

## **Varieties of Sovereign Crises: Latin America, 1820-1931**

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### **Abstract**

Sovereign debt defaults and renegotiations have been the bread and butter of Latin American countries since the first defaults in the 1820s. During the first period of financial globalization (1820-1931), there were sixty seven defaults, with countries as rich as Argentina and as poor as Bolivia all defaulting at least once. What can we learn from this first period of financial globalization? This paper creates an anatomy of debt defaults, renegotiations, investors' losses, and the re-entering in international capital markets and links this anatomy to the economic and financial evolution of the global economy, the financial centers, and the periphery.

**Keywords:** Sovereign crises, renegotiations, defaults, haircuts.

## **I. Introduction**

The debate on sovereign defaults surged in 1982 in the midst of the Debt Crisis but mostly died out in the late 1980s. In the midst of the Eurozone crisis, sovereign defaults have become again the focus of attention in both policy and academic circles. This time around, it is not emerging markets at the core of these expected defaults. Sovereign defaults have come back with a vengeance; now developed countries are the ones expected to default and the world is preparing for the aftershocks. Which countries will default? How protracted the renegotiation process will be? How large the losses will be? When will the defaulting countries return to international capital markets?

Sovereign debt defaults and renegotiations have been the bread and butter of Latin American countries since the first defaults in the 1820s. During the first period of financial globalization (1820-1931) there are sixty seven defaults across all countries from the richest, like Argentina, to the poorest, like Bolivia. There are episodes of systemic crises across the region and episodes of isolated defaults. What can we learn from this first period of financial globalization?

This paper creates an anatomy of debt defaults, renegotiations, losses, and the re-entering in international capital markets and links this anatomy to the economic and financial evolution of the global economy, the financial centers, and the periphery. Our one hundred years of defaults allows us to examine not only those defaults that are solved rapidly but also those that are protracted with countries defaulting several times on the same bonds. We can keep track of the renegotiations and the cumulative investors' losses. We can also examine the characteristics of the domestic economies that trigger long renegotiation episodes. These one hundred years of defaults will allow us to make a distinction between defaults following crises in the periphery, such as the coffee crisis in Brazil in 1898 or the revolutionary war in Mexico in 1914, and the defaults following crises in the financial center, such as the ones in 1825, 1873, and 1931. Finally, we study the ability of defaulting countries to re-enter capital markets following crises with origin in the periphery and those with origin in the financial center. The experiences of this long episode will help us to understand better the aftermath of the current crisis with the financial center at its epicenter.

The rest of this paper is organized as follows. Section II provides a history of Latin American countries participation in international capital markets. Section III examines in detail the characteristics of the defaults, renegotiations, and re-entering in international capital markets. This Section also computes the haircuts in each episode. Section IV examines the fundamentals of each country and links these fundamentals to the success or failure of each renegotiation. Section V classifies the sovereign defaults into sustainability crises and liquidity crises. Section VI concludes.

## **II. Latin America's Participation in International Capital Markets<sup>1</sup>**

All Latin American countries (except Puerto Rico and Cuba) gain independence from Spain and Portugal in the early 1800s. The new independent countries immediately eliminate the restrictions to trade imposed on the colonies by Spain and Portugal. International trade restarts and participation in international capital markets soon follows, with all governments floating bonds in London, the new financial capital of the world. The first Latin American country to float bonds in London is Colombia. The first issue is in 1820 for 547,784 British pounds. By the end of 1825, the total issuance by Latin American countries has reached 20 million British pounds, with participation of both small and large countries. The ability of Latin American countries to tap funding in London is favored by the increase in liquidity fueled, in part, by the sharp decline in military spending following the end of the Napoleonic wars and partly because of the monetary injections of the Bank of England. It is not just sovereign's borrowing. Private international investors create a large number of firms to exploit mineral resources in Latin America. Overall, the early years of the 1820s are characterized by global growth and increases in international trade.

The boom ends in the summer of 1825 when the Bank of England raises its discount rate to stop the drain of reserves triggered by England's import boom and the outflow of capital. The tightening of liquidity is followed by a stock market crash in October, a banking panic in December, and numerous bankruptcies. The financial debacle in London rapidly spreads to

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<sup>1</sup> This chronology is heavily based on "International Lending Cycles: Shocks in the Financial Center and the Periphery," Kaminsky (2012).

continental Europe, with bankruptcies of major banks in Germany, Italy, Amsterdam, Saint Petersburg, and Vienna.<sup>2</sup> The crisis extends rapidly to Latin America as overseas loans are cut off. This is not all. The crisis also triggers a major fiscal problem in Latin America. As world trade collapses, so do tariff revenues, the only source of income of the governments of the new countries. Peru defaults in April 1826; Gran Colombia (Colombia, Ecuador, and Venezuela) and Chile default in September 1826; Mexico defaults in October 1827; Argentina defaults in 1828; and the Federation of Central America defaults in February 1828. Only Brazil does not default outright although it suspends the sinking fund of the Portuguese loan in 1827 and suspends the sinking fund of the 1824-25 loans in 1831.<sup>3</sup> It takes three decades before the debts are renegotiated and capital flows to Latin America resume.

The world economy recovers in the early 1840s and world trade starts to boom again. With the European economy growing, the need for primary products and raw materials increases, benefiting Latin American economies, in particular, Chile and Peru.<sup>4</sup> The growing international trade brings a fiscal bonanza to all Latin American countries (as tariff revenues increase accordingly) and with it, the possibility of settlement of the foreign debts.<sup>5</sup> Brazil is the first to re-enter the market in 1839<sup>6</sup> and is followed by Peru in 1853. Still, the new loan boom to Latin America only flourishes in the 1860s after the end of the panic of 1857<sup>7</sup> and mostly after the end of the British crisis of 1866.<sup>8</sup>

The capital flow bonanza to Latin America in the 1860s is far larger than that of the early 1820s, with capital flows during this period financing governments but also the construction of

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<sup>2</sup> See also Bordo and Murshid (1999) *The International Transmission of Financial Crises before World War II: Was there Contagion?*

<sup>3</sup> The so-called Portuguese Loan is originally issued by Portugal in 1823. It is transferred to Brazil as a price for independence.

<sup>4</sup> The export of agricultural and mineral products surges dramatically: Guano from Peru, copper and wheat from Chile, wool from Argentina, coffee from Brazil, sugar and tobacco from Cuba, and silver from Mexico. See Marichal (1989).

<sup>5</sup> Chile is the first to renegotiate its debt in 1842, Peru follows in 1849. Most Latin American countries renegotiate their debts in the 1850s.

<sup>6</sup> Brazil also issues a 5% bond for 769,200 British pounds in 1829 to service its foreign debt. It takes another ten years for Brazil to be able to tap international capital markets again.

<sup>7</sup> The crisis of 1857 begins in the U.S. A railroad stock boom fueled by British capital and the California gold discoveries in 1849 crashes in August 1857 with a banking panic. The crisis spreads to England in the Fall. From England the crisis spread to the continent, with a serious panic in Hamburg in December.

<sup>8</sup> The crisis of 1866 is triggered by the collapse of Overend & Gurney.

railroads and the creation of commercial banks across Latin America. This boom in international capital flows ends in 1873. The end of the Franco-Prussian War in 1870 plays a critical part in the unfolding of this crisis. Following the defeat of the Napoleon III, the new French government has to pay a huge indemnity of 5,000 million francs (£200 million) to Germany. These huge indemnity transfers lead to a massive flow of capital into the economies of central Europe, fueling speculation in various financial markets. A spectacular stock market crash in Vienna in May 1873 ends with the stock market boom in Austria and spreads rapidly to Germany. Between 1873 and 1878, half the Austrian banks close, and 400 of the 800 Austrian joint-stock companies go bankrupt. Stock markets in Amsterdam and Zurich also crash. The crisis crosses the Atlantic in September, the New York Stock market collapses, and is followed with a U.S. banking panic. As during the crisis of 1825, there is a collapse in world trade and in the prices of commodities and loans are called off. Tax revenues in Latin America sharply drop and trigger a new wave of defaults across Latin America. The decline in commodity and stock prices as well as the bank and industrial bankruptcies in most countries start the first worldwide 1873 recession. The crisis is also felt in the Middle East. By 1876 the Ottoman Empire, Egypt, Greece, and Tunisia have defaulted. In total, by the year 1876 fifteen non-European nations have suspended payments on almost 300 million British pounds. In Latin America, Bolivia, Colombia, Costa Rica, Guatemala, Honduras, Peru, and Uruguay default on their foreign debt.

While the world depression of the 1873 wreaks havoc in many of the Latin American economies, with several countries defaulting on their foreign debts, by the early 1880s a process of recovery has begun. The upswing in world economic activity fuels foreign trade and new capital flows to Latin America. This time around, capital flows finance a new variety of private activities and the adoption of the cutting edge technologies of those times, such as railways, tramways, gas works, banks, production of raw materials, mining, and land companies, with Argentina and Uruguay the most important recipients of this inflow. The boom of the 1880s ends in 1890 with the crisis set off by the near-failure of Baring Brothers, the underwriter of Argentine Government loans. The Bank of England prevents a panic via a recapitalization of Baring Brothers with the help of other major London financial institutions and loans from the Banque de France and the Russian central bank. Still, the crisis spreads back to Latin America with the cessation of British lending to Argentina, Uruguay, and Brazil. Between 1890 and 1894

Argentina, Ecuador, Guatemala, Nicaragua, Paraguay, Uruguay, and Venezuela default. During the next years there is a sharp decline in the flow of British capital.

The next international capital flow cycle starts in mid-1890s and ends with the start of WWI.<sup>9</sup> While Britain continues to be the main creditor, French, German and American investors set up new companies in banking as well as in railways, tramways, mines, sugar refineries, flour mills, gas works, and even some early electric and telephone companies. This episode is considered until now the heyday of financial globalization. The outbreak of World War I contributes to the end of this boom in international capital flows. In July, as war becomes imminent, a liquidity crunch spreads around the world as investors start to liquidate foreign assets, fueling panics in all asset markets. While the panic is promptly stopped by the central banks in the United Kingdom, the United States, and continental Europe, the outbreak of the war in Europe causes an abrupt suspension of capital flows.<sup>10</sup> Only Brazil, Ecuador, Mexico, and Uruguay default. This time around, the governments of most nations of the region continue to service their debt using export surpluses. In fact, during the war, Latin America becomes a net capital exporter.

Capital flows resume with the end of the war in Europe. Again as in the earlier capital flow bonanzas, international capital finances massive investment to implement the major inventions of the late nineteenth century, including electricity, automobiles, communications, and petrochemicals. Increases in productivity due to all major inventions as well as innovations in industrial organization lead to a boom in economic activity that spills over around the world. Again as in the mid-1860s, 1880s, and the 1900s, stock prices boom. Also, most Latin American nations benefit from the continuing rise in international prices of raw materials and primary products. It is at this time that New York becomes the leading financial center while lending from London and Paris retrenches following the imposition of capital controls in Great Britain

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<sup>9</sup> This boom is temporarily interrupted in 1907 with a crisis originating in the United States following the San Francisco earthquake in April 1906. The destruction caused by the earthquake puts pressure on financial resources in the United States and puts strain on the Bank of England's reserves when British insurance companies start to pay out the U.S. claims. To stop the loss of reserves, the Bank of England hikes the discount rate from 3.5 to 6 percent causing a severe liquidity crunch in the United States. The U.S. stock market crashes in early 1907 and economic activity begins to decline. In October, depositor runs on trust companies spread to the commercial banks. Banks suspend cash payments and the economy enters a sharp recession.

<sup>10</sup> See Bordo and Murshid (1999).

and France<sup>11</sup> and the collapse of capital markets in Germany. In 1927-1928 the Federal Reserve, concerned over stock market speculation, tightens monetary policy; a recession begins in July 1929. Prices of commodities collapse, stock markets around the globe crash, and capital flows sharply decline, precipitating currency and banking in Latin America, Europe, and Australia. In September 1931 Great Britain abandons the Gold Standard and so does the United States in 1933. Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Guatemala, Nicaragua, Panama, Paraguay, Peru, and Uruguay default in the midst of the great depression.

In our chronology, we emphasize the common cycles of booms and busts in international capital flows fueled by developments in the financial centers and the global economy. It is following these international capital flow bonanzas that we observe clusters of defaults across most Latin American countries. Table 1 examines the characteristics of these systemic-default episodes, which we define as five-year episodes with defaults of at least 20 percent of countries in Latin America. This table summarizes the origins, the background, the mechanisms of transmission, and the countries that defaulted during these episodes. Sixty-five percent of all defaults in Latin America occur during these systemic crises.

Defaults also occur in times of booms in the global economy, with fragilities just emerging in the periphery. It is in those episodes that we observe isolated crises in various countries in Latin America. Table 2 shows those defaults with idiosyncratic patterns, such as the Brazilian default in 1898 following the coffee price collapse or Chile's default in 1880 in the midst of the War of the Pacific.

### **III. The Anatomy of Defaults in Seven Latin American Countries<sup>12</sup>**

In this paper, we examine the sovereign crises and the ensuing renegotiations on the terms of the debt and calculate investors' losses after the defaults in seven countries: Argentina,

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<sup>11</sup> Foreign lending is formally restricted in Great Britain starting in December 1914. While formal restrictions are removed in various stages and completely eliminated in November 1919, foreign lending continues to be restricted by the Bank of England, with control undertaken through moral suasion. As discussed in Cottrell (2005) all projected foreign flotation has to be discussed with the Bank of England's Governor.

<sup>12</sup> This version of the paper does not include the analysis of all the default episodes, in particular, those of the 1930s. They will be included in the next version of the paper. Also, we only estimate the losses of investors using only the nominal yield of the defaulted bond. The haircuts in Table 4 provide a lower bound to the haircuts. We will report the haircuts using the effective yield at the time of default in the next draft.

Brazil, Chile, Colombia, Mexico, Peru, and Uruguay. We focus only on defaults of the central government. Argentina defaults twice, 1828 and 1891.<sup>13</sup> Brazil defaults four times: 1827, 1898, 1914, and 1931. Chile defaults three times: 1827, 1879, and 1931. Colombia defaults seven times: 1821, 1826, 1849, 1873, 1879, 1900, and 1932. Mexico defaults four times: 1828, 1854, 1914, and 1928. Peru defaults three times, 1826, 1876, and 1931. Uruguay defaults four times, 1875, 1891, 1915, and 1933. As shown in Table 3, the average duration of default spells is 14 years. The country and global conditions during the first and last cluster of defaults are quite unusual. During the first episode of defaults, all the countries are in the midst of civil wars and wars of independence. After 1931, global conditions change dramatically as barriers to trade and capital mobility are erected around the world, signaling the end of the first episode of globalization. That is why, we also show the duration of the spells excluding these unusual episodes in the last two rows of the table. The average spell declines to 11 years. Interestingly, as shown in the last two rows of the Table, the duration of the spells is quite long in the case of Colombia, Mexico, and Peru, with the duration of the negotiations in the case of Argentina, Chile, and Uruguay being on average half that time. While Brazil's default-spells are as protracted as those of Colombia, Mexico, and Peru; Brazilian defaults are somewhat different from those three countries. Colombia, Mexico, and Peru default outright with no service payment during the duration of the default. In contrast, Brazil continues to pay coupons but it suspends the sinking fund.

Table 4 provides a higher resolution picture of the defaults and renegotiations of these seven countries. For each default, columns 2 and 3 show the bonds that are in default as well as the outstanding debt in default in British pounds. Column 4 provides the characteristics of the agreement with particular attention to the suspension of the sinking fund and payment of interest, reduction in interest rates and if new bonds are exchanged for the old bonds, it shows whether the old bonds are exchanged at par, discount, or premium. Finally, Column 5 shows the estimated haircuts. We follow Jorgensen and Sachs (1988), Sturzenegger and Zettelmeyer (2005), and Cruces and Trebesch (2011) and estimate investors' losses as the percentage difference between the present values of old and new instruments, discounted at various yields:

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<sup>13</sup> Until 1862 the territories of what became Argentina are in the midst of a civil war, with the province of Buenos Aires fighting the rest of the provinces. In fact, the 1,000,000- British pound loan of 1824, which is defaulted in 1830, is not technically an Argentina loan. This bond is issued by the province of Buenos Aires in 1824.



the risk free yield and the yield prevailing immediately after the exchange. This column shows the average haircut using these various yields.<sup>14</sup>

Argentina defaults twice. The first default occurs in 1828, in the aftermath of the global crisis with London at its epicenter. At that time Argentina foreign sovereign debt consists of just one bond, the 6% 1,000,000 pound bond floated in 1824. At the time of the default, the amount outstanding is approximately 970,000 pounds. Argentina suspends the sinking fund as well as coupon payments. No negotiations occur until the 1850s. An agreement is reached in 1857 and a new 3% bond is issued for 1,641,000 pounds equal to the unpaid interest (not capitalized). There is no exchange of the old bond for a new bond. The agreement does not allow for reductions in the value of the principal and Argentina has to resume the sinking fund and new coupon payments of the 1824 6% bond in 1860. Investors' losses oscillate around 73 percent.

Argentina re-enters international capital markets in the mid-1860s. The first new government bond is issued in 1866. Private foreign issues start even earlier in 1861. From 1861 until 1890, private and sovereign international borrowing sharply increases, amounting to 166 million British pounds.<sup>15</sup> Following the borrowing boom of the 1880s, the government of Argentina defaults again in April 1891: while the government maintains the sinking fund and pays the coupons of the 1886-1887 5% 8,290,000 pound loan, it suspends both the sinking fund and the coupon payments of ten bonds, with an outstanding balance of 23 million British pounds. Most of the defaulted debt consists of the new borrowing since 1866. The outstanding amount of the 1824 bond is only 244,000 pounds. In contrast to the default of 1824, which is only renegotiated in 1857 after 29 years, this default is renegotiated within a couple of months. This first renegotiation is quite unfavorable to Argentina. According to the agreement of 1891, the government has to issue a 6% Funding Loan to service the defaulted bonds (sinking fund and coupon payments) between 1891 and January 1st, 1894. The principal of the bonds is

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<sup>14</sup> To estimate the haircuts, we need to know the terms of each bond: sinking fund, coupons, and whether amortizations are at par or at market prices. This information is described in the original prospectuses. Sometimes earlier prospectuses are lost and we need to rely on information published in newspapers or studies at the time of the issue of those bonds. We also use information from the Annual Reports of the Confederation of Foreign Bondholders. In some cases, we are unable to obtain the information for all bonds defaulted. In this case, we report which bonds are not included in our estimations of losses. Sometimes the bonds can be amortized at market prices. Our estimations so far assume that all amortizations occur at par.

<sup>15</sup> The data on international capital flows to Argentina from 1824 to 1931 are part of a new database on international issuance in London, Paris, Berlin, Frankfurt, and New York constructed by Graciela Kaminsky. See, "Two Hundred Years of Financial Integration: Latin America since Independence," (<http://home.gwu.edu/~home>) for an analysis of the database.

maintained at its par value and the sinking fund and coupon payments have to be resumed (with payments in cash) in 1894. From 1891 to 1893, the government has to issue approximately a 7,600,000 pound 6% bond to cover the debt service of the defaulted bonds, increasing the government debt by about 25 percent. Our estimates of the present discounted value of the debt before and after renegotiation indicates that investors obtain a 9 percent gain from this arrangement. With no new borrowing in the midst of the collapse in international capital flows in the 1890s and with an increasing debt burden, Argentina repudiates the 1891 agreement in 1892. A new agreement is reached in 1893, the so-called Romero Agreement. Other government bonds, such as the 5% loan of 1886-1887 for 8,000,000 pounds, are included and the total amount in default is 44 million pounds. The new agreement includes reductions in interest rates oscillating between 100 to 360 basis points for five years. The sinking fund on all bonds is suspended until 1901. The new agreement leads to on average 18 percent haircuts. This is the last default of the central government of Argentina in the first period of financial globalization from 1824 to 1931.

Brazil defaults four times during the first episode of financial globalization. Brazil first taps international capital markets in 1824. Two bonds are issued in 1824-1825 for a total of 3,686,200 British pounds. Also, as a price for independence from Portugal, in 1825 Brazil accepts as part of its international liabilities the 1,400,000 British pound 5% Bond issued by Portugal in 1823. The London panic in 1825 makes it difficult to service the debt. Brazil unilaterally suspends the sinking fund of the Portuguese Bond in 1827. It resumes the sinking fund payment in 1836 only to suspend it again in 1840. Again it resumes the sinking fund in 1843 to suspend it in 1844. Finally, it resumes the sinking fund of this bond in 1850. Brazil also unilaterally suspends the sinking fund of the 1824-1825 bonds in 1831 only to resume it in 1851. Still, Brazil continues to pay interest on the debt over the period 1827-1950.<sup>16</sup> Thus, our analysis indicates that Brazil is in default from 1827 to 1850.<sup>17</sup> As just described, the Brazilian default is in sharp contrast to the default of Argentina in 1828. Argentina defaults outright and does not make any payments until 1857 when the debt is renegotiated. Naturally, access to international

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<sup>16</sup> The information on the service of the debt during from the early 1820s to 1951 is collected from Bouças (1950), Carreira (1980), and *Estatísticas Históricas do Brasil* published by the Fundação Instituto Brasileiro de Geografia e Estatística (a government agency).

<sup>17</sup> Previous research on this episode is contradictory. For example, Marichal (1989) and Paiva Abreu (2006) conclude that Brazil does not default in the 1820s or anytime during the 1825-1951 period. In contrast, Standard & Poors and Bein and Calomiris (2001) identify the 1826-1829 period as a default event.

capital markets following their defaults is quite different. Argentina cannot tap international capital markets until 1866. In contrast, Brazil issues a 5% bond for 769,200 British pounds in 1829 to pay coupons. Also in 1839 Brazil issues a 5% Bond for 411,200 British pounds and in 1843 it issues a 5% bond for 732,600 British pounds, all issued before Brazil resumes the complete service of the debt in 1851. Our estimates of investors' losses oscillate around ... percent.

Brazil participates heavily in international capital markets from the 1860 until the 1890s. Government debt increases to approximately 38 million British pounds by 1898. It defaults again 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 following the Baring Crisis in 1890. Brazil issues in 1898 a Funding Loan (Rothschild is the underwriter) for 8,613,717 British pounds to pay coupons from 1899 to 1901. Interest payments are made regularly since 1902. The sinking fund of all the bonds is suspended for thirteen years (1898-1911). Again as during the earlier default in 1827, Brazil re-enters international capital markets even before it resumes full service of the debt in 1912. It issues six 5% bonds in 1903, 1905, 1907, and in 1908 (for 5,500,000; 3,000,000; 3,000,000; and 21,000,000 (in three bonds) British pounds, respectively) Moreover, Brazil issues a 4% conversion bond in 1908, reducing coupons on previous 5% bonds. This time around, many commodity-rich states, such as, Sao Paulo, start tapping international capital markets following the constitutional reform in 1891 giving state governments the sole right to tax exports. Using the nominal rate on the defaulted bond as our discount rate, investor losses are zero.<sup>18</sup>

Following the collapse of rubber exports in 1912 and the sharp decline of coffee prices when the coffee support-plan implemented by Brazil is deemed illegal in the United States, Brazil defaults in 1914 in the midst of highly illiquid capital markets at the onset of WWI. As in 1898, Brazil issues a Funding Loan (Rothschild is the underwriter) for 14,502,396 British pounds to pay coupons from 1914 to 1917 while interest payment are made regularly starting in 1918. Brazil suspends the sinking for thirteen years (1915-1927). This time around, some states and municipalities also default. The total central government external debt at the time of the default

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<sup>18</sup> By definition if coupons on the defaulted bond are paid as scheduled and only the sinking fund is suspended for an interval of time, the haircut calculated using the nominal rate on the defaulted bond will be zero. In general, the effective yield at the time of the agreement is higher than the nominal rate. In this case, the haircut will be larger than zero.

is approximately 91 million British pounds. Our estimated haircuts for this episode oscillate around 1 percent.

Chile defaults in 1827, 1879 and 1931. Chile first taps international capital markets in 1822, issuing a 6% Bond for 1,000,000 British pounds. As Argentina, during the default of the 1820s, Chile does not service the debt (coupons and sinking fund). In 1842, an agreement is reached and a new 3% bond is issued for 765,500 pounds equal to the unpaid interest (not capitalized). There is no exchange of the old bond for a new bond. The agreement does not allow for reductions in the value of the principal and Chile has to resume the sinking fund and new coupon payments of the 1822 6% bond in 1847. Investors' losses oscillate around 44 percent.

As Argentina and Brazil, Chile participates heavily in international capital markets during the 19<sup>th</sup> century. Following the resolution of the default of the 1820s, Chile first issues a new 4.5% bond in 1858 for 1,854,800 British pounds for the construction of railways. By 1879, Chile's public external debt reaches approximately 6 million British pounds. It is in that year that the war with Bolivia and Peru starts. Chile unilaterally suspends the sinking fund for three years but it continues to pay coupons. When calculated at the nominal yield of the bond, investors' losses following default oscillate are zero.

The characteristics of Colombia's default stand in sharp contrast with those of Argentina, Brazil, and Chile. Until 1830, Colombia is part of a federation (Gran Colombia) including Ecuador and Venezuela. Gran Colombia first participates in international capital markets in 1820 floating a 10% debenture of 547,783 British pounds. This bond is defaulted in 1821. In May 1822, the government of Gran Colombia issues a 6% loan for 2,000,000 pounds in part to pay principal (at par) of the 1821 debenture as well as the arrears in interest (not capitalized). Estimated investors' losses of this agreement oscillate around 86 percent. In 1824, in the midst of the boom of the 1820s, Gran Colombia floats another bond for 4,750,000 British pounds. These two bonds are defaulted in 1826. In 1834, the external debt of Gran Colombia is divided among the three countries in the following proportions: Colombia: 50 percent, Venezuela: 28.5 percent, and Ecuador: 21.5 percent. The outstanding external debt of Colombia in 1834 is 3,312,975 British pounds. Colombia renegotiates its debt in 1845. New bonds are issued to pay the principal and the unpaid (not capitalized) coupons. The new bonds carry very low interest rates starting at 1 percent (in the case of the bonds issued to pay the unpaid principal) or even

zero interest rate in the case of the bonds issued to pay interest arrears. In both cases, interest rates increase slowly until they reach 6 percent for the bonds paying the principal and 3 percent for the bonds paying the interest arrears. These same bonds are defaulted in 1848, then again in 1873, in 1879, and in 1900. Renegotiations take time. For example, the default in 1848 is renegotiated in 1861 and the one in 1879 is renegotiated in 1896. Only the default of 1873 is renegotiated within a couple of months. In all the agreements, bonds are issued to pay for (non-capitalized) arrears in coupons. These bonds pay very low interest for several years. The agreement of 1861 adds a new feature: investors are compensated with land (about 1,500,000 hectares). The principal is maintained at par value with not exchanges for new bonds. The debt is renegotiated in 1873. Again investors receive land in partial payment (2,000,000 hectares). This time around, bonds are heavily discounted, with discounts oscillating between 67 percent (for outstanding principal) and 83 percent (for unpaid coupons). The agreement of 1896 also includes discounts. In this case, there are discounts on interest arrears that are reduced by 57 percent. Haircuts in these renegotiations oscillate between 70 and 90 percent. From 1850 to 1900 bonds and shares issued by Colombia in international capital markets amount to just 15 million British pounds (of which 12 million pounds are bonds exchanged in the renegotiations for the old bonds plus bonds issued to pay unpaid interest). Basically, Colombia is out of international capital markets with most of the issuance to repaid defaulted bonds and deferred coupons.

Until the last twenty years of the 19<sup>th</sup> century, Mexico's defaults and participation in international capital markets are mostly similar to that of Colombia, with long default spells and inability to tap international capital markets. Mexico issues two bonds in London in the 1820s. Both bonds are for 3,200,000 pounds, the first one in 1824 and the second one in 1825. This is basically the debt defaulted in 1827. There are several attempts to renegotiate the debt in 1831, 1837, 1842, and 1846. In all these attempts, Mexico promises to issue bonds to pay for coupon arrears and exchange the defaulted bonds for new bonds (sometimes at par, sometimes with a heavy discount). In the midst of civil wars and the 1846 war with the United States in which Mexico losses half of its territory, all these renegotiations fail. Only in 1851, an agreement is reached. At that time, Mexico issues a 3% bond for 10,241,650 British pounds in exchange for old bonds and to pay in part the arrears in coupons. This bond is guaranteed with government revenues, mainly tariffs. Mexico also promises future annual transfers of 250,000 pesos starting

in 1857 to amortize the debt. Bondholders also receive 2,500,000 U.S. dollars for part of the unpaid coupons. The estimated haircut is approximately 74 percent.

Mexico suspends payments again in 1854. As with the default of 1827, renegotiations are quite protracted amid civil wars and the Franco-Mexican war of 1862-1867. The settlement of the debt occurs in 1886, once the country has been stabilized under Porfirio Díaz. Previous debt (including the bonds issued by the Maximilian Government in 1864) is converted into a new 3% bond. Old bonds are converted into new bonds at heavy discounts, between 50 and 80 percent. Arrears in coupons are also capitalized in this 3% bond at 85 percent discount. The estimated investors' loss is 81 percent.

With the debt successfully settled, Mexico is able to participate in international capital markets again. It is not just sovereign borrowing but also private investment financing the construction of railways, mining production, banks creation, and various manufacturing activities (particularly in the tobacco and paper sectors), and production of commodities, such as sugar, rubber, and coffee.

Mexico defaults again in the midst of the Revolutionary war in 1914. Government debt by then has escalated to approximately 103 million British pounds. The debt is settled in 1922 (Convenio Lamont-De la Huerta. June 16, 1922). By this agreement, Mexico acknowledges all the debts prior to the revolution. There are coupon arrears for a total of approximately 40,000,000 British pounds. These arrears are agreed to be paid at par over a period of forty years beginning in January 1928. These arrears do not accumulate any interest. By this agreement, all service of the debt, including the sinking funds, is agreed to be fully resumed in cash. The debt service is partially guaranteed from 1923 to 1927 by oil export tax revenues, a tax on railways and railway revenues. The estimated haircut is 27 percent. Payments are suspended on June 30, 1924 and a new agreement is signed in October 1925 that includes the capitalization of unpaid coupons from 1924 to 1925 and the privatization of the national railway system. In 1928, under large fiscal pressure, Mexico suspends payments on the debt. The debt is only renegotiated in 1942.

Peru also taps international capital markets in the early 1820s. It issues two 6% bonds for 1,816,000 pounds. The crisis in London in 1825 and the collapse in international liquidity together the unstable political and economic conditions in Peru due in part to the ongoing war of independence trigger a default in 1826. In the 1840s, Peru's economic conditions improve with

the discovery of deposits of guano and with the increase demand for this fertilizer from European countries. In 1842 the Peruvian government declares the deposits of guano a state monopoly, securing a new source of income. Within a short time, the ruinous fiscal conditions improve and the fiscal accounts are balanced, making it possible for the government to reach an agreement with its creditor. The 1849 agreement includes a 25 percent debt-relief on the unpaid coupons and the issue of a bond for the rest of the arrears. Also the old bonds are exchanged at par for new bond. Interest rates on both bonds are reduced in the first few years after the agreement. These favorable economic conditions also allow Peru to tap the international capital market repeatedly. In 1853 it issues four new bonds for a total of 5,000,000 pounds. In 1862 it issues a new bond for 5,500,000 pounds and in 1865 it issues a 10,000,000 pound bond. Part of the raised funding is used to convert previous external debt to better terms and to consolidate the internal debt. The capital flow bonanza continues into the early 1870s with the issues of two bonds, one for 11,920,000 pounds and the second for 37,000,000 pounds. While part of those issues is used to convert previous debt, a large part is devoted to the constructions of railways and public works. But economic conditions in Peru turn for the worst with the exhaustion of the guano deposits and the introduction of artificial fertilizers that leads to a collapse in demand of guano. With fiscal conditions deteriorating rapidly and with international liquidity strained following the 1873 crisis, Peru defaults again in 1876. By that year, Peru's external debt is approximately 40,000,000 pounds and the debt to exports ratio reaches 8.16. With no ability to make any commitments of repayments, an agreement, known as the Grace contract, is reached by which the claims of investors on the loans of 1869, 1870, 1872 including the accumulated arrears in interest are cancelled. In total, the foreign debt at the time of this agreement is about 55 million pounds. In return for the cancellation of the debt, Peru cedes the national railway system for a period of 66 years. The government also compromises to pay an annuity of 28,000 pounds for thirty years and gives bondholders 2 million tons of guano. This is Peru's last default in the 19<sup>th</sup> century. After this agreement Peru does not regain access to international capital markets. From 1890 until the onset of WWI, private and public international issuance is below 15 million pounds.

Uruguay's participation in international capital markets and defaults has similar characteristics to those of Argentina. From 1864 until 1900, Uruguay floated approximately 61 million pounds (of which 30 million pounds are refunding loans to exchange old bonds and the

rest is new funding). Renegotiations are not protracted as those of Colombia and haircuts as those of Argentina in 1890 oscillate around 20 percent. The first default occurs in 1875 in the aftermath of the first world recession of 1873. At that time Uruguay foreign sovereign debt consists of just one bond, the 6% 3,500,000 pound bond floated in 1871. A debt-settlement agreement is reached in 1878. A 1.25% funding loan is issued to pay arrears in interest payments. A new bond is exchanged for the old bond at par but with interest rates reduced and the sinking fund suspended for five years. The estimated haircut is 14 percent.

In the early 1880s Uruguay regains access to international capital markets, with private issuance from 1880 to 1890 reaching .... million pounds and public issuance amounting to .... million pounds. In the midst of the 1890 Baring, Uruguay defaults again. This time around, government debt has increased to approximately 18 million pounds. As is the case of Argentina in the 1890s, a debt settlement agreement is reached within a year. A new 3.5% bond for 19.3 million pounds is issued in 1892 and exchanged for the old bonds at a premium. Also a new funding loan is issued in 1891 to pay for interest in arrears. The estimated losses for investors, as examined in Table 5, oscillate around 20 percent. The last default before 1931 occurs at the onset of the war in 1915. While there is an initial attempt to renegotiate the debt in 1915, the debt settlement is only reached in 1921. The suspended sinking fund is resumed in 1921 and 1922. Using the nominal yield of the defaulted loans, the haircut is zero.

#### **IV. Domestic and Global Fragilities Behind Sovereign Defaults**

Why do sovereign issuance and defaults across these seven countries differ so much? Argentina, Brazil, Chile, and Uruguay participate heavily in international capital markets and default mostly in the midst of crises with the financial center at its epicenter. Idiosyncratic shocks sometimes also trigger defaults in these countries: For example, Chile also defaults in 1880 in the midst of the War of the Pacific 1879-1883 (Chile fighting against Bolivia and Peru) while Brazil also defaults in 1898 following the collapse of the price of coffee. In contrast, Colombia and Mexico default even at times of booms in international capital markets and do not participate heavily in international capital markets.<sup>19</sup>

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<sup>19</sup> Peru did participate heavily in international capital markets from the 1850s until the 1870s in the midst of the guano boom. Otherwise, international issuance was quite limited. During the early part of the 19<sup>th</sup> century Mexico



We look first at the characteristics of these economies. Naturally, economic data in the 19<sup>th</sup> and early 20<sup>th</sup> centuries are quite limited and very difficult to collect. We first focus our attention on exports to capture the size of the economy, its evolution, and the ability of the country to repay foreign loans. Second, we look at the evolution of the country's terms of trade, again, to assess the ability of repayment. Finally, we examine the evolution of the exchange rate to assess competitiveness and the ability of the government to access domestic credit during episodes of illiquidity in international capital markets in general or when they cannot tap international capital markets because of domestic fragilities.

## IV.1 Exports

We collect data on exports from a variety of sources both domestic and international. We convert the data to British pounds to compare with government international indebtedness and assess the ability of those countries to service their debt. Some countries, like Argentina, Brazil, and Chile have publications with export data starting in the early 19<sup>th</sup> century. The data from Colombia, Peru, Mexico, and Uruguay has to be complemented with data from the main trading partners. We use data on U.S. and U.K. imports from these countries to obtain, when possible, annual series of exports for the period 1820-1931.<sup>20</sup> Not only do we use the country trading-partner data to extend the domestic series but also to check the data published in domestic statistical abstracts.<sup>21</sup> To assess the long run sustainability of the foreign debt, we estimate the Hodrick-Prescott trend of exports. These trends are shown in Figure 2.

The first noticeable finding is the size of these economies in the early years of the 19<sup>th</sup> century. Brazil and Mexico are the largest economies in the 1820s. Brazil's exports (about 4.5 million British pounds) are about seven times the exports of Argentina, six times those of Chile,

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is not able to tap international capital markets. All changes with the stabilization of the country during the presidency of Porfirio Diaz (1876-1911). Mexico loses access to international capital markets again with the onset of the Mexican Revolution in 1910.

<sup>20</sup> To better assess the evolution of exports of these countries, we will also collect data French and the so-called Low Countries (Belgium, the Netherlands, and Luxembourg) imports from Latin America.

<sup>21</sup> We could not use data from the U.S. and the U.K. to construct export series of Uruguay because in the 19<sup>th</sup> and early 20<sup>th</sup> centuries a large part of the exports of this country to Europe is channeled via Argentina and Brazil and there are no data on imports of these countries from Uruguay.

fifteen times those of Colombia,<sup>22</sup> thirty six times those of Peru. Of course, Uruguay's economy at that time is even far smaller and not even independent. Mexico is the second economy in size, with Brazilian exports being twice those of Mexico. These statistics put already in perspective the ability of those countries to service the bonds floated in 1822-25, which amount to one million British pounds for Argentina, 3.6 million British pounds for Brazil (5 million British pounds if we include the 1,400,000 bond inherited from Portugal), one million British pounds for Chile, 3.4 million British pounds for Colombia,<sup>23</sup> six million British pounds for Mexico, and one million British pounds for Peru. The debt export ratios for the first episode of international borrowing oscillate between approximately a minimum of 1 for Brazil and a maximum of 14 and 20 for Colombia and Peru, respectively. The debt-export ratio for Argentina is 2, for Chile is 1.7, and for Mexico is 3. Uruguay does not participate in the international capital market until the 1860s.

The second important feature to note is the speed at which these countries' exports increase during the first episode of financial globalization, 1820-1931. We first look at the 19<sup>th</sup> century patterns. Argentina's exports surpassed those of Brazil in 1898. Argentina is the fastest growing country in the 19<sup>th</sup> century. In 1900, Brazil's exports are three times those of Chile, fifteen times those of Colombia, twice those of Mexico, seven times those of Peru, and six times those of Uruguay.<sup>24</sup> By the end of the 19<sup>th</sup> century Argentina and Brazil are the largest economies, equal in size. While still far smaller than Brazil, Chile, Peru, and Uruguay gain ground relative to Brazil, with their exports becoming a larger fraction of those of Brazil when compared to the 1820s. During the 19<sup>th</sup> century, Mexico's exports grow on average at the same pace as those of Brazil, with Mexico's economy at the end of the century continuing to be about a half of that of Brazil. Finally, by the end of the century, Colombia becomes the smallest economy when measured by its exports. Colombia grows on average at the slow pace of Brazil,

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<sup>22</sup> The comparison for Colombia is for the last half of the 1830s, when our data on exports begins.

<sup>23</sup> In the 1820s, Colombia is not a separate country. At that time, it forms part of the Gran Colombia comprising Colombia, Ecuador, and Venezuela. Gran Colombia issues three bonds in the 1820s. The first one in 1820 for 547,783.5 British pounds. One for 2,000,000 British pounds in 1822 and the other for 4,750,000 British pounds. These last two bonds are in part used to repay the bond of 1820. That is, the Gran Colombia's debt outstanding in 1825 when it defaults is 6,750,000 British pounds. When the Gran Colombia separates in 1831, the Gran Colombia's debt is allocated to the three new countries. Colombia's share is 50 percent of the Gran Colombia's debt.

<sup>24</sup> Brazil's exports in the 1860s are about eight times those of Uruguay.

with Brazil's size continuing to be about fifteen times those of Colombia by the end of the 19<sup>th</sup> century.

To further understand these countries' sovereign defaults and renegotiations in the 19<sup>th</sup> century, we also examine the different pattern of export growth in the earlier and later part of the 19<sup>th</sup> century. In particular, we look at the average annual growth rates during the 1820-1860 and the 1860-1900 episodes. As shown in the table below Figure 2, there are accentuated idiosyncratic patterns. One group consists of the high growth countries, with annual growth rates consistently above 3 percent. Argentina and Chile are in this group. On the other, there is Brazil that consistently is growing at an average of 2.6 percent per year. The other countries growth rate is period dependent. Colombia and Peru grow fast during the 1820-1860 period but stagnate during the second half of the 19<sup>th</sup> century. While both Colombia and Peru grow fast in the earlier periods, it is Peru the one with the highest growth rate, in most part because of guano exports from 1840 to 1880. With a growth rate of about 11 percent per year on average, the burden of the foreign debt dramatically falls (by the 1840s the debt over exports ratio is only ... times) and allows Peru to tap international capital markets again. This is not the case of Colombia, while exports grow at a higher pace in the earlier period, the debt burden remains high and Colombia does not regain access to international capital markets. Finally, Mexico stagnates during the first half of the 19<sup>th</sup> century and only starts growing faster with the rise to power of Porfirio Díaz in 1876. From 1860 to 1900, Mexico grows at about 5 percent annual rate. After many years of renegotiating the debt contracted in the 1820s, it is during the "Porfiriato" that Mexico settles its defaulted foreign debt and begins to participate in international capital markets. We could not find data on Uruguay's exports for the first episode. Our data start in 1865. From that time until 1900, Uruguay is a fast growing country, with growth rates just below 5 percent.

Growth in the 20<sup>th</sup> century shows some similarities but also new patterns compared to the 19<sup>th</sup> century. Argentina, Chile, and Uruguay continue to be fast-growing economies and allowing them to continue tapping international capital markets. Brazil maintains a growth rate of 2.5 percent per year similar to that of the 19<sup>th</sup> century. In contrast, Colombia and Peru show a better performance in the early 20<sup>th</sup> century. Colombia's exports start increasing at an average rate of 8 percent per year and Peru's exports start growing at approximately 5 percent per year, making it possible for these two economies to access international capital markets. Mexico, in

the midst of the instability of the civil war, stagnates when compared to its growth in the late 19<sup>th</sup> century, with growth rates of just 3 percent, limiting its access to international loans.

Naturally, sustainability of the foreign debt can only be asserted by the debt-exports ratio and the ability of the economy to keep on servicing the debt. We will examine the characteristics of these economies at the time of default in Section V.

## **IV.2 Terms of Trade**

We collected the data from a variety of sources. For Argentina, Brazil, and Chile, we use mostly domestic publications. For Colombia, Mexico, Peru, and Uruguay, we mostly use the terms of trade estimated by Christopher Blattman, Jason Hwang, and Jeffrey G. Williamson (2004). Their estimates cover the period 1865-1959. The data for Argentina cover the whole sample. For the rest of the countries, we extend the data on the terms of trade. We collect data on the prices of the principal exports of those countries for the remaining period from various publications in the United Kingdom and the United States. We then calculate the terms of trade of those countries as the ratio of the weighed prices of the main exports in each country (in British Pounds) over the wholesale price index of the United Kingdom.

Overall countries specialize in a small number of commodities. Argentina and Uruguay export tallow, hides, wool in the earlier part of the sample, while during the latter part of the sample their main exports are cereals and beef. Brazil's main exports are sugar and coffee in the earlier part of the sample. Coffee continues to be one of the main exports in the latter part of the sample but rubber becomes important towards the end of the 19<sup>th</sup> century. With competition from South East Asia (Indonesia and Malaysia) in the production of rubber, Brazilian rubber exports decline dramatically after WWI, with coffee becoming again the main Brazilian export until the end of our sample. Chile's main exports are copper and nitrates with copper being the most important commodity export during the earlier times and nitrates becoming more important since 1880. Colombia's main exports are coffee, tobacco, and cotton. Cotton is more important before the 1840s, tobacco becomes the main export in the mid-19<sup>th</sup> century, and coffee becomes the main export during the early years of the 20<sup>th</sup> century. Mexico's main exports are silver and petroleum, with silver dominating during the 19<sup>th</sup> century and petroleum during the early 20<sup>th</sup> century. Peru's main exports are silver, copper, sugar, guano, and cotton. Silver and sugar are

the main exports in the earlier part of the 19<sup>th</sup> century, guano dominates from the 1840s to the 1880s, copper, cotton, and sugar dominate the late 19<sup>th</sup> and early 20<sup>th</sup> centuries.

Figure 3 shows the evolution of the terms of trade for our seven economies. There are mostly no trends in the terms of trade with the exception of those of Mexico as the price of silver (its main export) declines in the later part of the 19<sup>th</sup> century, suggesting that, for all the economies (with the exception of Mexico) terms of trade long term evolution does not threaten debt sustainability. But, what about the volatility of the terms of trade? With short-run inelastic supply of exports of commodities, sharp movements in the terms of trade can create or destroy access to foreign assets and international liquidity, putting at a disadvantage those countries with highly volatile terms of trade in bad times, when terms of trade decline. As shown in the first table in Figure 3, volatility is far larger in Brazil and Colombia than in the rest of the countries, putting those countries more at risk in bad times. In particular, it is important to note that Brazil's defaults in 1898 and 1914 are preceded by drastic declines in its terms of trade due to collapses in coffee prices in 1898 and rubber prices in 1914.

We will come back to the analysis of terms of trade changes for each country at the onset of every default in Section V. It is important however, to examine whether terms of trade volatility exacerbate liquidity crunches during episodes of crises in the financial center. The stylized evidence is shown in the last table of Figure 3. During the first episode of financial globalization there are five crises with the financial center at its epicenter. The 1825, 1914, and 1890 crises start in London, the 1873 crisis starts in Vienna, and the 1931 crisis starts in New York. While all these crises trigger sovereign defaults across Latin America, the ones with farther reach are the 1825 and 1931 crises, with thirteen Latin American countries defaulting in 1825 and in 1931. Notably, these are the crises that are preceded by the collapse of terms of trade in all Latin American countries. Terms of trade decline by 22 percent on average during the four years before the crisis of 1825 and by 26 percent during the four years before the crisis of 1931. In contrast, the terms of trade on average across all countries in Latin America either remain constant or increase prior to the 1873, 1890, and 1914 crises. Only seven countries default in the crises of 1873 and 1890 and four countries default in the 1914 crisis. Interestingly, only the terms of trade for Argentina and Uruguay collapse prior to the 1890 crisis that ends with the default of both countries. Also, only the terms of trade of Brazil and Colombia collapse prior to the 1914. Brazil defaults in 1914 but Colombia does not.

### **IV.3 Exchange Rate Regimes**

The sovereign crisis in the Eurozone has brought back the attention of academia and policy makers to exchange rate regimes. Many have pointed the straightjacket imposed by the euro on slow growing countries in southern Europe. Greece, Italy, Portugal, and Spain have grown at an average annual rate of 2.3 since 1999. It is claimed by many that without a devaluation and an independent central bank, the perspectives of these countries in the next decade look somber especially given the inability of the governments to implement an expansionary fiscal policy in the presence of a large debt overhang.

The 19<sup>th</sup> and early 20<sup>th</sup> centuries are also witness to another fixed exchange rate regime in corset: the gold standard. Are there any links between sovereign crises and the adoption/abandonment of the Gold Standard? What is the reaction of countries in times of stress following adverse domestic or external shocks? Importantly, only the United Kingdom is on the gold standard from 1816 until the start of WWI, the countries in the periphery adhere to the gold standard only sporadically, with currency inconvertibility and paper monies being adopted in times of stress.

We now examine the ins and outs of the gold standard, the evolution of the exchange rates in Latin America since the 1820s, and the links to sovereign crises. This is not a straightforward task, especially for the early years of the 19<sup>th</sup> century and for some countries even in the later part of the 19<sup>th</sup> century and early 20<sup>th</sup> centuries. We consulted large number of sources: the US Director of the Mint publication, the Economist, the London Times, many books and essays published by authors in the respective countries, and Ph.D. dissertations on exchange rates and economic history. As usual, exchange rate quotations can be obtained more easily for those countries with active participation in international capital markets and overall liquidity in domestic financial markets. Also, when the country is under an inconvertible currency, quotations can only be obtained from domestic journals and newspapers. Most of the times, it is impossible to have a continuous series of exchange rate quotations.

Figure 4 shows the nominal exchange rate between the domestic currency and the British Pound (or the U.S. dollar). We now describe briefly fiscal problems, money issuance of inconvertible currencies, and the evolution of the exchange rate for our seven countries in the

sample The shaded areas in this figure identify the episodes of default. As discussed above, sometimes when countries have inconvertible currencies, it is hard to find the exchange rate of the paper money. We include boxes in the figure to point the episodes of inconvertible currencies.

### ***1. Argentina***

While peso fuertes (hard pesos) pegged to gold or silver circulated in Argentina, paper pesos became the most important money in circulation from the late 1820s. With no precious metals in the territory and the inability to tap international capital markets following the London panic in 1825, extensive issue of paper money (and currency inconvertibility) becomes the only way to finance the war with Brazil from 1826 to 1828. In the end, with so voluminous fiscal needs Argentina (the province of Buenos Aires) defaults in 1828. Fiscal deficits escalate in the next thirty years because of international and domestic conflicts (trade blockades of the French from 1838 to 1840 as well as of the British fleet from 1845 to 1847, the war of the “Triple Alianza,” from 1864 to 1870, and internal wars (1853 to 1861)). Bouts of issuance, inflation, and depreciation continue until 1861. Following the unification of the country and the stabilization that follows it, Argentina restores convertibility and stabilizes the exchange rate with the introduction of the peso fuerte (hard peso). As can be seen from Figure 4, the stabilization does not last long. Even the introduction of the gold standard in 1881 is short-lived. A large issue of banknotes in the midst of the economic boom in the late 1860s and early 1870s and the international issuance boom of the 1880s (financing fiscal spending and fueling a land boom) end with a depreciation of approximately 200 percent by 1890. As in the 1820s, monetization of the debt is not enough and Argentina defaults in 1891. The completion of the renegotiations of the external debt and the fiscal austerity program that follows, allows the country to return to the gold standard in 1899. This time around adherence to the gold standard is long lasting with a short-lived interruption in the midst of WWI.

## ***2. Brazil***

As with Argentina, wars (independence and against Argentina) and domestic revolts lead to financial needs: International borrowing in 1824/5 helps but the London panic of 1825 and the drying of international capital markets leaves Brazil with no choice but to monetize the fiscal deficit and default on its sovereign debt, with the milreis depreciating 100 percent within four years. With domestic stability, the value of the milreis stabilizes and the gold standard is adopted in 1849, still paper money continues to circulate. Again, the war of the Triple Alliance 1864-1870 and the financial needs it imposes on the government leads to the abandonment of convertibility but the milreis is stabilized at the end of the war. Fiscal problems re-emerge in 1888-1889 due to internal conflicts, with international issuance financing the fiscal needs. The 1880s are also a decade of boom in international lending for both the public and private sector. International capital markets, not only provide financing to the government but also contribute largely to the construction of railways, water and gas works. The Barings crisis in 1890 and the lack of international liquidity that it triggers makes international financing difficult to obtain and again issuance of paper money helps with the deficit. The milreis depreciates 200 percent. In the end, the collapse in international liquidity together with the dramatic fall of the price of coffee fuels a sovereign crisis in 1898. At that time, Brazil can only resort to domestic financing, paper issuance increases sharply and the milreis depreciates again by 200 percent.

As international capital markets start booming again in the 1890s, Brazil (even in the midst of a default) accesses international capital markets. Mainly, it is the states. With new fiscal resources following the change in the constitution, the States start tapping international capital markets. Even the central government borrows again. With new international funding the exchange rate stabilizes. But the international crisis at the onset of WWI together with the collapse of the price of rubber initiate a new cycle of money issuance, inflation, devaluation of the domestic currency and the sovereign default in 1914.

## ***3. Chile***

After independence from Spain, Chile is in a de facto gold standard. A currency reform in 1851 introduces bimetallism but the depreciation of silver in the 1870s ends with bimetallism



and Chile is in the silver standard. Starting in the 1860s bank notes become guaranteed by the treasury and with the depreciation of silver, bank notes become popular in the 1870s. In 1865, Chile declares war against Spain. With liquidity in international capital markets, Chile is able to finance the war by issuing three bonds in London. Again in 1879, Chile is involved in another international conflict: the War of the Pacific. This time around (and with a large external debt burden), the government opts for issuing domestic debt and paper money. Chile also defaults in 1880 (it suspends the sinking fund). The domestic currency depreciates by 42 percent. The domestic currency remains inconvertible for several years, with the Chilean peso depreciating over 100 percent in the 10 years following the end of the sovereign default. Chile returns to the gold standard in 1895 but it is suspended again in 1898. With issuance of paper money escalating, the peso depreciates by almost 200 percent when Chile re-enters the gold standard in 1926. The gold standard is abandoned again in 1931 in the midst of the great depression.

#### ***4. Colombia***

The links between currency inconvertibility and abandonment of metallic standards with sovereign defaults in Colombia are more tenuous than those of Argentina, Brazil, and Chile. Argentina, Brazil, and Chile are not gold (silver) rich countries. Thus, access to gold/silver is only possible by borrowing in international capital markets. When the financial center is in distress or when the countries in the periphery are in default, international borrowing collapses, making it impossible for the non-rich gold (silver) countries in the periphery to maintain the gold (silver) standard. In this case, fiscal deficits have to be financed with issue of paper money. In contrast, Colombia is a mineral rich country that can mint its domestic gold/silver resources.

In 1821, the Congress of Cúcuta adopts the silver standard. The metallic standard is maintained even in the midst the crisis in 1825 and the default of 1826, which is only renegotiated in 1845. Colombia defaults again in 1849 but it does not abandon the bimetallic standard. However, in 1860 in the midst of a civil war, with large fiscal needs, and still in sovereign default, Colombia abandons the metallic standard and the currency becomes inconvertible. As in Argentina, Brazil, and Chile, fiscal deficits are financed by issuing paper money.<sup>25</sup> In 1861 the sovereign debt is renegotiated and in 1871, Colombia adopts the gold

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<sup>25</sup> We have been unable to find quotations for the Colombian peso during the 1860-1870 inconvertibility episode.

standard, pegging the peso to the French franc at a rate of 1 peso = 5 francs. Again, the wars of 1876 and 1885 make impossible the continuation of the gold standard and the service of the sovereign debt. Colombia defaults in 1879 and abandons the gold standard in 1886. From 1888, printing press inflation caused Colombia's paper money to depreciate, especially during the Thousand Days War (1899-1902). In 1905 Colombia returns to the gold standard and renegotiates its sovereign debt. There is a currency reform with the peso oro replacing the old peso at a rate of 100 old paper pesos = 1 peso oro. Colombia does not default again or abandons the gold standard until the great depression.

## ***5. Mexico***

Similarly to Colombia, Mexico is a rich silver country making it possible to keep the silver standard even without access to international capital markets and in times of sovereign default during most years of the 19<sup>th</sup> and early 20<sup>th</sup> centuries. The Mexican peso depreciates starting in the 1870s as the price of silver declines. Mexico adopts the gold standard in 1905. Monetary stability collapses with the civil war, 1910-1914. Large issuance of paper money occurs from July 1913 to August 1914 and the currency becomes inconvertible. When Carranza enters the city of Mexico a new wave of paper money issuance occurs (August 1914 to June 1916). During this period, about twenty one different monies co-exist. Mexico also defaults in 1914. In July 1915 the government approves the exchange of all those monies for a new currency the so-called un-falsified. However, public confidence is not restored, rejecting the new paper money. Over this period the domestic currency depreciates 1,100 percent. Mexico adopts the gold standard in 1916 but it only renegotiates its sovereign debt in 1922. Again in 1928 Mexico defaults and abandons the gold standard.

## ***6. Peru***

To be completed

## **7. Uruguay**

Coinage in Uruguay is insignificant during the first half of the 19<sup>th</sup> century, with mostly foreign currencies (Spanish, Mexican, and various South American monies) circulating. By the Coin Act of June 23<sup>rd</sup> 1862 a bimetallic standard is introduced at the beginning of 1863. As in Argentina and Brazil, sovereign debt problems are accompanied by abandonment of a metallic standard.

Uruguay defaults four times: 1875, 1891, 1914, and 1931. The onset of the 1875 crisis is preceded by political and economic fragilities in the late 1860s and beginning of the 1870s: Domestic military conflicts, the so-called “Revolution of the Lanzas” (1870-1872), and international conflicts (the war of the Triple Alliance (1864-1870)), with the accompanying fiscal deficits; a major agricultural crisis with the spread of foot and mouth disease; and a systemic banking crisis, lead to the collapse of the metallic standard in 1868. Paper pesos depreciate sharply in the midst of the crisis reaching about 15 paper pesos per gold peso in 1868. The gold premium declines to 9 paper pesos per gold peso in 1869, but increases again to 14 pesos paper per gold peso in 1871. The international financial crisis in 1873 transforms all these fragilities into a perfect storm. Uruguay defaults in 1875. A debt-settlement agreement is reached in 1878.

By the mid-1880s Uruguay is tapping again international capital markets. As in Argentina, the boom is accompanied by fiscal profligacy, land speculation, and monetary expansion. In the midst of the international crisis (triggered by the almost bankruptcy of Baring Brothers) Uruguay defaults again in 1891. As in the 1870s, issuance of unconvertible currency is the norm with the premium gold pesos over paper pesos oscillating around 80 percent in 1892.

Uruguay defaults again in 1914. Again, the domestic currency depreciates in this instance and stabilizes afterwards, with Uruguay adopting the gold standard in 1926 only to abandon it again in 1929 at the onset of the crisis that leads to the great depression.

## **V. Insolvency and Liquidity Crises**

In this section we try to assess the nature of the sovereign crises. In particular, we try to answer the question: What triggers crises? Is it debt insolvency? Or it is a crisis in the financial

center that leads to a collapse of international lending? Large debt/GDP ratios are universally accepted as an indicator of insolvency crises whereas a crisis in the financial center leading to debt-servicing difficulties in the periphery is generally understood as an indicator of liquidity crises. As we discussed in Section IV, volatility of the terms of trade can also trigger liquidity booms or liquidity crashes.

To address whether the debt is sustainable, we look at the debt dynamics below:

$$D_{t+1} = (1 + r)D_t - TB_t \quad (1)$$

Where  $D$  is external debt,  $r$  is the interest on the foreign debt, and  $TB$  is the trade balance. To account for the effect of growth on borrowing capacity, equation (1) can be rewritten in terms of ratios to exports.

$$(1 + g)d_{t+1} = (1 + r)d_t - tb_t \quad (2)$$

Where  $g$  is the growth rate of exports,  $d$  is the debt to exports ratio, and  $tb$  is the trade balance to exports ratio. From equation (2), the trade balance that stabilizes the debt ratio is

$$\overline{tb}_t = d_t(r - g) \quad (3)$$

We can also estimate the average trade balance,  $\tilde{tb}$ , needed to reduce the debt ratio in the year of the default to  $\alpha$  in  $n$  years

$$\left[ \alpha - \left( \frac{1 + r}{1 + g} \right)^n \right] d_t = - \left( \frac{\tilde{tb}_t}{1 + g} \right) \sum_{i=0}^{n-1} \left( \frac{1 + r}{1 + g} \right)^i \quad (4)$$

A primer of our results is reported in Table 5. The first and second columns in Table 5 show the country and the year when the country suspends the service of the debt. The next four columns examine whether the crises in Latin America reflect insolvency problems: The third column shows the debt/export ratio at the time of the default. The fourth column shows the trade surplus (as a percent of exports) that is needed to reduce the debt/export ratio at the time of the

default to 100 percent in ten years. In our estimations in this table, we assume the real rate of interest is 6 percent for all countries while the growth rates used are shown in column (6). The fifth column shows the extra savings effort needed to reach a debt/exports ratio equal to 100 percent in ten years. This is equal to the estimate in column (4) minus the average trade surplus run by the country over a 40-year interval around the time of the default. The sixth column shows the long-run average growth rate of exports over a 40-year period around the time of the default. The last two columns examine whether the defaults in Latin America reflect liquidity problems. Column (7) provides a measure of international liquidity crunches across all Latin American countries at the time of defaults. In particular, we estimate the change in Latin American international issuance-to-exports ratio in the year of the default relative to the maximum issuance-to-exports ratio in the previous three years. Column (8) shows the four-year change in the terms of trade of the defaulting country prior to the default.

The crises of the 1820s are different from the later crises. On average, debt/exports ratios are far larger at the onset of the sovereign crisis in the 1820s than in any of the other crises. No wonder, this is the sovereign crisis that takes far longer to get resolved. Brazil and Chile are the ones with less severe insolvency problems, with debt to exports ratios (in percent) of 121 and 130, respectively. While Brazil has a lower debt/exports ratio than Chile, Chile grows at a faster pace during the 1820-1860 period thus requiring a lower trade surplus to reduce the debt/exports ratio (in percent) to 100 within ten years. Brazil and Chile are the countries that resolve the debt problems the fastest. Brazil never suspends coupon payments and resumes all the sinking funds at the latest in 1851. Chile is the first to renegotiate successfully its debt in 1842. Colombia, Mexico, and Peru are the countries with the worst insolvency problems at that time. This is why both Colombia and Mexico undergo long lasting renegotiations during most of the 19<sup>th</sup> century and are unable to tap international capital markets again during most of the 19<sup>th</sup> century (Mexico regains access in the last twenty years of the 19<sup>th</sup> century). Peru turns to be different. The Guano boom starting in the 1840s allows Peru to tap heavily international capital markets only to default again when the boom turns into a bust. But the crises of the 1820s are not just about insolvency problems. The crunch in international liquidity is the most pronounced, with issuance (in terms of exports) proportion of exports declining by 108 percent. Terms of trade collapses are also very pronounced for most of the countries at the onset of these crises, fueling

larger external and fiscal deficits. Brazil is the one to suffer the most in this respect with terms of trade declines of 31 percent.

As in the 1820s, the turbulent 1930s are also witness to dramatic massive adverse shocks to liquidity. International issuance sharply declines (less in terms of exports than in the 1820s) and the terms of trade collapse for most of the countries. Again, Brazil's terms of trade are the ones that decline the most. Unfortunately, for this draft we have not been able to estimate the yet the debt/export ratios for all the countries.

Three countries in our sample default in the aftermath of the international crisis in 1873: Colombia, Peru, and Uruguay. Clearly Peru has the worst insolvency problem. With exports growth declining sharply following the guano collapse, the ability of Peru to service its debt is null. The settlement of the debt in 1889, the so-called Grace contract, reflects this problem. All Peru's foreign debt is forgiven in exchange for land and the bondholders' right to operate Peru's national railway system for 66 years and the steamboat system in Lake Titicaca.

Argentina and Uruguay are the only countries in our sample to default following the Baring Crisis in 1890. Both countries have large debt/exports ratio, reflecting solvency problems. The debt burden is higher in Uruguay. In part this higher ratio reflects the 1883 consolidation of Uruguay's domestic and external debt into a 5% bond for approximately 11 million British pounds (7 million to cancel all domestic debt and 4 million to pay off the 1871 6% bond for 3.5 million British pounds and the 1878 bond issued to pay coupon arrears following the default in 1876). In contrast, the debt burden for Argentina does not include the external debt of the provinces. Also, Argentina has, at the time of the 1891 crisis, a sizeable domestic debt. Liquidity problems, in the form of a collapse in international liquidity and the decline in the terms of trade add to the burden of the debt.

Brazil, Mexico, and Uruguay default in the midst of the 1914 crisis. Liquidity shocks are more important in the case of Brazil because its terms of trade collapse. In contrast, the terms of trade of Uruguay increase in the years preceding the 1914 crisis. It is still true that international issuance declines sharply at the onset of this crisis. The debt burden is also high across all countries but more severe in Uruguay and Mexico. The problems in Mexico are dramatically increased by the political and economic instability in the midst of the revolutionary war.

## **VI. Concluding Remarks**

Our results are quite preliminary. Still, they point to a variety of sovereign crises. In one extreme we have the cases of Argentina, Brazil, Chile, and Uruguay, with overall less insolvency problems and mostly defaulting at times of international liquidity crunches. In the other extreme, we have Colombia, Mexico, and Peru. Large debt/export ratios and low growth (with the exception of the Guano Boom for Peru) are at the core of their sovereign crises.

We have still plenty of work to do. First, we have only estimated haircuts with only one rate of discount: the rate that keeps the defaulted bond at par value. We need to estimate investors' losses using the yield prevailing immediately after the settlement is reached, as in Sturzenegger and Zettelmeyer (2005). Second, we still have not calculated the debt/export ratios at the onset of the 1931 crisis. Third, the debt/exports ratios only include central government external debt. The debt/ratios calculated reflect accurately external public indebtedness of the countries in the earlier part of the sample. Starting in the 1880s, provinces in Argentina start to participate heavily in international capital markets. Similarly, Brazilian states start to tap heavily international capital markets following the constitutional reform of 1891 giving state governments the sole right to tax exports. It is impossible to estimate haircuts for loans taken by states, provinces, and municipalities since most of the prospectuses are lost. Still, we can estimate the approximate burden of the debt of provinces, municipalities, and states in all the countries at the time of the default to evaluate insolvency problems. Fourth, we are still checking our export data with information from a larger group of trade-partner countries. Fifth, we are still trying to complete our database on exchange rates during inconvertibility episodes.

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Table 1

## Systemic Sovereign Defaults

Episode	Origin of the Shock	The Background	Mechanism of Transmission	Latin America's Sovereign Defaults
1826-1830	1825 London Panic	The crisis is preceded by a boom in international capital flows. The increase in global liquidity is in part triggered by the end of the Napoleonic Wars and the reduction in government spending in Great Britain, which leads to a sharp decline in interest rates.	In the summer of 1825, the Bank of England raises the discount rate to avoid the loss of foreign exchange reserves. A stock market crash in London leads to a banking panic in England. The crisis spreads to Continental Europe, with many banking houses failing. There is a reversal in international capital flows, with countries in the periphery losing access to international capital markets	Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Peru, Venezuela
1873-1877	Stock Market Collapse in Vienna	This crisis is preceded by surge in capital flows from England and continental Europe to finance the construction of railroads in Latin America and the periphery as well as by a speculative land boom in Germany and Austria fueled by the French gold indemnity paid to Prussia after the Franco-Prussian war	The Austrian-German boom collapses in a spectacular stock market crash in Vienna in May 1873. Stock markets in Amsterdam and Zurich also crash. In the U.S. a banking panic in September follows the collapse of the stock market in New York. Reversal of capital flows. Economic activity worldwide collapses, fueling a sharp downturn in commodity prices.	Bolivia, Colombia, Costa Rica, Guatemala, Honduras, Peru, Uruguay
1890-1894	Baring Crisis	The crisis culminates a major lending boom from England and the continent in the 1880s to finance railroads and other infrastructure worldwide. Capital flows also trigger a boom in land prices.	The international crisis is fueled by Argentina's default, which leads to the collapse of Baring Brothers in November 8, 1890. The Bank of England prevents a panic by arranging an operation to recapitalize Barings with the aid of other major London financial institutions and a temporary rescue loan from the Banque de France and the Russian central bank. Capital flows to Latin America and the periphery contract sharply.	Argentina, Ecuador, Guatemala, Nicaragua, Paraguay, Uruguay, Venezuela
1914-1918	World War I	A new surge in international liquidity finances railroads, construction of cities, gas, electricity, and telephone companies	The outbreak of World War I precipitated a massive international financial crisis across the world as the belligerents scramble to liquidate foreign assets. In late July, there is massive selling in the London Stock Exchange with this collapse triggering margin calls, sales of assets, driving stock prices further down. Panics in all asset markets and a scramble for money.	Brazil, Ecuador, Mexico, Uruguay
1931-1935	The Great Depression	The 1920s experienced a major stock market boom associated with massive investment that brought the major inventions of the late nineteenth century to fruition. These included: electricity, automobiles, communications, and petrochemicals.	The stock market crash on Wall Street in October of 1929 ushers in the great worldwide depression. Banking crises in continental Europe contribute to the sharp recession. England abandons the gold standard in September 1931 and the United States in 1933. Contractionary monetary and fiscal policies in the United States further the contraction. Commodity prices collapse.	Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Guatemala, Nicaragua, Panama, Paraguay, Peru, Uruguay,

Table 2

## Idiosyncratic Sovereign Defaults

Year	Country	Causes of the Crisis
1821	Colombia	War of Independence.
1834	Colombia	
1844	Mexico	
1848	Venezuela	Revolution and civil unrest
1850	Colombia	
1854	Mexico	War and fiscal problems
1868	Ecuador	
1872	Dominican Republic	Civil unrest and war; repudiations
1880	Chile and Colombia	Chile: War of the Pacific. Colombia: Trade depression, then civil war
1895	Costa Rica	
1898	Brazil, El Salvador, Venezuela	Brazil: Coffee price collapse, El Salvador:..., For Venezuela: Revolutions and European blockades
1900	Colombia	War of the 1,000 Days 1899-1902
1901	Costa Rica	
1906	Ecuador	Civil unrest and then depression
1907	Colombia	
1911	Nicaragua	
1920	Paraguay	
1921	El Salvador	
1928	Mexico	

Table 3

**Duration of Sovereign Default Spells  
(in Years)**

Episodes	Argentina	Brazil	Chile	Colombia	Mexico	Peru	Uruguay
<b>Systemic Sovereign Defaults</b>							
1826-1830	27	25	16	19	22	24	
1873-1877						15	4
1890-1894	3						1
1914-1918		13			8		7
1931-1935		12	17	13		21	6
<b>Idiosyncratic Sovereign Defaults</b>							
1821				4			
1848				14			
1854					31		
1862							
1879			5	18			
1898		13					
1900				6			
1928					14		
<b>Average all crises</b>	15	16	13	12	19	20	5
<b>Average excluding the 1820's crisis</b>	4	13	11	11	18	18	5
<b>Average excluding the 1820's and 1930's crises</b>	4	13	5	11	18	15	4

Table 4

## Defaults, Renegotiations, and Haircuts

Default Year	Bonds in Default	Debt Outstanding at the time of default (in pounds)	Agreements	Haircuts (in Percent)
<b>ARGENTINA</b>				
1828	6% Buenos Ayres loan 1824	970,000	<b>Agreement 1857.</b> Issue of a new bond amounting 1,641,000 for the arrears of interests. Principal remains at par. Reduced debt service until 1859	73
1891	6% Buenos Ayres loan 1824 6% Railway loan 1881 5% Loan 1884 5% Northern Central Railway Extension 1887-8-9 5% Treasury Conversion 1887 5% National Bank (German loan) 1887 4.5% Internal Gold loan 1888 4.5% Conversion 1889 3.5% External 1889 5% Northern Central Railway 1890 (2nd emission)	30,770,930	<b>Agreement 1891:</b> Issue of a 6% Funding Loan of 1891 in exchange for the debt service of the ten bonds in default between 1891 and January 1st, 1894. After 1894 full resumption of the debt service at par.	-9
1893	In addition to the ten previous bonds: 5% Loan of 1886-7 5% Waterworks loan of 1892 6% Funding loan of 1891 5% Buenos Aires Port loan 1892	44,152,975	<b>Agreement 1893 (Romero's agreement):</b> Reduction of 60% on the interest rate of 11 bonds representing 28,098,500 pounds of nominal value for 5 years. Reduction of 100 basic points in the interest rate of 3 bonds representing 21,250,400 pounds for 5 years. Suspension of the sinking fund until 1901. On March 27th, 1897 the Government announces its intention to resume the full payment of interest one year before stated in Romero's agreement. Sinking fund is resumed in 1901 as stated in Romero's Agreement	18
<b>BRAZIL</b>				
1827	5% Loan 1824/25 5% (Portuguese) Loan 1825	4,868,468	Full resumption of the suspended sinking funds in 1851.	0
1898	4.5% Loan of 1883 4.5% Loan of 1888 4% Loan of 1889 5% Loan of 1895 5% Western of Minas Railroad Company Loan 1893 4.5% Internal Gold Loan of 1879.	37,731,820	<b>Announcement:</b> Issue of a 5% funding loan to pay coupons of these bonds during 3 years (1898-1901). Coupon payment are resumed in 1902. Suspension of the amortization of all the bonds until 1911.	0
1914	4.5% Loan 1883 4.5% Loan 1888 4% Loan 1889 5% Loan 1895 5% Loan 1908 4% Loan 1910 4% Loan 1911 5% Loan 1913 4% Railway Guarantees Rescission Bonds 5% Companhia Lloyd Brasileiro Bonds The Lloyd Brasileiro 4% Bonds 4% Bonds of 1911 (Ceara Railway Loan) 5% French Loan 1908-9 (Colon, Itapura, Corumba Railway) 4% French Loan 1910 (Goyaz Railway Loan) 4% French Gold Loan 1911 (Viacan Bahiana Loan) 5% French Loan 1909 (Recife Port Loan) 5% Loan 1903	90,599,520	<b>Announcement:</b> Issue of a 5% funding loan to pay coupons of these bonds (except the 5% Loan 1903) during three years (1914-1917). Coupon payments are resumed in 1918. The sinking fund of all the bonds to be resumed in 1927.	1

Table 4 Continuation

## Defaults, Renegotiations, and Haircuts

Default Year	Bonds in Default	Debt Outstanding at the time of default (in pounds)	Agreements	Haircuts (in Percent)
<b>CHILE</b>				
1827	6% Loan 1822	942,871	<b>Agreement 1842:</b> Issue of a new bond for the outstanding debt (i.e. 934,000 pounds) with the same characteristics as the original. Issue of a 3% bond to pay for the unpaid coupons. Service of this last bond commenced in September 1847.	44
1879	4.5% Loan 1858 6% Loan 1867 5% Loan 1870 5% Loan 1873 5% Loan 1875	6,163,106	<b>Announcement:</b> Resumption of the sinking fund in the second semester of 1884 after the victory of Chile in the war against Peru and Bolivia.	0
<b>COLOMBIA</b>				
1821	10% Loan 1820	273,891	<b>Agreement 1822:</b> Issue of a 6% loan for 1,000,000 pounds on May 13th, 1822 to pay for the 1821 Debentures, the arrears of interest at August 21st, 1821 (i.e. 140,000 pounds), and other expenditures. Amount of unpaid interest was 91,612 pounds which were quoted at 65.5 (i.e. total issue 140,000).	
1826	6% Loan 1822 6% Loan 1824	3,312,975	<b>Agreement 1845:</b> Issue of New Active bonds for the principal of the debt carrying 1% interest for 4 years and then increments of 0.25% per annum until the maximum 6% was reached. Issue of Deferred Bonds for the arrears of interest for the total debt. No interest for 16 years. Interest 1% with increments of 0.125% per annum until 3% was reached. Maturity in 16 years. Deferred interest bonds were guaranteed by the Tobacco monopoly and Customs receipts.	86
1849	1% -6% New Active bonds 1845 1% to 3% Deferred bonds 1845	6,460,550	<b>Agreement 1861:</b> Issue of new Active Debt with lower interest rates to convert unpaid interest of the Active bonds of 1845. In addition 30 hectares of land to be assigned to each 100 pounds of Active debt and 16 hectares of land to each 100 pounds of Deferred Debt of 1845.	84
1873	2%-3% New Active Debt 1861	6,630,000	<b>Agreement 1873:</b> Issue of 2,000,000 of New Bonds at 4.5% until 1878 and 4.75 afterwards, to be given in exchange for the bonds of the Old debt in the following terms: i) Each 100 pounds active (1845) Conversion to receive 34 pounds of the New bonds; ii) Each 100 pounds of the Deferred Bond (1845 Conversion) to receive 17 pounds of the New bonds. iii) Each 100 pounds of the 3% Bond (1861 Paris Convention) to receive 66 pounds of the New bonds. iv) 2,000,000 hectares of land were given in compensation for the loss of interest under the conversion.	70
1879	4.5%-4.75% New Conversion Bonds 1873	1,947,871	<b>Agreement 1896:</b> New bonds to be issued for 2,700,000 pounds at 1.5 from January 1st 1897 increasing by 0.5 % every 3 years until reaching 3%. The principal of the 1873 bonds outstanding to be converted at par and the arrears of interest at 43% of their nominal value. Sinking fund to commence from January 1st, 1900 (0.5% increasing by 0.5% every 3 years until reaching 1.5%) to be applied by tenders or purchases while the price were below par and by drawings at 60% when interest rate was below 3% and at 70% when interest were at 3% in the event of the price rising to or above par.	50
1900	1.5%-3% Consolidated External Debt 1896	2,700,000	<b>Agreement 1905:</b> The payment of interest to be resumed from July 1st, 1905 as stated in the Agreement of 1896. Issue of certificates at par for unpaid coupons. Payment of 50% by June 30th, 1907.	

Table 4 Continuation

## Defaults, Renegotiations, and Haircuts

Default Year	Bonds in Default	Debt Outstanding at the time of default (in pounds)	Agreements	Haircuts (in Percent)
<b>MEXICO</b>				
1828	5% Loan 1824 6% Loan 1825	6,584,362	<b>Agreement 1851:</b> After several failed renegotiation in 1831, 1837 and 1846, a new agreement is reached in 1851 consisting of: payment of US\$2,500,000 to the bondholders as partial compensation for unpaid coupons; conversion of the 5% loan of 1846 into a 3% loan with discount. After 1857, 250,000 pesos would be sent annually to London to start paying the principal. 1,200,000 pounds for unpaid interest were forgiven.	74
1854	3% Loan 1851	12,288,781	<b>Agreement 1886:</b> Issue of a 3% loan in exchange for the 50% of the 3% loan of 1864, amounting 4,864,800 pounds, for the 15% of the interest in arrears of the 3% loan 1851 from July 1866 to July 1886, amounting 6,14,990 pounds and for the 20% of the existing Deferred bonds of 1837, unpaid certificates of the conversion of 1851 and certificates issued by Baring for the unpaid third part of the coupon matured on July 1st, 1866.	81
1914	3% Loan 1886 5% Loan 1889 5% Loan 1894 5% Loan 1899 5% Loan 1903-1907 4% Loan 1904 4.5% Loan 1908 4% Loan 1910 6% Loan 1913 4% to 6% Raylways bonds 1893-1914	103,711,615	<b>Agreement 1922:</b> Mexico acknowledges all the debts previous to the revolution. Unpaid interest from 1913 to 1923 will be paid at par over a period of 40 years starting in 1928 but without interest on those arrears. Interest from 1923 to 1927 will be paid part in cash and part with 20-year scripts carrying 3% interest since 1928. The debt service would be resumed in cash in a date no later than January 1928. The government commits to fix the rail stock and return the railways to private management in a prompt date. Debt service is guaranteed partially by taxes on oil exports and railways and the revenue of the railway system. <b>Agreement 1925:</b> Same modifications to the 1922 Agreement are introduced: railways return to private management in January 1926. In addition to the previous guarantees, a share of oil production tax would be included. The unpaid minimum amounts the government had to pay for 1924 and 1925 would be converted into a 3% 8-year bond beginning in January 1928.	27
<b>PERU</b>				
1826	6% Loan of 1822 6% Loan of 1825	1,816,000	<b>Agreement 1849:</b> Conversion of the two bonds for a new active bond 4%-6%. 25% of the interest was written off. Issue of a new passive bond to pay the balance of unpaid interest at 1%-3% from 1852.	
1876	5% Loan 1869 5% Consolidated Loan 1872	38,220,000	<b>Agreement 1889 (/Grace Contract):</b> Cancellation of all the foreign debts -principal and interest in exchange of guano, concession of the whole national railway system for 66 years, annuity for 30 years, concession of the steamboat in Lake Titicaca and land.	100 - Concessions
<b>URUGUAY</b>				
1875	6% Consolidated loan of 1871	3,110,960	<b>Agreement 1878.</b> Issue of a new bond of 371,520 pounds at 1.25% to pay for the unpaid coupons. Reduction on the interest rate to 2.5% for 5 years and principal on hold. In February 1883, full resumption of the debt service. New bonds for old bonds were exchanged at par.	14
1891	5% Unified loan of 1883 6% Sterling loan of 1888 6% Sterling loan of 1890 (Baring Loan)	16,724,300	<b>Agreement 1892:</b> Issue of a new bond to pay for interest in arrears for 625,572 pounds. Issue of a new bond of 3.5% to pay for the interest and the outstanding principal of three bonds including a conversion premium. Total issue of 19,300,000. Sinking Fund 1% although the government had the right to increase the amount devoted for redemption. Bonds exchange at premium.	20
1915	3.5% Consolidated debt loan 1892 5% Loan 1896 5% Loan 1905 5% Loan 1909	23,807,799	<b>Agreement 1915:</b> The sinking fund is suspended until one year after the close of the WWI. Interest rates are paid regularly. <b>Agreement 1921-22:</b> The suspended sinking fund was resumed as follows: On the loans of 1905 and 1909 in July 1921; on the consolidated loan of 1892 on August 1921; and on the loan of 1896 in January 1922. Interest rates are paid as scheduled originally.	0

Note: All these haircuts are obtained using a rate of discount equal to the nominal yield of the defaulted bond. By definition if coupons on the defaulted bond are paid as scheduled and only the sinking fund is suspended for an interval of time, the haircut calculated using this discount rate will be zero. In general, the effective yield at the time of the agreement is higher than the nominal rate. In this case, the haircut will be larger than zero.

**Table 5**  
**Identifying Solvency and Liquidity Crises**

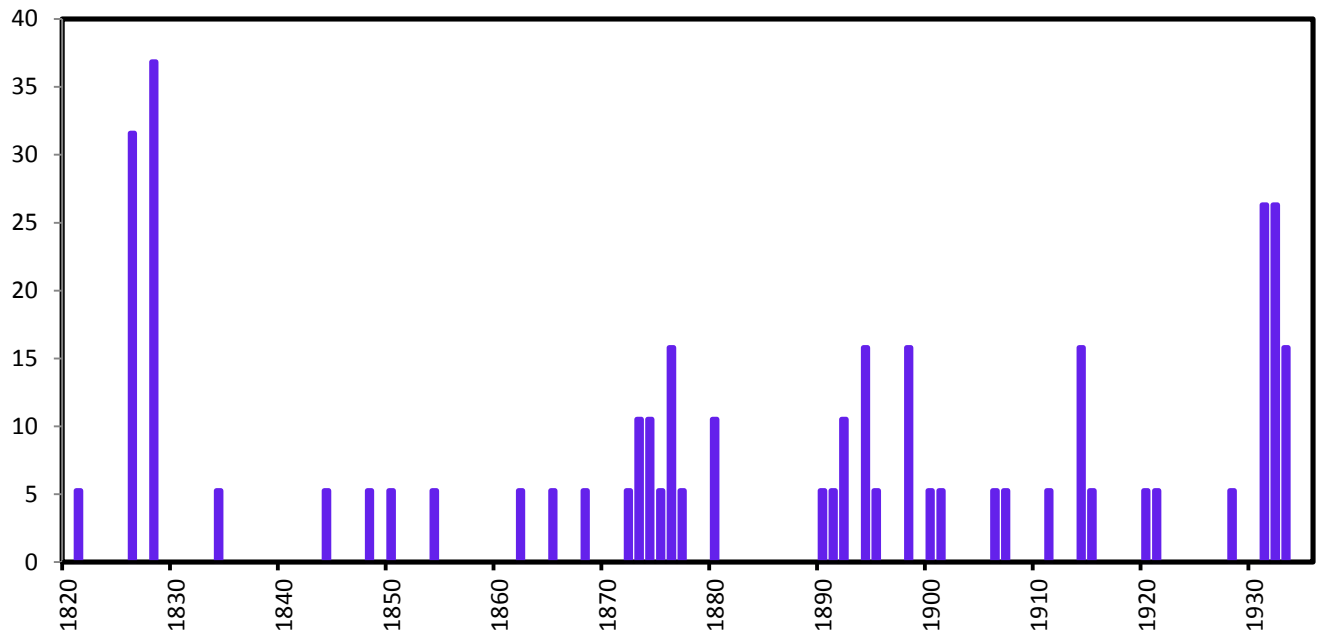
Country (1)	Year of default (2)	Sustainability Indicators				Liquidity Indicators	
		Debt-Exports Ratio (in Percent) (3)	Trade Balance- Export Ratio To Reduce the Debt Burden (in Percent) (4)	Savings Effort Ratio (in percent) (5)	Average Exports Growth (in Percent) (6)	International Liquidity Crunch (7)	Terms of Trade Changes (8)
Argentina	1828	196	12		4.6	-108	13
	1891	159	6		5.9	-74	-8
Brazil	1826	121	6		2.9	-108	-31
	1898	123	6		2.5	-7	-34
	1914	145	9		2.5	-32	-37
	1931				2.5	-19	-44
	1827	130	4		5.0	-108	-21
Chile	1879	88	...		3.0	14	5
	1931				3.5	-19	-11
	1826	1355	132		6.2	-108	4
Colombia	1849	1216	117		6.2	0	22
	1873	180	16		0.3	-17	21
	1879	57	...		0.3	14	13
	1900	120			0.3	-11	-12
	1932				8.2	-19	-40
	1828	321	32		1.8	-108	6
Mexico	1854	431	46		1.8	-8	13
	1914	468	47		3.1	-32	-9
	1928				3.1	1	-5
	1826	2010	157		11.2	-108	-31
Peru	1876	816	103		0.1	-21	13
	1931				5.3	-19	-13
	1876	100	2		3.9	-21	21
Uruguay	1891	315	27		3.9	-74	-10
	1915	183	11		4.6	-27	20
	1933					-19	-32

**Notes:** Column 4 shows the international debt to exports ratio in the year of the default. Column 5 shows the average trade balance to exports ratio needed to reduce the debt to exports ratio to 100 percent in ten years. Column 6 shows the 40-year average growth rate around the year of the default. Column (7) shows a measure of international liquidity crunch across Latin America. In particular, it shows the change in in the issuance to exports ratio for Latin America in the year of the default relative to the peak value in the previous three years. Column (8) shows the 4-year change in the terms of trade of each country. Exports in all cases are measured at their trend value obtained using the Hodrick-Prescott filter.

**Figure 1**

**Sovereign Defaults in Latin America**

(in Percent of Countries)

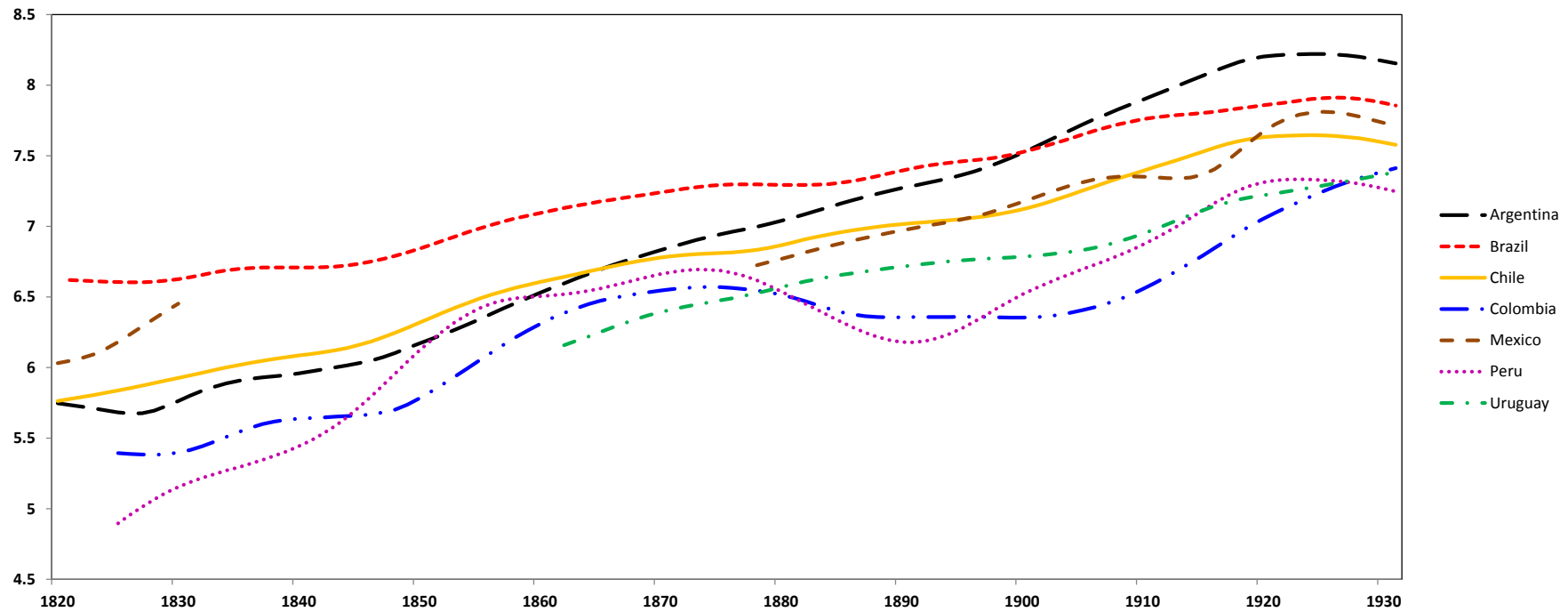


Note: The bars indicate how many countries defaulted in each year (in percent of all countries).



Figure 2

Exports Trends: 1820-1931  
(in logarithms)



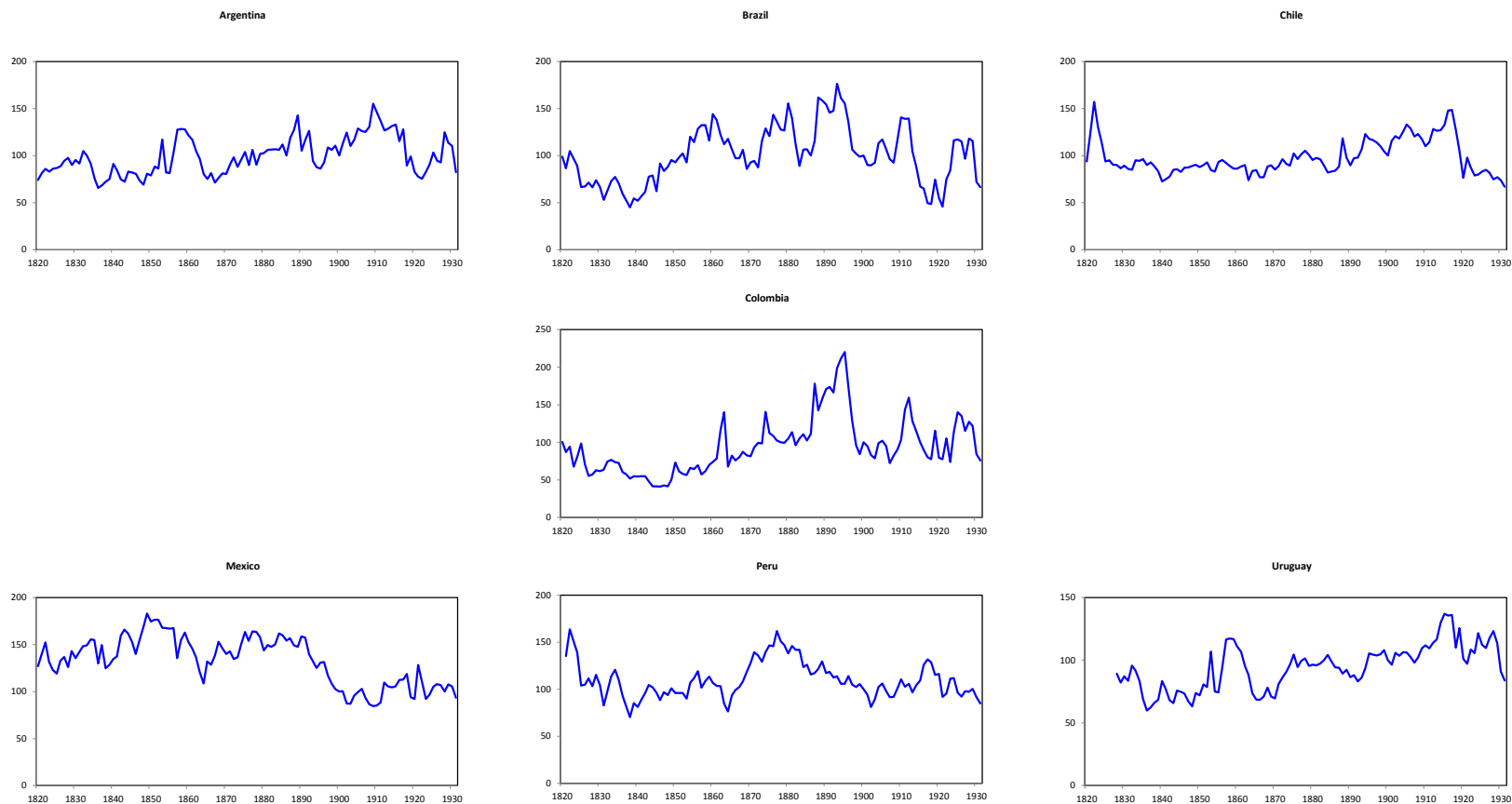
Long Term Annual Growth Rates \*

Episode	Argentina	Brazil	Chile	Colombia	Mexico	Peru	Uruguay
1820-1860	4.60	2.85	4.97	6.19	1.76	11.16	....
1860-1900	5.87	2.50	3.00	0.26	4.80	0.07	3.88
1900-1931	4.82	2.49	3.46	8.18	3.12	5.30	4.55

Notes: \* We are still revising the data for the 1820-1860 period. Also, we are still revising the data on exports for Mexico and Peru for the 1900-1931 period. Due to missing data, the growth rate of Mexico's Exports from 1820 to 1860 is estimated as the growth rate from 1828 to 1878 while the growth rate for the period 1860-1900, is estimated as the growth rate for the period 1878-1900.

Figure 3

Terms of Trade  
1900=100



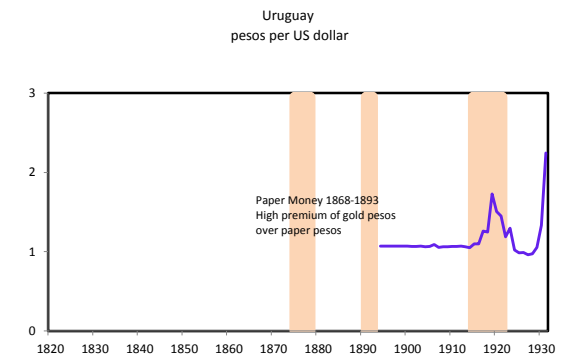
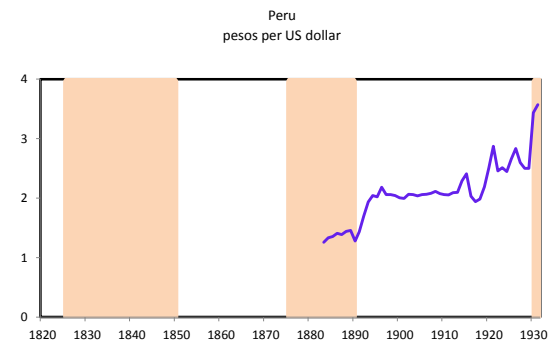
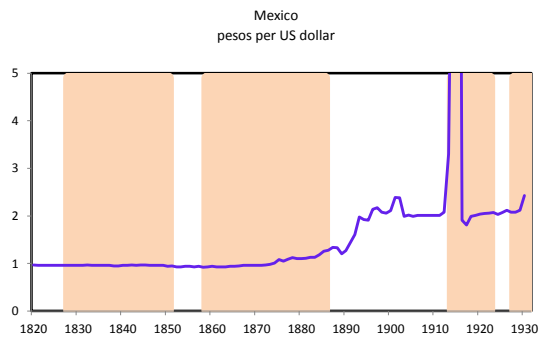
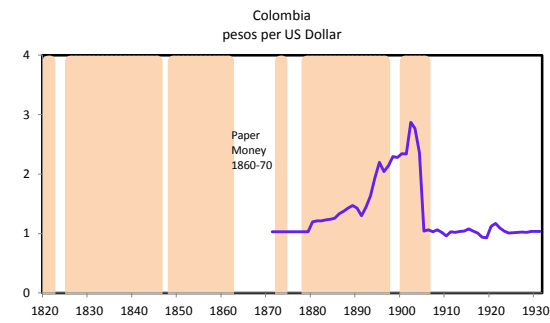
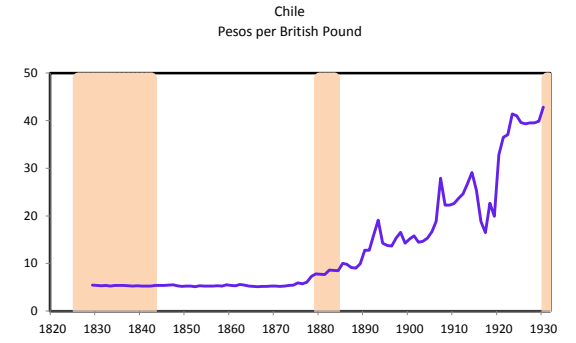
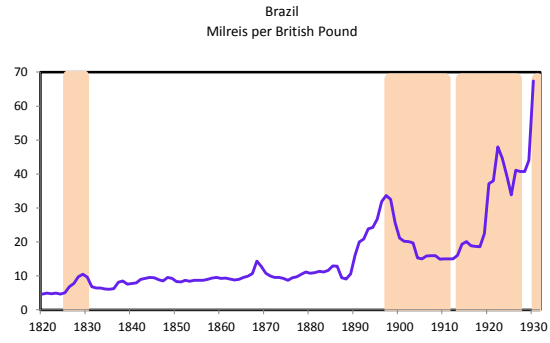
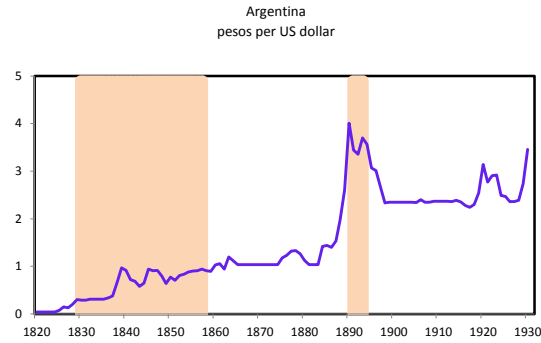
Standard Deviation of Terms of Trade

Episodes	Argentina	Brazil	Chile	Colombia	Mexico	Peru	Uruguay
1820-1931	20	30	18	37	25	19	18
1820-1860	16	25	15	15	17	18	16
1860-1900	15	24	12	40	17	20	12
1900-1931	21	27	24	23	10	12	13

Fluctuations in the Terms of Trade During Crises in the Financial Center

Episodes	Argentina	Brazil	Chile	Colombia	Mexico	Peru	Uruguay	All
1822-1825	1	-37	-40	5	-22	-37	...	-22
1870-1873	10	24	7	21	-2	1	30	13
1887-1890	-12	34	1	-4	1	0	-8	2
1911-1914	-4	-37	11	-20	18	2	19	-2
1928-1931	-34	-44	-11	-40	-7	-13	-32	-26

**Figure 4**  
Exchange Rates and Sovereign Defaults



Notes: Shaded areas represent episodes of sovereign default.