

Foreign Currency Debt, Financial Crises and Economic Growth : A Long-Run Exploration



Michael D. Bordo

Rutgers University and NBER

Christopher M. Meissner

UC Davis and NBER

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Introduction

- Both the contemporary and historical record demonstrate that borrowing in foreign currency is associated with financial fragility and costly financial crises.
- In this paper we investigate the costs of foreign currency debt by assessing the losses to economic growth and income per capita arising from foreign currency debt.
 - Foreign currency debt has a negative indirect impact on per capita income because it is associated with financial crises.
 - This impact is largest when unsustainable foreign borrowing induces crises and when countries fail to strengthen their financial systems during financial booms.
 - Evidence comes from two periods of open financial integration – 1880-1913 and 1972-2002.



Introduction

- Our results suggest that minimizing foreign currency financing is not a sufficient condition for financial security and the avoidance of growth reducing financial crises.
- Historically, many countries with solid financial systems and good reputations in capital markets have avoided crises and maintained living standards despite hard currency exposure.
- Lasting financial stability and good economic outcomes depend partially on rationally managing foreign currency exposure on the balance sheet, but also on strengthening financial development and limiting other sources of vulnerability in the macro economy.



Introduction

- Thus, breaking free from the alleged burden of hard currency debt will not guarantee that countries avoid financial crises in the future.
- Further strengthening the financial system, the institutional framework and prudent external borrowing may also be key components of financial stability.



2. Foreign Currency Debt, Financial Integration and Crises : A Long Run Overview and Comparison

- Like the last 40 years, 1880-1913 witnessed a strong surge in the integration of international capital markets. Capital flowed free of controls.
- Cross border, market-based financing for projects in both the developed and the less-developed regions played an important role in shaping the flow of capital from London.
- Today market based financial centers, multilateral lenders and bilateral agreements direct capital to the developing world, but since the 1970s market-based cross-border flows have been the area of primary interest



2.1 The Size and Direction of International Capital Flows

- In the first era of globalization, average current account deficits in countries such as Australia, Canada, New Zealand and the U.S. were about three percent. In the periphery, they were lower but still significant.
- Foreign investment accounted for up to 20 percent of total capital formation in many of the emerging markets. This value was 50 percent in Australia, Canada, Argentina and Brazil.
- Since the 1980s, a series of countries liberalized their capital accounts.
- In the past 30 years the persistence and size of current account deficits have been lower than in the first period of globalization but some countries have also received important net inflows of foreign capital.



2.2 Other Stylized Facts of Global Finance over the Long Run

- Pre 1913 capital exports from Western Europe took the form of bond finance, private bank loans and direct investment.
- Covered interest parity held tightly for a number of core countries.
- Adhering to the gold standard and stabilizing exchange rates lowered the yield spread on sovereign bonds.
- Today private flows via banks in the 1980s and subsequently bond finance since the 1990s have been central. Equity acquisitions are also increasingly important.
- Direct investment has also become an important feature of development finance.



2.3 Foreign Currency Financing in Two Periods of Globalization

- Contemporary work on currency denomination of debt by Eichengreen and Hausman (1999) focused mainly on external borrowing. They called a high ratio of foreign currency liabilities to total international liabilities, 'original sin' because the currency denomination aspect of the contract was ostensibly unrelated to fundamentals.
- Bordo and Meissner (2006) tracked international and domestic debt and the currency denomination of both types of liabilities 1880-1914 for 18 countries.
- However many emerging markets issued and placed long term debt that was denominated and payable in local currency.



2.3 Foreign Currency Financing in Two Periods of Globalization

- These included financially underdeveloped countries like Argentina, Brazil, Chile, Italy, Russia, Spain and Portugal.
- By contrast, countries that were more financially developed like the U.S., Canada, Australia and Scandinavian were heavily exposed to hard currency debt
- Today developing country governments are quite able to market substantial proportions of their total debt in local currency. Also foreign investors are increasingly willing to hold developing country local currency debt.
- So are countries that reduce exchange rate exposure the most guaranteed financial stability? Or do additional factors need to accompany a break away from foreign currency debt?



2.4 Original Sin? A long run view of hard currency debt's origins and consequences

- Bordo and Meissner (2006) show pre 1914 some countries with very heavy foreign currency exposure did not have severe financial instability or debt defaults while others with intermediate levels of hard currency exposure did have frequent and severe financial crises.
- Recently, many advanced countries with significant outstanding hard currency debt avoided severe crises while emerging countries with a high percentage of foreign currency debt had debt crises.
- The lesson from the long-run is that sound debt management, the development of sound fiscal and financial capacity has allowed countries with a high percentage of foreign currency debt to escape financial crises.
- Minimizing currency mismatches, by for example, acquiring reserves also reduced the incidence of crises.



2.5 The Origins of Foreign Currency Financing

- Recently Bordo, Meissner and Redish (2005), Flandreau and Sussman (2005) showed that historically financial development and credibility were neither necessary nor sufficient to eliminate high levels of foreign currency debt relative to the total amount of international liabilities.
- In the past the proportion of hard currency debt relative to total external borrowing was inversely related to economic size, initial conditions and chance historical events.
- Eichengreen Hausman and Panizza (2005) came to a similar conclusion for today.



2.5 The Origins of Foreign Currency Financing

- Historical data on the percentage of total debt denominated in foreign currency shows that the U.S., Canada, Australia and Scandinavia had higher percentages of hard currency sovereign debt outstanding than Argentina, Spain, and Russia.
- The latter had weaker financial and institutional framework.
- The advanced emerges eventually found it optimal to reduce their reliance on foreign currency debt. e.g. the US in the 1930s
- Historically high exposure to hard currency liabilities has not been a proxy for dysfunctional policies and institutions.



2.5 The Origins of Foreign Currency Financing

- Some countries with hard currency liabilities and with sound institutional fundamentals had good economic fortunes. They avoided financial crises.
- Other countries with lower levels of exposure to hard currency debt with weaker fundamentals had terrible crises.



3. International Financial Flows, Hard Currency Debt, Crises and Economic Growth: A Brief Conceptual Framework

- We follow an open-economy approach to the balance sheet view of the credit channel transmission mechanism as in Mishkin (2003) and Jeanne and Zettlemeyer (2005).

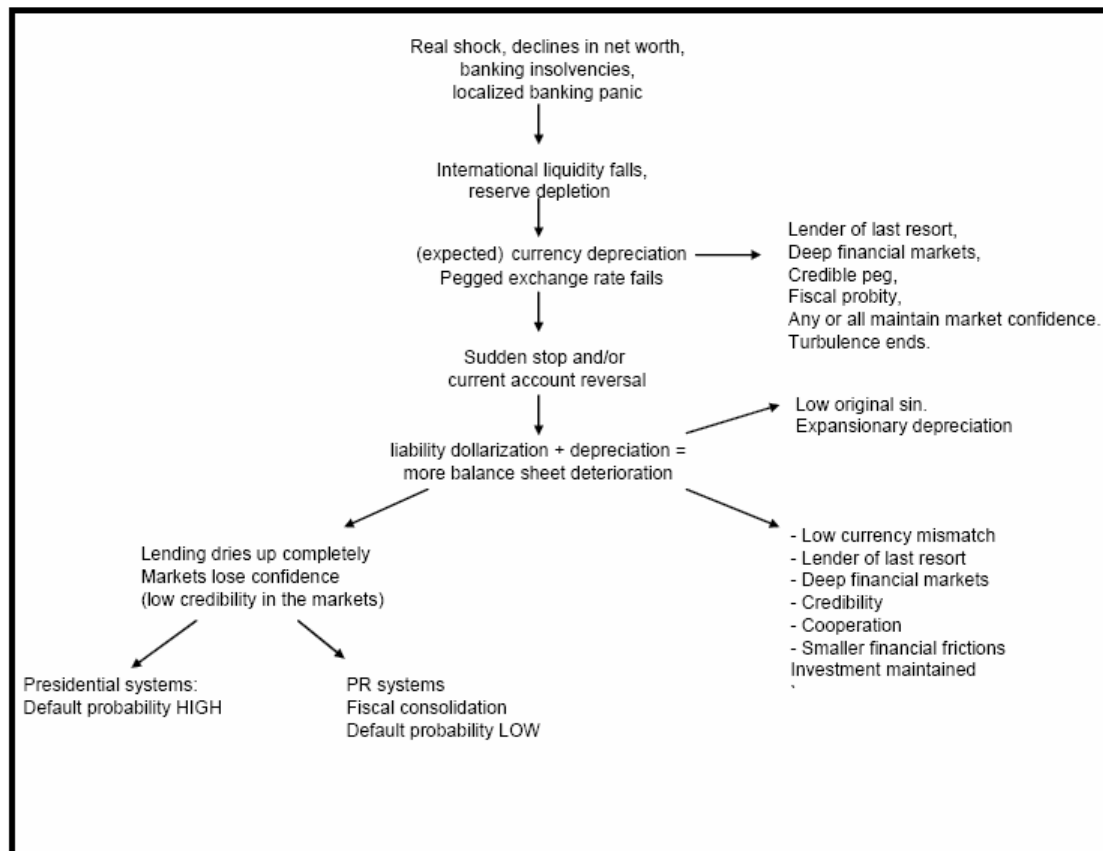


Figure 1.



3. International Financial Flows, Hard Currency Debt, Crises and Economic Growth: A Brief Conceptual Framework

- The Framework
 - Sudden stops are exacerbated by high levels of foreign currency debt relative to total borrowing.
 - Large capital inflows are often associated with a speculative attack on the currency or sharp currency drops especially when policy makers have low credibility or low reserve positions.
 - All else equal, foreign currency debt exposure in the face of a currency crisis makes private and public debt default more likely. Private agents' balance sheets are impaired.
 - The economy sinks into recession and revenues fall. Governments and private agents are more likely to default in such a scenario.
- Original sin interacts in a complex way with other fundamentals in contributing to crises.



4. Empirical Evidence: The Potential Costs of Hard Currency Debt

- We test whether foreign capital flows are key determinants of currency crises conditioning on a number of factors.
- We investigate below whether combinations of high ratios of hard currency debt to the total, poor reserve positions and other factors matter for crisis outcomes or whether original sin alone matters the most.
- Table 1 column 1 and 4 estimate a probit model where the dependent variable is one if there was a currency crisis and zero otherwise.



4. Empirical Evidence: The Potential Costs of Hard Currency Debt

Table 1 Determinants of Financial Crises, Full Sample

Covariates	First Wave of Market Integration 1880-1913			Second Wave of Market Integration 1973-2002		
	(1) Currency	(2) Debt	(3) Avg. value ^a	(4) Currency	(5) Debt	(6) Avg. value ^a
Lag of Level of Net Inflows/GDP	0.003*** (0.001)	–	1.79	0.003** (0.001)	–	1.08
Original Sin	-0.00008 (0.00022)	-0.00006 (0.00005)	52.46	0.0013** (0.0003)	0.0004* (0.0002)	77.63
Original Sin x Currency Crisis	–	0.0003* (0.0002)	2.05	–	0.007** (0.005)	5.84
Lag of Short term real UK/US Interest Rate	0.021** (0.009)	-0.0020 (0.0013)	2.75	0.0003 (0.0019)	0.003*** (0.001)	6.98
Lag of Reserves/Money	-0.0004** (0.0002)	-0.0002 (0.0001)	48.46	-0.00005 (0.0001)	-0.00007 (0.00007)	50.78
Lag of Bank Crisis	0.04 (0.06)	0.03** (0.02)	0.05	0.08*** (0.03)	0.01* (0.01)	0.10
Currency Crisis	–	-0.003 (0.005)	0.04	–	-0.21** (0.21)	0.06
Country-Years	508	508		1088	1088	
Countries	18	18		45	45	
Obs. P	0.04	0.012		0.06	0.02	
Pred. P (at x-bar)	0.03	0.005		0.04	0.01	
Pseudo-R ²	0.11	0.22		0.10	0.15	



4. Empirical Evidence: The Potential Costs of Hard Currency Debt

- Column 1 and 4 show for the 1880-1913 and 1973 -1997 that a large inflow of capital relative to GDP has a positive and statistically association with a currency crises.
- Original sin is not associated with a higher chance of a crisis in the first period but it is positively related to currency crises in the second period.
- In column 2 and 5 we test whether debt crises are related to the presence of hard currency debt.
- We see that the marginal impact of a higher ratio of hard currency debt to total debt is associated with a higher probability of having a debt crisis in both waves of globalization when there is also a currency and or banking crisis.



4. Empirical Evidence: The Potential Costs of Hard Currency Debt

- This supports the observation that currency depreciation increases the real burden of foreign currency debt making default more likely and that foreign currency debt is more likely to be associated with a crisis as a side effect of large foreign capital inflows.
- We also find evidence that strong financial systems (proxied by the ratio of reserves to money) are important for explaining the lack of incidence of major financial meltdowns.
- Table 2 calculates the predicted probability of having a debt crisis generated by the probit models for debt crises in Table 1.



4. Empirical Evidence: The Potential Costs of Hard Currency Debt

- Table 2 calculates the predicted probability of having a debt crisis generated by the probit models for debt crises in Table 1.

Table 2 Likelihood of Debt Crises: First and Second Waves			Pr(Debt Crisis)		
Economic Conditions	Pr(Debt Crisis)		Economic Conditions	First Wave	Second Wave
	1880-1913	1972-2004		1880-1913	1972-2004
<i>Scenario #1: Excellent Fundamentals</i>			<i>Scenario #3: Bad Fundamentals</i>		
Original Sin = 100			Original Sin = 100		
Original Sin x Currency Crisis = 0			Original Sin x Currency Crisis = 0		
Gold Coverage Ratio = Average	<0.01	0.02	Gold Coverage Ratio = 0	0.08	0.07
Currency Crisis = 0			Currency Crisis = 0		
Bank Crisis Last Year = 0			Bank Crisis Last Year = 1		
<i>Scenario #2: Good Fundamentals</i>			<i>Scenario #4: Worst Fundamentals</i>		
Original Sin = 100			Original Sin = 100		
Original Sin x Currency Crisis = 100			Original Sin x Currency Crisis = 100		
Gold Coverage Ratio = Average	0.20	0.10	Gold Coverage Ratio = 0	0.63	0.21
Currency Crisis = 1			Currency Crisis = 1		
Bank Crisis Last Year = 0			Bank Crisis Last Year = 1		



4. Empirical Evidence: The Potential Costs of Hard Currency Debt

- We evaluate the probit model using the estimated coefficients, a 100 percent hard currency debt ratio and a range of values for the other included covariates that reflect financial development and financial robustness.
- We define “excellent” fundamentals as an observation with the sample average reserve to money stock ratio, no banking crisis in the previous year and no currency crisis this year.
- We define “good” fundamentals as a country that has “excellent” fundamentals but falls victim to a currency crisis.
- We define “bad” fundamentals as a country that has a banking crisis in the previous year and no international reserves.



4. Empirical Evidence: The Potential Costs of Hard Currency Debt

- The “worst” case is a situation with no reserves and a twin banking and currency crisis.

Table 2 Likelihood of Debt Crises: First and Second Waves			Pr(Debt Crisis)		
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	First Wave	Second Wave		1880-1913	1972-2004
<i>Scenario #1: Excellent Fundamentals</i>			<i>Scenario #3: Bad Fundamentals</i>		
Original Sin = 100			Original Sin = 100		
Original Sin x Currency Crisis = 0	<0.01	0.02	Original Sin x Currency Crisis = 0	0.08	0.07
Gold Coverage Ratio = Average			Gold Coverage Ratio = 0		
Currency Crisis = 0			Currency Crisis = 0		
Bank Crisis Last Year = 0			Bank Crisis Last Year = 1		
<i>Scenario #2: Good Fundamentals</i>			<i>Scenario #4: Worst Fundamentals</i>		
Original Sin = 100			Original Sin = 100		
Original Sin x Currency Crisis = 100	0.20	0.10	Original Sin x Currency Crisis = 100	0.63	0.21
Gold Coverage Ratio = Average			Gold Coverage Ratio = 0		
Currency Crisis = 1			Currency Crisis = 1		
Bank Crisis Last Year = 0			Bank Crisis Last Year = 1		



4. Empirical Evidence: The Potential Costs of Hard Currency Debt

- Table 2 shows
 - 1) Scenario #1 shows that a 100 percent hard currency debt ratio and good fundamentals is not associated with a highly significant likelihood of a debt crisis in either period.
 - 2) Scenarios #2 and #4 demonstrate that hard currency liabilities raise the predicted likelihood of having a debt crisis very significantly both for countries with good fundamentals and bad fundamentals.
 - 3) A 100 percent ratio of hard currency debt relative to total debt, combined with a move from the best to the worst fundamentals raises the predicted odds of suffering a debt crisis by over 70 times in the first period and by about ten times in the second period.



Foreign Currency Debt, Financial Crises, and Economic Growth

- We examine whether hard currency debt has an impact on economic growth rates via its impact on financial crises. We present a series of cross-country growth regressions which include as key explanatory variables net capital inflows and episodes of financial crisis.
- For 1880-1913 we use a set of 19 countries, for 1972-2002 we have 43 countries.
- We explore growth in non-overlapping 5 year periods.



Foreign Currency Debt, Financial Crises, and Economic Growth

- We run the regression below :

$$\begin{aligned} \overline{Growth}_{it,t-4} = & \alpha_0 + \alpha_1 \left\{ \left(\frac{\overline{ForeignK}}{GDP} \right)_{it,t-4} \right\} + \alpha_2 \overline{Crisis}_{it,t-4} + \alpha_3 \left\{ \left(\frac{\overline{Savings}}{GDP} \right)_{it,t-4} \right\} + \alpha_4 (\overline{Enrol}_{it,t-4}) + \\ & \alpha_5 \left\{ \left(\frac{\overline{Exports}}{GDP} \right)_{it,t-4} \right\} + \alpha_6 (\overline{\Delta \ln(Population)})_{it,t-4} + \alpha_7 \ln \left(\frac{GDP}{population} \right)_{it-4} + \mu_i + \delta_t + \varepsilon_{it} \end{aligned}$$

where the independent variables are : the first year period average of the ratio of the net inflow to GDP, a crisis dummy, a measure of domestic saving and other standard growth regression control variables.



Foreign Currency Debt, Financial Crises, and Economic Growth

- Table 3, columns I to IV show that there is no clear positive association between international capital inflows and economic growth but crisis periods are bad for growth – they reduce growth by one to two percent.

Table 3 International Financial Integration and Growth, Five Year Periods, 1880-1910 and 1972-2003

Dependent Variable: Average Five Year Percentage Growth Rate of GDP per Capita in non-overlapping periods

Covariates	First Wave of Market Integration 1880-1910		Second Wave of Market Integration 1973-2002	
	(I)	(II)	(III)	(IV)
Avg. Net Capital Inflows/GDP	-0.022 (0.118)	0.11 (0.12)	-0.005 (0.031)	0.013 (0.034)
Avg. Years in Crisis [‡]	-0.91 (0.67)	-2.84** (1.15)	-1.35*** (0.42)	-1.08*** (0.38)
Avg. Percentage School Enrollment	0.24 (0.24)	0.64** (0.22)	0.02 (0.03)	0.03 (0.03)
Avg. Exports/GDP	0.02 (0.04)	0.02 (0.14)	0.05*** (0.02)	0.04** (0.02)
Avg. Population Growth Rate	-0.28 (0.80)	0.75 (0.97)	0.06 (0.37)	-0.05 (0.40)
Average Savings/GDP	–	-0.06 (0.10)	–	0.12** (0.05)
Ln GDP per capita in first year of 5 yr period	-5.31* (2.96)	-4.49 (4.96)	-5.72*** (1.30)	-6.81*** (1.40)
Constant	36.91* (20.35)	27.15 (38.19)	52.60*** (11.65)	60.84*** (12.39)
Mean Country Growth Rate (% per year) (std. dev)		1.33 (1.69)		1.73 (2.02)
Mean Years in crisis (std. dev)		0.12 (0.20)		0.18 (0.29)
Number of country years	105	62	241	241
Number of Countries	19	12	48	48
R ² -within	0.26	0.43	0.30	0.33



The Quantitative Impact of Hard Currency Debt on Growth

- The combined evidence from Table 1 and Table 3 suggests that hard currency debt, by triggering financial crises, could be responsible for significant reductions in economic growth arising from those crisis events.
- We ascertain the quantitative impact.
- In the case where a country has excellent fundamentals but also has 100 percent hard currency debt, using the coefficient on the crisis variable from column IV of Table 1 (1972-1997) and the predicted probability of a crisis from column 2 of Table 2, the contribution to the average predicted growth rate is a decline in growth of 0.02 percent



The Quantitative Impact of Hard Currency Debt on Growth

- By contrast consider a country with the worst fundamentals in the probit models and 100 percent hard currency debt. In the first period we see a loss in growth of just over 2 percent. In the second period the loss is 0.22 percent.
- Finally consider a scenario that raises hard currency debt to total debt ratio from 50 percent to 100 percent.
- In the worst case scenario using the coefficients from the Tables we find that for the 1880-1913 period that expected growth would drop by -0.91 percent (the average growth rate was 1.33 percent.)
- For the 1972-2002 period growth drops by -0.18 percent (the average growth rate was 1.7 percent)



The Quantitative Impact of Hard Currency Debt on Growth

- Alternatively, between 1972 and 2002, a halving of the hard currency debt ratio, when poor fundamentals are in place, could eliminate much of the reduction to expected growth we found above and which we attributed to hard currency debt.
- Between 1880 and 1913 a reduction in the hard currency debt by one half only eliminates half of the lower expected growth coming from 100 percent hard currency debt.
- Thus hard currency debt plays a much stronger role in accounting for growth performance associated with crises in the current era of globalization.
- But the overall impact on expected growth is much smaller relative to the earlier wave of globalization.



The Overall Impact of Capital Inflows.

- Financial crises are associated with significantly lower growth in the years immediately following their onset.
- Financial development, can help shield countries from currency and debt crises and hence lower growth due to crises.
- Hard currency debt can exacerbate the possibility of a debt crisis especially when there is a currency crisis and countries are financially fragile.
- If hard currency debt can increase the likelihood of a crisis, then raising the level of local currency debt is likely to keep growth at a steadier pace
- High amounts of hard currency debt can be managed and may not impact on crises if other fundamental factors are in place.



Conclusions and Comparisons over Two periods of Financial Globalization

- ① Today hedging strategies are much more varied, the range of debt instruments, the global patterns of supply and demand have all changed.
- ② The current debt data is not as complete as the pre 1914 data. We lack information on domestic debt.
- ③ Given the differences there is evidence that integration in both periods has been a key determinant of financial crises.
- ④ Foreign currency debt combined with a poor reserve position and a weak banking sector is a recipe for crisis.
- ⑤ Countries can protect themselves if they bolster their defenses in advance.
- ⑥ Conscious efforts to reduce foreign currency obligations may still not be enough to head off crises. Countries must fortify their financial systems.