The International Transmission of Financial Crises before World War II:

Was there Contagion?

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Abstract

Recent research has attributed the rise in cross-market correlations during periods of financial turbulence as evidence of transmission via channels that are otherwise dormant during periods of relative tranquility. Without being explicit as to what these channels are, they are usually surmised as evidence of financial contagion. In a systematic investigation of pre- and post-crisis cross-market correlations, in three periods of history, we find some evidence of greater market co-movements after the onset of a crisis. However, this strengthening of cross-market linkages, whether contagion or not, seems to infect only those countries that otherwise have weak bilateral ties during periods of relative stability. In contrast the excess market co-movements observed in tightly integrated markets is, in general, of lesser magnitude. In general, however, we find evidence of considerable volatility in cross-market correlations, as such it is unclear that even significantly higher correlations observed during periods of instability cannot be dictated by the constraints of the traditional relationships that prevail during periods of relative stability. That is, whereas correlations between markets may be tighter during periods of turmoil, that such co-movements are unique to such times is not necessarily the case.

1. Introduction

The financial crises in the 1990s in Mexico and East Asia have been decried for their virulence and for the far-reaching effects and international spread beyond the epicenters. That crises can spread across international borders should not, of its own accord, be surprising; it is merely a reflection of the interdependence of cross-country fortunes in the presence of real and identifiable channels of transmission. However, recent crises were claimed to be a threat to global economic and political stability because they were so contagious. In particular, this increased international scope of crises has popularized a view that would suggest that the spread of crises can be indiscriminate, affecting countries with otherwise strong fundamentals that display no obvious connections or linkages to other crises-affected countries. It is this phenomenon which is often called contagion.

However, confusion prevails over the term "contagion," as there exists no accepted definition. It is broadly used in the finance literature in reference to volatility clustering and spillovers observed in asset markets. An analogous interpretation of the word "contagion," as a catch-all term that refers to all the channels through which shocks are disseminated between countries, can be found in the literature on financial crises, e.g. Kaminsky and Reinhart (1998). These channels include: crises linkages such as the effects of a devaluation of a country's currency on the competitiveness of its trading partners; financial market integration which closely links asset markets across international borders; and the responses of common lenders to a region (or even a larger number of countries) to a crisis in one country which constrains liquidity.

A narrower definition of the word "contagion" separates contagion effects from those that are justifiable by economic fundamentals, e.g. Eichengreen, Rose and Wyplosz (1996) define contagion stemming from a currency crises as follows (though the definition is applicable to crises in general):

> [By] contagion...we mean a systematic effect on the probability of a speculative attack which stems from attacks on other currencies, and is therefore an additional effect above and beyond those of domestic "fundamentals."[1]

According to this view, transmission occurs through various non-fundamentals based channels that operate after the onset of a crisis, but are unimportant during periods of tranquility. Various theories have been forwarded as to what these possible channels of transmission may be. Some theories have centered around self-fulfilling expectations and panic (Masson 1998). While some other explanations have stressed weakening incentives in gathering country-specific information in increasingly globalized securities markets, as an important culprit responsible for the greater levels of volatility that have been observed across emerging markets. According to this view, investors are unable to distinguish one emerging country from another, and are thus prone to lumping all emerging countries into one group. The revelation of a bad state in one market then causes a universal shift in expectations across all emerging markets and a movement of funds into safer markets.

A comparison of the cross-correlations between markets prior to and after the onset of a crisis can suggest the importance of the above channels of transmission, but cannot separate one channel of transmission from the other. Recent studies, such as, Baig and Goldfajn (1998), Forbes and Rigobon (1998) have implemented such tests for contagion in financial market variables. Baig and Goldfajn (1998) test for contagion between the markets of Thailand, Malaysia, Indonesia, Korea and the Philippines during the recent Asian crisis. They find that the cross-country correlations among currencies and sovereign spreads increase significantly during the crisis period, while the evidence of contagion in equity markets is mixed. Forbes and Rigobon (1998) have shown that the measure of cross-market correlations is biased upward during periods of higher volatility, in which case the rise in the correlation coefficients that we observe during a crisis, need not signify that linkages between countries have in fact strengthened significantly. After correcting for this bias they have found the incidence of contagion in stock market returns in three separate episodes of volatility to be weak.

However, the challenge in assessing the empirical importance of contagious channels of transmission, is more involved than verifying the incidence of higher correlations at times of crisis to be statistically significant. A test of the null hypothesis that $\rho_1 = \rho_2$, where ρ_1 is the cross-correlation during

periods of relative calm and ρ_2 is the cross-correlation during periods of greater volatility, is based on the assumption that correlations between markets can change following the onset of a crisis, however, during either a period of tranquility or a period of crisis these correlations are constant. A test as to whether the correlations change during periods of turbulence then, attempts to assess whether the observed differences between the measured correlation coefficients can be attributable to statistical noise, or whether the correlation between markets is state-dependent, where a stable period represents the realization of one state and a crisis period the realization of another.[2] However, it is not clear that the correlation between two variables is constant over a given period of time. The correlation coefficient may be dependent on other factors in both a tranquil periods and crisis periods. For instance, it is possible that market co-movements are generated in response to news, where large shocks or "bigger news" reaches a wider audience and has greater leverage in affecting markets. Thus larger shocks may generate greater co-movements between markets. To the extent that shocks are both larger and more volatile during periods of turbulence, we would expect that the unconditional distribution of the sample correlation coefficient to have a higher mean and variance during turbulent periods. It is not clear therefore, that a simple test that $\rho_1 = \rho_2$ will necessarily be picking up differences in cross-market linkages that are attributable to the state variable. The point is that crises may be accompanied by increases in the correlation coefficient even in the absence of any structural shifts in the relationship between markets, since typically shocks are larger during periods of crisis.

The objectives of our paper are very simple: to examine the record of financial crises in the past 120 years; and the evidence for the prevalence of channels of transmission that could be called "contagion." We examine the evidence of increases in correlations during periods of volatility relative to periods of tranquility between the years 1880-1914, when the world was on the gold standard, and also for the period between 1919-1939, when the world operated on the gold exchange standard and contrast our findings for that period with the more recent period between 1973-1997.[3] We omit the Bretton Woods period from the comparison because in that period there were virtually no banking crises and the currency crises that

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[1] Eichengreen, Rose Wyplosz (1996) "Contagious Currency Crises," p. 2.

[2] A test of the null hypothesis that $\rho_1 = \rho_2$ is based on the sample correlation coefficient, which has an *r*-distribution. An appropriate transformation can bring this distribution closer to normality. See Fisher 1915, and Ruben 1966. The difference in the transformed sample correlation coefficients – during periods of calm and periods of greater instability – can then be approximated by a random variable that has a normal distribution. A test of the null is then straightforward, however, implicitly we assume that the two samples of crisis and non crisis observations are independent, and that each sample is drawn from a bivariate normal distribution with correlation ρ_1 and ρ_2.

[3] We define periods of volatility as periods when there is either a currency crisis or a banking crisis or a coincidence of these two events.

occurred had very minor real effects. See Bordo and Eichengreen (1999). We attempt to discern patterns in the manner that correlations are affected during periods of crisis, as this gives us information on the significance of international linkages and the geographical pattern of such linkages. This is because during turbulent periods, if shocks are not communicated between countries in an indiscriminate manner, rather if there exists some order in the way that correlations across countries are affected, then this may suggest that shocks are dissipating via standard channels of transmission, casting doubt on those contagional avenues of transmission that underplay the significance of the traditional relationship between markets.

Though evidence of any such patterns may shed light on which markets display increased co-movement during periods of crisis, thereby revealing the salient channels of transmission, such analysis cannot isolate the impact of a shock in one country on another. For this purpose VAR analysis is useful, as it disentangles the effect of a shock in one country on another. VAR analysis thus allows us to answer questions as to whether channels of transmission change significantly when we restrict our attention to crisis dates and which countries were the primary recipient of shocks during crises and which countries were largely insulated. The answers to these questions are important in understanding the extent of contagion relative to say fundamentals based transmission.

Scrutiny of the correlation coefficient in two exclusive windows of time – one corresponding to a period of tranquility and the other to a period of turmoil – provides a foundation for a test of the importance of contagion based transmission. Moreover, VAR analysis affords a more precise picture of the cross-country linkages during crises and non-crisis periods. However, even though these methods provide an idea of the extent of the average relationship between countries over periods of time they do not cast light on the short-term aspects of this relationship. To this end, we investigate the dynamics of the correlation coefficient by rolling a three-month window over the sample. This exercise traces the developments across markets as summarized by the co-movements of bond prices. In addition, it reveals the volatility of the correlation coefficient during periods of stability and during periods of instability, which may offer suggestions on how to interpret the significance of a rise in correlation during periods of volatility.

In section 2, we first describe the history of international financial crises in the nineteenth and twentieth centuries. With this narrative as background, combined with the aid of a chronology of financial crises (banking and currency crises) for 21 countries,[4] both advanced and emerging, in section 3, we examine some empirical evidence using annual data on the co-movements between countries, in periods of

crisis, in five macroeconomic variables: real GDP growth, CPI inflation, the change in the ratio of net exports to GDP, M2 money growth, and the change in short-term interest rates for a panel of 21 countries from 1880-1939 and for 28 countries from 1973-1998 (the 21 countries plus 7 countries affected by recent crises).[5] Although an analysis of the annual data can provide insights into transmission between countries over the long run, annual data is unlikely to cast a sufficiently fine net to "catch" the bulk of contagion effects which are largely short term.

To this end, in section 4, our focus switches to the co-movements of bond prices, for which we have weekly data for both the prewar and interwar periods. We conduct a variety of tests for contagion. First we compare the cross-country correlations during periods of relative tranquility to that during periods of turmoil. We do this for both the prewar and interwar periods. We then examine whether there exist any discernible patterns in the manner in which correlations are seen to rise across countries as well as the dynamics of the correlation coefficient. We estimate Vector Autoregressions (VAR) using our interwar data, for which we have the longest continuous series. We estimate the impulse responses of shocks to various countries for periods of tranquility as well as periods of crisis. The impulse responses allow us to isolate the impact of a shock in one country on another, thus underlining the various bilateral cross-country interdependencies that exist. Moreover, a comparison of the impulse responses for periods of crisis and non-crisis, allow us to see to what extent cross-border linkages change during crises, as well as providing a means by which to investigate the role of various countries in communicating shocks.

Section 5 compares the historical high frequency patterns to that of recent emerging countries during the recent Asian crisis. Section 6 concludes with some lessons from history.

2. Historical Perspectives on the International Transmission of Financial Crises

The recent series of crises in emerging markets, the Mexican crisis of 1994-95 and the "tequila spillovers" to Latin American and other countries, the Asian crisis of 1997-98 and its "spillovers" to Brazil and Russia, has led to the view that financial crises (both currency and banking crises) tend to spread across countries like a contagious disease unless they are curtailed by vigorous international intervention. From an historical perspective the recent spate of international financial crises is nothing new. In the century and

[4] The countries in our sample are: Argentina, Australia, Belgium, Brazil, Canada, Chile, Denmark, Finland, France, Germany, Greece, Italy, Japan, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, U.K., USA.

[5] The 7 additional countries are: Indonesia, Korea, Malaysia, Mexico, Philippines, Singapore and Thailand.

a half preceding World War II there were numerous international financial crises, some of which dwarfed the recent batch in both severity and scope. Below we discuss their incidence and evolution.

The Incidence of International Financial Crises

The nineteenth century had periodic international financial crises in virtually every decade since 1825. Kindleberger (1986a) Appendix B presents a chronology going back to the seventeenth century. His focus was primarily on showing a common incidence of crises in the core countries of Europe and the U.S. Morgenstern (1959) displays a chronology of stock market panics for European countries and the U.S. from 1880-1939 showing a high degree of cross-country coherence. Thorp's (1926) *Business Annals* is also a source showing common patterns of banking panics, stock market crashes, and financial stress in 17 countries. Bordo (1986) focused on 4 European countries (U.K., France, Germany, Sweden) and the U.S. and Canada 1870-1939. His chronologies of financial crises, banking panics, and stock market crashes highlighted the international coincidence of these events and of several empirical measures of financial stress under the classical gold standard and gold exchange standards. Recently Bordo and Eichengreen (1999) compiled a chronology of banking and currency crises based on historical narratives and a currency crisis index for 21 countries from 1880-1973. This chronology is complemented with measures of the economic impact of crises. Again a pattern of recurrent international crises is evident. (See Figure 1).

From this literature we learn that there were periodic financial crises in a large number of countries over the past century and a half. The key crisis years before World War II were 1825, 1837-38, 1847, 1857, 1866, 1873, 1890-93, 1907-1908, 1914, 1920-21, and 1929-33. In the postwar Bretton Woods regime, although there were currency crises in advanced countries associated with adherence to the adjustable peg exchange rate regime, there were no banking crises and the crises observed had relatively minor economic effects. For the period beginning in 1880 for which we have sufficient data to assess the economic impact of crises, the evidence from Bordo and Eichengreen (1999) suggests that the severity of crises in emerging countries before 1914 may not have been as great as that observed in today's emerging countries and that it is the incidence of twin currency and banking crises today that may account for the different experiences.

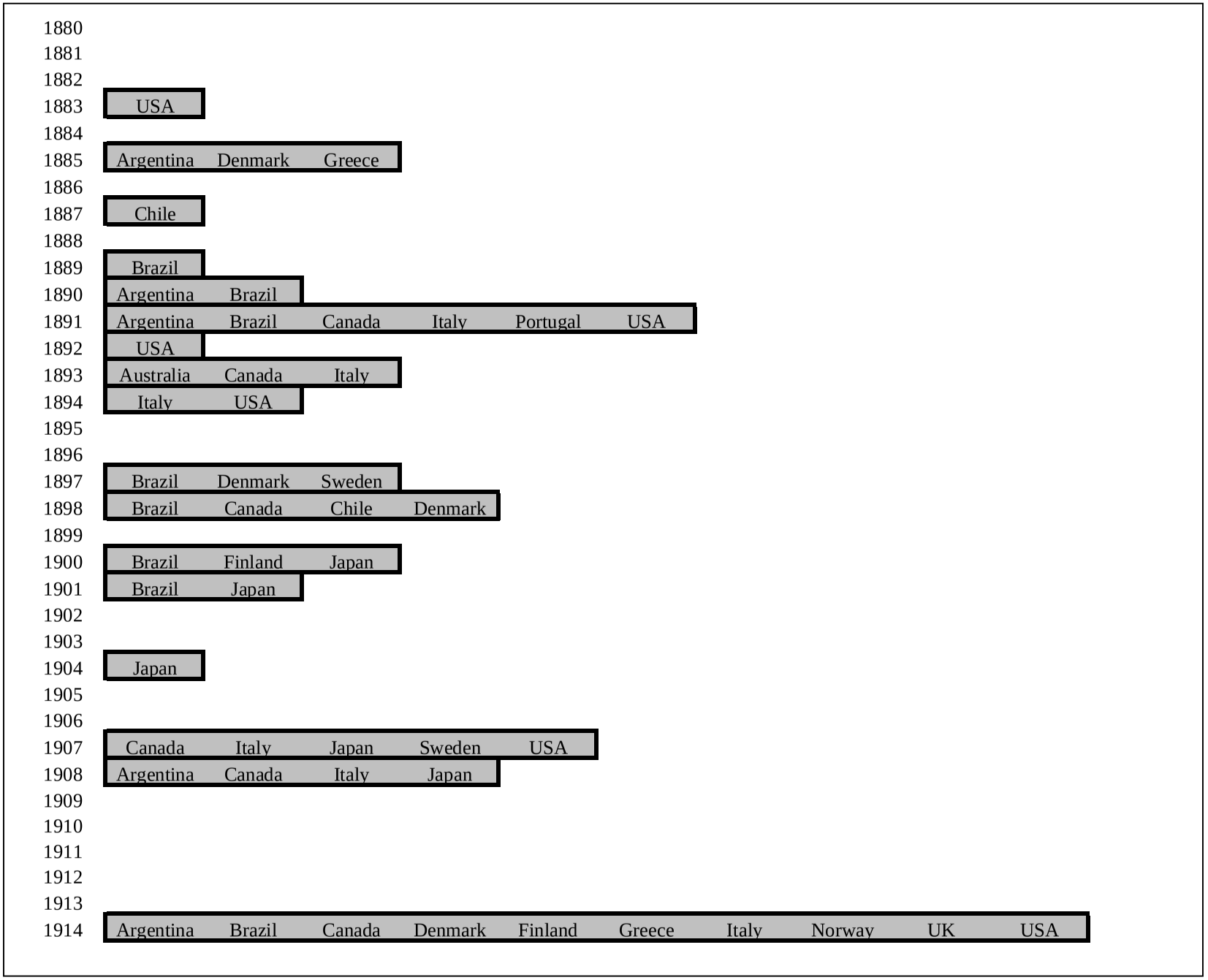
Patterns of Transmission

From the historical literature we can discern a number of explanations for the international transmission of crises. These include linkages through international trade, through lending from the core to peripheral countries, through arbitrage in short-term securities markets, stock markets, and commodities between advanced countries, and through gold flows and the money supply and psychological factors independent of the other channels.

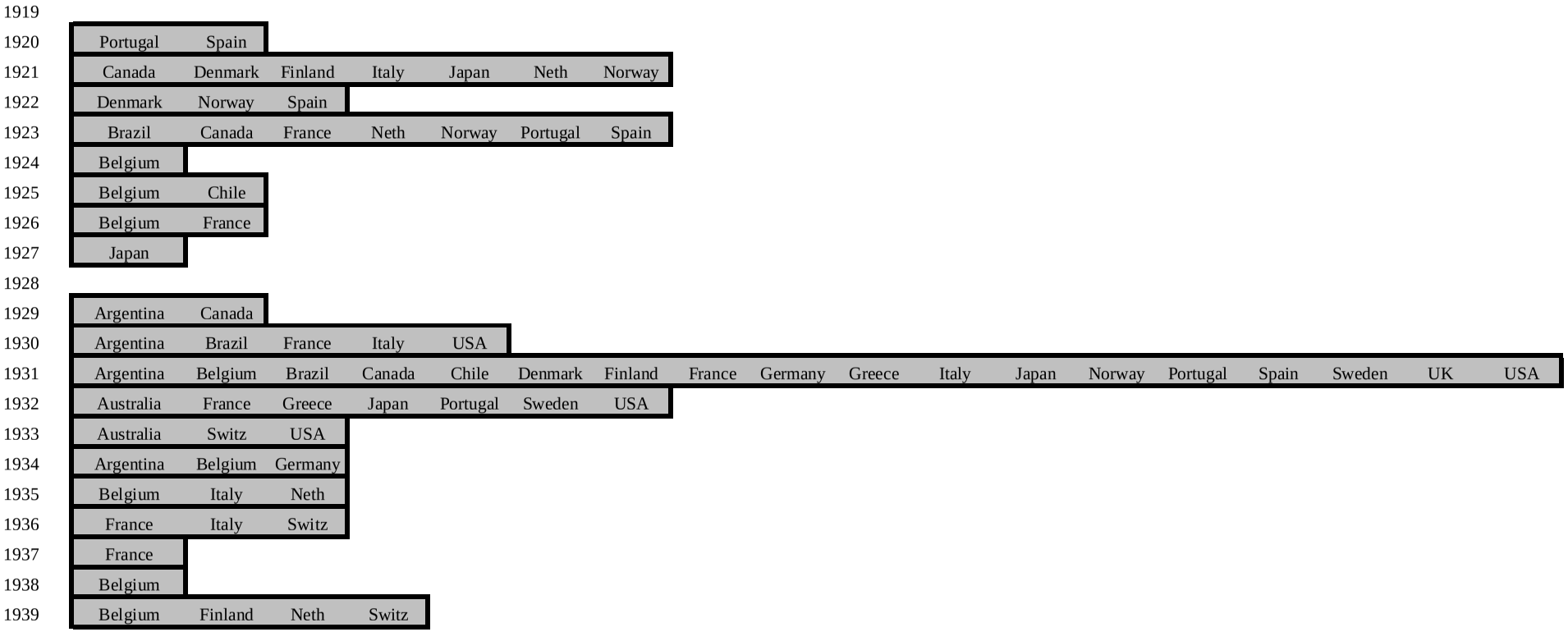
All of the pre-World War II crises occurred under variants of the gold standard. This has two important implications. First, most countries adhering to gold convertibility after 1880 were tightly linked to each other by the fixed exchange rates of their gold parities and the absence of serious impediments to the flow of goods and capital. This facilitated the transmission of shocks, including financial crises, between countries. Second, these international crises often occurred in periods of deflation when, under the self-regulating operation of the commodity theory of money which in the long-run drives the price level for the gold standard world, an excess demand for monetary gold created an environment of monetary stringency and financial distress (Bordo and Wheelock 1998, Bordo, Duekker, Wheelock 1999).

Within this context the record suggests a number of geographical patterns of crisis transmission. The dominant mechanism was between the advanced countries of Europe, with crises often originating in Great Britain, the center of the international financial system, and from the core to the periphery countries of North America, Latin America, and the rest of the world. However, crises also originated in the periphery and especially the U.S., which spread to Europe and then back to the periphery. Below we document some of the more important episodes.

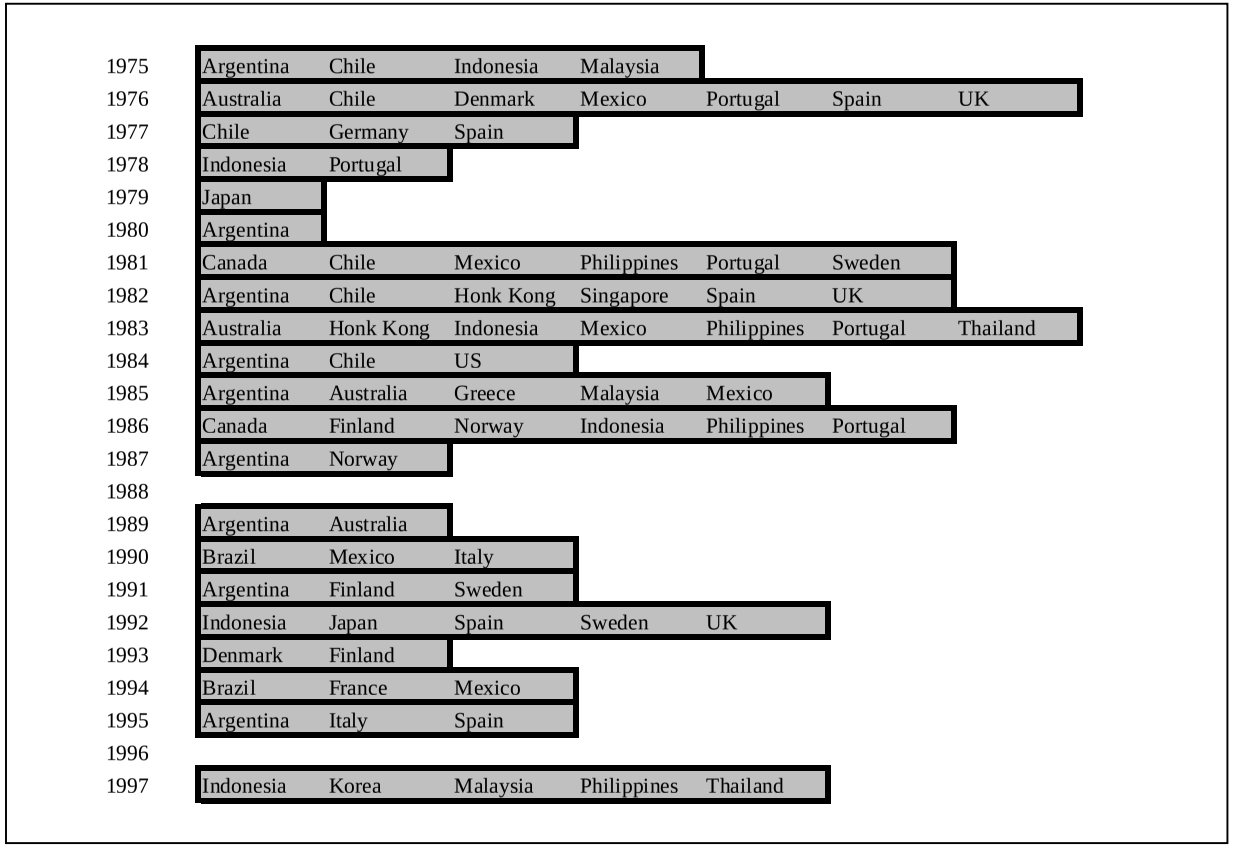
Countries Affected by Crises, from a Sample of 21 Countries, 1880-1914
Source: Bordo and Eichengreen (1999)



Countries Affected by Crises, from a Sample of 21 Countries, 1919-1939
Source: Bordo and Eichengreen (1999)



Countries Affected by Crises, from a Sample of 28 Countries, 1973-1997
Source: World Economic Outlook (1998)



Episodes of International Financial Crises

1825. The crisis of 1825 is often viewed as the first international financial crisis. The liberation of Latin America in the early 1820s led to a massive inflow of capital from Britain to finance the exploitation of gold and silver mines and of sovereign loans to the newly independent republics. It also led to an export boom. These foreign influences combined with the rapid growth of the new industries of the industrial revolution and liberal monetary expansion in the years after the Napoleonic wars led to a speculative mania on the London Stock Exchange (Gayer, Rostow, and Schwartz 1953, Neal 1998, Bordo 1998). A growing trade imbalance and a drain on the Bank of England's gold reserves led the Bank to raise its discount rate in the summer. A stock market crash in October triggered a banking panic in December, which spread to the continent. The Bank, concerned over its own reserves, did not act quickly enough to allay the panic, which resulted in numerous bankruptcies and a recession. The crisis spread to Latin America as the overseas loans were cut off, a decline in investment and exports reduced tax revenues and led to sovereign debt defaults across the region. It took three decades before the debts were renegotiated and capital flows in Latin American resumed (Marichal 1989).

1836-38. This crisis was primarily an Anglo-American affair. In 1836, the Bank of England began raising Bank rate in response to an external gold drain caused by poor corn harvests and capital flows to the U.S. to finance a boom in cotton lands. The resultant stock market crash in December 1836, spread to Paris. The effects on the U.S. were dramatic. A reduction in lending to cotton factors in New Orleans sparked a banking panic there that spread through the correspondent banking system to New York. The resultant nationwide panic led to suspension of specie payments in May 1837 that lasted close to a year. The crisis was transmitted through capital market linkages and through specie outflows and their effects on money supply (Temin 1969, Levy-Leboyer 1982, Huffman and Lothian 1984).

1847. This crisis which was primarily a European affair was triggered by the collapse of a speculative boom in railroad shares in London. As in earlier episodes, the British balance of trade turned negative. The Bank reacted to declining gold reserves by raising its discount rate. This ended the boom, caused prices to fall and triggered a major banking panic, which ended only with an announcement that the Chancellor of the Exchequer had signed a letter temporarily suspending the Bank Charter Act, thereby allowing the Bank to issue more notes than would be covered by its gold reserves (Clapham 1945,

Dornbusch and Frenkel 1984). According to Kindleberger (1986a), the crisis spread to Germany and Holland in the next year through international banking channels.

1857. This crisis began in the U.S. A railroad stock boom fueled by the California recently discovered gold fields and British capital, collapsed in August 1857. This led to the banking panic of 1857 with widespread bank failures. This crisis spread to England in the fall and, like the 1847 event, was ended in November by a Treasury letter. From England the crisis spread to the continent, with a serious panic in Hamburg in December. According to Kindleberger, the crisis was also felt in South America, South Africa and the Far East.

1873. The crisis of 1873 is viewed as a major international crisis. The run-up to the crisis was a lending boom in Latin America to finance railroads fueled from England and the continent, and a speculative land boom in Germany and Austria fueled by the French gold indemnity paid to Prussia after the Franco-Prussian war. The Austrian, German boom collapsed in a spectacular stock market crash in Vienna in May. Stock markets in Amsterdam and Zurich also crashed. In the U.S. a banking panic in September followed the collapse of a stock market boom in New York with the failure of Jay Cook, a major financier and President of the Union Pacific railroad. According to Kindleberger, the German crisis contributed to the U.S. event as capital flow was cut off despite the fact that the dollar was floating in this period which would have negated the price specie flow channel of transmission. This crisis had serious repercussions in Latin America. The downturn in the European economy ushered in by the crises and the turnaround in world prices from inflation to deflation in this period reduced exports, tax revenues (trade taxes were the principal form of taxation in Latin America), and debt service leading to a new wave of defaults (Marichal 1989).

1890. The Baring crisis of 1890 triggered an international crisis in England and Latin America that has resonance for today. The crisis culminated a major lending boom from England and the continent in the 1880s to Argentina and Uruguay to finance railroads and other infrastructure. Many of the loans went to the Argentine provincial banks, that were not financially sound, fueling a monetary expansion and their collapse. The international crisis erupted when the House of Baring (a major investment bank in London that held the unsaleable paper of the Buenos Aires Water Supply and Drainage Company) declared itself to the Bank of England to be insolvent on November 8, 1890. The Bank prevented a panic by

arranging a lifeboat operation to re-capitalize Barings with the aid of other major London financial institutions and a temporary rescue loan from the Banque de France and the Russian central bank. The crisis spread back to Latin America with the cessation of British lending to Argentina, Uruguay, and Brazil. According to Kindleberger the 1890 crisis was also linked to a major bank failure in Paris in 1889 and was the foundation for a later series of crises in 1893.

1893. Major crises in the U.S. and Australia in 1893 have been linked to the earlier Baring crisis and to a general downturn in the world price level. The U.S. panic of 1893 is generally associated with the Sherman Silver Purchase Act, a fillip to the Free Silver Movement, which led investors fearing that the issue of silver certificates would force the U.S. off the gold standard, to flee the U.S., hence precipitating a gold outflow and monetary contraction. The proximate cause of the massive banking panic in the summer of 1893 was a stock market collapse and increase in commercial failures that awakened fears about the solvency of commercial banks.

The Australian crisis was preceded by a land boom, which was in large part financed by domestic bank lending. The immediate cause of the panic was falling export prices, which made it difficult for the pastoral sector to repay its loans. The trigger was the closure of three banks. The crisis was aggravated by a withdrawal of British deposits and loans. Retrenchment by the surviving banks in turn precipitated a long depression (Bordo and Eichengreen 1999).

1907. The 1907 crisis had many of the attributes of the earlier crisis but in terms of its international scope and its virulence it was probably the worst of the gold standard era. The trigger is said to have been the Bank of England, which began raising its discount rate in 1906 from 3.5 percent to 6 percent to counter a gold drain. This action had the effect of reversing the flow of gold to the U.S. and severely tightening U.S. money market conditions. A stock market crash occurred in early 1907, and economic activity began to decline. In October, depositor runs on trust companies spread to the commercial banks. The money stock declined precipitously, banks suspended cash payments, and the economy entered a sharp recession. According to Kindleberger (1986a) the crisis spread from England via France to Italy, which had been undergoing a speculative boom. The connection was by Paris clearing its decks of London securities and both centers stopped lending to Italy and other peripheral countries (Bonnelli 1982). According to the chronology in Bordo and Eichengreen, 9 out of their 21 countries were hit by crises.

1914. The outbreak of World War I precipitated a massive international financial crisis across the world. In the Bordo-Eichengreen (1999) sample of 21 countries, 15 countries had currency crises, banking crises, or both. This crisis, unlike the others, did not spread from the core to the periphery but occurred virtually simultaneously in all countries as the belligerents scrambled to liquidate foreign assets. This led to panics in all asset markets and a scramble for high-powered money. Banking panics in the U.S., U.K., and other countries were allayed by timely lender-of-last-resort intervention.

1920-22. The post war deflation and recession, triggered by monetary authorities in the U.S., U.K., and other countries in an attempt to roll back the wartime inflation and post war commodity boom and to restore price levels to their prewar gold standard levels, were associated with both banking and currency crises in a number of countries (Denmark, Italy, Finland, Netherlands, and Norway). However, unlike the crises of the nineteenth century there was no clear pattern of international transmission.

1929-33. The stock market crash on Wall Street in October of 1929 ushered in the greatest worldwide contraction of all time. The collapse in world output from 1929-33 was heralded by a collapse in commodity prices in the emerging countries. The stock market boom in New York by 1928 choked off U.S. capital flows to central Europe and Latin America and precipitated currency crises in a number of countries (Australia, Argentina, Uruguay, and Brazil) early in 1929 (Kindleberger 1986a). The Wall Street crash precipitated by tightening Federal Reserve policy was instantly reflected in stock market crises around the globe.

The story of the international propagation of the Great Depression is well known (Eichengreen 1992, Kindleberger 1986b, Friedman and Schwartz 1963). The U.S. downturn in 1929 turned into a depression in 1930 and 1931 after the Federal Reserve failed to allay a series of banking panics. The resultant collapse in prices and output worldwide forced sovereign borrowers to cut back on servicing their debts and then to default, precipitating a collapse of foreign lending in 1931. At the same time the U.S. induced depression and deflation precipitated banking and currency crises in central Europe, forcing the U.K. to abandon gold in 1931. Transmission occurred through gold flows, the money supplies, and capital flight. Adherence to gold for most countries acted as “golden fetters” preventing monetary authorities from following expansionary monetary policy (Eichengreen 1992).

3. Annual Evidence Based on Correlations for Possible Incidence of Transmission/Contagion Effects

3.1 Methodology

The approach taken in this section is to examine the patterns of correlations (in non-crisis and crisis years) of annual data for 5 macroeconomic variables (real GDP growth, the change in net exports relative to GDP, money (M2) growth, CPI inflation and changes in short-term nominal interest rates) for 21 countries for the periods 1880-1914, 1919-1939 and for 28 countries for the period 1973-1997.[6] Crises are defined as both currency crises and banking crises and are summarized in Figure 1. The crisis dates for 1880-1939 come from Bordo and Eichengreen (1999), for 1973-1997 from the World Economic Outlook May 1998. We divide our sample of countries in each period into emerging and advanced, the distinction rests on the criterion of the level of per capita GDP and whether countries were net capital importers.[7]

The purpose of the exercise is to discover general patterns of inter-country linkages which could be considered as transmission or possible contagion effects of financial crises and to see how these patterns change across the three historical monetary/exchange rate regimes. The regimes are: the pre World War I classical gold standard; the interwar gold exchange standard and the current managed float regime.

Important differences between the regimes which impact on the incidence, severity and transmission of crises include the basic differences between the two historical regimes which were fixed exchange rate regimes based on gold convertibility and the present managed floating regime based on fiat money.[8] The former regime is generally characterized by greater openness to macro shocks including financial crises[9] than the float.

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[6] Data Sources: 1880 – 1939, Bordo and Scwartz (1987), 1973 – 1997, *International Financial Statistics*.

[7] For the period 1880 – 1914 the emerging countries are: Argentina, Australia, Brazil, Canada, Chile, Denmark, Finland, Greece, Italy, Japan, Norway, Portugal, Spain, Sweden, United States. The advanced countries are: Belgium, France, Germany, the Netherlands, Switzerland and Great Britain. For the interwar period, 1919-1939 the emerging countries were: Argentina, Brazil, Chile, Greece, Portugal and Spain, with the advanced countries, in addition to the original 6 now including: Australia, Canada, Denmark, Finland, Italy, Japan, Norway, Sweden and the U.S. For the 1973-97 period, the advanced country sample is the same as the interwar but the emerging country sample has been enlarged to include: Indonesia, Korea, Malaysia, Mexico, Philippines, Singapore and Thailand.

[8] Also of importance for the incidence and spread of financial crises is the fact that the interwar gold exchange regime was less stable and less credible than the prewar classical gold standard. See Eichengreen (1992).

[9] This of course, needs to be qualified by the effects of increasingly open capital markets which offset the insulation properties of floating exchange rates. Also, it should be noted that within the rubric of the

In addition there are key institutional differences between the regimes.[10] These include the facts that: there were fewer countries in the prewar period that had central banks which could serve as a lender of the last resort to allay a crisis, compared to the later regimes; many of the emerging countries in our prewar sample were more advanced than today's emerging countries in terms of the development of government and market institutions, and financial markets; there were no international financial institutions such as the IMF to provide emergency funds in a crisis, although there was limited central bank cooperation during crises between the advanced countries (Bordo and Schwartz 1998). Finally although both goods and financial markets were integrated in all 3 periods, the evidence suggests that in many respects globalization today may be more extensive than in the early regimes (Bordo, Eichengreen and Irwin 1999).

The methodology we follow however is limited. Annual data can not very well identify the impact of crises which usually occur in the short space of days and weeks. Moreover, correlation is not causation and to make meaningful inferences about causality such analysis needs to be supplemented with other information and techniques. Thus we view the correlation analysis here as simply providing information to supplement the high frequency data analysis undertaken in sections 4 and 5 below.

3.2 The Patterns of Correlation

We present the results of our correlation analysis in two ways: (1) in a summary table (Table 1) between 3 groups of countries (emerging, advanced, advanced and emerging), which displays the average correlations between countries that had positive correlations in non-crisis years and the average increase in correlation during crisis years between countries that had positive correlations; (2) in Appendix I, we show, for each variable the individual country correlation matrices underlying Table 1.

3.3 Real GDP

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managed float regime, many of the countries in our sample at various times have pegged their currency to the dollar or other dominant currencies.

[10] See Bordo and Eichengreen (1999)

Table 1, panel A shows that on average that in the classical gold standard period, the correlation in non-crisis years in real growth was the largest between the advanced and emerging countries among the three groups. The correlation increased in all 3 groups during crises, with the largest increases in the advanced countries. The increase in the average correlation coefficient between crisis and non-crisis years and the increase in countries affected could reflect the effect of common shocks or the transmission of shocks. The pattern we observe is similar to that found by Bergman, Bordo and Jonung (1998) who used a band pass filter to remove all non-business cycle frequencies from this real GDP data for a subset of these countries.

Appendix I, Table 1, Panel A suggests some regional patterns. The correlation of GDP growth between the countries of Latin America, the U.S. and Canada, and the countries of Scandinavia, could reflect common regional shocks or the transmission of business cycle disturbances. The table also suggests evidence for inter-regional linkages in crisis years, for example between Argentina and Australia, Australia, Canada and the U.S.

For the advanced countries alone we observe correlations between the core European countries which increase with crises e.g. between the United Kingdom and France. Focusing on the relationship between advanced and emerging countries we see evidence of traditional trade links in the non-crisis year correlations between the United Kingdom, Denmark, consistent with the explanation, based on gravity equations, given by Eichengreen and Irwin (1998). Countries are linked by international trade through long-run political and historical ties as well as more traditional determinants of the pattern of trade. These results may be consistent with the trade channel of transmission found in other studies (Eichengreen and Rose 1999 and Rose and Glick 1998).

For the interwar period, Table 1, Panel B, suggests that the highest positive correlation for real growth in non-crisis years was between the advanced countries, while greatest increases in the number of countries with high positive correlation was also the case for this group. This likely reflects the fact that our sample of advanced countries now includes many prewar emerging countries.

The inter-country pattern from Appendix I, Table 1 highlights regional and traditional linkages, for example in the emerging countries the rise in correlation among the Latin American countries, and between Spain and Portugal; in the advanced countries the high correlation between the Scandinavian

countries and an increase in correlation between them during crises; increased correlation between Australia, Canada, the U.S. and Europe during crisis years. This pattern captures the spread of the Great Depression as does the rise in correlation between the Latin American and Iberian countries with the advanced countries. The interwar experience thus provides strong evidence for transmission effects during crises. We cannot however determine the exact nature of the channels but the regional and international linkages we observe suggest the importance of international trade.

Finally for the recent period, from Table 1 we observe the highest correlation in non-crisis years as well as the largest increase in positive correlations to be between advanced countries. This suggests that the business cycle tightens in crisis years. However the correlation in this regime was higher in the earlier periods which suggests an increase in the international transmission effects of crises.

From Appendix I Table 1, in non-crisis years, we discern for the emerging countries regional patterns of correlation in Asia and Latin America but also links between countries in these regions and southern Europe. The increase in positive correlations for the emerging countries is also largely regional although there are some increased correlations between regions suggesting the possibility of contagion effects.

For the advanced countries, the correlations in non-crisis periods are highest within the European Union and positive correlations increase most between those countries, although we also observe rising positive correlations between the U.S., Australia, Canada and Japan and between those countries and Europe. We do not detect much of a pattern in the correlations between the advanced and emerging countries although one can observe rising correlations between Latin America and Europe and Southern Europe and the core European countries.

In sum the evidence for real growth linkage suggests patterns of international transmission during crises which are largely regional and likely trade linked, as well as to a lesser extent, possible unaccounted for interregional contagion effects. Moreover these effects seem to be greater in the recent regime. Further research however is required to identify the channels.

Table 1. Average Correlation over all Countries that Displayed a Positive Correlation over Non-Crisis Years
And Average Increase in Correlations over all Countries that Displayed an Increase During Crisis Years.

Panel A. Real GDP Growth Rates

	rgdp prewar								
	Emerging			Advanced			Emerging-Advanced		
		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage
Average correlation over all countries that displayed a positive correlation over non-crisis years	0.18579	95	48.47%	0.18553	6	24.00%	0.2278	37	52.86%
Average increase in correlations over all countries that displayed an increase during crisis years	0.31937	101	51.53%	0.68805	16	64.00%	0.31468	36	51.43%
	rgdp interwar								
	Emerging			Advanced			Emerging-Advanced		
		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage
Average correlation over all countries that displayed a positive correlation over non-crisis years	0.18082	8	32.00%	0.34653	90	45.92%	0.26334	38	54.29%
Average increase in correlations over all countries that displayed an increase during crisis years	0.64447	16	64.00%	0.51672	139	70.92%	0.53586	51	72.86%
	rgdp 1973-1997								
	Emerging			Advanced			Emerging-Advanced		
		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage
Average correlation over all countries that displayed a positive correlation over non-crisis years	0.2848	106	62.72%	0.37229	180	80.00%	0.31162	136	68.33%
Average increase in correlations over all countries that displayed an increase during crisis years	0.37056	90	53.25%	0.45678	114	50.67%	0.38551	93	47.69%

Panel B. Change in Net Exports to GDP Ratio.

	net exports prewar								
	Emerging			Advanced			Emerging-Advanced		
		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage
Average correlation over all countries that displayed a positive correlation over non-crisis years	0.21571	92	46.94%	0.21246	4	25.00%	0.19727	26	46.43%
Average increase in correlations over all countries that displayed an increase during crisis years	0.39039	101	51.53%	0.5391	6	37.50%	0.43801	29	51.79%
	net exports interwar								
	Emerging			Advanced			Emerging-Advanced		
		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage
Average correlation over all countries that displayed a positive correlation over non-crisis years	0.52441	17	68.00%	0.40509	34	17.35%	0.33335	34	48.57%
Average increase in correlations over all countries that displayed an increase during crisis years	0.23577	4	16.00%	0.51976	16	8.16%	0.50442	35	50.00%
	net exports 1973-97								
	Emerging			Advanced			Emerging-Advanced		
		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage
Average correlation over all countries that displayed a positive correlation over non-crisis years	0.32983	106	62.72%	0.4722	144	64.00%	0.35303	97	49.74%
Average increase in correlations over all countries that displayed an increase during crisis years	0.29538	78	46.15%	0.25546	96	42.67%	0.26904	115	58.97%

Table 1. Average Correlation over all Countries that Displayed a Positive Correlation over Non-Crisis Years
And Average Increase in Correlations over all Countries that Displayed an Increase During Crisis Years.

Panel C. Money Growth Rates

	money growth prewar								
	Emerging			Advanced			Emerging-Advanced		
		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage
Average correlation over all countries that displayed a positive correlation over non-crisis years	0.24717	127	56.44%	0.12391	4	25.00%	0.2678	41	68.33%
Average increase in correlations over all countries that displayed an increase during crisis years	0.32005	101	44.89%	0.76436	8	50.00%	0.39274	22	36.67%
	money growth interwar								
	Emerging			Advanced			Emerging-Advanced		
		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage
Average correlation over all countries that displayed a positive correlation over non-crisis years	0.16862	16	64.00%	0.41059	144	73.74%	0.29051	52	74.29%
Average increase in correlations over all countries that displayed an increase during crisis years	0.43803	10	40.00%	0.37694	98	50.00%	0.3032	22	31.43%
	money growth 1973-97								
	Emerging			Advanced			Emerging-Advanced		
		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage
Average correlation over all countries that displayed a positive correlation over non-crisis years	0.27216	104	61.54%	0.21782	126	56.00%	0.29723	87	44.62%
Average increase in correlations over all countries that displayed an increase during crisis years	0.26598	68	40.24%	0.31357	98	43.56%	0.38243	95	48.72%

Panel D. Change in CPI

	prices prewar								
	Emerging			Advanced			Emerging-Advanced		
		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage
Average correlation over all countries that displayed a positive correlation over non-crisis years	0.25338	90	73.77%	0.2865	16	64.00%	0.29557	52	94.55%
Average increase in correlations over all countries that displayed an increase during crisis years	0.25704	71	58.20%	1.19888	4	16.00%	0.17479	17	30.91%
	prices interwar								
	Emerging			Advanced			Emerging-Advanced		
		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage
Average correlation over all countries that displayed a positive correlation over non-crisis years	0.21166	22	61.11%	0.51072	156	69.33%	0.33804	64	71.11%
Average increase in correlations over all countries that displayed an increase during crisis years	0.39152	18	50.00%	0.32922	96	42.67%	0.41013	52	57.78%
	prices 1973-97								
	Emerging			Advanced			Emerging-Advanced		
		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage
Average correlation over all countries that displayed a positive correlation over non-crisis years	0.57322	98	57.99%	0.74386	210	93.33%	0.63498	158	81.03%
Average increase in correlations over all countries that displayed an increase during crisis years	0.2372	64	37.87%	0.11777	102	45.33%	0.17209	77	39.49%

Table 1. Average Correlation over all Countries that Displayed a Positive Correlation over Non-Crisis Years
And Average Increase in Correlations over all Countries that Displayed an Increase During Crisis Years.

Panel E. Change in Nominal Interest Rates

	interest rate prewar								
	Emerging			Advanced			Emerging-Advanced		
		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage
Average correlation over all countries that displayed a positive correlation over non-crisis years.	0.32517	34	53.13%	0.66989	30	83.33%	0.25418	29	63.04%
Average increase in correlations over all countries that displayed an increase during crisis years.	0.58362	26	40.63%	0.19033	22	61.11%	0.14048	10	21.74%
	interest rate interwar								
	Emerging			Advanced			Emerging-Advanced		
		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage
Average correlation over all countries that displayed a positive correlation over non-crisis years.	0.32035	10	40.00%	0.30883	87	71.31%	0.36997	25	45.45%
Average increase in correlations over all countries that displayed an increase during crisis years.	0.99097	12	48.00%	0.3629	55	45.08%	0.59377	39	70.91%
	interest rate 1973-97								
	Emerging			Advanced			Emerging-Advanced		
		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage		number of countries satisfying criterion	number of countries satisfying criterion expressed as a percentage
Average correlation over all countries that displayed a positive correlation over non-crisis years.	0.26866	76	52.78%	0.40921	184	81.78%	0.22888	133	68.21%
Average increase in correlations over all countries that displayed an increase during crisis years.	0.38097	52	36.11%	0.33565	138	61.33%	0.40557	80	41.03%

3.4 Net Exports

In large measure the pattern observed from the real growth correlations is buttressed by that for net exports. The broad averages in Table 1, panel B for the pre 1914 period, show similar non crisis years correlation across the groups of countries, with the greatest increases in positive correlations for the advanced countries. The patterns in Appendix 1, Table 2, back up those for GDP growth. We see positive correlations of net exports in the Latin American, Scandinavian and Iberian regions with increases in crisis years. Also there are a number of countries which have positive correlations with countries outside the region. Similarly for the advanced countries only and between the advanced and emerging countries, we observe a tightening of the linkages between crisis and non crisis years and the development of new linkages, possible evidence for contagion effects.

For the interwar the highest average positive correlation of net exports in non crisis years was between emerging countries (Table 1, panel B) but the greatest increases in correlation and number of countries was in the advanced countries. The patterns discerned for individual countries from Appendix 1, Table 2 shows the presence of trading blocs, e.g. in the tight correlations in non crisis years for the Commonwealth countries. These linkages also increase in crisis years. For this period however, it is hard to discern any pattern in increases in correlations between the advanced and emerging countries.

In the recent period, the correlations in non crisis years between advanced and emerging countries was on average highest of the three groups. The increase in correlations was similar across the groups as displayed in Table 1, Panel B. For individual countries in Appendix 1, Table 2, regional patterns of correlation in non crisis years are apparent as well as increases in correlations in crisis years, e.g., in Asia, but there is also a pattern of increasing correlation between Asia and Latin America consistent with the stories of contagion and tequila effects.

For the advanced countries we see a very high correlation between the European countries in non-crisis years and in crisis years between Germany and the rest of Europe. Also, the table for correlations between advanced and emerging countries suggests an increase in correlation in crisis years between Southern Europe and the rest of Europe, East Asia and Europe and East Asia and Australia, evidence of the transmission of crises beyond regions. Finally, a comparison of these patterns across the three regions

suggests that transmission and possible contagion effects have increased across regions compared to the two earlier regimes.

3.5 Money Growth

In the pre World War I period, the highest correlation on average in changes in money supply in non-crisis years was between advanced and emerging countries but the highest increase in correlation was for the advanced countries (see Table 1, panel C). The individual country correlations in Appendix Table 3 do not reveal much of a recognizable pattern of correlations between the emerging countries in non crisis years, although we do observe an increase in the number of countries where correlations increase in crisis years.

For the advanced countries we see an increase in correlation during crises between the countries in Continental Europe but not with the United Kingdom. We do not sense much of any pattern of correlation between the advanced and emerging countries.

Thus the linkages of the classical gold standard seem to be strongest within the advanced countries. The absence of detectable correlations in non-crisis years or of increases in correlation in crisis years between the U.S. and U.K. is a bit of a puzzle. It may reflect the use of low frequency data and the fact that our correlations are concurrent.[11]

For the interwar period, the highest non-crisis correlation on average was for the advanced countries. Also the greatest increases in correlations (and the largest number of countries involved) was for these countries. This is consistent with the traditional view that the Great Depression was a gold standard story (Eichengreen 1992, Friedman and Schwartz 1963).

For individual countries regional patterns in non-crisis years for the emerging countries are evident for Latin America and Iberia (Appendix 1, Table 3). These correlations increase in crisis years as do those between the two regions. For the advanced countries, strong regional links in North America, the Commonwealth and Europe are observed as well as linkages between Europe and North America. These

[11] See Huffman and Lothian (1984) who use the Granger-Causality technique and annual data to detect a causal role for money supply in the transmission of the business cycle, including severe cycles with banking panics, between the U.K. and the U.S. in this period.

linkages tighten in crisis, especially between the U.S. and Germany, consistent with the story that the Great Depression was transmitted by monetary channels via the fixed exchange rate gold standard. Finally, although positive correlations in money growth in non crisis years are observed within the advanced and the emerging countries we do not see much of an increase in correlation between Europe and the periphery. This likely reflects the fact that most of the countries in our emerging country sample for the interwar were not on the gold standard or had left it by 1929.

For the recent period, the average correlation between money growth rates in non-crisis years was highest of the three groups among the emerging countries, as was the increase in correlation in crisis years (Table 1 Panel C). For the individual countries we do not detect much of a pattern of correlation in non-crisis years either within regions or between them. (Appendix I, Table 3). A similar conclusion holds for increases in correlation in crisis years. This phenomenon seems consistent with adherence to the fluctuating exchange rate regime which allows monetary independence.

For the advanced countries, we also do not observe much correlation in non-crisis years between monetary growth rates, with the principal exception of the European countries that were part of the EMS. During crises we observe an increase in correlation in crisis years for the European countries and between the U.S. and Germany.

There is little correlation in non crisis years nor an increase in correlation in crisis years, except between Southern Europe and Western Europe, and to a lesser extent between East Asia and Japan, Latin America and the U.S.

In sum, the evidence suggests that money supply was most likely a very important channel for transmission of crisis in the interwar period, less so in the gold standard period except among the advanced European countries, as also was the case for the recent period. The absence of a pattern of increase in correlation in crisis years to countries beyond the major regions suggests that contagion through money supply was not likely an important channel.

3.6 Price Level Changes

In the gold standard period the average correlation of changes in the price level between the 3 groups of countries was very similar in non-crisis years, with the largest increase in correlation occurring in advanced countries (Table 1, Panel D). Focusing on individual countries correlations in Appendix I, Table 4, the pattern in non-crisis years across the emerging regions of Latin America, North America and Scandinavia is quite similar. Inflation is positively correlated across the countries in these regions. There is however, little increase in correlation within the regions or between them during crisis years. A parallel pattern prevails for the advanced countries and between advanced and emerging countries. This suggests that for the pre 1914 period there is little evidence for the transmission of deflationary shocks in periods of crisis.

For the interwar, the highest average correlation in non-crisis years at 0.51 was in the advanced countries, a significant increase in correlation occurred across all these groups (Table 1, Panel D). For individual countries, a pattern of strong correlation in non-crisis years across the advanced countries is evident and the correlation increases during crisis, especially between Germany and the other European centers. This was not the case for the emerging countries whose correlation in price changes between countries in non-crisis years was weak and did not increase much in crises. The only emerging country which conformed to the European pattern was Argentina.

This evidence for the interwar is consistent with the traditional story; deflationary shocks were transmitted during crisis across the gold standard, with Germany and the U.S. as the epicenter. Price levels in the emerging countries, not on the gold standard, moved independently.

For the recent period the advanced countries had the highest average correlation in price level changes in the crisis years, while the highest average increase in correlation was in the emerging countries (Table 1, Panel D). Changes in price levels are correlated between individual emerging countries only for East Asia and there was little increase in correlation in any of the emerging countries. By contrast price changes are closely connected in non-crisis periods between the advanced countries, but there is little increase during crisis years. A similar pattern holds between the advanced and the emerging countries.

This evidence suggests that in this period crises were not transmitted between countries through a deflation channel.

Thus a comparison across regimes suggests that the only period in which crises were strongly associated with the transmission of price level changes across the world was during the interwar.

3.7 Interest Rates

The highest correlation of the percentage change in short term interest rates on average for non-crisis years among the 3 countries during the pre 1914 period was for the advanced countries (Table 1, Panel E). The highest increase in correlation in crisis years was for the emerging countries. The large increase in the number of emerging countries with increases in correlation during crisis years with countries to which there was little or no correlation in non crisis years may be possible evidence for contagion effects. Between individual emerging countries prominent examples of increasing correlation in crisis include Chile and Argentina, the U.S. and Canada, the U.S., Italy and Scandinavia, Italy, Spain and Brazil (see Appendix 5, Table 5).

For the advanced countries we observe significant non-crisis correlations across European countries, correlations between interest rates increase during crises but not as much as in the emerging countries. There are only a few examples of increased correlation during crises between advanced and peripheral countries.

For the interwar period, the average correlation in non-crisis years was quite similar across the 3 groups. The largest increase in correlation was in the emerging countries (Table 1, Panel E.) From the individual correlations in Appendix I Table 5, not much of a pattern of correlations between interest rates is evident in non-crisis years, except for Latin America. However a very large jump in correlations in crisis years which encompasses countries for which there is little correlation in non-crisis years suggests the possible presence of contagion effects.

For the advanced countries, significant correlations in non-crisis years between the U.S. and the U.K., other European centers and the U.S., reflect the financial linkages of the interwar gold exchange standard. Although we detect some increases in correlation in crisis years, the pattern is not clear.

Finally, between the advanced and emerging countries, Argentina, Spain and Portugal are linked to Europe in non-crisis years. Increasing correlation between U.S. and U.K. interest rates on the one hand and those of Southern Europe and Latin America on the other suggest evidence for transmission/contagion effects in asset markets.

For the post war, the highest average correlation of interest rates across country groups was for the advanced countries, while increases in correlations and number of countries affected were significant for the emerging and advanced-emerging groups. (Table 1, Panel E). This pattern may indicate possible transmission/contagion effects. Between individual countries apparent patterns of correlation in non-crisis years are apparent inside Latin America and East Asia. (Appendix I Table 5). In crisis years the correlation in interest rates between countries in these regions increases substantially seemingly reflecting the tequila and contagion effects of the Mexican and Asian crises. For the advanced countries we also detect a significant increase in correlation between the European countries and between Europe, the U.S. and Japan which likely reflects transmission effects from the ERM crisis in 1992-93.

The evidence for interest rates seems to suggest increased inter-regional transmission effects through asset market channels. However annual data can only make very limited suggestions on the underlying causal mechanisms. To learn more we turn to higher frequency data.

To summarize for the evidence on transmission/contagion effects as revealed by the annual correlation analysis of the key macro aggregates: the patterns discussed for real growth and net exports suggest the likely importance of international trade linkages in the transmission of crises. The patterns for money supply and prices suggest that adherence to the fixed exchange rate gold standard regime was important in the transmission of crises across countries. Finally the interest rate evidence points in the direction of transmission through traditional asset market channels as well as possible contagion effects.

4. Financial Market Contagion in the Prewar and Interwar; Evidence from Weekly Bond Prices

4.1 Bond Price Correlations

Recent studies, such as Baig and Goldfajn (1998), Forbes and Rigobon (1998), have tested for contagion in financial markets by examining the behavior of the correlation across countries, in financial market variables, such as securities prices, interest rates and exchange rates. Whereas high correlation

across countries is not in itself evidence of contagion, as this may merely reflect historic cross-country dependence, significant increases in the correlation coefficient are interpreted as evidence of contagion. The idea underlying such tests is the view that the strength of cross-country linkages is state dependent. The occurrence of a bad state, in particular a crisis, excites otherwise dormant channels of transmission, radically changing the nature of the linkages between countries, thus amplifying the cross-border impact of a shock, which shows up as an increase in the correlation coefficient. As noted above, however, care should be taken in how we interpret the results from such tests, as it is not clear that an increase in correlations between markets is necessarily evidence that the channels by which shocks are communicated are any different from relatively stable periods.

In what follows we proceed with a systematic investigation of these ideas. We begin by comparing the cross-country correlations in the change in weekly bond prices, during periods of crisis and periods of relative tranquility, for both the prewar and interwar periods.[12] We then investigate more closely the dynamics of the correlation coefficient by calculating the correlation over a sub sample which we roll forward through time. We do this for both relatively stable periods as well as periods of turbulence and search for evidence that would suggest that the correlation coefficient behaves somewhat differently during periods of crisis. In section 5, we expand this research to include the more recent period.

4.1.1. Pre World War I Period

For the prewar period we have data on three non-adjacent years – 1890, 1893 and 1907 – for eight countries.[13] The figures reported in the source were rounded to the nearest half, making it difficult to pick up correlations between countries, especially at relatively stable times, when bond price movements were

[12] The distribution of the sample correlation coefficient – the r distribution – is somewhat complicated. However, a simple transformation – known as the z transformation – brings the distribution close to normality. See Fisher (1915), or for more recent references see Gayen (1951) and Ruben (1966). In order to test the null hypothesis that two samples of size n_1 and n_2 are from two independent bivariate normal populations with correlation coefficients ρ_1 and ρ_2 such that $\rho_1 = \rho_2$, we employ the test statistic

$$U = (z_1 - z_2) \Big/ \left(\left(1/n_1 - 3 \right) + \left(1/n_2 - 3 \right) \right)^{1/2}, \text{ where } z_i = \tanh^{-1} r_i, i = 1,2,$$

where r_i is the sample correlation coefficient.

minimal. As such we expect our estimates of the correlation coefficient to be biased downward. Hence the results of a test for a rise in correlations can only be interpreted liberally. The data is nevertheless suggestive and can shed light on the ties between the financial markets across various countries.

In order to compare correlations in the pre-crisis period with those of the crisis period, it was necessary to have some additional information regarding the dates of crises, than could be obtained from an annual chronology such as that reported in Bordo and Eichengreen (1999). We identified these dates by reviewing various issues of *The Economist, Weekly Commercial Times* as well as the *Commercial and Financial Chronicle* – a methodology which is clearly subjective. First, a crisis, banking or currency, however defined, is never so precise as to present an obvious demarcation of the crisis period. Second, the commercial magazines of that era, which comment on such matters, do not adhere to a scientific methodology or terminology. The severity and ramifications of a crisis therefore had to be based on the tone of the narrative.

These problems are compounded when testing for contagion since crises do not occur simultaneously across all countries and the contagion stemming from a turbulent period typically cannot be attributed to any single event. It is thus necessary to identify the event with the broadest repercussions. In 1890 this was most likely the Baring crisis. In 1893, there were two important crises whose effects spilled over and affected external markets; the Australian crisis in May, which impacted on U.K. markets, but did not generate a crisis there and the U.S. crisis in October, which resulted in the closure of numerous Pennsylvania banks (Friedman and Schwartz, 1963). For our sample of countries, we believe that the repercussions of the U.S. crisis were the more broadly felt of the two events, thus the months up to October of that year are treated as non-crisis observations. Finally, we view the U.S. crisis in 1907 as the catalyst behind the sequence of events that generated crises in 8 other countries in our sample of 21 countries. The beginning of the U.S. crisis in 1907 can be traced back to the troubles of Knickerboker Trust Co., which began on October 21.

Initially we estimate the correlation coefficients of the weekly change in bond prices in a pooled sample of non-crisis observations, as well as for a pooled sample of all crisis observations. The obvious advantage of using a pooled sample is that it affords more precise estimates of the correlation coefficient by

[13] The countries in our sample are Argentina, Brazil, Canada, Chile, France, the Netherlands, the U.K. and

virtue of a larger sample. For small samples the test statistic, *U*, (see footnote 9), poorly approximates a normal distribution. This point should not be downplayed given the frequency of our data and that the average length of a crisis is relatively short. Moreover, the correlation between countries can be volatile, which can, depending upon the choice of window, cause an incorrect assessment of cross-country linkages. A pooled sample is less sensitive to these short-term movements in correlations away from the mean, thus providing a more accurate picture of the long-term relationship between countries. Such an exercise thus picks out the countries that were consistently highly correlated. However, it is not clear how one should compare these correlations to those emerging from a pooled sample of non-crisis periods, for pooling over various episodes of crisis blurs the contagion effect that stems from any specific event. Thus, we cannot necessarily make statements about contagion per se, however, we can make more general statements about the underlying nature cross-country linkages during turbulent periods. Since pooling the data hides considerable information about the extent of cross-country dependence specific to particular years, we extend our analysis by estimating the correlation coefficients for the non-crisis as well as the crisis sub-period surrounding the Baring crisis.[14]

We estimate the correlation coefficient for a window of time that preceded the Baring crisis in 1890 and contrast this to that which we observe in the period following the crisis. This exercise provides us with a closer look at the contagion that stemmed from this crisis. We then proceed to estimate the correlation coefficients by rolling a 3-month window over the sample. This provides a check of the robustness of our results as to the choice of window as well as affording a better view of the dynamics of the correlation coefficient between countries prior to and after the onset of a crisis.

In Table 2 we report the cross-country coefficients across all countries across all non-crisis periods. Although in general practically all the correlations across markets are positive, few are significant. The correlations between Brazil and France, the Netherlands and Chile and the U.S. and Canada seem relatively high. There is also some evidence of high correlations between the South American countries.

On the whole the evidence suggests that the emerging countries were somewhat correlated with each other and strongly correlated with the advanced countries. But the three advanced countries in our sample are weakly correlated. We must be cautious what we infer from this result. The temptation is to

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the U.S. Source: *The Economist, Weekly Commercial Times*, various issues.

conclude that the linkages across the advanced countries were weaker than those between the emerging countries or those between the advanced and emerging countries. However, this need not have been the case. Since bond prices were less variable for the advanced countries, given the selection rule inherent in the way the data was reported, small changes in bond prices were not detected, thus tending to bias the correlation coefficient downward. This bias is likely to be larger for the advanced countries rather than the emerging countries where bond prices fluctuated more widely.

The high correlations between the emerging countries either suggests that emerging countries were closely integrated and shocks in one emerging country were being felt in others, or it suggests that shocks to a common third country were driving these high correlations. We suspect the latter, i.e. we believe that shocks being transmitted from the core to the periphery were more important in explaining the high correlations between the emerging countries, than shocks that were being communicated between the peripheral nations. Whereas a pattern of correlations emerges that is suggestive, it is difficult to argue this case, by relying solely on the evidence of our correlations.[15] Headway can be made into this issue using VAR analysis, which allows us to isolate the effects of a shock in one country on another. [16]

In order to make inferences about contagion it is necessary to compute the cross-market correlations for crisis periods. We estimate these coefficients for the pooled sample of all crisis observations covering all three years, as well as for the specific crisis periods. Table 5 reports the changes in correlation between crisis and non-crisis periods – entries that are significant at 5% are shaded.

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[14] The analysis of the 1893 and 1907 crises reveals few new insights so to save space we omit them.

[15] When we isolate cases involving relatively high correlations between emerging countries, we typically observe even stronger correlations with a common advanced country. For instance, the correlation between Argentina and Chile is 0.168; both countries are also strongly correlated with the Netherlands. The correlation between Argentina and the Netherlands is 0.218 and the correlation between Chile and the Netherlands is 0.244. Similarly Brazil and Argentina are moderately correlated and both countries display considerably stronger correlations with France.

[16] We investigate this issue more closely, for the interwar period, using VAR analysis, in section 4.2. In general we find that for this period shocks to the core had larger effects on emerging countries than did shocks in other emerging nations.

Table 2. Cross-Country Correlations During Tranquil Periods; 1880 - 1914

(Shaded entries are positive correlations that are significant at 5%)

Full sample: 04/01/1890 – 25/10/1890, 07/01/1893 – 30/09/1893, 05/01/1907 – 28/09/1907								
	Argentina	Brazil	Canada	Chile	France	Neth.	U.K.	USA
Argentina	1	0.120107	-0.006713	0.16765233	0.16552	0.21822	0.00701962	0.044892221
Brazil		1	0.00444	0.048676905	0.25289	0.038669	0.13446051	0.124723186
Canada			1	0.03617084	0.067809	-0.163117	0.11544808	0.22793795
Chile				1	-0.024761	0.24402	0.028065298	0.063684364
France					1	0.087005	0.04490648	0.15555124
Neth.						1	0.095481169	0.095437488
U.K.							1	0.088051099
USA								1

Table 3. Change in Cross-Country Correlations During Crises Periods; 1880 - 1914

(Shaded entries are positive correlations that are significant at 5%)

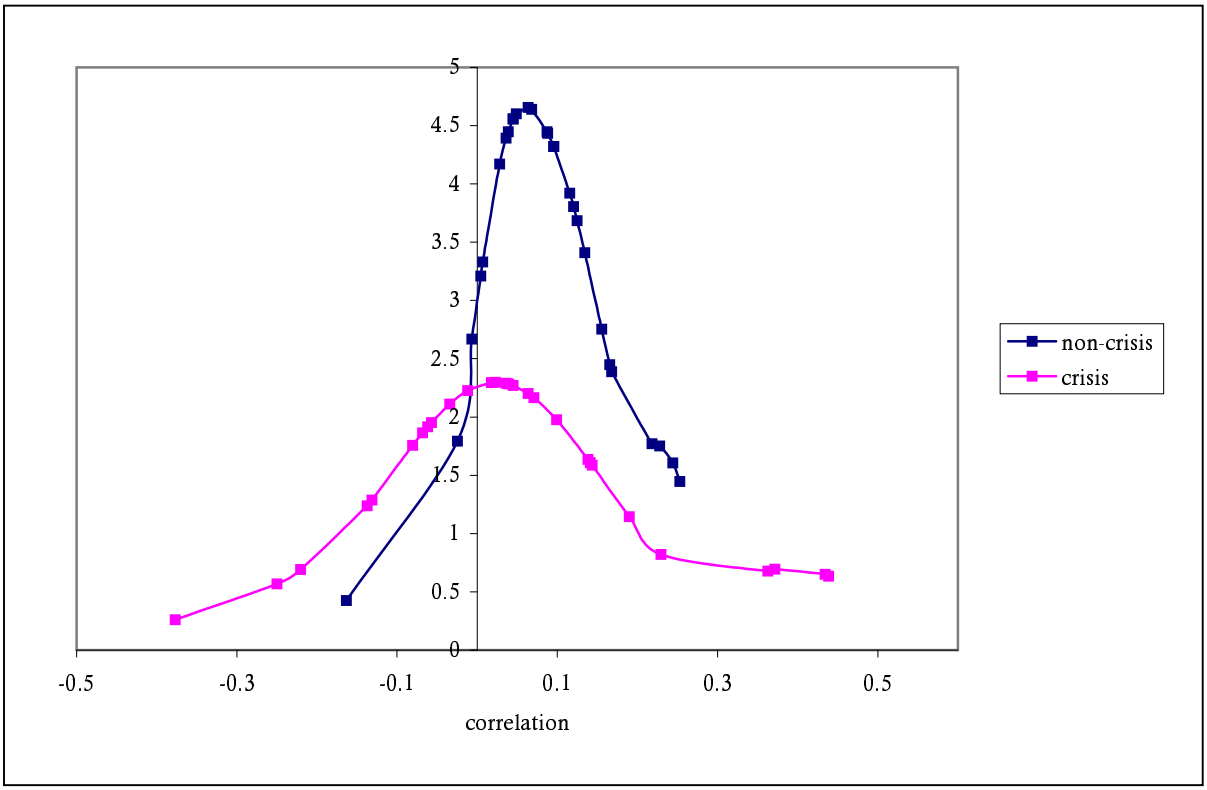
Full sample: 01/11/1890 – 27/12/1890: 07/10/1893 – 30/12/1893, 05/01/1907 – 28/09/1907								
	Argentina	Brazil	Canada	Chile	France	Neth.	U.K.	U.S.A.
Argentina		-0.32814	0.080268	-0.17106	0.003566	-0.12998	0.09045	-0.14185
Brazil			0.079623	0.081473	-0.27809	0.128205	-0.07966	0.13191
Canada				0.183268	-0.04221	0.212406	0.269522	-0.1381
Chile					0.00016	-0.43144	0.361555	0.39439
France						-0.42667	-0.1487	0.298205
Neth.							-0.14822	-0.13368
U.K.								0.09095

A characteristic that emerges from these results, is that the variation in the correlation coefficient increases during crisis periods, that is some countries are more negatively correlated than before, while others are more strongly positively correlated. This can be seen clearly from Figure 2, which plots the distribution of the correlation coefficient across all countries during periods of crisis and periods of relative stability. Given that our sample of countries is fairly diverse, we would expect the distribution of the correlation coefficient during periods of crisis to be more fat-tailed, this follows because a shock in any one individual country is not communicated everywhere, this causes larger negative correlations to arise because crises-affected markets diverge from those unaffected by crises, and larger positive correlations arise because crises-affected countries move closer together. However, we also observe that the mean value of the correlation coefficient decreases during periods of crisis. Thus there is no indication of a strengthening of cross-country linkages in general. However, this does not preclude the possibility of a rise in correlations within groups of countries.

Focusing on the three advanced countries in our sample – France, the Netherlands and the U.K. – we find that all the correlations between these countries actually decrease sharply during periods of instability. For the emerging countries the evidence of an increase in correlations is a little stronger. We see instances of both increases in correlation as well as decreases. The evidence that the correlation between the advanced and emerging countries increases is somewhat stronger. All significant increases in correlation that we observe are between the advanced and emerging countries.

An interesting result is that the correlations between certain countries that were high during periods of relative stability showed no indication of increasing during periods of crisis. Observe from Tables 2 and 3 that the correlations between all countries that are significant during non-crisis periods decrease during periods of crisis. For instance that the correlation between the U.S. and Canada is significant, but this correlation declines by –0.138 and becomes insignificant during periods of instability. However, correlations between countries that were weakly correlated or negatively correlated during relatively calm periods do increase. Exceptions are the U.S. and Brazil, the U.S. and France and Canada and the U.K.

Figure 2. The Distribution of the Correlation Coefficient During Periods of Tranquility and Crisis; 1880 - 1914



To summarize these findings, there is no indication that correlations increase across all markets during crisis periods. Moreover, there is no evidence that correlations increase between countries that are related, in terms of their regional similarities, their levels of development or by the extent that they trade with each other. Whereas periods of stability suggest patterns in the correlation coefficient that reflect these similarities by which we can group countries, the linkages that tie these markets of these countries together seem to weaken during periods of volatility. For instance the high positive correlation in the movement of U.S. and Canadian bond prices during periods of stability reflects the fact that the U.S. provided the largest export market for Canada. However, it seems that averaging over three episodes of crisis, two of which that had debilitating effects on the U.S., provides an impression that the Canadian markets were largely insulated from the effects of the sharp downturns experienced in the U.S.

Whereas the evidence that linkages across countries in general, or within the class of emerging or within the class of advanced countries, do not increase, there is some evidence that would indicate that periods of crisis brought the emerging markets closer to the advanced markets. We suspect that the impact of crises in the advanced countries spilled over to the emerging markets and vice versa. Examining table 3,

we see increases in correlations between the U.K. and Brazil, Canada, Chile and the U.S. Also we see increases in correlation between the U.S. and France and the U.S. and the Netherlands.

Baring Crisis 1890

We now switch our attention to each specific episode of crisis. We begin with the Baring crisis. We compute the correlations between the U.K. and each other country in our sample for the period of stability prior to the crisis and the period of turmoil, from November to the end of the year. In Table 4, we report the correlation with the U.K. over the 9 months preceding the crisis, as well as the increase in correlation during the crisis. The shaded entries represent those that are significant at 5%.

Prior to the crisis, we see that the U.K. displays positive correlations with all the countries in our sample. The correlation with Brazil, Canada the U.S. and in particular Chile are relatively high. The correlation with Argentina, France and the Netherlands is small. The weak correlation with Argentina is interesting and may reflect the fact that initially the crisis in Argentina had only a mild impact on U.K. markets, with the troubles only beginning when the weak position of Baring Brothers was revealed. After the onset of the crisis, with the exception of the Netherlands, the correlation between U.K. markets and all other markets decrease, sharply in some cases. Interestingly, the correlation with Argentina decreases. Thus the movements in bond prices in British and Argentine markets, do not seem to reflect the sequence of events that caused the crisis in the U.K., which can be traced to British interests in Argentina.

In Figure 3, we plot the correlations in bond price movements with the U.K., for the period from July 22, 1890 to December 27, 1890. The correlation coefficients were calculated by rolling a three-month window through time. Thus, the value of the correlation coefficient that is reported at any particular point in time, reflects the correlation between those markets over the previous three months ending at that date. Some interesting patterns are immediately transparent. Note that the correlations are highly volatile. Note that the correlation with Argentina is high between April and June. This could reflect the spillover of the Argentine crisis on U.K. markets, a characteristic that our earlier analysis did not reveal. Notice that the correlation between the U.K. and all other countries, with the exception of Canada and the U.S., rise toward the beginning of June. The correlations with all three South American countries as well as with the Netherlands increase. The correlation with Canada and the U.S. increased somewhat later, toward the

middle of August. This rise in correlations during the summer months is consistent with the seasonal movements in interest rates which we observe from this era. Prior to the Baring crisis the correlations with the Netherlands and the Latin American countries are low. With the onset of the Baring crisis, these correlations tend to decrease further, with the exception of the correlation between the U.K. and the Netherlands.

Clearly, the above analysis is sensitive to the choice of windows. The use of a rolling window does, alleviate this problem to some extent. However, even so the analysis remains very sensitive to the width of the window. Nevertheless, the rolling correlations do reveal some key underlying characteristics that are otherwise not observable. In particular, we see that the correlations between countries are highly volatile even during stable periods. To an extent, this volatility in the correlation coefficient could reflect a common seasonal pattern that has little to do with causation, although it is not clear that this is so.

We also observe that though correlations between countries can rise dramatically during periods of crisis, as for instance, the correlation between the U.K. and the Netherlands, there are several instances when the correlations between markets that we believe to be highly integrated actually decrease, e.g. the correlation between the U.K. and U.S., or the correlation between the U.K. and Canada, or that between the U.K. and Argentina. The suggestion is thus, these markets remain largely insulated from the effects of a crisis. The Argentine crisis which began in 1890, sparked a depression, the effects of which – including several bank failures, and sharply depreciating exchange – were felt for three years. It is therefore interesting that the correlation between the U.K. and Argentina isn't seen to rise as a result. A valid argument is that the effects of crises took some amount of time to spillover to other markets and our short windows, which terminate at the end of the year, are not catching the bulk of these effects.

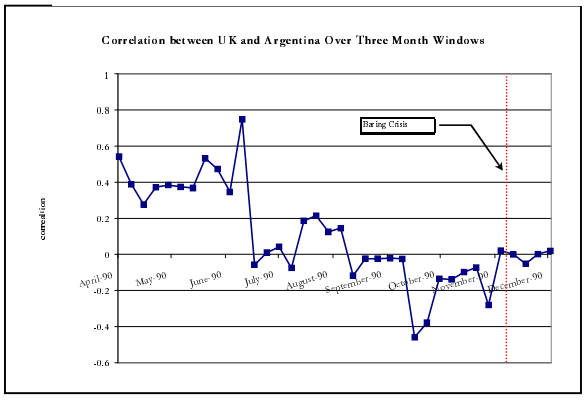
In summary, for non-crisis years we observe evidence of regional patterns in the data that may reflect trade linkages between countries as was the case for the annual data. However, these patterns are less clear during crisis years. There is some indication of a tightening of links between the advanced and emerging countries. However, in general, the evidence of rises in correlation following the Baring crisis is weak, with the Netherlands as an exception. It is therefore difficult to conclude that the contagion stemming from the Baring crisis significantly impacted on the bond markets in other countries. However,

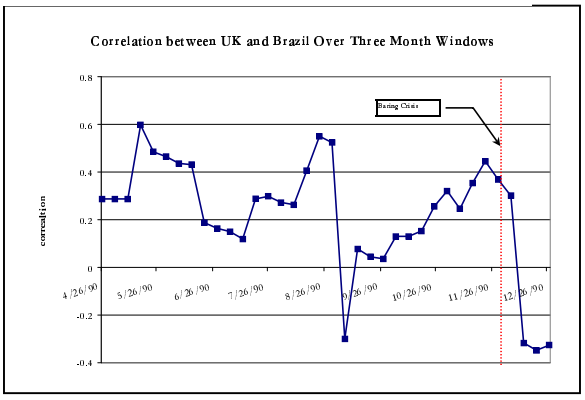
we do observe a pattern which suggests that contagion effects may have spread across countries that were otherwise traditionally weakly correlated.

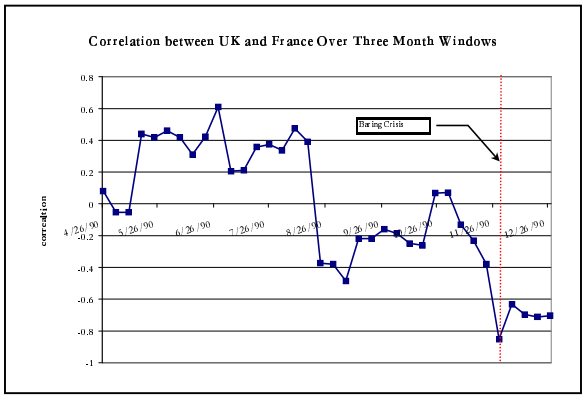
Table 4. Pre-Crisis Correlations and Post-Crisis Increases in Correlation with the U.K.
January 1890 – December 1890

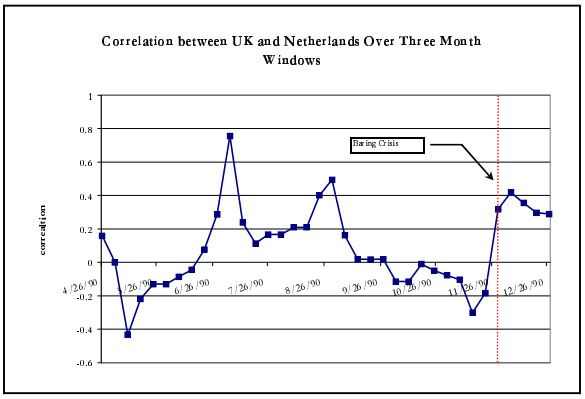
Pre-crisis : 04/01/1890 – 25/10/1890 Post-Crisis: 01/11/1890 – 27/12/1890		
Country	Pre-Crisis Correlations	Post Crisis Increases in Correlations
Argentina	0.089270466	-0.06993
Brazil	0.195218771	-0.52101
Canada	0.221622255	-0.44889
Chile	0.315791788	-0.54306
France	0.107773775	-0.81184
Netherlands	0.068206988	0.221064
USA	0.180142595	-0.76427

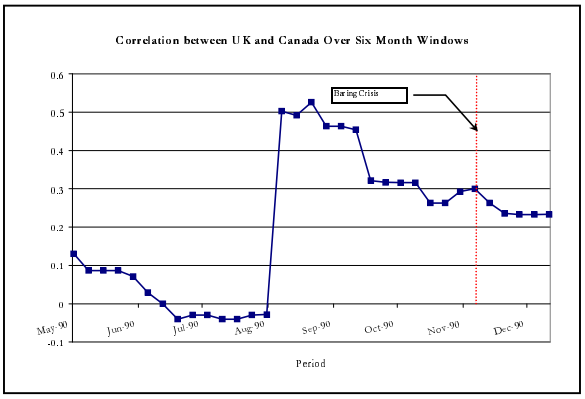
Figure 3. Behavior of the Correlation Coefficient Through Time; Correlations with the U.K. and Other Countries, April 1890 – December 1890

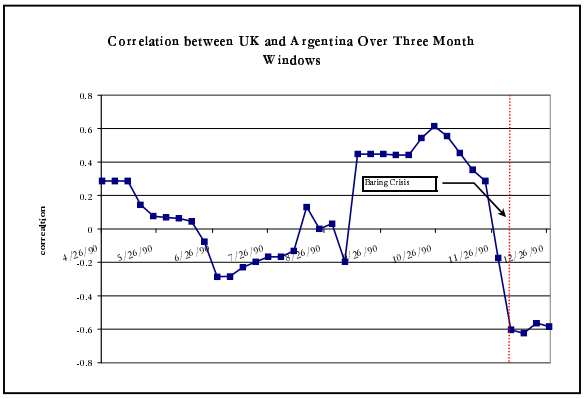









Correlation between UK and Canada Over Six Month Windows
Baring Crisis
0.6
0.5
0.4
0.3
0.2
0.1
0
-0.1
May-90
Jun-90
Jul-90
Aug-90
Sep-90
Oct-90
Nov-90
Dec-90
Period


Correlation between UK and Argentina Over Three Month Windows
Baring Crisis
correlation
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
4/26/90
5/26/90
6/26/90
7/26/90
8/26/90
9/26/90
10/26/90
11/26/90
12/26/90

4.1.2. Interwar Period

The coverage of our data for the interwar is more comprehensive spanning over 11 years from January 2, 1925 to May 15, 1936 and 16 countries.[17] Moreover the difficulties faced with the rounded data for the prewar are no longer a concern. Overall the quality of the interwar data is superior to that which we utilized for the prewar. As such the bulk of the weight of our statistical analysis is based on our findings for the interwar.

We proceed as above by estimating the correlations of weekly changes in bond prices for a pooled sample of crisis and non-crisis periods. Again our choice of crisis dates is based on the contemporary narrative. As can be seen from the histogram in Figure 1, the years between 1929-1933 were the most heavily polluted with crises. The boom in speculative activity in the U.S. in the latter part of the 1920s culminated with collapse on the New York Stock Exchange in October 1929. The sequence of events that led up to this event can be traced back to the declines on the NYSE from September of that year. On October 21, margin calls led to heavy selling with the volume of sales exceeding 6 million shares. By October 29, this number had reached 16.4 million.[18] See Malkiel 1996.

Despite the turbulence on Wall Street, the extent of the contagion to other sectors, such as the bond market, is unclear. In 1929, there were only 2 crises in our sample of 21 countries. Even so the historic significance that has been attributed to this event suggests an obvious date by which to demarcate an earlier period of relative stability from the period of instability to follow. Nevertheless the inclusion of the three months following the October stock market collapse in our pooled sample of crisis dates is debatable, as the turmoil in the market for long-term government bonds was of a lesser extent than that in the stock market.[19]

By contrast to 1929, 1931 was the "year of crises." Altogether 18 countries in our sample of 21 experienced crises. Given the mayhem of that year, it is not obvious which event had the widest repercussions. The failure of Kreditanstalt, Austria's largest private bank, in May, triggered a banking

[17] The countries in our sample are: Argentina, Belgium, Brazil, Canada, Chile, Denmark, Finland, France, Germany, Italy, the Netherlands, Sweden, Switzerland, the U.K. and the U.S.
[18] Today's equivalent of a 16.4 million trading day would be in excess of a one billion trading day.
[19] In fact, we find little evidence of contagion in bond prices following the events in October of 1929. However, the volatility in bond prices was considerably greater compared to the earlier period of stability.

crisis in Germany within a month and caused instability on much of the continent. While Britain's departure from gold, on September 21, set the stage for several countries to break their ties to gold, thus having wide repercussions for Europe and the rest of the world. Given the almost continuous instability in that year, we are unwilling to commit to a particular sub-period of volatility, as such we demarcate the lengthy period from May to the end of the year as a crisis period.

For 1932-33 we focus on repercussions of the banking panic in the U.S., whose beginnings can be traced to the failure of numerous Midwestern banks in October of 1932. The crisis sharpened considerably in January of 1933, and was not over until a string of bank holidays had been declared in March of that year. As such the period from October 1932 to March 1933 is included in our sample of crisis observations.

We then focus on a specific period of turmoil following Britain's departure from the gold standard. We examine the behavior of the correlation coefficient around that time, both by calculating the correlations prior to and after the onset of each crisis and by rolling a 3-month window over the sample.

Table 5 reports the correlation coefficients for non-crisis weeks, for the pooled sample. Again the shaded entries are those that are statistically significant at 5%. Some regional patterns are transparent. Argentina, Brazil and Chile are seen to be highly correlated. We also see that the central European countries are strongly correlated with each other and also with Japan. The U.K. displays significant correlations with Canada and France. The U.K. was the second largest export market for Canada at that time, thus the positive correlation between the two countries reflects these trade linkages. As we would expect, the U.S. and Canada are strongly correlated with each other. The U.S. is also correlated with Denmark and Finland.

Table 6, reports the crisis period correlations. The evidence of a strengthening of cross-market linkages is dramatic, with 85% of the countries now displaying positive correlations with each other. In particular observe that several of the European countries are significantly correlated with each other as well as with the South American countries and with Canada. France is correlated with 13 countries, while Belgium and Italy are strongly correlated with 11 countries. The U.K. is now highly correlated with 9 countries. Interestingly we observe that Chile displays strong correlation with 13 countries. This characteristic of displaying strong correlations with other countries was observed for the pre World War I

period as well. Chile is an interesting case in that it broke its link to gold in 1878 and remained on a fiduciary standard for the next 48 years; with a brief 3-year return in 1895. It is also interesting because of its reliance on its export sector, which experienced a boom stemming from the expansion of the nitrate industry. Thus, Chile was a relatively open country and this may in part explain the large correlations that we observe with other countries.

Figure 4, plots the distribution of the correlation coefficient during periods of crisis and periods of stability. The mode of the distribution of ρ – the correlation coefficient – during non-crisis periods is clearly at zero, however, there is also evidence of some structure in the distribution for values of ρ close 0.1. Moreover, the right tail of the distribution is fairly heavy. This contrasts with what we observed for the pre World War I period, when the distribution of the correlation coefficient was more symmetric around zero. The heavier right-tails and the more pronounced structure at ρ close to 0.1, merely indicates that correlations between markets were in general higher during the interwar period than the prewar. During crisis periods the mode of the distribution of ρ shifts to about 0.22 and correspondingly the mean of ρ increases. The right-tail of the distribution is heavy, and eventually tapers off at ρ near 0.6. There is also evidence of some structure in the distribution close to 0.1 and 0.35. In contrast to the pre World War I era, there is ample evidence of a strengthening of cross-country linkages in general, during periods of crisis.

Table 7 reports the increases in correlation during crisis periods over non-crisis periods. Again the evidence of increases in correlations is strong, with nearly 86% of countries showing an increase. The countries that stand out, in that they display a large number of significant increases are Belgium, Canada, Chile, Denmark, France, Italy, Sweden and the U.K. The correlations between the South American countries by comparison, or the correlations between the U.S. and Canada, and the U.S. and Europe do not seem to increase as much and in some cases decrease. The countries that stand out for showing relatively few increases in correlations are Finland, Japan, the Netherlands and the U.S.

For the pre World War I period the evidence suggested that the countries strongly correlated during periods of relative stability, displayed a decline in correlations during periods of volatility. Countries that displayed an increase in correlations were typically those that showed low correlations during periods of tranquility. Close scrutiny of Tables 5 and 7, also suggests a similar pattern of behavior.

The pattern that emerges is that the correlation between the European countries rises during a crisis, however, there is no indication that the rises in correlations occur between those countries that displayed significant correlations during the periods of tranquility. For instance, the correlation between Denmark and the U.K., for our pooled sample of non-crisis observations, increases dramatically from -0.079 to 0.447, during periods of crisis. Similarly the correlation between the U.K. and the Netherlands rises from -0.030, while the correlation between the U.K. and Germany rises from 0.034 to 0.373. Whereas instances of declines in correlation were few, countries traditionally depicting little co-movement during times of relative stability tended to display greater evidence of co-movements during periods of instability than those countries that were highly positively correlated over the period of non-crisis years. This point is made clearly in Figure 5, which plots the correlation coefficient during crisis years against the correlation coefficient during non-crisis years. A non-parametric fit reveals clear evidence of a negative slope reflecting the reversals in country rankings based on the correlations in bond price movements.

Britain's Departure from Gold; September, 21 1931

On September 21, 1931, runs on Sterling precipitated by France and the Netherlands forced the U.K. off the gold standard. Over the next year some 25 other countries followed the U.K. in abandoning gold (Friedman and Schwartz, 1963). In Figure 6, we plot bond price indices for a sample of 13 countries, from the period July 3, 1931 to November 27, 1931. The extent of the co-movement in bond prices following this event is dramatic. Bond prices in each country are seen to decline for a period following the Sterling crisis. In Table 13, we report the correlations between the U.K. and all other countries in our sample. With the exception of Finland, Japan, Switzerland and the U.S., all correlations with the U.K. increase. However, only two of those increases – the correlation between the U.K. and Argentina and the correlation between the U.K. and Belgium – are significant. The failure to verify many of these increases to be statistically significant, may be explained by the small sample of observations that we are forced to work with and the resulting poor approximation of the test statistic to normality. Nevertheless, the evidence of a strengthening of linkages between the countries in our sample and the U.K. is striking.

Figure 7 provides a look at the dynamics of the cross-correlations between U.K. markets and other markets in our sample. The correlation coefficient is seen to be highly volatile. There is an increase in

correlations in May after the onset of the Austrian crisis. There is also a marked increase in correlations across the board in September, following Britain's departure from the gold standard. There is thus a clear indication of a rise in correlations following the Sterling crisis, however, this increase is seen to be short-lived.

Figure 4. Distribution of the Correlation Coefficient; 1919 - 1939

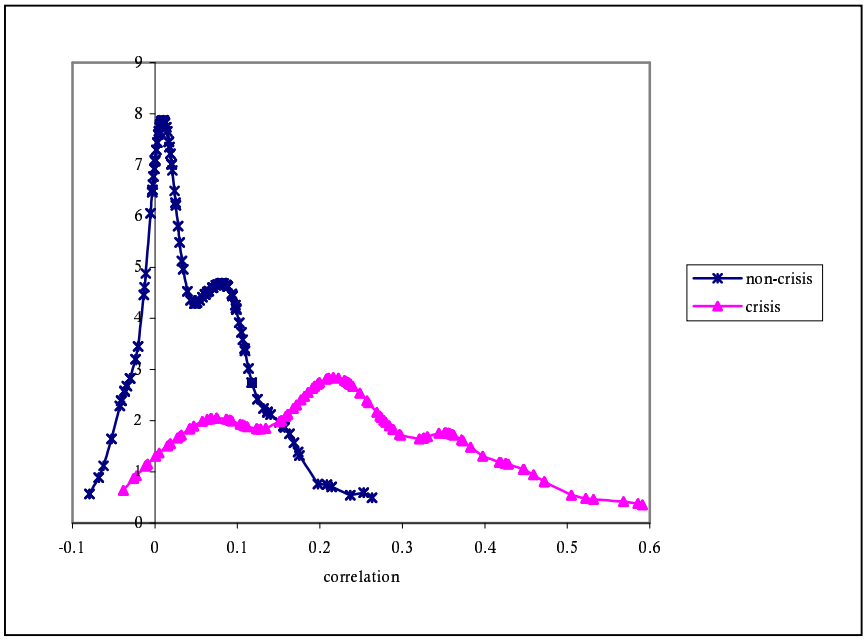


Figure 5. Bond Price Correlations in Crisis Periods vs. Correlations in Non-Crisis Periods; 1925 - 1936

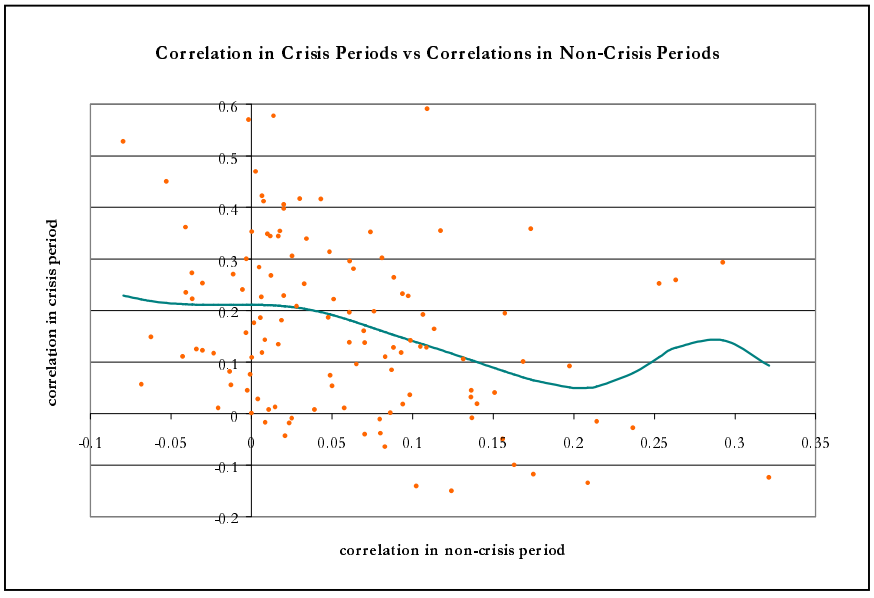


Table 5. Cross-Country Correlations During Tranquil Periods; 1925 - 1936

Pooled Sample; Non-Crisis Dates: 02/01/1925 – 18/10/1929, 07/03/1930 – 24/04/1931, 01/01/1932 – 30/09/1932, 24/03/1933 – 05/15/1936																
	Argentina	Belgium	Brazil	Canada	Chile	Denmark	Finland	France	Germany	Italy	Japan	Neth.	Sweden	Switz.	U.K.	U.S.A.
Argentina	1	-0.00328	0.20866	0.01221	0.140057	0.076101	0.069729	0.051084	-0.04269	-0.05269	0.082888	-0.06832	-0.03027	0.008319	0.065115	-0.02063
Belgium		1	-0.0369	0.000267	0.020166	-0.00167	0.018736	0.013722	0.020201	0.002704	0.020169	0.321231	0.010063	0.001605	0.054093	0.025043
Brazil			1	0.087026	0.292513	0.136472	0.175102	0.000245	0.1687	0.032842	0.093939	-0.01348	0.048925	0.000132	0.04777	0.006488
Canada				1	0.017708	0.173445	0.157218	0.074013	0.048433	0.063468	0.039236	-0.00077	-0.00309	0.016804	0.117442	0.155901
Chile					1	0.030116	0.098759	0.007633	0.093862	0.025364	0.060789	0.050161	-0.00538	0.00476	0.016793	0.060861
Denmark						1	0.197527	0.006665	0.131538	0.081056	0.08821	0.070477	0.109145	0.006176	-0.07957	0.16304
Finland							1	-0.04086	0.236753	0.093059	0.102353	0.080058	0.027937	-0.03416	-0.04067	0.124173
France								1	0.104764	0.25298	0.108595	0.113466	0.061008	0.011746	0.263366	0.014715
Germany									1	0.097338	0.098327	0.151004	0.079604	0.004101	0.034256	-0.02348
Italy										1	0.136234	0.136837	0.21421	-0.03662	0.04317	0.057679
Japan											1	0.082962	0.086237	0.008481	0.01081	-0.06225
Neth.												1	0.088425	0.021002	-0.03028	0.023619
Sweden													1	-0.0112	0.106493	-0.01264
Switz.														1	0.005712	0.070376
U.K.															1	-0.0025
U.S.A.																1

Table 6. Cross-Country Correlations During Crisis Periods; 1925 - 1936

Pooled Sample; Crisis Dates: 25/10/1929 – 28/02/1930, 01/05/1931 – 25/12/1931, 07/10/1932 – 17/03/1933																
	Argentina	Belgium	Brazil	Canada	Chile	Denmark	Finland	France	Germany	Italy	Japan	Neth.	Sweden	Switz.	U.K.	U.S.A.
Argentina	1	0.153199	0.074425	0.279833	0.158883	0.274437	0.229677	0.273009	0.067778	0.397363	0.01861	-0.01162	0.222417	0.15144	0.161138	-0.01037
Belgium		1	0.235422	0.353167	0.425123	0.568096	0.199612	0.591181	0.417747	0.472249	0.248478	0.197196	0.358084	0.17724	0.664748	0.0154
Brazil			1	0.171785	0.585522	0.181246	0.057404	0.108948	0.269046	0.284074	0.111959	0.067552	0.122989	0.001055	0.233981	0.124269
Canada				1	0.371743	0.531615	0.351229	0.425813	0.361966	0.34439	0.046949	0.075045	0.296562	0.151247	0.472119	0.106291
Chile					1	0.446767	0.240097	0.419511	0.326081	0.330421	0.198487	0.103512	0.234737	0.288576	0.360737	0.257031
Denmark						1	0.28922	0.428649	0.23702	0.382599	0.216169	0.207678	0.700118	0.231951	0.447677	0.063359
Finland							1	0.320638	0.208716	0.210976	-0.03845	0.041882	0.235812	0.090715	0.193922	-0.02585
France								1	0.234703	0.504958	0.236768	0.277697	0.356312	0.355983	0.522229	0.027274
Germany									1	0.325258	0.134386	0.19101	0.068523	0.031771	0.373332	0.093299
Italy										1	0.167722	0.128106	0.198488	0.185646	0.458981	0.068173
Japan											1	0.192974	0.087364	-0.00895	0.018077	0.086201
Neth.												1	0.352191	-0.02238	0.091639	0.005202
Sweden													1	0.259003	0.298188	0.042562
Switz.														1	0.191235	0.030028
U.K.															1	0.042282
U.S.A																1

Table 7. Change in Cross-Country Correlations During Crises Periods; 1925 - 1936

Non-Crisis Dates: 02/01/1925 – 18/10/1929, 07/03/1930 – 24/04/1931, 01/01/1932 – 30/09/1932, 24/03/1933 – 05/15/1936 and Crisis Dates: 25/10/1929 – 28/02/1930, 01/05/1931 – 25/12/1931, 07/10/1932 – 17/03/1933																
	Argentina	Belgium	Brazil	Canada	Chile	Denmark	Finland	France	Germany	Italy	Japan	Neth	Sweden	Switz	U.K.	U.S.A.
Argentina		0.670923	-0.31264	-0.15378	-0.12498	0.235796	-0.36435	0.011349	0.193567	0.495647	0.450823	-0.29382	-0.33101	-0.19807	-0.02701	-0.05011
Belgium			-0.12137	0.310387	0.107527	0.294958	-0.18037	0.15685	0.213096	0.21272	0.310073	-0.08507	-0.1943	-0.06957	0.098818	-0.1612
Brazil				0.109599	0.554019	-0.18317	0.309665	0.266112	0.106562	0.180189	-0.45781	0.505848	-0.23813	-0.081	-0.09624	-0.04622
Canada					0.363565	0.310486	-0.02605	0.669013	0.428709	0.417419	0.307578	-0.18155	0.022133	0.249524	0.11327	-0.22361
Chile						0.180434	0.139685	0.429458	0.276779	0.14417	-0.118	-0.07621	-0.096	0.247443	0.093957	0.27357
Denmark							-0.21322	-0.04645	0.7376	0.539736	0.56209	0.150192	-0.03501	-0.24506	0.66667	0.179542
Finland								-0.09831	0.039454	-0.05997	-0.02498	0.127224	-0.12607	0.072518	0.293376	-0.27559
France									0.340502	0.162302	0.333352	0.054235	-0.03174	0.324689	0.050774	-0.1529
Germany										0.358752	0.477646	0.29583	-0.03374	0.051604	0.405396	0.00179
Italy											0.25157	0.10681	0.057868	-0.17192	0.473298	-0.06239
Japan												-0.01847	-0.04998	-0.00265	0.286728	0.143926
Neth.													-0.13899	-0.33093	0.699103	-0.1787
Sweden														0.022443	0.196838	0.212286
Switz.															-0.06703	-0.27066
U.K.																-0.22319

Figure 6. Bond Price Indices Before and After the Sterling Crisis, July 3, 1931 – November 27, 1931. (July 3, 1931 = 100)

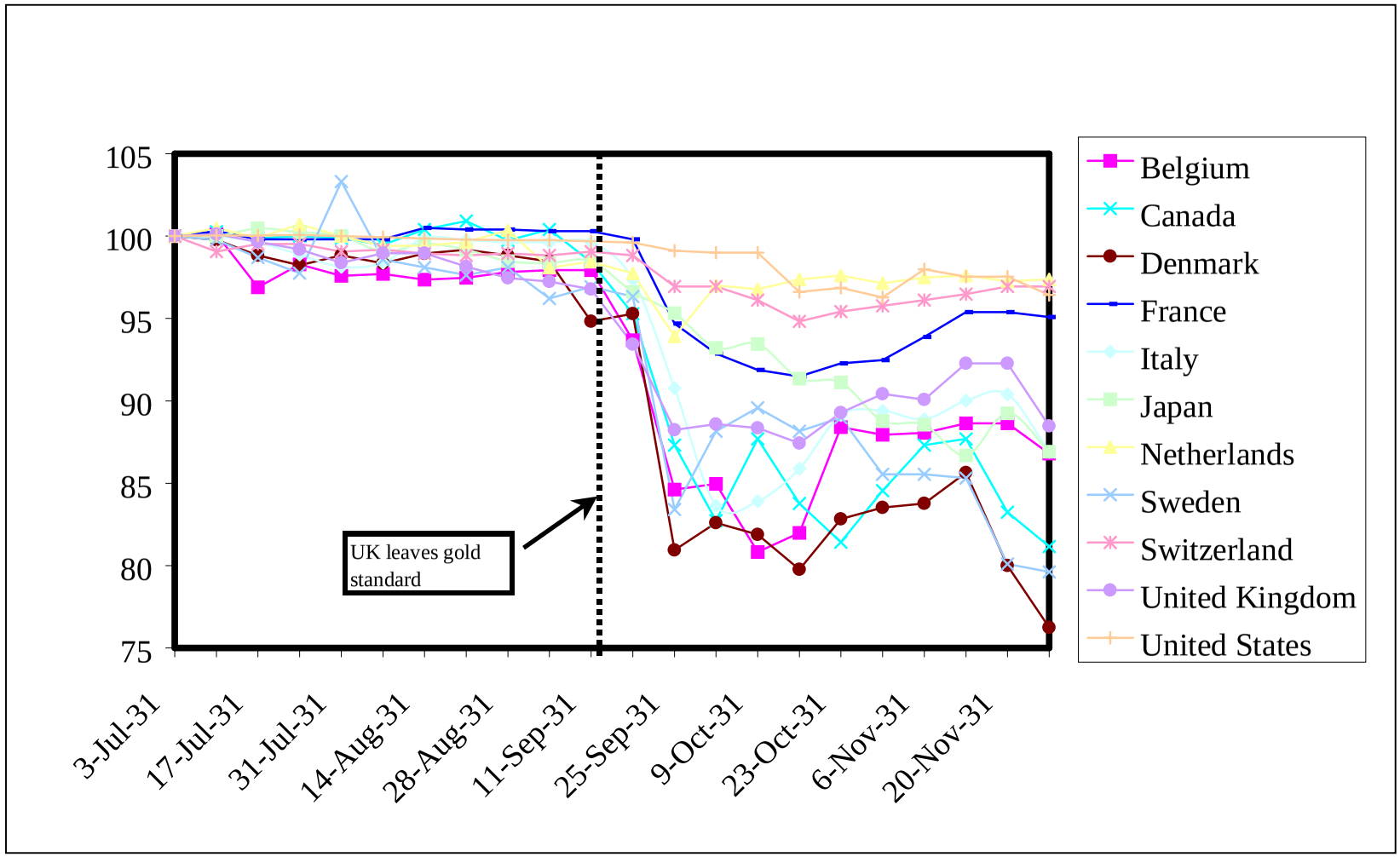
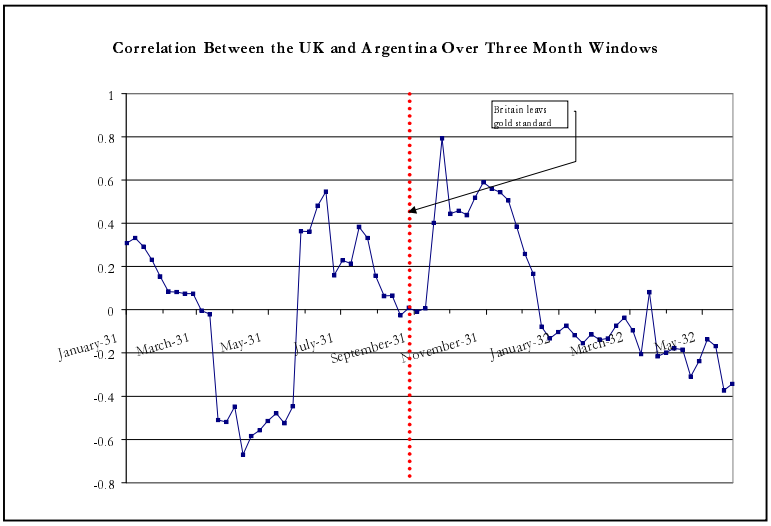
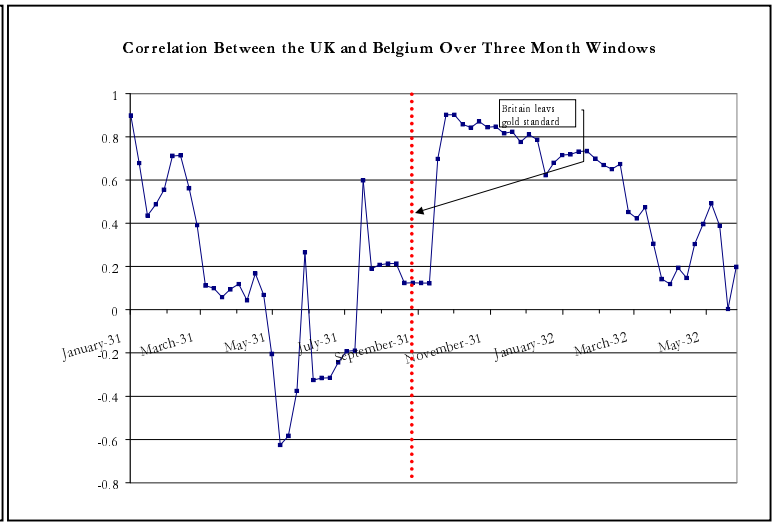


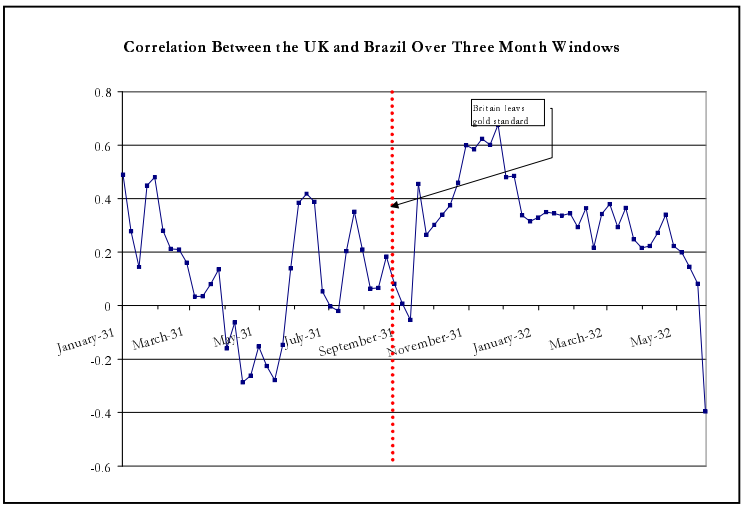
Table 8. Pre-Crisis Correlations and Post-Crisis Increases in Correlation with the U.K. (1931)

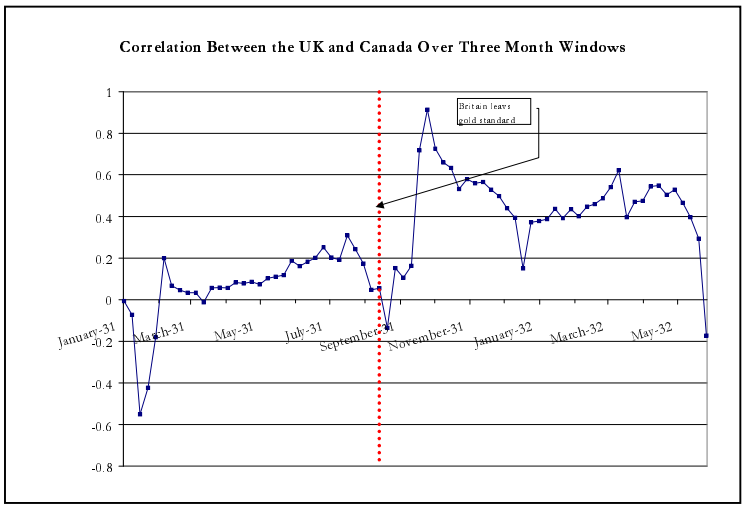
Pre-crisis: 02/01/1931 – 18/09/1931 and Post-crisis: 25/09/1931 – 29/01/1932		
Country	Pre-Crisis Correlations	Post Crisis Increases in Correlations
Argentina	-0.44666	0.642944
Belgium	0.088236	0.627421
Brazil	0.100568	0.180825
Canada	0.076307	0.398209
Chile	-0.07662	0.236151
Denmark	-0.00397	0.472699
Finland	0.393646	-0.19157
France	0.499075	0.176882
Germany	0.289491	0.066213
Italy	0.190665	0.382124
Japan	0.24733	-0.18235
Netherlands	0.410385	-0.16906
Sweden	0.067007	0.204613
Switzerland	0.394566	-0.08103
United States	0.375893	-0.19912

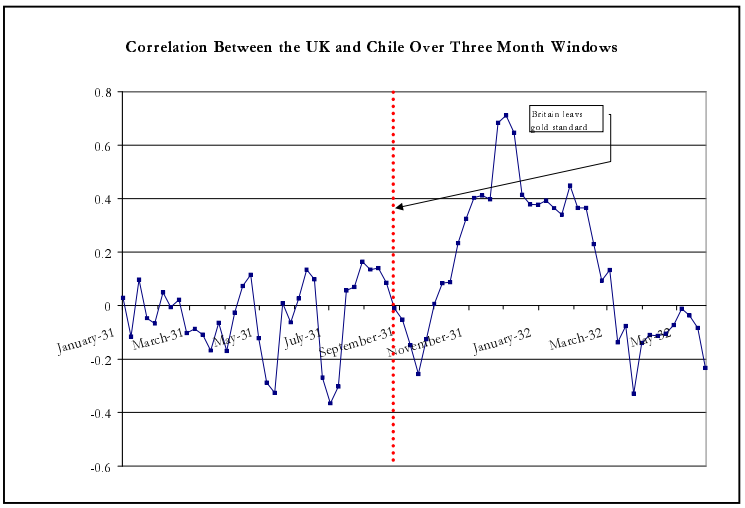
Figure 7. Behavior of the Correlation Coefficient Through Time; Cross Correlations Between the UK and Other Markets, January 2, 1931 – May 27, 1932

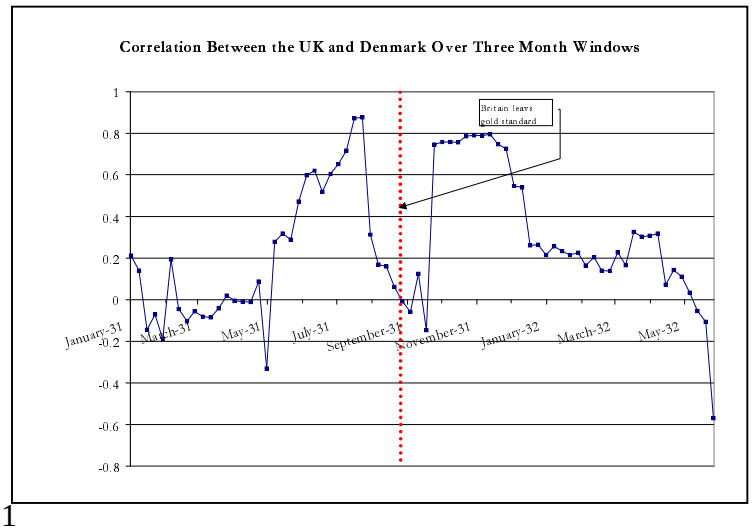


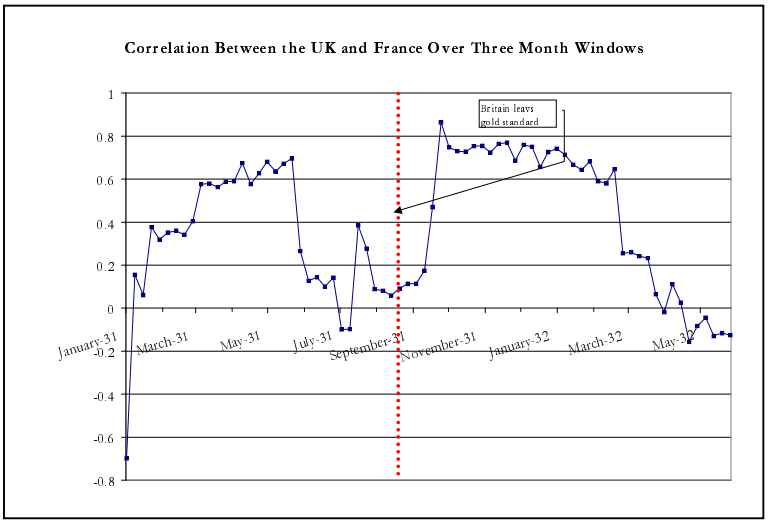


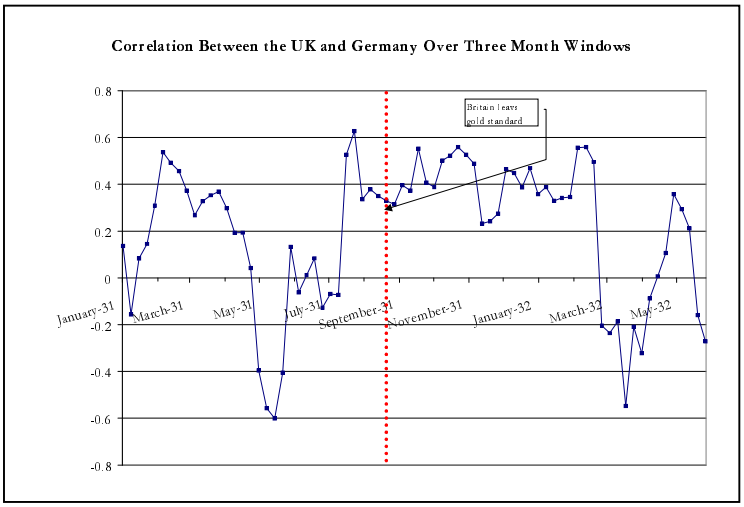


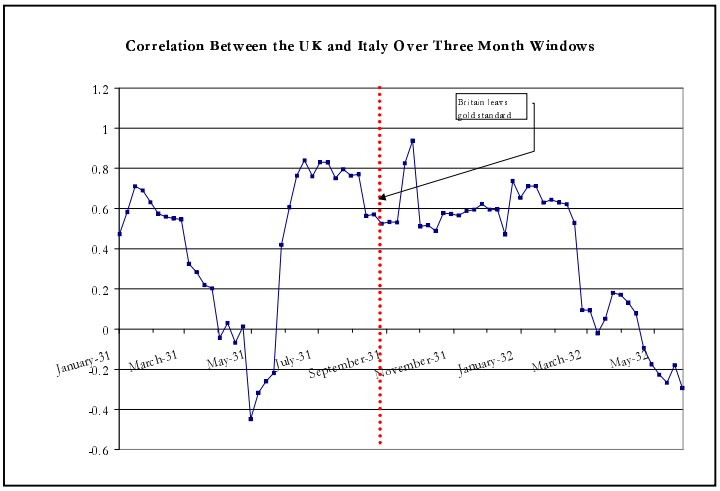


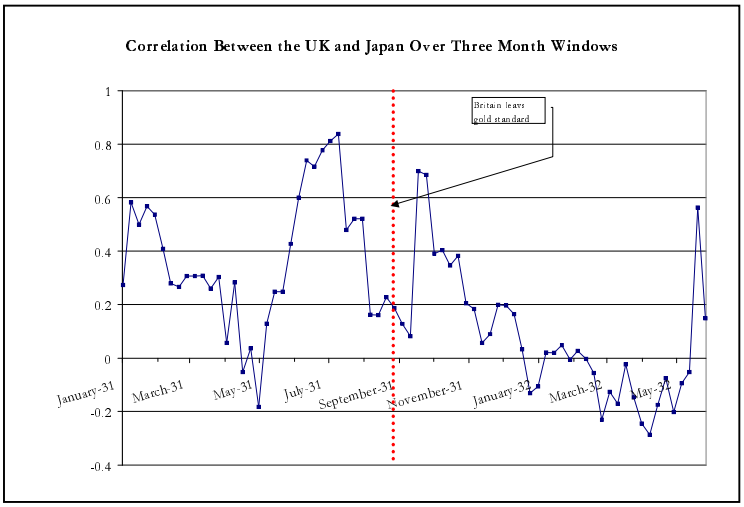


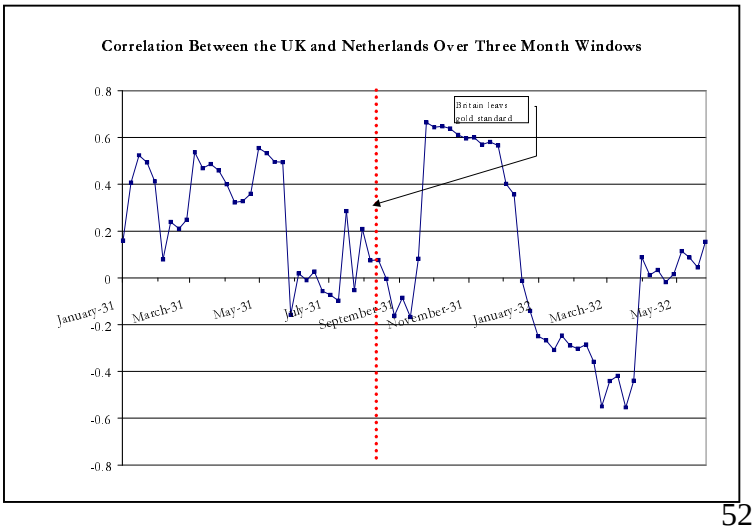


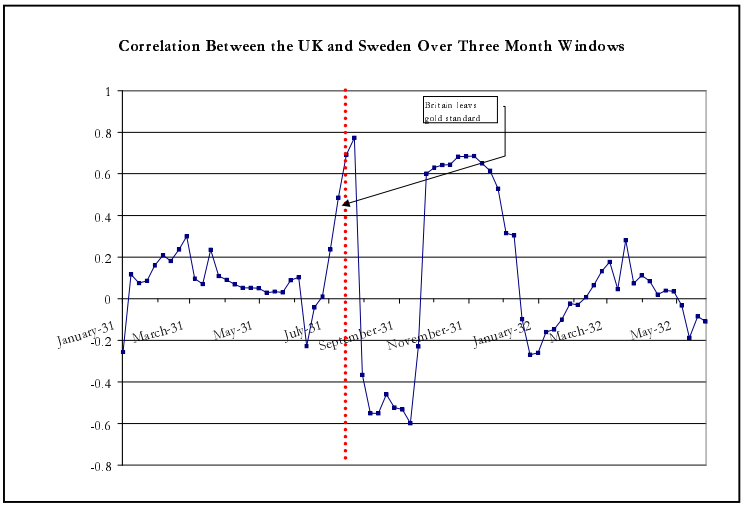

Correlation Between the UK and France Over Three Month Windows
Britain leavs gold standard
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
January-31
March-31
May-31
July-31
September-31
November-31
January-32
March-32
May-32

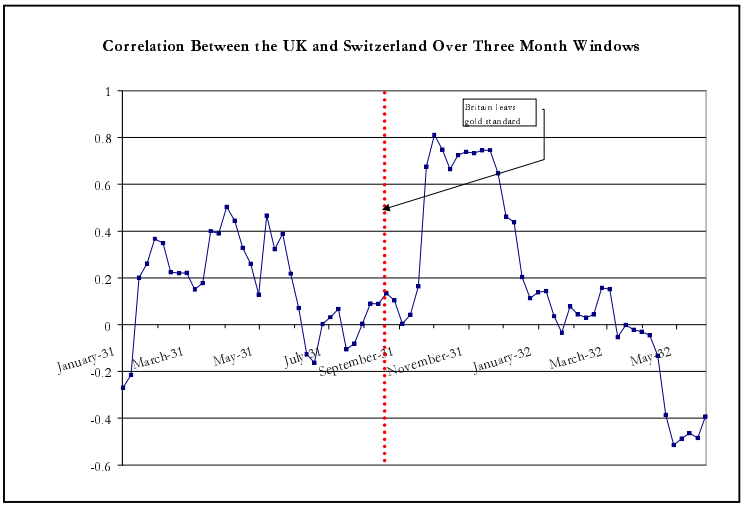

Correlation Between the UK and Germany Over Three Month Windows
Britain leavs gold standard
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
January-31
March-31
May-31
July-31
September-31
November-31
January-32
March-32
May-32

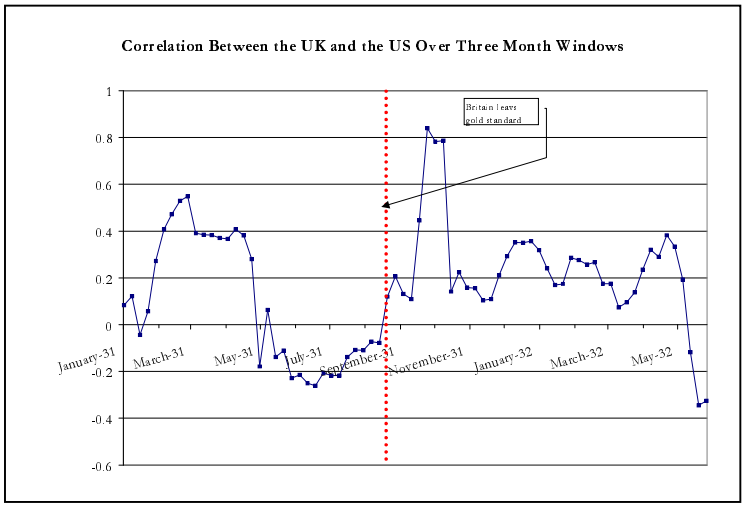

Correlation Between the UK and Italy Over Three Month Windows
Britain leavs gold standard
1.2
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
January-31
March-31
May-31
July-31
September-31
November-31
January-32
March-32
May-32


Correlation Between the UK and Japan Over Three Month Windows
Britain leavs gold standard
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
January-31
March-31
May-31
July-31
September-31
November-31
January-32
March-32
May-32


Correlation Between the UK and Netherlands Over Three Month Windows
Britain leavs gold standard
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
January-31
March-31
May-31
July-31
September-31
November-31
January-32
March-32
May-32


Correlation Between the UK and Sweden Over Three Month Windows
Britain leavs gold standard
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
January-31
March-31
May-31
July-31
September-31
November-31
January-32
March-32
May-32


Correlation Between the UK and Switzerland Over Three Month Windows
Britain leavs gold standard
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
January-31
March-31
May-31
July-31
September-31
November-31
January-32
March-32
May-32


Correlation Between the UK and the US Over Three Month Windows
Britain leavs gold standard
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
January-31
March-31
May-31
July-31
September-31
November-31
January-32
March-32
May-32

Summary of the Weekly Bond Price Evidence for the Interwar

To summarize, for the interwar we have observed a larger number of significant correlations than that for the prewar era and larger numbers of significant increases in correlation. The vast majority of countries display positive correlations in bond price movements during periods of stability. This difference cannot wholly be attributed to a sudden strengthening of international ties. In part, at least, it has something to do with the fact that our data for the prewar was rounded. On the whole there is considerable evidence of greater co-movement in bond prices during periods of instability over the years 1929-33, than that which we observed for the three years of prewar data. The number of instances when rises in correlations were significant is also striking, suggesting strong evidence of contagion. The evidence of contagion, by contrast, is weaker for the prewar period, though the paucity of the data for that period does not allow for a better comparison.

It is questionable though that the evidence of rises in correlation that we observe can establish the importance of contagious channels of transmission. Indeed two common themes emerge from our analysis of both periods that casts doubt on the contagion hypothesis.

First, the reversal in rankings of countries in terms of the strength of their cross-country linkages is not easily explained. Whereas, the sharpening of linkages across markets otherwise weakly correlated during periods of low volatility, tends to suggests contagion, it is not clear why these avenues of transmission should not be pronounced amongst countries that are strongly correlated during periods of relative tranquility. If contagion, whether it is the outcome of self-fulfilling prophecies, or herding behavior, is indiscriminate, then countries which are tightly linked via real channels of transmission should experience such contagion effects too. Instead they seem to be largely insulated from such contagion. This is somewhat of a puzzle.

An explanation of this may have to do with the relationship between investors' information sets and the correlations between markets. If markets are highly correlated, presumably reflecting high levels of integration, investors can anticipate the impact of a shock in one country on the other, or trace back the origins of a disturbance in country B to events in country A. When markets are weakly correlated investors are unable to assess the impact of a shock in one country on another. This uncertainty present between

these two markets may make these markets more prone to herding behavior. Recent research, such as Calvo and Mendoza (1998), has suggested an explanation for herding behavior as an outcome of optimizing behavior in highly globalized markets. Specifically, increased globalization of markets has increased the costs of obtaining market-specific information. The impact of a shock in one market thus has an uncertain impact on another market. We believe that a similar argument with only minor modification can explain the pattern of behavior that we observe. Specifically, we suspect that investors are better able to forecast the effect of a shock in one market on another market when they are highly correlated. A shock in the U.S. therefore does not cause herding behavior in Canada, as agents are largely informed of the effect that this will have in Canada. However, investors are unable to forecast the impact of a shock in one country on another when they are weakly correlated. As such a shock in one country may well lead to contagion in all markets that display weaker correlations.

Second the volatility of the correlation coefficient seen in our analysis of specific episodes of financial turmoil, is such that the relevance of tests that attempt to establish the truth of contagion, by virtue of a comparison of correlations in two windows of time, is brought into question. Such tests are founded on the assumption that the correlation over given windows of time is constant. Since the validity of this assumption is suspect, the accuracy of such analysis is brought into question. Specifically, a test of the null hypothesis

$$H_0 : \rho_1 = \rho_2$$

where ρ_1 is the correlation between markets during periods of stability and is the ρ_2 correlation during periods of instability, based on the test statistic

$$U = \frac{\left(z_1 - z_2\right)}{\left(\left(\frac{1}{n_1 - 3}\right) + \left(\frac{1}{n_2 - 3}\right)\right)^{1/2}}, \text{ where } z_i = \tanh^{-1} r_i, i = 1,2,$$

assumes a comparison across two samples drawn from two independent bivariate normal populations with correlations ρ_1 and ρ_2. Where the violation of the first assumption of independence is obvious, it should also be clear that the correlation between two markets is likely to be time-varying over any period of observation that allows statistical comparisons. Hence in comparing the correlation in bond prices of a period of relative stability and over a period of volatility, we are violating both the assumption of

independence, by virtue of the persistence of the bond price series, and the assumption that over any given period we are drawing from a population that possesses certain stationarity properties. Whereas wide-sense stationarity is a property that is often assumed of a given time series, the stationarity over time of the contemporaneous covariances across variables is a far stronger assumption.

A possible solution to this problem is to identify the main source of volatility in the correlation coefficient and then proceed by fitting a function that allows for this dependence and then test for a break in this relationship following the onset of a crisis. As we hinted to earlier, the size of the shocks affecting the markets, ε. As such we could estimate $\rho(\varepsilon|s)$, where s is a state variable indicating whether there is a crisis or not, and examine whether $\rho(\varepsilon|s_1) = \rho(\varepsilon|s_2)$ for 2^S where S is the support of ε. Given the somewhat discrete nature of our bond price series and the lack of observations that correspond to "big news" events, i.e. large shocks, we are not inclined to pursue such an avenue of investigation. A better solution, and one that further research in this area should implement, would measure the impact on volatility in one market of shocks in another market, thus tracing out a "news impact curve," where the news is represented by the size of shocks in the adjacent market. For an example of research along similar lines, see Engle and Ng (1995). A rise in correlations in bond prices in two markets is then depicted by the convexity of this function. A test of whether channels of transmission differ during periods of crisis could then proceed with a comparison of the crisis and non-crisis "news impact curves." Presumably the presence of contagion would be suggested by a crisis "news impact curve" that dominates the non-crisis "news impact curve."

4.2 VAR Analysis: the Interwar

Although scrutiny of the correlation coefficient can provide insights into the degree of interdependence between countries, such a methodology cannot account for the complex inter-relationships that exist between countries and does not provide a means by which to disentangle the effects of a shock in one country on another. That we observe strong correlations between two countries, or a significant rise in correlations during crises periods, may be by virtue of a complex chain of transmission and feedback effects of which we are largely ignorant. A rise in cross-correlations between two markets suggests but does not necessarily imply transmission and or contagion from one market to the other. In order to shed

light on the inter-relationships between countries we estimate a vector autoregression using weekly data on bond prices for 10 countries in the interwar period.[20] This methodology advanced by Sims (1972, 80), was motivated by the desire to limit the role of restrictions in econometric modeling and allow instead for the endogeneity of all the variables in the system. As such, in contrast to the Box-Jenkins approach, where the objective of making accurate short term forecasts dictates the need for parsimonious specifications, in the specification of a VAR, no attempt is made to "pare down" the number of parameters, where the goal is not accurate forecasting, but to reveal the underlying relationships among the variables.

In the present context, VARs provide a framework from which we can analyze the complex dynamics that exist between any two variables in the system by isolating the impact of a shock in one variable on another. By examining impulse response functions, we can obtain a sense of these dynamics, and shed light on the extent of transmission effects across pairs of countries. Moreover, by properly accounting for dates at which countries experienced crises, we can see to what extent these dynamics change during crises and thus make inferences about possible contagion effects.

We estimate VARs using the weekly data on bond prices for the interwar period. We choose a lag length of one week; changing the specification does not significantly improve the fit. We distinguish between periods of crises and periods of relative tranquility and estimate a VAR using a pooled sample of non-crisis observations as well as for a pooled sample of crisis observations. We restrict our attention to a sample of 10 countries for which we have data without gaps for a 7-year period. The period running from 1929-33 was viewed as particularly turbulent, and sub-periods within these years were chosen to constitute our crisis dates (for details of the choice of crisis dates, see section 4.1.2). Periods of relative tranquility within these years were removed from our sample of crises observations and adjoined to our pooled sample of non-crises observations.

Since the sample is divided into two parts, consisting of an amalgam of the major crises dates and a complementary set of non-crises dates, what emerges from our study are not the characteristics of contagion surrounding specific episodes of crises, rather the underlying patterns of transmission and contagion between the countries of interest for the entire period of concern. In theory it is possible to treat the occurrence of each crisis in each country separately by the incorporation of several multiplicative

[20] The ten countries in our sample are: Argentina, Belgium, Brazil, Canada, Chile, France, Germany, Japan,

dummies. Thus we would in essence be estimating a state-dependent VAR, where the number of states is given by n^2, where n is the number of countries in our sample and where each state represents one possible outcome of crisis or non-crisis combinations in the sample of n countries, i.e. if our sample consisted of three countries, Canada, the U.K. and the U.S., then one possible outcome is no crisis in Canada, no crisis in the U.K. and crisis in the U.S. We could also treat each state as unobserved, such an approach would not require us to identify the crisis dates a priori. However, such flexibility would quickly exhaust the degrees of freedom in our sample and render such an exercise infeasible. Moreover, the estimation of a Markov Switching VAR using such a specification is even less appropriate as our sample of observations would not cover a period of time sufficiently lengthy to allow the estimation of the transition probability matrix. Motivated by such concerns, as well as the desire to keep the analysis simple and allow a more direct comparison with our earlier methodology, we divide the sample into two parts constituting periods of stability and instability, rather than employing any finer divisions.

Figure 8 plots the impulse response graphs for selected countries corresponding to periods of relative tranquility.[21] The impulse response functions trace out the time profiles of the effects of a one-unit innovation in bond prices on domestic bond prices. The impulse responses reveal a number of interesting patterns. First, the effects of shocks in foreign markets seem to die out fairly quickly – typically after two or three weeks. Second, shocks originating from core countries seem to have a significant effect on the peripheral countries. In particular, we observe that the U.S. consistently has a large impact on all other nations. We also observe that innovations to the core European countries often spills over to other markets. In general there is greater cross-border transmission to the peripheral countries, irrespective of the source of the shock.

This agrees with our findings from the correlation study, where we saw evidence of correlations between the advanced and emerging countries and also saw that the emerging countries were moderately highly correlated. However, the impulse response graphs suggest that the core countries were more insulated from the effects of shocks abroad, reflecting the lower levels of volatility in bond prices in these countries. For instance, we observe that a shock to Brazil has a fairly strong effect on Argentina, which lasts for at least two periods. The impact of this shock on Germany by comparison is rather muted. Third,

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the U.K. and the U.S.

we observe evidence of regional patterns and trade linkages. For instance, a shock in the U.K. has a large impact on Canada as well as Argentina, reflecting the fact that the U.K. was the second largest export market for Canada, and a major export market for Argentina. Similarly shocks to several European nations have a large impact on Chile. This could reflect Chile's reliance on its export sector. Also shocks to Chile are seen to spillover to Brazil and vice versa, and shocks to the European countries are often communicated to each other, reflecting regional linkages.

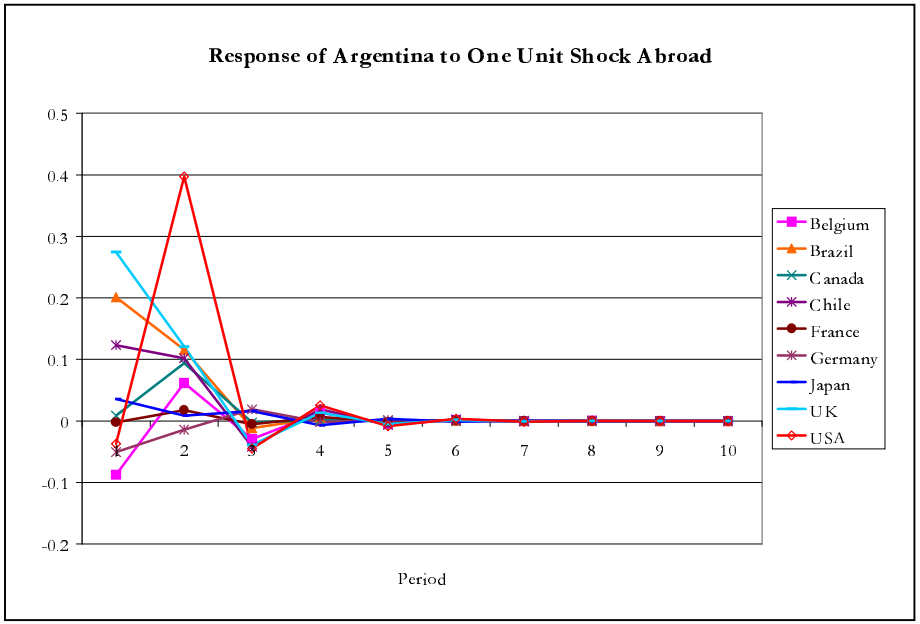
Figure 9 plots the impulse response graphs for crises years. The evidence that linkages strengthen during periods of crisis is striking. The effects of shocks are seen to be of greater amplitude and more persistent. This is particularly true of the three Latin countries, which are also the three emerging countries in our sample. Although regional similarities and trade linkages persist – for instance we still see a shock to Brazil and Argentina has a moderately large impact on Chile, while shocks to U.K. and Belgium spillover to Germany and shocks to Canada spillover to the U.S., the patterns are no longer so sharp. For instance Canada and Belgium are often seen to be important countries in disseminating shocks even when no obvious regional or trade patterns are visible.

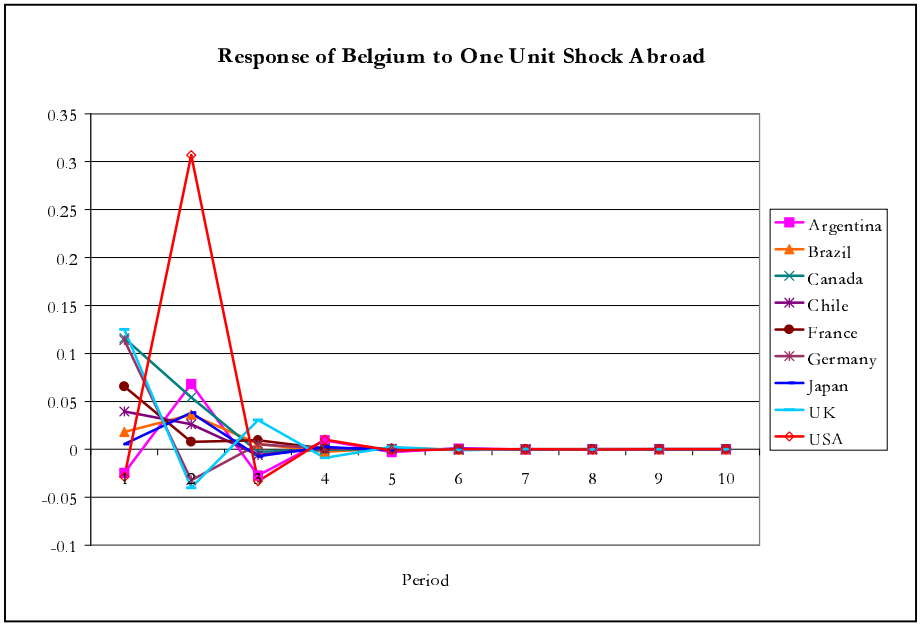
In general, this analysis backs up our earlier findings that countries that are historically weakly correlated are often found to be highly correlated during periods of crisis. Specifically, we observe instances when countries that have minor impacts on other countries during periods of tranquility have considerably larger impacts during periods of crisis.

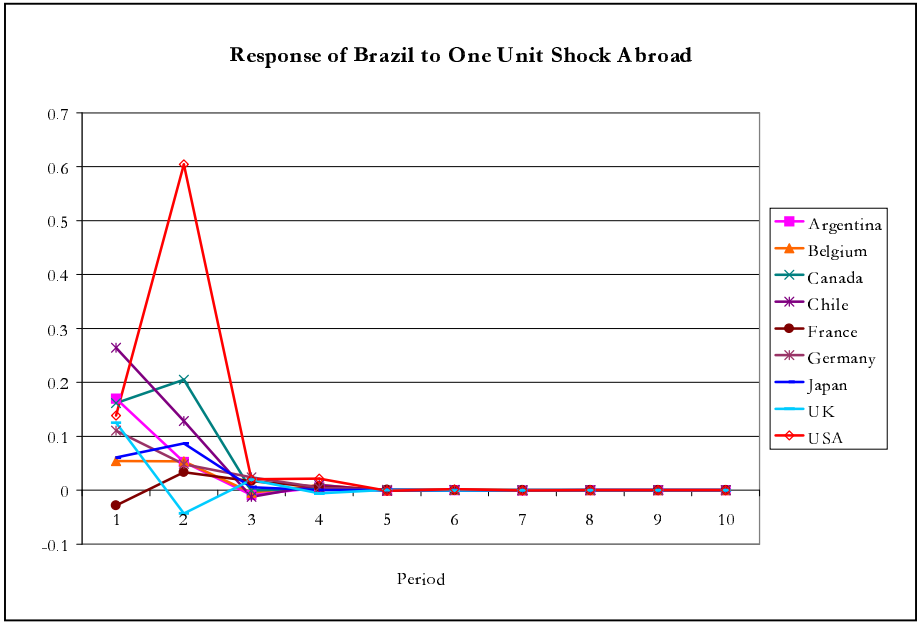
On the other hand, countries that had a strong impact during non-crisis dates do not display such strong evidence of a strengthening of the channels of transmission. In several cases the impulse response graphs are in fact less pronounced than during non-crisis dates. For instance, the initial impact of a shock from the U.S. has the largest impact on Argentina. This continues to be the case in crisis years, however, the initial impact of this shock seems to be no different during crisis years than during non-crisis years. For crisis years, we also find that Canada and Belgium have a large impact on Argentina, whereas earlier they had a minor impact. For Belgium the initial impact of the shock from the U.S. remains largely the same during crisis years, though during crisis years Chile has a large impact on Belgium as does Canada. We see

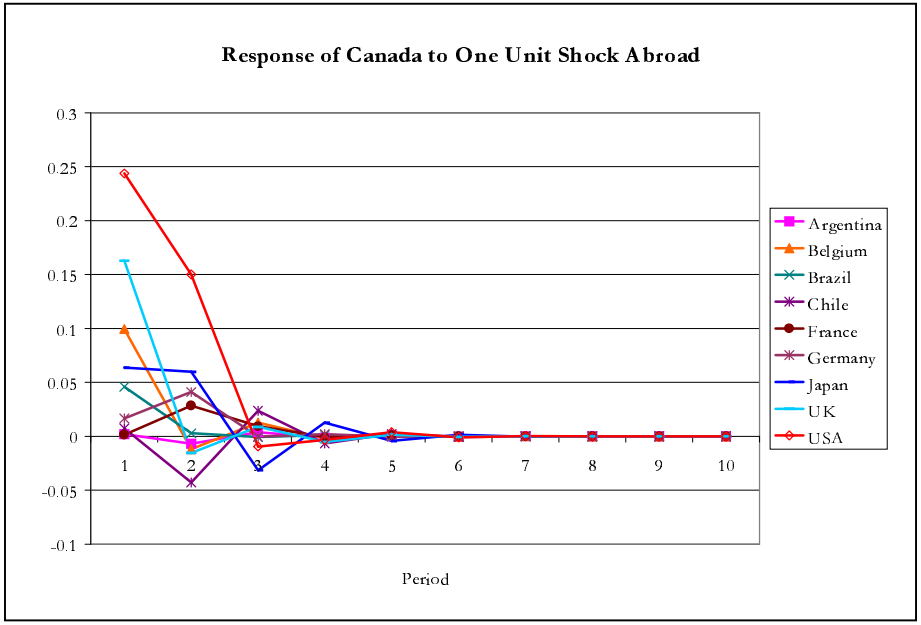
[21] Changing the ordering of the impulse response functions did not affect the results.

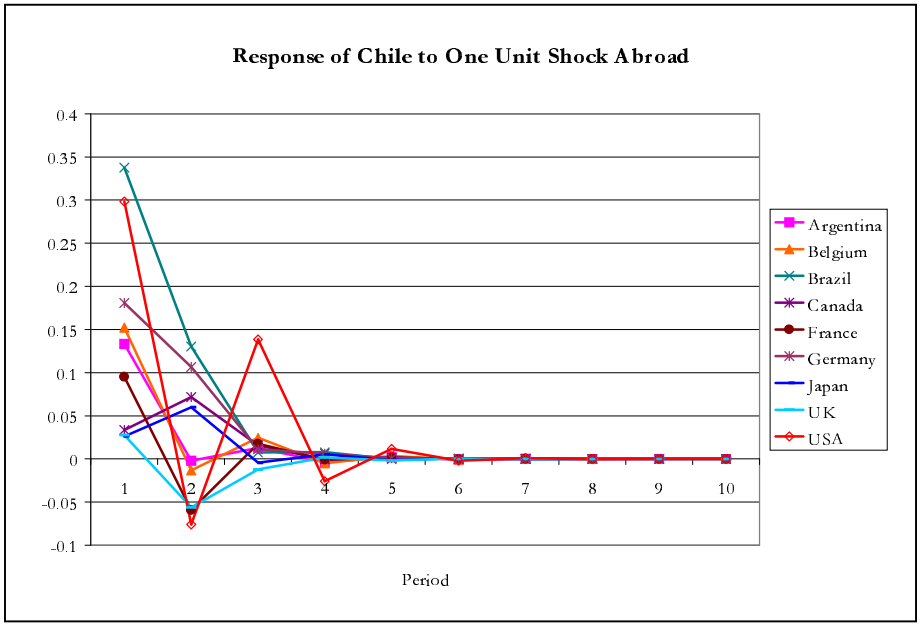
Figure 8. Impulse Responses for Non-Crisis Periods, 02/01/1925 – 18/10/1929, 07/03/1930 – 24/04/1931, 01/01/1932 – 30/09/1932, 24/03/1933 – 05/15/1936

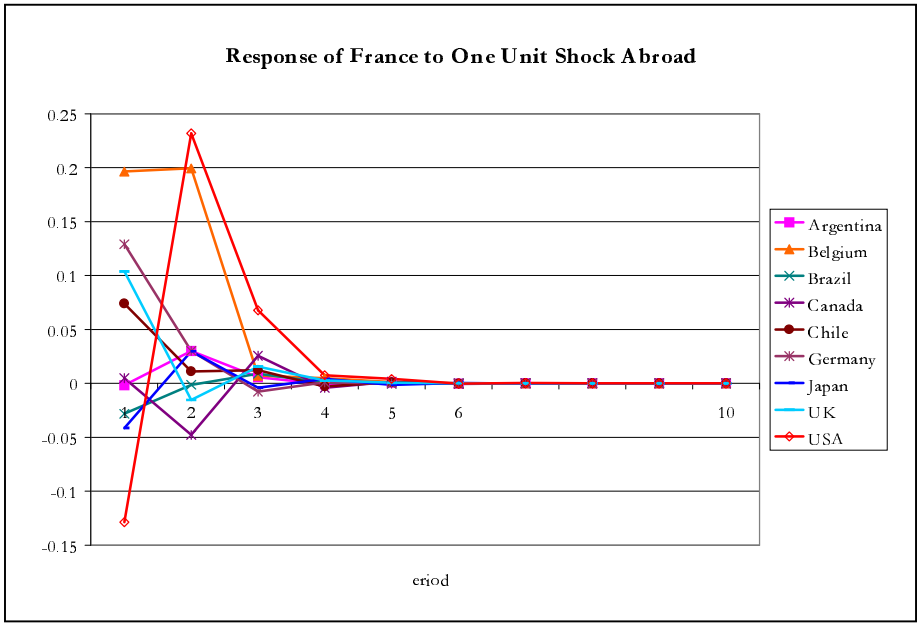


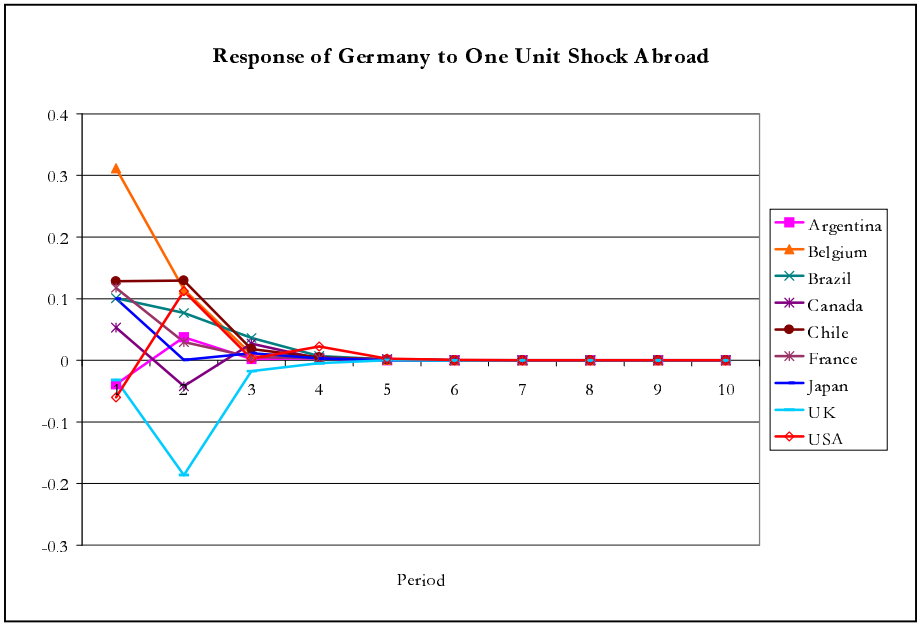


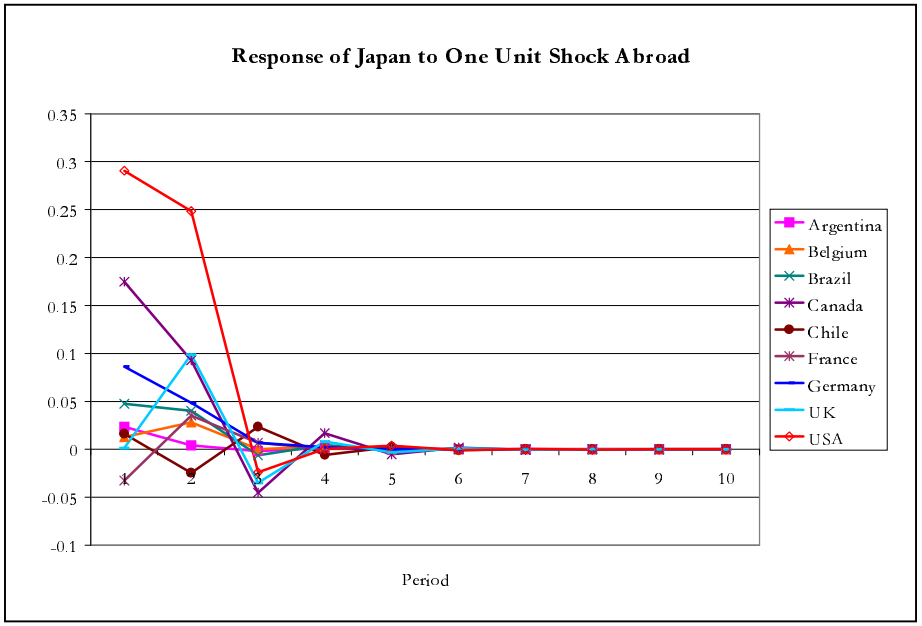


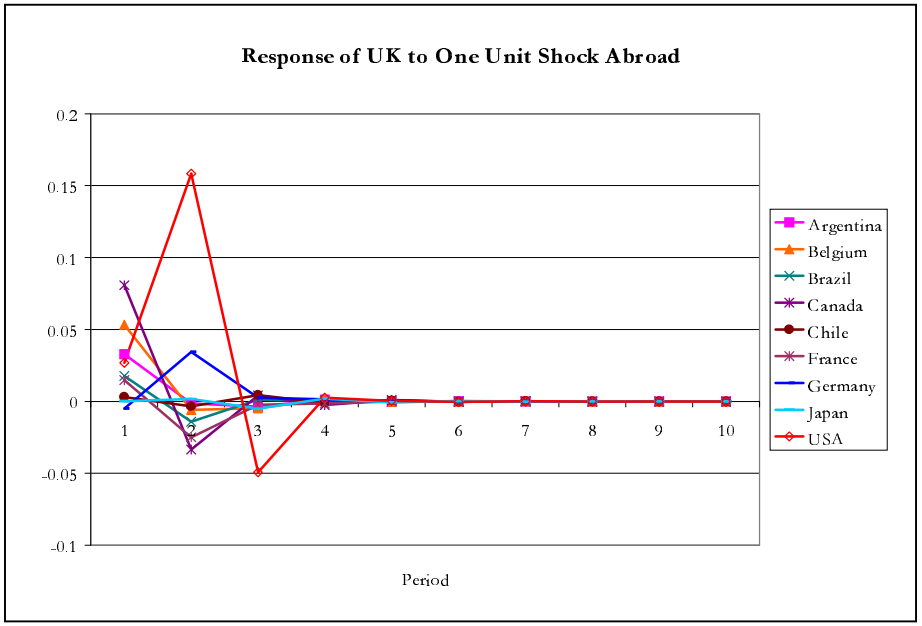



Response of Chile to One Unit Shock Abroad
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
-0.05
-0.1
1
2
3
4
5
6
7
8
9
10
Period
Argentina
Belgium
Brazil
Canada
France
Germany
Japan
UK
USA


Response of France to One Unit Shock Abroad
0.25
0.2
0.15
0.1
0.05
0
-0.05
-0.1
-0.15
2
3
4
5
6
10
eriod
Argentina
Belgium
Brazil
Canada
Chile
Germany
Japan
UK
USA


Response of Germany to One Unit Shock Abroad
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
1
2
3
4
5
6
7
8
9
10
Period
Argentina
Belgium
Brazil
Canada
Chile
France
Japan
UK
USA


Response of Japan to One Unit Shock Abroad
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
-0.05
-0.1
1
2
3
4
5
6
7
8
9
10
Period
Argentina
Belgium
Brazil
Canada
Chile
France
Germany
UK
USA



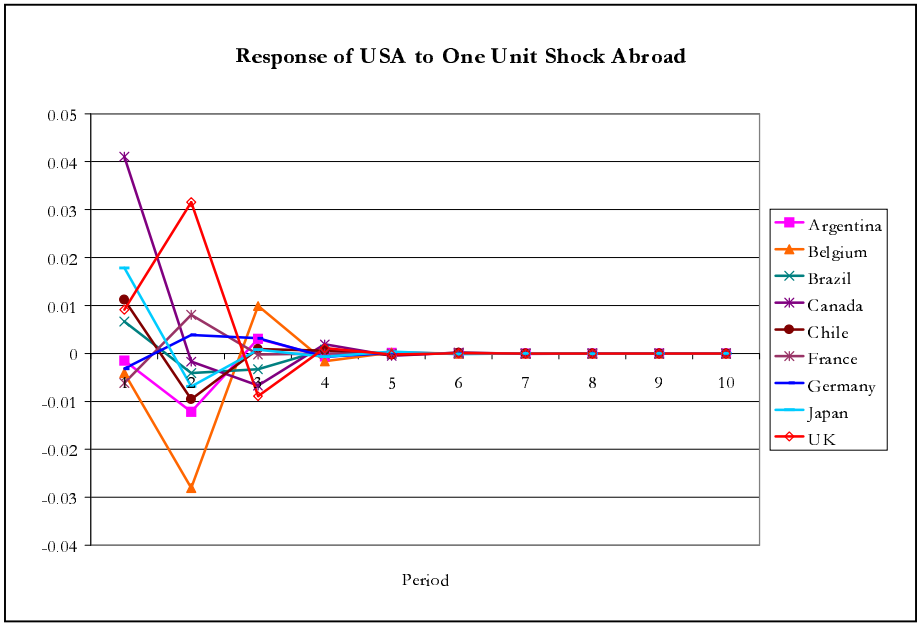
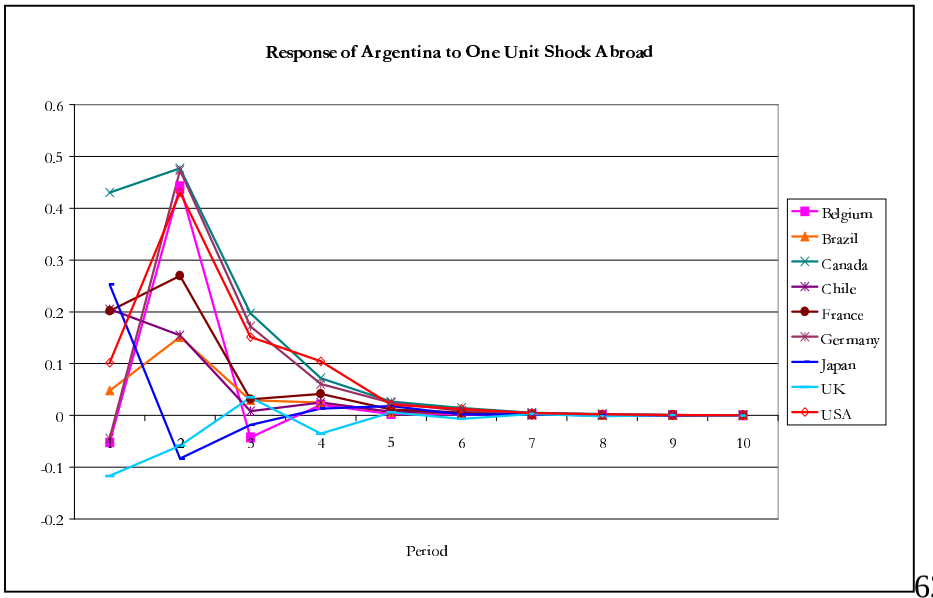
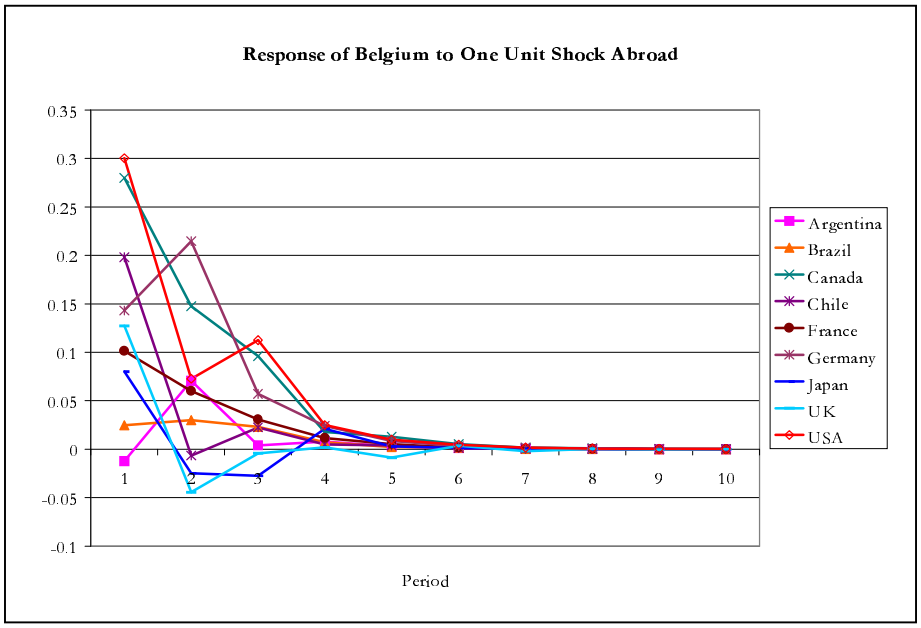
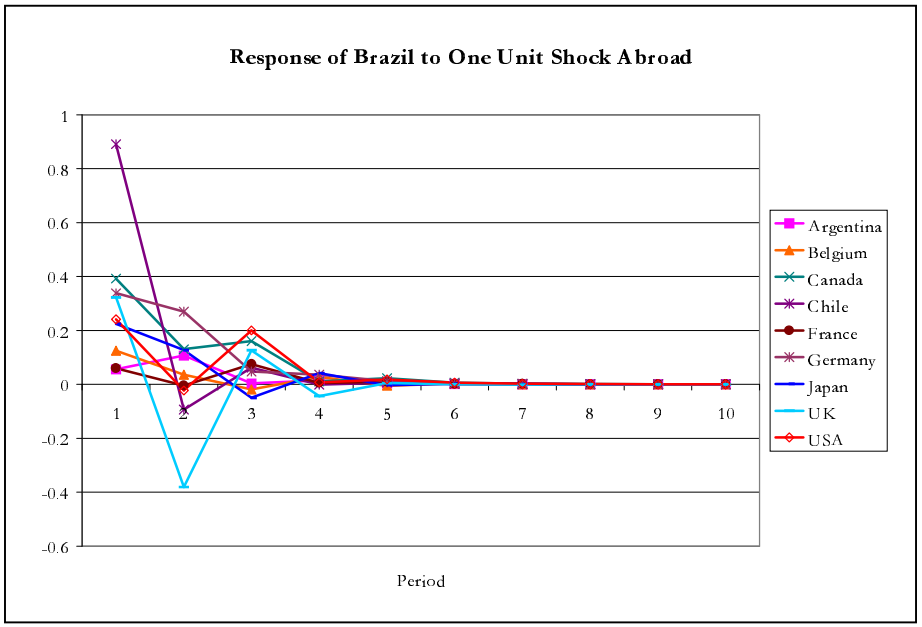
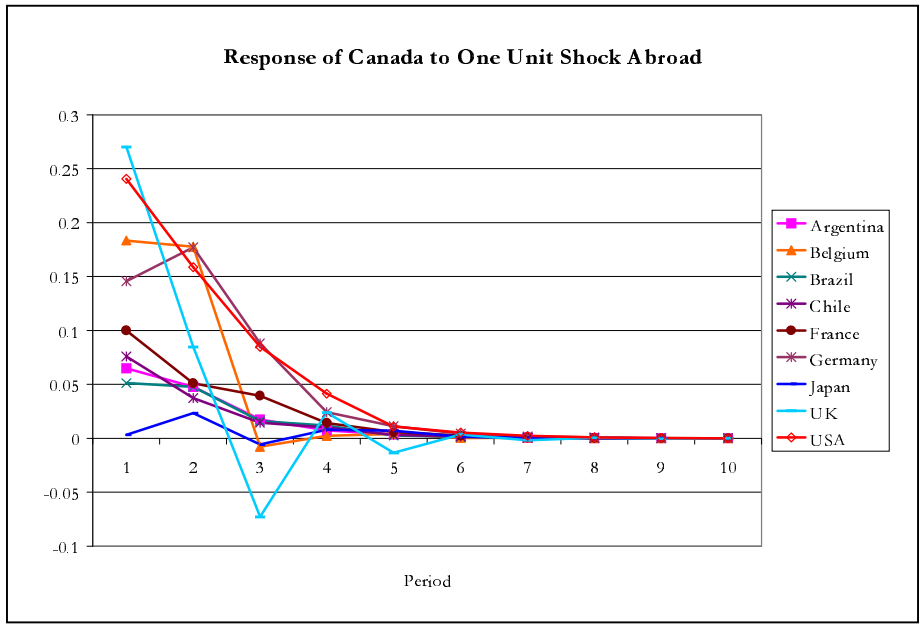


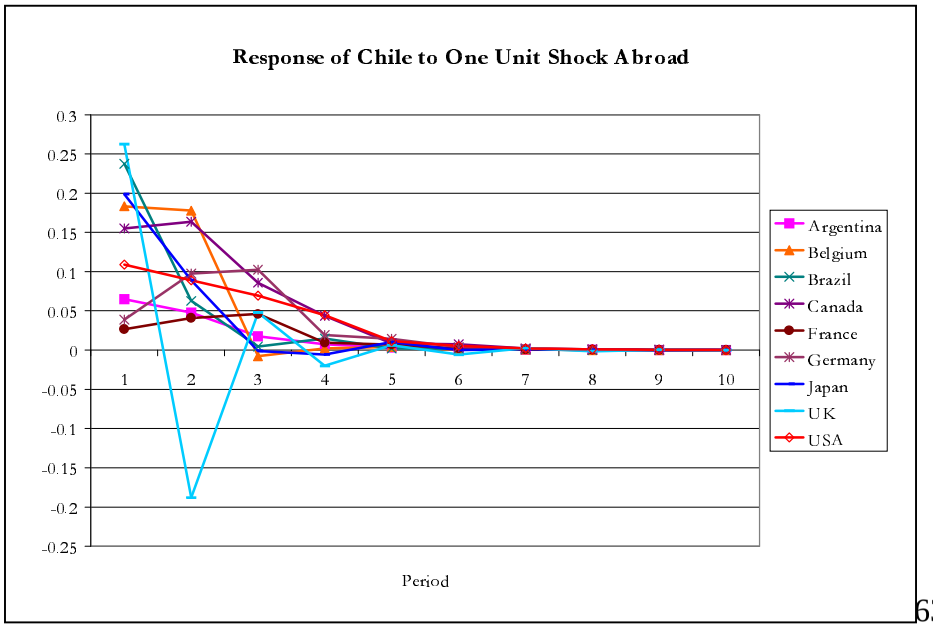
Figure 9. Impulse Responses for Crisis Periods, 25/10/1929 – 28/02/1930, 01/05/1931 – 25/12/1931, 07/10/1932 – 17/03/1933

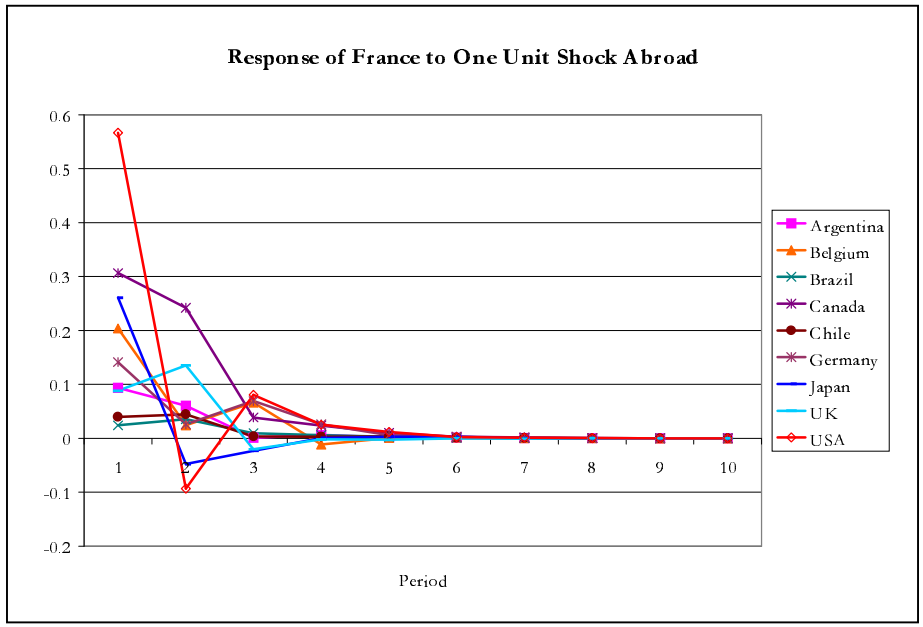


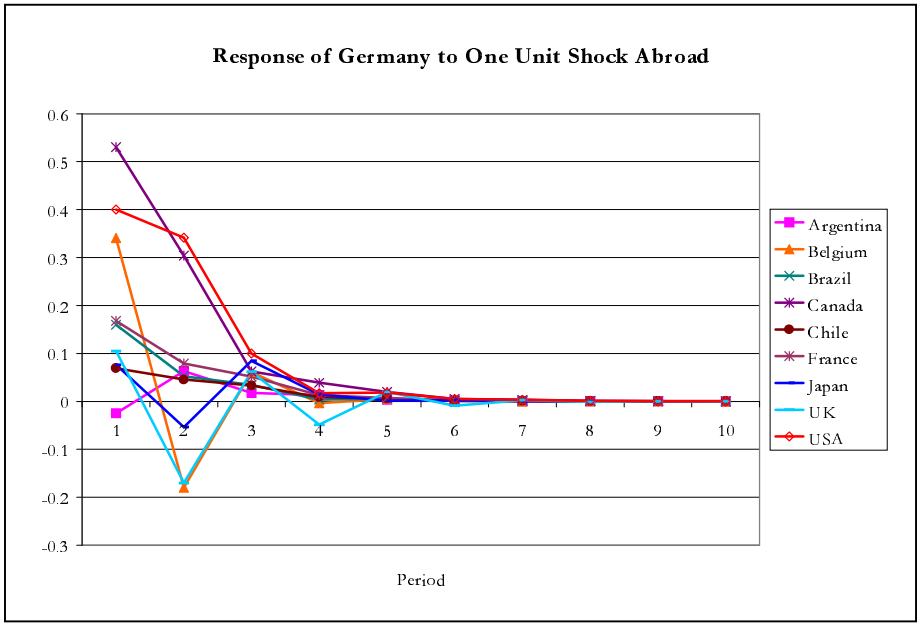



Response of Brazil to One Unit Shock Abroad
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
1 2 3 4 5 6 7 8 9 10
Period
Argentina
Belgium
Canada
Chile
France
Germany
Japan
UK
USA


Response of Canada to One Unit Shock Abroad
0.3
0.25
0.2
0.15
0.1
0.05
0
-0.05
-0.1
1 2 3 4 5 6 7 8 9 10
Period
Argentina
Belgium
Brazil
Chile
France
Germany
Japan
UK
USA


Response of Chile to One Unit Shock Abroad
0.3
0.25
0.2
0.15
0.1
0.05
0
-0.05
-0.1
-0.15
-0.2
-0.25
1 2 3 4 5 6 7 8 9 10
Period
Argentina
Belgium
Brazil
Canada
France
Germany
Japan
UK
USA


Response of France to One Unit Shock Abroad
0.6
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
1 2 3 4 5 6 7 8 9 10
Period
Argentina
Belgium
Brazil
Canada
Chile
Germany
Japan
UK
USA


Response of Germany to One Unit Shock Abroad
0.6
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
1
2
3
4
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6
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8
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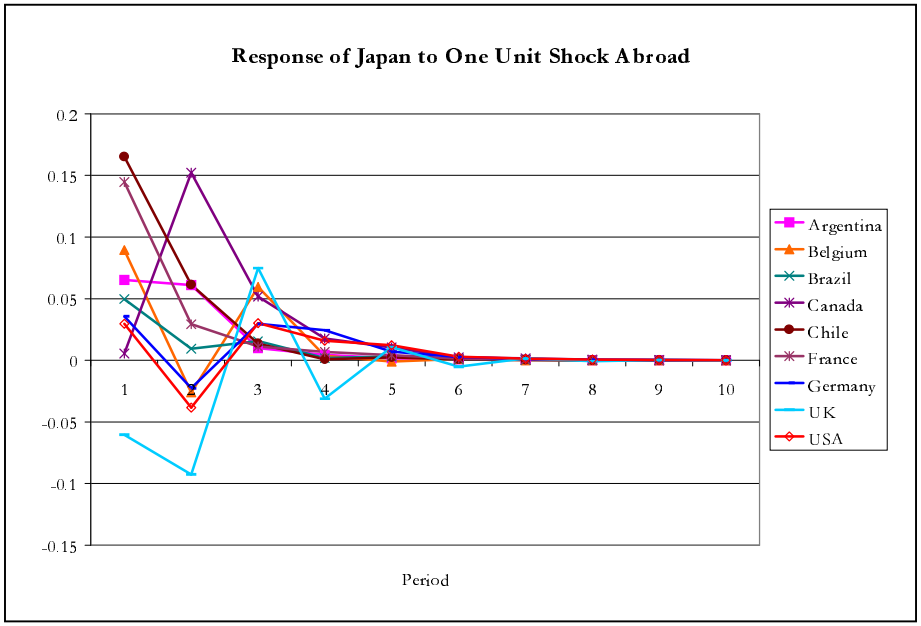
10
Period
Argentina
Belgium
Brazil
Canada
Chile
France
Japan
UK
USA


Response of Japan to One Unit Shock Abroad
0.2
0.15
0.1
0.05
0
-0.05
-0.1
-0.15
1
2
3
4
5
6
7
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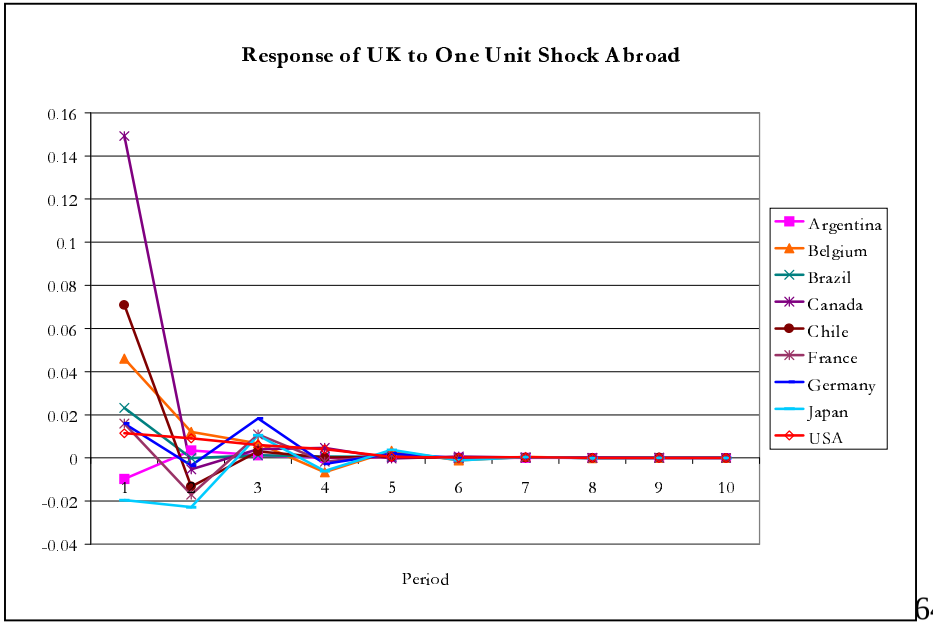
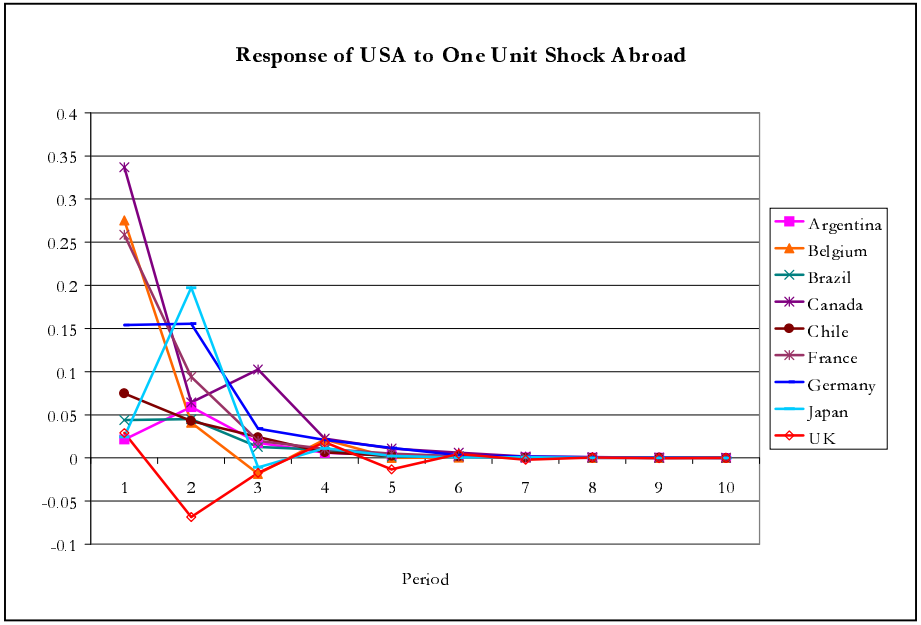
10
Period
Argentina
Belgium
Brazil
Canada
Chile
France
Germany
UK
USA


Response of UK to One Unit Shock Abroad
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
-0.02
-0.04
1
3
4
5
6
7
8
9
10
Period
Argentina
Belgium
Brazil
Canada
Chile
France
Germany
Japan
USA


Response of USA to One Unit Shock Abroad
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
-0.05
-0.1
1
2
3
4
5
6
7
8
9
10
Period
Argentina
Belgium
Brazil
Canada
Chile
France
Germany
Japan
UK

that Belgium has a large impact on Canada during non-crisis years. During crisis years, however, Canada and the U.S. have a huge impact, whereas the impact of shocks to Belgium are roughly unchanged.

In summary, the evidence supports our earlier findings and suggests that in general linkages strengthen during crisis. Patterns reflecting regional, historic and trade ties emerge. Moreover, we find that advanced countries were largely responsible for spreading shocks to the emerging countries and were themeselves more insulated from these shocks. And although linkages between groups of countries that are tightly integrated do increase – the evidence on this limited. It seems that shocks can and do spillover from countries that are not necessarily tightly linked during periods of tranquility as was suggested by the correlation study.

5. Bond Price Correlations; the Recent Experience

Below we contrast our findings for the prewar and interwar periods with the more recent period. Due to data limitations we have restricted our analysis to the period covering the recent Asian crisis. We proceed as above, by examining the extent to which cross-correlations in bond prices increased after the onset of the Asian crisis. We then estimate correlations across time to obtain a sense of the correlation dynamics. We define the crisis period from July 7, 1997 to May 25, 1998 and the tranquil period as January 6, 1995 to June 30, 1997.

Our data for the recent period is weekly and covers a sample of 23 countries.[22] In Table 9 we report the cross-country correlations over the non-crisis period. In general the correlations are higher than for the pre World War I or interwar periods. Some regional patterns are also apparent. In particular, the European countries are strongly positively correlated with each other. The U.K., France display significant correlations with four other European countries, while Germany is significantly correlated with five European nations. The U.K. is also correlated with Canada and the U.S., while the correlations between Germany and Singapore are significant. Spain is interesting, in that it displays strong correlations with

[22] The countries in our sample are Australia, Brazil, Canada, Denmark, Germany, Hong Kong, Indonesia, Italy, Japan, Malaysia, Mexico, Philippines, Portugal, Singapore, Spain, Switzerland, Thailand, the U.K. and the U.S. Source: Reuters database.

more countries than even Germany – eight all in all, of which six are European. The evidence of high correlations amongst the Asian countries is weaker. However, with the exception of the Philippines, the correlations between Malaysia and the rest of the Asian countries in our sample are significant, as is the correlation between Thailand and Hong Kong. Thailand also displays moderate correlations with Singapore, while Indonesia is moderately correlated with the Philippines, though these are not significant. Interestingly, none of the correlations between the Asian countries and Japan or the U.S. are significant. Although Singapore displays strong correlations with both of these countries, none of these correlations are significant. Indeed Singapore is the only country that displays a moderately high correlation with Japan. Thailand is strongly correlated with both Hong Kong and Malaysia. It is also highly correlated with Singapore, though not significantly.

Table 9. Cross-Country Correlations During Tranquil Periods; January 6, 1995 – June 30, 1997

	Aus.	Brazil	Canada	Den	Fra.	Ger.	Greece	HK	Indon.	Italy	Japan	Malay	Mex.	Philipp	Port	Sing	Spain	Swed	Switz	Thai	U.K.	USA
Aus.	1	-0.08	0.18	0.24	-0.06	0.32	-0.09	-0.05	0.06	0.26	-0.03	0.01	-0.26	0.01	0.45	0.12	0.39	0.05	0.35	-0.21	-0.03	0.09
Brazil		1	-0.12	-0.12	0.17	-0.21	-0.27	-0.06	0.20	-0.23	0.34	0.15	-0.08	0.02	-0.45	-0.06	-0.23	-0.07	-0.09	-0.18	-0.04	-0.12
Canada			1	0.58	0.08	0.16	0.08	0.01	0.06	0.09	0.05	-0.24	0.30	-0.01	0.29	0.00	0.36	0.34	0.19	-0.45	0.48	0.53
Den				1	0.41	0.63	0.17	0.07	-0.18	0.49	0.01	-0.12	0.20	-0.30	0.30	0.10	0.57	0.78	0.07	-0.31	0.48	0.46
France					1	0.52	0.06	-0.30	-0.23	0.38	0.05	-0.09	-0.18	-0.01	-0.01	-0.08	0.27	0.45	-0.26	-0.47	0.08	0.11
Ger.						1	0.14	-0.10	-0.35	0.44	0.20	-0.09	-0.04	-0.16	0.27	0.33	0.38	0.64	-0.07	-0.04	0.13	0.22
Greece							1	-0.41	-0.43	0.16	-0.08	-0.39	-0.01	0.06	0.37	-0.14	0.22	0.19	-0.13	-0.09	0.27	-0.14
HK								1	0.13	0.33	0.08	0.39	0.20	-0.32	0.19	0.17	0.17	0.11	0.28	0.49	0.08	0.21
Indon.									1	-0.43	-0.10	0.50	-0.05	0.28	-0.24	0.27	-0.28	-0.15	0.27	0.08	0.16	-0.11
Italy										1	0.18	-0.06	-0.07	-0.50	0.66	-0.15	0.78	0.56	-0.06	-0.01	0.23	0.19
Japan											1	-0.03	-0.01	-0.20	0.04	0.30	0.06	0.09	-0.38	-0.04	0.22	0.24
Malay.												1	0.09	0.06	-0.23	0.42	-0.14	-0.06	0.05	0.43	-0.01	-0.07
Mexico													1	-0.22	-0.16	0.02	-0.07	0.30	-0.03	0.06	-0.04	0.45
Phil.														1	-0.18	0.18	-0.20	-0.30	0.02	-0.22	-0.14	-0.30
Port.															1	-0.03	0.67	0.33	0.08	0.01	0.36	0.10
Sing.																1	0.03	0.07	0.15	0.26	0.23	0.25
Spain																	1	0.56	0.11	-0.15	0.52	0.25
Swe.																		1	-0.06	-0.08	0.47	0.28
Switz.																			1	-0.06	0.12	0.13
Thai.																				1	-0.09	-0.27
U.K.																					1	0.39
U.S.A.																						1

Table 10 reports the increase in correlations during the crisis period. Although, the correlation between Thailand and Brazil, Canada, Denmark, France and Germany increase considerably, none of the increases are significant. Again this has to do, at least in part, with the small size of our sample. We also see moderate increases in correlation between Thailand and Australia, Canada, Indonesia, Italy, Japan, Mexico, Philippines, and the U.S. A similar pattern is observed of Indonesia, in that correlations increase substantially with a number of European countries, where two of these increases are significant. There is also evidence that correlations with some of the Asian countries increase. However, this increase is mild. The Philippines displays a number of significant increases in correlation with various countries, primarily European. While Hong Kong displays an increase in correlations with a number of emerging countries, namely Brazil, Greece, Mexico, and the Philippines, however, only the increases with Brazil and Greece are significant. Singapore stands out, in that the correlations with the Asian countries decline.

Close scrutiny of Tables 9 and 10 reveals an interesting result, which bears resemblance to that which was observed for the interwar and prewar periods. For those periods we observed a reversal in country rankings based on their cross-correlations. For the more recent period this is not the case, however, for all countries whose correlations lie within the interval [-.5,.2] during periods of tranquility, there seems to be no relationship between ρ_1 – the non-crisis period correlation – and ρ_2 – the crisis period correlation. Moreover, on average the crisis-period correlation for such countries is zero. For countries with high correlations, we find that on average the crisis period correlation $\rho_2 > 0$, however $\rho_2 < \rho_1$. We interpret this result as suggesting that there could be contagion to countries that are normally weakly correlated, although there could just as well not be any. Since correlations are in general lower between countries that were originally strongly correlated, on average there seems to be no evidence of contagion to these countries. Quite the contrary, these countries seem fairly insulated from shocks emerging from their close partners.

For the prewar and interwar periods, we found the cross-country correlations to be very volatile. We examine whether this is so for the recent period also. As above, we roll a three-month window over the sample and estimate the correlation between two markets at each date. Figure 10 plots the correlation

Table 10. Change in Cross-Country Correlations During Crisis Periods; July 7, 1997 – May 25, 1998

	Aus.	Brazil	Canada	Den.	France	Ger.	Greece	HK	Indon.	Italy	Japan	Malay.	Mexico	Phil.	Port.	Sing.	Spain	Swe.	Switz.	Thai	U.K.	U.S.A.
Aus.		0.08	0.13	0.03	0.29	-0.04	0.03	-0.18	-0.11	0.07	0.35	0.15	0.03	0.11	-0.45	-0.10	-0.06	0.24	-0.36	0.06	0.41	0.42
Brazil			-0.04	-0.09	-0.47	0.03	0.87	0.47	-0.32	0.37	-0.38	-0.11	0.66	0.05	0.72	0.12	0.12	-0.10	0.13	0.33	0.32	-0.08
Canada				-0.59	-0.07	-0.18	-0.13	-0.39	-0.09	-0.16	0.24	0.35	-0.46	0.37	-0.39	0.22	-0.34	-0.36	-0.37	0.16	-0.49	-0.19
Den.					0.30	0.16	-0.37	-0.16	0.47	-0.39	-0.14	0.24	-0.51	0.51	-0.09	-0.23	-0.05	-0.03	0.32	0.28	-0.45	-0.23
France						0.40	-0.39	0.17	0.18	-0.33	-0.07	0.14	-0.19	0.18	0.22	-0.13	0.34	0.27	0.77	0.23	-0.01	0.18
Ger.							-0.35	-0.02	0.40	-0.31	-0.19	0.17	-0.31	0.43	-0.01	-0.55	0.31	0.14	0.69	-0.19	0.00	0.11
Greece								0.63	0.37	-0.09	0.18	0.35	0.18	0.21	-0.23	0.39	-0.20	-0.36	0.04	0.38	-0.37	-0.02
HK									-0.06	-0.13	-0.23	-0.49	0.22	0.35	0.07	0.01	-0.30	-0.16	-0.22	-0.05	-0.22	-0.66
Indon.										0.54	0.03	-0.39	0.01	-0.37	0.39	-0.35	0.38	0.31	-0.30	0.16	-0.22	0.05
Italy											0.05	0.22	0.27	0.53	-0.31	0.09	-0.26	-0.46	0.26	0.19	-0.02	-0.02
Japan												0.19	-0.09	0.51	0.09	-0.40	0.02	-0.12	0.36	0.07	-0.28	-0.12
Malay.													-0.07	0.12	0.17	-0.52	0.25	0.22	-0.03	-0.13	0.11	0.17
Mexico														0.09	0.50	-0.24	-0.10	-0.66	0.01	0.05	0.03	-0.75
Phil.															0.42	-0.08	0.43	0.57	0.21	0.18	0.10	0.51
Port.																-0.15	-0.21	-0.17	0.32	0.02	-0.52	-0.07
Sing.																	-0.16	-0.19	-0.40	-0.10	-0.20	-0.54
Spain																		-0.03	0.49	0.01	-0.45	0.10
Swe.																			0.48	-0.10	-0.42	-0.03
Switz.																					-0.17	-0.17
Thai.																					-0.09	0.04
U.K.																						-0.11
USA																						

between Thai interest rates and those of four Asian countries and four "core" countries. This exercise reveals detaials that are not otherwise visible in our investigation of correlations in fixed windows of time. The correlation between Thailand and Hong Kong is seen to rise in October. This coincides with the devaluation of the Hong Kong dollar. The correlation between Thailand and Indonesia increases soon after the devaluation of the Thai bath, however, despite this increase, the correlation between the markets is lower than that which prevailed in the two months prior to the collapse of the Thai currency. The correlation between Thailand and Malaysia seems to be high in the two months preceding the crisis, and largely remains high until just prior to the Honk Kong devaluation. The correlation then proceeds to fall sharply before rising again briefly at the time of the devaluation in Hong Kong. The correlation between Thailand and Singapore shows an increase prior to the Thai devaluation, and largely remains high except for a momentary fall before October.

The correlation between Thai interest rates and those in the core countries shown, rises soon after the Thai devaluation. However, this increase is small and short-lived. The correlations fall back to zero and then quickly turn negative. There is thus evidence of contagion. However, these effects are often seen to be short lived. Moreover, there is considerable volatility in the correlation coefficient even during periods of stability.

In summary the evidence suggests that correlations between markets are in general stronger for the recent period than they were for the pre WWII period. This likely reflects closer asset market integration in the recent period. Moreover, periods of crisis are accompanied by a more noticeable increases in correlations. However, evidence for patterns of contagion are not clear. There is little evidence to suggest that countries that are closely integrated will be effected by contagion stemming from each other. Similar to what was observed for the prewar and interwar periods, we observe high levels of volatility in the correlations across countries. This volatility again casts doubt on standard methods of testing for contagion.

6. Conclusion

The key theme that emerges from our empirical analysis is that the correlations between key macro aggregates at annual frequencies and bond prices at weekly frequencies across three regimes over the past century is generally consistent with theoretical priors. However, during periods of financial crisis, these patterns seem blurred, when high correlations are sometimes observed between countries that are difficult to explain on the basis of historic levels of co-movement.

The annual data on five fundamental macro aggregates revealed, for both the classical gold standard and the interwar periods, strong evidence of regional co-movements and of linkages expected by traditional trading patterns. The evidence also suggested that such correlations were often higher during crisis periods, thus suggesting evidence of a tighter business cycle. Moreover the evidence suggests some correlation between different sets of countries during crises.

This underlying theme was observed in the analysis of the weekly data. Both correlation and VAR analysis suggested evidence of regional and trade patterns for the prewar, interwar and the recent Asian crisis. Moreover, the evidence pointed to the core countries of the prewar and interwar gold standards as major players in disseminating shocks to the rest of the world. However, such patterns seem to be weaker during periods of crisis.

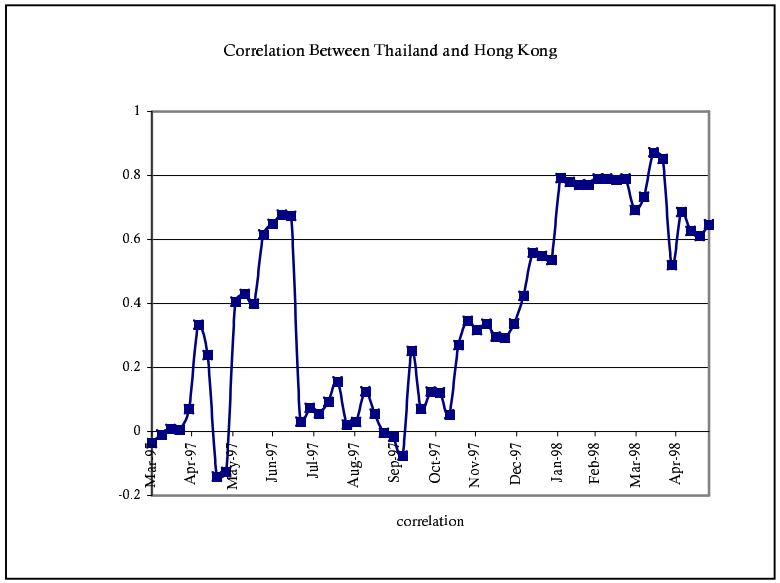
The two historic periods were regimes of general fixed exchange rates and we would expect the transmission of shocks during financial crises. For the recent period, when greater exchange rate flexibility prevails we observe both clear correlations across the world which suggests the importance of closer financial market integration and in crisis periods a similar pattern, as observed in the other periods of an increase in correlation with countries which did not exhibit clear correlations in non-crisis periods, thus there is considerable evidence at both the annual and weekly frequencies which suggests that countries that are not otherwise correlated show considerable co-movement at times of crisis. The question arises, is this evidence of contagion? If it is, it may reflect investor uncertainty as to the transmission of shocks between weakly connected markets.

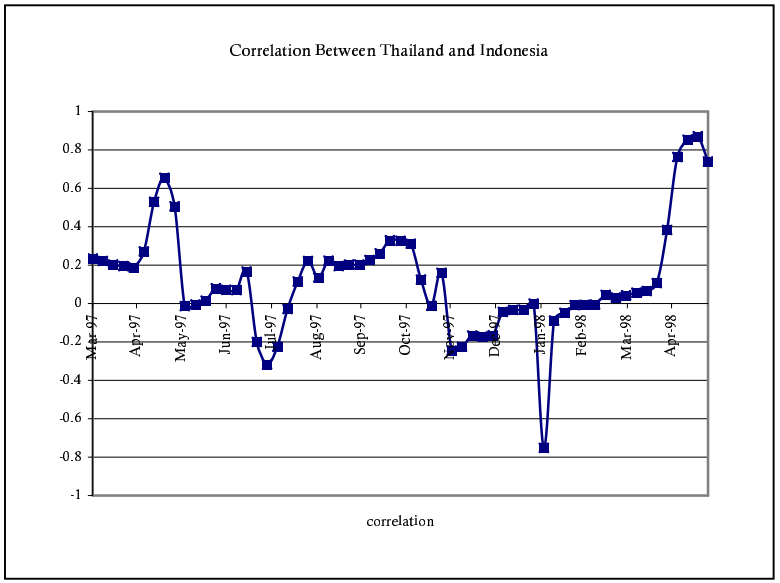
However, a finding which emerges from our weekly data, that the volatility in the correlation coefficient can be extremely high, casts doubt on the importance of contagion effects. This volatility,

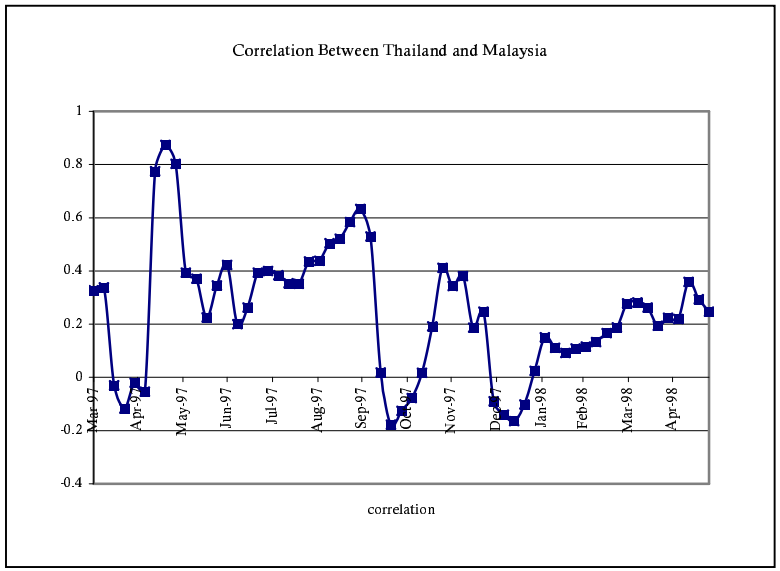
observed for both crisis and non-crisis periods, suggests that correlations between markets can periodically be high even during periods of stability in the absence of a major shift in cross-market links. As such it is not necessarily clear that new channels of transmission a.k.a. contagion are in operation during periods of crisis, simply because we observe higher correlations between countries.

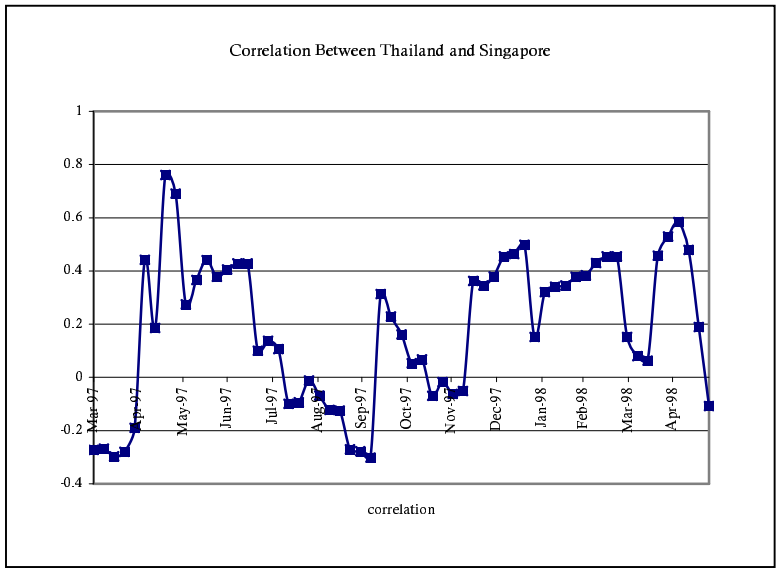
The mixed pattern observed by our empirical analysis clearly suggests the need for further research. Our evidence also suggests that the emphasis on contagion effects in the recent literature is clearly over blown and the case for an enhanced international crisis manager or an international lender of last resort to deal with contagion is not transparent.

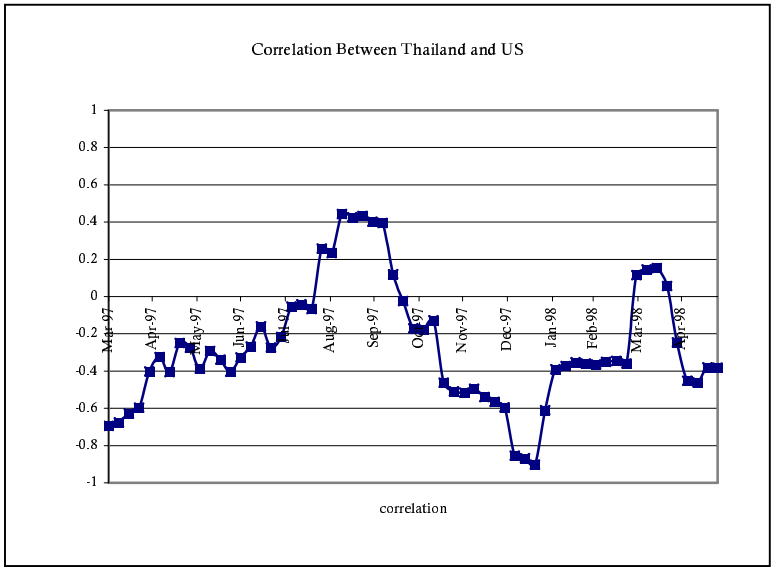
Figure 10. Behavior of the Correlation Coefficient Through Time Correlation Between Thai Markets and Other Markets; March 1997 – May 1998

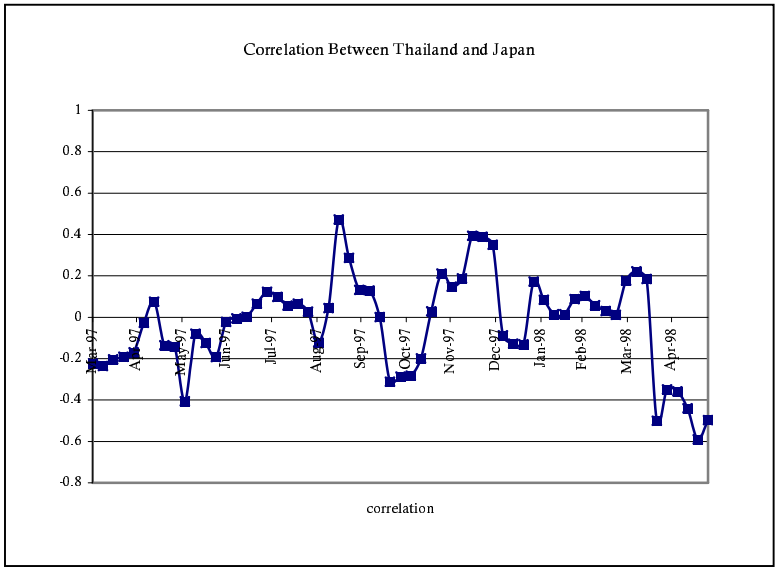









Correlation Between Thailand and US
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
Mar-97
Apr-97
May-97
Jun-97
Jul-97
Aug-97
Sep-97
Oct-97
Nov-97
Dec-97
Jan-98
Feb-98
Mar-98
Apr-98
correlation


Correlation Between Thailand and Japan
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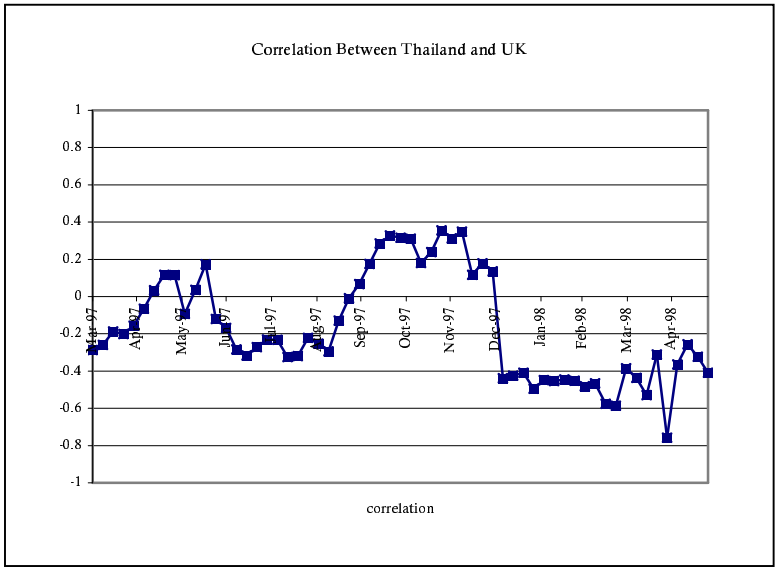
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
Mar-97
Apr-97
May-97
Jun-97
Jul-97
Aug-97
Sep-97
Oct-97
Nov-97
Dec-97
Jan-98
Feb-98
Mar-98
Apr-98
correlation


Correlation Between Thailand and UK
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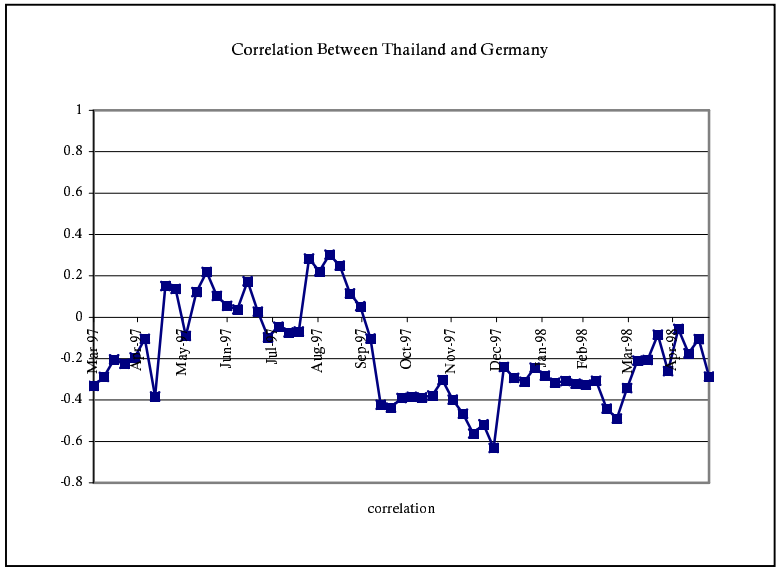
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
Mar-97
Apr-97
May-97
Jun-97
Jul-97
Aug-97
Sep-97
Oct-97
Nov-97
Dec-97
Jan-98
Feb-98
Mar-98
Apr-98
correlation


Correlation Between Thailand and Germany
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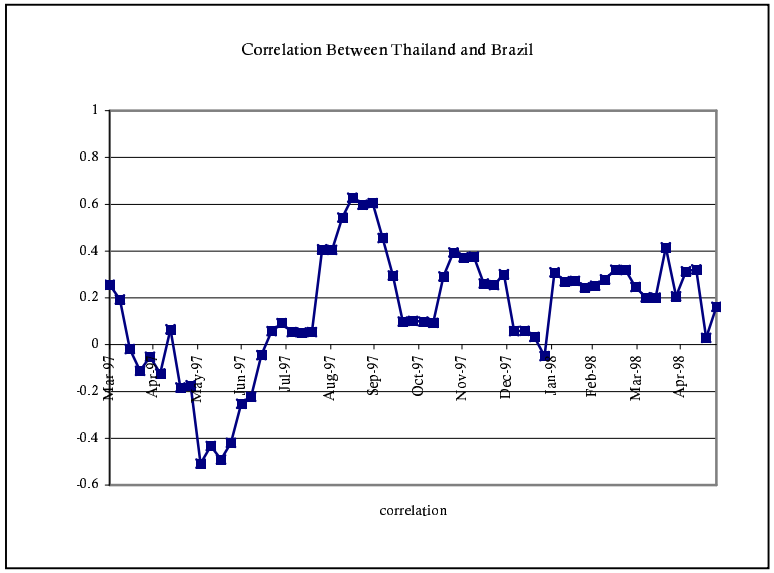
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
Mar-97
Apr-97
May-97
Jun-97
Jul-97
Aug-97
Sep-97
Oct-97
Nov-97
Dec-97
Jan-98
Feb-98
Mar-98
Apr-98
correlation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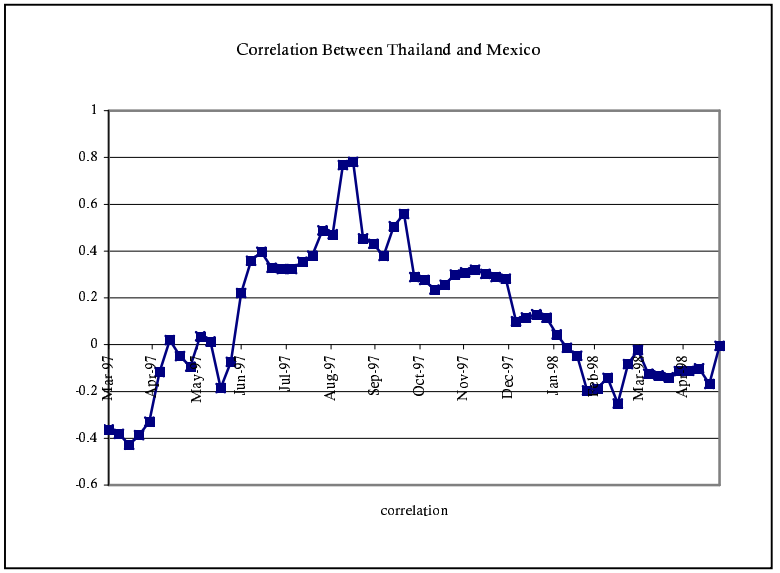
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
Mar-97
Apr-97
May-97
Jun-97
Jul-97
Aug-97
Sep-97
Oct-97
Nov-97
Dec-97
Jan-98
Feb-98
Mar-98
Apr-98
correlation


Correlation Between Thailand and Mexico
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0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
Mar-97
Apr-97
May-97
Jun-97
Jul-97
Aug-97
Sep-97
Oct-97
Nov-97
Dec-97
Jan-98
Feb-98
Mar-98
Apr-98
correlation

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Appendix I

Table 1.A. Panel A. Cross-Country Correlations at Non-Crisis Dates; Real GDP Growth Rates; 1880 - 1914

Non-crisis dates: 1881 – 89, 1892, 1894 – 96, 1899, 1902 – 06, 1909 – 11, 1913																			
	Argentina	Australia	Belgium	Brazil	Canada	Chile	Denmark	Finland	France	Germany	Italy	Japan	Neth.	Norway	Portugal	Spain	Sweden	UK	USA
Argentina	1	0.2496	0.5413	-0.1241	-0.0350	0.2263	-0.2980	0.0143	0.3849	0.1393	-0.2073	0.1120	-0.4779	-0.1123	-0.1801	-0.1135	0.2131	-0.0436	-0.1000
Australia		1	-0.1044	0.2481	0.2474	0.0341	0.3051	0.3926	-0.1474	0.1443	0.2881	0.0385	0.0802	-0.1807	0.1364	-0.1168	0.3657	0.1130	0.1804
Belgium			1	-0.0645	-0.0804	0.4188	-0.2215	-0.3440	0.3825	-0.2714	-0.3654	0.2060	-0.4542	-0.1360	-0.1160	0.1073	-0.0313	-0.2580	-0.0154
Brazil				1	0.5230	-0.0462	0.0526	-0.2013	-0.1810	-0.0109	0.1472	0.0779	-0.0302	0.1463	-0.2309	-0.0751	-0.0794	-0.1195	0.1711
Canada					1	0.0011	0.1199	-0.0518	0.0335	0.0422	0.4254	-0.4803	0.5730	-0.0667	-0.2479	0.0572	-0.0350	-0.0904	0.3801
Chile						1	0.1705	-0.0553	0.4273	-0.1588	-0.0284	0.0159	-0.3077	-0.3492	0.0009	0.0190	-0.2927	0.0061	0.1293
Denmark							1	0.3582	-0.0457	0.2546	0.4994	0.0755	0.0799	-0.1107	-0.2221	0.1238	0.1011	0.3934	0.3854
Finland								1	-0.0406	0.0525	0.4373	0.2122	-0.2853	-0.1664	-0.1656	-0.1283	0.3399	0.3677	-0.1936
France									1	-0.0567	-0.1093	0.0494	-0.5080	-0.0910	-0.3368	0.2065	0.1864	0.0758	-0.1989
Germany										1	0.1394	-0.1591	-0.2129	-0.2257	0.0524	0.1108	-0.0480	-0.2652	0.0349
Italy											1	-0.2191	0.3721	-0.1964	-0.2107	0.1877	0.0199	0.1341	0.3018
Japan												1	-0.0960	-0.2472	-0.2554	-0.1952	-0.1096	0.0980	-0.0844
Netherlands													1	0.1813	0.2099	0.2866	-0.0017	0.0617	0.5991
Norway														1	-0.1778	0.1110	0.3214	0.2516	0.0440
Portugal															1	-0.4265	-0.3309	-0.0958	0.0753
Spain																1	-0.0610	-0.1509	0.2769
Sweden																	1	0.4457	-0.2665
UK																		1	-0.1043
USA																			1

Table 1.A. Panel B. Cross-Country Correlations at Non-Crisis Dates; Real GDP Growth Rates; 1919 – 1939

Non-crisis dates: 1919 - 20, 1922, , 1924 - 28, 1934 - 38																			
	Argentina	Australia	Belgium	Brazil	Canada	Chile	Denmark	Finland	France	Germany	Italy	Japan	Neth.	Norway	Portugal	Spain	Sweden	UK	USA
Argentina	1	0.5416	0.3949	0.2632	0.0866	0.1682	0.3017	0.1237	0.5337	-0.1744	0.2812	0.3426	0.0952	-0.0970	-0.0306	-0.2808	-0.1933	-0.1189	-0.0533
Australia		1	0.1759	0.0424	-0.1316	0.5187	-0.1258	-0.0639	0.2985	0.0803	0.3403	0.1613	-0.2509	-0.3268	-0.4868	-0.4249	0.3848	-0.2268	0.1259
Belgium			1	0.5542	0.1205	-0.2745	0.7113	0.8459	0.3823	0.0768	0.0574	-0.1817	0.6435	0.5876	0.0622	-0.2867	-0.1003	-0.7436	-0.3381
Brazil				1	-0.0131	-0.1255	0.4173	0.4551	-0.0044	0.4473	0.0426	0.1962	0.4754	0.1271	-0.0183	-0.5068	-0.3476	-0.2371	-0.1365
Canada					1	-0.2286	0.1510	0.1601	0.0233	-0.1801	0.4267	-0.0572	0.2262	0.1945	0.4344	0.3851	-0.1780	0.1643	0.4628
Chile						1	-0.3740	-0.4812	0.5016	-0.5650	0.4532	-0.0626	-0.5850	-0.4303	0.0543	-0.2154	0.0902	0.0910	0.2280
Denmark							1	0.7739	0.4487	-0.3159	-0.2993	-0.1039	0.6586	0.7661	0.3284	-0.2451	-0.4647	-0.5521	-0.1582
Finland								1	-0.0116	0.5992	-0.1398	-0.0536	0.6602	0.6870	0.0477	-0.0660	-0.0991	-0.6899	-0.4174
France									1	-0.8894	0.0760	0.0011	0.2990	0.2887	0.5649	0.0346	-0.3868	-0.1527	0.3390
Germany										1	-0.1128	0.2421	-0.1613	-0.3102	-0.7368	-0.2606	-0.1121	0.6209	-0.1329
Italy											1	0.1047	-0.2975	-0.1630	0.2017	-0.1408	-0.0052	0.2007	0.2712
Japan												1	0.1474	-0.2984	-0.3281	-0.2406	0.0721	0.1375	-0.1330
Neth.													1	0.5974	0.1417	0.0011	-0.1443	-0.5068	-0.1207
Norway														1	0.3805	0.0084	-0.1863	-0.4206	-0.0116
Portugal															1	0.1913	-0.7561	0.2166	0.3802
Spain																1	0.2252	0.3094	0.1472
Sweden																	1	-0.2490	-0.2000
UK																		1	0.5849
USA																			1

Table 1.A. Panel C. Cross-Country Correlations at Non-Crisis Dates; Real GDP Growth Rates; 1973 - 97

Non-crisis dates: 1973 - 74, 1977 - 80, 1984, 1987 - 91, 1993 - 96																											
	Arg.	Australia	Belgium	Brazil	Canada	Chile	Den.	Finland	France	Ger.	Greece	Indon.	Italy	Japan	Korea	Malay.	Mexico	Neth.	Norway	Phil.	Port.	Sing.	Spain	Sweden	Switz.	Thai.	U.K.	U.S.A
Arg.	1	-0.2166	-0.3706	0.16897	-0.1095	-0.2318	0.2231	-0.4093	-0.362	0.12204	-0.2616	-0.0483	-0.1624	-0.2829	0.00385	0.0119	0.29716	-0.1804	0.42926	-0.1911	-0.1744	-0.2429	-0.2626	-0.3444	-0.433	-0.4962	-0.208	-0.1753
Australia		1	0.14151	0.33808	0.68502	-0.1283	0.54113	0.69634	0.14099	-0.4746	0.1463	-0.0818	0.19051	0.03928	0.17254	0.07068	-0.0803	0.10444	0.22328	-0.15	-0.1078	0.45637	-0.0092	0.67046	0.17349	-0.0982	0.6252	0.63373
Belgium			1	0.3255	0.36089	-0.5214	-0.0621	0.53636	0.77635	0.15716	0.28576	0.37134	0.78194	0.3624	0.14604	0.32037	0.28993	0.57167	-0.074	0.33418	0.53978	0.27432	0.71754	0.68514	0.62938	0.10273	0.16604	0.03101
Brazil				1	0.52236	-0.5995	0.1199	0.44066	0.21099	-0.3539	0.14996	0.68079	0.51398	0.02828	-0.1104	0.26883	0.454	0.2228	0.51754	0.20614	0.31315	0.1679	0.13446	0.30442	0.32861	-0.451	0.14944	0.18053
Canada					1	-0.4275	0.27751	0.6388	0.53221	-0.4304	0.27847	0.10634	0.55932	0.25473	0.50415	0.00306	0.06074	0.20557	0.05509	0.25123	0.32472	0.47191	0.44577	0.54839	0.33588	0.13216	0.79348	0.73607
Chile						1	-0.1135	-0.1577	-0.3365	0.02346	0.01766	-0.4278	-0.4363	-0.1168	-0.3849	-0.4743	-0.4032	-0.5068	-0.1903	-0.1711	-0.3456	-0.2173	-0.5655	-0.2992	-0.1226	0.09261	-0.2469	-0.0814
Den.							1	0.22261	0.09263	0.10735	0.42596	0.1445	0.05353	0.14431	0.37927	0.43083	-0.0645	0.18646	0.43813	-0.1794	0.02269	0.22419	-0.1659	0.35943	-0.2426	-0.0511	0.52539	0.53791
Finland								1	0.57452	-0.5216	0.18606	0.20353	0.61667	0.18218	-0.0441	0.18137	0.09063	0.28482	0.09587	0.45891	0.41602	0.45958	0.28856	0.8034	0.60911	-0.0841	0.50192	0.35453
France									1	0.11142	0.49853	0.2972	0.81822	0.54266	0.42726	0.35558	0.26126	0.66057	-0.2087	0.5915	0.7368	0.28429	0.71008	0.55771	0.6012	0.38415	0.47909	0.35495
Ger.										1	0.41466	-0.0443	0.04401	0.39874	0.25049	0.20645	0.1513	0.18341	-0.1935	-0.2267	0.18737	-0.1436	0.08759	-0.1643	-0.1265	0.25652	-0.1942	-0.1987
Greece											1	0.37707	0.39364	0.79803	0.30249	0.2711	0.33066	0.18802	-0.0406	0.22017	0.50214	0.36265	0.07373	0.12646	0.23449	0.38222	0.5029	0.56854
Indon.												1	0.33196	0.20036	-0.1529	0.4706	0.30012	0.37953	0.42387	0.32838	0.45892	0.03495	0.21263	0.06197	0.2837	-0.1533	-0.0077	0.05789
Italy													1	0.42379	0.26192	0.24771	0.37523	0.45701	0.0768	0.43431	0.65902	0.16725	0.52696	0.67643	0.61311	-0.07	0.2927	0.2224
Japan														1	0.35612	0.17177	0.31466	0.25718	-0.317	0.21359	0.67446	0.36966	0.30226	0.09968	0.51606	0.43899	0.45081	0.50823
Korea															1	0.21795	-0.1881	0.40204	-0.209	0.00712	0.23072	0.11387	0.51679	0.21217	-0.1884	0.47651	0.65632	0.56044
Malay.																1	0.06795	0.61195	-0.0294	0.26832	0.3784	0.30206	0.24419	0.2152	0.10384	0.13922	0.20699	-0.0099
Mexico																	1	0.23566	0.31528	0.18627	0.33549	-0.0113	-0.0151	0.01354	0.2939	-0.2829	-0.1224	-0.0159
Neth.																		1	0.0411	0.21949	0.41901	-0.1153	0.66643	0.43379	0.2582	0.10654	0.16676	0.11389
Norway																			1	-0.2437	-0.229	-0.421	-0.323	0.20203	-0.2836	-0.7818	-0.1839	0.05256
Phil.																				1	0.73698	0.33724	0.39425	0.10671	0.33479	0.28462	0.32598	-0.0477
Port.																					1	0.37407	0.56682	0.24318	0.58376	0.31059	0.40192	0.14145
Sing.																						1	0.15514	0.23864	0.40267	0.49082	0.66799	0.37488
Spain																							1	0.40062	0.39883	0.36395	0.32868	0.09716
Sweden																								1	0.38696	-0.1531	0.39229	0.25963
Switz.																									1	0.13209	0.12372	0.1614
Thai.																										1	0.49628	0.3169
U.K.																											1	0.80013
U.S.A																												1

Table 1.B. Panel A. Change in Correlations at Crisis Dates; Real GDP Growth Rates; 1880 - 1914

Crisis dates: 1890 - 91, 1893, 1897 – 98, 1900 - 01, 1907 - 08, 1912, 1914																			
	Argentina	Australia	Belgium	Brazil	Canada	Chile	Denmark	Finland	France	Germany	Italy	Japan	Neth.	Norway	Portugal	Spain	Sweden	UK	USA
Argentina		0.1231	-0.1176	0.2162	-0.0600	0.3124	0.0166	0.1158	-0.0258	0.0523	0.4514	0.0135	0.3404	0.1166	0.0994	0.2050	-0.2173	-0.1219	-0.1698
Australia			0.4779	-0.0473	0.1867	-0.0032	-0.3717	0.0020	0.0629	-0.1229	-0.0210	-0.0482	-0.3226	0.0844	-0.1841	0.3603	0.0565	0.1049	0.1249
Belgium,				0.3977	0.4385	-0.1381	-0.2036	0.8924	-0.1940	0.5126	0.6626	-0.1158	0.1422	0.1713	0.2866	-0.2226	0.5766	0.0455	0.2031
Brazil					-0.0962	0.5489	-0.0303	0.2225	-0.0224	-0.3150	0.1699	0.0097	0.1100	-0.3453	0.5644	-0.1943	0.5842	-0.1700	-0.1936
Canada						-0.0890	-0.1838	0.3319	-0.0443	-0.1009	0.2535	0.2763	-0.5530	-0.0018	0.0827	0.0480	0.4926	0.2136	0.1773
Chile							-0.0144	0.0629	-0.1223	0.0070	0.4262	0.1011	0.8767	0.2537	0.3409	-0.2339	0.1722	-0.2519	-0.4149
Denmark								-0.4320	0.2094	-0.1648	-0.3061	-0.4680	-0.3590	0.2234	-0.1622	-0.1993	-0.5359	-0.3579	-0.1340
Finland									0.2379	0.4954	0.0365	-0.4051	0.4735	0.2324	0.1072	-0.0904	0.1076	-0.3254	0.2790
France										0.2896	0.5903	0.0333	0.7182	-0.4262	0.0579	-0.2364	-0.4672	0.3218	0.0015
Germany											0.0819	-0.0513	0.5665	0.4004	-0.4082	-0.2081	-0.4102	0.1389	-0.1449
Italy												0.1825	0.1896	-0.1162	0.3843	-0.3739	0.1825	0.2523	0.0418
Japan													1.1203	-0.1199	0.2921	0.0998	0.1612	0.0881	-0.0474
Neth.														0.7722	0.4807	-0.7258	0.0679	-0.6819	-0.7365
Norway															-0.0494	-0.0544	-0.4631	-0.3086	0.0330
Portugal																0.2318	0.6533	-0.1521	-0.2299
Spain																	-0.1606	0.4714	0.1129
Sweden																		-0.4641	0.4361
UK																			0.3511

Table 1.B. Panel B. Cross-Country Correlations at Non-Crisis Dates; Real GDP Growth Rates; 1919 – 1939

Crisis dates: 1921, 1923 , 19229 – 33, 1939																			
	Argentina	Australia	Belgium	Brazil	Canada	Chile	Denmark	Finland	France	Germany	Italy	Japan	Neth	Norway	Portugal	Spain	Sweden	UK	USA
Argentina		-0.0217	0.1118	0.1360	0.2028	0.2767	0.1557	0.1406	0.0494	0.3332	0.0527	-0.2637	0.1670	-0.0223	-0.1768	0.2604	0.1735	0.4922	0.2949
Australia			0.0434	0.1598	0.1247	-0.1748	-0.0681	0.1606	-0.3046	-0.0843	0.2686	-0.2563	0.3659	-0.0355	0.2561	0.5565	-0.2757	0.1947	0.0838
Belgium				-0.1848	0.1270	0.3961	0.0142	-0.7343	0.0793	-0.1193	0.1346	-0.1562	0.0529	-0.4446	-0.1867	-0.1448	0.1257	0.7520	0.5983
Brazil					0.2063	0.3579	0.0061	0.1358	0.1525	0.2026	0.0989	-0.0706	-0.0895	-0.0427	-0.2162	0.4702	0.1987	0.5617	0.2143
Canada						0.5562	0.2940	0.0306	0.3198	0.5353	0.0345	-0.0877	-0.0836	0.1523	-0.0080	0.2060	0.4065	0.5616	0.1436
Chile							0.5214	0.4753	0.1499	0.6869	0.0915	-0.1706	0.4884	0.4685	0.1443	0.5154	0.3469	0.5736	0.2621
Denmark								-0.2204	0.4704	0.2286	0.3155	-0.2183	-0.2794	-0.1119	0.1084	0.2165	0.5366	0.7187	0.4870
Finland									0.0758	0.1356	-0.0428	0.2046	-0.5993	-0.4602	-0.3461	0.4356	0.0444	0.7392	0.2499
France										0.4961	0.0490	-0.5006	-0.2958	-0.0208	-0.2259	0.0599	0.4758	0.2903	0.1535
Germany											-0.0783	0.5334	0.0807	0.2296	-0.1678	0.6732	0.3163	0.2065	0.2712
Italy												-0.5364	0.2854	0.1556	0.1322	0.5703	0.1313	0.2066	0.0630
Japan													-0.2965	-0.0230	-0.0296	0.1861	-0.1748	-0.1211	-0.0220
Neth.														-0.4100	-0.5913	-0.3810	0.0067	0.4876	0.1958
Norway															0.0994	0.2647	0.3214	0.7386	-0.0141
Portugal																0.3179	0.6628	0.1367	-0.1411
Spain																	0.2135	0.2983	0.1638
Sweden																		0.7383	0.2978
UK																			0.1399

Table 1.B. Panel C. Change in Cross-Country Correlations at Crisis Dates; Real GDP Growth Rates; 1973 - 97

Crisis dates: 1975 - 76, 1981 - 83, 1985 - 86, 1992, 1997																												
	Arg.	Australia	Belgium	Brazil	Canada	Chile	Den.	Finland	France	Ger.	Greece	Indon.	Italy	Japan	Korea	Malay.	Mexico	Neth.	Norway	Phil.	Port.	Sing.	Spain	Sweden	Switz.	Thai.	U.K.	U.S.A
Arg.		0.0475	0.6253	-0.1020	0.2894	0.7325	-0.2095	0.1758	0.2708	0.1736	0.0801	0.2963	0.0629	-0.5608	0.0191	0.2280	-0.4635	0.4870	-0.3021	0.5323	0.2238	0.3936	0.5279	0.1448	0.2732	0.3130	0.3254	0.4228
Australia			0.0310	0.0499	0.0232	0.8468	-0.4492	-0.8461	-0.0146	1.0247	0.3667	0.5239	0.2591	0.2704	-0.3196	-0.1481	0.6952	0.4760	0.3776	-0.1302	0.5220	-0.7727	0.0884	-0.7280	0.2790	0.1307	-0.7078	-0.1630
Belgium				0.4715	-0.1868	0.5995	0.8909	-0.6711	0.0911	0.5918	0.5756	-0.3114	-0.0023	-0.2709	0.1780	0.1217	-0.1769	0.1776	0.7305	0.1382	0.3353	-0.3104	-0.0358	-0.5639	-1.0393	-0.0092	0.1957	0.1479
Brazil					-0.3104	0.7168	0.7465	-0.2312	0.5924	1.1077	0.7163	-0.8280	0.2707	0.2402	0.3531	-0.4039	-0.4313	0.4916	0.1890	-0.1223	0.5752	-0.7066	0.7163	0.2170	-0.1396	0.2885	0.4983	-0.0345
Canada						1.1284	-0.1941	-0.6275	-0.5435	0.9915	0.1269	0.4461	-0.1386	-0.2267	-0.2515	0.2229	0.3119	0.4653	0.5582	-0.1219	-0.1039	-0.3551	-0.1771	-0.4371	-0.0464	-0.2419	-0.6572	0.1538
Chile							-0.0634	-0.2409	0.1655	0.4842	0.1002	1.0948	0.5666	-0.2289	0.2105	0.5592	0.8359	1.0125	0.6192	0.1088	0.5252	0.1474	0.5470	-0.0562	0.4171	-0.0908	0.0434	0.6144
Den.								-0.1091	0.6942	0.6128	0.4215	-0.4660	0.7791	0.2455	0.1305	-0.4403	-0.2223	0.5001	0.3026	0.3102	0.7302	-0.6319	1.0259	0.1942	0.1904	0.1232	0.2243	-0.3084
Finland									-0.5495	0.2147	-0.3050	-0.7272	-0.7479	-0.1476	-0.0136	-0.5352	-0.1473	-0.3904	-0.2939	-0.4949	-0.4974	-0.6208	0.1419	-0.0212	-0.2110	-0.7396	0.0234	-0.4386
France										0.4814	0.3237	-0.2547	-0.0171	-0.1604	-0.0191	-0.0913	-0.1753	-0.2022	0.6645	-0.1014	0.1951	-0.3823	-0.1097	-0.2855	-0.9038	-0.2365	-0.1378	-0.4488
Ger.											0.4234	0.3615	0.8365	-0.1871	0.2409	-0.0880	-0.1586	0.6979	1.1273	0.3861	0.5957	-0.1613	0.5571	0.3390	0.2140	0.0196	0.6355	0.7925
Greece												-0.2810	0.5801	-0.1163	0.1849	-0.0810	-0.1747	0.6501	0.8867	-0.0402	0.3817	-0.6246	0.6216	0.1741	-0.2943	0.1450	-0.0768	-0.1908
Indon.													-0.1437	-0.3246	0.3341	0.0298	0.1637	-0.2344	-0.3084	0.1500	-0.2454	0.4510	-0.5187	-0.5901	-0.4450	0.5235	-0.5075	0.2786
Italy														0.1421	0.3762	-0.0919	-0.3852	0.2861	0.7708	-0.1843	0.1965	-0.4001	0.1202	-0.3336	-0.6315	0.4119	0.1831	0.2203
Japan															0.0375	-0.3952	-0.3635	-0.1843	0.6545	-0.4573	-0.3731	-0.6803	-0.2282	0.2412	-0.3280	0.0073	-0.2681	-0.4487
Korea																-0.0802	-0.3597	-0.1502	0.6380	0.4345	0.0920	-0.0026	-0.0706	0.2113	0.1004	-0.0436	-0.1479	-0.1029
Malay.																	0.3593	-0.3848	0.0603	0.4941	-0.1897	0.5476	-0.3740	-0.7281	-0.9597	0.0742	-0.6252	0.1922
Mexico																		-0.0525	-0.3315	-0.0619	-0.1258	0.3093	-0.2818	-0.4612	-0.4306	0.0862	-0.4691	0.0114
Neth.																			0.8894	-0.1307	0.2254	-0.1026	0.0158	-0.2373	-0.2110	-0.1385	0.2811	0.5831
Norway																				0.1749	0.8636	0.0330	0.9692	0.0737	0.4687	0.9929	0.7001	0.6566
Phil.																					-0.3648	0.3928	-0.2166	-0.2107	-0.9932	-0.2403	-0.3994	0.0870
Port.																						-0.6075	0.0579	-0.0385	-0.6902	-0.1845	-0.0789	-0.0586
Sing.																							-0.5541	-0.7094	-1.1257	-0.3907	-1.1978	-0.3103
Spain																								0.3497	-0.2041	-0.7098	0.5750	0.2510
Sweden																									0.1365	-0.2948	0.5066	-0.0724
Switz.																										-0.4658	0.2733	0.0567
Thai.																											-0.8071	-0.2598
U.K.																												-0.4732
U.S.A																												

Table 2.A. Panel A. Cross-Country Correlations at Non-Crisis Dates; Money Growth Rates; 1880 - 1914

Non-crisis dates: 1881 – 89, 1892, 1894 – 96, 1899, 1902 – 06, 1909 – 11, 1913																			
	Argentina	Australia	Brazil	Canada	Chile	Denmark	Finland	France	Germany	Greece	Italy	Japan	Neth.	Norway	Portugal	Spain	Sweden	UK	USA
Argentina	1	-0.1147	0.2251	0.0607	0.2303	-0.1230	-0.0957	-0.0404	0.2741	-0.2692	0.3639	-0.0376	0.3169	-0.1219	-0.4184	0.3269	-0.1637	-0.3828	0.0391
Australia		1	0.4589	0.1661	0.1247	0.3625	0.3095	0.0690	0.3130	0.0095	0.0903	0.0962	0.0816	0.1996	-0.0801	0.0400	0.1423	0.2549	0.0946
Brazil			1	0.3594	0.0502	0.1801	0.1421	0.1960	0.2480	-0.3205	0.0483	0.1981	0.3756	0.2456	-0.0471	0.2100	0.0196	-0.1306	-0.1188
Canada				1	0.1901	0.2278	-0.1248	0.4133	0.0959	-0.0689	0.0431	0.2238	0.3318	0.2716	-0.1984	-0.0285	0.1265	0.0567	0.5591
Chile					1	0.1352	-0.0782	0.1341	0.3289	-0.2408	0.4311	0.3471	0.5944	-0.3721	0.1902	-0.3482	-0.0241	-0.1538	0.0952
Denmark						1	0.1975	-0.1292	0.0834	0.3024	-0.2085	0.1543	-0.0191	-0.1750	-0.0468	-0.1107	-0.1462	-0.0789	0.3782
Finland							1	-0.3852	0.4000	-0.1082	-0.3497	0.1563	0.0112	0.2888	0.1383	0.2354	0.2040	0.5005	-0.1122
France								1	-0.1414	0.2223	0.2983	0.1350	0.0651	0.0275	-0.0468	0.0184	0.0767	-0.1947	0.1350
Germany									1	-0.3026	0.2487	0.5476	0.1827	0.1522	-0.3215	-0.2376	0.1582	-0.0618	0.0356
Greece										1	-0.0956	-0.1799	-0.3533	0.0702	0.5470	0.1010	-0.1437	0.0640	0.4499
Italy											1	0.3954	0.6632	-0.2794	-0.0108	-0.0865	0.1546	-0.3908	0.1922
Japan												1	0.7900	0.7201	0.4802	0.7680	0.6715	0.6831	0.2309
Neth.													1	-0.2143	0.0760	-0.1021	-0.5525	-0.1645	-0.0448
Norway														1	-0.5364	0.3876	0.3198	0.4644	0.1005
Portugal															1	-0.0123	-0.2148	0.2573	-0.1447
Spain																1	-0.0501	0.3601	-0.0176
Sweden																	1	0.2207	0.3012
UK																		1	-0.0014
USA																			1

Table 2.A. Panel B. Cross-Country Correlations at Non-Crisis Dates; Money Growth Rates; 1919 - 1939

Non-crisis dates: 1919 - 20, 1922, , 1924 - 28, 1934 - 38																			
	Argentina	Australia	Belgium	Brazil	Canada	Chile	Denmark	Finland	France	Germany	Italy	Japan	Neth.	Norway	Portugal	Spain	Sweden	UK	USA
Argentina	1	0.5227	-0.0104	0.3942	0.2157	-0.1213	-0.0237	0.2680	-0.0216	-0.1259	0.1147	0.2832	0.1821	-0.1411	0.0051	0.0064	0.2035	0.1762	0.1769
Australia		1	-0.3678	0.1139	0.4033	0.4593	0.2311	0.3568	-0.2099	0.0784	0.2630	0.4118	0.1232	0.1658	0.0791	0.1509	0.3323	0.4170	-0.0052
Belgium			1	-0.4184	0.1624	-0.3181	-0.2978	-0.3373	0.2513	-0.1702	-0.0280	-0.5924	-0.2780	-0.5101	-0.0640	0.3047	-0.3224	-0.1263	0.4574
Brazil				1	-0.0423	-0.4800	-0.0928	0.1440	-0.0284	0.5626	-0.1267	0.2288	0.0293	0.0697	0.0863	0.0427	-0.0405	-0.2817	-0.0065
Canada					1	0.1614	0.3074	0.7614	0.2476	0.5398	0.4523	0.3954	0.2257	0.2564	0.0045	0.4177	0.5629	0.5995	0.3034
Chile						1	0.1360	0.1646	0.0242	0.0277	0.3135	0.1171	0.1619	0.2192	0.0826	0.1093	0.1580	0.3487	0.0997
Denmark							1	0.4677	-0.2532	-0.3182	0.4290	0.6475	0.5108	0.7037	0.2796	0.6857	0.8326	0.8103	-0.2259
Finland								1	0.2471	0.3757	0.6830	0.7152	0.4604	0.4599	0.3800	0.6462	0.7912	0.7253	0.0393
France									1	0.4291	0.3765	0.1349	0.4837	-0.3444	-0.3653	0.0590	0.0215	-0.3051	0.1931
Germany										1	0.4760	0.2392	0.0735	0.5082	-0.4265	-0.2818	0.0889	-0.4729	0.2900
Italy											1	0.4943	0.2706	0.5145	0.7646	0.6602	0.6265	0.7455	0.2191
Japan												1	0.8258	0.6911	0.2974	0.8352	0.8405	0.6181	0.0020
Neth.													1	0.4438	0.0217	0.7468	0.6560	0.3976	0.1198
Norway														1	0.5176	0.7443	0.6741	0.6074	0.1294
Portugal															1	0.7089	0.3218	0.4562	0.1874
Spain																1	0.7023	0.7004	0.3439
Sweden																	1	0.8767	-0.0447
UK																		1	0.0224
USA																			1

Table 2. A. Panel C. Cross-Country Correlations at Non-Crisis Dates; Money Growth Rates; 1973 - 97

Non-crisis dates: 1973 - 74, 1977 - 80, 1984, 1987 - 91, 1993 - 96																												
	Arg.	Aus.	Belgium	Brazil	Canada	Chile	Den.	Finland	France	Ger.	Greece	Indon.	Italy	Japan	Korea	Malay.	Mexico	Neth.	Norway	Phil.	Port.	Sing.	Spain	Sweden	Switz.	Thai.	U.K.	U.S.A
Arg.	1	-0.1900	0.0041	0.3201	-0.1223	-0.1990	-0.2709	-0.0684	-0.0193	0.0607	0.3491	0.2938	0.0323	-0.3319	-0.1297	-0.0705	0.0394	-0.0586	0.1102	0.4417	-0.1132	0.2154	0.1639	0.3032	-0.2936	0.0637	0.0873	-0.2178
Aus.		1	0.0729	-0.0406	0.0595	-0.1612	0.5722	-0.1644	-0.2901	-0.1730	-0.3364	-0.1424	0.0553	-0.1534	-0.1399	0.3590	0.2256	-0.2825	0.3502	-0.1652	0.5352	0.2072	0.0920	-0.3535	0.2261	0.4037	0.0217	0.0660
Belgium			1	-0.1895	-0.0645	0.4357	0.1039	-0.2472	0.2599	-0.0015	-0.1819	0.1412	0.1850	0.5653	0.5540	0.5460	-0.3062	0.4079	0.0971	0.4857	0.1391	0.4925	0.2505	0.0341	0.2266	0.2226	0.3556	0.0772
Brazil				1	-0.3035	-0.3670	-0.3194	-0.1136	-0.4289	0.3567	0.3882	-0.0873	-0.3693	-0.3669	-0.2908	0.2195	-0.1034	-0.2371	-0.2128	0.0342	-0.5271	0.2395	-0.1540	-0.1406	-0.2415	0.1177	-0.2896	-0.1097
Canada					1	-0.1911	0.0448	-0.1885	-0.0186	-0.2654	-0.1760	-0.2338	-0.0382	0.1100	-0.3585	-0.0752	-0.1369	0.2657	0.1031	-0.2618	0.0582	-0.3604	-0.3274	-0.0159	0.2912	-0.2748	0.0603	0.0762
Chile						1	-0.0671	-0.0046	0.5213	-0.1716	0.2717	0.5434	0.3060	0.5790	0.6178	0.3068	-0.2440	-0.1718	-0.0285	-0.0594	0.4856	-0.0116	0.5494	0.3872	-0.1230	0.0496	-0.1943	0.1116
Den.							1	-0.0420	-0.0906	0.0405	-0.3580	-0.4261	0.1021	0.0570	-0.0977	-0.0502	0.6379	-0.0584	0.8227	-0.0449	0.3795	0.1504	0.2500	-0.2477	0.4056	0.5681	0.6678	0.0375
Finland								1	-0.5155	-0.2263	-0.2354	-0.2213	0.0132	0.1705	0.3742	-0.1994	0.5903	-0.2177	-0.1237	-0.1107	0.0646	-0.1453	-0.0186	-0.3329	-0.1829	-0.0540	-0.2130	0.2339
France									1	-0.0482	0.3113	0.5088	0.4529	0.1696	0.2153	-0.1711	-0.4770	0.0934	0.0300	-0.0670	0.2280	-0.0077	0.2670	0.7106	-0.1671	-0.0974	0.1946	0.1156
Ger.										1	0.1507	-0.3420	-0.1036	0.0369	-0.1971	-0.0796	0.0735	0.1906	-0.0468	0.0319	-0.5563	0.0655	0.3108	-0.0147	0.1730	-0.2517	0.1759	0.0331
Greece											1	0.3532	0.2102	-0.0420	-0.0107	-0.0352	-0.2863	-0.5640	-0.0653	-0.2389	-0.1049	-0.3040	0.3878	0.5573	-0.1894	0.1087	-0.2632	-0.1450
Indon.												1	0.3908	-0.2086	0.3624	0.2631	-0.4686	-0.2223	-0.2742	0.2420	0.3539	0.2153	0.2811	0.6500	-0.4086	0.0412	-0.3560	0.0712
Italy													1	0.0833	0.4445	0.1441	-0.0260	-0.3953	0.0149	-0.2239	0.4908	0.2222	0.4273	0.6478	0.0352	0.2102	0.0820	0.6874
Japan														1	0.4509	0.2610	-0.1461	0.1440	-0.0770	-0.1426	0.1516	-0.0835	0.1833	-0.1344	0.3470	-0.0218	0.0682	0.0785
Korea															1	0.2714	-0.0083	-0.0730	-0.1229	0.2056	0.3392	0.1998	0.4903	0.0798	-0.2843	0.1294	0.0090	0.3421
Malay.																1	-0.3753	-0.1478	-0.2413	0.1747	0.3054	0.5586	0.0501	-0.0961	0.2575	0.3777	-0.2404	0.1120
Mexico																	1	-0.1952	0.6182	-0.0460	0.1572	-0.0538	0.2643	-0.3387	-0.0411	0.2454	0.3643	0.0999
Neth.																		1	-0.0363	0.5447	-0.4579	0.1033	-0.3220	-0.1993	0.1801	-0.4360	0.4103	-0.1923
Norway																			1	0.0919	0.3062	-0.0094	0.3726	-0.0307	0.1174	0.4834	0.7069	-0.1564
Phil.																				1	-0.2343	0.4375	0.0329	-0.0932	0.0234	0.1780	0.4021	-0.4139
Port.																					1	0.1126	0.3503	0.1301	-0.0800	0.3668	-0.0402	0.2290
Sing.																						1	-0.0510	0.0406	-0.0255	0.4408	0.2359	0.3259
Spain																							1	0.3236	-0.1529	0.1449	0.1433	0.1356
Sweden																								1	-0.1543	-0.0774	-0.0656	0.3248
Switz.																									1	0.2445	0.2816	-0.1516
Thai.																										1	0.3897	-0.1043
U.K.																											1	-0.1075
U.S.A																												1

Table 2.B. Panel A. Change in Correlations at Crisis Dates; Money Growth Rates; 1880 - 1914

Crisis dates: 1890 - 91, 1893, 1897 – 98, 1900 - 01, 1907 - 08, 1912, 1914																			
	Argentina	Australia	Brazil	Canada	Chile	Denmark	Finland	France	Germany	Greece	Italy	Japan	Neth.	Norway	Portugal	Spain	Sweden	UK	USA
Argentina		0.2594	-0.0081	-0.2400	-0.4250	0.0214	0.2640	0.4120	0.0429	-0.2244	-0.1386	-0.0581	-0.1636	0.4350	0.0502	-0.0728	0.2568	0.0666	-0.1007
Australia			-0.4684	-0.0663	-0.1774	-0.2997	-0.3253	0.2724	0.0661	-0.2508	0.2442	-0.8141	0.9397	0.4469	0.3528	0.3928	0.6403	-0.0665	0.2121
Brazil				-0.0390	0.0225	-0.0872	0.1863	-0.4652	-0.0466	0.3323	-0.2737	0.3609	-0.2251	-0.3199	-0.0249	-0.1311	-0.4905	0.0707	0.0911
Canada					-0.3900	-0.0661	0.0127	-0.2391	0.2888	0.3125	-0.3196	-0.4203	0.0164	-0.0656	0.1265	0.2240	0.0420	-0.1580	-0.0045
Chile						-0.3075	0.2577	-0.4850	-0.3884	0.3103	-0.0187	-0.1466	-0.2151	0.2982	-0.0337	0.1489	0.2209	0.2031	-0.0511
Denmark							-0.3678	0.2319	0.0118	-0.4583	0.1653	-0.1963	-0.1101	0.0725	0.0419	0.0330	-0.0292	-0.0342	-0.1925
Finland								-0.3450	-0.3624	0.2582	0.3653	0.2365	-0.1524	-0.0671	-0.0038	0.1163	-0.1608	-0.1170	0.2894
France									0.5048	-0.4935	-0.1729	-0.3229	0.5151	-0.0892	-0.1739	-0.3804	-0.1790	-0.4157	-0.4280
Germany										0.0127	-0.1739	-0.4275	0.4797	-0.0821	0.0874	0.0779	-0.0815	-0.1998	-0.1005
Greece											-0.0379	0.2463	0.9093	-0.2944	-0.0392	-0.1794	0.0725	0.4464	-0.1612
Italy												-0.5074	-0.1678	0.4418	0.2013	0.0442	0.2632	0.4107	-0.2164
Japan													-0.2354	-0.1166	-0.3468	-0.1094	-0.4567	-0.0416	-0.2869
Neth.														-0.5101	0.1938	0.4336	-0.5081	0.2526	0.0526
Norway															0.1187	-0.0142	0.2866	-0.5069	0.3923
Portugal																0.0616	0.0773	0.2244	0.1435
Spain																	0.1071	-0.1179	0.2795
Sweden																		-0.2293	0.2077
UK																			0.0187

Table 2.B. Panel B. Change in Correlations at Crisis Dates; Money Growth Rates; 1919 – 1939

Crisis dates: 1921, 1923 , 19229 – 33, 1939																			
	Argentina	Australia	Belgium	Brazil	Canada	Chile	Denmark	Finland	France	Germany	Italy	Japan	Neth.	Norway	Portugal	Spain	Sweden	UK	USA
Argentina		-0.1470	0.0162	-0.2453	0.0069	0.1148	0.1049	0.0911	-0.1125	0.1444	0.2823	-0.1377	0.1447	-0.4653	0.1943	0.2205	-0.3625	-0.6827	0.0403
Australia			0.3046	-0.2555	0.3211	-0.1963	0.1731	-0.0417	0.6650	0.0036	0.3558	0.2696	0.0409	0.1808	-0.3940	-0.1595	0.1859	-0.2297	0.3590
Belgium				0.0503	-0.1456	-0.2439	0.1271	0.5588	0.1027	-0.1391	0.1949	0.2858	0.4045	0.1784	0.4266	0.2018	0.1595	-0.4815	0.0536
Brazil					-0.1110	0.2357	-0.3989	0.0141	-0.3298	-0.2597	-0.1658	-0.1451	-0.6664	-0.0034	0.3755	-0.5961	-0.2400	0.2047	-0.0763
Canada						0.0527	0.1134	-0.2623	0.0847	0.0881	0.1419	0.1988	-0.0313	-0.2255	-0.1828	-0.1108	-0.0351	-0.6638	0.1213
Chile							-0.0187	-0.2522	-0.2343	0.2158	-0.2699	0.0857	-0.2950	-0.0794	-0.1944	-0.4694	-0.0158	0.2942	-0.1798
Denmark								-0.5123	0.4068	0.3952	-0.1308	-0.2046	0.1814	-0.4075	-0.7324	0.0437	-0.1275	-0.4897	0.1869
Finland									-0.0627	0.0567	-0.0235	-0.2674	-0.4969	-0.5625	0.3022	-0.4165	-0.8103	-1.2292	0.3583
France										-0.8569	0.1467	0.2458	0.0223	0.5515	-0.0847	0.2955	0.3760	0.2549	0.0638
Germany											-0.5685	0.2694	-0.4475	-0.7496	1.2124	0.2109	0.3104	-0.6232	0.1681
Italy												-0.0123	0.0779	-0.6556	-0.5541	-0.2196	-0.5335	-1.2523	0.2930
Japan													-0.7394	-0.1205	-0.3728	-1.2239	-0.1242	-0.2911	0.2423
Neth.														-0.4676	-0.4996	0.1108	-0.3934	-0.4036	-0.0680
Norway															-0.7498	-0.8014	0.1174	0.0763	-0.2437
Portugal																-0.7414	-0.8277	-0.9319	0.1151
Spain																	-0.4816	-0.9853	0.0718
Sweden																		-0.1246	0.0559
UK																			-0.7171

Table 2.B. Panel C. Change in Cross-Country Correlations at Crisis Dates; Money Growth Rates; 1973 - 97

Crisis dates: 1975 - 76, 1981 - 83, 1985 - 86, 1992, 1997																												
	Arg.	Australia	Belgium	Brazil	Canada	Chile	Den.	Finland	France	Ger.	Greece	Indon.	Italy	Japan	Korea	Malay.	Mexico	Neth.	Norway	Phil.	Port.	Sing.	Spain	Sweden	Switz.	Thai.	U.K.	U.S.A
Arg.		-0.1239	0.3057	-0.4510	0.7865	0.3707	1.0113	0.1896	0.3013	0.0048	-0.3853	-0.5019	0.3149	-0.1250	0.3459	-0.2653	0.1578	0.3177	0.1580	-0.2197	0.1756	-0.7175	0.1465	-0.1188	0.0166	-0.4418	-0.2430	0.4360
Australia			-0.1440	0.5903	-0.2466	0.1862	-0.7785	-0.4818	-0.2355	0.6472	-0.4301	-0.0671	-0.6734	-0.0589	-0.2892	-0.0104	-0.8090	0.1448	-0.2163	0.7416	-0.5947	-0.2906	-0.6193	-0.0525	-0.1469	-0.0804	-0.4047	0.0585
Belgium				-0.3922	0.0811	-0.0751	0.2840	-0.0709	0.3066	0.0052	0.4598	-0.2079	0.4736	-0.4552	-0.2636	-1.1110	0.8116	0.0254	-0.7963	0.1984	-0.0737	-0.5431	0.3815	0.7366	0.0514	0.1050	-0.2448	0.0414
Brazil					0.4826	0.1742	-0.0118	-0.1439	-0.3816	0.3235	-0.9435	-0.4178	-0.3355	0.0489	0.2108	0.2427	-0.2524	0.0001	0.8915	-0.1870	0.9063	-0.1877	-0.6400	-0.8074	-0.1207	0.1244	-0.1015	0.6762
Canada						-0.1228	0.4558	0.3133	-0.0800	0.5356	-0.0845	-0.0223	-0.1488	-0.5812	0.2353	-0.4840	0.5690	-0.0165	0.0289	0.2231	0.5638	-0.4237	0.3591	-0.0444	-0.8113	-0.1396	0.2883	0.5092
Chile							-0.1782	-0.6482	-0.6316	0.0070	0.1032	-0.1849	0.2763	-0.0210	-0.3108	0.0632	-0.0121	0.2521	-0.0641	0.2155	-0.6793	0.3218	0.0214	-0.1872	0.5585	0.4916	0.0789	-0.2409
Den.								0.3959	0.7544	-0.2234	0.2445	0.3200	0.0357	-0.5682	-0.0827	-0.5995	-0.4063	0.0141	-0.8204	0.4819	-0.4488	-0.6430	-0.0154	0.6756	-0.8869	-1.1637	-0.8038	0.0099
Finland									1.0214	-0.0651	0.4177	0.1270	0.0217	-0.5230	-0.2749	-0.0352	-0.3193	0.1659	0.3253	-0.3428	-0.2780	0.0942	-0.1261	0.4056	-0.0758	-0.6660	0.2337	-0.5257
France										-0.4769	0.1355	-0.3642	0.1279	-0.1922	-0.0971	-0.4191	0.8909	-0.0665	-0.4679	0.3296	-0.5666	0.0478	0.2501	0.0910	0.1414	-0.2530	-0.1721	-0.4727
Ger.											-0.7065	-0.5421	-0.1899	-0.5929	0.5566	0.2328	0.0235	0.2796	0.3348	0.2225	0.9496	-0.1865	-0.9284	-0.5416	-0.0933	0.6333	-0.4980	0.5902
Greece												0.0590	0.5341	0.7577	0.4510	-0.1411	0.7444	0.4823	-0.3227	-0.1975	0.1726	0.8523	0.3057	-0.0791	0.2643	0.1304	0.5885	0.0461
Indon.													-0.2534	0.9278	-0.8585	-0.2522	0.2166	-0.2011	-0.0576	-0.4796	-0.6116	-0.1807	0.3268	-0.2296	0.4614	-0.2078	0.8260	-0.6068
Italy														0.2660	0.2373	-0.3220	0.4473	0.8008	-0.4081	0.2889	-0.6885	0.0656	0.3357	0.0166	0.4010	0.0115	-0.0126	-0.8932
Japan															-0.4697	-0.1471	0.1678	-0.4463	-0.3934	-0.1787	-0.0771	0.6186	0.4003	0.4271	-0.1508	0.5164	0.3592	-0.2319
Korea																-0.1190	0.4114	0.6407	0.1786	-0.3390	-0.3192	0.2195	-0.3810	-0.0638	0.7006	0.2794	-0.2405	-0.1918
Malay.																	-0.4021	-0.0153	0.8391	-0.4195	-0.7630	-0.0991	-0.4829	-0.5399	0.1141	-0.1001	-0.2903	-0.4354
Mexico																		0.6488	-1.1705	-0.0432	0.4450	-0.0702	0.1088	0.7977	-0.0595	-0.1844	0.1834	0.3588
Neth.																			-0.2470	-0.3199	0.5249	-0.4604	0.4582	0.4517	0.4594	0.5344	-0.1974	0.2469
Norway																				-0.3932	-0.4692	0.0401	-0.9930	-0.7721	-0.4521	-0.7382	-1.3498	0.2280
Phil.																					0.0323	-0.6883	0.0386	0.4534	0.1670	-0.0203	-0.7277	0.4298
Port.																						-0.2993	-0.3556	-0.3183	-0.3915	-0.0720	0.5211	0.6774
Sing.																							0.0174	-0.1751	0.1869	0.1604	-0.6036	-0.4311
Spain																								0.5022	0.3342	-0.0884	0.3486	-0.3198
Sweden																									0.4208	-0.0410	0.4875	-0.6690
Switz.																										0.0922	-0.2537	-0.3596
Thai.																											-0.4943	0.4884
U.K.																												0.1888
U.S.A																												

Table 3.A. Panel A. Cross-Country Correlations at Non-Crisis Dates; Net Exports to GDP Ratio; 1880 - 1914

Non-crisis dates: 1881 – 89, 1892, 1894 – 96, 1899, 1902 – 06, 1909 – 11, 1913																		
	Argentina	Australia	Brazil	Canada	Chile	Denmark	Finland	France	Germany	Italy	Japan	Neth.	Norway	Portugal	Spain	Sweden	UK	USA
Argentina	1	-0.1054	-0.4669	-0.0102	0.3854	-0.0054	0.1576	0.3256	-0.0970	0.0092	-0.1126	-0.4458	-0.4205	0.0706	-0.4129	-0.3088	-0.2562	-0.0143
Australia		1	0.1679	-0.2801	0.0632	0.1244	0.0471	0.0808	-0.0183	0.0210	0.4255	0.1571	-0.0474	0.0457	0.2732	-0.0801	-0.1419	0.0747
Brazil			1	0.0887	-0.6449	0.2148	-0.0837	0.1970	-0.2366	-0.0519	0.3191	0.1094	-0.0116	0.1804	0.2576	-0.0463	0.0199	-0.1067
Canada				1	0.1145	-0.0383	0.3288	0.1026	0.0901	-0.0799	-0.2873	-0.6477	0.3533	-0.0737	-0.3668	-0.0256	-0.2299	0.2373
Chile					1	0.0237	0.3993	-0.1816	0.1289	0.1367	-0.2995	-0.6892	0.2642	-0.0558	-0.4659	-0.1023	-0.3038	-0.1871
Denmark						1	0.2727	-0.0606	0.3153	0.2253	-0.2267	-0.3726	0.2811	0.0912	-0.7754	0.4031	-0.0238	0.1150
Finland							1	-0.1829	0.1726	0.2619	-0.2799	-0.7205	0.2000	0.1116	-0.4497	0.1518	-0.3177	0.1407
France								1	-0.1053	-0.1002	0.1156	-0.6415	-0.0081	-0.0883	-0.0782	-0.4822	-0.0799	-0.3841
Germany									1	0.3344	-0.0122	-0.3702	0.4144	-0.1303	-0.6387	0.3283	0.3695	0.0390
Italy										1	-0.1605	-0.6779	0.0711	0.0853	-0.8264	0.0490	0.0375	-0.0315
Japan											1	0.4943	0.0118	0.2093	0.3361	0.2837	-0.0150	0.2086
Neth.												1	-0.4684	0.7193	0.7193	0.3132	0.2282	-0.0206
Norway													1	0.1685	-0.3748	0.2275	-0.0332	-0.2155
Portugal														1	0.7026	0.1043	-0.4806	-0.1213
Spain															1	-0.1985	0.1018	-0.3108
Sweden																1	0.1756	0.3368
UK																	1	0.0138
USA																		1

Table 3.A. Panel B. Cross-Country Correlations at Non-Crisis Dates; Net Exports to GDP Ratio; 1919 – 1939

Non-crisis dates: 1919 - 20, 1922, , 1924 - 28, 1934 - 38																			
	Argentina	Australia	Belgium	Brazil	Canada	Denmark	Finland	France	Germany	Greece	Italy	Japan	Neth.	Norway	Portugal	Sweden	Switz.	UK	USA
Argentina	1	-0.1402	-0.8151	0.5106	-0.1329	-0.3297	-0.3883	0.1946	-0.2371	-0.5374	0.1774	-0.2656	-0.1108	-0.3004	0.3280	-0.0926	-0.7505	-0.2931	0.2489
Australia		1	0.0247	-0.0669	-0.2393	0.1115	0.3197	-0.2293	0.2257	-0.2767	-0.0598	-0.1266	0.0281	0.2738	0.2071	0.2386	-0.8197	0.1859	-0.5289
Belgium			1	0.6413	-0.3195	-0.0553	0.3700	0.6457	-0.8901	0.6894	0.3413	0.3720	-0.2802	0.4873	0.3523	0.3769	0.2834	-0.4356	0.9980
Brazil				1	-0.1468	-0.7868	-0.6890	0.1215	0.1086	0.1479	0.5819	0.0804	-0.4797	-0.5457	0.7233	-0.2984	0.1618	-0.2750	0.4929
Canada					1	-0.3042	-0.2297	0.1164	0.0335	0.2784	0.1910	-0.0010	0.1377	0.2501	0.0081	-0.2932	0.6248	-0.1585	-0.0978
Denmark						1	0.7982	0.2423	0.2809	0.2313	-0.7627	0.3085	0.9030	0.9100	-0.2835	0.7353	0.0005	-0.2034	-0.6060
Finland							1	0.2546	-0.0047	-0.3787	-0.3200	0.1032	0.6297	0.8266	-0.4302	0.6871	0.6480	0.0834	-0.7288
France								1	-0.5179	0.6713	0.4790	0.2924	0.5779	0.4635	-0.1968	-0.0838	0.7355	-0.0442	0.3748
Germany									1	-0.1857	-0.1229	-0.2663	-0.2837	0.1104	0.5875	-0.1284	-0.3965	-0.8003	-0.3861
Greece										1	0.0746	0.5752	0.2719	0.4646	0.1902	-0.4306	0.8543	0.4384	0.6451
Italy											1	-0.2705	-0.7379	-0.6005	-0.0095	-0.5852	0.6505	0.3689	0.3787
Japan												1	0.5680	0.4889	0.4543	0.4200	0.8389	-0.3918	-0.0994
Neth.													1	0.9225	0.0641	0.8251	0.4533	-0.4522	-0.5512
Norway														1	-0.0185	0.8501	0.9013	-0.2948	-0.6894
Portugal															1	0.1699	-0.0507	-0.6593	0.1291
Sweden																1	-0.2299	-0.4623	-0.5605
Switz.																	1	0.3149	0.2190
UK																		1	-0.1042
USA																			1

Table 3. A. Panel C. Cross-Country Correlations at Non-Crisis Dates; Net Exports to GDP Ratio; 1973 - 97

Non-crisis dates: 1973 - 74, 1977 - 80, 1984, 1987 - 91, 1993 - 96																												
	Arg.	Australia	Belgium	Brazil	Canada	Chile	Den.	Finland	France	Ger.	Greece	Indon.	Italy	Japan	Korea	Malay.	Mexico	Neth.	Norway	Phil.	Port.	Sing.	Spain	Sweden	Switz.	Thai.	U.K.	U.S.A
Arg.	1	0.1574	-0.3098	-0.0342	-0.0782	0.1824	-0.2780	-0.5530	-0.4870	0.0166	-0.3851	-0.0710	-0.4329	-0.2277	-0.0791	0.1642	0.2955	-0.2110	-0.1587	0.3517	-0.1088	-0.2530	-0.3359	-0.3594	-0.4625	-0.2101	-0.1140	0.1130
Australia		1	-0.0023	-0.2615	-0.0388	-0.2417	-0.0418	-0.0208	0.1426	-0.3626	-0.3617	-0.2666	-0.0151	-0.3286	-0.1609	0.0380	-0.2835	-0.0561	-0.0089	0.0175	0.3510	-0.1013	0.0453	0.0828	-0.0415	-0.0460	0.0831	0.5009
Belgium			1	0.3579	0.1366	0.5136	0.8205	0.4467	0.6281	0.5915	-0.4335	-0.8396	0.6217	0.5285	0.4960	-0.3441	0.1127	0.9401	0.4058	-0.1364	0.7358	0.7901	0.1691	0.8257	0.6157	0.2114	-0.4533	-0.2485
Brazil				1	-0.0509	0.5103	0.4192	-0.0548	0.0136	0.4000	0.0588	-0.3172	0.1294	0.7616	0.8495	0.3540	0.4825	0.3590	0.1746	0.5068	0.3199	0.3739	0.2861	0.1654	0.0713	0.3375	-0.1450	-0.7498
Canada					1	-0.3636	-0.0672	0.5151	0.3431	0.0105	0.2894	-0.1450	0.1706	-0.0646	-0.1186	-0.1030	0.6026	0.1623	0.3178	-0.1557	0.2735	0.0165	0.6242	0.5595	0.0385	-0.0633	0.2980	-0.2473
Chile						1	0.4933	-0.2997	-0.1653	0.6548	-0.2731	-0.4644	0.0479	0.4124	0.6048	0.0607	0.1246	0.4617	0.0235	0.4296	0.1606	0.5044	-0.3624	0.0786	0.0181	0.2629	-0.6565	-0.3497
Den.							1	0.3703	0.4900	0.3414	-0.3250	-0.6789	0.6222	0.4812	0.4380	-0.4364	-0.0826	0.8171	0.6818	-0.3107	0.4821	0.8803	0.0586	0.6151	0.5596	-0.1297	-0.2076	-0.2145
Finland								1	0.9132	-0.0361	0.1620	-0.3963	0.8651	0.3190	0.0754	-0.3279	0.1168	0.3830	0.3519	-0.6553	0.3720	0.5567	0.7242	0.7715	0.8298	-0.2606	0.4582	-0.1724
France									1	0.0880	-0.1484	-0.5682	0.8960	0.3499	0.1437	-0.3385	0.0068	0.5434	0.3873	-0.5783	0.6302	0.6247	0.6513	0.8511	0.8690	-0.1385	0.1961	-0.0722
Ger.										1	-0.1493	-0.4426	0.2351	0.3741	0.6193	0.3013	0.3460	0.4478	-0.1129	0.2427	0.3700	0.4019	-0.0871	0.2886	0.1667	0.5123	-0.6826	-0.5115
Greece											1	0.5495	-0.0514	0.0442	0.0641	0.3905	0.1856	-0.5451	-0.1284	0.0639	-0.4758	-0.2000	0.3729	-0.2109	-0.1354	0.1144	0.5461	-0.3829
Indon.												1	-0.5990	-0.4415	-0.5038	0.2139	-0.2055	-0.7843	-0.2831	0.0828	-0.7608	-0.7699	-0.1714	-0.7163	-0.5524	0.0040	0.2472	0.1852
Italy													1	0.4556	0.3319	-0.2171	0.0058	0.5093	0.3389	-0.6086	0.4479	0.8144	0.5138	0.7160	0.9361	-0.2298	0.2126	-0.2396
Japan														1	0.8182	0.1427	0.4266	0.4813	0.0280	0.2387	0.3564	0.5086	0.4090	0.4114	0.5406	0.3664	-0.0039	-0.7274
Korea															1	0.4850	0.4426	0.3597	-0.0873	0.4431	0.3956	0.5042	0.2552	0.2516	0.2900	0.4829	-0.1944	-0.7560
Malay.																1	0.3797	-0.5195	-0.5844	0.5925	-0.0564	-0.3284	0.1621	-0.4030	-0.3050	0.5307	-0.0020	-0.4900
Mexico																	1	0.1319	-0.0278	0.3973	0.2664	-0.0095	0.4929	0.2848	-0.0812	0.2881	0.0513	-0.7506
Neth.																		1	0.5045	-0.1718	0.6480	0.7218	0.1005	0.7775	0.5388	0.0425	-0.4395	-0.1890
Norway																			1	-0.4245	0.3497	0.5010	0.2473	0.5256	0.1726	-0.4297	0.1163	-0.0037
Phil.																				1	0.0196	-0.3673	-0.1258	-0.3284	-0.5774	0.6746	-0.3702	-0.3383
Port.																					1	0.4400	0.4422	0.7557	0.3759	0.2935	-0.2644	-0.1936
Sing.																						1	0.1741	0.6480	0.7204	-0.2212	-0.0710	-0.2736
Spain																							1	0.5825	0.4246	0.0564	0.5153	-0.4928
Sweden																								1	0.6663	0.0455	-0.0409	-0.2155
Switz.																									1	-0.1541	0.1704	-0.1618
Thai.																										1	-0.4823	-0.3614
U.K.																											1	-0.0270
U.S.A																												1

Table 3. B. Panel A. Change in Correlations at Crisis Dates; Net Exports to GDP Ratio; 1880 – 1914

Crisis dates: 1890 - 91, 1893, 1897 – 98, 1900 - 01, 1907 - 08, 1912, 1914																		
	Argentina	Australia	Brazil	Canada	Chile	Denmark	Finland	France	Germany	Italy	Japan	Neth.	Norway	Portugal	Spain	Sweden	UK	USA
Argentina		0.2504	0.3266	0.1684	-0.1666	0.0755	-0.0582	-0.4542	-0.1341	0.3959	0.4816	0.3894	0.0500	0.4360	-0.3464	0.2046	-0.0284	-0.1232
Australia			-0.2140	0.4843	-0.0149	-0.0647	0.2115	-0.0486	-0.0538	0.4976	0.0501	-0.2782	-0.0594	0.1656	-0.0020	0.3912	-0.0381	0.1342
Brazil				0.1126	0.0305	0.1393	0.0829	-0.0121	0.0631	0.2056	0.1218	0.0519	0.3535	0.2856	-0.6072	-0.0083	-0.2134	-0.1376
Canada					-0.2422	0.4169	-0.0613	-0.0596	0.2831	0.3533	0.3797	0.4447	0.0078	0.4257	-0.3680	0.3271	-0.1611	-0.3282
Chile						-0.2790	-0.0303	0.0811	-0.0805	-0.0953	0.0756	0.1230	-0.1660	-0.2134	0.0402	-0.1619	0.2022	0.2523
Denmark							-0.1269	0.2685	0.1789	0.0934	0.2625	0.2136	0.0331	0.3299	-0.1687	-0.0333	-0.0970	-0.3683
Finland								0.2993	0.1951	0.0001	0.2847	0.3277	0.2691	-0.2495	-0.3331	0.2323	-0.0224	-0.1718
France									0.4980	0.0172	-0.0430	1.0508	0.3152	-0.2606	0.2818	0.4837	0.2203	0.0996
Germany										-0.5592	-0.0889	-0.2917	0.0802	-0.4146	-0.3032	0.1644	-0.0397	-0.3567
Italy											0.4790	0.7284	-0.1661	0.4066	0.0912	0.1641	-0.3809	-0.0631
Japan												-0.2338	0.2129	0.3444	-1.1314	0.4169	-0.3117	0.1148
Neth.													0.4270	0.1036	-0.3792	0.2105	-0.3108	-0.4317
Norway														-0.2958	-0.4747	0.1341	-0.2649	0.0051
Portugal															-0.7230	0.0096	-0.2148	-0.0062
Spain																-0.5832	0.2339	0.2961
Sweden																	-0.2179	-0.5079
UK																		0.2768

Table 3. B. Panel B. Change in Correlations at Crisis Dates; Net Exports to GDP Ratio; 1919 – 1939

Crisis dates: 1921, 1923 , 19229 – 33, 1939																			
	Argentina	Australia	Brazil	Canada	Denmark	Finland	France	Germany	Greece	Italy	Japan	Neth.	Norway	Portugal	Spain	Sweden	Switz.	UK	USA
Argentina		0.6069	-0.3243	0.5732	-0.1526	0.3033	-0.3017	0.0958	-0.2753	-0.3398	0.3290	-0.3676	-0.0414	0.3216	-0.7533	-0.2085	0.4181	-0.0514	-0.0665
Australia			0.1080	0.6076	-0.4272	-0.1434	-0.1322	-0.0702	-0.3363	-0.2172	0.0961	-0.3683	-0.4048	0.3743	-0.1422	-0.3731	0.4871	-0.2258	0.5700
Brazil				-0.0591	0.7392	1.0544	-0.0535	0.4926	-0.6565	0.0738	-0.1583	0.4844	0.1689	-0.3278	-0.0809	0.0925	0.2344	-0.1432	-0.9803
Canada					0.7489	0.3267	-0.5590	-0.1547	-0.2189	0.2183	-0.1818	-0.0909	0.3422	0.1482	-0.8568	0.4840	-0.4814	-0.7131	-0.2528
Denmark						-0.2775	0.0653	-0.4583	0.2792	1.0922	-0.1856	0.0190	-0.0611	-0.1022	0.8213	0.0975	-0.1637	0.0793	-0.0106
Finland							-0.0096	0.7845	-0.2787	0.7039	0.2615	-0.2573	-0.5360	0.8027	0.9889	-0.3197	0.0271	-0.5103	0.3201
France								-0.1545	-0.4272	0.0775	0.1715	0.0575	0.0326	-0.0601	0.0836	0.2777	0.3808	-0.3740	-0.4507
Germany									-0.0783	0.6279	-0.3218	-0.2846	-0.4428	-0.0058	0.4994	-0.6040	-0.0753	-0.2461	-0.2367
Greece										-0.3878	0.0556	-0.3467	0.0787	-0.5986	-0.3582	0.4068	-0.0990	-0.1906	-0.0564
Italy											0.1731	1.0076	0.7810	-0.1526	0.5750	0.7167	-0.5223	-0.4873	-1.0096
Japan												-0.5769	-0.3305	0.0872	-0.0091	-0.2704	-0.7600	-0.4982	0.0948
Neth.													-0.1582	-0.4327	0.5984	0.0711	0.5528	0.6232	0.1161
Norway														-0.3503	0.4746	0.0373	-0.1364	0.2319	0.2926
Portugal															-0.6569	-0.4163	0.1090	-0.0484	0.0414
Spain																0.3849	-0.2234	-0.2219	-0.9889
Sweden																	0.3169	0.4416	0.3028
Switz.																		0.1195	0.3606
UK																			0.4821

Table 3.B. Panel C. Change in Cross-Country Correlations at Crisis Dates;Net Exports to GDP Ratio; 1973 - 97

Crisis dates: 1975 - 76, 1981 - 83, 1985 - 86, 1992, 1997																												
	Arg.	Australia	Belgium	Brazil	Canada	Chile	Den.	Finland	France	Ger.	Greece	Indon.	Italy	Japan	Korea	Malay.	Mexico	Neth.	Norway	Phil.	Port.	Sing.	Spain	Sweden	Switz.	Thai.	U.K.	U.S.A
Arg.		-0.4890	0.0245	0.1216	0.4646	0.0135	-0.4782	0.2061	0.2549	0.4229	0.1449	-0.1063	0.0732	0.3804	0.2927	0.1543	0.2063	0.1581	-0.0999	0.0198	0.3549	-0.4965	0.7281	0.2049	0.1163	0.4135	0.3455	-0.5602
Australia			0.6116	-0.1642	-0.4833	0.5779	0.2415	0.3469	0.4563	0.5134	0.5025	0.2147	0.6113	0.0872	0.1258	0.4190	-0.1679	0.3863	-0.2110	-0.6413	-0.0824	0.6743	-0.3266	0.2684	0.9561	0.1825	-0.8283	-0.1049
Belgium				-0.2201	-0.3208	-0.0826	-0.3175	0.1840	0.2947	0.0547	0.2782	0.3807	0.3074	-0.0665	0.0806	0.7631	-0.1387	-0.3080	-0.3183	0.0427	0.0103	0.0562	0.3418	0.0376	0.0486	0.2535	-0.2547	-0.1314
Brazil					0.1913	-0.1624	-0.1453	-0.2299	-0.0216	-0.4890	-0.6992	0.4145	-0.2955	0.0385	-0.3698	-0.2746	-0.0943	-0.2925	0.1560	0.2011	0.1447	-0.3914	0.1754	-0.1422	-0.4991	-0.5291	0.1756	0.0667
Canada						0.2332	0.0610	-0.3461	-0.5639	0.1257	-0.7576	-0.2660	-0.2543	-0.0027	0.0616	-0.5234	0.2270	0.0555	0.1762	0.0904	-0.5156	-0.2147	-0.2146	-0.4181	-0.5784	-0.0294	0.3298	-0.0551
Chile							-0.6962	-0.0287	0.2982	-0.4469	-0.3082	-0.0065	0.1433	0.0829	0.0699	0.5580	0.2179	-0.4542	-0.4965	-0.2277	0.5135	-0.4915	0.4570	-0.0520	0.3304	0.0091	-0.0679	-0.0094
Den.								0.1356	0.0059	-0.3999	0.1550	0.8038	-0.1810	-0.3646	-0.5380	0.0723	-0.1267	-0.2265	0.0719	0.0865	-0.4485	-0.0751	0.1100	-0.0975	-0.3567	-0.0332	0.1438	0.2520
Finland									-0.1041	0.6993	0.0215	0.0956	-0.0378	-0.3529	-0.0381	0.2342	-0.2338	0.3930	0.0839	0.3016	-0.1742	0.2210	-0.1928	0.1215	-0.4081	0.6826	-0.5204	0.0423
France										0.6001	0.1976	0.3041	0.0366	-0.0220	0.2421	0.7361	-0.2216	0.1840	-0.2040	0.4358	0.0194	0.2472	-0.1107	0.0629	-0.2053	0.6056	-0.7388	-0.2310
Ger.											0.1644	-0.2703	0.5290	0.0587	0.0457	0.1140	-0.1449	0.0541	-0.0521	-0.0706	0.2953	0.0186	0.8610	0.4760	0.1971	0.3445	0.3336	-0.1012
Greece												-0.3031	0.1130	-0.4456	-0.3621	-0.3820	-0.7738	0.1558	-0.1642	-0.2619	0.1509	0.1800	-0.6561	0.1990	0.2391	-0.0797	-0.4926	0.7900
Indon.													0.0553	0.1722	-0.1307	-0.3124	-0.3679	0.5684	0.5338	-0.0811	0.3650	0.5837	-0.3066	0.2455	0.3452	-0.6748	0.0809	0.2584
Italy														-0.2225	0.0994	0.4979	-0.0769	0.1594	-0.2508	0.3445	0.1176	0.0408	-0.0073	0.2162	-0.2498	0.8082	-0.7829	-0.0174
Japan															0.0587	0.3247	-0.1430	-0.3425	-0.0707	0.5817	0.4733	-0.3418	0.2975	-0.0867	-0.6437	0.0002	-0.3316	-0.1648
Korea																0.1041	-0.0816	-0.2673	-0.2691	0.1866	0.4830	-0.3355	0.4064	0.1543	-0.1601	0.1493	-0.3618	-0.0739
Malay.																	-0.6396	0.5432	-0.0884	-0.2524	0.8347	0.4066	-0.0223	0.5099	0.8491	-0.0284	-0.7599	0.1867
Mexico																		-0.1587	0.1825	-0.1971	-0.1434	-0.3128	-0.0239	-0.1893	-0.4325	-0.3262	0.2345	0.1844
Neth.																			0.0303	-0.0616	-0.2886	0.0481	0.4049	-0.0518	-0.0661	0.3269	0.2765	-0.0166
Norway																				0.2454	-0.5959	-0.1060	0.0393	-0.1752	-0.4687	0.0031	0.4126	-0.0487
Phil.																					0.4661	0.0586	0.6163	0.1910	0.1154	-0.4376	0.4069	-0.4103
Port.																						-0.0581	0.1981	-0.2232	0.0157	0.2808	-0.4211	-0.5435
Sing.																							0.1432	0.1626	-0.0597	0.5400	-0.3996	0.2262
Spain																								0.1323	-0.5595	0.4363	-0.4911	-0.4084
Sweden																									-0.2517	0.4083	-0.2555	-0.2198
Switz.																										0.6292	-0.9859	0.4346
Thai.																											0.0077	-0.0492
U.K.																												0.0968
U.S.A																												

Table 4.A. Panel A. Cross-Country Correlations at Non-Crisis Dates; Change in CPI; 1880 – 1914

Non-crisis dates: 1881 – 89, 1892, 1894 – 96, 1899, 1902 – 06, 1909 – 11, 1913																		
	Argentina	Australia	Belgium	Brazil	Canada	Chile	Denmark	Finland	France	Germany	Italy	Neth.	Norway	Portugal	Spain	Sweden	UK	USA
Argentina	1	-0.2250	0.1444	0.7743	-0.4259	0.1577	0.4123	0.7039	-0.2688	0.3218	0.2808	-0.8148	0.1174	0.1604	-0.2211	0.3908	0.0631	0.0425
Australia		1	-0.6428	-0.5446	0.1325	-0.3234	0.1570	-0.0324	0.3494	0.3994	0.0193	-0.0412	-0.2000	-0.2708	-0.0829	0.0474	-0.0398	-0.1373
Belgium			1	0.1117	0.1060	0.1103	-0.0255	0.1946	0.0212	-0.6242	0.1045	0.5762	0.0044	0.2193	0.1540	-0.0429	0.0243	-0.2378
Brazil				1	-0.4335	0.4641	0.2786	0.6220	-0.3748	0.2573	0.1218	-0.9009	0.1462	0.2411	-0.2219	0.3975	-0.0968	0.1849
Canada					1	-0.2370	0.3726	0.0745	0.1902	-0.0414	0.0760	-0.1745	0.6978	-0.3553	0.3826	0.4295	0.5908	0.0686
Chile						1	0.0839	0.2354	-0.1025	-0.3457	-0.0853	0.0852	-0.1240	-0.0236	-0.6113	0.0842	-0.6920	-0.1650
Denmark							1	0.7340	-0.1214	0.4932	0.3913	-0.5547	0.4173	-0.3141	-0.0875	0.6922	0.2064	0.2068
Finland								1	0.0457	0.3663	0.1664	0.0765	0.2970	0.0166	-0.1502	0.7177	0.0610	-0.1696
France									1	-0.1048	-0.7287	0.9371	0.0149	-0.0522	-0.1128	-0.1570	-0.1510	-0.9065
Germany										1	0.2753	-0.6378	0.2737	0.1529	0.2637	0.5466	0.3216	0.3029
Italy											1	-0.6291	0.1691	0.3203	0.4500	0.5133	0.2966	0.6130
Neth.												1	-0.8478	0.2292	-0.6328	-0.6928	-0.9382	-0.8007
Norway													1	-0.0497	0.4207	0.6948	0.7479	0.2021
Portugal														1	0.5779	0.2127	-0.0298	-0.1217
Spain															1	0.3532	0.6785	0.2636
Sweden																1	0.4247	0.1822
UK																	1	0.4043
USA																		1

Table 4.A. Panel B. Cross-Country Correlations at Non-Crisis Dates; Change in CPI; 1919 – 1939

Non-crisis dates: 1919 - 20, 1922, , 1924 - 28, 1934 - 38																				
	Argentina	Australia	Belgium	Brazil	Canada	Chile	Denmark	Finland	France	Germany	Greece	Italy	Neth.	Norway	Portugal	Spain	Sweden	Switz.	UK	USA
Argentina	1	0.2579	0.7532	-0.1149	0.6490	0.0279	0.3678	-0.1823	0.4493	0.3634	0.2539	0.1310	0.2124	0.3256	0.0023	0.4753	0.1931	0.6795	0.4391	0.5014
Australia		1	0.4892	0.5950	0.5996	0.0723	0.8778	-0.2790	0.6328	0.5588	0.5000	-0.3079	0.8019	0.8474	0.2245	0.7863	0.5597	0.5745	0.7836	0.6369
Belgium			1	0.3067	0.7313	-0.0488	0.6141	-0.2536	0.8910	0.6119	0.7089	-0.1118	0.4973	0.4535	0.0061	0.4651	-0.0874	0.7333	0.2828	0.7148
Brazil				1	0.2406	0.1807	0.4101	0.4436	0.7353	0.4659	0.7450	0.2583	0.3253	0.1741	0.5684	-0.0065	-0.1795	0.3889	0.2147	0.4116
Canada					1	-0.1646	0.7681	-0.4219	0.5322	0.9225	0.2171	-0.3089	0.8088	0.7151	0.5738	0.6595	0.4021	0.8787	0.7024	0.9669
Chile						1	0.2117	0.1065	0.1295	-0.5013	0.1980	0.1024	-0.1204	0.0582	0.3743	0.0303	0.0309	-0.4591	0.1613	-0.2697
Denmark							1	-0.5607	0.7827	0.6488	0.3678	-0.5567	0.9190	0.9417	0.6740	0.8535	0.5468	0.5909	0.7837	0.7441
Finland								1	0.6923	0.3569	0.2695	0.9364	-0.6423	-0.7153	0.5547	-0.7318	-0.5452	0.3935	-0.3673	-0.3162
France									1	0.6593	0.9606	0.6662	0.4335	0.3566	0.9827	0.1884	-0.8234	0.6323	-0.0053	0.5967
Germany										1	-0.2636	0.3507	0.8613	0.7534	0.4569	0.5597	0.6734	0.9108	0.7241	0.9790
Greece											1	0.2136	0.1628	0.0727	0.2582	-0.0172	-0.6364	0.4352	-0.1328	0.3255
Italy												1	-0.6834	-0.6849	0.2629	-0.6180	-0.4624	0.5815	-0.2758	-0.2751
Neth.													1	0.9271	0.5584	0.8062	0.5776	0.6398	0.7305	0.8287
Norway														1	0.3924	0.9587	0.7581	0.6383	0.8425	0.6640
Portugal															1	-0.0728	0.2911	0.1629	0.5649	0.5728
Spain																1	0.8042	0.6360	0.8347	0.5619
Sweden																	1	0.0956	0.8618	0.2902
Switz.																		1	0.5208	0.8685
UK																			1	0.6199
USA																				1

Table 4. A. Panel C. Cross-Country Correlations at Non-Crisis Dates; Change in CPI; 1973 - 97

Non-crisis dates: 1973 - 74, 1977 - 80, 1984, 1987 - 91, 1993 - 96																												
	Arg	Australia	Belgium	Brazil	Canada	Chile	Den.	Finland	France	Ger.	Greece	Indon.	Italy	Japan	Korea	Malay.	Mexico	Neth.	Norway	Phil.	Port.	Sing.	Spain	Sweden	Switz.	Thai.	U.K.	U.S.A
Arg	1	0.0546	-0.1132	0.5249	-0.0433	-0.1478	-0.1727	0.0362	-0.1912	-0.1275	0.0729	-0.2684	-0.1915	-0.1206	-0.1983	-0.2417	-0.0936	-0.2770	-0.1035	0.0370	0.0046	-0.1507	-0.1606	0.1634	0.1471	-0.1843	0.0444	-0.0960
Aus.		1	0.6368	-0.3869	0.8450	0.5487	0.8537	0.8673	0.7615	0.3907	0.4343	0.5295	0.7820	0.6769	0.6281	0.4486	0.0882	0.5787	0.8623	0.0707	0.6814	0.5307	0.7934	0.6834	0.2877	0.6132	0.8541	0.7067
Belgium			1	-0.3179	0.7499	0.8396	0.8593	0.9091	0.8541	0.8046	0.6788	0.8564	0.8400	0.9386	0.6878	0.8542	-0.2876	0.9215	0.6345	0.6461	0.8070	0.8780	0.6781	0.6482	0.6664	0.7812	0.7503	0.6984
Brazil				1	-0.4711	-0.2314	-0.5266	-0.3263	-0.4986	-0.0671	-0.0386	-0.3196	-0.4787	-0.2698	-0.3135	-0.2958	-0.2375	-0.3125	-0.4710	-0.2083	-0.3856	-0.2126	-0.4511	-0.1011	0.0646	-0.3065	-0.3089	-0.3710
Canada					1	0.5549	0.9206	0.8859	0.9265	0.6415	0.6874	0.6380	0.9009	0.7377	0.8442	0.5604	-0.1345	0.7312	0.8144	0.3205	0.7850	0.6556	0.8114	0.8212	0.5158	0.7460	0.9036	0.9114
Chile						1	0.6663	0.7428	0.5855	0.6679	0.5569	0.9375	0.5420	0.9471	0.5447	0.9316	-0.1340	0.7414	0.4594	0.4241	0.5106	0.9454	0.3626	0.3223	0.7372	0.7620	0.5072	0.4764
Den.							1	0.9307	0.9688	0.6668	0.5735	0.7341	0.9522	0.8177	0.8226	0.6815	-0.1342	0.8328	0.8345	0.3864	0.8204	0.7376	0.8588	0.7062	0.4068	0.7933	0.8837	0.8751
Finland								1	0.8885	0.7020	0.6945	0.7509	0.8914	0.8879	0.7388	0.7029	-0.1043	0.8205	0.8346	0.4637	0.8334	0.7767	0.7741	0.8019	0.5899	0.7608	0.8931	0.7868
France									1	0.7160	0.6681	0.7163	0.9777	0.7671	0.8617	0.6376	-0.2014	0.8442	0.7887	0.4737	0.8322	0.7065	0.8380	0.7455	0.4495	0.7883	0.8921	0.9318
Ger.										1	0.6778	0.7724	0.7321	0.8087	0.7896	0.7879	-0.6121	0.8878	0.3554	0.4086	0.5079	0.8078	0.4979	0.5919	0.7315	0.8185	0.6851	0.7193
Greece											1	0.6940	0.6151	0.6697	0.6902	0.5349	-0.0354	0.5688	0.5777	0.5853	0.5473	0.6886	0.2867	0.6997	0.8383	0.6590	0.6496	0.7178
Indon.												1	0.6712	0.9313	0.7152	0.9300	-0.1574	0.8029	0.5066	0.4859	0.5236	0.9605	0.3840	0.3683	0.7644	0.8697	0.6083	0.6642
Italy													1	0.7523	0.8494	0.6154	-0.2528	0.8722	0.7739	0.4153	0.8058	0.6584	0.8735	0.7747	0.4090	0.7800	0.9352	0.9087
Japan														1	0.7271	0.9300	-0.2517	0.8864	0.6050	0.4514	0.6440	0.9610	0.5674	0.5729	0.7540	0.8689	0.7283	0.6737
Korea															1	0.6584	-0.3321	0.7965	0.6231	0.2119	0.4877	0.7450	0.6096	0.6724	0.5406	0.9257	0.8495	0.9528
Malay.																1	-0.3351	0.8504	0.3907	0.4670	0.4702	0.9624	0.3876	0.3600	0.7248	0.8507	0.5326	0.5499
Mexico																	1	-0.5010	0.3125	-0.0431	-0.0945	-0.2715	-0.2651	-0.1843	-0.2472	-0.3326	-0.2421	-0.2443
Neth.																		1	0.5162	0.4604	0.6821	0.8341	0.7255	0.6374	0.5837	0.8444	0.7834	0.7452
Norway																			1	0.2523	0.6809	0.5009	0.6961	0.7349	0.2636	0.5635	0.7511	0.7009
Phil.																				1	0.6602	0.4641	0.2027	0.3614	0.5381	0.2564	0.2688	0.3066
Port.																					1	0.5165	0.8242	0.7202	0.3893	0.4192	0.7103	0.6414
Sing.																						1	0.4056	0.4608	0.7909	0.8980	0.6159	0.6580
Spain																							1	0.7197	0.1042	0.4946	0.8042	0.6986
Sweden																								1	0.4856	0.5309	0.8213	0.7203
Switz.																									1	0.6536	0.4715	0.4897
Thai.																										1	0.7812	0.8367
U.K.																											1	0.9041
U.S.A																												1

Table 4. B. Panel A. Change in Correlations at Crisis Dates; Change in CPI; 1880 – 1914

Crisis dates: 1890 - 91, 1893, 1897 – 98, 1900 - 01, 1907 - 08, 1912, 1914																		
	Argentina	Australia	Belgium	Brazil	Canada	Chile	Denmark	Finland	France	Germany	Italy	Neth.	Norway	Portugal	Spain	Sweden	UK	USA
Argentina		-0.1303	0.0818	0.3601	-0.3063	0.0576	0.0561	0.4931	-0.3808	0.0621	0.0110	-0.1808	0.1253	0.1750	-0.1839	0.1607	0.0875	0.0761
Australia			-0.4644	-0.3878	-0.1241	-0.4839	0.0534	-0.2098	0.0021	0.1646	0.0544	0.2815	-0.2494	-0.0441	0.0712	-0.1494	-0.2546	-0.3829
Belgium,				0.0897	0.0828	0.1683	0.0839	0.1575	-0.1017	-0.3766	0.0888	0.4854	-0.0060	0.1458	0.1180	0.0288	0.0727	-0.1441
Brazil					-0.4113	0.1867	0.2857	0.3908	-0.2155	0.2539	0.0829	-0.6151	0.0849	0.0479	-0.2223	0.3151	-0.1355	0.2598
Canada						-0.2257	0.0667	-0.1598	0.1542	-0.3884	0.0240	-0.0745	0.2866	-0.6035	0.0983	0.1775	0.0239	-0.4477
Chile							-0.2252	0.0883	-0.2248	-0.4519	-0.2500	-0.1697	-0.0345	-0.1126	-0.3333	0.0618	-0.5385	-0.1919
Denmark								0.1423	-0.2051	-0.0773	0.1559	-0.6122	-0.0997	-0.3745	-0.2984	0.0217	-0.1855	-0.1173
Finland									0.0413	-0.2121	0.0512	-0.1246	-0.0969	-0.2116	-0.2801	-0.0193	-0.3979	-0.3691
France										-0.2686	-0.6565	1.2075	-0.1927	0.0116	-0.1444	-0.3523	-0.1942	-0.9603
Germany											-0.0447	-0.5579	-0.2690	-0.1305	-0.0138	-0.1448	-0.3010	-0.0410
Italy												-0.6459	0.0176	0.0719	0.1704	0.2924	-0.0084	0.1784
Neth.													-0.6696	-0.2786	-0.5714	-0.2995	-0.5511	-0.1120
Norway														-0.2807	0.0104	0.0393	0.0933	-0.0854
Portugal															0.1726	0.0678	-0.3134	-0.2436
Spain																-0.1254	0.1623	-0.0543
Sweden																	-0.1348	-0.1545
UK																		-0.1254

Table 4. B. Panel B. Change in Correlations at Crisis Dates; Change in CPI; 1919 – 1939

Crisis dates: 1890 - 91, 1893, 1897 – 98, 1900 - 01, 1907 - 08, 1912, 1914																				
	Argentina	Australia	Belgium	Brazil	Canada	Chile	Denmark	Finland	France	Germany	Greece	Italy	Neth	Norway	Portugal	Spain	Sweden	Switz	UK	USA
Argentina		-0.0654	0.2895	-0.2856	0.0355	-0.4884	-0.1854	-0.1688	0.1120	-0.0008	0.4580	-0.2170	-0.3403	-0.2373	-0.4535	0.0620	-0.2582	0.0828	-0.2406	0.0118
Australia			-0.0600	0.1780	-0.0868	-0.3803	0.2130	0.0871	0.0719	-0.1046	0.6028	-0.3574	0.0688	0.3250	-0.2679	0.2709	-0.1054	0.1261	0.2387	-0.0929
Belgium				0.0460	0.1182	0.0306	0.4324	-0.1675	0.3842	0.0520	0.5489	-0.1172	-0.0556	0.3620	-0.4435	0.1579	-0.3589	0.2717	-0.0576	0.1223
Brazil					-0.0468	-0.0166	0.1527	0.1571	0.1511	-0.0203	0.3326	-0.2044	0.1084	-0.2112	-0.0402	-0.2146	-0.1448	0.2355	0.0139	0.0558
Canada						-0.5842	0.0339	-0.1293	-0.0724	0.1193	0.4275	-0.7289	-0.0377	0.0980	-0.0741	0.1557	-0.2659	0.1109	-0.1110	0.0032
Chile							-0.3986	0.2777	-0.1353	-0.4604	0.3583	-0.2242	-0.6619	-0.4670	-0.1321	-0.1287	-0.3993	-0.4835	-0.3033	-0.7116
Denmark								-0.2307	0.6247	0.5344	0.6525	-0.7057	0.1154	0.0524	-0.0691	0.1898	-0.1769	-0.0860	-0.0172	0.0056
Finland									0.1093	-0.2683	0.0094	0.4665	-0.3463	-0.4868	-0.0624	-0.4393	-0.2447	-0.0789	-0.2734	-0.0156
France										0.2556	0.4951	-0.1078	-0.0102	0.0654	0.3582	-0.1439	-0.9949	0.1577	-0.3993	-0.0268
Germany											-0.6420	-0.0395	0.2604	0.7313	-0.1132	0.4143	0.1379	0.2760	0.2214	0.1444
Greece												0.1392	0.4958	0.3958	-0.1528	0.3200	0.0680	0.8254	0.3595	0.4797
Italy													-0.8958	-0.8888	-0.2101	-0.5649	-0.5739	0.2524	-0.7074	-0.6864
Neth														0.2303	0.0754	0.1695	-0.2119	-0.1206	-0.0912	0.0242
Norway															-0.2382	0.1381	0.1272	-0.0347	0.0681	0.0692
Portugal																-0.1076	-0.1893	-0.2610	-0.1121	-0.0921
Spain																	0.1848	-0.1598	0.1897	0.1407
Sweden																		-0.7190	0.0048	-0.3385
Switz																			-0.3943	0.1923
UK																				-0.1249

Table 4.B. Panel C. Change in Cross-Country Correlations at Crisis Dates; Change in CPI; 1973 - 97

Crisis dates: 1975 - 76, 1981 - 83, 1985 - 86, 1992, 1997																												
	Arg.	Australia	Belgium	Brazil	Canada	Chile	Den.	Finland	France	Ger.	Greece	Indon.	Italy	Japan	Korea	Malay.	Mexico	Neth.	Norway	Phil.	Port.	Sing.	Spain	Sweden	Switz.	Thai.	U.K.	U.S.A
Arg.		0.3849	0.5535	-0.7588	0.1036	0.6222	0.3808	0.3883	0.4653	0.0537	0.0714	0.4665	0.5427	0.4422	0.1005	-0.1931	0.3287	0.4528	0.2401	0.6998	0.6016	-0.2433	0.5558	0.3026	-0.1477	-0.1671	0.2924	0.0941
Australia			0.1507	-0.1415	-0.0976	-0.0413	-0.0463	-0.0370	0.0159	-0.2037	0.1558	0.0918	0.0729	-0.1312	-0.2307	-0.3051	0.2995	-0.0442	-0.0041	0.0314	0.1682	-0.6031	0.1397	0.1597	-0.0243	-0.5280	-0.1758	-0.2259
Belgium				-0.0467	0.0433	-0.3509	0.0325	0.0283	0.0784	-0.1513	-0.3592	-0.1073	0.1193	-0.2589	-0.1352	-0.4086	0.3306	-0.1078	0.1542	-0.2642	0.0643	-0.6394	0.2230	0.2440	-0.1203	-0.4414	0.0270	-0.0239
Brazil					0.0298	0.0157	0.0657	-0.0684	0.1222	0.3362	0.0442	0.0458	0.1139	-0.0093	0.1444	0.3700	-0.0288	0.1186	-0.0359	0.2578	0.1002	0.2482	0.1202	-0.2721	0.1488	0.1365	-0.0372	0.1361
Canada						-0.4100	0.0537	-0.0776	0.0114	-0.0478	-0.1006	-0.1370	-0.0018	-0.2533	-0.1289	0.1421	0.1766	-0.0481	0.1583	-0.1232	-0.1000	-0.0726	0.0078	0.0440	0.1898	-0.0849	-0.2131	-0.0201
Chile							-0.3490	-0.0950	-0.3311	-0.5245	-0.7598	-0.1079	-0.1392	-0.0593	-0.1198	-1.1168	-0.1779	-0.0761	-0.2460	-0.3874	-0.1977	-1.4338	0.2213	0.0834	-0.9767	-0.8838	0.2684	-0.2987
Den.								-0.0153	0.0083	-0.0479	-0.0523	-0.0874	0.0124	-0.1975	-0.0779	-0.0375	0.1567	-0.0607	0.1300	-0.1200	-0.0492	-0.2556	0.0360	0.2318	0.2431	-0.1795	-0.0947	0.0060
Finland									0.0104	-0.1098	-0.3506	0.0973	0.0575	-0.0505	-0.0004	-0.2619	0.0203	0.0555	-0.0064	-0.1479	-0.0394	-0.5807	0.1729	0.1338	-0.1288	-0.3359	0.0263	-0.0254
France										-0.0414	-0.1284	-0.1068	0.0043	-0.2207	-0.2060	0.0097	0.2992	-0.1104	0.1354	-0.1072	0.0175	-0.2066	0.0406	0.2013	0.2670	-0.2226	-0.1790	-0.0971
Ger.											-0.5204	-0.2698	-0.1003	-0.3245	-0.1170	0.0314	0.1498	-0.1223	0.0977	-0.0776	-0.1080	-0.1580	0.0076	-0.0497	0.0829	-0.1878	-0.1348	0.0250
Greece												-0.7385	-0.0816	-0.7705	-0.4968	-0.2118	0.5776	-0.5573	0.0856	-0.3704	0.0831	-0.3812	0.2483	-0.0952	-0.2436	-0.4705	-0.5231	-0.3027
Indon.													0.0320	-0.0167	-0.0264	-0.6121	-0.1167	0.0583	0.0273	-0.5428	-0.0330	-1.0084	0.3770	0.2669	-0.6628	-0.5794	0.2473	-0.1547
Italy														-0.1209	-0.2048	-0.0679	0.3688	-0.1054	0.1402	-0.0857	0.0853	-0.3137	0.0743	0.1907	0.2200	-0.3269	-0.1612	-0.1317
Japan															0.0379	-0.6826	-0.2458	0.0256	-0.1250	-0.3081	-0.2584	-1.0011	0.1462	0.0489	-0.6327	-0.5444	0.2305	-0.0857
Korea																0.0795	-0.2048	0.0274	0.0325	-0.1134	-0.2157	-0.2056	0.0006	-0.0099	-0.0427	-0.1047	-0.0257	-0.0450
Malay.																	0.0305	-0.3094	0.1927	-0.4142	-0.2342	-0.0592	-0.0204	0.1248	0.0679	0.0482	-0.1647	0.2772
Mexico																		-0.0092	-0.1092	-0.0147	0.5419	0.0359	0.3752	0.3125	0.1543	-0.0803	-0.1575	-0.0886
Neth.																			0.0973	-0.2497	-0.2051	-0.5620	0.0411	0.0609	-0.1305	-0.3343	0.1549	0.0215
Norway																				-0.1160	0.0742	-0.0637	0.1752	0.1633	0.3267	-0.0140	-0.0733	0.1073
Phil.																					-0.1903	-0.2305	0.0093	0.0931	-0.0342	-0.1389	-0.0347	0.0150
Port.																						-0.4158	0.0326	0.1672	0.1318	-0.3233	-0.1853	-0.1694
Sing.																							-0.3068	-0.1265	0.0014	-0.0098	-0.4996	0.0735
Spain																								0.1984	0.3674	-0.2303	0.0292	-0.0301
Sweden																									0.1258	-0.0639	-0.0495	0.0710
Switz.																										-0.0383	-0.1487	0.2686
Thai.																											-0.3537	0.0274
U.K.																												-0.1589
U.S.A																												

Table 5.A. Panel A. Cross-Country Correlations at Non-Crisis Dates; Change in Nominal Interest Rates; 1880 – 1914

Non-crisis dates: 1881 – 89, 1892, 1894 – 96, 1899, 1902 – 06, 1909 – 11, 1913														
	Argentina	Belgium	Brazil	Canada	Chile	France	Germany	Italy	Japan	Netherlands	Sweden	Switzerland	UK	USA
Argentina	1	0.2525	0.3840	0.3624	0.1075	0.4673	0.0091	-0.2209	0.5242	0.1521	0.1944	0.1363	0.3249	0.2601
Belgium		1	0.3322	0.1207	0.2498	0.6391	0.5627	0.3796	-0.1956	0.7665	0.3121	0.4524	0.6827	0.3585
Brazil			1	-0.2917	0.6029	0.3762	0.4447	-0.2397	0.4289	0.1507	0.3749	0.0807	0.1532	0.0310
Canada				1	-0.1075	-0.2198	-0.4676	0.0848	0.0080	-0.0414	0.6715	-0.2909	-0.4302	-0.2647
Chile					1	0.0987	0.3740	0.4190	-0.5051	0.3752	-0.0545	-0.0128	0.1644	0.5635
France						1	0.7232	-0.0804	0.0611	0.6607	0.1162	0.6141	0.7745	0.4113
Germany							1	0.1264	-0.2063	0.7342	-0.0929	0.6266	0.8117	0.6096
Italy								1	-0.2903	0.3467	-0.1462	0.1712	0.0730	0.4241
Japan									1	-0.1215	0.0449	0.2099	0.0471	-0.1093
Netherlands										1	0.0327	0.5673	0.8608	0.6250
Sweden											1	-0.1175	-0.2044	-0.3483
Switzerland												1	0.5717	0.3592
UK													1	0.5717
USA														1

Table 5.A. Panel B. Cross-Country Correlations at Non-Crisis Dates; Change in Nominal Interest Rates; 1919 – 1939

Non-crisis dates: 1919 - 20, 1922, , 1924 - 28, 1934 - 38																	
	Argentina	Belgium	Brazil	Canada	Chile	Denmark	France	Germany	Italy	Japan	Netherlands	Portugal	Spain	Sweden	Switzerland	UK	USA
Argentina	1	0.1213	0.0009	0.5618	0.1941	0.3356	-0.5357	-0.1759	0.9625	0.9944	-0.1750	0.8610	-0.6509	0.1178	-0.2858	-0.1700	0.1531
Belgium		1	-0.6921	-0.0371	-0.2718	-0.2728	0.5080	0.0593	0.1049	0.3285	0.2390	0.7143	-0.7754	0.0318	0.1558	0.5387	0.5389
Brazil			1	0.3996	-0.6890	0.3730	-0.0709	-0.6312	0.0811	-0.0732	-0.4405	-0.4118	-0.0327	0.4944	-0.2355	-0.5503	-0.6219
Canada				1	-0.3007	-0.3036	-0.4910	-0.3139	0.3555	0.0083	-0.0501	0.6201	-0.9577	-0.0013	-0.5393	-0.3735	-0.3579
Chile					1	0.0353	0.1835	-0.0837	-0.3282	-0.6293	-0.2184	0.2089	0.4346	-0.2633	-0.2130	-0.4307	-0.3633
Denmark						1	0.1215	-0.2410	0.4939	0.3023	0.1554	0.2815	0.0734	0.1367	-0.0079	0.6591	0.2930
France							1	-0.0043	-0.3976	-0.2524	-0.1670	-0.8101	0.8730	0.1210	-0.1174	0.3664	0.3624
Germany								1	0.0356	0.0626	0.5748	0.6595	-0.3397	0.1254	0.4453	0.4556	0.5259
Italy									1	0.4553	0.0942	0.7554	-0.5564	0.4158	0.0315	0.3232	0.4388
Japan										1	-0.1438	0.9048	-0.6627	-0.0902	0.0951	0.5923	0.5389
Netherlands											1	0.3778	-0.4672	0.0719	0.5912	0.4361	0.4130
Portugal												1	-0.7116	-0.3621	-0.1064	0.3995	0.6878
Spain													1	0.0725	-0.4758	-0.2855	-0.3370
Sweden														1	0.1553	0.1776	0.3547
Switzerland															1	0.4461	0.5303
UK																1	0.8928
USA																	1

Table 5. A. Panel C. Cross-Country Correlations at Non-Crisis Dates; Change in Nominal Interest Rates; 1973 - 97

Non-crisis dates: 1973 - 74, 1977 - 80, 1984, 1987 - 91, 1993 - 96																												
	Arg.	Australia	Belgium	Brazil	Canada	Chile	Den.	Finland	France	Ger.	Greece	Indon.	Italy	Japan	Korea	Malay.	Mexico	Neth.	Norway	Phil.	Port.	Sing.	Spain	Sweden	Switz.	Thai.	U.K.	U.S.A
Arg.	1	-0.1380	0.4593	-0.6275	0.2598	0.5526	0.3500	0.3208	0.3682	0.4643	0.5700	0.5864	0.1229	0.7652	0.2986	0.5127	-0.1539	0.6052	0.0961	0.4633	0.1544	-0.2063	0.0879	0.4341	0.4754	0.0996	0.3223	-0.0334
Australia		1	0.2973	0.6021	0.6726	0.0631	0.0958	0.0425	0.2464	0.4054	-0.2356	-0.0823	0.2378	0.2070	0.5243	0.0447	0.0510	0.2100	-0.1569	0.0861	-0.1810	0.1726	-0.0142	0.1408	0.3518	0.1871	0.5079	0.6573
Belgium			1	0.1491	0.7177	0.0257	0.2996	0.0359	0.6677	0.7449	0.3014	-0.1332	0.6297	0.2161	0.1956	0.0919	-0.1966	0.9150	-0.0601	0.2633	-0.2577	0.6087	-0.1554	0.1375	0.2490	0.1540	0.7389	0.3551
Brazil				1	0.1504	0.0108	0.0357	0.0697	0.1288	0.1558	-0.3335	-0.7029	0.1205	-0.1384	0.2210	-0.1601	-0.0189	0.0362	-0.2300	-0.0480	-0.0128	0.1598	0.1494	-0.0993	0.2542	0.0427	0.1830	0.2455
Canada					1	-0.0554	0.0559	-0.0457	0.4360	0.6501	0.2468	0.3638	0.4149	0.3834	0.4934	0.0382	-0.1485	0.7111	-0.0907	0.2267	-0.3713	0.5632	-0.2352	0.1711	0.1991	0.3417	0.8579	0.7827
Chile						1	0.1292	0.1359	0.3087	0.1918	-0.2855	-0.1039	0.3281	0.2432	0.0975	0.3673	0.0243	-0.1665	-0.0706	0.2144	-0.4305	-0.4589	-0.2541	0.4218	0.4405	-0.1377	-0.0769	-0.2783
Den.							1	0.1011	0.6388	0.3538	-0.1491	-0.3859	0.3469	-0.3215	-0.0745	0.0403	0.0613	0.1877	0.3861	0.2805	0.3286	-0.1087	0.5943	0.2923	0.1208	-0.2338	-0.1716	-0.1516
Finland								1	0.3104	0.1951	0.0448	0.3663	0.5742	0.3363	0.1633	0.5709	-0.2000	0.2012	0.3754	0.2772	0.7684	-0.4637	0.4114	0.6562	0.7449	0.3872	0.3057	-0.1998
France									1	0.8004	0.0113	-0.1690	0.6252	0.2182	-0.0144	0.5391	-0.0779	0.5856	0.3285	0.4707	0.1291	0.0025	0.1096	0.6859	0.5000	0.2566	0.4486	0.2369
Ger.										1	0.3770	0.0712	0.4138	0.4987	0.3393	0.4387	-0.2124	0.7321	0.2673	0.2392	-0.1076	0.1344	-0.2028	0.5099	0.6283	0.0995	0.6356	0.4248
Greece											1	0.3900	-0.2497	0.5633	0.4138	0.1325	-0.5833	0.4361	-0.0550	0.2493	0.0590	0.3723	-0.2502	0.0035	0.2152	0.1566	0.3039	0.2044
Indon.												1	0.1710	0.4546	0.2559	0.3223	-0.0934	0.1811	0.3625	-0.0728	0.0401	-0.1991	-0.4183	0.3344	0.1541	0.1715	0.3446	0.0489
Italy													1	-0.1811	-0.0985	0.2160	-0.0648	0.5164	0.3115	0.0444	-0.0185	0.2397	-0.0253	0.4668	0.2449	0.3069	0.4948	-0.0132
Japan														1	0.5307	0.5884	-0.3505	0.3173	-0.2396	0.6255	-0.0890	-0.0540	-0.3477	0.3575	0.6298	0.4494	0.5319	0.4502
Korea															1	-0.1015	-0.1657	0.2997	-0.1153	0.1417	-0.0272	0.2538	0.0292	0.0875	0.5541	0.1475	0.4265	0.4035
Malay.																1	-0.3718	0.0388	0.1533	0.5040	0.2937	-0.3304	-0.2862	0.8277	0.5861	0.5630	0.2148	0.1568
Mexico																	1	-0.0376	0.2807	-0.3296	-0.2045	-0.5258	0.3655	-0.2828	-0.2049	-0.4331	-0.1159	-0.1159
Neth.																		1	0.1116	0.1900	-0.1457	0.5090	-0.0447	0.1253	0.3087	0.1623	0.8183	0.3773
Norway																			1	-0.3315	0.3140	-0.4570	0.2126	0.4295	0.1833	-0.2398	-0.0654	-0.2572
Phil.																				1	0.2032	0.0667	0.2339	0.3780	0.3551	0.5319	0.2650	0.2689
Port.																					1	-0.2430	0.5994	0.4094	0.2372	0.4735	-0.2254	-0.1299
Sing.																						1	-0.2466	-0.3028	-0.3022	0.3922	0.4861	0.4549
Spain																							1	-0.0523	0.0278	-0.0637	-0.2562	-0.2306
Sweden																								1	0.6299	0.6010	0.2559	0.1605
Switz.																									1	0.2205	0.4038	0.0833
Thai.																										1	0.5159	0.5648
U.K.																											1	0.6622
U.S.A																												1

Table 5.B. Panel A. Change in Correlations at Crisis Dates; Change in Nominal Interest Rates; 1880 – 1914

Crisis dates: 1890 - 91, 1893, 1897 – 98, 1900 - 01, 1907 - 08, 1912, 1914															
	Argentina	Australia	Belgium	Brazil	Canada	Chile	France	Germany	Italy	Japan	Neth.	Sweden	Switz.	UK	USA
Argentina		#DIV/0!	0.3305	-0.9364	-1.1687	0.5380	0.2371	0.0715	-0.2974	-0.2320	0.7895	0.3949	0.2227	0.2358	0.4170
Belgium,				-1.1257	-0.1557	-0.6158	0.0538	0.0377	-0.5316	-0.0640	-0.0868	-0.1827	0.2061	-0.1552	-0.2956
Brazil					1.0993	-0.6718	-1.0238	-0.6514	0.9077	-0.0152	-0.9342	-0.1250	-0.8272	-0.6702	-0.8193
Canada						0.1423	0.0847	0.2252	-0.2037	-0.3644	0.1520	-0.5071	0.0455	-0.0007	0.3749
Chile							-0.5411	-0.7109	-0.2394	0.6693	-0.5221	0.2950	-0.5161	-0.3294	-0.4548
France								0.0980	-0.2466	-0.4678	0.1143	-0.0982	0.1566	0.0090	0.0332
Germany									-0.3881	-0.3072	0.0157	0.0473	0.0995	-0.0107	-0.0642
Italy										0.1030	-0.2939	0.2579	-0.1305	0.2116	-0.2977
Japan											-0.2465	0.1010	-0.3861	-0.2906	-0.3079
Neth.												0.1166	0.0946	-0.0853	-0.0223
Sweden													-0.0389	0.3714	0.3139
Switz.														-0.0673	-0.1215
UK															-0.0790

Table 5.B. Panel B. Change in Correlations at Crisis Dates; Change in Nominal Interest Rates; 1919 – 1939

Crisis dates: 1921, 1923 , 19229 – 33, 1939																
	Argentina	Belgium	Brazil	Canada	Denmark	France	Germany	Italy	Japan	Neth.	Portugal	Spain	Sweden	Switz.	UK	USA
Argentina		0.5156	-0.1182	-0.2349	0.1602	-0.3911	0.0099	-0.8946	0.2288	-0.6458	-0.3454	0.4039	-0.4136	-0.3473	-0.0542	0.0563
Belgium			0.3788	0.0609	0.3707	-0.4741	-0.4463	-0.2208	0.3117	-0.0685	-0.1913	0.3548	0.0533	0.2898	-0.3743	-0.0116
Brazil				0.1038	0.0718	0.2490	0.1569	0.1569	0.1441	0.2677	0.3668	0.0018	0.1566	0.4494	0.2547	0.6154
Canada					0.1142	0.0246	0.0717	0.0661	-0.1376	-0.1719	0.2548	-0.0496	0.2980	0.0508	0.1707	0.4200
Denmark						0.0598	-0.0132	0.1183	0.1592	0.0367	0.1730	0.1080	0.0470	0.2051	-0.0533	0.1174
France							-0.3617	0.7444	-0.2223	0.7203	0.7413	-0.5485	0.3611	0.8228	-0.3350	0.0696
Germany								-0.1333	0.1342	-0.5459	-0.1439	0.0863	0.1270	-0.6818	-0.0617	-0.7510
Italy									-0.3825	0.1219	0.0196	-0.1870	-0.7404	-0.0264	-0.3593	-0.0903
Japan										-0.1821	-0.0114	0.1466	0.1777	-0.2712	-0.5581	-0.3667
Neth.											0.1367	-0.3534	0.1533	0.0640	0.0595	-0.0504
Portugal												0.2795	0.4490	0.6844	0.1378	0.0714
Spain													-0.0319	-0.3188	0.2450	0.1546
Sweden														-0.0136	-0.1747	-0.4128
Switz.															0.1226	0.1636
UK																-0.4187

Table 5.B. Panel C. Change in Cross-Country Correlations at Crisis Dates; Change in Interest Rates; 1973 - 97

Crisis dates: 1975 - 76, 1981 - 83, 1985 - 86, 1992, 1997																												
	Arg.	Australia	Belgium	Brazil	Canada	Chile	Den.	Finland	France	Ger.	Greece	Indon.	Italy	Japan	Korea	Malay.	Mexico	Neth.	Norway	Phil.	Port.	Sing.	Spain	Sweden	Switz.	Thai.	U.K.	U.S.A
Arg.		0.9234	-0.4911	-0.3696	0.1646	0.3101	-0.2858	-0.2936	-0.3838	-0.7738	-1.0459	0.4136	-0.1727	-1.0975	-0.9971	-0.5913	0.4837	-0.8892	0.4401	-0.3255	-0.4880	0.1926	-0.0782	0.0182	-0.2788	0.3902	0.2785	0.3336
Australia			-0.0780	-1.2600	-0.2696	0.5553	0.2298	-0.1395	0.1144	-0.1607	0.2736	1.0823	0.0568	-0.1195	-1.2054	-0.4329	0.6796	-0.0470	0.6435	-0.4239	-0.1720	-0.0646	0.3828	0.5250	0.0774	0.4460	0.1563	-0.4058
Belgium				-0.1279	-0.2115	-0.4735	0.4465	0.8038	0.2208	0.1491	0.3803	-0.8668	0.2767	0.3258	-0.1179	-0.4129	0.1751	-0.3067	0.8173	0.1786	-0.0238	-0.1917	0.4416	0.3347	0.5709	-0.2998	-0.5046	0.3944
Brazil					-0.5907	-0.6872	-0.0137	-0.1938	-0.0719	0.0614	0.6307	-0.2971	-0.1181	0.2316	0.3762	0.2211	-0.2758	0.2492	-0.1563	-0.1042	0.3839	-0.1366	-0.2056	-0.2794	-0.2690	-0.5458	-0.6949	-0.5317
Canada						0.1347	-0.1273	0.3805	0.0793	-0.1796	-0.0078	0.6362	-0.0472	-0.5624	-0.8036	-0.4726	0.1658	-0.1492	0.4951	0.1282	0.0369	-1.0005	0.1416	0.2333	0.3162	-0.3865	-0.7063	0.0907
Chile							-0.2967	-0.4739	-0.4465	-0.7867	-0.2842	1.1039	-0.5885	-0.8155	-0.9245	0.0015	0.4429	-0.3997	0.1888	-0.2821	0.6567	0.1929	0.3684	-0.4073	-0.7654	0.3096	0.0889	0.0939
Den.								0.6348	0.0424	0.2424	0.7131	-0.6141	0.4603	1.0460	-0.0285	-0.0575	0.3913	-0.0438	0.3873	-0.1895	-0.4524	0.9393	-0.0562	0.1957	0.4533	0.3583	0.5294	0.3379
Finland									0.2201	0.2288	0.6820	-1.3663	0.1016	0.2270	-0.2298	-0.4766	0.2349	-0.1232	0.3728	0.4047	-0.8682	0.9255	-0.4115	-0.1966	-0.2522	-0.7051	-0.1569	0.6344
France										0.0738	0.5331	-0.8310	0.2993	0.0440	-0.1556	-0.7334	0.3040	-0.0062	0.4125	-0.3109	-0.3214	0.1899	0.3951	-0.2308	0.2160	-0.4536	-0.4099	0.4229
Ger.											0.1975	-1.0712	0.3936	-0.0616	-0.0236	-1.0034	0.1162	0.1163	0.2246	-0.1995	-0.2361	0.1255	0.5113	-0.1390	0.2325	-0.0855	-0.4150	0.2970
Greece												-1.3900	0.8691	0.0975	-0.3708	-0.3949	0.9114	0.0426	0.6145	-0.0873	-0.1918	-0.0164	0.4090	0.6532	0.3071	-0.3627	-0.0575	0.0633
Indon.													-1.1710	-1.4546	-1.2559	-1.3223	-0.9066	-1.1811	0.6375	1.0728	-1.0401	1.1991	1.4183	-1.3344	-1.1541	0.8285	0.6554	0.9511
Italy														0.7097	0.1034	-0.3469	0.2751	-0.0901	0.5508	0.0745	-0.3638	0.1943	0.6781	0.1040	0.3495	-0.3156	-0.3173	0.5906
Japan															-0.1646	-0.9237	0.5033	-0.0998	0.7227	-0.7030	-0.3678	0.9066	0.6735	0.1942	-0.2293	-0.0789	0.1020	-0.3682
Korea																-0.1699	-0.5457	0.0346	-0.2855	-0.2839	-0.2823	-0.0392	-0.0520	-0.4435	-0.6266	-0.0954	-0.5233	-0.3669
Malay.																	0.4007	-0.8497	-0.1070	-0.2090	0.2799	0.3153	0.3916	-1.2012	-1.2212	-1.1051	-0.8719	-0.6558
Mexico																		-0.1248	0.1832	-0.0651	0.1800	0.6762	0.0702	1.0071	0.2677	0.7126	0.5129	-0.1788
Neth.																			-0.0237	-0.2765	-0.1906	-0.6179	0.0155	0.1389	0.4589	-0.1185	-0.6020	0.2996
Norway																				0.5899	-0.6383	0.9090	0.3579	0.3025	0.2648	0.3054	0.3965	0.7195
Phil.																					0.1701	-0.0647	-0.7809	-0.5788	-0.0498	-1.1709	-0.5371	0.1638
Port.																						0.0934	-1.0872	-0.9675	-0.3828	-1.2237	-0.3953	-0.3041
Sing.																							0.5715	0.5833	0.6147	-0.0590	0.0123	-0.5748
Spain																								0.5373	-0.0566	0.4513	0.4023	0.2252
Sweden																									-0.2505	-0.1744	0.4203	0.1144
Switz.																										-0.1606	0.0226	0.6063
Thai.																											0.3024	-0.5811
U.K.																												-0.4823
U.S.A																												