gold Standard is in line with the literature on the impact of this institution on borrowing constraints (e.g. Gregory 1979; Bordo and Rockoff 1996; and Eichengreeen and Flandreau 1996). The paper is also related to the literature on modern country risk (e.g. Edwards 1986; and Izvorski 1998) as well as to the on-going discussion about "herd behavior" and "contagion" during Asia's recent crisis (e.g. Corsetti *et al.* 1999; and Radelet and Sachs 1998). Finally, this paper extends our previous work on this issue. In Sussman and Yafeh (1999a) we examine in detail the effects of institutional reforms on the risk premium on Japanese government bonds in the Meiji period. There we present detailed evidence showing that the adoption of the Gold Standard was the major turning point in Japan's "credit rating" between 1870 and 1914 (some of the results from that paper are reproduced here). In Sussman and Yafeh (1999b) we argue that, in addition to affecting the risk premium, the Gold Standard had a major impact on Japan's integration into world capital markets.

The rest of the paper is organized as follows: Section II provides some background on the Meiji period reforms in Japan and on the recent financial crisis in Korea. In Section III we describe the two data sets used for this study and present our empirical approach. Section IV presents the main findings. The interpretation of the results and some concluding remarks are in Section V.

II. A Brief Historical Overview

In this section we briefly survey some key facts about capital markets in the late nineteenth century, about Japan during the same period, and about Korea during the recent crisis. These facts will serve as background for the analysis that follows. This survey is by no means exhaustive, as each of the subjects covered is discussed in detail in a large number of publications and books.

A. International Capital Markets, 1870-1914

The period between 1870 and World War I is often described as an era of global finance in which capital markets were probably as integrated as they are today. Capital outflows from Britain to

contemporary developing economies were extremely high and barriers to movements of capital (and labor) were virtually absent. For a more detailed discussion of this period, see, for example, Bordo *et al.* (1998) or O'Rourke and Williamson (1998).

B. Japanese Institutional Reforms in the Meiji Period (1868-1912)

In general, the Meiji era was a period of dramatic change in Japan. Within less than forty years, a backward, feudal society was transformed into an industrial and military power with a well established modern state structure. At the time, the pace and scope of the Meiji period reforms had no parallel in the world. At first, the old feudal system was abolished and major agrarian and tax reforms were introduced in 1873. The government began importing "model" textile plants at around the same time. The early 1880s witnessed the consolidation of the banking system, the establishment of a modern central bank, the Bank of Japan (1882), and the privatization of the industrial plants introduced by the government earlier. Also during the 1880s, a modern cabinet system replaced the traditional form of government. Possibly the most important institutional reform, the Meiji Constitution, was promulgated in 1889, after nine years of deliberations and attempts to incorporate the best features of contemporary European constitutions. The Meiji Constitution, which remained unchanged through the end of Word 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 legal system and set the ground for a two-house parliamentary system in existence until today. The first parliament convened in 1890 following the first elections. The Meiji period was also a period of political turmoil including, among others, Japanese military victories over China (1894-5) and Russia (1904-5).

C. Korea, 1996-1999

There are so many chronologies of the recent financial crisis in Asia (e.g. Roubini 1999) that it should suffice to simply list briefly the major events that took place in Korea during this period. In October 1996 Korea gained the official status of a developed country when it joined the OECD. 1997, however, brought about a deep crisis. The change began with the collapse of the *Hanbo*

conglomerate in early 1997, and was followed by trouble in two other *chaebols* (*Sammi* and *Jinro*) in the spring of the same year. By June 1997, *Kia*, a larger group, defaulted on its debt, and in September the Bank of Korea was forced to intervene to prevent massive bankruptcies of commercial banks. The Asian crisis reached Korea in October 1997 a few months after it hit Thailand and Indonesia. The collapse of the *won*, the flight of foreign investors, and the large amount of short term debt (both sovereign and private) forced the Korean government to seek assistance from the IMF in November of that year, after a government reform package failed to calm financial and currency markets. Korea received $57 billion from the IMF, as well as assistance from Japan and other lenders in December 1997. In February 1998, Kim Dae-Jung took office as the new president and began his tenure with attempts to reform the economy. In particular, President Kim sought to introduce market reforms that would limit the influence of the major *chaebol* conglomerates. Naturally, the government's attempts to limit their scope of activities were faced by *chaebol* opposition. In addition to reforming the conglomerates and the financial system, attempts were made to relax the existing strict labor laws so as to enable companies to fire at will. These attempts led to severe labor disputes in the spring and summer of 1998. Another source of conflict during the same period was the publication of a "hit list" of companies liable to be liquidated (because banks were forced to cut off their lines of credit). Despite these difficulties, by fall 1998 there were signs that reforms were on their way (some of the major conglomerates agreed to "focus;" labor disputes were settled) and the economy began to show signs of recovery in early 1999.

III. The Data and Methodology

A. Historical Japanese Data

Our data set includes *monthly* data on sovereign bond yields between 1870 and 1914 for Japan, China (and a number of other contemporary developing economies, which are not considered here). The data are drawn from the *London Times* and from the *Economist*'s *Investor's Monthly Manual*. We define the yield difference between Japanese bonds and British consol yields as the risk premium

(British consol yields are drawn from the NBER *Macroeconomic History* data set). Japanese bond coupons were payable in pounds in London, and therefore did not involve any exchange rate risk.

We supplement the statistical information by recording each time in which political or economic events in Japan or China are reported either in the *London Times* or in the *Economist* between 1870 and 1899. These data, as well as articles from the *Economist*, will be used to evaluate the nature of information British investors had on reforms in Japan and on events in China that could affect the risk associated with Japanese government bonds.

B. Modern Data: Korean and Other Sovereign Debt, Fall 1996 — Spring 1999

Our contemporary data set includes *daily* data on Korean quasi-sovereign debt (KDB bonds with a coupon of 7.25% and maturity in May 2006)[1] between October 1996 and May 1999. In addition, we have information on sovereign debt yields of Thailand, Indonesia and Malaysia, as well as Brazil and Argentina.[2] The risk premium on Korean debt is defined as the "spread," namely the yield differences relative to a similar US Treasury bond.

We construct a list of events in Korea and neighboring countries from a large number of newspapers and other sources. These include, among others, *The New York Times, The Financial Times, The International Herald Tribune, The Economist,* and *The Korea Herald.*

C. Empirical Approach

There are a number of possible (albeit imperfect) methods that can be used to identify the dates in which a dramatic change in a time series ("structural break") takes place. We apply these methods

[1]Information is available on other types of Korean government and quasi-government bonds. The correlation between the various series is very close to one. We choose this KDB bond because it provides the longest data series.

[2]Included in the analysis are the following sovereign bonds: Thailand, coupon rate 7.75%, maturity date April 2007; Indonesia, coupon rate 7.75%, maturity date August 2006; Malaysia, coupon rate 7.75%, maturity date August 2006; Brazil, coupon rate 8%, maturity date April 2014; and Argentina, coupon rate 6.18%, maturity date March 2005.

to the analysis of both the Japanese and the Korean risk premium series.

a) An iterative search for breaks

This method assumes no *a priori* knowledge of potential break dates. Instead, it is based on using all the available data for repeated estimations of the following equation:

$$\begin{aligned}\log(\text{Risk Premium})_t = {} & \beta_0 + \beta_1 \log(\text{Risk Premium})_{t-1} \\ & + \beta_2 \Delta\log(\text{Risk Premium})_{t-1} + \beta_3 \Delta\log(\text{Risk Premium})_{t-2} \\ & + \beta_4 TREND + \beta_5 EVENT_{long} + \beta_6 EVENT_{short},\end{aligned} \tag{1}$$

where $EVENT_{long}$ is a dummy variable that takes the value zero at all times prior to the proposed break and the value one from the time of the break onwards, and $EVENT_{short}$ takes the value one at the time of the event and zero at all other times. If an event had a long-term impact on yields then the "long" dummy variable should be different from zero (assuming the series in not unit root). A significant "short" dummy implies that an event created only short-term "blip."[3] The method involves repeated estimation of equation (1) while moving the break date and the corresponding *EVENT* dummy variables one observation at a time and recording their statistical significance. The sample is then split in two at the point where the statistical significance of the $EVENT_{long}$ dummy is highest, and the process is repeated within each half of the sample until no statistically significant break points are detected in any sub-sample. We use this method to search for breaks in *both* the Japanese and the Korean risk premium series.

b) Search for breaks around major historical events

This alternative approach is based on using all the available institutional and historical background, rather than on searching the data without using any prior knowledge. This amounts to testing the hypothesis that a particular event that took place at a known date caused a break in the risk premium series. The disadvantage of this approach is that it is not always clear when an event should make an impact (some events are expected in advance, while others are understood only with some delay), and

[3]When the time series is unit root, the $EVENT_{short}$ dummy variable identifies one-time breaks that have a permanent effect on the series, see Sussman and Yafeh (1999a).

also raises a number of econometric difficulties (discussed in detail in Sussman and Yafeh 1999a). Here we apply this approach to the historical Japanese data only because it is relatively easy to identify "important" events (in Japan or in neighboring China) with the hindsight of a full century. We do not, however, attempt to apply this method to the recent (short) Korean risk premium series where it is more difficult to determine which events "should have made an impact." In practice, the use of this method means that we construct an eighteen month "*window*" around events that we suspect may have influenced the risk premium and then estimate equation (1) within each "window." The "window" is constructed so as to include one major event only. Obviously, this imposes a constraint on the length of the "window" and consequently also on the statistical power of the test.

c) Listing "good" and "bad" days

For the Korean risk premium series (which is not only shorter but also of higher frequency) we choose to list the "worst twenty days" in which the risk premium increased by the largest percentage, and the "best twenty days" in which the risk premium sharply declined. This approach resembles the iterative search for breaks in that it assumes no prior knowledge about the nature of events that may have been important. Instead, it is an attempt to identify dates at which major changes in the risk premium took place and then examine what events took place on these dates and how they may have caused the observed market response. In the case of Korea, this is done by searching news articles and media reports for events that occurred on or around these days, either in Korea or in neighboring countries. Thus, we can evaluate the types of domestic events that affected the Korean risk premium, as well as the influence of events in neighboring economies ("contagion"). Naturally, this approach too raises several problems, most notably it does not provide a means to evaluate the statistical significance of the identified dates, and may tend to emphasize short-term "jitters." We return to these issues later.

d) A word of caution

All three methods listed here are far from perfect. The iterative search does not make use of any historical and institutional knowledge. The search for breaks around historical events is subject

to several econometric critiques, assumes break dates correspond perfectly to dates of historical events, and is of limited statistical power. The listing of "good" and "bad" days does not enable an evaluation of their statistical significance or of the duration of their impact. Moreover, none of the three methods can measure cumulative effects of a sequence of events. Nevertheless, given the shortcomings of the available techniques, we use all three to draw some basic conclusions about the nature of events that affected financial markets in the nineteenth century and today. Our main findings seem clear enough regardless of the statistical approach used.

IV. Results and Discussion

In Section A, we discuss the events and reforms that determined the Japanese risk premium in the Meiji period. We then proceed to examine the impact of events in China (and elsewhere) on the Japanese risk premium. In Section B, we turn to modern Korea and identify (domestic and foreign) events that caused the most pronounced changes in the risk premium. A discussion of the results and their implications appear in Section V.

A. Japan, 1870-1914

Table 1 displays the dates, volume, and coupon interest rates for Japanese government debt issued in London. From 1870 to the early twentieth century coupon interest 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. Clearly the volume of 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 portrays the risk premium on Japanese government debt from 1870 to August 1914.[4]

[4]There are a number of technical issues related to the calculation of the risk premium, which are discussed in Sussman and Yafeh (1999a). Figure 1 presents a naive calculation, based on the ratio of the bond's interest payments to market price. Other possible calculations are, for example, yield to maturity, or the *Economist*'s risk premium series, which is calculated according to a different formula. These calculations do not materially affect the results.

TABLE 1

JAPANESE BOND ISSUES IN LONDON

Year	Issue (pounds)	Interest Rate	Maturity (years)	Use of Proceeds
1870	1,000,000	9%	13	railways
1873	2,400,000	7%	25	misc.
1897	4,390,000	5%	53	military
1899	10,000,000	4%	55	railways, telephone
1902	5,104,000	5%	55	military, telephone
1904	22,000,000*	6%	7	military
1905	60,000,000*	4.5%	25	military
1905	25,000,000	4%	25	misc.
1907	23,000,000	5%	40	misc.
1910	11,000,000	4%	60	misc.

Note: * denotes total proceeds raised in two separate issues of similar terms.
Source: Reproduced from Sussman and Yafeh (1999a), based on Suzuki (1994)

Yields on Japanese government debt decreased from about 6 percentage points above British Consol yields in the early 1870s to slightly more than 2 percentage points above consol yields toward the end of the nineteenth century. It is important to note that this trend was not common to all developing countries of the time (e.g. yields on Russian and Turkish bonds did not fall during the period). Most important for the purpose of this paper is the fact that the decline in Japanese yields was not smooth. While yields fell in the 1870s (for reasons we discuss in detail in Sussman and Yafeh 1999a), they remained flat (or increased moderately) from the early 1880s until the mid-1890s. In particular, the dramatic reforms of 1880s (the establishment of the Bank of Japan, the Meiji Constitution, and more) produced no discernible impact on the London capital market. Clearly, the most conspicuous change in Japan's risk premium took place in 1897 with the adoption of the Gold Standard. In its aftermath, the yield differential between Japanese and British bonds declined from over four percentage points to a two percent premium. A similar picture appears in the data on the volume of foreign borrowing and the composition of the Japanese government debt, see Figure 2. Capital inflows were miniscule until the adoption of the Gold Standard in 1897, when the trend was reversed.

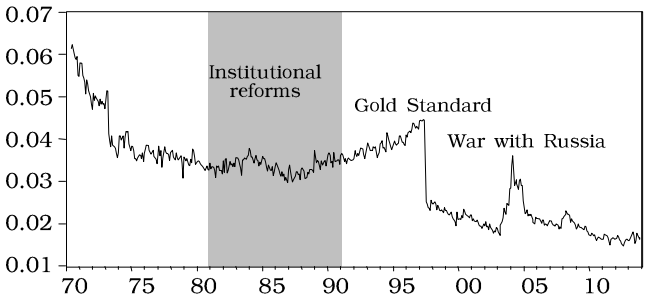

FIGURE 1
THE JAPANESE RISK PREMIUM, 1870-1914

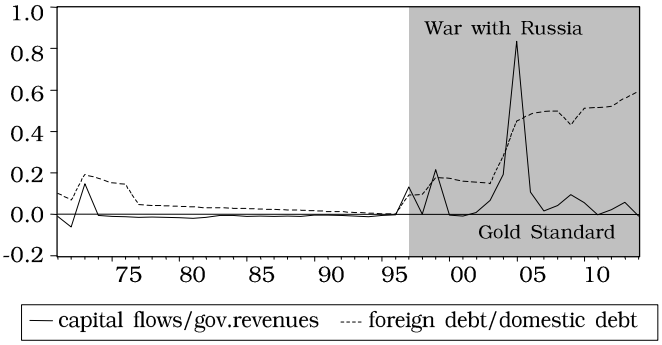

FIGURE 2
JAPANESE FOREIGN BORROWING, 1870-1914

We supplement the "ocular econometrics" presented so far with a more formal search for breaks in the Japanese risk premium series. This is done by using *both* the *iterative search for breaks* (where no breaks are assumed *a priori*) as well as the *search for breaks around major historical events*. The main result (reproduced from Sussman and Yafeh 1999a) is that the Gold Standard appears to be *the* major turning point in the Japanese risk premium series. It is found to be the most significant break point in the *iterative search for breaks* whereas no major breaks can be detected during the reform period of the 1880s (not shown). A similar picture emerges from the "windows" constructed around major historical events. Table 2 indicates that none of the major institutional reforms

TABLE 2

TESTS FOR STRUCTURAL BREAKS AROUND MAJOR HISTORICAL EVENTS
JAPAN, 1870-1914

Date	Event	Long-term break	Short-term "blip"
June 1873	Agrarian reform	-0.35*	None
Dec. 1877	Suppression of the Satsuma Rebellion	None	None
Nov. 1880	Privatization of government plants	None	None
Oct. 1882	Establishment of the Bank of Japan	None	None
June 1885	Introduction of convertible to silver yen notes	-0.05*	None
Feb. 1889	The Meiji Constitution	None	None
July 1890	First Parliamentary elections	None	None
July 1894	Outbreak of the Sino-Japanese war	None	+0.10*
April 1895	End of the Sino-Japanese war	None	None
June 1897	Adoption of the Gold Standard[1]	-0.50	Not available
June 1902	Anglo-Japanese treaty	-0.07*	None
Feb. 1904	Declaration of war on Russia[2]	None	+0.17*
Jan. 1905	Russian surrender in Lushon	-0.09*	None
Aug. 1910	Annexation of Korea	None	None
July 1912	Death of Emperor Meiji	None	None

Note: Using an eighteen month "window" around each event, we regress (the natural logarithm of) the risk premium, that is, the difference between Japanese bond yields and the yield on British Consols, on (a constant), the logarithm of the risk premium lagged one year, increments in the risk premium lagged one and two years, a trend (if significant), and two dummy variables for each event. The first dummy variable ("long") takes the value zero until the event, and the value one starting in the month in which the event took place and in every month thereafter through to the end of the "window." The second dummy variable ("pulse") takes the value one in the month of the event, and zero in all other months. If an event had a long-term impact on Japanese bond yields, we would expect the "long" dummy variable to be different from zero. A significant "pulse" dummy implies that an event created a short-term "blip." Yields are calculated as the ratio of interest payment to market price. For the wars with China and with Russia, the "long" dummy variable takes the value one starting in the month in which the war ended, and the "pulse" dummy variable equals one when in the month in which the war broke. We report the coefficient of the event dummy variables, both long-term and temporary, if their impact is statistically significant. Coefficients should be interpreted as percent change in existing yields.
* denotes statistic significance at the five percent level.
1) Because the entire stock of outstanding bonds was redeemed, we do not apply the test to this event. The estimated impact is based on the issue of new 5 percent bonds instead of the outstanding 7 percent debt. See text for further details.
2) The "window" around the war with Russia is two years long.

Source: Reproduced from Sussman and Yafeh (1999a)

in Japan had any discernible impact on the Japanese risk premium, despite that this methodology has been criticized as likely to identify breaks "too easily" (e.g. Christiano 1992).[5] What we wish to emphasize here is not the relatively small number of events that caused a break, but rather the kind of events that did influence the image of Japan in the eyes of foreign investors, and the kind of events that did not. Apparently, foreign investors found the institutional changes of the 1880s hard to evaluate. By contrast, the Gold Standard (and some political events, most notably the victory over Russia in 1905) played an important role in changing the image of Japan in the eyes of British investors.[6] Historical reports cited in Sussman and Yafeh (1999a) suggest that the Japanese government was well aware of the symbolic value of the Gold Standard and adopted it deliberately so as to improve the terms of Japanese foreign debt. Indeed, once "on" the Gold Standard, British investors showed great interest in Japanese government bonds, which could now be issued with far longer maturity (Table 1), with virtually no collateral, and with lower underwriting commissions (see Suzuki 1994). The evidence on the Gold Standard-induced improvement in Japan's "credit rating" fits the view that the Gold Standard was viewed as a commitment to a modern stable macro-economic policy. Eichengreen (1985) and Bordo and Rockoff (1996) also corroborate this hypothesis. They show that countries that were committed to the Gold Standard "as a good housekeeping seal of approval" (e.g. Canada and Australia) enjoyed lower risk premia

[5]The declining risk premium of the 1870s occurs early in our period of observation, and may be due to a number of factors which are discussed in detail in Sussman and Yafeh (1999a).

[6]In Table 2 we choose not to report the impact of the Gold Standard on yields using a "window" similar to that constructed around other events. This is because the decline in yields that accompanied the adoption of the Gold Standard was due to the complete withdrawal of the 1873 seven percent bonds and the issuance of new five percent bonds of longer maturity. When the entire stock of old bonds was about to be redeemed, yields approached the short-term risk-free interest rate (or prices approached the coupon redemption value). Therefore, the observed decline in interest rates from seven to five percent is likely to be an overestimate of the impact of the Gold Standard. A more conservative estimate can be inferred by using market yields in the early 1890s (before the approaching redemption began to drive them upwards) which were around six percent. The implied decline in the risk premium following the adoption of the Gold Standard according to this estimate is a third (rather than a half).

TABLE 3

CONTAGION IN NINETEENTH CENTURY ASIA: THE IMPACT OF EVENTS IN CHINA ON THE JAPANESE RISK PREMIUM, JAPAN, 1870-1914

Date	Event	Long-term break	Short-term "blip"
Dec. 1883	Outbreak of the Chinese-French War over Vietnam (Annam)	None	None
June 1896	Chinese-Russian military alliance	None	None
June 1900	Outbreak of the Boxer Rebellion	None	+0.05
May 1907	Instability and revolts in several regions of China	None	None
Sep. 1911	The Chinese Revolution	None	None

Note: The method used here is similar to that of Table 2.

in the period 1870-1914 relative to countries that went "on" and "off" the Gold (e.g. Brazil).

a) Contagion in Nineteenth Century Asia: Events in China and Japan's Risk Premium

In Table 3 we construct a "window" around several important events that took place in China, and using equation (1), examine their impact on the Japanese risk premium. We find that none of the major political and economic events that took place in China during the period (other than ones in which Japan was directly involved) had any impact on the risk British investors associated with Japanese sovereign debt. The dramatic Boxer Rebellion, in the suppression of which Japan took part, had only a small and marginally significant impact on Japan's country risk, and the impact was short-lived for the duration of the rebellion (i.e. a "blip"). The Japan-China war (described in Table 2) affected Japan directly, but it too only caused a short-term "blip." Other "shocks" in China were not immediately transmitted to Japan's cost of foreign debt. This is despite the fact that the Japanese and Chinese risk premium series were highly correlated during the period. Moreover, this absence of short-run "contagion" is certainly not due to the fact that information about events in Asia was incomplete. Tables 4A and 4B clearly show that the *London Times* reported events in Asia regularly and in detail, as did the *Economist.*

TABLE 4A

ARTICLES ON JAPAN IN THE *LONDON TIMES*

Year	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: The table displays a classification of Japan-related articles in the *London Times* between 1871 and 1899. The classification is based on our own reading of the articles. Articles which could not be classified into the four categories (e.g. articles dealing with miscellaneous news on Japan or with Japanese culture) are not included.

TABLE 4B

ARTICLES ON CHINA IN THE *LONDON TIMES*

Year	Internal instability and wars	Commerce and economics	Foreign relations	Institutions and reforms
1870	64	55	85	0
1871	14	33	21	2
1872	1	42	7	2
1873	6	75	27	0
1874	12	72	30	1
1875	24	71	74	2
1876	21	21	41	3
1877	6	34	29	4
1878	8	48	43	2
1879	17	17	30	2
1880	4	10	30	0
1881	1	21	18	0
1882	3	21	11	0
1883	29	16	67	1
1884	66	24	74	2
1885	18	10	43	3
1886	8	19	57	4
1887	7	20	35	5
1888	11	26	28	2
1889	13	86	15	4
1890	4	33	17	1
1891	77	11	142	0
1892	16	15	38	0
1893	14	17	15	0
1894	*	3		0
1895	*			
1896	2	21	70	1
1897	1	27	15	0
1898	17	12	37	6
1899	13	29	56	2
1900	55	18	76	1

Note: This table is similar to Table 4A, but displays a classification of China-related articles in the *London Times* between 1870 and 1900. * denotes a very large number of articles related to the Japan-China War of 1894-5.

Unlike "contagion" in Asia today, the perceived effect of events in China on Japanese debt was only due to the possibility that Japan would incur costs as a result of its direct involvement in China. The *Economist* expressed concern, for example, about the commercial implications on Japan of the 1911 Chinese Revolution, and on the possibility of Japanese military intervention in China (December 23, 1911). But in other cases, there was no reason for Chinese "shocks" to affect Japan's credit worthiness.[7] Finally, we examine if the one documented episode of "contagion" in the nineteenth century, namely the Baring Crisis (and Argentina's default) of 1890, had an impact on Japan's cost of capital.[8] Using a "window" around the crisis peak (November 1890), we find that the Baring Crisis did not have *any* impact on the Japanese risk premium. If anything, there was a slight increase in the price of Japanese bonds, which suggests that investors shifted some of their money into Japanese bonds, rather than run away and spread the crisis. As we will see in the next section, this is in sharp contrast with the experience of the recent Asian crisis.[9]

Before moving to examine present-day Korea, it is perhaps interesting to note that in both Table 2 and Table 3 very few events are significant (despite the claim mentioned above according to which this method should result in too many breaks). Perhaps this is due to the limited statistical power of the search for breaks using relatively short "windows." The important point, however, is not the actual magnitude of the effect, but the finding that most reforms caused little response until incorporated in a well understood signal, namely the Gold Standard. As for events in China, our basic claim is that (unlike the contagion observed in Asia today) these have been of limited importance in comparison with both the Gold Standard and political events concerning Japan itself (e.g. the 1905 victory over Russia or the 1902 alliance with Britain).

[7]These findings are in line with Sussman and Yafeh (1999b): Although in the long run, sovereign debt yields of countries "on" the Gold Standard moved together, short-term idiosyncratic fluctuations were not always transmitted across the borders.

[8]According to Eichengreen (1997), this crisis affected interest rates in many countries in Latin America and elsewhere.

[9]The effect of the Baring Crisis on Japanese bond prices remains positive albeit statistically insignificant even when we examine *daily* data around the peak of the crisis.

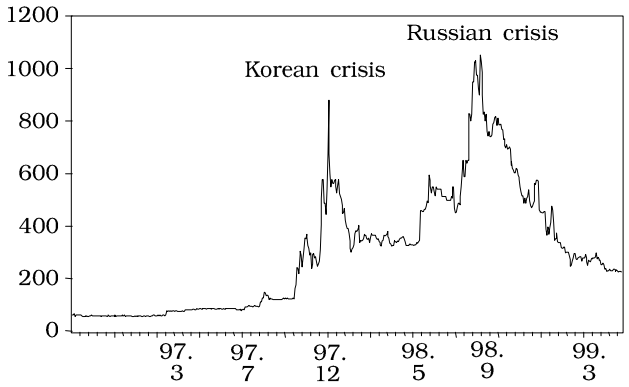

FIGURE 3
THE KOREAN RISK PREMIUM, 1996-1999

B. Present-Day Korea

The risk premium on Korean bonds is displayed in Figure 3. Unlike the Japanese bonds in the Meiji period there is no declining trend in the data, which obviously cover a much shorter time period. Yet there is quite a bit of variance in the series. The "spread" ranges between a minimum of about 50 basis points (above a comparable US Treasury bond) in October 1996 after Korea joined the OECD, and a maximum of about 1,000 which is reached during the financial crisis in fall 1997 and during the Russian debt crisis in summer 1998. In addition, the figure displays several "spikes" which represent days in which the risk premium increased (or declined) by up to thirty percent! Before investigating what happened on these dates, it is interesting to note another important feature of the Korean risk premium: The correlation between the Korean risk premium series and the premium on sovereign bonds of neighboring Asian countries is exceptionally high, in spite of the fact that the series cover a fairly short time span. In particular, the correlation between the Korean and Thai risk premia is close to 0.97. The comparable figure for the Indonesian and Malaysian premia is about 0.8, whereas the correlation with the premium on Latin American (Argentine and Brazilian) bonds is about 0.5 and 0.3, respectively.[10]

[10]Cointegration tests confirm that the Korean and Thai series are

a) The best and the worst days

Table 5A lists the twenty days in which the risk premium on Korean sovereign bonds increased by the highest percentage (the "worst twenty days"), and Table 5B displays the "best twenty days." Of course, many of these days represent only short-term pulses, which do not amount to major "breaks" (that is, long-term changes in trends or levels). Such pulses should probably be compared in magnitude with short-term fluctuations in the historical data. Six of the forty days listed in Tables 5A and 5B are identified by the *iterative search for breaks* as significant (and relatively) long-term breaks in the Korean risk premium series. October 27, 1997 is the first and most significant break; December 24, 1997 is the second most significant; June 2, 1998 and September 7, 1997 are found in the third iteration; and February 18, 1998 and August 21, 1998 are the fourth iteration breaks.

V. Interpreting the Results and Their Implications

Our findings imply that there are interesting similarities and differences between Asian sovereign bonds in the nineteenth century and today. First, in both nineteenth century Japan and present day Korea, foreign investors relied on "summary statistics" and did not pay attention to interim news reports on domestic changes. For example, British investors though well informed about the Meiji Constitution did not update their beliefs about Japan as a borrower until she adopted the macroeconomic symbol of developed economies, namely the Gold Standard. In the case of Korea, investors seem to be very sensitive to agreements with the IMF (and possibly the implied commitment to reform), as well as to the opinion of well-known credit rating agencies. Korea's acceptance to the OECD and its successful negotiations with foreign creditors were two other "summary statistics." As noted above, these events need not be long-term break points, but they are nevertheless interpreted as "news" whereas other domestic events and attempted reforms with potentially equally important implications go unnoticed, at least until they are incorporated in a credit rating agency's assessment of credit worthiness.[11] Evidently, such

cointegrated with a coefficient that is close to 0.9.

"summary events" convey information beyond what investors can learn from other events. This would explain the "jump" in Japan's risk premium with the adoption of the Gold Standard which apparently contained new information beyond what was provided by the establishment of the Bank of Japan and the accumulation of gold reserves, both prerequisites for Japan to go "on" the Gold. Similarly, Moody's changes in Korea's credit rating must have conveyed information that was not available to market participants by observing earlier events. Again, note that our point here is not to gauge the number of events that make the Korean risk premium fluctuate, but rather to point out what kind of events matter a lot and what kind of events matter only a little.

Another evident feature in Tables 5A and 5B is that many of domestic events that are noticed by foreign investors are related to instability (e.g. labor disputes), much like the "pulses" of the nineteenth century (e.g. the outbreak of the wars with China or Russia, see Table 2). Other events are noticed apparently because they involve a foreign party (e.g. the accord between some of the Korean conglomerates and foreign banks and the relaxation of restrictions on foreign investment). A plethora of media reports about (for example) the relations with North Korea or attempted reforms in labor markets do not seem to have a big impact on the risk premium. The reason is probably the inability of investors to follow in detail all the events that take place in a large number of countries where they invest some of their portfolio. Another possible explanation is that foreign investors (both today and a hundred years ago) cannot evaluate the credibility and significance of domestic reforms. This creates the "Gold Standard symptom:" Reforms are not credible until they are "certified" by well-understood Western institutions.[12] It should be noted, however, that the magnitude (and frequency) of market responses seems much higher in the modern data than it was a hundred years ago.

[11]Nevertheless, it appears that Korea's agreements with the IMF did not prove to be major turning points with an effect similar in magnitude to that of the Gold Standard in Meiji Japan. Note, however, that in general, short-term fluctuations in the Korean data are much larger than the "blips" identified in our historical Japanese data set.

[12]In Sussman and Yafeh (1999a) we argue that a military victory over an *ex-ante* stronger rival (e.g. Japan's victory over Russia) can also "certify" a country's domestic progress and development.

TABLE 5A

THE LARGEST INCREASES IN THE KOREAN RISK PREMIUM

(The Worst Twenty Days)

	Date	Event	% increase in premium	Effect on other countries
(1)	27/10/97	Bad economic news from Hong Kong*	27.53	Th, Indon
(2)	30/10/97	Bad economic news from Hong Kong	25.59	Th, Indon
(3)	02/06/98	Labor disputes*	24.90	No
(4)	23/10/97	Bad economic news from Hong Kong	24.37	Th, Indon
(5)	10/12/97	Government suspends five cash strapped companies	23.48	Indon
(6)	23/12/97	Credit agencies downgrade Korean sovereign debt	22.95	No
(7)	21/08/98	Russian default*	21.59	Mal, Indon
(8)	19/03/97	?	21.26	Indon
(9)	22/12/97	Moody's lowers ranking of Korean sovereign debt to junk	20.18	Th, Indon
(10)	11/12/97	Moody's lowers ranking of Korean sovereign debt	19.79	Th, Indon
(11)	19/12/97	Korea Investors Service downgrades *chaebol* affiliates	17.97	No
(12)	16/06/98	55 firms about to fail	17.64	No
(13)	02/09/97	Trouble selling Kia*	14.78	No
(14)	10/09/98	Bad economic news from Brazil	14.29	Lat Am
(15)	09/12/97	Stocks and won plunge – "investor worries"	13.77	No
(16)	25/08/97	S&P may cut Thailand's rating	13.70	No
(17)	25/11/97	Non-performing loans bigger than expected	13.19	No
(18)	27/08/98	Russian default	13.16	Th, Lat Am
(19)	13/01/99	Bad day in the stock market	13.12	Lat Am, Th, Indon, Mal
(20)	12/12/97	Suharto's health problems	12.73	Th, Indon

Note: Th, Indon, Mal, and Lat Am denote events that had a large impact (above 10 percent change) on the risk premium on Thai, Indonesian, Malaysian, and both Argentine and Brazilian bonds, respectively. * denotes events that are found significant in the iterative search for structural breaks. ? denotes a date in which no major event is reported.

TABLE 5B

THE LARGEST DECREASES IN THE KOREAN RISK PREMIUM

(The Best Twenty Days)

	Date	Event	% decrease in premium	Effect on other countries
(1)	24/12/97	Overshooting the day before?*	-30.09	Th
(2)	21/11/97	Government to turn to the IMF for assistance	-24.17	No
(3)	21/12/98	Talk of debt upgrading	-24.09	No
(4)	10/10/96	Korea joins OECD	-20.99	No
(5)	19/01/99	Fitch upgrades Korean sovereign debt	-20.40	No
(6)	18/02/98	Conglomerates reach accord with foreign banks*	-19.10	No
(7)	04/11/97	Thai (and Korean) stocks rally	-18.40	Th
(8)	16/12/97	All three presidential candidates will abide by IMF deal	-18.35	Th, Indon
(9)	04/01/99	S&P upgrades Korean sovereign debt	-17.92	Th
(10)	29/07/98	Agreement with the IMF on revised economic goals	-17.52	No
(11)	26/12/97	Financial markets fully open to foreigners	-12.46	No
(12)	09/09/97	KDB issues $750 million bonds in US	-12.31	No
(13)	15/01/99	?	-11.45	Lat Am
(14)	23/01/98	?	-11.14	No
(15)	16/02/99	Successful negotiations with foreign creditors	-10.94	No
(16)	13/08/98	?	-10.66	Argentina
(17)	13/01/98	Government takes steps to ease cash crunch	-10.05	No
(18)	18/12/97	Reforms and approval of 2nd part of IMF loan	-9.77	No
(19)	25/01/99	?	-9.74	No
(20)	15/09/98	Government to acquire 2 ailing banks	-9.72	Lat Am

Note: Th, Indon, Mal, and Lat Am denote events that had a large impact (above 10 percent change) on the risk premium on Thai, Indonesian, Malaysian, and both Argentine and Brazilian bonds, respectively. * denotes events that are found significant in the iterative search for structural breaks. ? denotes dates in which no major event is reported.

Our results on "contagion" are, perhaps, more interesting. Even though British investors in the nineteenth century had fewer sources of information about Asia than investors today, the distinction between events in different Asian countries seems to have been clearer in the past than it is now. Instability in China was not immediately transmitted to the Japanese risk premium. By contrast, the panic and contagion of the recent Asian crisis are very clear in our modern data. Rumors about Indonesia's President Suharto's health problems had a strong impact on the risk associated with Korean sovereign debt, as did economic news from Thailand, Hong Kong, and far away countries such as Brazil. The threat of Russian default in summer 1998 (and perhaps the LTCM fiasco as well) pushed the risk premium on Korean sovereign debt to unprecedented levels. These results on "imported shocks" are corroborated by the findings of Kaminsky and Schmukler (1999) who show that stock market "jitters" in East Asia are often caused by unrelated events in neighboring countries. Izvorski (1999) reports similarly that prices and yields on Brady bonds seem to move together, despite the issuing countries' different economic fundamentals.

One explanation for this phenomenon is that foreign investors "re-balance" their portfolio in favor of safer assets in view of information that reveals a risk greater than previously perceived with respect to their emerging market bonds. But the logic of this argument should apply also to nineteenth century bond markets, although it was probably more difficult and time consuming for investors at that time to shift large amounts of capital as swiftly as they can now. Moreover, it is not clear why the optimal response to bad news from Indonesia should be a sale of Korean bonds. Perhaps it is the case that regional funds today (e.g. Asia funds) lump together assets from neighboring countries, and are therefore forced to liquidate positions in all countries included in their portfolio if investors wish to withdraw money in view of a crisis in one emerging market. But if this is the reason for the impact of Suharto's health on the price of Korean bonds, it does not seem to be efficient either from the individual investor's point of view or from the point of view of the countries involved.

Another possible reason for the fact that shocks today are transferred more easily to neighboring countries may be that the world today, and particularly East Asia, are better integrated in

terms of trade flows. This means that shocks are easily transmitted from a country to its trading partners (Glick and Rose 1999). Our results could then be explained if trade relations between Korea and Indonesia today were more important than Chinese-Japanese trade around the turn of the century, but this hardly seems to be the case.[13]

A third explanation for increased influence of events in neighboring countries could be the nature of the data. For example, the high-frequency (daily) modern Korean data may reveal short-term shocks that are hidden in the low frequency (monthly) historical data. To examine this issue we transform the Korean series from daily into monthly data by using only one observation at the end of each month. The transformed Korean risk premium series (not shown) is less volatile than the daily risk premium series but still appears to be quite different from the historical Japanese series. It is much less smooth, and foreign shocks do not seem to disappear in the transformed series. On the contrary, the events of August 1998 in Russia, for example, appear to be very dramatic in the monthly data as well, causing a 126 percent increase in the risk premium relative to the previous month. The events of fall 1997 are clearly evident too. Thus, it is unlikely that the increased magnitude and frequency of imported shocks are simply an artifact of the frequency of the data.

Before suggesting a more plausible explanation for the regularities we observe, it is interesting to note another feature that is common to our study of Korean sovereign debt and to Kaminsky and Schmukler's (1999) study of Asian stock markets. There are some days in which markets are highly volatile although there is no event or news report that can clearly account for the negative

[13]For example, according to the *Historical Statistics of Japan* (published by the Japan Statistical Association) China accounted for about one eighth of Japan's foreign trade in 1900, whereas the *Economist*'s Country Report for Korea does not rank Indonesia, Malaysia, or Thailand among Korea's major trading partners in 1996. Malaysia accounted for only 3 percent of Korea's exports and two percent of her imports. Indonesia accounted for about two and a half percent of Korea's imports and was not one of the major export destinations for Korean goods. Trade with Thailand was even smaller. Moreover, the volume of external trade of Meiji Japan (in relation to GNP) was substantial (see again the *Historical Statistics of Japan*) so that it is not possible to argue that trade with Indonesia today "matters more" to Korea than trade with China did for Japan a hundred years ago.

or positive "jump." This leads us to the following conclusion. The extreme degree of capital market integration today, combined with the large number of market participants and the easiness of trade, facilitates the flow of capital to developing economies. Yet huge and swift capital flows come with the cost of high volatility in financial markets with no apparent reason. Moreover, capital inflows are accompanied by shocks that are imported from neighboring countries ("contagion"), even though some of these shocks need not directly affect the economic wellbeing of the country whose markets they affect. This does not mean to suggest that international capital flows should be taxed or controlled, since such measures may have significant negative consequences. But it does mean that just like some stock markets impose trading halts to enable investors to "take a breath" and think twice when stock price movements are extreme, some mechanism that slows down transactions in sovereign bonds when there is very high volatility may also be beneficial. Similarly, investment funds that lump together assets from neighboring countries may be convenient, but they may also be one of the reasons why shocks cross borders from one country to the next even when fundamentals are quite different.

(Received August, 1999; Revised October, 1999)

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