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Sovereign debt defaults and currency crises in Latin America

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Document Version

Publisher's PDF, also known as Version of record

Publication date:

2015

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Boonman, T. M. (2015). *Sovereign debt defaults and currency crises in Latin America*. University of Groningen, SOM research school.

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Chapter 2

Historical and theoretical background

Latin America's experiences with recurrent and new financial crises have played an important role in the development of theoretical models of currency and sovereign debt crises. Over time, different crisis dynamics have been observed. As a consequence, new theories and models have been developed to capture these new mechanisms. We present both the economic history of the region and the development of theories and models for currency crises and sovereign debt defaults in this chapter. This background will place the later chapters in context. Section 2.1 describes the economic history of Latin America. We focus on four countries in the region, Argentina, Brazil, Chile and Mexico. We present a brief history of currency and sovereign debt crises in Section 2.2 and a theoretical framework in Section 2.3.

2.1 Economic history of Latin America

The large majority of Latin American countries gained independence in the 1820s. In the first fifty years of independence the countries suffered from deep macroeconomic instability as periods of optimism about the natural resource extraction alternated with defaults, seigniorage and high inflation.

This was the start of a recurrent pattern of lending booms followed by a default crisis and macroeconomic adjustment (Taylor, 2005). We subdivide the history since 1870 into different periods by using standard international institutional structural breaks.

2.1.1 1870–1914: Global trade and financial integration

After yet another macroeconomic and financial crisis in the early 1870s in the region, this time caused by a stock market crash in Austria, which spread around Europe and then to the Americas, a new investment boom began in the 1880s, bigger than ever before. Lending was concentrated in five countries (Argentina, Brazil, Chile, Mexico and Uruguay), and apart from sovereign lending, there was a boom in investments in the private sector, mainly in infrastructure, but also in mining and other commodity-related industries. The development strategy in the 1880s in Argentina had ‘bubble tendencies from the start’ (Taylor, 2005). Sovereign lending was not accompanied by increases in short-term revenues, which made repayment difficult (Bordo and Meissner, 2007). Additionally, external debt was almost totally denominated in foreign currency or in gold, while the proceeds of the debt were invested domestically. This currency mismatch is known as ‘original sin’ (Eichengreen and Hausmann, 1999). Original sin is the situation in which the domestic currency cannot be used to borrow abroad or to borrow long term, even domestically. Because of this (currency or maturity) mismatch financial fragility is unavoidable. A depreciation of the currency will increase the debt service obligations in domestic currency, which increases the probability of a sovereign debt default (Bordo and Meissner, 2007). A global depression in the 1890s slowed down the expansion, and international interest rates surged. In 1890 the “Baring Crash” hit Argentina: a triple financial crisis (bank, currency and debt crises) led to a deep recession. The name of the crisis originated from the English Baring Brothers & Co. bank that had high exposure on Argentina and required a bail-out (Bordo and Landon-Lane, 2010). Brazil was affected by the deep recession of its neighbor, which was worsened further by great political instability, ad-

justments to the abolition of slavery, abandonment of the gold standard, and inconsistent monetary and fiscal policies. However, Brazil managed to drag on, until it finally defaulted in 1898, in the midst of a coffee crisis (Kaminsky and Vega-Garcia, 2014). The next international capital flow started in the mid 1890s and ended in 1914 (Kaminsky and Vega-Garcia, 2014). Various authors, a.o. Bordo and Meissner (2007) and Taylor (2005), compare the 1870–1914 period of globalization with the current period of globalization (1980–now). The main feature was the existence of relatively unrestricted international trade. Both capital and labor were free to move across international borders, and the widely adopted gold standard provided a well-established mechanism for balance-of-payment adjustments (Bulmer-Thomas, 2003).

In this period Argentina was the fastest growing country in Latin America, and took over first place from Brazil and Mexico in terms of the level of exports. The principal exports from the region were raw commodities. For Argentina cereal and beef; for Brazil cotton, sugar, coffee, rubber and coffee; for Chile nitrate and copper; and for Mexico: silver and petroleum, with silver more important up to 1900 and petroleum from 1900 on (Kaminsky and Vega-Garcia, 2014).

2.1.2 1914–1930: The collapse of the old world order

With the outbreak of World War I (1914) the center of the world capital market gradually shifted from London to New York. During the war Latin America suffered from capital controls, a slowdown in capital flows, a stop of foreign direct investments from Europe, and inflationary war finance. The withdrawal of foreign capital flows had negative consequences for the real economy. Brazil defaulted, as well as revolutionary Mexico (the revolution started in 1910 and ended in 1920).

After the war Latin American countries continued with the commodity exports oriented policies, which were successful because of the high demand for commodities. Capital flows also resumed, mostly from the United States, that took over the role from Great Britain, France and Germany. Its strong dependence on commodities made the region very vulnerable to ad-

verse conditions in the world commodity markets. By the end of the 1920s the U.S. Federal Reserve tightened monetary policy to slow down the surging stock prices. A recession followed and demand for commodities collapsed. Most Latin American countries returned to the Gold Standard in the mid 1920s in an attempt to promote trade and capital flows, but between 1929 and 1931 all abandoned the Gold Standard permanently.

2.1.3 1931–1944: Great Depression and WW II

With the Great Depression (1929) the demand for commodities and its prices decreased dramatically. Between 1928 and 1932 the unit value of exports fell by more than 50%. In volume terms the worst affected countries in the region were Bolivia, Mexico, Chile and Cuba. Another group of countries was less affected, as they produced and exported food and agricultural products: Argentina, Brazil, Ecuador, Peru and Central America (Bulmer-Thomas, 2003). While prices decreased, the nominal interest rate on outstanding foreign debt remained constant. This increased the real burden of the debt. As a consequence, an increasing share of the exports proceeds had to be used to service the debt, and imports had to be reduced. This affected the government revenues, because a large part of its revenues were collected through tariff duties on imports, as was the case for Brazil, or on exports, as was the case for Chile. All except a few countries (Argentina, Venezuela) defaulted in the early 1930s, Mexico already in 1928 (Bulmer-Thomas, 2003; Edwards, 2008).

Latin America recovered after 1932, although there were differences between the countries regarding speed and recovery mechanisms. In general, domestic demand contributed most to the recovery. This was possible due to loose fiscal and monetary policies. Internationally, the world was characterized by protectionism. In these years manufacturing in Argentina, Brazil, Mexico, Chile, Peru, Colombia and Uruguay expanded further. Conditions were good: with real depreciation of the exchange rate, tariff increases and exchange rate controls, consumers turned to local products instead of imported products (Bulmer-Thomas, 2003).

World War II was the third major external shock to strike Latin America in 25 years. The impact on trade was greater than WW I because continental Europe could no longer be traded with, and world trade was increasingly distorted by protectionist tariffs and barriers. The United States stepped into the vacuum, to secure access to strategic commodities, and not to lose political support from Latin American countries in the wake of rising fascism and communism. A system of inter-American economic cooperation started. Fiscal balances of Latin American countries were in deficit, because of the lower government revenues (import tariffs, direct taxes) and higher government expenditures (countercyclical investments, investments in social infrastructure, military spending). Most countries borrowed the deficit from the bank system, which led to monetization of the deficit. Stock-market indexes soared and real estate prices increased by a factor of ten or more during the war years. This increased inequality of the income distribution. Latin America continued with its trade surplus, and the countries saw their international reserves surge by more than 20% per year.

The high foreign reserves disappeared as fast as they had been created. They were used to negotiate the defaulted debt of the 1930s, to nationalize foreign-owned properties, and increasingly to finance imports. Imports had become relatively cheap, because the fixed exchange rate was not adjusted despite running a structural higher inflation than its trade partners from other regions. When imports continued to grow Latin American governments installed imports restrictions.

2.1.4 1945–1971: Inward-looking regimes

In the last stage of World War II the International Bank for Reconstruction and Development (later World Bank) and the International Monetary Fund (IMF) were founded. With the Bretton Woods agreement from 1944 exchange rates of the IMF-member countries were fixed. The world entered a period of low international trade and finance.

Latin America followed two distinct development paths. Six Latin American countries built up a significant industrial base (Argentina, Brazil, Chile,

Mexico, Colombia and Uruguay) and followed an import substitution industrialization (ISI) strategy. The other fourteen Latin American countries did not have an industrial base and continued on an export growth path, accompanied by export diversification.

The performance of the six Latin American countries under the ISI policy has been controversial. Compared to the period before 1950 and after 1980, this was a period of accelerated economic growth, particularly given the high growth in population and urbanization. Social conditions improved, yet poverty and inequality remained high. Although Latin America's growth was high, compared to other parts of the world the growth was not impressive. Another reason for the controversy was the heterogeneity of performances in the region. In Brazil and Mexico growth had accelerated significantly and averaged more than 6% per year; in Argentina and Chile growth was modest (Ocampo and Ros, 2011). The ISI policy was criticized because the newly developed industrial sector was highly inefficient, and in order to survive it required increasingly higher import barriers in the form of tariffs, licenses and quotas. As a result of protectionism the region's currencies became artificially strong, discouraging exports and hurting competitiveness in the agricultural sector (Edwards, 2008). Capital flows in this period were repressed, sovereign debt crises did not take place, but various currency crises occurred (Bordo and Landon-Lane, 2010). In the group of countries that continued the export-led growth were both cases of success (Venezuela) and failure (Cuba). This can be attributed to the so-called commodity lottery, which refers to the great differences in price changes across primary commodities (Blattman, Hwang and Williamson, 2007). In the case of Venezuela the surging oil prices were related to the success of the export-led policy, while Cuba's failed policy was related to decreasing sugar prices.

2.1.5 1972–now: Market reforms and return to globalization

With the end of the Bretton Woods agreement in 1971–1972 the world entered a new era, characterized by market reforms and a slow return to the pre-1914 times of global trade and capital flows.

The oil price shocks of 1973 and 1979 had a large impact in Latin America. Oil exporters (Mexico and Venezuela) initiated ambitious development plans aimed at rapid industrialization. They borrowed heavily and rapidly accumulated very large external debts. Unfortunately, the large investment projects turned out inefficient (Edwards, 2008). Oil importing countries tried to smooth the negative impact on their terms of trade by borrowing heavily abroad (Edwards, 2008). While various Asian economies opened up their economies and saw their exports surge, Latin American economies started to lag behind (Taylor, 2005). Some countries (Argentina, Chile and Uruguay) started with market reform experiments, while others (Brazil and Mexico) continued their state-led industrialization and turned to market reforms later (Ocampo and Ros, 2011). Banks in developed countries were eager to invest the earnings of newly-rich OPEC creditors and Latin America provided attractive returns. International bank lending to the "Big 3" (Argentina, Brazil, and Mexico) doubled from 1979 to 1981 (Edwards, 2008). As a consequence, external indebtedness in the region was high. By the end of the 1970s international interest rates were low (real interest rates were low or even negative) and commodity prices were high. In the early 1980s an unexpected increase in international interest rates and a decrease in commodity prices hit the region. As a consequence Mexico announced in 1982 that it was unable to meet payment of its foreign debt. This quickly caused investors to withdraw investments from the region, which caused defaults in countries in the region, in what was later baptized a 'sudden stop' of capital inflows (Dornbusch, Goldfajn and Valdes, 1995). During the renegotiations that lasted almost a decade, Latin America was excluded from global financial markets, and suffered from low economic growth, quickly worsening social conditions, and hyperinflation. This period became known as the 'lost decade' (Edwards, 2008).

To find a solution for the debt crisis and macroeconomic problems, Latin American governments, international lenders and international multilateral institutions achieved a breakthrough in 1989 when the 'Brady Plan' was announced. In this plan banks could exchange their old, defaulted debt claims

on emerging economies' governments for new, long-term, tradable bonds with a lower face value, and usually with a collateral. In order to be eligible to participate in the Brady debt exchanges the Latin American countries had to show a commitment to implement economic reforms. Mexico and Costa Rica were the first countries to enter this plan in 1989; Venezuela and Uruguay followed in 1990 and 1991, and Argentina and Brazil in 1992 (Edwards, 2008).

During the late 1980s and early 1990s many Latin American countries initiated market-oriented reforms. These reforms are known under the name 'Washington Consensus', a "collection of loosely articulated ideas aimed at modernizing, deregulating and reforming the Latin American economies" (Edwards, 2010: page 64). The reforms focused on efforts to reduce fiscal imbalances and inflation, to open the economy to international trade, to deregulate investments and the business sector, to develop domestic capital markets, to privatize public enterprises, and to reallocate public expenditures towards the poorest segments of society. The results arrived fast: inflation decreased, credit was once again available, and in some countries GDP growth increased drastically, exceeding 6% per year.

The impressive early results suppressed important weaknesses. Many countries had adopted rigid exchange rate regimes, and had allowed their currencies to strengthen significantly. This reduced exports' competitiveness in the global market place, increased current account deficits, and encouraged speculation. In most countries privatization of public utilities was implemented without putting in place proper regulation and competition policies. Financial crises and political chaos hit the region in the second half of the 1990s (Edwards, 2008). In December 1994 the Mexican Peso collapsed and after floating the currency, the peso lost more than 65% of its value. The bank sector collapsed and a debt crisis could only be avoided through IMF assistance. The Mexican crisis generated a wave of contagion through the region, the 'tequila effect': capital flows declined, and the cost of borrowing internationally surged. Argentina was particularly affected. From 1998 to 2002 the region was hit by financial crises in Brazil, Ecuador, Argentina

and Uruguay. As a result of the macroeconomic crises and economic setbacks of the late 1990s and early 2000s, frustration erupted across most of Latin America, and the public grew increasingly skeptical about the benefits of globalization and market orientation, and voters made a sharp turn to the left of the political center. Many of the elected presidents were critical of the Washington Consensus (Edwards, 2008; Grilli, 2005), although in a few countries (Colombia, Mexico and Chile) more market and international oriented political parties came to power.

In 2002–2007 and largely as a result of improving commodity prices and favorable global financial conditions, the Latin American countries experienced a surge in growth. Real per capita GDP growth averaged 3.2%. The recovery was particularly pronounced in countries recovering from deep crises, such as Argentina and Venezuela. In addition to the pickup in growth, other macroeconomic indicators also improved during this period: in most countries external debt decreased and inflation remained low (Edwards, 2008).

In 2008, demand and prices for commodities dropped as the Global Financial Crisis (2007–2009) deteriorated. As a consequence of the situation in the USA and Europe the currencies of Latin American countries appreciated, which further affected the exports position. But—like in most emerging countries all over the world—the effects were relatively small. This changed with the collapse of Lehman Brothers in September 2008. The financial markets reacted strongly and negatively: the stock markets plunged, exchange rates depreciated sharply, and interest rates surged. International capital flows and trade came to a virtual stand-still. However, the situation reversed in the course of 2009 and the financial impact was less severe than in past global crises (Ocampo, 2009; Porzecanski, 2009; and Jara, Moreno and Tovar, 2009). The region weathered the Global Financial Crisis remarkably well. The main reason is that the situation at the start of the crisis was much better than in previous external shocks. After the period of economic prosperity in the 2002–2007 boom, most countries in the region had low currency mismatches, a more flexible exchange rate regime, improved supervi-

sion on the banking sector, more credible monetary and fiscal policies, high foreign reserves, and low sovereign external debt levels.

Figure 2.1 presents a time line of the history of the four Latin American countries under study, Argentina, Brazil, Chile and Mexico. We identify ten global and external events, the Barings Crash, WW I, the Great Depression, WW II, the end of Bretton Woods, the first and second oil crises, the Latin American debt crisis, the Asia crisis and the Global Financial Crisis. Most countries in the region have experienced recurring military coups and regimes since the 1930s and up to the end of the 1980s. Whereas Argentina has seen wide swings in its political system, represented by the polity2 indicator, Mexico has experienced gradual changes and extended periods of autocratic systems.

2.2 History of currency crises and sovereign debt defaults

2.2.1 Currency crises

Table 2.1 shows the currency crises in the four Latin American countries under study. The classic Gold Standard (1880–1913) era runs up to WW I and is characterized by relatively few currency crises. And when a crisis occurred, the authorities showed a firm commitment to restore convertibility at the pre-crisis gold price once the difficulties were over. Due to this credibility of the authorities investors had no reasons to flee (Bordo and Eichengreen, 2001). Another difference with later periods is that banking crises did not spill over to the currency markets. The authorities did not bail out banks with large-scale credits, but instead suspended deposit convertibility, so that the currency increased in value compared to deposits. This created arbitrage possibilities and with the consequent foreign capital inflows the country could restore deposit convertibility (Bordo and Eichengreen, 2001).

Figure 2.1. Time line of Argentina, Brazil, Chile and Mexico, 1870–2010. The blue circles represent currency crises, the red triangles represent sovereign debt defaults, and the green line is the polity2 dummy variable that represents the political system, on a scale from +9 (pure democracy) to -9 (pure autocracy). The yellow shaded areas represent external and global events; green shaded areas represent national events, and military coups are represented by black vertical bars.

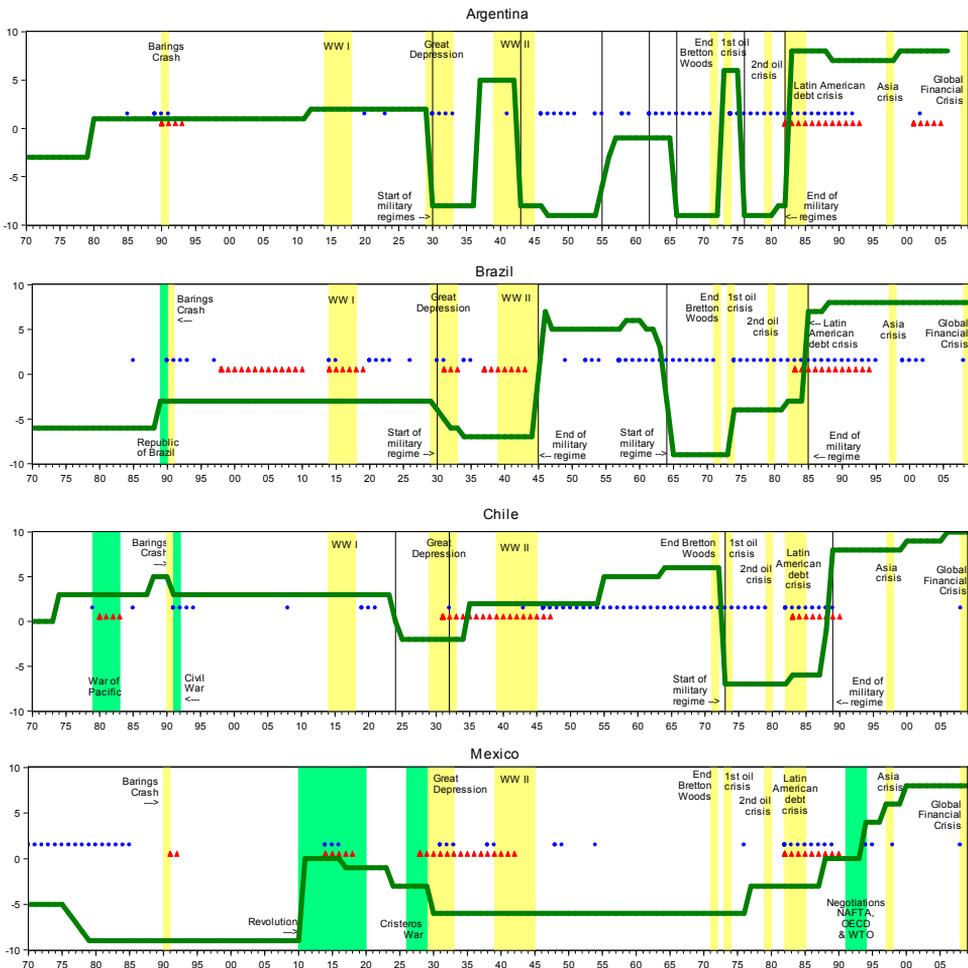


Table 2.1. Dating of currency crises in Argentina, Brazil, Chile and Mexico, 1870–2012.

	Period I (1870-1913)	Period II (1914-1930)	Period III (1931-1944)	Period IV (1945-1971)	Period V (1972-2012)
Argentina	1885, 1889–1891	1920, 1923, 1930–1931	1933, 1941	1946, 1948–1949, 1951, 1954–1955, 1958–1959, 1962, 1964–1965, 1967, 1969–1971	1974–1992, 2002
Brazil	1885, 1890–1891, 1893, 1897,	1914–1915, 1920–1921, 1923, 1926, 1930–1931	1934–1935,	1949, 1952–1954, 1957–1959, 1961–1965, 1967–1969, 1971	1974–1975, 1977–1995, 1999, 2001–2002, 2008
Chile	1879, 1885, 1891, 1893–1894, 1908	1919, 1921	1932, 1943	1946–1949, 1951–1955, 1957–1958, 1960, 1962–1965, 1967, 1969–1979	1982–1985, 1987, 1989, 2008
Mexico	1891–1892	1914–1916	1931–1933, 1938–1939	1948—1949, 1954	1976, 1982–1987, 1989, 1994–1995, 1998, 2008

Source: Reinhart and Rogoff (2011)

Notes:

A currency crisis is identified when the annual depreciation is greater than 15%, and 10% higher than the previous year (definition from Frankel and Rose, 1996).

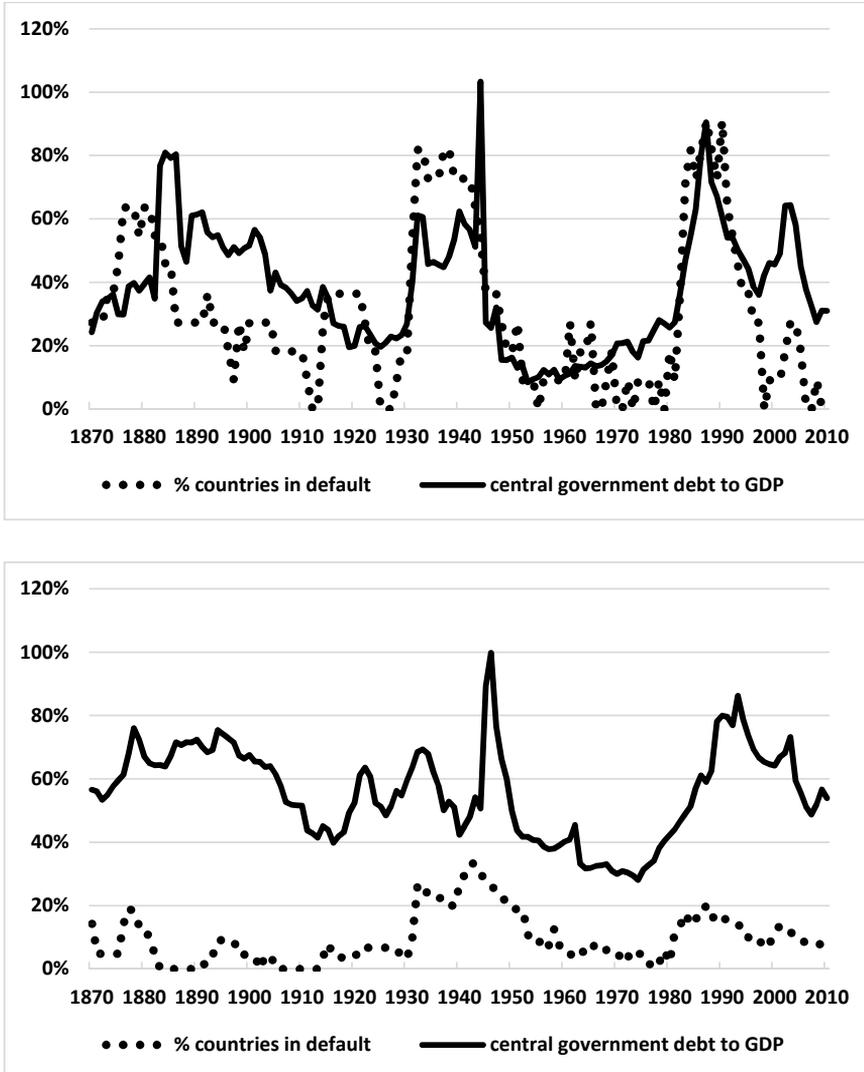
The Golden Standard era ended at the start of WW I. Most Latin American countries returned to the Gold Standard in the mid 1920s in an attempt to promote trade and capital flows, but between 1929 and 1931 all abandoned the Gold Standard permanently. In this—unstable—period a large number of currency crises occurred. The Bretton Woods period (1945–1971) features an adjustable peg regime, widespread capital controls and extensive financial regulation, designed to prevent a reoccurrence of the financial chaos of the interwar. There were very few banking and debt crises, but there were frequent currency crises. Many countries were unable to align their domestic financial policies with their pegged currencies (Bordo and Landon-Lane, 2010). The post-Bretton Woods period (1972–now) is characterized by a wide variety of currency regimes, currency regime switches and currency crises. The currency crisis literature starts in this period.

2.2.2 Sovereign debt defaults

Prior to 1800, only a few countries (Austria, France, England, Prussia, Portugal and Spain) experienced debt defaults. There were simply not many countries that had the capacity to build up foreign debt and then go into default. After 1800, global income rose as a consequence of the Industrial Revolution, international capital markets developed and the emergence of new countries (mainly in Europe and Latin America) led to an explosion of sovereign debt borrowing, soon followed by defaults (Reinhart and Rogoff, 2009).

The top panel in Figure 2.2 shows the number of countries in default as a percentage of all countries (dotted line) and the debt-to-GDP ratio (solid line) for Latin American countries from 1811 to 2010. We exclude six Central American countries, because these represent one third of the number of countries, while the size of these economies is relatively small. The percentage of countries in default does not vary substantially when these countries are included, but the average debt-to-GDP ratio is affected heavily. We can observe three periods where more than 60% of countries in the region are in default: the 1870s, 1930s and 1980s.

Figure 2.2. Latin America and the rest of the world: debt-to-GDP ratio and countries in default, 1870–2010. The top panel presents Latin America, excluding Central America. The lower panel presents the rest of the world.



Source: Reinhart and Rogoff (2009).

Notes:

The vertical axis represents the number of countries in default as a percentage of all countries (dotted line), and the central government debt as a percentage of GDP (solid line). The sample includes countries that were independent states in the given year. For Latin America (excluding Central America) the number of countries is 12 throughout the whole period and for the rest of the world the number of countries increases from 21 in 1870 to 51 in 2010. The percentage of countries in default is determined by the ratio of the number of countries in default to the total number of countries. For the debt we use the total (domestic plus external) gross central government debt. The debt-to-GDP ratio is calculated as the unweighted average of the countries' debt-to-GDP ratios.

We also see that debt-to-GDP peaks in the years after the peak in percentage of defaults. This does not come as a surprise, since the debt typically increases until a restructuring agreement is reached and GDP decreases in the first years following the default. The bottom panel in Figure 2.2 shows the historical pattern of defaults and debt for the rest of the world from 1811 to 2010. The percentage of countries in default is substantially lower than in Latin America. Only in World War II the percentage surpasses 30%. Other periods of distress are the 1870s, 1930s and 1980s, which coincide with the periods of distress for Latin America. The debt-to-GDP ratio is generally higher than in Latin America, except in the periods that follow the major debt default episodes (1870s, 1930s and 1980s).

The episodes of increased number of defaults correspond to boom-bust cycles of international capital flows, in the early 1860s, 1920s and 1970s (Sturzenegger and Zettelmeyer, 2007). Also the late 1880s and the years before World War I are considered lending booms. Lending booms end in busts, which are usually triggered by one of the following factors: (i) a deterioration in the terms of trade of the debtor country, (ii) a recession in one the major creditor countries, (iii) a rise in international borrowing costs, or (iv) a crisis in a major debtor country that is transmitted internationally through financial and trade linkages (Sturzenegger and Zettelmeyer, 2007). Global economic factors, including commodity prices and center country interest rates (the UK and later USA), play a major role in precipitating sovereign debt crises. Peaks and troughs in commodity price cycles appear to be leading indicators of peaks and troughs in the capital flow cycle, with troughs typically resulting in multiple defaults (Reinhart and Rogoff, 2009). The episodes of boom-bust cycles seem to affect Latin America stronger than the rest of the world, which suggests that global circumstances play an important role in the debt dynamics of the region (either through common shocks or contagion).

The sovereign debt default episodes for the four countries of our focus (Argentina, Brazil, Chile and Mexico) are presented in Table 2.2. Most crises are clustered in systemic default periods, which are defined as five year epi-

sodes in which at least 20% of the countries in Latin America are in default (Kaminsky and Vega-Garcia, 2014). Systemic defaults in Latin America took place in 1873–1877 (stock market collapse in Vienna, Austria spread around the world), 1890–1894 (Barings crisis), 1914–1918 (World War I), 1931–1934 (Great Depression) (Kaminsky and Vega-Garcia, 2014), and also the 1980s debt crisis can be considered a systemic default.

Table 2.2. Dating of sovereign debt default episodes in Argentina, Brazil, Chile and Mexico, 1870–2012.

	Period I (1870-1913)	Period II (1914-1930)	Period III (1931-1944)	Period IV (1945-1971)	Period V (1972-2012)
Argentina	1890–1893	-	-	-	1982–1993, 2001–2005
Brazil	1898–1901, 1902–1910	1914–1919,	1931–1933, 1937–1943	-	1983–1994
Chile	1880–1883	-	1931–1947	-	1983–1990
Mexico	1866–1885	1914–1922, 1928–1942	-	-	1982–1990

Notes:

Based on Standard & Poor's, from Borensztein and Panizza (2009).

IMF assistance to avoid a possible debt default is used in Argentina 1995, Brazil 1998–1999 and 2001–2002, and Mexico 1995.

There are also defaults with idiosyncratic patterns, in Argentina 2001–2005, Brazil 1898–1910 and 1937–1943, Chile 1880–1883, and Mexico 1928–1942. Argentina's default in 2001 is caused by a combination of high debt level and fiscal deficit, low economic growth, and an overvalued fixed exchange rate. Brazil defaults in 1898 following the collapse of the price of coffee, its main export crop, political instability in the early years of the Republic, and the decline in international lending after the Baring Crisis in 1890 (Kaminsky and Vega-Garcia, 2014). Brazil's default in 1937 is related to the continued bad situation in the world markets. The country is not able to continue servicing the restructured debt after the 1931–1934 default.

When Chile starts the War of the Pacific in 1879, it stops in 1880 paying the sinking funds to amortize the debt, although it continues to service the coupon payments on its debt (Kaminsky and Vega-Garcia, 2014). Mexico, still caught up in the aftermath of its revolution (1910–1920), with fiscal difficulties and high political unrest including the Cristero war (1926–1929), defaults in 1928.

2.2.3 Conclusion

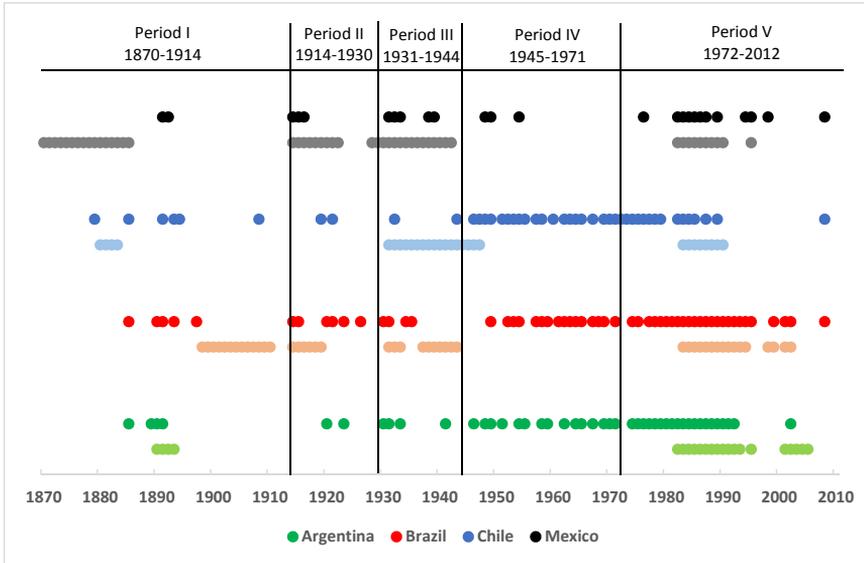
Latin America has experienced many sovereign debt defaults. The majority of the crises occurs in systemic default episodes, and is related to boom-bust patterns in international lending and commodity prices, and to sudden stops in foreign capital flows. A second feature is that the debt as a percentage of GDP is generally lower in Latin America than in the rest of the world.

In Figure 2.3 we present both the sovereign debt crises and the currency crises for Argentina, Brazil, Chile and Mexico. Most sovereign debt crises are accompanied by a currency crisis, but there is no clear pattern in timing: six sovereign debt crises are preceded by a currency crisis, five sovereign debt crises occur in the same year as the currency crisis, and four sovereign debt crises are followed by a currency crisis. We note that the Bretton Woods period (1945–1971) shows a very distinct picture than the other periods: no sovereign debt crises while the number of currency crises is much higher than in most other periods. The post-Bretton Woods period (1972–now) is characterized by a large number of currency crises and sovereign debt crises. It is no coincidence that the financial crisis literature accelerates in the late 1970s.

2.3 Theoretical framework

Since the late 1970s recurring crises and new crisis mechanisms have forced the literature to evolve continuously. Economists have constructed new theories and frameworks to model financial crises. In general there seems to be more consensus in theories on currency crises than in theories on sovereign

Figure 2.3. Currency crises and sovereign debt crises in Argentina, Brazil, Chile and Mexico, 1870–2012. Currency crises are represented by the upper, dark colored dotted lines. Sovereign debt crises are represented by the lower, light colored dotted lines.



Source: Reinhart and Rogoff (2011).

debt crises. In Section 2.3.1 we treat various theories related to currency crises. We have used these theories to determine which variables to include in our Early Warning System for currency crises that we present in Chapter 3. We also turn to the theories for interpreting our empirical findings. In Sections 2.3.2 and 2.3.3 we focus on theories on sovereign debt and sovereign debt defaults respectively. We use these in Chapter 4 to determine which variables show a distinct pattern during periods of debt service difficulties, and in Chapters 5 and 6 to analyze the impact of sovereign debt defaults on real GDP growth. Lastly, we present relations between currency crises and sovereign debt defaults in Section 2.3.4.

2.3.1 Currency crises

Theoretical models of currency crises have been developed since the late 1970s, based on the seminal work of Krugman (1979). The characteristics of crises have changed over time, and so have the models. The literature distinguishes three generations of financial crises and corresponding models.

The *first generation models* explain the crises as the result of fundamental inconsistencies in domestic policies, which at that time (1970s and 1980s) characterized the crises. The crises are preceded by a deterioration of the fundamentals, such as recurring budget deficits, which are monetary financed, or persistent current account deficits, which exhaust the foreign reserves. Basically, the crises originate from the desire of governments to maintain a fixed exchange-rate regime which is inconsistent with other policy goals (Krugman, 1979).

With the crisis of the European Monetary System in 1992–1993 a *second generation model* develops, because the weak economic fundamentals alone could not explain such a dramatic drop in the exchange rate. If fundamentals are strong, no currency attack will take place, and if they are weak then the government will not defend the currency. But if fundamentals are in a “grey zone”, multiple equilibria are possible. Relative small changes of economic fundamentals can have a big impact. When speculators suspect that the government is not committed to defend the exchange rate (for instance to restore international competitiveness), then a massive attack follows which can trigger a self-fulfilling devaluation of the domestic currency (Obstfeld, 1996).

The Asian crisis of 1997–1998, a *third generation crisis*, gives a new boost to crisis research. Banks and financial institutions expand and ease their loan granting policies prior to the crisis, because they count on a government bailout in case of solvency problems. The behavior based on moral hazard leads to an excessive build-up of external private debt followed by a collapse (McKinnon and Pill, 1997). A currency devaluation can trigger a banking crisis when banks have a mismatch on the balance sheet: domestic assets financed by foreign liabilities (Chang and Velasco, 1998). Krugman

(2003) adds that a combination of factors such as panics in the international investment community, policy mistakes in handling the crisis, and poorly designed international rescue programs cause a financial panic, which results in currency crises, runs on banks, massive bankruptcies and political turmoil.

2.3.2 Sovereign debt

Before turning to the theoretical literature on sovereign debt we first present brief thoughts on why governments borrow, and why investors lend to governments.

Why do governments borrow?

In Keynesian and New-Keynesian theories debt is used to smooth business cycle fluctuations. In other words, countercyclical fiscal policy is used to stimulate the economy in bad times (Stahler, 2013). As a consequence, sovereign debt builds up in the recession phase and should be repaid in the expansion phase of the business cycle.

In the political economy literature governments have an incentive to borrow, because of 'fiscal illusion' and 'common pool' problems. Fiscal illusion refers to the characteristic that voters consistently underestimate the future costs of current spending programs, and do not learn from previous experiences that pre-election expansions will be followed by contractions. With common pool problems a particular group benefits from debt-financed expenditures while the financing costs are shared over a larger base (the common pool), or have to be repaid in some future date. Expenditures tend to be used to increase the probability of reelection, or to limit space for new policy in case political opponents come to power (Stahler, 2013).

Using external debt instead of domestic debt is typically blamed on the underdeveloped domestic capital markets in emerging economies. Both the size and liquidity of the capital market, and the institutional framework (protection of investors, enforcement of the law, etc.) are the most important

factors of using external debt. However, since 2000 there is a trend that the share of government debt denominated in domestic currency compared to total government debt is increasing, particularly in Latin America (Panizza et al., 2010).

Why do governments service their debt?

Sovereign debt is fundamentally different from private debt. There is no legal mechanism or international institution that guarantees property rights for creditors, so strictly speaking there is no incentive for the sovereign to repay its external debt. Although there is no incentive to repay its external debt, a sovereign faces a cost if it defaults on debt. Das et al. (2012) and Panizza, Sturzenegger and Zettelmeyer (2009) identify three groups of costs: (i) exclusion from capital markets and higher interest costs, (ii) collateral damage in the form of a decline in output and (international) trade, and (iii) contagion of a sovereign default to the financial sector. There is also a political cost: policy makers who take the decision to default may lose their jobs and political career, and the ruling party typically loses in the next elections (Borensztein and Panizza, 2009).

2.3.3 Sovereign debt defaults

We present three theoretical models that fit the features of sovereign debt defaults in emerging economies. The literature on sovereign debt defaults starts with boom-bust models that provide a framework to integrate financial crises and cycles. The crises in the 1990s lead to the development of sudden stop models. Recently, the seminal paper of Eaton and Gersovitz (1981) has regained attention. The model is adapted to emerging economies, because these have substantial different features in business cycles and volatility than developed economies.

Boom-bust models

Boom-bust models have a long tradition. Detzer and Herr (2014) provide an overview of the boom-bust theories, and list several important points that the theories share. First, in all theories financial crises are the result of an unsustainable boom phase. The boom phase can create asset price inflation in asset markets (Kindleberger and Aliber, 2005; Shiller, 2012), create overcapacities in production (Wicksell, 1898; Hayek, 1929, 1931), or a combination of both (Fisher, 1911; Keynes, 1930, 1936; Minsky, 1986, 1992). Second, feedback mechanisms play a key role, both in the expansion phase and in the contraction phase. We can distinguish objective and subjective feedback mechanisms. Objective feedback mechanisms are, for example, wealth effects, changes in income, development of asset prices, real interest rates effects. Subjective feedback mechanisms are, for example, changes in perceptions which lead to more positive or more negative expectations. Third, exogenous factors trigger an expansion or a boom. It can be a new innovation, a deregulation in specific markets, the end of a war, the election of a political party, a period of unjustified low interest rates, etc.

We present here in more detail one of the most important representatives of the boom-bust models, Minsky (1986, 1992) which builds upon Wicksell (1898) and Keynes (1936). Minsky's Financial Instability Hypothesis (1992) identifies three distinct financing regimes: hedge, speculation and Ponzi schemes. The hedge regime is stable while the other two are unstable. A hedge financing scheme means that a country has sufficient expected cash flows to cover interest and principal payment of contracted debt. Speculative financing means that a country can pay its interest commitments, but cannot repay the principle out of operating cash inflows. These countries have to roll over their liabilities, in other words, they have to issue new debt to pay off expiring debt. Ponzi-financing means that a country does not have enough income cash flows to pay interests and the principle on outstanding debts. These countries have to issue new debt to pay interests and to pay principle (Minsky, 1992).

Starting in a period where the economy just went through a crisis, lenders

demand high margins of safety and high interest rates, and borrowers only borrow for the best investment projects. This leads to a phase of stability, where investments and profits are low but stable. The stability boosts confidence in the economy. Both borrowers and lenders lower their margins of safety, and debt financed investments increase. Higher investments lead to higher profits, which lead to higher investments. Over periods of prolonged prosperity, a feeling of euphoria is reached; credit granting becomes easier, firms and investors borrow at a low cost. The economy transits to an unstable system, because firms tend to move from hedge to speculative financing regimes or even to Ponzi finance schemes. With this high fragility, small deviations from expectations can lead to defaults of borrowers and the collapse of the economy. The boom turns into a bust when interest rates increase. This can occur because bottlenecks in the financial system make banks increase interest rates, or because inflation increases so much that the central bank will increase the interest rate. When this happens and how much fragility is built-up is not explained in the model. In the bust phase a negative spiral develops: speculative and Ponzi-financed firms get into trouble rolling over their debt, and therefore banks require new financing or sell assets. Banks and firms will use their cash flows to reduce their debt ratios or keep liquidity. Lower asset prices, lower consumption, unemployment and depression are the result (Detzer and Herr, 2014).

For sovereign debt crises we distinguish two types of boom-bust mechanisms: direct and indirect. The *direct link* is between a debt-related boom-bust and sovereign default. With increasingly euphoric sentiments on emerging economies, prices of bonds increase and interest rates decrease. Debt lending and borrowing surges, and speculative or even Ponzi-financing come into existence. When countries continue to borrow and lenders continue to lend a boom is created. This boom may end in a sovereign debt crisis when sentiments change and interest rates increase sharply and governments cannot roll over debt. The 1980s debt crisis is a classic example of this mechanism. The *indirect link* is between an asset-related boom-bust and sovereign default. If asset prices have increased significantly and for a pro-

longed period of time, then these asset prices (shares, real estate or other financial assets) may be inflated. A consequent sharp drop in the asset prices may cause a banking crisis, especially if banks have invested in the assets or have lent to investors with exposure to the assets. A consequence of a banking crisis is contagion to sovereign debt crises as occurred in Iceland and Ireland in the GFC, and Indonesia in the Asia 1997-1998 crisis. The third generation currency crisis model (see Section 2.3.1) describes this mechanism in more detail.

The main shortcoming of the boom-bust model is that it does not provide a formal quantitative framework. The model describes the mechanism, but does not provide information on the timing of a turning point, nor does it specify when the bust phase ends in a 'normal' recession or in a financial crisis.

Sovereign debt default models

The seminal paper of Eaton and Gersovitz (1981) on international lending has regained attention recently, when it was adapted to fit characteristics of sovereign debt crises in emerging economies by Aguilar and Gopinath (2006), Arellano (2008) and others.

Eaton and Gersovitz (1981) present a small, open economy that receives a stochastic endowment stream of a tradable good in a Dynamic Stochastic General Equilibrium (DSGE) model. The government's objective is to maximize the total discounted expected utility of private agents. Each period the government takes two decisions: whether to default or continue to service its debt obligations, and if it does not default how much to borrow or to invest in the next period. Risk-neutral investors determine the price of bonds. The country defaults if the benefits of default exceed the costs of default. The benefit of a default is that debt is never repaid. The benefits grow with the size of the outstanding debt. The cost of a default is that the country is excluded from capital markets, and will not be able to use a countercyclical borrowing policy to smooth the impact on business cycles. The costs are determined endogenously by the variability and growth rate of the country's

income. As a consequence, there is a credit ceiling at which the costs just exceed the benefits of a default.

Recently, various additions and adjustments have been proposed to fit stylized facts of emerging economies (Panizza et al., 2009). Emerging economies are characterized by high volatility of interest rates, output and consumption, countercyclical interest rates and net exports and procyclical borrowing (Hatchondo and Martinez, 2009). One strand, represented by studies such as Aguiar and Gopinath (2006) and Arellano (2008), sticks to the one-period setting, whereas another strand, such as Hatchondo and Martinez (2009) and Chatterjee and Eyigungor (2012), studies debt defaults in a multiple period setting.

The main innovation of Arellano (2008) is the non-linear cost of default, which is state-contingent. Default is more costly in good states, and more likely in bad states and at high debt levels. The state of the business cycle is central in the transmission mechanism. In booms, investors perceive a lower probability of default, so interest rates are low. Thus, debt is cheap and used to increase consumption especially in low income, or 'small wealth' countries, making consumption more volatile than output. The trade balance deficit increases because imports increase. In recessions, small wealth countries want to borrow, but cannot because there are no contracts available. Consumption drops, the trade balance deficit becomes smaller, and country spreads surge as investors perceive a higher probability of a default. Incentives to default are higher when an economy has large debt positions and is in a recession; after a prolonged recession, debt holdings can grow so much that the economy experiences net capital outflows. Then it is more costly for a risk averse borrower to service its debt obligations than to default, and it is attractive to default. The model of Arellano (2008) generates low average country spreads compared to the observed values. Country spreads are an indication of the risk premium on debt, and measured as the difference between yields on sovereign bonds of emerging market economies and U.S. Treasury securities of comparable maturities and denominated in US dollar. Default probabilities do not explain the entire country spread. Multiple-

period models improve this, and are presented next.

Multiple-period sovereign default models take into account an important feature of emerging economies' debt: governments do not only borrow short-term debt that has to be repaid fully in one period, but also issue long-term debt. This changes the dynamics of defaults. We can distinguish two types of long-term debt: perpetual debt as in Hatchondo and Martinez (2009), and long-term and finite debt as in Chatterjee and Eyigungor (2012).

With the availability of long-term debt Hatchondo and Martinez (2009) introduce incentives to overborrow, since repayment is of less importance for current decision makers. When the debt use increases, the default probability on all outstanding debt increases, and thus, the market value of all outstanding debt becomes less. This is known as debt dilution. However, the government pays a higher interest spread only on the newly contracted debt, not on the previously issued debt because the interest rate on the existing debt is fixed. This induces the government to choose a higher debt burden, because the government can benefit fully from higher government expenditures in the form of political goodwill, while the interest costs increase only marginally.

Chatterjee and Eyigungor (2012) use long-term (finite) debt. Investors expect that the probability of a default in the near future is low in good times due to persistence in output. As a consequence, the country spread is low, and the impatient sovereign borrows aggressively. When output declines, the probability of a default and thus the country spread increases. The higher spreads make debt servicing for the sovereign more difficult. If income stays low (which is not unlikely, given the assumed persistence in the income), the sovereign may default.

There is one important shortcoming in the sovereign debt default models that we have described: output or income is considered to be exogenous. Recently, Mendoza and Yue (2012) have made a first attempt to endogenize business cycles into the sovereign debt default model by means of a financial amplification mechanism. An increased probability of default causes higher costs of debt, which increases the costs of financing imported net working

capital. As a consequence, companies will switch to domestic inputs, which are not optimal substitutes. This leads to an efficiency loss, and GDP will drop. The incentive for default increases, and the same holds for the probability of default. The process repeats itself, and the total negative effect on output is stronger due to the amplification effect. A government will default when the benefits of default are greater than the costs of default. The cost of default is an endogenous increasing convex function of total factor productivity, which is different from the models used for sovereign debt defaults. Mendoza and Yue (2012) adopt the asymmetric approach proposed by Arellano (2008), which makes it more costly to default in good states, and more likely to default in bad states.

Sudden-stop models

Sudden-stop models are introduced in the mid 1990s to explain and model the role of foreign capital flows in financial crises. A sudden stop is defined as a large reduction of the inflow of international capital. This typically occurs when international investors stop investing in a country.

Sudden-stop models are proposed by a.o. Dornbusch et al. (1995), Calvo and Mendoza (1996), Calvo (1998, 2003), Edwards (2007) and Mendoza (2010). Contrary to Krugman (1979), in Calvo's (2003) model sudden stops precede Balance of Payments (BOP) crises. The sudden stop causes a collapse of aggregate demand, which causes a drop in demand for money. If the exchange rate is fixed, then international reserves will fall if the government decides to support the exchange rate. If the drop in international reserves is large enough, then a BOP crisis will follow.

Standard sovereign debt default models cannot produce sudden stops, because agents have access to a frictionless credit market, including consumption smoothing and investment financing (Mendoza, 2010). The literature on sudden-stop models views credit frictions as the central feature of the transmission mechanism that drives sudden stops (Mendoza, 2010). One of these frictions is that consumers will not always be able to borrow from abroad to smooth the effect on consumption of a large output drop. In

particular in sudden-stop models this is not possible because capital inflows stop or even reverse.

There is little consensus on what triggers sudden stops, but there is agreement on the consequences: real depreciation of the exchange rate and downturns of economic activity (Calvo, 2003; Catão, 2006). The effects are more dramatic in emerging economies. How do defaults fit in? The depreciation of the real exchange rate makes it more difficult to service foreign currency denominated sovereign debt (original sin) and can lead to a default. The downturn of economic activity that follows a sudden stop affects the fiscal budget as tax revenues will drop, and expenditures increase. Debt servicing becomes complicated and interest rates increase. Calvo (2003) shows that in a low-growth region the default alternative dominates full debt repayment.

Catão et al. (2011) combine sudden stops with sovereign default models, and add asymmetric information about (persistent) fiscal shocks, which the government observes and investors cannot observe. When a government is confronted with a substantial tax revenue shock, it will contract additional debt (on top of the roll-over debt). Investors will interpret this decision as a signal that the government was hit by a sizable and persisting tax revenue shock. As a consequence investors will demand a higher interest rate, because they perceive a higher risk to default. If the country is hit by recurring negative fiscal shocks, then this may end in default. A second reaction from the government is to cut government expenditures. This is not a certain way out since budget cuts depress output and thus tax revenues. With the lower future repayment capacity the probability of a default increases. As a consequence foreign capital may stop flowing in. This sudden stop in capital flows can then lead to a default.

Discussion

We have reviewed various theoretical models that fit stylized facts of sovereign debt defaults in emerging economies. We have presented three groups of models that describe different aspects: boom-bust models focus on bubbles and busts in investment and asset prices; sovereign debt default models fo-

cus on the mechanism of interest rates and cost-benefit analysis of default; and sudden-stop models focus on sudden stops in capital inflows. There are also similarities. The models of sovereign debt defaults in emerging economies, such as Arellano (2008), have in common with boom-bust models (Minsky, 1992) that a prolonged period of low interest rates make borrowing cheap and attractive. Debt is an attractive asset for investors, and this provokes overlending. When the situation reverses (the models differ on the shock that provokes this turning point) interest rates increase, and so income and consumption drop. Rolling over the debt obligations is only possible if the country accepts the higher interest rate that the investors demand. The fiscal budget is under great pressure, because revenues decrease as a consequence of the economic slowdown, and government expenditures increase due to the higher interest rate. If the recession persists and the debt level is high, a debt default may occur. Agosin and Huaita (2011, 2012) show that some sudden stops are endogenous to prior capital booms. Periods of increasing capital inflows lead to a situation of financial instability *à la* Minsky. When capital inflows surge, the current account deficit increases and the domestic currency appreciates. The longer the preceding boom period, the higher the probability of a sudden stop. Any event can lead to a sudden decline in inflows. This holds especially when capital flows are dominated by non-FDI items, when the current account deficit is large, when there is contagion from sudden stops in other emerging markets and when external debt relative to exports is high.

The models of sovereign debt defaults can be combined with sudden-stop models. Sovereign debt default models tend to focus on domestic factors as driving defaults, while default episodes can also be caused by exogenous changes in global credit cycles (for instance in a global sudden stop). When capital inflows stop, a government will face difficulties to roll over expiring debt. This increases the probability of a default, and with that the cost of borrowing, making debt servicing even harder. This can lead to a sovereign debt crisis because the government can not roll over the debt, or because the benefits of defaulting are greater than the costs. The idea that in addi-

tion to domestic factors, defaults are influenced by the behavior of creditors and international capital markets is consistent with the fact that default episodes tend to happen in clusters, typically after periods of market bonanza (Panizza et al., 2010).

2.3.4 Relation between currency and sovereign debt crises

Although in this thesis we focus on currency crises and sovereign debt crises separately, the relation between currency and sovereign debt crises is important, because of the overlap in these crises, as can be seen in Figure 2.3. When two types of financial crises occur simultaneously or when one crisis type triggers another, then this is called a twin crisis. The literature on twin crises has focused mainly on currency and banking crises, and less on twin currency and sovereign debt crises (Herz and Tong, 2004; Villemot, 2012). Currency and sovereign debt crises are related through three different linkages: (i) common causes, (ii) contagion effects between crises, and (iii) complementary budget financing aspects (Dreher, Herz and Karb, 2006).

A common cause can be a negative shock on aggregate demand. The consequent output and employment losses have a negative impact on the government's fiscal budget (lower tax revenues and higher government expenses), which increase the probability of default. As a consequence, interest rates increase and access to international capital markets becomes more difficult. The negative shock also imposes market pressure on the local currency to devalue. If the currency is pegged and the authorities are committed to defending the peg, then the authorities have to sell foreign reserves and/or increase the interest rate. The latter policy measure worsens the recession. An alternative is to abandon the peg and use monetary expansion to fight the recession. Investors can anticipate this devaluation and withdraw their capital, which increases the pressure on the exchange rate even more. Another common cause can be an increase in the international interest rate. If the domestic interest rate does not adjust, then foreign capital will flow out and put the exchange rate under pressure. Rolling over foreign currency denominated debt will become more expensive since interest rates

increase. Additionally, world aggregate demand will slow down, which affects exports-oriented countries. If the domestic interest rate adjusts, then this may lead to a recession with the same negative consequences for the government budget and increased debt servicing problems as mentioned above. A third common cause can be a sudden deterioration of political, institutional and structural conditions. As a consequence investors withdraw their capital and interest rate surge. This sudden stop increases the probability of a debt crisis, because the government expenditures increase as expiring debt will be rolled over with a higher interest rate, while the government revenues are depressed as the higher interest rate slows down economic activity. When capital flows out, then the exchange rate is under pressure to depreciate. As a consequence, the probability of a currency crisis increases.

A second possible linkage between debt and currency crises is contagion. A debt crisis may trigger a currency crisis when investors withdraw part of their investments in financial securities from the affected country. A currency crisis in a country with a pegged exchange rate can trigger a debt crisis in two ways. First, the government can decide to defend the peg by increasing the interest rate. A higher interest rate makes new debt more expensive, which increases the incentive to default. The increasing interest rate can also cause a recession, with rising bankruptcies and lower tax revenues as a consequence. The probability of a default increases. Second, a government can decide not to defend the peg. As a consequence, the country loses reputation and a financial panic can develop, because investors expect more depreciation. Capital flows out and the interest rates will surge, which can end in a default. Currency mismatches (original sin) can aggravate the contagion, because a depreciation of the exchange rate will have a negative impact on debt servicing obligations on foreign currency denominated debt. If the private sector is also indebted in foreign currency, then bankruptcies of companies and bank defaults further increase fiscal problems.

The third linkage explains how currency crises and debt crises can be negatively connected via the financing of the fiscal budget. When a govern-

ment runs a fiscal deficit, it can choose between five options. The government can reduce expenditures, increase taxes, issue new debt, generate seigniorage through monetary expansion, or default on the debt. If the first two options are not feasible due to political pressure, and the government does not want or cannot increase debt, then only the last two options remain. If the government selects the monetary expansion option, there is no need for financing through a debt default. The probability of a currency crisis increases, because printing money to finance the budget induces inflation and devaluation pressure. At the same time, the probability of a debt default decreases, because the government decided not to opt for the default. If the government decides to default on its debt, there is no need for monetary expansion, which keeps the devaluation pressure low. In other words, the currency crisis and the debt crisis are negatively connected in this linkage.

Several authors have analyzed the linkages between currency and sovereign debt crises in a common, theoretical framework, in which a government does not make decisions on exchange rate policy (maintain or exit peg) and debt policy (service or default) separately. Bauer, Herz and Karb (2007) find that the incentive to default depends on the size of the debt (higher debt level increases the incentive to default), and the incentive to abandon the fixed exchange rate peg depends on economic fundamentals (bad fundamentals increase the incentive to abandon the peg). However, in some situations a country with a high debt level but good fundamentals can prevent a default, while a country with bad fundamentals but a low debt level can prevent a currency crisis. Intermediate debt levels and intermediate fundamentals lead to multiple equilibria. Some combinations lead to a debt crisis, others to a currency crisis, and again others to a twin crisis. In the model of Jahjah and Montiel (2003) currency mismatches (original sin) are central in the transmission mechanism between currency and debt crises. Whether a currency crisis can trigger a debt crisis depends on the credibility and ability of a government to commit itself to maintain the peg.

2.4 Conclusion

Sovereign debt crises and currency crises have a long history in Latin America. Since the early 19th century most countries have been independent, which is much longer than emerging countries in Africa and Asia. The period from 1880 to 1913 is considered the first era of globalization and the degree of international trade and finance is comparable to the second era of globalization, which started in the early 1980s (Bordo and Meissner, 2007). Theoretical models are constructed to understand the mechanisms of crises. Over time, different crisis dynamics have been observed. As a consequence, new theories and models have been developed to capture these new mechanisms.

The majority of the debt crises in Latin America in the period 1870–1930 take place during systemic default periods (1890–1893, 1914–1918), and are characterized by a boom-bust pattern. Latin America has always been vulnerable for external conditions, in particular commodity prices, external trade and finance. The other debt crises can be traced back to national events (a war in Chile in the 1880s, a commodity price collapse and political turmoil in Brazil at the end of the 19th century, and a revolution in Mexico in the 1910s). In the period 1931–1971 international trade and finance decrease. The sovereign defaults in the period 1931–1944 are related to the unfavorable global circumstances, and most take place during the systemic default period 1931–1934. Under the inward-oriented policies in the Bretton Woods period (1944–1971) the dependency on global conditions is lower, and there are no sovereign debt crises in the four Latin American countries that we investigate. Currency crises do occur, and with a much higher frequency than before. Krugman (1979) propose a balance of payment crisis model that is focused on the fiscal and monetary causes of crises. Emerging markets have a tendency to run high fiscal deficits, which eventually result in an unsustainable level of the public debt. When lenders stop lending a crisis occurs. This model gives an appealing explanation for crises in the 1960s and 1970s in Latin America (Kaminsky, 2006; Calvo, 2003). It is later baptized as the

first-generation currency crisis model.

With the opening up to international finance in the 1970s, emerging countries start to borrow heavily in the international capital markets. In the early 1980s almost all Latin American countries default on the debt, and is known as the Latin America debt crisis. The crisis has all elements from a boom-bust crisis. With the crises in the 1990s (Mexico 1994–1995, Asia 1997–1998, Russia 1998, Brazil 1998) a new phenomenon arrives: foreign capital flows reverse, which triggers a currency and/or a debt crisis. The sudden-stop model captures this. In the early 1990s a second generation currency crisis model is developed, which captures self-fulfilling crises to explain the EMS 1992–1993 currency crisis. The crises in Mexico 1994–1995 and Asia 1997–1998 lead to the development of a third generation currency crises model, that captures moral hazard and excessive borrowing. With the Argentina 2001–2005 crisis the seminal work of Eaton and Gersovitz (1981) receives renewed attention. The model is adjusted to fit the features of emerging economies (Aguilar and Gopinath, 2006; Arellano, 2008).

Latin America's experiences with recurrent and new financial crises have contributed to the development of theoretical models of currency and sovereign debt crises. That makes this region such an appealing field for economic research, particularly because there is relatively little research, and more data become available—including on the period that resembles the current situation most, the first globalization period 1880–1913.