Foreign Capital and Economic Growth in the First Era of Globalization*

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Abstract

The First Era of Globalization, 1870-1913, was marked by a degree of integration in goods and financial markets comparable to that which prevails today. It also exhibited a large number of financial crises that unfolded in ways very similar to those experienced since the 1970s. In light of skepticism about whether market-based finance is good for development, this paper will reexamine the impact of capital market integration on economic growth during this period. First we will explore whether there are growth benefits from participation in the international capital market. Second we will analyze the side effects of open international capital markets. Between 1880 and 1913 financial crises that accompanied sudden stops meant that any growth advantages to greater inflows of foreign capital were greatly diminished. We then look at several determinants of debt crises and financial crises including the currency composition of debt, debt intolerance and the role of political institutions. We argue that the set of countries that had the worst growth outcomes were those that had currency crises, original sin, poorly developed financial markets and presidential political systems. Those that avoided financial catastrophe generated credible commitments and sound fiscal and financial policies. Such countries succeeded in escaping major financial crises and grew relatively faster despite the potential of facing sudden stops of capital inflows, major current account reversals and currency speculation that accompanied international capital markets free of capital controls.

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1. Introduction

The period from 1870-1913 was a period of globalization in both goods and financial markets comparable to the present era of globalization. Growth of international trade surged, so that by 1913, the principal economies of the world had ratios of merchandise exports to GDP of at least 15 percent. .Globally the figure almost doubled from 4.5 to eight percent between 1870 and 1913. Transportation costs fell, and tariffs stayed low compared to their levels after 1913. It was also an age of mass migration with few impediments to the flow of people across borders. Financial globalization burgeoned--current account deficits persisted for long periods, and many nations imported foreign capital to the tune of at least three to five percent of GDP each year. In 1913 Obstfeld and Taylor (2004) estimate that the ratio of net foreign liabilities to global GDP was on the order of 25 percent. Of great importance, capital controls were non-existent.

Today, opponents and supporters of "globalization" argue vigorously about the benefits of such a process. With respect to financial globalization, optimists suggest that opening up to global capital markets can make crucial investment funds available, enhance risk sharing, transfer technology and reign in errant policy makers. Pessimists suggest that global capital flows are fickle and move for reasons unrelated to fundamentals causing financial disruption and economic volatility. Decoupling from the global capital market through the use of capital controls can help protect a country from temperamental financial markets.

Optimists might cite as evidence for their view the late nineteenth century when many countries seem to have benefited from the free movement of capital. The areas of recent European settlement such as Australia, Canada, the United States, and even parts of Argentina and Brazil had high standards of living and witnessed rapid economic growth. Inward investment to these areas, coming largely from Great Britain, was massive prior to 1913. Much of this financing went into fixed interest rate long-term bonds that national governments and local companies issued in London, but equity investments were important too. By 1913 a majority of overseas investment was direct

investment. Early in the period, conventional wisdom holds that funds were essential in building productive capacity and improving the infrastructure that would allow goods to reach ever larger international markets. Such investment also enhanced technology transfer from the core to the periphery.

Investment in machinery and equipment is often acknowledged to be a driver of growth as in Delong and Summers (1991). But it is not totally clear from basic growth theory that greater investment per effective worker leads to significantly faster economic growth. Gourinchas and Jeanne (forthcoming) argue that financial liberalization may not be associated with large increases in the growth rate. Moreover, many countries fail to channel available funds into productive investments. They often squander them instead on frivolous military campaigns or excessive public consumption. In addition, some countries are unprepared for the rapid cessation of capital inflows that seem to periodically afflict open international capital markets. Like today, nations in this earlier period had to contend with financial crises--many of which have great resonance for recent experience. In both eras, many emerging countries faced sudden stops accompanied by currency crises, banking crises and twin crises. They also faced a number of debt crises and all-encompassing financial crises.

This leads us to ask several questions:

- Did borrowing and integration into the global capital market of the time confer growth benefits? Was reliance on the global capital market associated with faster economic growth?

- Did the numerous financial crises and sudden stops of the era reduce the growth benefits of unencumbered international financial integration?

- What were the determinants of financial crises? Why were some countries able to borrow so heavily and have so few financial crises while others borrowed relatively little and still suffered from financial meltdowns?

In terms of fundamental causes of financial crises, *original sin*, *debt intolerance* and *currency mismatches* have been recently cited as key problems in debt management, and as a matter of fact, many, if not most, countries suffered from *original sin* in the first era of globalization. The external, and even the domestically issued debt they accumulated to finance their development was largely denominated in foreign currency or in terms of pre-defined amounts of gold through "gold clauses", just as emerging market debt today is almost entirely denominated in dollars, euros or yen. When the exchange rate depreciates, debt service in gold or foreign currency becomes very difficult leading to default, the consequent drying up of external funding and economic collapse. We wish to ascertain whether different debt structures might play a role in explaining the difference in crisis incidence.

We also wonder if debt management policies that created or alleviated balance sheet mismatches as discussed in Goldstein and Turner (2004) mattered. We examine whether poor reputation and accumulated default experience was a problem as hypothesized by Carmen Reinhart, Kenneth Rogoff and Miguel Savastano (2003) in their work on *debt intolerance.* Finally we check whether politics matters since Kohlscheen (2006) has argued that presidential systems are one reason nations have been serial defaulters since 1960.

After accounting for all of these factors, we find striking evidence consistent with modern theoretical developments on financial crises that examine the way capital markets, balance sheets, exchange rates, financial development and politics interact. But the emerging country experience was quite varied. Although most capital importers had original sin, some were relatively financially mature and a few had crucial political institutions that generated credibility. There were few crises in these countries. These countries are very likely to have experienced positive growth benefits from integration.

But in other places, financial mismanagement, financial underdevelopment or severe imbalances led to currency mismatches. These made debt payments more onerous and tended to push countries to the brink of default. When capital markets became illiquid, the accountability of the executive branch of government, something determined by the constitutional framework, led to crises of confidence and ultimately to significant differences in the willingness of countries to continue servicing their debt. We find that

presidential countries (i.e., where the executive did not rely on the legislative branch for continued tenure) were significantly more likely to default.

Our assessment of the benefits of capital market integration is thus mixed. Our findings are also based somewhat more on correlation than on evidence that would allow us to argue unambiguously for a causal role of capital market integration in spurring economic growth. Nevertheless, the evidence is suggestive that the growth benefits of integration for many countries were positive after controlling for the incidence of crises., However holding integration constant, crises paired with sudden stops seem to be associated with slower growth leading to lower levels of output per capita in every year after a crisis. We discuss the reasons countries were more likely to suffer crises. Nations that had the strongest growth in this period of freely mobile international capital were those that had robust financial systems and a certain set of institutions and safeguards in place that shielded them from severe financial crises.

2. Background and History on International Capital Markets

The period between 1880 and 1913 was one of deep integration in international capital markets. Capital moved across borders freely and with virtually no controls. With the recent decline in capital controls in many important countries, there has been a surge of interest in this earlier period. This is not surprising. The first period of globalization was a period free of capital controls and where market-based financing of both the core and periphery reigned. Trade costs were low between many core countries and they declined quickly between the core and the periphery due to technological revolutions in transportation and communications, exceedingly low-tariffs in Great Britain and the rise of a global system of fixed exchange rates under the classical gold standard (Jacks, Meissner and Novy, 2006). Box 1 discusses the main features of the first wave of globalization.

At the core of this globalized economy was Great Britain. She had experienced an industrial revolution slightly earlier than other countries and had also accumulated a vast surplus of savings. This surplus was channelled through the City of London to borrowers from all over the world. Net inflows were large even by contemporary standards. Figure 1 shows the average ratio of the current account to GDP in the economically advanced core (excluding the main capital exporters), the economically advanced capital importers and the poorer regions of the world.[1] In the core capital importing countries, the average deficit in the later part of the period was on the order of three to five percentage points of GDP. On average the current account deficit in countries such as Australia, Canada, New Zealand and the US, was on the order of three percent and much higher in many years. In the periphery the levels were somewhat lower in absolute value. Great Britain exported the majority of capital flows while France, Germany and Holland provided somewhat smaller amounts. In Great Britain the current account surplus never fell below one percent of GDP and averaged over four percent of GDP the entire period.

Schularick (2006) estimates a global measure of capital market integration (gross world assets divided by global GDP) to be about 20 percent in 1913 while today he estimates it at roughly 75 percent. However, much of today's "integration" is about rich-to-rich gross flows. Gross inflows (which are widely assumed to equal net flows) into the less developed world were much larger in the first era of globalization as Obstfeld and Taylor (2004) and Schularick (2006) discuss. This was a period less afflicted by the so called Lucas Paradox whereby foreign capital shies away from poor countries.

Capital exports from Britain took the form of fixed income bond finance, private bank loans and direct investment. Early in the period portfolio investment dominated, but by 1913 Svedberg (1978) argued that direct investment accounted for over 60 percent of all foreign investment. The type of inflow varied by country and by period. Marketable bonds were typically placed by London investment banks such as the Rotshchilds or Baring Brothers amongst many others. Bonds were traded on the London Stock exchange

[1] We define the core countries to include Belgium, Denmark, Norway, Sweden and Switzerland. France, Germany, Great Britain, and the Netherlands. These are a group of capital exporters and/or financial centers. We place Australia, Canada, New Zealand and the United States into an "offshoots" category. These regions were extensive capital importers and also had a special institutional heritage being members (or once having been members) of the British Empire. The periphery is defined to include Argentina, Austria-Hungary, Brazil, Chile, Egypt, Finland, Greece, India, Italy, Japan, Mexico, Portugal, Russia, Spain, Turkey, Uruguay

and daily quotes were available in the *London Times*. Obstfeld and Taylor (2004), Mauro and Sussman (2006) and Flandreau and Zúmer (2004) all contain interesting discussions on the details of high finance in this first era of globalization. Obstfeld and Taylor (2004) emphasize that covered interest parity held tightly for a number of core countries. Mauro and Sussman study the efficiency of the London bond market and pay particular attention to the reactions of bond yields to political information. They argue that markets moved on news of domestic political turmoil and that comovement amongst bond prices was much lower than it has been in the past twenty to thirty years. Flandreau and Zúmer (2004) discuss at length the models that institutional investors used to judge the finances of recipient countries. They argue that the ratio of interest payments to revenue was one of the key determinants of countries sovereign risk assessment since nominal debt values can carry significantly different interest burdens. Moreover they show evidence of threshold effects in judging sustainability. The marginal increase in the bond spread for a one percent increase in the interest to revenue ratio for less indebted countries (i.e., lower than 20 to 30 percent) was virtually nil while above this point it was large and positive.

A large amount of British lending went to the British Empire. Ferguson and Schularick (forthcoming) argue that these regions paid less for their capital than other similar countries outside of the empire. This was natural because of the nature of property rights, political ties and other institutional distortions such as the Joint Stock Acts. Property rights and political ties would tend to reassure investors that debts would be repaid. As a matter of fact *no* British colony ever defaulted in this period.

Clemens and Williamson (2004) find little evidence that Empire mattered for the quantity of capital imported. They note that key recipients of capital such as Canada, the various colonies of Australasia and other new world regions were richly endowed in natural resources, high in human capital and scarce in labor and capital. Such a combination apparently made for profitable investment relative to the domestic opportunities and those available in labor abundant resource poor Europe. After controlling for these factors, they find that the British empire did not receive greater inflows from Britain (i.e., quantities) than other regions such as Latin America and Asia. France was the second largest capital exporter. The volumes exported were about half those of Britain. French capital was mainly directed eastward towards Russia and also to

other outposts in the French sphere of geo-political influence (cf. Fishlow, 1986). Politics rather than the market is widely believed to have determined where a significant portion of French funds ended up. Loans would be granted if strategic purposes would be served or special industrial interests could be assured of a market for their wares.

Previous work by Edelstein (1982) has shown that ex post returns on British foreign investments were not extremely high compared to the alternatives at home and that debenture return differentials converged by 1910. Nevertheless, Figure 2 shows that as capital markets developed further between 1870 and 1913 and low inflation reigned, nominal bond yields (the coupon yield divided by the price) converged dramatically. This evidence would be consistent with the idea that default risk fell over the period as development proceeded and projects and countries matured. Meissner and Taylor (2006) also show that the British yield on foreign investments relative to the yield paid on liabilities outstanding fell over the period. One reading of this is that international capital markets became more competitive and the number of high yield projects fell over time.

On the receiving side, contemporaries mostly viewed foreign inward investment as something to be coveted. American, Japanese and Russian policy makers amongst many many others of the period cited the need to attract greater foreign capital as one of the reasons to join the gold standard and fix their exchange rates to the British pound. Foreign capital was viewed an essential ingredient for these savings constrained economies. Without it they argued that further development of their economic potential would have been limited. Fishlow (1986) remarks that foreign investment accounted for about 20 percent of total investment in the typical developing country of the time and up to 50 percent in Australia, Canada, Argentina and Brazil.

The ratio of public borrowing to private varied over time. Clemens and Williamson (2004) tabulated the data available in Irving Stone (1999) based on gross capital issues (gross inflows) on London markets for the period 1870 to 1913. New capital issues were split roughly 55 percent to public and 45 percent to private entities in the 1870s. The share of public investment declined secularly over time to 33 percent between 1886 and 1893 and 28 percent between 1907 to 1913. Measuring these shares is complicated because many governments of the time guaranteed railway debt and so the actual liability fell to the government in many cases. Heavy government involvement in

borrowing wasn't necessarily synonymous with unproductive borrowing as vital infrastructure development was often managed by national and local governments.

Fishlow (1986) characterized countries as revenue borrowers or development borrowers. We examined an investors' almanac of the period called *Fenn on the Funds* to gain further insight into this distinction, and Box 2 discusses this distinction further. In 1874 this manual provides short outtakes from the bond prospectuses for each and every sovereign borrower on the London market. Australasia, the component colonies of the future South Africa, and Canada and its provinces borrowed the vast majority, if not the strict entirety, of funds for railroads, harbors, sewage systems, and other infrastructure. For these places, Fenn's manual would often state something to the effect that 'the vast majority of funds have been for internal improvement'.

Other bond issues in countries like Russia (an issue to strengthen the specie [reserve] fund), Japan (to pay charges on pensions), Egypt (Pasha loan for re-payment of existing debt), Austria (an issue in 1851 to improve upon the value of the paper florin), and India (debt issued for many wars including the Sepoy mutiny of 1857) borrowed to plug revenue gaps or to fund offensive, defensive and civil wars. Many of these same countries had considerable amounts of issues dedicated to unspecified ends in the prospectuses. Of course unsound investment would often be greeted coolly by the market with a low price at its initial public offerings.

It is difficult to sort out whether new issues for unspecified projects were simple consolidations of old productive debt, whether war finance should be classified as productive spending or not (since the vanquished often paid large war indemnities or suffered economic repression), and to know the actual share for each country of sovereign borrowing versus private borrowing. Therefore we have not been able to systematically assess whether countries were revenue or development borrowers for each and every year of the period. Future work could attempt to delineate more clearly each kind of borrower and to correlate this variable with subsequent economic growth.

Another problem is that it is not clear whether this source and the productive/revenue dichotomy could adequately characterize countries' prospects. For 1874 we catalogued the issues for the entire set of economically important countries. We found that for countries like the US (federal financing of the Civil War we know), and

even Canada (which the very same source reported as being a sound infrastructure borrower), a majority of its issues were listed as unspecified. Compounding the difficulties would be judging between the quality and management of the projects such as railroads that actually seem on paper to be for productive purposes. For example in Bolivia one issue was for the construction of a canal to the Atlantic. This project failed to prove technically feasible and the market value of the issue sank.

Despite these difficulties, we totalled the face value of all bonds listed in Fenn's 1874 edition that clearly stated in the abstracted prospectus that the bond was issued for infrastructure or other productive investment. We then divided this value by the total face value of bonds outstanding. As a matter of fact the yield spread roughly captures these distinctions. For bond spreads we use data based on Bordo, Meissner and Weidenmier (2006). The spread is calculated for a long-term issue listed in London and payable in gold minus the British consol yield.[2] The correlation between the spread and the ratio of bonds issued for productive purposes to total bonds is -0.25. Figure 3 plots the spread versus the ratio and reveals a negative correlation. The coefficient on the spread in a regression is -0.03 and has a robust t-statistic of -1.96 (p-value = 0.06). Thus the bond spread can be considered a more continuous measure of development versus revenue financing. Figure 3 reveals that both types of countries inhabited the market during this period of open capital flows. Moreover, the calculation is not perfect. We see Turkey (i.e., the Ottoman Empire), a fiscal disaster with a high spread but Brazil and the US with equivalent measures of productive spending and low spreads. The latter two had sound finances and solid reputations (see Summerhill 2006 on Brazil). Moreover it is likely that some of the unclassified debt was actually put towards productive uses or markets had the belief that this would be the case.

In sum, a sort of proto-Washington Consensus of free trade, fixed exchange rates, and liberal economies more or less reigned between 1880 and 1913. Capital markets became strongly integrated and nations relied on foreign and domestic capital to finance new projects aimed at meeting the demand of ever-larger and wealthier global markets, but also for bringing forward future revenue that they hoped for or expected.

[2] The consol was the British long-term bond payable in sterling which was solidly convertible into gold. This calculation is the period equivalent to today's calculation which would subtract the long-term US treasury yield from the yield on a domestic dollar bond of equivalent maturity.

3. Economic Growth and Foreign Capital in Theory and Empirics

The theoretical case for capital market integration is nearly the same as that for free trade. Opening to foreign capital allows for resources to be allocated where they are most needed. In addition, risk sharing is also enhanced with globally integrated capital markets. It is also argued that policy is improved since footloose capital harnesses errant policy makers.

Recent research on these benefits has not been as unambiguous about the salutary effects of globalized capital. In a standard Ramsey-style growth model, Gourinchas and Jeanne (forthcoming) argue that the long-run growth and welfare effects of capital market liberalization are surprisingly small. In the short run however, a country that has an initial capital to labor ratio of one-half its steady state value, the growth rate in output would rise after a move from financial autarky to financial liberalization by only 0.5 percentage points. In the long-run, say after five years the gorwth effects are negligible. The reason is that opening up speeds a country to its steady state. And since in a standard growth model convergence towards the steady state is quite quick (11.49 percent of the output gap is eliminated each year in the Gourinchas and Jeanne calibration) most countries are on average very near their steady state already, the growth and welfare impact is small. To get a larger impact, one would have to argue that capital market liberalization *changes* the steady state potential of a country.

Other studies based on contemporary empirical evidence are inconclusive. Edison, Levine, Ricci and Slok (2002) suggest there is no evidence against the null hypothesis that international financial integration does not raise the growth rate of per capita output. Prasad, Rajan and Subramanian (2006) find little evidence that greater reliance on foreign capital is accompanied by higher growth rates and some evidence that higher growth accompanies less reliance on foreign capital.[3] Nevertheless Schularick and Steger (2006) apply the Edison et. al. methodology as closely as possible to the years

[3] See Kose et al (2006) for a survey of these issues.

between 1880 and 1913. They argue that there was a positive association between gross capital inflows from Britain and growth between 1880 and 1913.

Indeed, the conventional wisdom is that borrowing on capital markets was important for economic growth. Fishlow (1986) argued "[F]oreign investment was central to the trade and growth performance of most of the recipients in the late 19th century…" James Foreman-Peck (1994) claims that by adopting the gold standard Russia lowered its cost of capital, increased its imports of capital by 50 percent, or one percent of national product, and raised the growth rate of total output by perhaps one half of a percentage point. Collins and Williamson (2001) estimated that the decrease in investment from higher relative prices of capital goods was likely to decrease economic growth.

Notwithstanding this conventional wisdom, there are few papers that consider financial crises and integration together to assess the overall growth benefits of open international capital markets.[4] Financial crises and sudden stops of international capital flows seem to be part and parcel of liberalized international capital markets. Crises are known to be costly events in terms of output losses, and they most likely reduce welfare due to market coordination failures.[5] Moreover crises were not rare events in this period.

In Figure 4 we present the frequency of various types of financial crises (banking, currency, twin, debt, "third generation" crises and all types of crisis together) for the period 1880 to 1913.[6] The frequency is measured as the number of years a country was in crisis divided by total possible years of observation. We use the country-year as the unit of observation and eliminate all country-years that witness ongoing crises to come up

[4] Eichengreen and Leblang (2003) is an early exception. They look at our period plus evidence from the following 100 years and concluded that capital controls are associated with higher growth and crises are associated with lower growth. Their measure of integration is whether a country has capital controls or not. No country had such controls in our period so we use information on gross inflows as in Edison et. Al. (2003) and Schularick and Steger (2005).

[5] Allen and Gale (2000) analyze theoretically the possibility that banking and currency crises can be optimal. Marion (2000) argued that the assumptions of their model are unlikely to be fulfilled in practice. What one needs is that countries can issue large of amounts of debt in their own currency abroad and lend in equally large amounts to other countries in foreign currency. Since original sin was a fact of life even in this period it is unlikely that financial crises were optimal in the sense of Allen and Gale.

[6] Box 3 explains the various types of crises we consider and how we define them. Our crisis dates are listed in the appendix to Bordo and Meissner (2006a).

with a total number for years of observation.[7] We see the pattern found in Bordo et. al. (2001) in terms of the relative frequency of types of crises. The predominant form of crises before 1914 was banking crises, followed by currency crises, twin and then debt crises.[8] Bordo et al. (2001) and Bordo and Meissner (2006a, 2006b) noted in previous work that the recent period between 1973 and 1997 seems slightly more crisis prone. The incidence of nearly all varieties of crises is much higher relative to the past although crises are still quite uncommon overall. Mitchener and Weidenmier (2005), in a more inclusive sample, document 46 debt defaults by 25 different countries (out of roughly 40 to 50 sovereign countries) between 1870 and 1913. Overall, the average country could expect to be in crisis once a decade prior to 1913.

Another feature of the open capital markets landscape is the sudden stop. Sharp reversals in the current account or snap decreases in the inflow of foreign capital are alleged to be problematic for countries suffering from currency mismatch and which also are not very open to international trade (cf. Calvo, Izquierdo and Mejía, 2004). Calvo and Talvi (2005) show how Argentina and Chile both suffered a sudden stop. Financially fragile Argentina was hit by an "excruciating collapse" but Chile was hit by a growth slowdown. Adalet and Eichengreen (2005) note that current account reversals or sudden stops do not always come along with currency crises. In the period 1880-1913, they note that 15 percent of the crises preceded by current account deficits ended in a sudden stop, whereas the percentage was 37 percent between 1973 and 1997. Finally Bordo (2006) shows that the average (unconditional) output loss from a financial crisis was small, but it was large when the sudden stop was accompanied by some sort of financial crisis (banking, currency, twin, or debt). In Figure 4 we also give the incidence of sudden stops and the incidence of sudden stops accompanied by some sort of a financial crisis. We see that only about one-eighth of the sudden stops were accompanied by some sort of a financial crisis.

Bordo et al. (2001) also studied growth losses from financial crises. They found that the (unconditional) drop in the growth of income per capita during various types of

[7] For third generation crises we do not eliminate ongoing banking and currency crises and in the sudden stop and crisis measure we allow ongoing banking, currency or debt crises to enter the set of country-year observations.
[8] Debt crises were not studied by Bordo et al. (2001)

crises was 30 to 50 percent larger in the first era of globalization than between 1973 and 1997.[9] Overall, currency crises and banking crises were associated with growth losses of roughly eight percentage points, and twin crises with losses of upwards of 14 percentage points. At a trend growth rate of roughly 1.5 percent these are equivalent to losses of over four years worth of trend growth. The average length of these crises was between two and four years making for rather sharp downturns in the event of a crisis. So even though crises seem less frequent in this period than today, those countries that experienced them almost surely suffered important setbacks in economic progress. There is little doubt then that any assessment of the net impact on growth of global capital market integration needs to include financial crises. In the next section we attempt to gauge the growth benefits of capital market integration after accounting for financial crises. After that we proceed to isolate the determinants of financial crises and hence to ascertain how some countries were able to minimize their losses in the earlier period of unfettered capital flows.

We use several measures of integration into or reliance on the international capital market. The first, the current account relative to GDP, measures the period net inflow or outflow of capital. The scatter plot in the upper left hand corner of Figure 5 reveals no clear correlation between growth and net capital inflows. This data is for only those countries with a negative current account and covers 25 countries for a total of 783 country-year observations.

The next panel in the northwest corner uses a measure of gross inflows. This is data from Stone (1999) on total capital calls on London and includes public and private issues of debt effectively purged of refinancing issued. The conventional wisdom for the period is that gross flows were roughly equal to net flows for the capital importers (cf. Obstfeld and Taylor 2004). This panel also reveals no systematic relationship between growth in the years following large inflows.

The lower panels use stock measures. The lower left panel places the public debt to revenue ratio on the x-axis. The intent is to see if official borrowing either internationally or domestically had any impact on growth. A negative relationship is

[9] The statistic is the cumulative growth loss from the initial year of a crisis until resolution. The loss in each year is calculated as the difference between the pre-crisis growth trend and the actual growth rate of per capita output.

evident here. Canada, the uppermost point in the scatter is an outlier as much of its infrastructure improvement was funded publicly or guaranteed publicly but it also had the highest growth rate of the period. This unusual case stands out in the lower right panel as well. We also use the average (taken between 1880 and 1913) of the ratio of cumulative inflows of capital (where annual inflows from the Stone data are accumulated up to the present year) to GDP against the average rate of growth of per capita output between 1880 and 1913. This is the lower right panel in Figure 5. No particularly strong relationship is visible here either.[10]

In the three panels of Figure 6 we break the period into three parts (1880-1889, 1890-1899, and 1900-1913). We also average the growth rates within the period and average the ratio of gross inflows to GDP within each period. Schularick and Steger (2005) reported a strong positive relationship between 1900 and 1913 in a simple regression of average growth on the average level of capital inflows, initial income, enrolment rates and the primary fiscal surplus and inflation. We exhibit the same relationship here but note that strong sample selection bias is also evident by looking at the first and second periods. In the first period there is no obvious simple correlation and in the second period, a period of financial turmoil beginning with the Baring crisis, a default in Portugal, American free silver problems and further debt defaults in Portugal and Greece, there appears to be a negative relationship.[11]

Table 1 explores these correlations further with regression analysis. Here we run regressions of the following form

$$Growth_{it} = \alpha_0 + \alpha_1 Integration_{it} + \alpha_2 (\Delta Population_{it}) + \alpha_3 Enrol_{it} + \alpha_4 Growth_{it-1} + \alpha_5 \overline{Growth_t} + \mu_i + \varepsilon_{it}$$

Where *Growth* is the annual growth of per capita output $,\overline{Growth_t}$, is the average growth rate of per capita output for the set for countries for which growth observations are available, *Integration* is one of the four measures of capital market integration suggested above, Δ *Population* is the annual percentage change in the population, *Enrol* is the

[10] Separating flow to the private sector and flows to the public sector does not change the look of our scatter plots.
[11] A similar picture emerges if we use the lagged average inflows from the period 1880-1889.

percentage of the population aged 14 and below enrolled in primary school, μ is a country fixed effect and ε is an idiosyncratic error term.[12] Note we control for lagged levels of output per capita by using the lagged growth rate.[13]

In columns 3 and 4 we implement the following regression for the year 1913

$$\overline{Growth_i} = \overline{Integration_i} + \overline{\Delta Population_i} + \overline{Enrol_i} + \ln\left(\frac{GDP_{i1880}}{Pop_{i1880}}\right) + \varepsilon_i$$

where the bars denote averages for the period 1880 to 1913 and the value of initial GDP per capita in real terms is used as a standard conditional "convergence" term.

Finally in columns 6 and 7 of Table 1 we implement the GMM estimators used by Schularick and Steger (2005) and Eichengreen and Leblang (2003).[14] This takes care of the potential endogeneity of the lagged income term and the error term when including fixed effects.

Few of the measures of integration in Table 1 display a positive statistically significant relationship between economic growth and capital market integration. This is true whether we use flows and annual data or stocks and long-run average growth. In unreported regressions we separated private from government inflows of capital and found little difference in their coefficients in the growth regressions. More importantly there is even some evidence that growth was lower the more a country relied on market capital. The regression using the debt to revenue ratio shows that countries with higher debt to revenue ratios had lower average growth rates. Column 3 would have a negative and statistically significant coefficient on average gross inflows if Canada were excluded from the regression. If capital market integration were uncorrelated with any other omitted variables relevant to the growth experience then we could conclude from Table 1

[12] We allow for heteroscedasticity by using robust standard errors. We also cluster these at the country level.

[13] Schularick and Steger (2005) follow the methodology of Edison et al. (1999). This involves first eliminating roughly 80 percent of the observations because only averages over the previous five years are included as observations. Next, GMM techniques for dynamic panels developed are used. We believe that the temporal aggregation procedure is not likely to be appropriate when the times series are highly persistent (cf. Pesaran and Smith, 1995) and that GMM techniques are likely to be unsound for short panels. On the other hand, it is well known that when the time series component of the panel is large (here we have roughly 33 observations for each country) fixed effects in a dynamic panel is consistent. This still leaves the problem of the endogeneity of capital flows, and crises and slope heterogeneity. These issues are deserving of investigation and our econometric results should be interpreted with requisite caution.

[14] These are from Roodman (2005)

that there were not large growth benefits on average from the greater use of international funds. What explains these dismal results?

Many hypotheses come to mind as potential explanations for why greater capital market integration was not associated with faster economic growth. Table 2 gives us some leads to go on. In this table we have divided the countries into three separate groups in order of their reliance on British capital. We also put initial income in the third column so as to emphasize that catching-up is not playing any obvious role over the long-term. What does leap out of the table is that some countries performed well within each category and some countries performed poorly.

Taking the Gourinchas and Jeanne framework, one could argue that the difference between any two countries was one of concurrent institutional change. Take one country which grew faster and one which grew slower, but both of which were de jure equally as open to the wave of British (and other European) capital that surged across the globe after 1870. In their framework one possibility for why growth might be higher in one place is that such a country was also implementing institutional reforms at the same time so as to raise their steady state potential. Nothing like this leaps out of this table. In the middle group we see the US, Norway and Japan as the growth leaders. With the exception of Japan**,** perhaps there were no sweeping institutional changes in these countries during the period that one could argue shifted the steady states so dramatically. More generally of course, prior institutional differences might have made a difference, and better institutions might have attracted more capital. Clemens and Williamson (2004) argue however that factor endowments mattered more than institutions like the gold standard or empire membership for attracting British capital.

What does stand out to us is that financial crises are the difference within each group. Countries that grew slower (at each level of inflow to GDP) were much more likely to have spent more time in some sort of a financial crisis. Taking a closer look, it appears that it was not just financial crises. Sudden stops of foreign capital inflows and debt defaults also matter. Greece and Australia did not spend an inordinate amount of time mired in crisis. Nevertheless Australia had a major banking crisis and sudden stop and Greece defaulted on its sovereign debt in 1894.

Columns 5 through 7 of Table 1 explore the association between growth and integration while controlling for financial crises. In column 5 we reproduce the growth regression of column 2 but include a dummy equal to one if there was some sort of financial crisis and a dummy equal to one if there was a "sudden stop".[15] We also include the interaction between the two indicators to see if crises accompanied by sudden stops were especially troublesome as Bordo (2006) found using unconditional averages. We find that having a crisis and a sudden stop is associated with an economically significant decline in the growth rate (after controlling for a country specific trend and the average world growth rate) of over five percentage points. The coefficient is only significant at the 89 percent level of confidence but this is highly suggestive that financial crises coupled with funding problems on international capital markets can wreak economic havoc on domestic growth trajectories.[16]

In column 6 we re-run our regression from column 2 that used gross inflows as the measure of integration, but here we utilize the GMM estimator for dynamic panels as in Schularick and Steger (2005).[17] We find, as they did, a positive and statistically significant correlation between (the change in) capital inflows and growth. When we include controls for crises and sudden stops in column 7, we also find that increased integration still has a positive point estimate. But at the same time, having a crisis and a sudden stop at the same time is associated with growth that is lower by ten to fifteen percentage points and this coefficient is statistically significant at better than the 95 percent level of confidence. Our conclusion is that there is some evidence that increased capital market integration is associated with faster growth holding exposure to crises and sudden stops constant. But the opposite also holds. Holding integration constant, a

[15] Our measure of sudden stop requires that there is a drop in the ratio of capital inflows to gdp of at least two standard deviations for the within country level over the period and/or any drop in capital flows that exceeds three percent of GDP over a period shorter than four years.

[16] Bordo et. al (2001) looked at the connection between growth, recessions and crises. They argued that the potential endogeneity between crises and recessions was not the reason they found a strong connection between growth losses and financial crises. Future work on this period should address the potential endogeneity issues more carefully.

[17] We treat lagged growth as predetermined, using the second lag of the level of GDP per capita as an instrument, and all other variables as exogenous. We also include year dummies in this specification.

financial crisis coupled with a sudden stop or slowdown in the inflow of capital would lead to significantly lower growth rates.[18]

Financial turbulence is not considered in the Gourinchas and Jeanne modification of the Ramsey-Cass-Koopmans model. One could discount the necessity of including such messy short-run disturbances in such a model, but crises were a feature of the international landscape then as they are now. Moreover, countries had little will or capacity to use controls on the capital account. The next sections take a closer look at the determinants of crises. We make the point that countries avoided crises when they opted for sound financial policies. We also emphasize that the record seems to show that certain financial developments and political factors allowed countries to avoid the side effects emanating from curtailment of capital inflows.

4. The Theory and History of Financial Crises, Balance Sheets, Hard Currency Debt, and Exchange Rate Instability

We now turn to analyzing the determinants of financial crises. The balance sheet view of financial crises sees banking trouble, currency crises and debt crises that occur in the same or consecutive years as inter-related phenomena. Moreover there is a strong prediction that financial crises will be accompanied by economic downturns as accelerator effects or financial frictions lead to a sharp fall in investment. This is different from first generation models that viewed currency crises as events arising from unsustainable fiscal policy under a pegged exchange rate. It is also different from a strand of the literature which views banking crises as arising uniquely from poor supervision, weak structure or stochastic liquidity runs.

A few countries had first generation crises prior to 1913, but just as often they faced financial meltdown and economic turbulence by suffering twin (banking and

[18] In one of the most recent studies of the connection between foreign capital and growth Prasad, Rajan and Subramanian (2006) find no clear positive link between reliance on foreign capital and economic growth except for a possibly negative relationship. They suggest that financially underdeveloped countries are unable to channel foreign funds into productive projects and hence that fast growing developing countries tend to send their funds abroad to the advanced countries which are naturally growing more slowly.

currency crises) or even triple crises where in addition to a large depreciation and disruption in the banking sector sovereign debt went into default. One important factor determining the ultimate outcome may have been an interaction between the nature of the debt contracts in place and the robustness of the financial system. Our framework for thinking about financial crises follows Mishkin (2003) and Jeanne and Zettlemeyer (2005).[19] This view is inspired by an open-economy approach to the credit channel transmission mechanism of monetary policy. Balance sheets, net worth and informational asymmetries are key ingredients in this type of a model. Moreover the development of the financial system is crucial. In Box 4 we present some aspects of financial development. We present a diagram in Figure 7 that follows our chain of logic described below. In the following paragraphs we explain more fully the chain of logic in Figure 7.

In our view, initial trouble might begin in the banking sector for a number of reasons. One possibility is that international interest rates rise. This worsens the balance sheets of non-financial firms and banks alike. As the number of non-performing loans rises and net worth falls, a decline in lending can occur, contributing further to output losses. At this point, reserves may be used as a first line of defense as internationally mobile capital takes a pessimistic view. Net inflows of capital may also slow to a trickle perhaps culminating in a sudden stop. As reserves run out and foreign financing becomes scarce, larger financing gaps arise, and more trouble comes up in the financial sector.

If there is a strong financial system, that is, if any or all of the following obtain then countries can pull though the turbulence and avoid further economic fallout: there is a lender of last resort; deep and liquid financial markets exist; the quality of private lending has been high; the fiscal position is sound. These factors help generate credibility and confidence and assuring markets that the exchange rate will not move too much and hence there are no further impacts on the net worth of firms.

On the other hand, if the financial sector is weak or underdeveloped there could be increased stress for non-financial firms if they are forced to cut investment due to a lack of financing. Low investment could drive down demand for nontradeable goods or decrease the supply of tradeables. Coupled with nominal rigidities an economic downturn

[19] Mishkin's informal analysis follows a stream of literature from the late 1990s on the links between net worth, crises and depreciation.

might be expected. If policy makers wanted to maintain economic activity this could lead to an expectation of easy future monetary policy, inflation, and an expected exchange rate depreciation.[20] Governments may also have trouble making interest payments on debt coming due as capital markets become unwilling to continue rolling debt over and monetization and depreciation could be expected. The abandonment of an exchange rate peg, as reserves are depleted, is a possibility and floating regimes could also see large depreciation (expected and/or actual) occurring under such a scenario.

A slowdown of capital inflows could come along or even precede this depreciation. A contemporary view of the impact of such exchange rate changes and sudden stops is that they may be contractionary.[21] This is where original sin enters the picture. Since the majority of obligations for nearly all countries are in foreign currency or, in the late nineteenth century, denominated in terms of a fixed amount of gold, depreciation vis-à-vis creditor countries or breaking the link between gold and the domestic currency could lead to increases in the real value of debt. This is a redistribution of wealth from domestic borrowers to their creditors who are expecting a certain amount of gold or foreign currency.[22] This decline in the net worth of debtors can lead to another round of "disintermediation" because net worth matters for lending decisions. Less lending implies the possibility of widespread bankruptcies due to liquidity problems. Of course a few countries had low original sin, and some of them were even relatively undeveloped (financially and economically) such as Russia. In such a country, the probability that the depreciation causes further trouble may be limited. The deterioration

[20] Many countries cut the link to the gold standard in times of financial stringency or never had a formal link to the gold standard even in this hey day of the classical gold standard. Such countries typically ended up with accelerated money supply growth, inflation and nominal depreciations. Countries that adhered strictly to the gold standard were supposed to "play by the rules of the game" or implement a procyclical monetary policy. In the short run they did not necessarily do so. Nevertheless, countries that credibly adhered to the gold standard would often see stabilizing speculation and markets often expected tighter policy and/or deflation in countries running balance of payments deficits. These types of countries, because of their credibility could avoid the third generation fallout which we describe in the next few paragraphs.

[21] Theoretical work by Céspedes, Chang and Velasco (2004) demonstrates how under certain very plausible circumstances original sin can lead to contractionary depreciations.

[22] Eichengreen, Hausmann and Panizza (2003) argue that what matters is the aggregate external mismatch and if all debt is domestic, that one sector's losses are the others' gains. Our view however is that net worth matters. When a debtor's net worth deteriorates, borrowing capacity falls, and the capital markets seize up. This is one reason why we focus on domestic and external hard currency debt rather than just foreign holdings (or issues) of hard currency debt.

to debtors' balance sheets would be more severe the greater the amount of fixed interest rate hard currency debt outstanding.

There is some contention in the literature as to whether the amount of hard currency debt alone is what matters. Goldstein and Turner (2003) have argued that often countries insure themselves against exchange rate movements. Hard currency debt can be, and often is, backed up by hard currency assets. Alternatively, countries could have enough export capacity (or capability) to offset changes in liabilities due to exchange rate swings. To gauge the actual effect of original sin one must take account of the mismatch position or the entire balance sheet position of an economy.

It could also be the case that a solid financial system matters. When financial frictions are smaller and capital can get to most of the projects that are worthwhile (i.e., net worth and collateral constraints play less of a role in lending decisions perhaps due to better monitoring technologies or better property rights systems) the impact of depreciation and the loss of international capital could be less crucial. Lending dries up more slowly when there is a lender of last resort or a large liquid domestic asset market. When finances are sound in the first place, a liquidity problem has a high chance of being resolved and massive losses can be stemmed before they occur. Jeanne and Zettlemeyer (2005) emphasize that international crisis lending (into the official budget) from multilateral institutions can forestall crises if the government's finances would be sound in the absence of the "bad" no financing equilibrium.[23] This underscores the importance of fiscal probity in the definition of financial development.

In addition to the capital markets' decisions we must also consider the political decision making mechanisms that determine a sovereign's actions. Reinhart, Rogoff and Savastano (2003) have argued that original sin is a proxy for a weak financial system and poor fiscal control so we control for this possibility below. But we also think it is important to emphasize a political channel that interacts with an unfortunate financial hand of cards. When the going gets this tough and meltdown is a possibility, some types of political systems seem more capable of sustaining the good credit of a country than others. In an interesting set of papers, Emanuel Kohlscheen (2006a, 2006b) discusses

[23] Economic historians are more familiar with the "cooperation" between central banks and governments and private actors highlighted by Eichengreen, 1992.

why parliamentary and presidential regimes might have differential propensities to default on sovereign debt. In a parliamentary democracy, the executive depends upon continued support from the governing coalition while in a presidential democracy no such constraint exists. His main theoretical conclusion is that presidential democracies are much more likely to default than parliamentary democracies. An executive in a parliamentary democracy may try to find ways to improve the fiscal position through some sort of a political compromise on belt tightening. A presidential executive may hand the costs of a default to an interest group that is out of favor, and in any case he is usually not immediately liable for such an act. Empirically Kohlscheen (2006) finds that between 1970 and 2000 presidential democracies were (unconditionally) nearly five times as likely to default as parliamentary democracies. The correlation also stands up to closer scrutiny in multivariate regressions and advanced applied econometric techniques that control for endogeneity and selection. Bordo and Oosterlinck (2005) also find preliminary evidence that debt defaults were more likely amongst presidential democracies in the late nineteenth century.

The point of this chain of logic is that there are various routes that limit the probability of a major growth slowdown in the face of financial unrest. Those countries that limited the fallout from financial crises and sudden stops were the ones that managed to avoid deep economic downturns due to such crises. These countries borrowed for productive purposes, maintained strong reserve positions, were open to international trade, had sound financial development, and political institutions geared towards adhering to contractual obligations. On the other hand, some countries were extremely vulnerable to the capricious international capital market and its expectations that accompanied the free movement of capital. Their outcomes differed from the first group because they borrowed for revenue purposes which left little by way of future revenue streams and lent little credibility to them in the event of a shock or liquidity run. Eventually these nations would need to resort to inflation finance (and hence a depreciated exchange rate), or fell victim to a speculative attack--either of which could worsen their debt position due to original sin and their preponderant currency mismatches. We now turn to an empirical test of this framework in the late nineteenth century.

4.1 The Record on Original Sin

It has been the case since the 18th century that debt issued on international capital markets has been denominated in the currency of the market of issue and not the currency of the issuing country. It has also long been noted that such debt can become more onerous to repay in the face of depreciations, and that since emerging markets often face rapid exchange rate depreciations associated with sudden stops and reversals of capital inflows or very loose monetary policy, these countries are more often the victims of such a volatile combination.[24]

With the resurgence of private international lending to emerging markets since the 1970s, these phenomena have started to attract attention again. Eichengreen and Hausmann (1999) argued that the danger of exchange rate fluctuations in the face of foreign currency borrowing might oblige many countries to adopt hard currency pegs. They coined the term "original sin" because they argued foreign currency denominated debt was imposed by international capital markets. Nations with poor reputations, and *even nations with good reputations or solid fundamentals,* are obliged to issue debt in key international currencies. In other words, domestic policies or problems were not the only reason countries could not borrow in their own currencies. Because of "original sin" and the subsequent problems in the face of devaluation, Eichengreen and Hausmann (1999) argued that exchange rate stabilization was of the utmost importance. Contrary to our evidence from previous work (Bordo and Meissner 2006a, 2006b) they argued that original sin might be a problem even for countries where fundamentals and fiscal policies were sound but which might fall victim to a liquidity run. Bordo and Meissner (2006a, 2006b). looking at evidence from 1880 to 1913 and 1973 to 1997 found that many countries with high original sin were not obviously more prone to currency, banking or debt crises than countries with low levels. Instead they argued that a high level of original sin did not render a country financially fragile if it was accompanied by a sound financial system and a low mismatch (plus some idiosyncratic factors).

[24] Of course the overall level of indebtedness matters too. We control for this below. Right now we are holding this factor constant.

Eichengreen, Hausmann and Panizza (2005) have shown that countries with higher original sin have higher exchange rate volatility and higher macroeconomic volatility. Flandreau (2003) argues that in the nineteenth century, depreciation increased the debt burden because of original sin which led to sovereign debt crises. He illustrates this with reference to several cases in a narrative way.[25]

We collected data from various national sources on hard currency debt (cf. Bordo and Meissner**,** 2006a) and augmented and compared this with data made available by Flandreau and Zúmer (2004). What we refer to as hard currency debt is debt that carried a gold clause or was made payable at a fixed rate in a foreign currency.[26] Our measure of original sin, *OS*, is the ratio of this quantity to total public debt outstanding.

$$OS_i = \max\left(1 - \frac{\text{Securities issued in currency i by country i}}{\text{Securities issued by country i}}, 0\right).$$

The key difference between our measure and the workhorse measure in Eichengreen, Hausmann and Panizza (2005) is that we look at debt issued in domestic and international markets instead of looking only at international issues. One reason we view this as important is because many domestic issues of the day carried gold clauses. As described above, in the case where monetary authorities devalued the local currency in terms of gold this would have a similar effect to a depreciation when a country had foreign currency debt. In either event, real debt repayments for local currency gold clause debt and for foreign currency debt would both increase.[27] Hence, we do not classify debt as "debt issued in currency *i*" if it contained a "gold clause" stipulating a fixed quantity of gold per unit of local currency payable. Only debt payable in local paper currency, without mention of the gold-local currency exchange rate upon payment of coupons and principal, is included in the ratio above.

[25] Our conclusions differ from Flandreau's as we take on a wider set of hypotheses and cases. Empirical work by Flandreau and Zúmer (2004) which regresses sovereign bond yields on a ratio of interest service to government revenues and a number of other variables also argues that hard currency or gold debt was dangerous. Their tests are quite different from ours since our dependent variables are debt crises, banking crises, currency crises or twin crises. Frankel and Rose (1996) examined "currency crashes," external debt and exchange rate fluctuations but their approach to measuring original sin, its impact and the type of crises considered is different than ours.

[26] The data appendices and the text in our previous work on crises has more to say about the structure of this debt.

[27] We assume here that nominal depreciations are equivalent to real depreciations in the short-run perhaps because of sticky prices. On the domestic side we assume going off gold or a depreciation implies a depreciation of the local currency versus gold and domestic prices are constant over the short run.

Figure 8 shows the ratio of hard currency government debt to total government debt by country between 1880 and 1913. Our time series plots reveal most countries' measure of original sin to be constant over time. Some countries' situations "worsened". Japan became more exposed to foreign currency debt as it entered global capital markets from the late 1890s. Argentina and Brazil converted local currency paper debt into gold clause debt in the 1880s and 1890s respectively. One reason they did so was to lower the interest burden of new issues since gold debt was priced as a safer risk by investors. Only Spain and Italy appear to have decidedly decreased their reliance on hard currency debt relative to internal currency debt. All of these nations had floating currencies for some portion of the period. As noted by Flandreau and Sussman (2005), their situations appear similar to those of Russia and Austria-Hungary, countries which had relatively low degrees of original sin and which also had floating currencies over most of the period we cover. These are the counter-examples to those who believe that poor fiscal history, a shaky exchange rate policy and economic backwardness are causes of original sin. Nearly all of these countries had previous episodes of debt default and chronically poor fiscal situations. We return to these stories below.

The long-run averages of our original sin measure in Figure 8 also reveal a *counterintuitive ranking*, but are consistent with previous findings by Flandreau and Sussman (2005) and Eichengreen, Hausmann and Panizza (2005). Financial centers have less original sin. Small peripheral countries have a lot of original sin. Countries with ostensibly rotten fiscal institutions and poor international track records have intermediate levels of original sin. Notice that Spain, Russia, Austria-Hungary, Italy and Argentina are all towards the lower middle of the spectrum and many of these countries suffered some of the worst crises of the period. However, some countries with sound fiscal, financial and monetary records, like Australia, Canada, Denmark, Sweden, and the US also have moderate to high original sin. These countries, like others in Western Europe, had financial institutions that were evolving in the same direction as the core. The question then becomes: are these fundamentals along with the historical and current fiscal positions more important for explaining crisis incidence than the actual level of hard currency debt?

4.2 Currency Mismatches

Goldstein and Turner (2004) have argued that currency "mismatches" are the main problem with foreign currency debt. Countries that have foreign currency liabilities which are not offset by foreign currency assets may be more likely than countries with more foreign assets to find it difficult to repay their foreign currency debts in the event of a depreciation. Changes in the exchange rate can become a problem the greater the mismatch, as local currency assets lose value in terms of foreign liabilities. Goldstein and Turner have three key ingredients to their overall measure of a nation's mismatch. They first use the difference between all reported foreign assets and foreign currency liabilities outstanding. They then divide this measure by exports to account for openness to trade. For example, the mismatch decreases when exports are higher because a depreciation would likely attract a larger amount of extra revenue and thus such a country would be more naturally hedged. Finally they pre-multiply this ratio by the ratio of all reported foreign currency liabilities to all reported liabilities outstanding.

We focus on the government's mismatch due to severe data constraints. But we believe this is a relatively good proxy for the economy-wide mismatch. The functional form we choose is different from Goldstein and Turner and slightly closer to that found in Eichengreen, Hausmann and Panizza (2003).[28] For country *i* we have

$$\text{Mismatch}_i = \frac{\text{total hard currency debt outstanding - international reserves}}{\text{exports}}.$$

Our measure of reserves usually only includes gold reserves held at the central bank, in the banking system or held by the government treasury. The sources are listed in the appendix to our previous papers (cf. Bordo and Meissner 2006a and 2006b). Total hard currency debt (domestic and international issues) is calculated directly if the data are available or by multiplying the total debt outstanding by the percentage of total debt that is payable in gold or foreign currencies. A higher mismatch measure should be correlated with a greater probability of a debt default.

[28] Eichengreen Hausmann and Panizza (2003) report that the correlation between their measure of mismatch and the Goldstein and Turner measure is 0.82.

Countries that maintained strong reserves in their financial position relative to debt outstanding would possess low mismatch ratios. Nations that had fiat currency episodes, usually as a last resort in financing government deficits, or because of the inability to borrow at reasonable prices to get reserves would have low mismatch ratios. Nations that had a sound export base relative to their debt; or vice versa maintained their debt position in reference to their economic potential would also have low mismatch ratios. In essence then, the mismatch ratio while directly relevant for the capacity to repay and for immediate market expectations is *grosso modo* a proxy for the ability to maintain sound finances.

4.3 Debt Intolerance

A new literature on sovereign financial difficulties has emphasized the role of past defaults in creating current difficulties. Reinhart, Rogoff and Savastano (2003) (RRS) have coined the term *debt intolerance*. This line of research tries to explain why some countries are able to sustain very high debt to GDP ratios while other emerging market countries run into debt problems with comparatively low debt to GDP ratios. Their evidence suggests that past defaults generate poor sovereign ratings. Countries with worse track records in international capital markets suffer greater financial fragility due to increased borrowing costs at a given level of debt to GDP.

Default history or sovereign ratings are proxies for other underlying structural or institutional problems which make any given level of borrowing more difficult to sustain than if the country has a clean track record on international markets. Political institutions that raise the probability of default and which persist over time such as the constitutional frameworks discussed above are one possibility. Financial development may also be persistent because it depends in part on political and legal history. Economic structure which determines macroeconomic volatility but which is also endogenous to a nation's institutions could be another possibility (cf. Catão and Kapur, 2006) Confidence and

willingness of markets to sustain particular situations could be attainable either through sound fundamentals or because of membership in a particular empire or sphere of political influence. Hence we would also like to control for such fundamentals, as far as possible, to allow for the possibility of graduation from debt intolerance and also to be more precise about the particular factors which account for debt intolerance.

In addition to other controls such as the spread, the mismatch and the level of original sin, we control for debt intolerance by including a public debt to government revenue ratio and interacting this with an indicator variable that equals one if a country had at least one default episode between 1800 and 1880. If the increase in the probability of a financial crisis for a marginal increase in the debt to revenue ratio is larger for a past defaulter, we would argue there is evidence in support of the debt intolerance hypothesis. We also include a control for the constitutional setup of a country. In addition, the constitutional system turns out to be a significant determinant of financial crises. This could also be evidence compatible with the 'debt intolerance' hypothesis.

4.4. The Political Determinants of Financial Crises

Torsten Persson and Guido Tabellini (2003) have done path breaking research on the politics of fiscal outcomes. Two of their hypotheses are potentially relevant. The first is that electoral rules matter for the size of the budget deficit. Proportional electoral systems (PR) with higher propensities to form coalition and minority governments have greater tendency to spend more than they collect in revenue. Their evidence for the late twentieth century suggests majoritarian systems produce smaller deficits all else equal. It is not hard to see that if countries have PR systems that such low public saving could tilt the economy towards an unsustainable accumulation of foreign debt and reliance on international capital markets that make them vulnerable in ways described above.

Nevertheless we found no evidence in the pre 1914 era that different political systems produced the types of fiscal outcomes seen in the late twentieth century. Also we found no evidence (results unreported) that the electoral system mattered for financial crises. In the full sample, the median ratio of the surplus to GDP for PR systems was 0.16 while for majoritarian systems it was -0.42. This is not necessarily evidence against the

Persson and Tabellini hypothesis since if something else varied with the electoral system (perhaps the party structure, country size or empire membership patterns) this could easily hide any clean evidence on such a relationship. Also, deficits and fiscal patterns were quite a lot different in the nineteenth century than they are today in the age of entitlement spending and social democracy. Countries ran deficits to fund public spending on infrastructure, wars, or (in Egypt for example) the leaders' follies (see Box 2). Little spending, save for the odd veterans' pension scheme or the nascent social security schemes of which Germany was a leader, was in the form of entitlement outlays. And there was probably little expectation that intense lobbying would generate such spending. Nevertheless, more research could and should be done on the connection between fiscal outcomes and election rules in this historical period.

Another key hypothesis is that the constitutional framework matters. Presidential systems are different than parliamentary democracies. Presidents are not subject to votes of confidence. These institutions tend to limit the ability of the executive to undertake policies that are costly to particular interests. Presidents are able to carry out and implement policies that are much more directed towards special interests. Kohlscheen (2006) takes the argument to the issue of repayment of debt. He argues that the presidential constitutional framework is one of the reasons that nations serially default on their creditors.[29]

In Table 3 we show that between 1880 and 1913 only one parliamentary democracy, Greece, defaulted. The rest of the defaults (nine in total) were mostly by presidential democracies (seven) or in dictatorships.[30]

[29] The older literature on default poses the issue of default in terms of reputation versus gunboats. Eaton and Gersovitz (1981) argued that reputation was enough to sustain repayment. Bulow and Rogoff (1989) argued that absent the authority or ability to seize assets nations would always default and place the proceeds in a savings account thus making them better off. Amador (2006) provides a rationale for why democracies do not default. He argues they are unable to commit to a savings plan in the future and hence the Bulow Rogoff result does not hold. In his framework autocracies always default due to short time horizons. Our contribution to the debate fits in between Bulow and Rogoff and Amador. We define democracy more finely distinguishing between presidencies and parliaments—though the logic of the theory about default is slightly different the outcomes are similar. Gunboats and financial custodians working on behalf of creditors were also paramount in the late nineteenth century. We discuss some of the evidence on this below.

[30] Expanding this sample back to the 1870s would not overturn these tabulations or if we included more countries than we have in our macroeconomic database. No European parliamentary democracy defaulted after 1870 (perhaps with the exclusion of Portugal which we have coded as being presidential). See Table 1 in Mitchener and Weidenmier (2005).

If we look back further in time to the period between 1820 and 1880, the years when capital began to move freely and range widely across international borders, and years in which there were a large number of defaults, we also find that most defaults were by dictatorships or in places where executives were relatively unconstrained. In the 1840s in the United States nine out of 28 states or territories of the time defaulted and three other states came close to doing so (Wallis, Sylla and Grinath III 2004). A number of other significant defaults occurred in the newly created "republics" of Latin America and the older nations of southern Europe. The fact that state constitutions and the Latin American constitutions primarily follow a "presidential" system, where governors'/presidents' terms are independent of the legislature's support, is inescapable. Nevertheless the constitutional rule itself cannot explain everything. The constitutional rule for the executive persisted in the American states but few defaults occurred after the 1840s.

Wallis and co-authors argue that states implemented constitutional provisions for tax funding schemes for new debt and made voter approval via bond referenda mandatory. In addition, states eliminated the agency problem arising when state credit was channeled to private enterprises by discontinuing this practice. Exactly why American states were able to overhaul their institutions and to avoid a downward spiral into debt intolerance would also seem to be a promising avenue for future investigation. This could help us understand how emerging markets suffering from debt intolerance can escape such a problem today.

In terms of why sovereign countries actually did repay their debts there is a large amount of evidence from the period. Weidenmier (2005) analyzes the defaults of the US confederacy and finds evidence that both trade sanctions and reputation mattered for the ability to issue new debt on international capital markets during the war. Mitchener and Weidenmier (2005 and 2006) look at the impact of informal empires, trade sanctions, gunboats and the surrender of fiscal sovereignty. They find that the advent of informal ties with the US due to the Roosevelt corollary markedly improved the credit ratings of nations in the Caribbean basin in the early twentieth century. They also find that when groups of creditors sent in administrators to collect revenue (as they did in Egypt, Turkey and several other sovereigns between 1880 and 1913) countries were able to regain access to the capital markets more quickly than those which refused such a settlement. In

contrast to Rose's findings for the late twentieth century, the authors find no evidence consistent with the idea of trade sanctions.

6. The Determinants of Financial Crises

We next turn to formal tests of the framework for thinking about financial crises. The goal is to see whether the chain of logic proposed in Figure 7 represents a reasonable approximation to the globalized capital markets of the late nineteenth century. We have already established that, holding constant the level of capital inflows relative to GDP, having a financial crisis coupled with a sudden stop was associated with substantially lower growth relative to the long-run trend growth rate. The goal now is to isolate the determinants of financial crises. That is to take the story one layer back. Growth is lower during crises, but what causes crises? Are crises the fault of the capital importing countries, or simply a side effect of participating in open international capital markets? What did nations do that avoided crises in the past?

Figure 7 starts with real shocks and banking trouble leading to reserve losses, a currency crisis and eventually a halt to fresh capital inflows from abroad. There is a vast literature on American banking crises that suggests a major determinant of banking trouble was the rigidity of the local currency under the national banking system and the gold standard. Shocks to the market rate of interest due to unusually high demand for funds (for example, seasonal demands combined with cyclical financial stress) often led to banking failures and suspension of payments. But tracking the determinants of banking crises in a large sample of countries with standard macroeconomic controls is difficult as our previous work shows (2006a). This suggests that the trigger events for banking crises, which may end up cascading into other types of crises, are idiosyncratic real shocks, contagions and panics. The international dimensions of the major banking meltdown of the early 1890s in Australia have been synthesized most recently by Adalet and Eichengreen (2006). There poor regulation and over lending to the real estate sector contributed to something of a bubble. The roots of the famous 1890 Baring crisis in Argentina and London have been attributed by Flores (2006) to intensified competition amongst lenders. Many of the banking crises (but certainly not all) ended up, to some

extent, having an international dimension to some extent and so it would appear that there is substantial evidence supporting the idea that such shocks are a prime mover. In our regressions on the determinants of currency crises in Table 4 we find that banking crises are positively associated with currency crises but their marginal impacts are not statistically significant at conventional levels.

In Table 4 we investigate further the determinants of currency crises. We use a probit model where the dependent variable is one if there was a currency crisis and zero otherwise. We control for international and year-specific factors using the rate of interest on long-term consol bonds in London. We condition on the change in the ratio of the current account surplus to GDP, a gold standard dummy , and the presence of a banking crisis in the current or previous year. We also include the currency mismatch and the level of original sin. The idea is that higher levels of either variable could lead to an expectation of deeper trouble. The long-term interest rate, debt to revenue ratio, growth of the money supply and the ratio of gold reserves to outstanding bank liabilities roughly control for the level of financial development of an economy. The long-term interest rate also proxies for the quality of investment as per our discussion above.

Column 1 of Table 4 shows that the change in the current account to GDP ratio, and a lower level of reserves to notes outstanding are the only variables that are statistically significant. They are both associated with higher probabilities of a currency crash.[31] As mentioned above, the indicator for lagged banking crises is positive but not highly statistically significant. The original sin, mismatch variable, exchange rate regime, money supply growth and London interest rates are also not highly statistically significant.

The next link in our framework in Figure 7 relates currency depreciation, liability dollarization and balance sheets to further trouble including debt default. We argued that exchange rate depreciation, or the expectation of it, could exacerbate already precarious net worth positions in the face of extensive hard currency debt. Of course alternative strategies to avoiding this meltdown phase existed including obviating currency mismatches or greater financial development. A probit regression (column 2 Table 4)

[31] The results are robust if we use the percentage change in the ratio of the current account to GDP. We follow Edwards (2004) and the current account literature that looks at the change in percentage points rather than in percent.

using as a dependent variable the first year in which a country defaults (partially or in whole) on its sovereign debt obligations finds evidence for all of this.

First we see that a higher ratio of hard currency debt to total debt outstanding is associated with a higher probability of having a debt crisis. In column 3 we interact our original sin variable with an indicator variable equal to one if there was a currency crisis in the same year. This variable is positive and statistically significant. It implies that the marginal impact on the probability of having a debt crisis would be more than doubled from 0.03 to 0.07. We find evidence consistent with the hypothesis that original sin and currency crises are a factor in macroeconomic volatility.

We also find that a larger mismatch would lead to a higher risk of having a debt crisis. We include a squared term on this variable too and find that as the mismatch becomes very high the marginal impact becomes slightly smaller. It is possible that at very high levels of mismatch other policies are implemented to mitigate the impact but we are not controlling for these and venture few guesses as to what these policies might be.

As for the debt intolerance and political variables we find that constitutions matter while default history does not (column 2, Table 4). We find that presidential regimes raise the probability of having a debt crisis by a large 0.10 probability points compared to parliamentary regimes.[32] The partial effect associated with having a presidential regime is substantive. It is highly statistically significant. What this says to us is that political institutions become crucial at the point that financial markets lose confidence, the country's net worth takes a major hit and default is being considered. Based on this indirect evidence it appears that parliamentary democracies were able to find other ways of resolving their financial troubles besides default. Part of the difference, is that most empire observations in our sample were parliamentary democracies, while Latin American countries in our sample were presidential. We cannot rule out the possibility that omitted factors correlated with presidential systems are driving this result, but it does echo findings based on Kohlscheen's recent theoretical and sophisticated empirical research. And Kohlscheen claims to find the same high propensity to default amongst presidential systems even after carefully controlling for regional effects.

[32] There are no countries classified as dictatorships in our sample.

Previous default history does not make sustaining any given level of debt to revenue ratio more difficult. The notion that debt intolerance existed in the nineteenth century and manifested itself simply by the default record does not stand up. It appears more likely that institutional or structural factors and their interactions could have been at work in creating the phenomenon of serial default.

We also find that a surplus on the current account is related to fewer debt crises, higher interest rates at home and abroad are associated with a greater risk of a crisis and that there is only weak evidence that contemporaneous banking crises are associated with debt crises. Overall then we find strong support that original sin and balance sheets matter, but we also find evidence that financial development and deeper institutions are important for explaining the incidence of major financial meltdowns.

7. International Capital Markets and the Net Benefits of Laissez Faire Financial Globalization: Some Tentative Conclusions

We started this survey by highlighting the fact that there were basic features of the first era of globalization in capital markets quite similar to those today. We then proceeded to look at the stylized facts of globalization between 1880 and 1913. Cross- border capital flows were large, asset trade was unencumbered by capital controls. British and European capital scoured the planet in search of high returns going to where natural resources were abundant and capital and labor were scarce. Coincident with all of this, growth in many countries was strong. Some countries no doubt benefited from foreign capital. Canada and the other dominions and the United States prior to the Civil War come to mind.

On the other hand, these rather special examples obscure the difficulty that many other nations had in dealing with the capital market addiction. When funds dried up and the fundamentals were sour this combined to generate economically pernicious financial crises. Growth was substantially lower in the face of crises coupled with sudden stops. The more time a country spent in the midst of a crisis, the longer the growth downturn and the slower such countries grew. There were a number of catastrophes in this period that still have lessons for today.

We have outlined the role that hard currency debt, currency mismatches and financial development played in interacting with sudden stops of capital flow from the core countries. We also highlighted that political issues matter. There is no evidence that proportional electoral rules generated precarious situations because in this period such countries did not suffer from higher government deficits. Nevertheless, and much like today, presidential constitutions seem to be have been one of the decisive factors in leading countries to default when the final decision had to be made.

We also find evidence that the emerging markets of the day that had significant amounts of original sin can be divided into two sub-groups. One group includes, but is not limited to, Argentina, Brazil, Chile, Italy and Portugal. Each of these suffered a financial catastrophe (banking and currency crises, a sudden stop and a debt default) between 1880 and 1913. The other group, including Australia, Canada, New Zealand, Norway, and the US, had relatively little trouble with financial crises in terms of frequency or virulence. We ascribe this to the level of financial development and partially to the political characteristics that other independent peripheral countries did not possess. These countries had credibility and also managed their currency crises, banking crises and sudden stops relatively well preventing economic disaster from striking. Countries in the second group also matched their hard currency liabilities with hard currency reserves or took out such debt in proportion to their export earning potential and were less likely to have growth reducing sudden stops and financial crises. The opposite appears to have occurred in the first set of countries.

Our assessment of the growth benefits of market-based accumulation of capital is thus mixed and cautious. Unbridled enthusiasm for international capital markets is not enough. Poor governance and weak credibility combined with original sin and skittish capital markets led to much lower net benefits. On the other hand, there were some countries that accumulated a domestic capital stock through the judicious use and application of market purchased capital. Further research into the institutional mechanisms and decision making processes that enhance the proper use of capital will emphasize this point. It should also provide useful analysis for policy makers and other actors who wish to garner maximum benefit from access to capital markets.

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Data Appendix

Most of the data underlying this paper was used in our previous work (Bordo Meissner 2006a and Bordo and Meissner2006b) and is explained thoroughly in those sources. The bulk of the macro historical data set is that used in Bordo et. al. (2001). Even more expansive data descriptions and sources are listed in the working versions of our work on crises in NBER working papers 11173 and 11897.

Constitutional Rules: Data kindly supplied from David Leblang.

Crisis Dating:

As in Bordo et. al (2001) we date currency and banking crises using both qualitative and quantitative evidence. For all countries besides Austria-Hungary, Russia, New Zealand, South Africa, Mexico, Turkey, Egypt, Uruguay and India we have relied on the dates of Bordo et. al. in both periods. In the earlier period we have tried to date currency crises, when possible, by using an approach based on the exchange market pressure (EMP) methodology which looks at changes in reserves, the exchange rate and the interest rate.

Debt crisis dates were based on Beim and Calomiris (2001). Only private lending to sovereign nations is considered when building those default dates. Not every instance of technical default is included in the chronology, the authors identified periods (six months or more) where all or part of interest/principal payments were suspended, reduced or rescheduled. Some of those episodes are outright debt repudiations, while others were reschedulings agreed upon mutually by lenders and borrowers. Also data is taken from a spreadsheet underlying Reinhart, Rogoff and Savastano (2003).

Figure 1 Average Levels of the Ratio of the Current Account to GDP for Different Types of Capital Importers, 1880, 1913

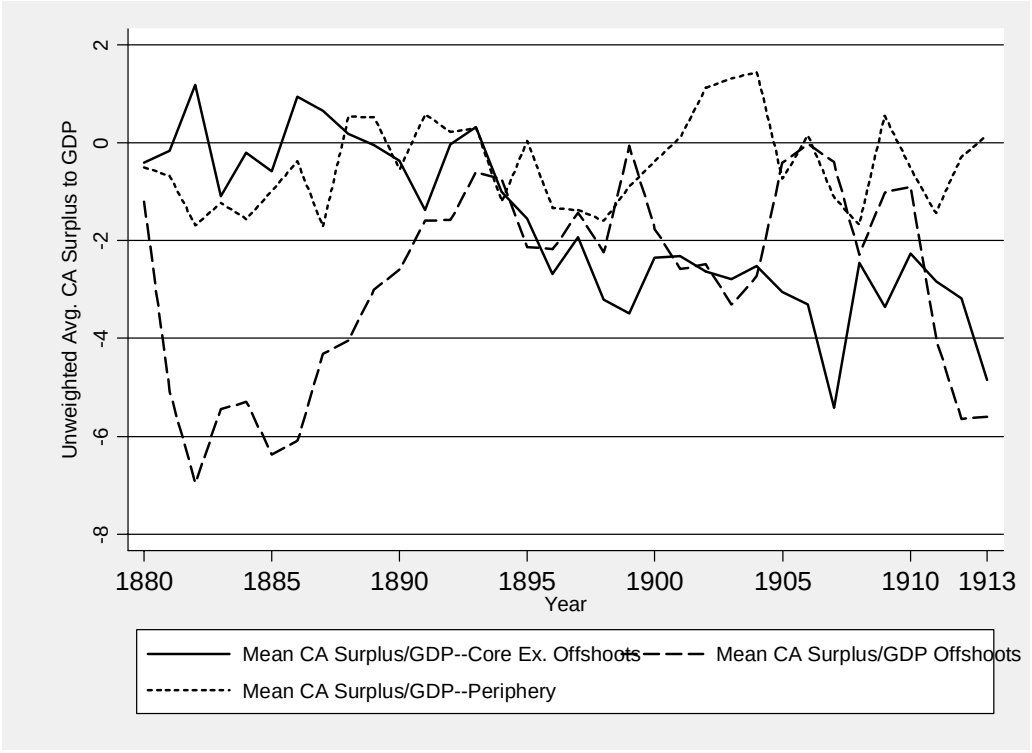
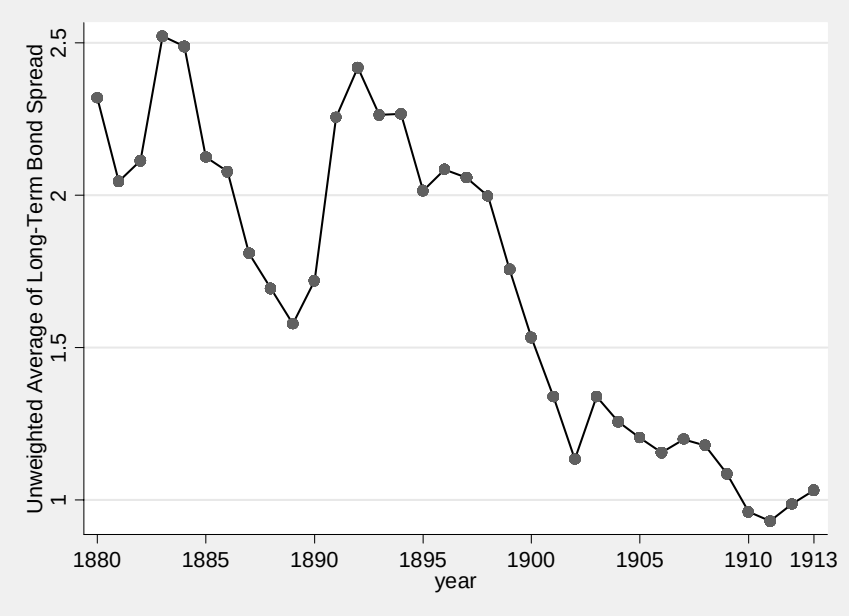


Figure 2 Average Bond Spreads, 1880-1913



Notes: Averages exclude bonds in default with spreads greater than 1200 basis points.

Figure 3 Bond Spreads versus a Measure of Productive Investment, 1874

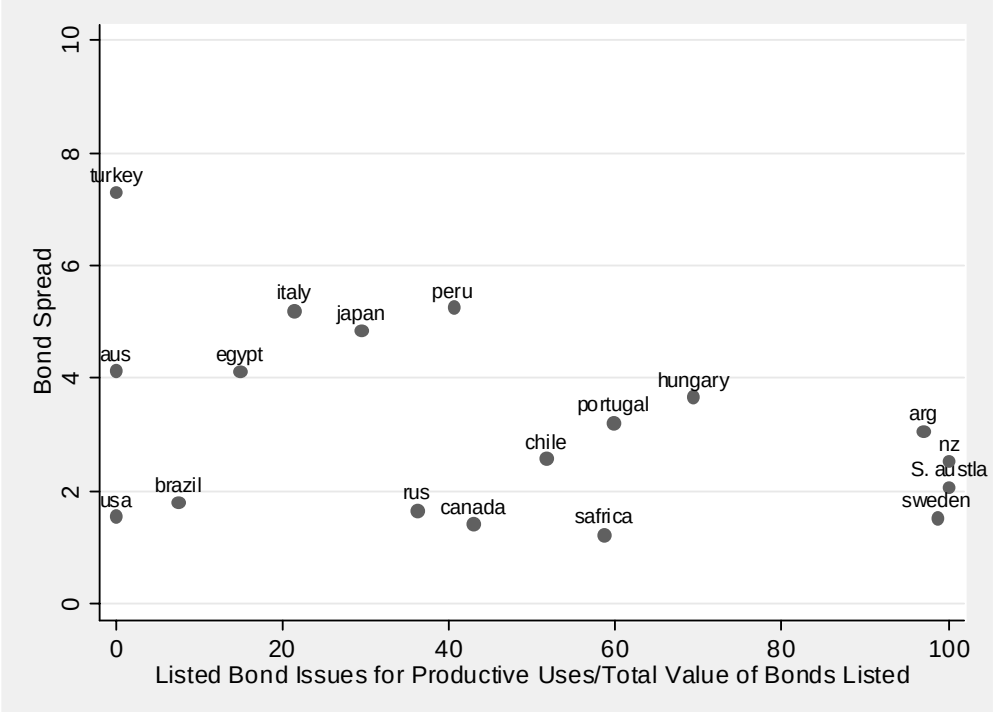


Figure 4 Crisis Incidence, 1880-1913

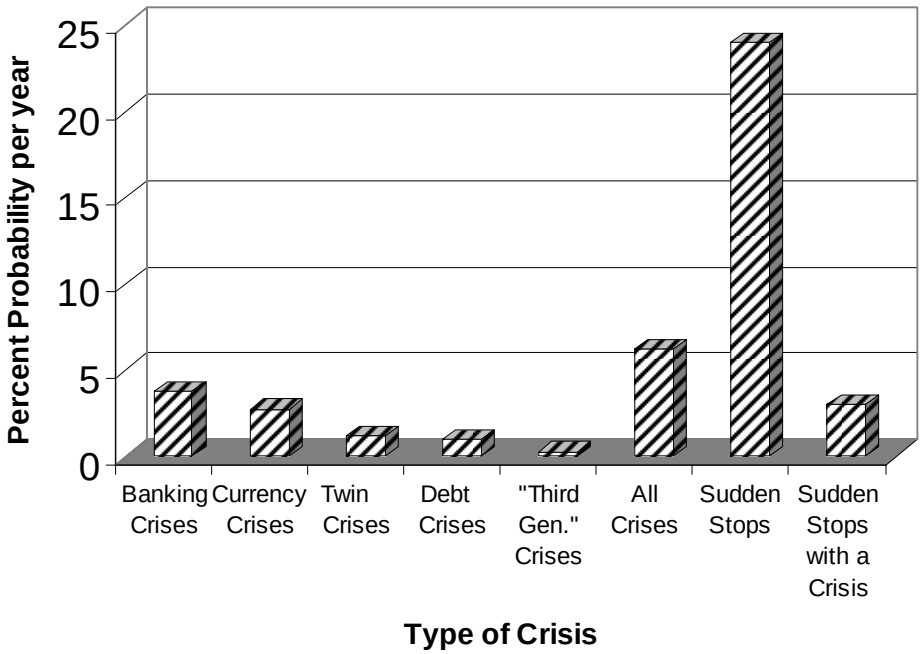
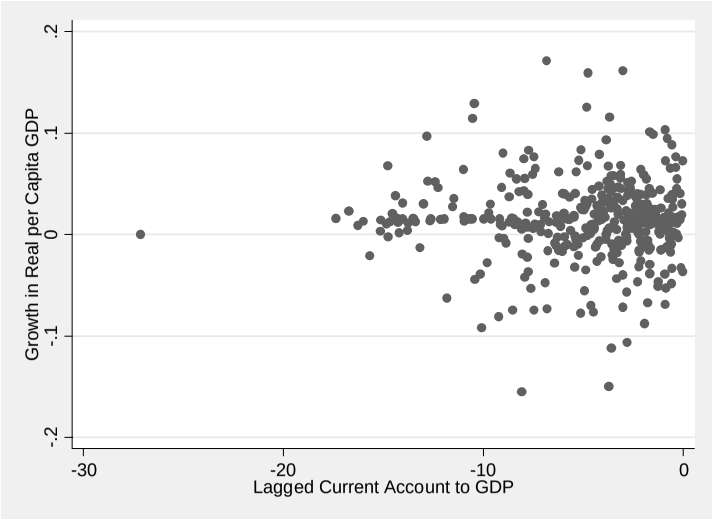
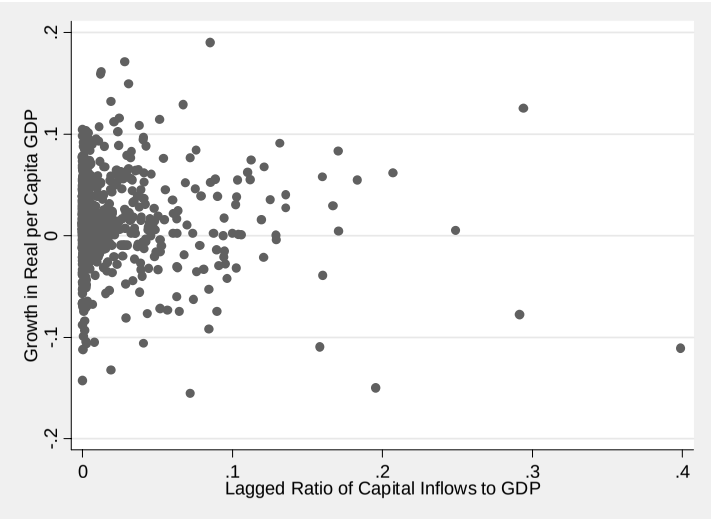
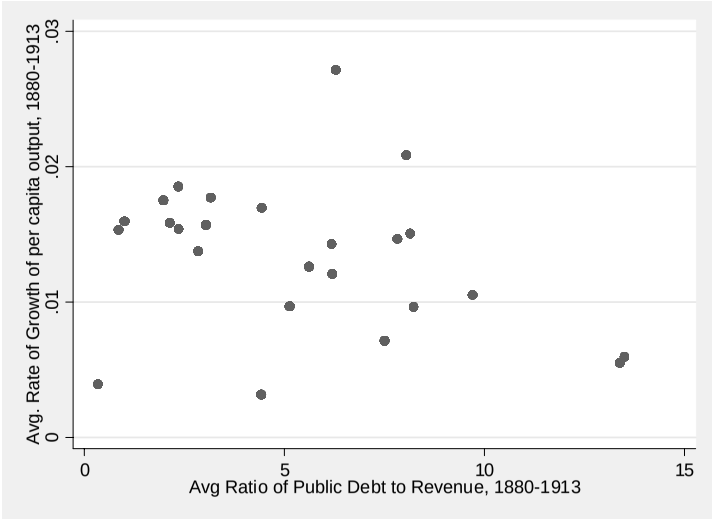


Figure 5 Growth in Per Capita GDP versus Various Measures of Capital Market Integration







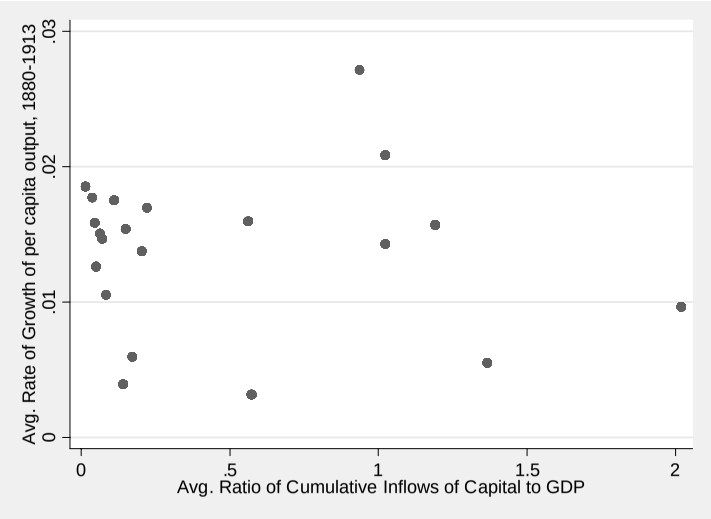
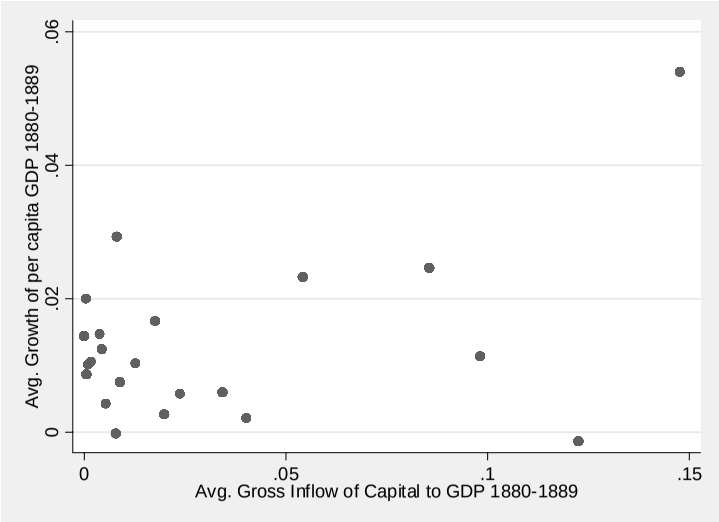
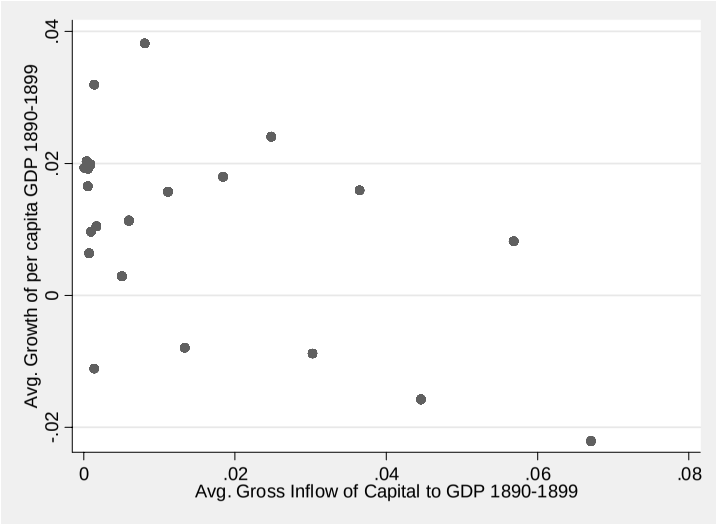


Figure 6 Growth in Per Capita GDP for three Sub-Periods versus Gross Inflows of Capital.





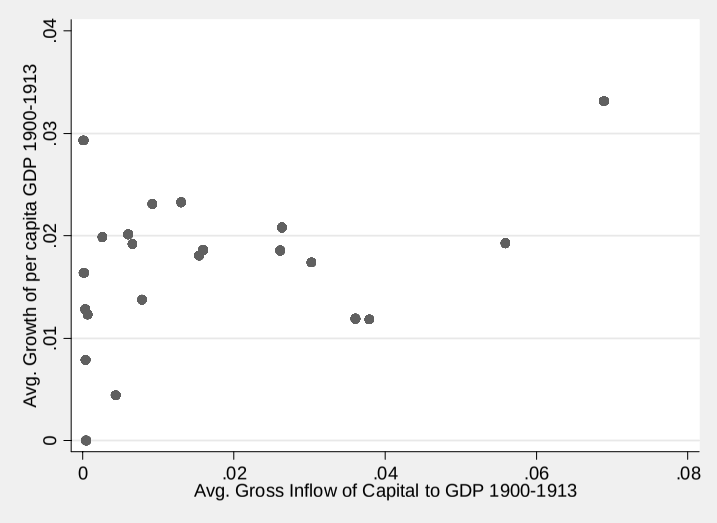


Table 1 Growth, Capital Market Integration and Financial Crises

Regressors	*Current Account*	*Gross Inflows*	*Avg. Cumulative Gross Inflows*	*Avg. Debt/Revenue*	*Gross Inflows & Crises*	*Gross Inflows GMM*	*Gross Inflows & Crises GMM*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*
[Current Account/GDP] *t* -1	0.00	---	---	---	---	---	---
	[0.00]						
[Gross Capital Inflows/GDP] *t* -1	---	-0.03	---	---	-0.03	1.12	1.11
		[0.06]			[0.06]	[0.59]*	[0.64]*
Avg. [Cumulative Capital Inflow /GDP]	---		0.0007	---	---		
			[0.003]				
Avg. [Debt/Revenue]	---	---	---	-0.0005	---	---	---
				[0.0002]**			
Sudden Stop x Financial Crisis					-0.05	---	-0.15
					[0.03]		[0.05]***
Sudden Stop	---	---	---	---	0.01	---	0.06
					[0.01]		[0.03]**
Financial Crisis	---	---	---	---	0.01	---	0.06
					[0.01]		[0.04]
ln[Percentage of the Population	0.03	0.02	---	---	0.02	0.20	0.20
Enrolled in School] t-1	[0.01]*	[0.01]*			[0.01]*	[0.09]**	[0.09]**
Mean { ln[Percentage of the	---	---	0.008	0.007	---	---	---
Population Enrolled in School t-1] }			[0.003]***	[0.002]**		---	
Growth rate of Population	-0.00	-0.00	---	---	-0.00	-0.02	-0.02
	[0.00]**	[0.00]**			[0.00]**	[0.02]	[0.02]
Growth of GDP per Capita *t*-1	-0.18	-0.19	---	---	-0.19	0.66	0.67
	[0.04]**	[0.04]**			[0.04]**	[0.14]***	[0.14]
Avg. of growth rates in the sample	1.14	1.02	---	---	1.02	---	---
	[0.53]*	[0.45]*			[0.48]*		
GDP per capita 1880	---	---	-0.007	-0.004	---	---	---
			[0.004]	[0.003]			
Constant	0.07	0.07	0.082	0.07	0.07	3.35	3.2
	[0.03]*	[0.02]*	[0.034]	[0.02]	[0.02]**	[1.43]**	[1.45]**
Number of obs	575	695	20	21	695	653	653
R-squared	0.11	0.10	0.40	0.63	0.11	---	---

Notes: Dependent variable in column (1) , (2), (5), (6), and (7) is the annual growth rate of GDP per capita. Dependent variable in columns (3) and (4) is the average between 1880 and 1913. Robust clustered standard errors are in parentheses. Country fixed effects are included in all columns. See the text for precise definitions of variables.

* p-value < 0.1; ** p-value < 0.05; *** p-value < 0.01

Table 2 Capital Flows, Growth and Crises

	Cumulative Gross Inflow of Capital/GDP	**Cumulative Growth of Real Per Capita GDP**	**Real GDP per Capita in 1880**	**Percentage of 33 Years with a Crisis**
Germany	0.011	0.845	2,078	0.09
Austria	0.044	0.516	1,911	0.09
Italy	0.052	0.622	1,546	0.15
France	0.053	0.644	2,100	0.12
Spain	0.077	0.415	1,594	0.03
Denmark	0.094	0.793	2,099	0.06
Sweden	0.102	0.677	1,846	0.06
Japan	0.114	0.685	791	0.15
Portugal	0.158	0.217	1,113	0.29
United States	0.165	0.662	3,193	0.14
India	0.197	0.138	582	0.2
Greece	0.228	0.489	---	0.12
Norway	0.306	0.575	1,444	0
Mexico	0.386	0.750	838	0.25
Chile	0.684	0.693	1,567	0.21
Uruguay	0.723	0.602	2,066	0.06
Brazil	0.825	0.110	756	0.47
Argentina	1.172	0.618	2,264	0.15
Canada	1.228	1.448	1,721	0.08
Australia	1.371	0.199	4,590	0.03
New Zealand	1.578	0.375	3,765	0.12

Notes: Cumulative capital inflows come from Stone and are measured in 1913 against GDP in 1913. Greece's per capita output is available in different units than the rest of the per capita output therefore only growth rates are available. Years with a crisis include initial years of a crisis or continuing years of crises.

Figure 7 Framework for Balance Sheet Crises

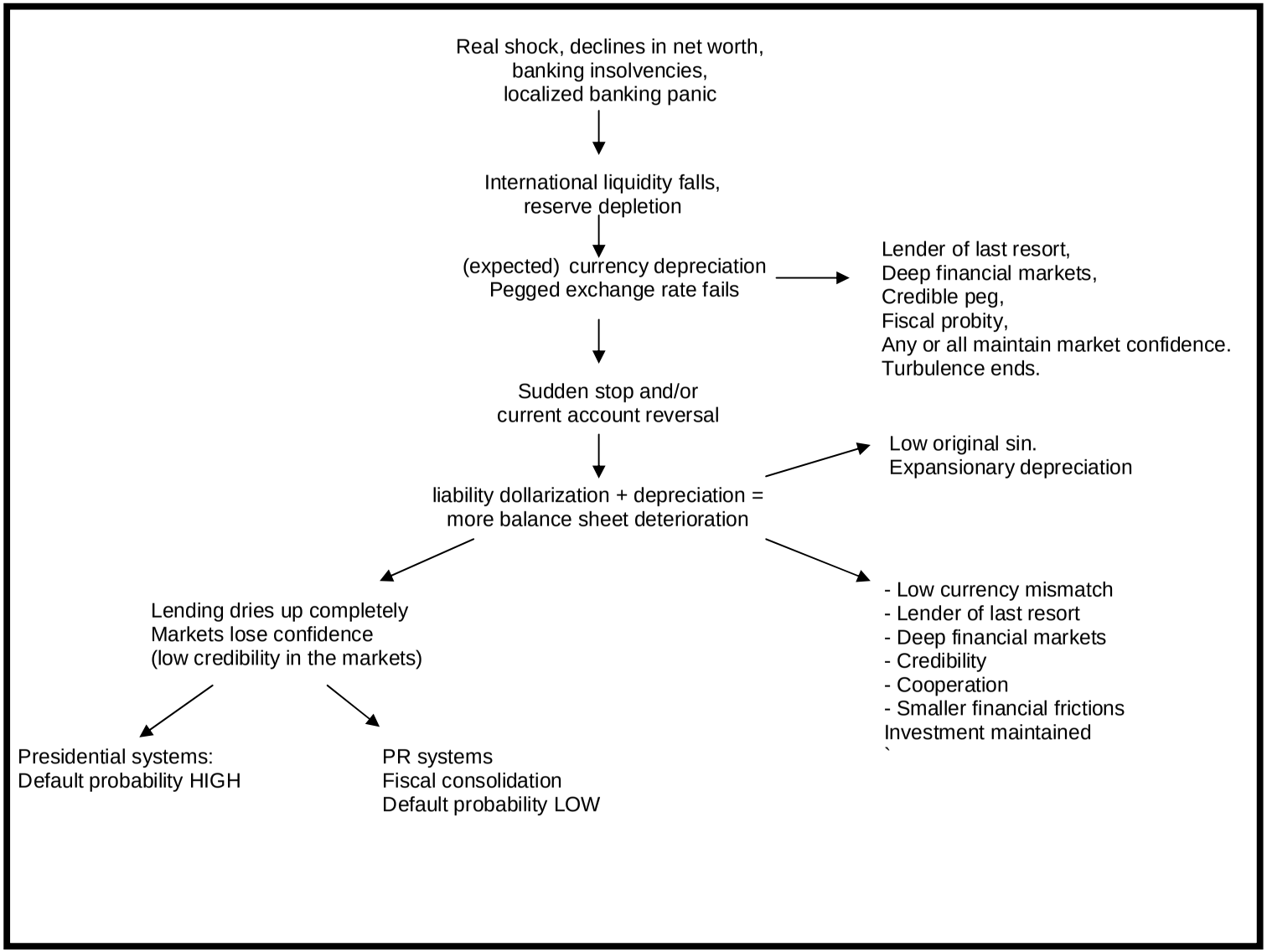


Figure 8 Original Sin, 1880-1913

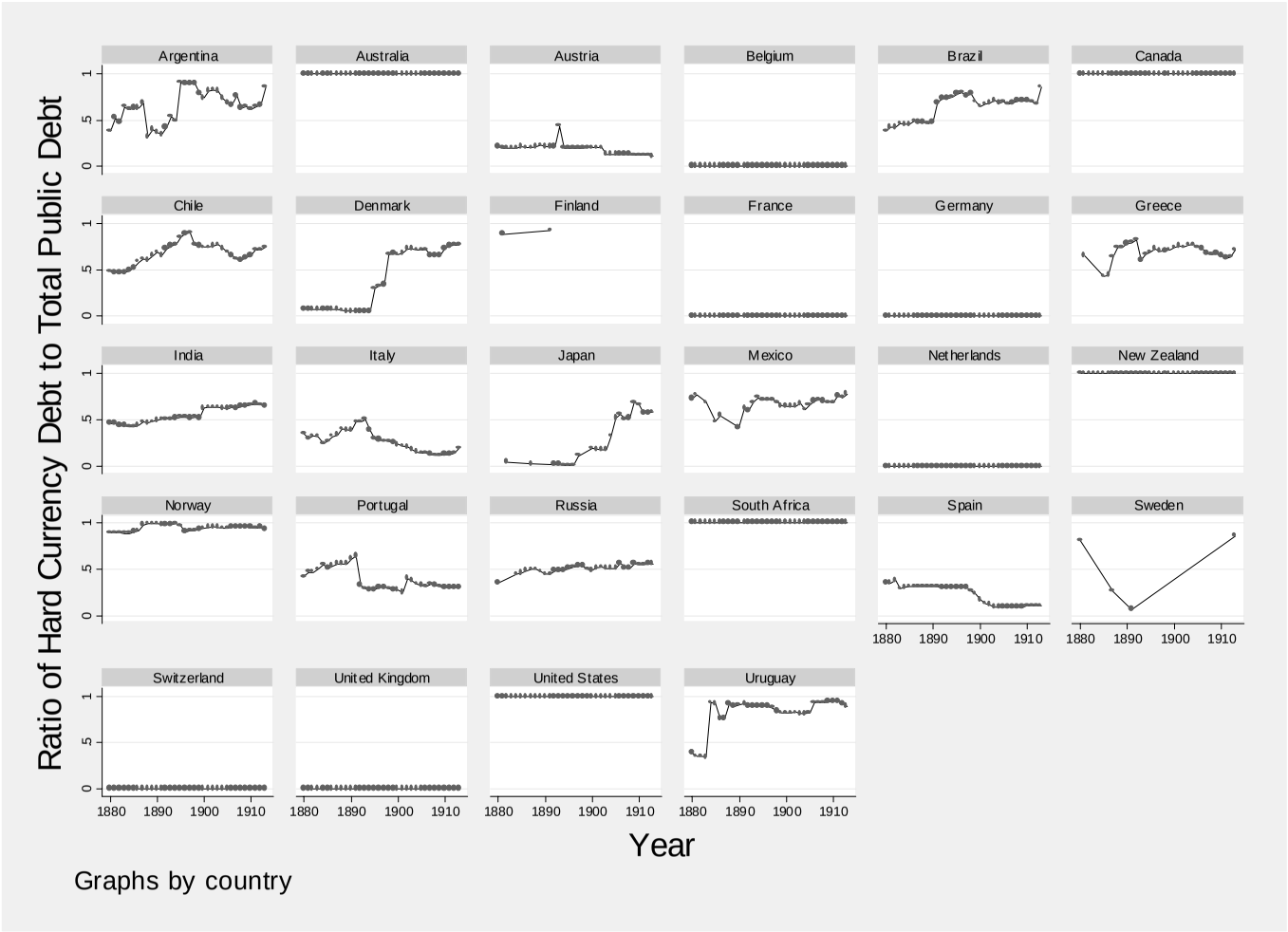


Table 3 Tabulations of Defaults and the Constitutional System

	Presidential A	Parliament B	Ratio of Presidential/Parliamentary Defaults
Number of Countries	14	11	
Percentage with a Default	50	9	**5.5**

Notes: See the data appendix for how countries were classified. Sample is restricted to countries where the executive is not a dictator including British dependencies (e.g., India, and the British colonies comprising what would become South Africa).

Table 4 The Determinants of Crises

Regressors	*Currency Crises*	*Debt crises I*	*Debt Crises II*
	(1)	*(2)*	*(3)*
Original Sin	0.001	0.070**	0.031**
	(0.019)	(0.032)	(0.014)
Original Sin x currency crisis	---	---	0.043*
			(0.023)
Original Sin x gold standard indicator	---	-0.051	---
		(0.033)	
Mismatch	0.003	0.011**	0.013**
	(0.003)	(0.004)	(0.006)
Square of mismatch	---	-0.002***	-0.002***
		(0.001)	(0.001)
Debt/Revenue	-0.002	0.002	0.003*
	(0.003)	(0.002)	(0.001)
Debt/Revenue x Pre-1880 Default	---	0.003*	0.001
		(0.002)	(0.001)
Pre-1880 Default	---	-0.064*	-0.017
		(0.035)	(0.015)
Presidential System	---	0.10	0.11
		(0.02)***	(0.02)***
Change in the Current Account/GDP	0.004	---	---
	(0.002)**		
Current Account/GDP	---	-0.003***	-0.004***
		(0.001)	(0.001)
Long-term interest rate	0.0001	0.009**	0.009***
	(0.003)	(0.003)	(0.003)
Consol interest rate	-0.006	0.033**	0.038**
	(0.021)	(0.016)	(0.017)
Gold standard dummy	0.023	0.044	0.004
	(0.018)	(0.030)	(0.004)
Percentage Change in the money supply	-0.053	---	---
	(0.098)		
Gold reserves/notes in circulation	-0.055**	---	---
	(0.025)		
Currency crisis in *t*	---	0.061***	-0.003
		(0.023)	(0.008)
Currency crisis in *t*-1	---	-0.007*	-0.007*
		(0.004)	(0.004)
Banking crisis in *t*	0.022	0.016	0.016
	(0.040)	(0.011)	(0.010)
Banking crisis in *t*-1	0.082	0.004	0.012
	(0.075)	(0.006)	(0.011)
constant	-1.46	-27.77	-26.36
	(1.16)	(9.73)	(11.7)
Number of obs	596	604	604
Pseudo R-squared	0.103	0.71	0.69

Notes: Dependent variable in column (1) is currency crises. Dependent variable in columns (2) and (3) is a debt default. Robust clustered standard errors are in parentheses. See the text for precise definitions of variables.

* p-value < 0.1; ** p-value < 0.05; *** p-value < 0.01

Box 1 Globalization's First Wave, 1870-1913

A large body of comparative economic history has emerged in the last decade and a half. The focus has been on comparing and contrasting the experiences of countries between 1870 and 1913 and after 1970 since both periods in time witnessed strong international capital market integration, impressive international trade and sweeping changes in international communications. This box outlines some of the main features of the global economy between roughly 1870 and 1913.

Great Britain was at the center of the global economy of the late nineteenth century. This country was one of the first to experience modern economic growth or sustained increases in per capita incomes. It was also the first country to adhere to a policy of relatively free and non-discriminatory international trade. Most famously this was enshrined in the Cobden Chevalier treaty of 1860 between Britain and France which established the Most Favored Nation clause and lowered tariffs substantially. Importantly it was also home to the most important banks and investment houses in global finance.

The terminology core and periphery probably stems largely out of this conceptualization of the late nineteenth century global economy. Colloquially economic historians often refer to the more developed countries as the core countries. Mainly these countries were in Western Europe and we consider all of the following in the core: Belgium, Denmark, Norway, Sweden and Switzerland. France, Germany, Great Britain, and the Netherlands. The periphery includes Argentina, Austria-Hungary, Brazil, Chile, Egypt, Finland, Greece, India, Italy, Japan, Mexico, Portugal, Russia, Spain, Turkey, Uruguay. We place Australia, Canada, New Zealand and the United States into an "offshoots" or areas of recent European settlement category. These countries were important capital importers but maintained stable political systems, were relatively rich and enjoyed fairly stable and rapid economic growth. Nations on the periphery were not only figuratively, but also literally, on the periphery or away from the centers of rapid economic change in Northwestern Europe (Northern France, Belgium, Western Germany, Holland and the British Isles).

Britain was at the heart of global economic finance in this period. Stable and predictable monetary policy in the form of a gold standard and vast trade links helped create the most important center of international finance of the time. In terms of the gold standard, by 1880 the vast majority of countries in the world, especially those with strong trade ties to the core countries, mimicked the British adherence to gold (defining their domestic currencies in terms of a fixed weight of gold) thus generating a global system of fixed exchange rates called the classical gold standard. Nevertheless a number of countries were unable to consistently maintain adherence to the gold standard. These countries operated fiat currencies and for the most part their exchange rates floated (or crashed) against the major economies.

London finance then was as important as New York finance is today. Major investment banks like the Baring brothers, N.M. Rothschild and Sons, Hambro, etc. all worked out of London and specialized in underwriting the bond issues for sovereigns and foreign

private companies alike. The London Stock Exchange was a large, liquid market that trades foreign bonds and equities as well as domestic equities. Numerous other correspondent banks that generated trade credit operated within London and the main credit instrument for trade settlement was the sterling Bill of Exchange. The reference, risk free interest rate was typically the yield on British perpetual bonds called “consols”.

Like today, financial crises were a fact of life. Each country has its own history of banking panics, typically characterized by a scramble by the public to convert bank liabilities into hard currency. Currency crises or large and rapid depreciations of the nominal exchange rate occurred from time to time when nations ran out of reserves (often due to speculation), or when they monetized fiscal expansions. The 1890s were a period of severe financial turmoil. Problems started when loans made by Barings to Argentine concerns failed to pay off. As British interest rates rose and international capital lost its appetite for risk, a banking crisis afflicted Australia. Currency speculation also dogged the United States in the early 1890s as interest groups advocating abandonment of the gold standard in exchange for a silver standard increased their political power. Silver was expected to keep depreciating against gold and so a silver victory would have meant a persistently depreciating exchange rate. Portugal (1891) and Brazil (1898) also defaulted on their sovereign debts in this decade. A number of debt defaults in periphery countries in the mid-1870s and a banking panic in 1907 emanating from the US, are other episodes when international capital markets faced systemic pressure.

Box 2 Revenue and Development Borrowers

The categorization of countries into revenue and development borrowers can best be understood by way of an example of each from the 1870s. The Australian colonies would have been considered development borrowers. Egypt would have been considered a revenue borrower. In between there were countries that did some of each type of borrowing in which case a finer measure than the revenue versus development dichotomy would be needed.

The Australian colonies undertook large amounts of borrowing. Fenn on the Funds notes that these colonies had some of the largest outstanding debt levels per capita. Nevertheless the very same manual advised that investors not to worry because most funds had been invested into infrastructure that would ensure the abundant natural resources could be brought to market to repay these debts. The prospectuses listed in the 1874 issue describe the reasons for which the bonds were issued in Queensland as “public works and immigration”. In South Australia great confidence is assured because the “whole [of the borrowing] has been for public works, ports, telegraphs, water,…” In New South Wales similar wording is found.

In Egypt it was quite a different situation. In 1876 Egypt defaulted on its sovereign debts leading to foreign administration of taxation and spending (see Mitchener and Weidenmier 2005 for a recent summary of the episode). Information about the use to which Egypt put its borrowing was sketchy at best during the run up to default. Fenn’s

Compendium does not list a single bond prospectus thus leaving the reader unaware of how the funds would have been invested. The Cave Report (quote is from Issawi 1982) which summarized Egypt's finances after the default claimed "…[Egypt] suffers from the ignorance, dishonesty, waste and extravagance of the East, such as have brought her Suzerin [Pasha] to the verge of ruin…caused by hasty and inconsiderate endeavours to adopt the civilization of the West". Even after default, British auditors found it difficult to evaluate the ultimate destination of borrowed funds.

In between these two extremes, many countries borrowed for both revenue and development reasons. The United States borrowed heavily on international capital markets (especially the states and private companies) in the 1840s and 1850s to help build railroad infrastructure to improve market access for farmers and inland manufacturers and to expand the size of the domestic market. On the other hand, in the 1860s the government of the Union contracted large debt liabilities to help it fund the Civil War. In Italy a large issue was for the Maremmana railroad but an even larger amount of issues went to unspecified destinations.

For these reasons the dichotomy of revenue versus development borrower, although useful for analytical purposes, deserves a finer measure. One possibility is to use the spread between long-term domestic bonds and the British long-term yield as a standard measure of default risk. Alternatively, Flandreau and Zúmer (2005) discuss the proto-credit rating system developed by the Credit Lyonnais at the end of the nineteenth century which depends upon several key determinants of the bond spread including the debt service to revenue ratio.

Box 3 Dating Financial Crises and Sudden Stops

In this paper we look at several different kinds of financial crises. These include currency crises, banking crises, and debt crises. Additionally we define twin crises as concurrent banking and currency crises, and "third generation crises" as a twin crisis accompanied by a debt default.

The building block for this data set is Bordo et al. (2001). As in Bordo et. al. (1999) we date currency and banking crises using both qualitative and quantitative evidence. For all countries besides Austria-Hungary, Russia, New Zealand, South Africa, Mexico, Turkey, Egypt, Uruguay and India we have relied on the dates of Bordo et. al. We identify currency crises as a period when there was a forced abandonment of an exchange rate commitment (typically the gold standard) or a large change in the nominal value of exchange rate within a given year. To date currency crises we also used an approach based on the exchange market pressure (EMP) methodology which looks at changes in reserves, the exchange rate and the interest rate.

Banking crises are identified as periods of severe difficulty in the banking sector when a large proportion of the banking system's capital is eroded.

Debt crisis dates were based on Beim and Calomiris (2001). Only private lending to sovereign nations is considered when creating these default dates. Not every instance of technical default is included in the chronology. The authors identified periods (six months or more) where all or part of the interest/principal payments were suspended, reduced or rescheduled. Some of those episodes are outright debt repudiations, while others were reschedulings agreed upon mutually by lenders and borrowers. Also data is taken from a spreadsheet underlying Reinhart, Rogoff and Savastano (2003).

Our measure of a sudden stop requires that there is a drop in the ratio of capital inflows to GDP of at least two standard deviations for the within country level over the period and/or any drop in capital flows that exceeds three percent of GDP over a period shorter than four years. Other measures based on the current account and which may also take into account output declines exist. For our purposes we wanted to purge the definition of a GDP measure since it is also the dependent variable of this analysis. The current account data has not yet been fully elaborated to include a large sample of countries using a definition based on such data. For this reason we use the Stone capital inflow data to date these episodes.

Box 4 The Financial System and Financial Development

The mechanics of the financial system has come to feature increasingly in the way economists' think about the macroeconomy. In recent macroeconomic theory financial frictions are formalized as a problem of asymmetric information in credit markets in which borrowers have better information on their prospects than do lenders. In these types of models collateral matters and the net worth of borrowers determines the equilibrium allocation of capital. Because of these frictions markets cannot always allocate capital optimally. However, when financial intermediaries are better at monitoring and have more information about the prospects for any particular project the economy can push closer to the first best outcome. This is one aspect of financial development and certainly if firms can get the optimal amount of capital at the right time this promotes economic stability and helps dampen the fallout from liquidity runs and debt deflation.

Another strand of the literature focuses more broadly on the entire financial system. Sylla and Rousseau (2003) claim that a well developed financial system has five key components. They are (1) sound public finances and public debt management (2) stable monetary arrangements (3) a variety of banks that operate both internationally and nationally (4) a central bank to stabilize domestic finances and manage international financial relations , and (5) well functioning securities markets.

The basic point is that a financial system that is well articulated can channel capital where it is most profitable and can withstand domestic and international real and financial shocks without major disruption.