NBER WORKING PAPER SERIES

BANKING CRISES: AN EQUAL OPPORTUNITY MENACE

Carmen M. Reinhart
Kenneth S. Rogoff

Working Paper 14587
http://www.nber.org/papers/w14587

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
December 2008

The authors are grateful to Vincent Reinhart, Keyu Jin, Tarek Hassan, Vania Stavrakeva for useful comments and suggestions on an earlier draft, and to Cesar Sosa, Chenzi Xu and Jan Zilinsky for excellent research assistance. The views expressed herein are those of the author(s) and do not necessarily reflect the views of the National Bureau of Economic Research.

Banking Crises: An Equal Opportunity Menace
Carmen M. Reinhart and Kenneth S. Rogoff
NBER Working Paper No. 14587
December 2008
JEL No. E6,F3,N0

ABSTRACT

The historical frequency of banking crises is quite similar in high- and middle-to-low-income countries, with quantitative and qualitative parallels in both the run-ups and the aftermath. We establish these regularities using a unique dataset spanning from Denmark's financial panic during the Napoleonic War to the ongoing global financial crisis sparked by subprime mortgage defaults in the United States.

Banking crises dramatically weaken fiscal positions in both groups, with government revenues invariably contracting, and fiscal expenditures often expanding sharply. Three years after a financial crisis central government debt increases, on average, by about 86 percent. Thus the fiscal burden of banking crisis extends far beyond the commonly cited cost of the bailouts. Our new dataset includes housing price data for emerging markets; these allow us to show that the real estate price cycles around banking crises are similar in duration and amplitude to those in advanced economies, with the busts averaging four to six years. Corroborating earlier work, we find that systemic banking crises are typically preceded by asset price bubbles, large capital inflows and credit booms, in rich and poor countries alike.

Carmen M. Reinhart
University of Maryland
School of Public Policy
and Department of Economics
4105 Van Munching Hall
College Park, MD 20742
and NBER
creinhar@umd.edu

Kenneth S. Rogoff
Thomas D Cabot Professor of Public Policy
Economics Department
Harvard University
Littauer Center 232
Cambridge, MA 02138-3001
and NBER
krogoff@harvard.edu

I. Introduction

Until very recently, the study of banking crises has typically focused either on earlier historical experiences in advanced countries, mainly the banking panics before World War II, or else has focused on modern-day emerging market experiences.[1] This dichotomy is perhaps shaped by the belief that for advanced economies, destabilizing, systemic, multi-country financial crises were a relic of the past.[2] Of course, the recent global financial crisis emanating out of the United States and Europe has dashed this misconception, albeit at great social cost.

As this paper will demonstrate, banking crises have long been an equal opportunity menace. We develop this finding using a core sample of sixty-six countries (plus a broader extended sample for some exercises).[3] We examine banking crises ranging from Denmark's financial panic during the Napoleonic War to the current "first global financial crisis of the 21st century." The incidence of banking crises proves to be remarkably similar in the high- and middle-to-low-income countries. Indeed, the tally of crises is particularly high for the world's financial centers: the United Kingdom, the United States, and France. Perhaps more surprising still are the qualitative and quantitative parallels across disparate income groups. These parallels arise despite the relatively pristine modern sovereign default records of the rich countries.

Three features of our expansive dataset are of particular note. First, our data on global banking crises go back to 1800, extending the careful study of Bordo, et al. (2001) that covers

[1] See Calomiris and Gorton (1991) and Gorton (1988) on pre–WWII banking panics; Sundararajan and Baliño (1991) for several emerging market case studies; Jácome (2008) on banking crises in Latin America.
[2] Studies that encompass episodes in both advanced and emerging economies include Bordo et al. (2001), Demirgüç-Kunt and Detragiache (1998) and Kaminsky and Reinhart (1999).

[3] The core sample spans 66 advanced and emerging market economies in Africa, Asia, Europe, Latin and North America and Oceania; see Appendix Table A1. The extended sample includes all countries, see Table A3.

back to 1880. Second, to our knowledge, we are the first to examine the patterns of housing prices around major banking crises in emerging markets, including Asia, Europe and Latin America. Our emerging market data set facilitates comparisons, across both duration and magnitude, with the better-documented housing price cycles in the advanced economies, which have long been known to play a central role in financial crises.[4] We find that real estate price cycles around banking crises are similar in duration and amplitude across the two groups of countries. This result is surprising given that almost all other macroeconomic and financial time series (income, consumption, government spending, interest rates, etc.) exhibit higher volatility in emerging markets.[5]

Third, our analysis employs the comprehensive historical data on central government tax revenues and debt compiled in Reinhart and Rogoff (2008a,c). These new data afford a new perspective on the tax and debt consequences of the banking crises (Previously, the kind of historical data on debt necessary to analyze the aftermath of banking crises across countries was virtually non-existent for years prior to 1990.[6])

We find that banking crises almost invariably lead to sharp declines in tax revenues as well significant increases in government spending (a share of which is presumably dissipative). On average, government debt rises by 86 percent during the three years following a banking crisis. These indirect fiscal consequences are thus an order of magnitude larger than the usual bank bailout costs that are the centerpiece of most previous studies. That fact that the magnitudes are comparable in advanced and emerging market economies is also quite remarkable. Obviously, both the bailout costs and the fiscal costs depend on a host of political

[4] See Reinhart and Rogoff (2008b) for an analysis of all post–WWII banking crises in advanced economies.
[5] See, for instance, Agénor, McDermott, and Prasad (2000).
[6] Bordo and Meissner (2006) offer domestic debt data for selected years across 30 countries for 1880–1913, while Jeanne and Guscina (2006) provide domestic debt for 19 countries for 1980–2005. The Reinhart and Rogoff (2008c) time series for sixty-six countries spans 1913–2007, and much earlier for a large subset of these countries.

and economic factors, including especially the policy response as well as the severity of the real shock which, typically, triggers the crisis.[7]

The paper proceeds as follows. Section II provides an overview of the history of banking crises, with particular emphasis on the post-1900 experience. We also document the incidence and frequency of banking crises by country and by region. We discuss the links between banking crises, financial liberalization, the degree of capital mobility, and sovereign debt crises and discuss international financial contagion.

Section III examines some of the common features in the run-up to banking crises across countries and regions over time. The focus is on the systematic links between cycles in international capital flows, credit, and asset prices—specifically, home and equity prices. The next section examines some of the common features of the aftermath of banking crises. We document the toll that the crisis takes on output and government revenues, as well as the typically profound effect on the evolution of government debt during the years following the crisis. The concluding section takes up the question of "graduation." Specifically, to what extent do countries ever "graduate" from (stop experiencing) serial major financial crises as they seem to graduate from serial sovereign debt crises?[8]

[7] Reinhart and Rogoff 2008a,c show that output growth typically decelerates in advance of a crisis.
[8] An example of graduate from serial default is France, which defaulted 8 times on its external debt between 1500 and 1800, but has not defaulted since.

II. Banking Crises in Historical Perspective

We begin this section by providing an overview of the evolution of banking crises through history. To do so, it is necessary to first identify and date banking crisis episodes. Our approach, which follows the standard methodology in the literature (e.g., Kaminsky and Reinhart, 1999, Bordo, et al., 2001, and Caprio and Klingebiel, 2005, among others), is documented in detail in the appendix, along with our principal bibliographical sources. [9]

One dimension that distinguishes this study from previous efforts is that our dating of crises extends far before the much-studied modern post–World War II era. Specifically, we start in 1800. Our work was greatly simplified back to 1880 by the careful study of Bordo, et al. (2001), but for the earlier period we had to resort to old and often obscure works. The earliest advanced-economy banking crisis in our sample is France 1802; early crises in emerging markets befell India, 1863, China (several episodes during the 1860s–1870s), and Peru in 1873. [10]

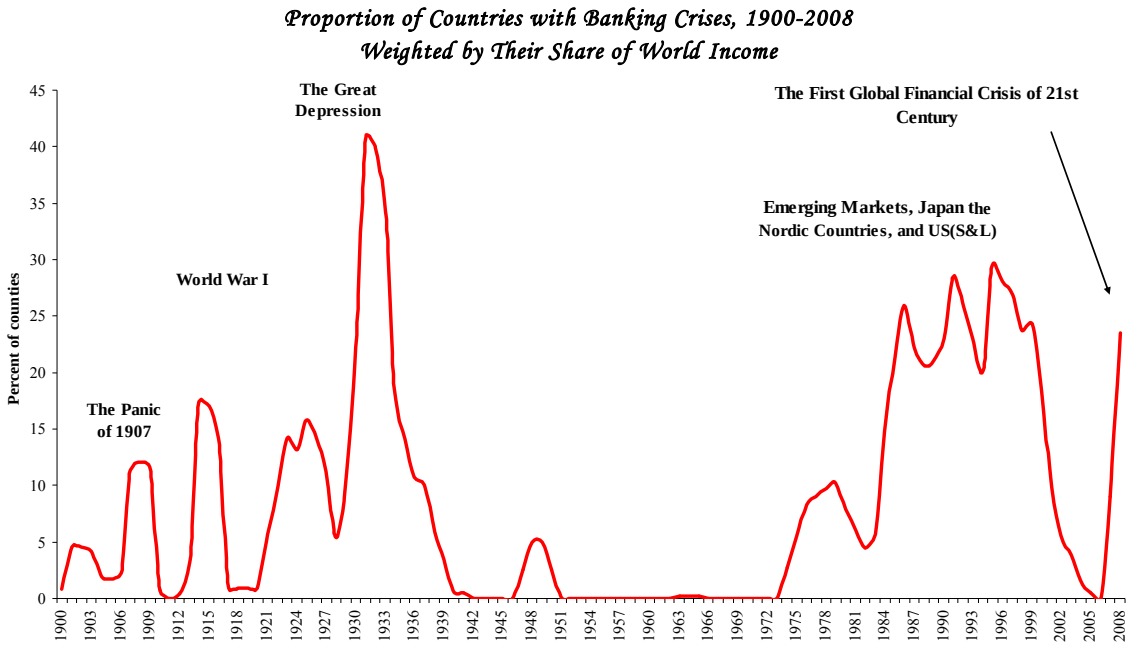
It may come as a surprise to the reader that previous attempts to document banking crises for the pre–World War II period are so limited. The problem is that because domestic banking crises do not typically impinge on large powerful creditors in the international financial centers, they do not leave the same imprint on the global press as, say, sovereign external defaults. For this reason, we acknowledge that despite our best efforts, our chronology may be missing a number of banking crises in emerging markets prior to World War II. [11] Fortunately, banking crisis episodes in the developed world tend to be better documented even throughout the 19th century.

[9] See also Reinhart and Rogoff (2008a).
[10] The work of Andrea McElderry (1976) and Cheng (2003) was invaluable in developing the timeline for China. The Peruvian case comes from a little-known 1957 book published in Lima by Carlos Camprubí Alcázar.
[11] The challenges encountered in dating banking crises are along similar lines as those faced when trying to construct a chronology of sovereign default on domestic debt, see Reinhart and Rogoff (2008c).

The Big Picture: Banking and Sovereign Debt Crises

Figure 1 plots the incidence of banking crises among the countries in our sample (which account for about 90 percent of world GDP). Specifically, the figure shows the percentage of all independent countries during 1900–2008 having a banking crisis in any given year. The tally weighs countries by their share of global GDP. This weighted aggregate is meant to provide a measure of the "global" impact of individual banking crises. As such, a crisis in the United States or Germany is accorded a much higher weight than a crisis in Angola or Honduras, all of which are part of our 66-country sample.

Figure 1



Sources: Bordo et al. (2001), Caprio et al. (2005), Kaminsky and Reinhart (1999), Jácome (2008), Maddison (2003), and additional sources listed in Appendix II, which provides banking crises dates.
Notes: Sample size includes all 66 countries listed in TableA1 that were independent states in the given year. Three sets of GDP weights are used, 1913 weights for the period 1800–1913, 1990 for the period 1914–1990, and finally 2003 weights for the period 1991–2006. The entries for 2007–2008 list crises in Austria, Belgium, Germany, Hungary, Japan, the Netherlands, Spain, the United Kingdom, and the United States. The figure shows a three-year moving average.

It is no surprise that the worldwide Great Depression of the 1930s posts the highest readings of banking crises during this 109-year stretch. Earlier, less widespread, "waves" of global financial stress are evident during and around the Panic of 1907 that originated in New York, as well as the crises accompanying the outbreak of the First World War. Another striking feature of Figure 1 is the relative calm during the late 1940s to the early 1970s. This calm may be partly explained by booming world growth, but perhaps more so by the repression of the domestic financial markets (in varying degrees) and the heavy-handed use of capital controls that followed for many years after World War II. (We are not necessarily implying that such repression and controls are the right approach to dealing with the risk of financial crises.)

Since the early 1970s, financial and international capital account liberalization took root worldwide. So, too, have banking crises. After a long hiatus, the share of countries having banking difficulties first began to expand in the 1970s. The break-up of the Bretton Woods system of fixed exchange rates together with the sharp spike in oil prices catalyzed a prolonged global recession, resulting in financial sector difficulties in a number of advanced economies. In the early 1980s, a collapse in global commodity prices combined with high and volatile interest rates in the United States contributed to a spate of banking and sovereign debt crises in emerging economies, most famously in Latin America and then Africa.

The United States had its savings and loan crisis beginning in 1984. During the late 1980s and early 1990s, the Nordic countries experienced some of the worst banking crises the wealthy economies had known in post–WWII following a surge in capital inflows and real estate prices. In 1992, Japan's asset price bubble burst and ushered in a decade-long banking crisis. Around the same time, with the collapse of the Soviet bloc, several formerly communist countries in Eastern Europe soon joined the ranks of nations facing banking sector problems. As the second half of the 1990s approached, emerging markets quickly faced a fresh round of banking crisis. Problems in Mexico and Argentina (1994–1995) were followed by the famous Asian crisis of 1997–1998, and then the troubles of Russia and Colombia, among others.[12] Argentina in 2001 and Uruguay in 2002 closed that upswing in the banking crisis cycle.

A brief tranquil period came to an abrupt halt in the summer of 2007 when the subprime crisis in the United States began in earnest, soon morphing into a global financial crisis.[13]

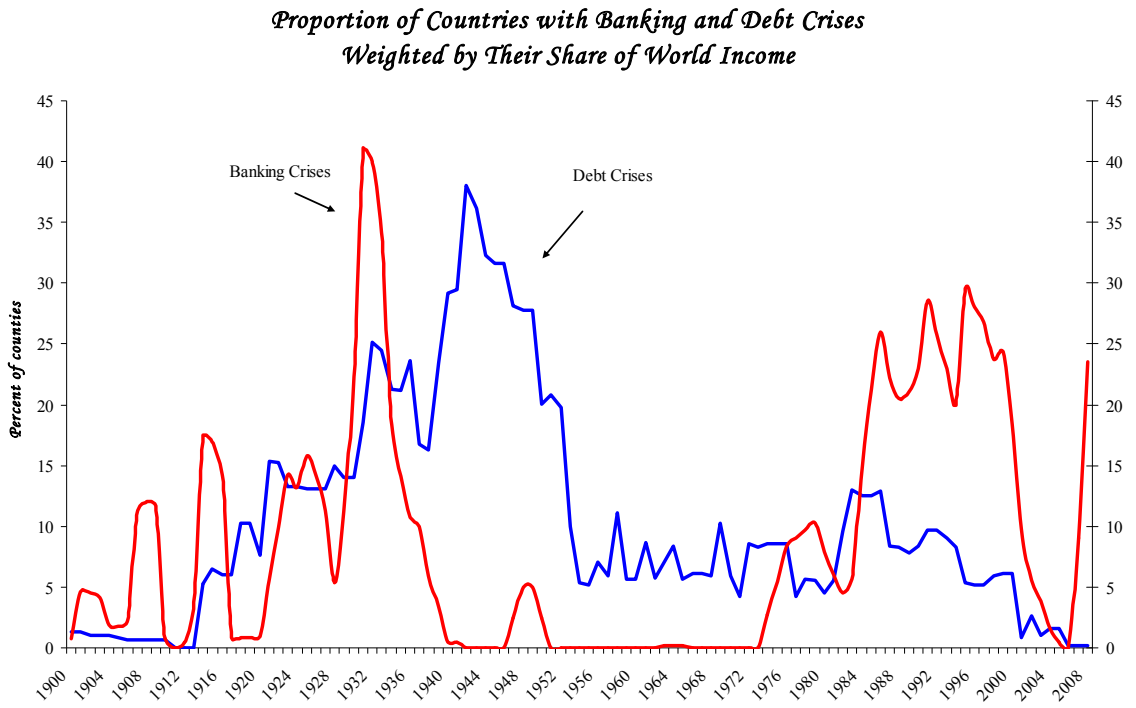
[12] While China's heavy-handed capital controls shielded it from contagious currency crashes during Asia's turmoil, it did not protect it from a systemic and costly banking crisis emanating primarily from large-scale lending to inefficient and bankrupt state-owned enterprises.

[13] Figure 1 does not fully capture the extent of the present upsurge in financial crises, as Ireland and Iceland (both having banking crises at the time of this writing) are not part of our core 66-country sample.

A high incidence of global banking crises has historically been associated with a high incidence of sovereign defaults of external debt. Figure 2 plots the (GDP-weighted) share of countries experiencing a banking crisis, as shown in Figure 1 and described above, against the comparably calculated share of countries experiencing a default or restructuring in their external debt. Sovereign defaults begin to climb with the onset of WWI (as do banking crises) and continue to escalate during the Great Depression and World War II. The decades that follow are relatively quiet, until debt crises sweep emerging markets beginning in the 1980s.[14] It remains to be seen whether the recent global surge in financial sector turbulence will lead to a similar outcome in the sovereign default cycle. Figure 2 suggests that a sharp rise in sovereign defaults would hardly be surprising.

[14] Note that in Figure 2 the debt crises of the 1980s do not loom as large as the previous cycle of defaults, as only middle- and low-income countries faced default, while in addition to emerging market economies several advanced economies defaulted during the Great Depression and several more defaulted during WWII.

Figure 2



Sources: Bordo et al. (2001), Caprio et al. (2005), Jácome (2008), Kaminsky and Reinhart (1999), Lindert and Morton (1989), Macdonald (2003), Maddison (2003), Purcell and Kaufman (1993), Reinhart, Rogoff, and Savastano (2003), Suter (1992), and Standard and Poor's (various years).
Notes: Sample size includes all countries, out of a total of sixty-six listed in Table 1 that were independent states in the given year. Three sets of GDP weights are used, 1913 weights for the period 1800–1913, 1990 for the period 1914–1990, and finally 2003 weights for the period 1991–2006. The entries for 2007–2008 list crises in Austria, Belgium, Germany, Hungary, Japan, the Netherlands, Spain, the United Kingdom, and the United States. The figure shows a three-year moving average.

Banking Crises: An Equal Opportunity Menace

In earlier papers, we have shown that the frequency of a default (or restructuring) on external debt is significantly lower for advanced economies than for emerging markets. For many high-income countries, that frequency has effectively been zero since 1800.[15] Even countries with a long history of multiple defaults prior to 1800, countries such as France and Spain, present evidence of having "graduated" from serial default on external debt.

The second column in Tables 1 and 2 highlights the vast differences between emerging markets (notably in Africa and in Latin America—but even in several countries in Asia) and high-income Western Europe, North America and Oceania. The third column of Tables 1 and 2 present the analogous calculation for each country for banking crises (i.e., number of years in banking crises, according to the extended dataset developed here, divided by the number of years since independence or since 1800—if independence was earlier). One striking observation from Tables 1 and 2 is that the average length of time spent in a state of sovereign default is far above the average amount of time spent in a financial crisis. A country can circumvent its external creditors for an extended period. It is far more costly to leave a domestic banking crisis hanging, due to the crippling effects on trade and investment.

[15] We do recognize, however, that the wide-spread abrogation of gold clauses—on domestic debt—during the 1930s' Great Depression by the United States and other developed economies were de facto sovereign defaults

Table 1. Debt and Banking Crises: Africa and Asia,
Year of Independence–2008

Country	*Share of years in default or rescheduling since independence or 1800*	*Share of years in a banking crisis since independence or 1800*
Africa		
Algeria	13.3	6.4
Angola	59.4	17.6
Central African Republic	53.2	38.8
Cote D'Ivoire	48.9	8.2
Egypt	3.4	5.6
Kenya	13.6	19.6
Mauritius	0.0	2.4
Morocco	15.7	3.8
Nigeria	21.3	10.2
South Africa	5.2	6.3
Tunisia	9.6	9.6
Zambia	27.9	2.2
Zimbabwe	40.5	27.3
Asia		
China	13.0	9.1
India	11.7	8.6
Indonesia	15.5	13.3
Japan	5.3	8.1
Korea	0.0	17.2
Malaysia	0.0	17.3
Myanmar	8.5	13.1
Philippines	16.4	19.0
Singapore	0.0	2.3
Sri Lanka	6.8	8.2
Taiwan	0.0	11.7
Thailand	0.0	6.7

[1] For countries that became independent prior to 1800 the calculations are for 1800–2006.
Sources: Authors' calculations, Bordo et al. (2001), Caprio et al. (2005), Kaminsky and Reinhart (1999), Jácome (2008), Standard and Poor's, Purcell and Kaufman (1993), Reinhart, Rogoff and Savastano (2003) and sources cited therein. See also Appendix II.

Table 2. Debt and Banking Crises: Europe, Latin America, North America, and Oceania, Year of Independence–2008

Country	*Share of years in default or rescheduling since independence or 1800*	*Share of years in a banking crisis since independence or 1800*
Europe		
Austria	17.4	1.9
Belgium	0.0	7.3
Denmark	0.0	7.2
Finland	0.0	8.7
France	0.0	11.5
Germany	13.0	6.2
Greece	50.6	4.4
Hungary	37.1	6.6
Italy	3.4	8.7
Netherlands	6.3	1.9
Norway	0.0	15.7
Poland	32.6	5.6
Portugal	10.6	2.4
Romania	23.3	7.8
Russia	39.1	1.0
Spain	23.7	8.1
Sweden	0.0	4.8
Turkey	15.5	2.4
United Kingdom	0.0	9.2
Latin America		
Argentina	32.5	8.8
Bolivia	22.0	4.3
Brazil	25.4	9.1
Chile	27.5	5.3
Colombia	36.2	3.7
Costa Rica	38.2	2.7
Dominican Republic	29.0	1.2
Ecuador	58.2	5.6
El Salvador	26.3	1.1
Guatemala	34.4	1.6
Honduras	64.0	1.1
Mexico	44.6	9.7
Nicaragua	45.2	5.4
Panama	27.9	1.9
Paraguay	23.0	3.1
Peru	40.3	4.3
Uruguay	12.8	3.1
Venezuela	38.4	6.2
North America		
Canada	0.0	8.5
United States	0.0	13.0
Oceania		
Australia	0.0	5.7
New Zealand	0.0	4.0

Sources: Authors' calculations, Bordo et al. (2001), Caprio et al. (2005), Kaminsky and Reinhart (1999), Jácome (2008), Standard and Poor's, Purcell and Kaufman (1993), Reinhart, Rogoff and Savastano (2003) and sources cited therein. See also Appendix II.

Tables 3 and 4 present a different perspective on the prevalence of banking crises. The second column tallies the number of banking crises (rather than the number of years in crisis) since independence or 1800; while the third narrows the window to the post–WWII period. Several features are worth noting. ***For the advanced economies during the full sample, the picture that emerges is one of serial banking crises.*** The world's financial centers, the United Kingdom, the United States and France stand out in this regard, with 12, 13, and 15 banking crisis episodes, respectively. The frequency of banking crises drops off markedly for the advanced economies and the larger emerging markets alike during post–WWII. However, all except Portugal experienced at least one post-War crisis prior to the current episode. When the present wave of crises is fully factored in, the apparent drop will likely be even less pronounced. Thus, ***while many now-advanced economies have graduated from a history of serial default on sovereign debt, or very high inflation (above 20 percent), graduation from banking crises has proven, so far, virtually impossible.*** Indeed, Tables 1–4 illustrate that despite dramatic differences in recent sovereign default performance, the incidence of banking crises is about the same for advanced economies as for emerging markets. It also should be noted that as financial markets have developed in the smaller, poorer economies, the frequency of banking crises has increased.[16]

[16] As we have already acknowledged, our accounting of financial crises in poorer countries may be incomplete, especially for earlier periods, despite our best efforts.

Table 3. Frequency of Banking Crises: Africa and Asia through 2008

Country	*Number of banking crises since independence or 1800*	*Number of banking crises since independence or 1945*
Africa		
Algeria	1	1
Angola	1	1
Central African Republic	2	2
Cote D'Ivoire	1	1
Egypt	3	2
Kenya	2	2
Mauritius	1	1
Morocco	1	1
Nigeria	1	1
South Africa [1]	6	2
Tunisia	1	1
Zambia	1	1
Zimbabwe	1	1
Asia		
China	10	1
India [1]	6	1
Indonesia	3	3
Japan	8	2
Korea	3	3
Malaysia	2	2
Myanmar	1	1
Philippines	2	2
Singapore	1	1
Sri Lanka	1	1
Taiwan [1]	5	3
Thailand	2	2

[1] For South Africa the calculations are for 1850–2008; for India these are for 1800–2008.
Sources: Authors' calculations, Bordo et al. (2001), Caprio et al. (2005), Kaminsky and Reinhart (1999), and Jácome (2008). See also Appendix II.

Table 4. Frequency of Banking Crises: Europe, Latin America, North America, and Oceania, Through 2008

Country	*Number of banking crises since independence or 1800*	*Number of banking crises since independence or 1945*
Europe		
Austria	3	1
Belgium	10	1
Denmark	10	1
Finland	5	1
France	15	1
Germany	8	2
Greece	2	1
Hungary	2	2
Italy	11	1
Netherlands	4	1
Norway	6	1
Poland	1	1
Portugal	5	0
Romania	1	1
Russia	2	2
Spain	8	2
Sweden	5	1
Turkey	2	2
United Kingdom	12	4
Latin America		
Argentina	9	4
Bolivia	3	3
Brazil	11	3
Chile	7	2
Colombia	2	2
Costa Rica	2	2
Dominican Republic	2	2
Ecuador	2	2
El Salvador	2	2
Guatemala	3	2
Honduras	1	1
Mexico	7	2
Nicaragua	1	1
Panama	1	1
Paraguay	2	1
Peru	3	1
Uruguay	5	2
Venezuela	2	2
North America		
Canada	8	1
United States	13	2
Oceania		
Australia	3	2
New Zealand	1	1

[1] For countries that became independent prior to 1800 the calculations are for 1800–2006.

Sources: Authors' calculations, Bordo et al. (2001), Caprio et al. (2005), Kaminsky and Reinhart (1999), and Jácome (2008). See also Appendix II.

Summary Tables by Region of Frequency of Banking Crises, 1800-2007, and 1945-2007

Tables 5a and 5b summarize, by region, the evidence on the number of banking crises and share of years in banking crisis. Table 5a starts in 1800. (The table only includes post independence crises, which explains why emerging markets have lower cumulative totals since 1800.) Table 5b gives the evidence for post-1945.

Table 5a: Summary on the Incidence and Frequency of Banking Crises: 1800 (or independence)–2008

Region/Group	*Share of years in a banking crisis since independence or 1800*	*Number of banking crises*
Africa	12.5	1.7
Asia	11.2	3.6
Europe	6.3	5.9
Latin America	4.4	3.6
Of which: Argentina, Brazil, and Mexico	9.2	9.0
North America	11.2	10.5
Oceania	4.8	2.0
Advanced	7.2	7.2
Emerging	8.3	2.8

Table 5b: Summary on the Incidence and Frequency of Banking Crises: 1945 (or independence)–2008

Region/Group	*Share of years in a banking crisis since independence or 1800*	*Number of banking crises*
Africa	12.3	1.3
Asia	12.4	1.8
Europe	7.1	1.4
Latin America	9.7	2.0
Of which: Argentina, Brazil, and Mexico	13.5	3.0
North America	8.6	1.5
Oceania	7.0	1.5
Advanced	7.0	1.4
Emerging	10.8	1.7

Notes: Advanced economies are comprised of North America, Oceania, Japan and all European countries not listed below as part of emerging Europe. Emerging economies consist of Africa, all Asian countries except Japan, Latin America, and emerging Europe (Hungary, Poland, Romania, Russia, and Turkey).
Sources: based on Tables 1–4.

Whether the calculations are done from 1800 (Table 5a) or from 1945 (Table 5b), on average there are no significant differences in either the incidence or number of banking crises between advanced and emerging economies—banking crises are an equal opportunity menace. In fact, prior to WWII the advanced economies with their more developed financial systems were more prone to banking crises than many of the smaller low income counterparts. [17]

The Bunching of Banking Crises: Contagion or Common Fundamentals?

In this section, we discuss the bunching of banking crises across countries that is so evident in the late-2000s case, where both common shocks (the bursting of the global housing bubble) and cross-country linkages (for example, because many countries bought U.S. subprime mortgage debt) are evident.

Bordo and Murshid (2001) and Neal and Weidenmier (2003) have pointed out that cross-country correlations in banking crises were also common during 1880–1913, a period of relatively high international capital mobility under the gold standard. [18] Table 6 looks at a broader time span including the twentieth century; the table lists the years during which banking crises are bunched; greater detail on individual country dates is provided in Appendix A3.[19] The famous Baring crisis of 1890 (which involved Argentina and the U.K. before spreading elsewhere) appears to be the first episode of international bunching of banking crises; this was followed by the panic of 1907, which began in the United States and quickly spread to other

[17] On average, 7.2 crises for the advanced versus 2.8 for the emerging market countries (Table 5a).
[18] Bordo and Murshid (2001) look at the period 1880–1913. Neal and Weidenmier (2003) emphasize that periods of apparent contagion can be more readily interpreted as responses to common shocks, an issue we return to in the context of the present crisis. But, perhaps, the bottom line as regards a historical perspective on financial contagion is best summarized by Bordo and Murshid (2001), who conclude that "there is little evidence to suggest that cross-country linkages are tighter in the aftermath of a financial crisis for the recent period" (as opposed to 1880–1913, the earlier heyday of globalization in financial markets that they study).
[19] Table 6 does not include the bunching of other "types" of crises, such as the wave of sovereign defaults during 1825 or the currency crashes/debasements of the Napoleonic Wars.

advanced economies (particularly, Denmark, France, Italy, Japan, and Sweden). These episodes are reasonable benchmarks for modern-day financial contagion. [20]

Of course, other pre–World War II episodes of banking crisis contagion pale when confronted with the Great Depression (which also saw a large bunching in sovereign debt defaults, as seen earlier in Figure 2).

[20] See, Neal and Weidenmeir (2003) and Reinhart and Rogoff (2008a).

Table 6. Global Banking Crises, 1890–2008:
Contagion or Common Fundamentals?

Years of bunching in banking crises	Affected countries	Comments
1890–1891	Argentina, Brazil, Chile, Portugal, UK, and US	Argentina defaults and there are runs on all Argentine banks (see della Paolera and Taylor (2001); Baring Brothers faces failure.
1907–1908	Chile, Denmark, France, Italy, Japan, Mexico, Sweden, US	A fall in copper prices undermines the solvency of a trust company (quasi bank) in NewYork.
1914	Argentina, Belgium, Brazil, France, India, Italy, Japan, Netherlands, Norway, UK, and US	The outbreak of WWI
1929–1931	Advanced: Belgium, Finland, France, Germany, Greece, Italy, Portugal, Spain, Sweden, US Emerging markets: Argentina, Brazil, China, India, Mexico	Real commodity prices collapse by about 51 percent during 1928–1931. Real interest rates reach almost 13 percent in the US.
1981–1982	Emerging markets: Argentina, Chile, Colombia, Congo, Ecuador, Egypt, Ghana, Mexico, the Philippines, Turkey, and Uruguay	Between 1979 and 1982, real commodity prices fall about 40 percent. US real interest rates hit about 6 percent—their highest readings since 1933. The beginning of the decade-long debt crisis in emerging markets.
1987–1988	Many small, mostly low-income countries, Sub-Saharan Africa-particularly hard hit.	The tail-end of a nearly decade-long debt crisis.
1991–1992	Advanced: Czech Republic, Finland, Greece, Japan, Sweden Others: Algeria, Brazil, Egypt, Georgia, Hungary, Poland, Romania, Slovak Republic	Real estate and equity price bubbles in the Nordic countries and Japan burst; many transition economies cope with liberalization and stabilization.
1994–1995	Argentina, Bolivia, Brazil, Ecuador, Mexico, and Paraguay Others: Azerbaijan, Croatia, Cameroon, Lithuania, Swaziland	The Mexican “tequila” crisis deals the first blow to the surge in capital inflows to emerging markets since the early 1990s.
1997–1998	Asia: Hong Kong, Indonesia, Malaysia, Philippines, Taiwan, Thailand, and Vietnam Others: Colombia, Ecuador, El Salvador, Mauritius, Russia, Ukraine	The second and last blow to capital flows to merging markets
2007--present	Germany, Hungary, Iceland, Ireland, Japan, Spain, UK, US and others	The US subprime real estate bubble—and other real estate bubbles in advance economies

The Late 2000s Global Financial Crisis

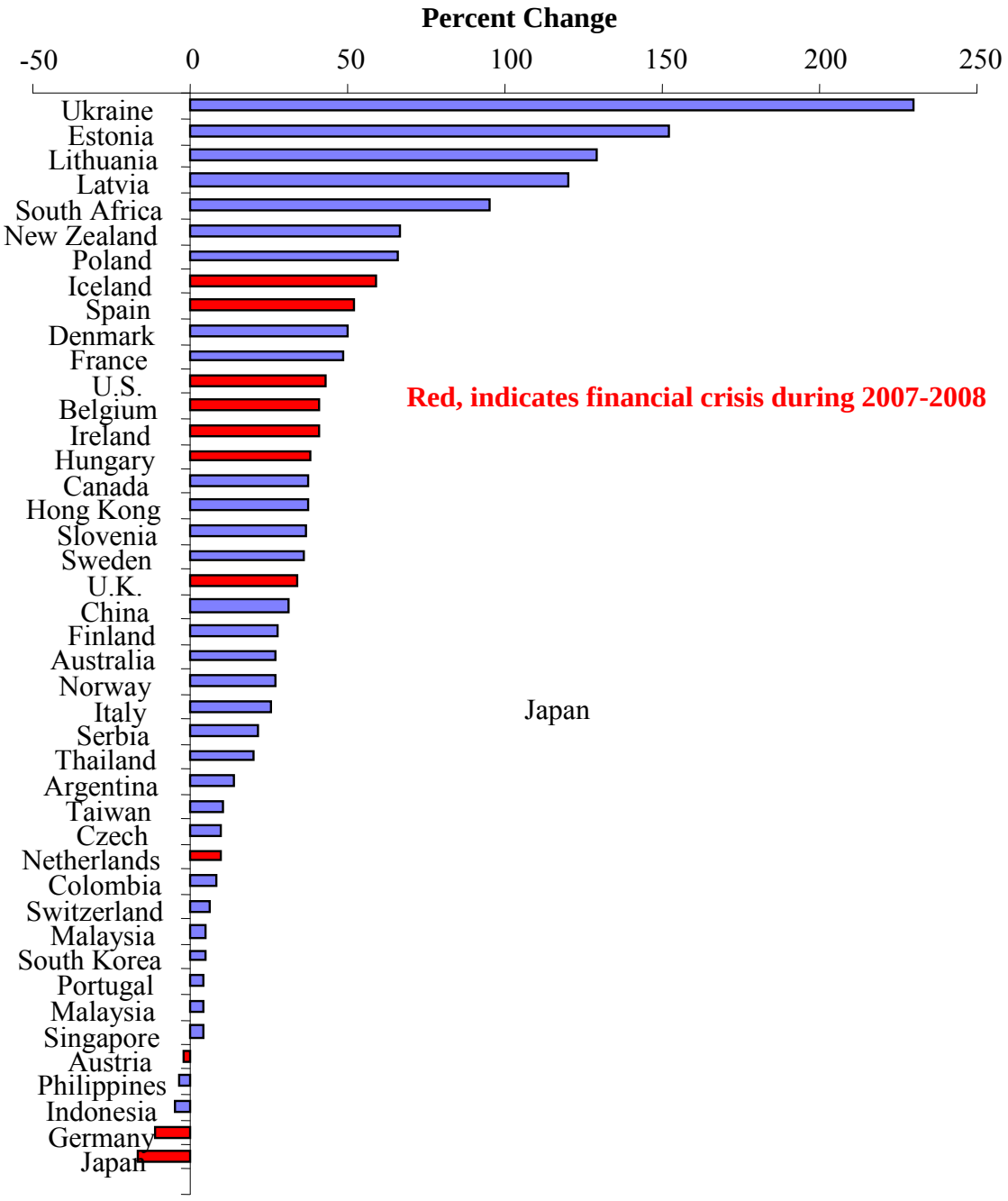
The current conjuncture is illustrative of the two channels of contagion, linkages and common shocks. There is little doubt that the U.S. crisis has spilled over into other markets through direct linkages. For example, German and Japanese financial institutions (and others ranging as far as Kazakhstan) sought more attractive returns in the U.S. subprime market, perhaps owing to the fact that profit opportunities in domestic real estate were limited at best and dismal at worst (Figure 3). Indeed, after the fact, it has become evident that many financial institutions outside the United States had nontrivial exposure to the U.S. subprime market.[21] This is a classic channel of transmission or contagion, through which a crisis in one country spreads across international borders. In the present context, however, contagion or spillovers are only part of the story.

That many other countries are experiencing economic difficulties at the same time as the United States also owes importantly to the fact that many of the features that characterized the run-up to the subprime crisis in the United States were present in many other advanced economies. Specifically, many countries in Europe and elsewhere (New Zealand, for example) were having their own home-grown real estate bubbles (Figure 3). This, in and of itself, makes these countries vulnerable to the usual nasty consequences of asset market crashes—irrespective of what may be happening in the United States.

[21] Owing to the opaqueness of balance sheets in many financial institutions in these countries, the full extent of exposure is, as yet, unknown.

Figure 3

Percent Change in Real Housing Prices: 2002-2006



Sources: Bank of International Settlements and sources listed in Table A4. China data covers 2003–2006.

Banking Crises, Capital Mobility, And Financial Liberalization

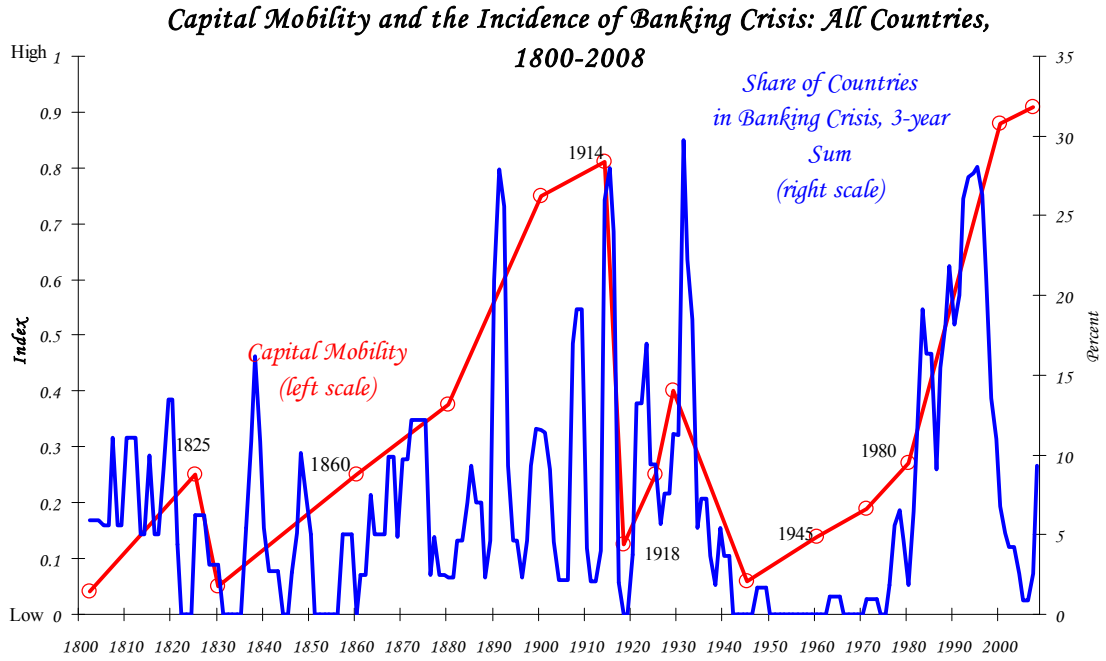
Also consonant with the modern theory of crises is the striking correlation between freer capital mobility and the incidence of banking crises, as shown in Figure 4. ***Periods of high international capital mobility have repeatedly produced international banking crises, not only famously as they did in the 1990s, but historically.*** The figure plots a three-year moving average of the share of all countries experiencing banking crises on the right scale. On the left scale, we graph the index of capital mobility, due to Obstfeld and Taylor (2004), updated and back cast using their same design principle, to cover our full sample period. While the Obstfeld–Taylor index may have its limitations, we feel it nevertheless provides a concise summary of complicated forces by emphasizing de facto capital mobility based on actual flows.

For the post-1970 period, Kaminsky and Reinhart (1999) present formal evidence on the links of crises with financial liberalization. In 18 of the 26 banking crises they study, the financial sector had been liberalized within the preceding five years, usually less. In the 1980s and 1990s most liberalization episodes were associated with financial crises of varying severity. Only in a handful of countries (for instance, Canada) did financial sector liberalization proceed smoothly. Specifically, the paper presents evidence that the probability of a banking crisis conditional on financial liberalization having taken place is higher than the unconditional probability of a banking crisis; probit analysis confirmed these results. Using a 53-country sample for the period 1980–1995 Demirgüç-Kunt and Detragiache (1998) also show, in the context of a multivariate logit model, that financial liberalization has an independent negative effect on banking sector stability and that this result is robust across numerous specifications. [22]

[22] See also, Drees and Pazarbasioglu (1998) for an insightful discussion of the Nordic experience with financial liberalization.

The stylized evidence presented in Caprio and Klingebiel (1996) suggests that inadequate regulation and lack of supervision at the time of the liberalization may play a key role in explaining why deregulation and banking crises are so closely entwined. Again, this is a theme across developed countries and emerging markets alike.

Figure 4



Sources: Bordo et al. (2001), Caprio et al. (2005), Kaminsky and Reinhart (1999), Obstfeld and Taylor (2004), and these authors.
Notes: This sample includes **all** countries (even those not in our core sample of 66). The full listing of banking crises dates are shown in Appendix II**.** On the left scale, we updated our favorite index of capital mobility, admittedly arbitrary, but a concise summary of complicated forces. The smooth red line shows the judgmental index of the extent of capital mobility given by Obstfeld and Taylor (2004), back cast from 1800 to 1859 using their same design principle.

III. Capital Flow Bonanzas, Credit Cycles and Asset Prices

This section examines some of the common features of banking crises across countries, regions and time. The focus is on the regularities among cycles in international capital flows, credit, and asset prices (specifically, housing and equity prices).

Capital flow bonanzas and crisis vulnerability

One common characteristic of the run-up to banking crises is a sustained surge in capital inflows. Reinhart and Reinhart (2008) delineate a criterion to define a capital flow bonanza, catalogue (country-by-country) "bonanza" [23] episodes for 1960–2006, and examined the links between bonanza spells and banking crises, employing the crisis dates defined and dated in the Appendix to the present paper. [24]

From the Appendix crises dates and the bonanza dates, two country-specific probabilities were calculated. The unconditional probability of a banking crisis, along the lines of those shown in Tables 1 and 2 (except for 1960–2007), and the probability of a banking crisis within a window of three years before and after the bonanza year or years—that is, as the conditional probability of a crisis. If capital flow bonanzas make countries more crises prone, the conditional probability, P(Crisis | Bonanza) should be greater than the unconditional probability of a crisis, P(Crisis).

---

[23]Reinhart an Reinhart define a capital flow bonanza as follows They settled on an algorithm that provided uniform treatment across countries but was flexible enough to allow for significant cross-country variation in the current account. As in Kaminsky and Reinhart (1999), we select a threshold to define bonanzas that is common across countries (in this case the 20th percentile).[23] This threshold included most of the better known episodes in the literature but was not so inclusive as to label a bonanza more "routine" deteriorations in the current account. Because the underlying frequency distributions vary widely across countries, the common threshold produces quite disperse country-specific cutoffs. For instance, in the case of relatively closed India, the cutoff to define a bonanza is a current account deficit/GDP in excess of 1.8 percent, while for trade-oriented Malaysia the comparable cutoff is a deficit/GDP ratio of 6.6 percent. [23]. [23]

[24] They performed a comparable exercise for currency, debt, and inflation crises.

Table 7 reproduces a subset of the results a Reinhart and Reinhart for banking crises. It presents aggregates of the country-specific conditional and unconditional probabilities for three groups (all countries, high income, and middle and low income).

The probability of a banking crisis conditional on a capital flow bonanza is higher than the unconditional probability. The bottom row of Table 6 provides the share of countries for which P(Crisis | Bonanza) ≥ P(Crisis) as an additional indication of how common place is it across countries to see bonanzas associated with a more crisis-prone environment. For banking crises, the majority of countries (61 percent) register a higher propensity to banking crises around bonanza periods.

We conjecture that the 61 percent figure would be higher if one were to include post-2007 data in Table 7. Many countries experiencing the most severe banking crises have also run large sustained current account deficits. These include many developed countries, such as the United States, the United Kingdom, Spain, Iceland and Ireland.

Table 7. Are Capital Flow Bonanza Episodes More Prone to Banking Crisis?
1960–2007

Probability of a banking crisis (in percent), 66-country sample	
Conditional on a bonanza (three-year window)	18.4
Unconditional	13.2
Difference	*5.2*
Memorandum item:	
Percent of countries for which conditional probability is greater than unconditional	60.9

Notes: The three-year window encompasses three years before the bonanza years (see Reinhart and Reinhart, 2008, Table 2), the year (or years if these are consecutive) of the bonanza, and the three years following the episode.
Italics denote significance at the one-percent confidence level.
Source: Reinhart and Reinhart (2008), based on Tables 2 and 4 and authors' calculations.

The findings on capital flow bonanzas in Reinhart and Reinhart (2008) are also consistent with empirical regularities surrounding credit cycles. Mendoza and Terrones (2008), who examine cycles in credit in both advanced and emerging market economies using a very different

approach from that just discussed, find that credit booms in emerging market economies are often preceded by surges in capital inflows. They also conclude that while not all credit booms end in financial crises, most emerging market crises were preceded by credit booms. They link credit booms to rising asset prices, an issue we turn to next. [25]

Equity and housing price cycles and banking crises

In this section, we summarize the literature on asset price bubbles and banking crises, extending it to incorporate new data on housing prices in emerging markets, as well as data on the unfolding crises in the advanced economies.

The now-infamous real estate bubble in the United States that began to deflate at the end of 2005 occupies center stage as a culprit of the present financial crisis. But the subprime episode is far from unique in that regard. In Reinhart and Rogoff (2008b), we document the trajectory in real housing prices around all the post–WWII banking crises in advanced economies, with particular emphasis on the "Big 5" crises (Spain, 1977, Norway, 1987, Finland and Sweden, 1991 and Japan, 1992).[26] The pattern that emerges is clear: a boom in real housing prices in the run-up to the crisis is followed by a marked decline the year of the crisis and in subsequent years. Bordo and Jeanne (2002), also studying the advanced economies during 1970–2001, find that banking crises tend to occur either at the peak of the boom in real housing prices, or right after the bust. Gerdrup (2003) presents a compelling narrative of the links between Norway's three banking crises during 1890s–1993 and the booms and busts in housing prices.

Table 8 illustrates the magnitude and duration of the downturn in housing prices that has historically accompanied major banking crises in both advanced and emerging economies.

[25] See also Kaminsky and Reinhart (1999), who also examine the growth in real credit to the private sector around both banking and currency crises.
[26] The years refer to the beginning of the crisis.

While the links between banking crises and the housing price cycle have been examined in both our earlier work and numerous other papers (most frequently case studies), this is the first paper to provide systematic evidence on the behavior of housing prices for emerging market economies around some of their major banking crises. The crisis episodes include the "Big 6" Asian crises of 1997–1998, Indonesia, Korea, Malaysia, the Philippines, Thailand, and the much buffeted Hong Kong.

Table 8. Real Housing Price Cycles and Banking Crises

Country	Crisis date	Peak	Trough	Duration of downturn	Magnitude of decline (in percent)
		Advanced economies: The Big 5			
Finland	1991	1989:Q2	1995:Q4	6 years	–50.4
Japan	1992	1991:Q1	Ongoing	Ongoing	–40.2
Norway	1987	1987:Q2	1993:Q1	5 years	–41.5
Spain	1977	1978	1982	4 years	–33.3
Sweden	1991	1990:Q2	1994:Q4	4 years	–31.7
		Asian Crisis: The Big 6			
Hong Kong	1997	1997:Q2	2003:Q2	6 years	–58.9
Indonesia	1997	1994:Q1	1999:Q1	5 years	–49.9
Malaysia	1997	1996	1999	3 years	–19.0
Philippines	1997	1997:Q1	2004:Q3	7 years	–53.0
South Korea	1997		2001:Q2	4 years	–20.4
Thailand	1997	1995:Q3	1999:Q4	4 years	–19.9
		Other emerging			
Argentina	2001	1999	2003	4 years	–25.5
Colombia	1998	1997:Q1	2003:Q2	6 years	–51.2
Historical episodes					
Norway	1898	1899	1905	6 years	–25.5
US	1929	1925	1932	7 years	–12.6
		Current cases			
Hungary	2008	2006	Ongoing	Ongoing	–11.3
Iceland	2007	November 2007	Ongoing	Ongoing	–9.2
Ireland	2007	October 2006	Ongoing	Ongoing	–18.9
Spain	2007	2007:Q1	Ongoing	Ongoing	–3.1
UK	2007	October 2007	Ongoing	Ongoing	–12.1
US	2007	December 2005			–16.6

Sources: Bank of International Settlements and the individual country sources described in the Data Appendix.

Other emerging market episodes include Argentina's mega-crisis in 2001–2002, and Colombia's 1998 crisis, which produced the worst recession since the national income accounts were tabulated in the early 1920s. In the current conjuncture of unfolding crises, we include

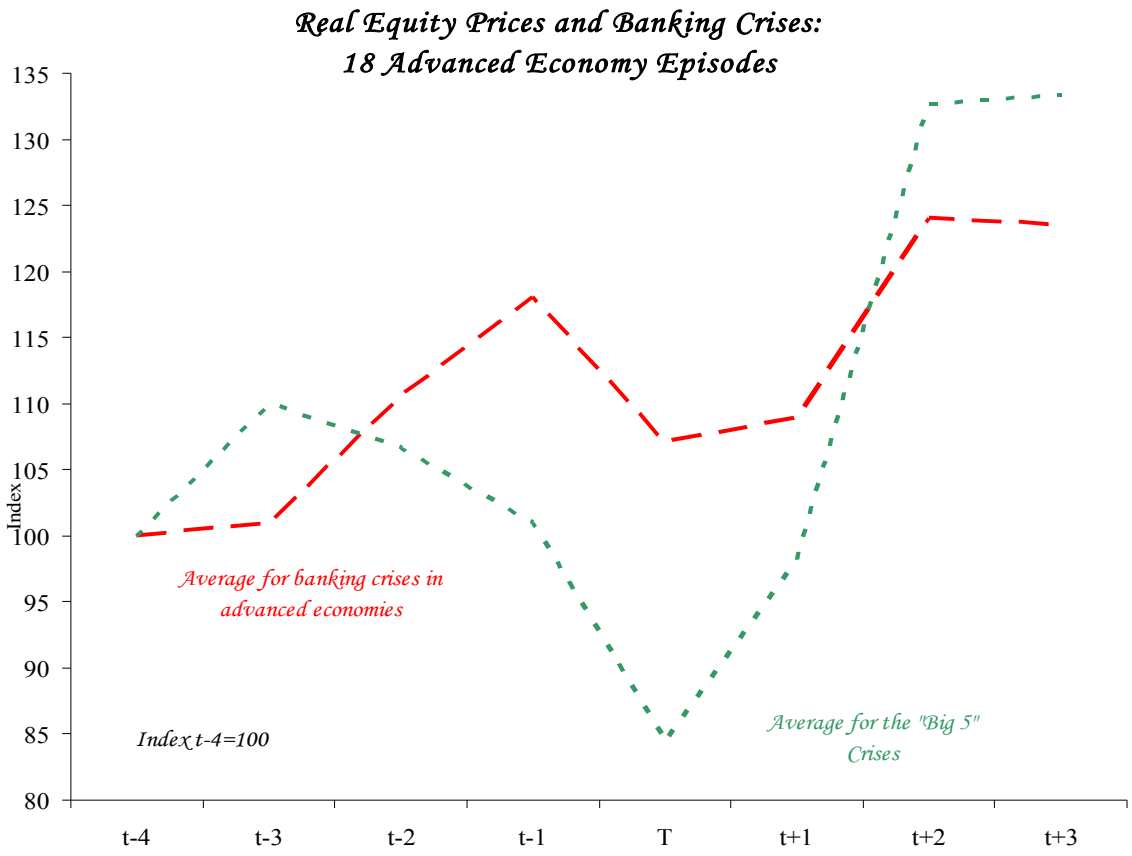
Hungary, in addition to the advanced economies that have had recent housing market bubbles (Iceland, Ireland, Spain, the United Kingdom, and the United States).[27]

Two features stand out from the summary statistics presented in Table 8. First is the persistence of the cycle in real housing prices in both advanced economies and emerging markets, typically four to six years.[28] The second feature that stands out from Table 8 is that the ***magnitudes of the declines in real housing prices around banking crises from peak to trough are not appreciably different in emerging and advanced economies.*** This comparability is quite surprising given that most macroeconomic time series exhibit drastically greater volatility in emerging markets, and thus it merits further attention.[29] Certainly, the first results presented here on comparing housing price booms and busts around banking crisis dates appears to strongly support the contention that banking crises are an equal opportunity menace.

The prolonged housing price downturns following financial crises are in stark contrast to the behavior of real equity prices, as illustrated in Figures 5a and 5b in which the pattern of decline and recovery is more v-shaped.

[27] Historical comparisons are hard to come by, as most real housing price series are of recent vintage. We do include in this category two episodes: the United States during the Great Depression and Norway's crisis at the turn of the century (1898).
[28] See Ceron and Suarez (2006), who estimate its average duration at six years
[29] For example, Agenor, McDermott, and Prasad (2000) provide evidence that output and real consumption are far more volatile in emerging markets; Kaminsky, Reinhart and Vegh (2003) present evidence that the amplitude of the cycle in real government spending is orders of magnitude greater in emerging markets.

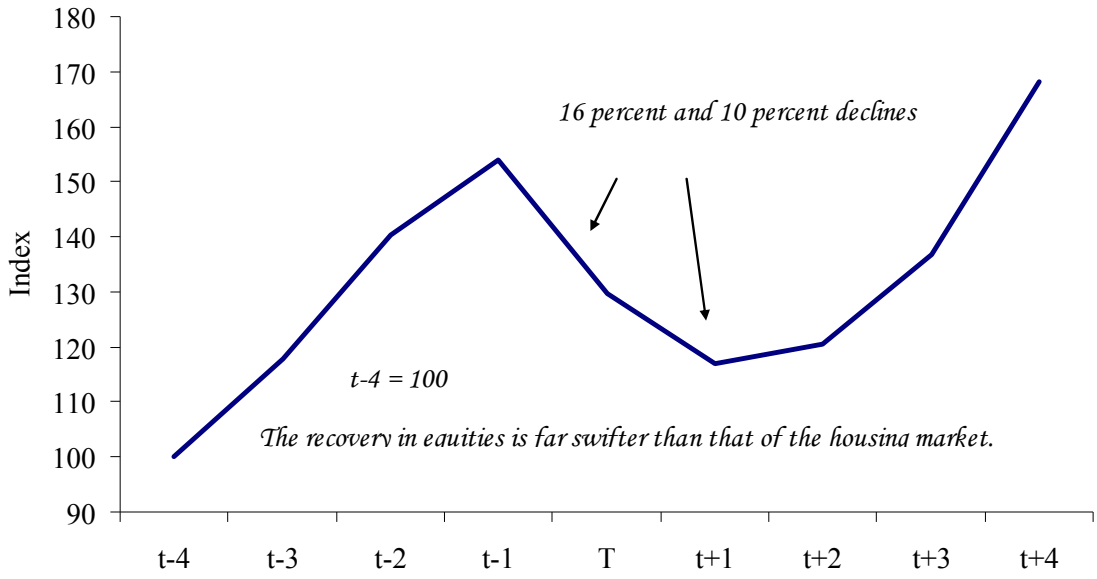
Figure 5a



Notes: The Big 5 crises are: Spain, 1977; Norway, 1987; Finland, 1991, Sweden, 1991; and Japan 1992.
Source: Global Financial Data and author's calculations.

Figure 5b

Equity Prices and Banking Crises: 40 Emerging Market Episodes



Source: Global Financial Data and author's calculations.
Notes: Four of the 40 episodes are pre–World War II (1921–1929).

These figures show the evolution of real equity prices from four years prior to the crisis to three years afterwards for emerging and advanced economies separately. As the figures make plain, equity prices typically peak before the year of the banking crisis and decline for 2–3 years as the crisis approaches and, in the case of emerging markets in the year following the crisis. However, the pattern tends to be v-shaped and the recovery complete, in the sense that three years after the crisis real equity prices are on average higher than the pre-crisis peak.

One can conjecture that one reason why major banking crises are such protracted affairs is that these episodes involve the real estate market's persistent cycle in a way that "pure stock market crashes" (for instance, Black Monday in October 1987 or the burst of the IT bubble in 2001) do not. [30]

Financial Sector Expansion and Financial Crisis

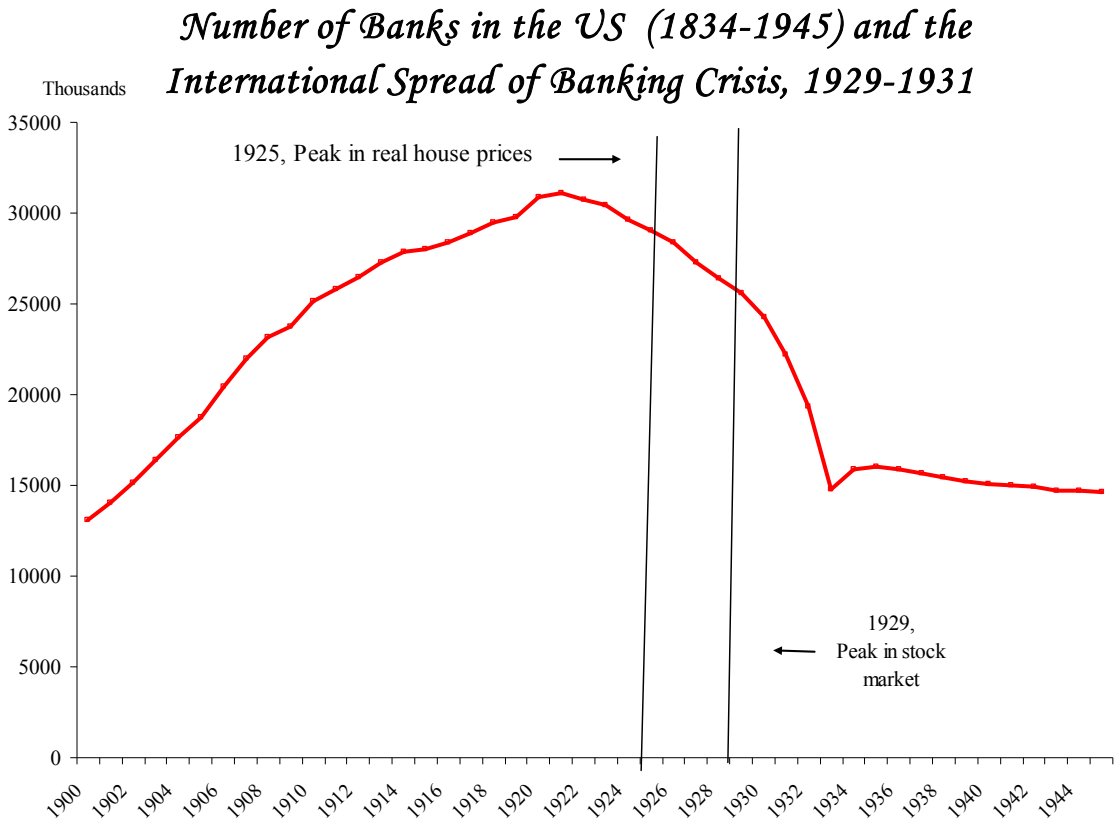
Philippon (2007) analyzes the expansion of the financial services sector (including insurance) in the United States, which averaged 4.9 percent of GDP during 1976–85, rising to 7.5 percent 1996–2005. His paper argues that this gain was not sustainable and a decline of at least 1 percent of GDP was probable. In the wake of the subprime crisis, the shrinkage of the financial sector during 2008 and 2009 is likely to be significantly larger. The pre-crisis explosion and post-collapse implosion of the financial sector surrounding a banking crisis is also not new or unique to the United States.

Figure 6 plots the number of banks in the United States in the run-up and aftermath of the Great Depression. Perhaps, the bubble in equity and real estate prices also extended to the number of financial institutions. This expansion in the run-up and contraction in the aftermath in

[30] This is consistent with the regularity that house prices are far more predictable (i.e., inertial) than equity prices.

the number of financial institutions is evident during other banking crises—especially in those cases where financial liberalization preceded the banking crisis.

Figure 6



Sources: Historical Statistics of the Unites States.

IV. The Fiscal and Growth Consequences of Banking Crises

Looking at the fiscal and growth consequences of banking crises, we again find some surprising parallels between developed countries and emerging markets. Our analysis of the fiscal consequences, in particular, is a sharp departure from the previous literature, which has focused almost entirely on imputed "bailout costs" to the government which, as we shall argue, are extremely difficult to measure. Instead, we will focus on the fiscal costs to the government, particularly the huge build-ups in debt that follow banking crises. We are able to do so by tapping the extensive new cross-country annual dataset on domestic debt compiled in Reinhart and Rogoff (2008c). This data allow us to show the remarkable surge in debt that occurs in the wake of crises.

That elusive concept of bailout costs

As we have noted, much of the literature that studies banking crisis episodes is fixated on providing estimates of the fiscal or bailout costs of these crises (see, for example, an excellent discussion in Frydl, 1999, and various papers in Norges Bank, 2006).[31] At the time of this writing, the International Monetary Fund estimates that the fiscal costs of the U.S. subprime crisis will tally about $1.4 trillion, or around 11 percent of GDP.[32] However, estimates of bailout costs vary markedly across studies, depending on the methodology and vary even more across time, depending on the length of horizon used to calculate the fiscal impact of the crisis, a point stressed in Frydl (1999). [33] Table 9 presents the upper and lower bounds of estimates of the bailout costs for some of the better-known banking crises in both advanced and emerging economies in nearly all regions. The discrepancies across estimates are large and, in some cases,

[31] See also Caprio et al. (2005), and Hoggarth et al. (2002), and Sanhueza (2001).
[32] See International Monetary Fund, October 2008 *World Economic Outlook* and *Global Financial Stability Report*.
[33] A similar problem plagues work on determining the effectiveness of foreign exchange intervention by measuring the profitability of such market purchases or sales. The results depend importantly on the width of the time window and implicit assumptions of the cost of financing. See Neely (1995).

staggering. Among the "Big 5" post–WWII crises in advanced economies, the differences in estimated bailout costs for Japan and Spain are 16 and 11 percent of GDP, respectively. Even for Norway, where the difference between the upper and lower bounds of the estimates is 2 percent of GDP, a different way of looking at the discrepancy is to note that the upper end of the estimates (4 percent of GDP) is twice as large as the lower bound estimates of the costs of the bailout. Furthermore, as noted in Vale (2006), if the costs are calculated over a longer time horizon after the crisis, the picture that emerges is even more at odds with the higher-end estimates; it shows that the Norwegian government actually made a small profit on the banking resolution, due to the later sale of shares in the nationalized banks.

Table 9. Creative Accounting? Bailout Costs of Banking Crises

Country/beginning year	Estimated bailout cost as a percent of GDP		
	Upper bound	Lower bound	Difference
Argentina, 1981	55.3	4.0	51.3
Chile, 1981	41.2	29.0	12.2
Ghana, 1982	6.0	3.0	3.0
Japan, 1992	24.0	8.0	16.0
Norway, 1987	4.0	2.0	2.0 [1]
Philippines 1984	13.2	3.0	10.2
Spain, 1977	16.8	5.6	11.2
Sweden, 1991	6.4	3.6	2.8
US (S&L), 1984	3.2	2.4	0.8

Sources: Frydl (1999) and sources cited therein and Vale (2006).
[1] In Norges Bank (2006) it is argued that the Norwegian government actually made a small profit on the banking resolution.

In what follows, we argue that this nearly universal focus on providing opaque calculations of bailout costs is both misguided and incomplete. It is misguided because there are no widely agreed upon guidelines to calculate these estimates. It is incomplete because the fiscal consequences of banking crises reach far beyond the more immediate bailout costs. These consequences mainly result from the significant adverse impact that the crisis has on government

revenues (in nearly all cases) and the fact that in several episodes the fiscal policy reaction to the crisis has also involved substantial fiscal stimulus packages.

Growth in the Aftermath of Crises

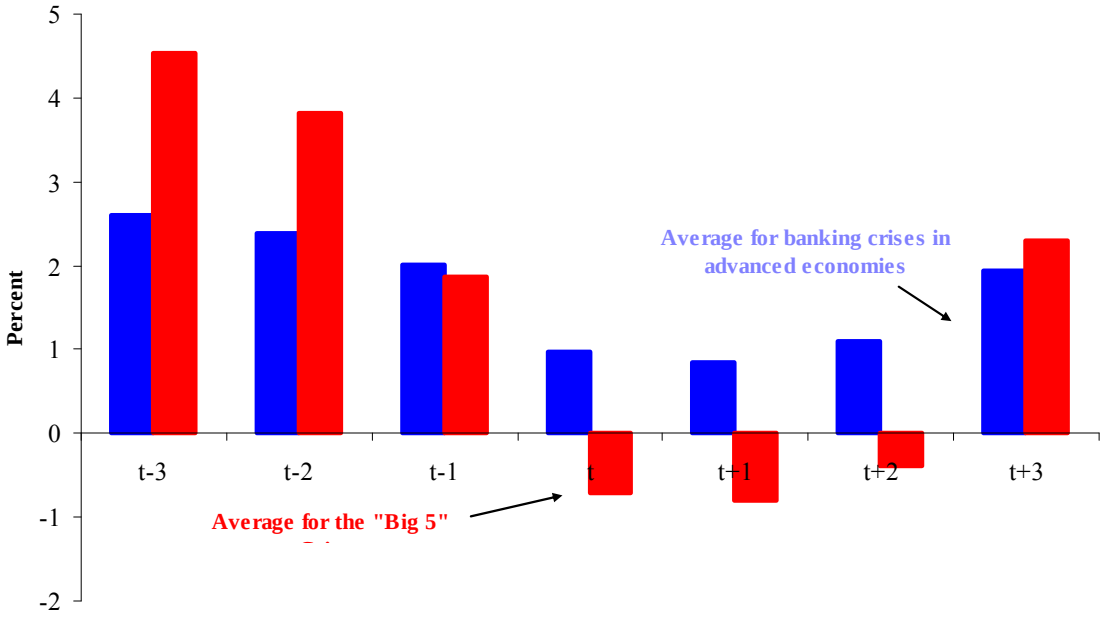
The fact that most banking crises, especially systemic ones, are associated with economic downturns is well established in the empirical literature and we offer no new compelling evidence on that score. [34] Reinhart and Rogoff (2008b) recently summarized the evolution of output before, during, and after all the banking crises (systemic or not) in post–WWII. Figure 7 shows the advanced economies as a group, as well as the "big five" (Japan, Nordics and Spain), while Figure 7b augments this analysis with a comparable summary for the post-war banking crises in emerging markets. As before, time *t* denotes the year of the crisis. It is interesting to note that the figures show a steeper decline but a somewhat faster comeback in growth for emerging markets than in the advanced economies. [35] It is beyond the scope of this paper to ascertain the longer run growth consequences of banking crises, but we wish to note this post-crises pattern because growth (important in its own right) has nontrivial implications for fiscal balances, government debts, and the broader cost and consequences of any financial crisis.

[34] See, for instance, Frydl (1999), and Kaminsky and Reinhart (1999), and especially Rajan, Detragiache and Dell'Ariccia (2008), who examine the output consequences of the credit channel following banking crises using micro data. We note that the cases of output collapses studied in Barro and Ursua (2008) virtually all are associated with banking crises.

[35] It is important to note that the v-shaped pattern of recovery is importantly influenced by the sharp comebacks of the Asian economies from the severe 1997–1998 crisis. Excluding these countries considerably worsens the average performance two and three years after the banking crisis, making the pattern look more u-shaped.

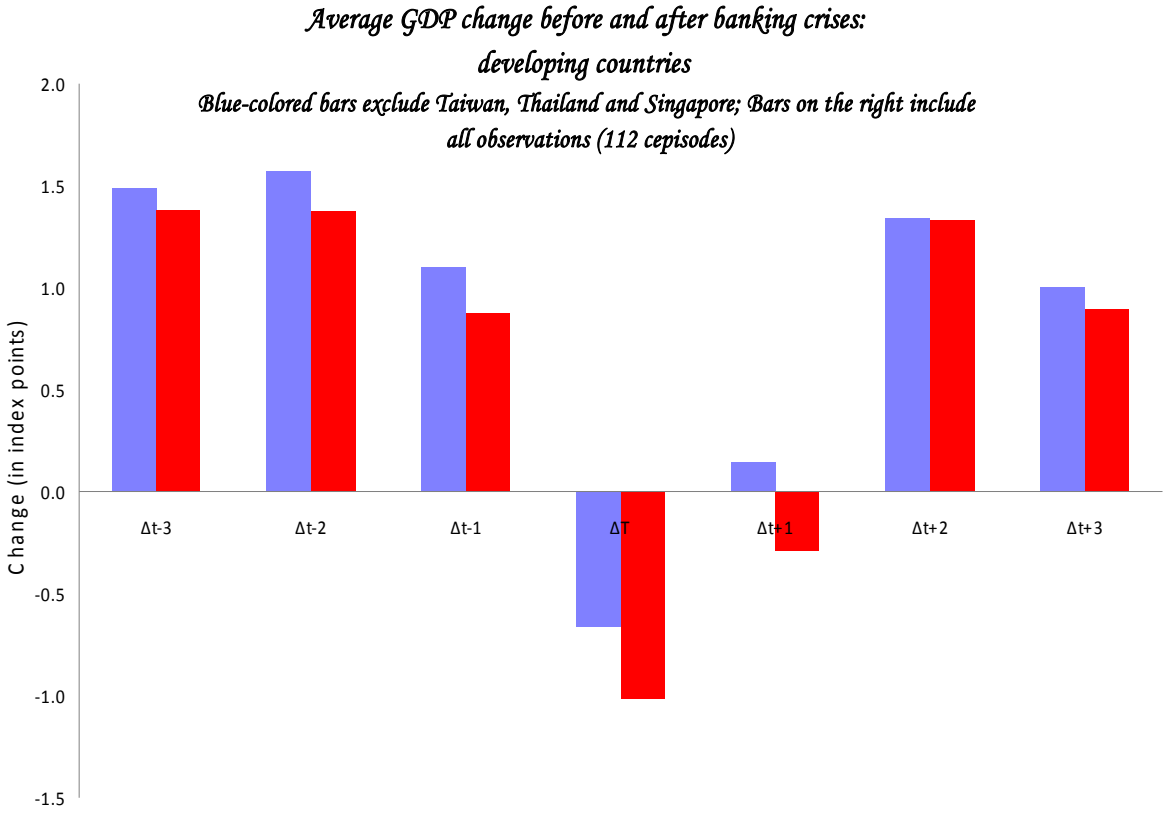
Figure7a

Real GDP Growth per Capita and Banking Crises (PPP basis)



Sources: Maddison (2003), Total Economy Database (2008), IMF *World Economic Outlook* (2008), and author's calculations.
Notes: Banking crisis episodes are listed in Appendix II.

Figure 7b



Sources: Maddison (2004), Total Economy Database (2008), IMF *World Economic Outlook* (2008), and author's calculations.
Notes: Banking Crisis episodes are listed in Appendix II.

Beyond Bailout Costs: The Impact Of The Crisis On Revenues And Debt

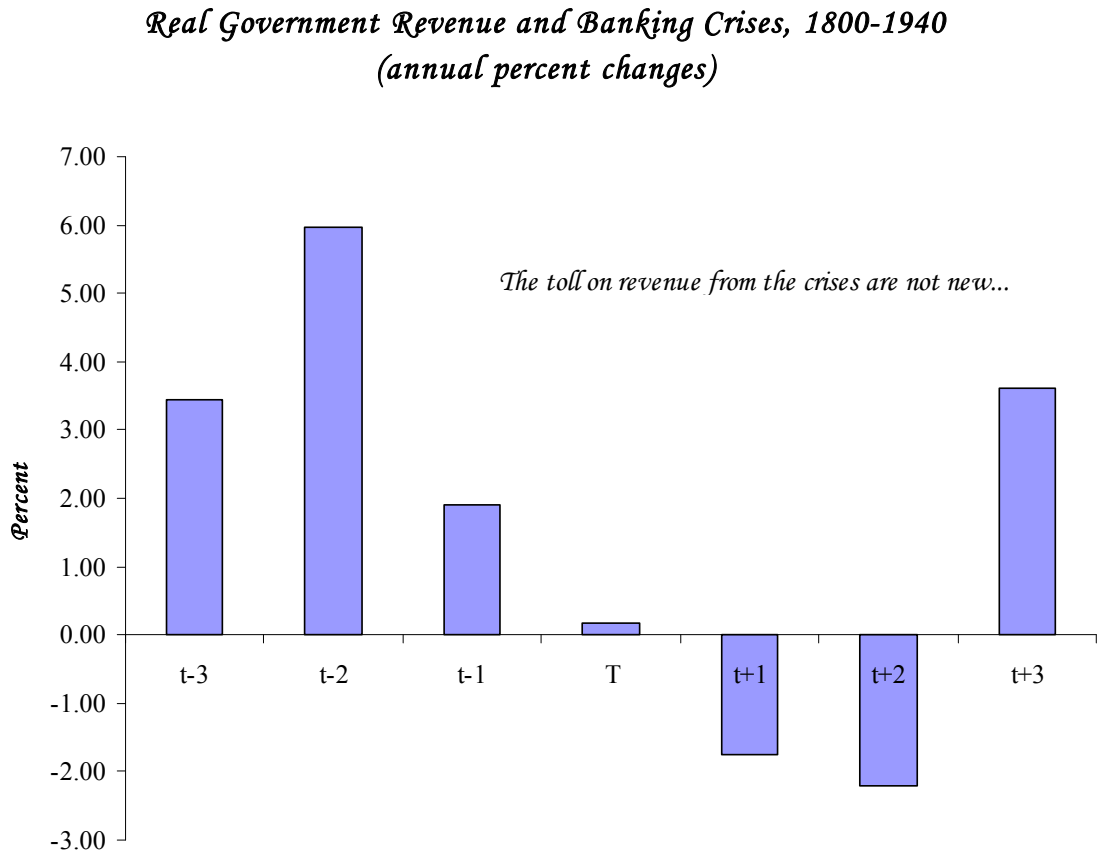
Since WWII the most common policy response to a systemic banking crisis (in both emerging and advanced economies) has been to engineer (with varying degrees of success) a bailout of the banking sector, whether through purchases of bad assets, directed mergers of bad banks with relatively sound institutions, direct government takeovers, or some combination of these. Such actions have had in many cases major fiscal consequences, typically early on in the crisis. However, as noted earlier, banking crises are protracted affairs with lingering consequences in asset markets—notably real estate prices and the real economy. As such it is not surprising that government revenues are adversely and significantly impacted by the crisis.

As noted, several studies have traced out the adverse impacts of banking crises on economic activity; what these studies have left unexplored is the direct consequences of the recession on government finances—specifically, tax revenues. Figure 8a plots the average pattern in annual real revenue growth three years before, during, and three years after banking crises for a total of 86 banking crises during 1800–1944 for which we have complete revenue data. [36]

The comparable exercise is shown for all 138 post–WWII banking crises in Figure 8b. The patterns for the pre- and post-war samples are not identical but strikingly similar. Annual revenue growth is robust in the years leading up to the banking crisis; growth weakens significantly the year of the crisis and subsequently posts declines in the years immediately following the onset of the crisis. For the pre-war episodes revenues decline, on average for two years, while for the post-war the revenue slump extends to the third year.

[36] Revenues (from Mitchell, 2003a, b, and c) are deflated by consumer price indices; the numerous sources for these data are given on a country-by-country and period-by-period basis in the data appendix to Reinhart and Rogoff (2008a).

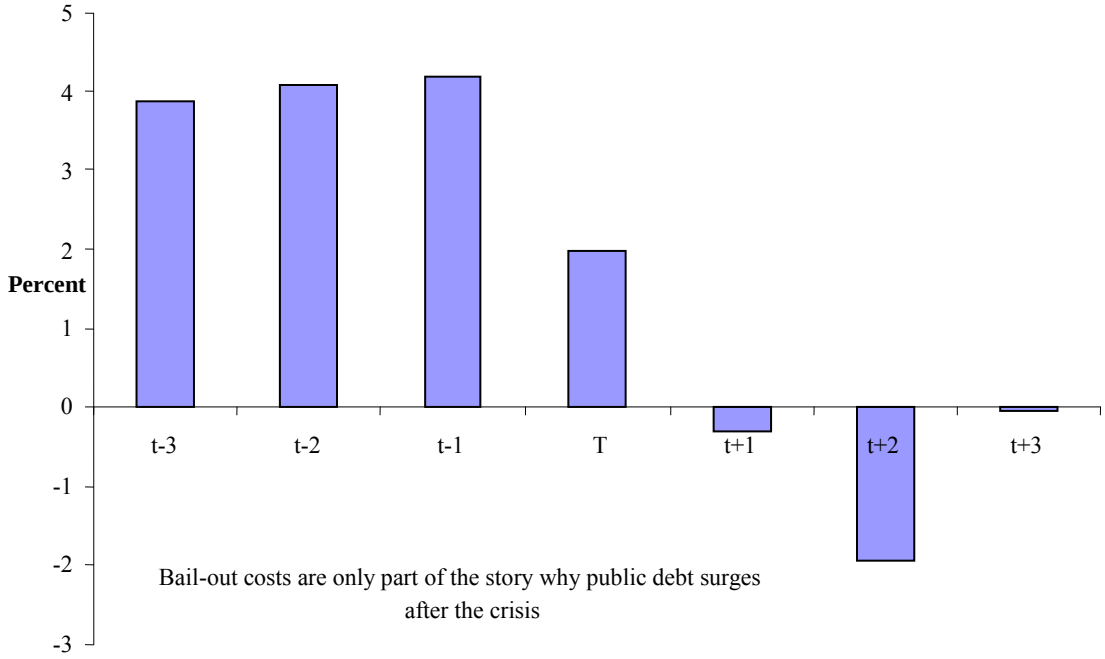
Figure 8a (all countries)



Sources: Revenues are from Mitchell (2003a, b,). For the numerous country-specific sources of prices see Reinhart and Rogoff (2008a).
Notes: Central government revenues deflated by consumer prices. There are a total of 86 banking crisis episodes during 1800–1940 for which we have revenue data.

Figure 8b (all countries)

Real Government Reveues and Banking Crises
(annual percent changes)



Sources: Revenues are taken from Mitchell (2003a, b). For the numerous country-specific sources of prices see Reinhart and Rogoff (2008a).
Notes: Central government revenues deflated by consumer prices. There are a total of 138 banking crises during 1945–2008 for which we have revenue data.

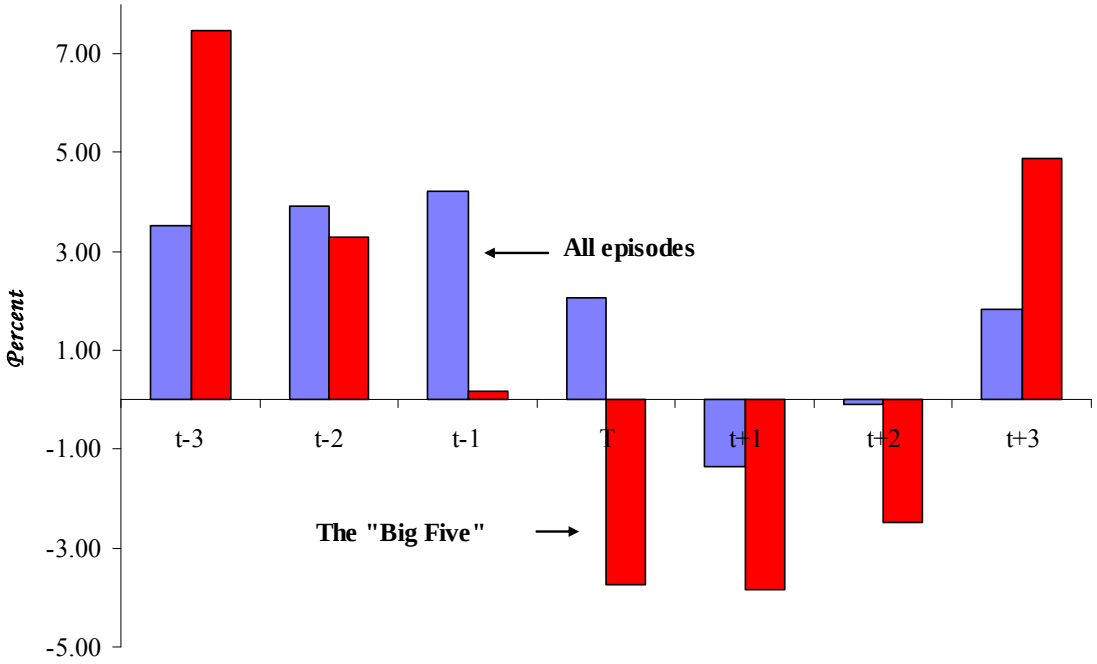
Parallels in Revenue Losses between Emerging Markets and Developed Economies

Again, the parallels between developed countries and emerging markets is striking. Figure 8c shows the revenue declines surrounding banking crises for the advanced countries across the entire sample, with the "big five" post-war crises also listed separately. Revenue growth resumes (from a lower base) starting in the third year after the crisis. Advanced economies exhibit a strong inclination to resort to stimulus measures to cushion economic activity, seen most spectacularly in the aggressive use of infrastructure spending in Japan during the 1990s. Emerging markets are far less well poised to engage in countercyclical fiscal policy.

Nevertheless, the effect of the crisis on the trajectory of taxes is broadly similar. Figure 8d gives revenue declines around banking crises for emerging markets for the entire sample. The average revenue drop is actually quite similar to the "big five," although the recovery is faster—in line with a more swift recovery in growth, as discussed in the preceding section.

Figure 8c

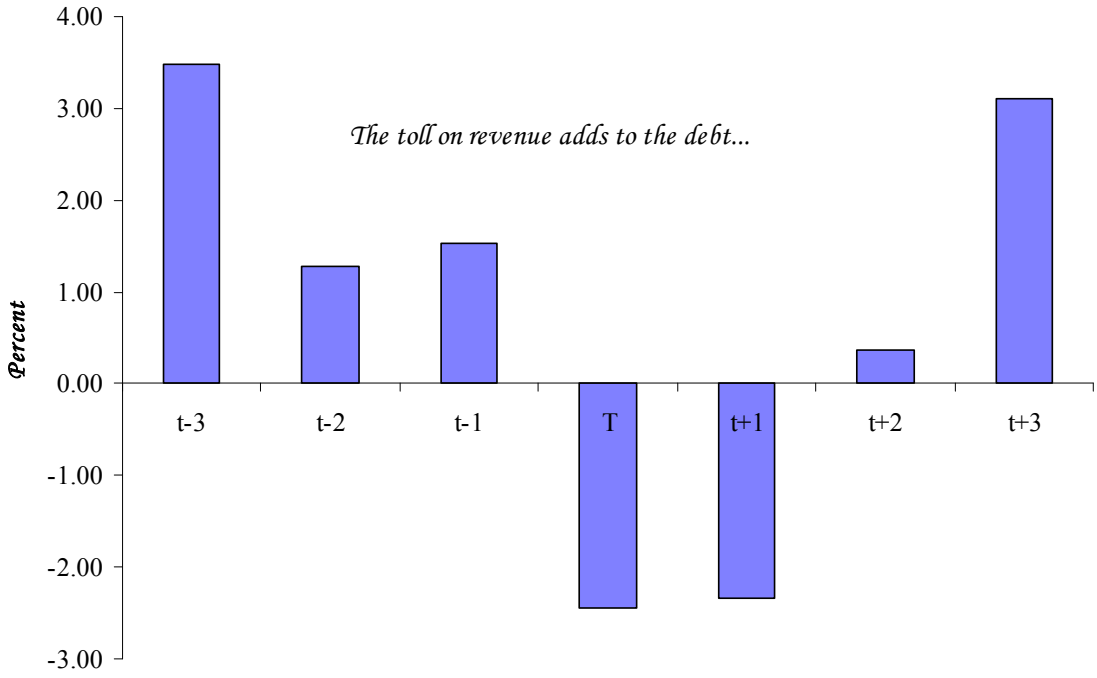
Real Government Revenue and Banking Crises,
Advanced Economies, 1815-2007
(annual percent changes)



Sources: Revenues are taken from Mitchell (2003a, b,). For the numerous country-specific sources of prices see Reinhart and Rogoff (2008a).
Notes: Central government revenues deflated by consumer prices.

Figure 8d

Real Government Revenue and Banking Crises,
Emerging Markets, 1873-2007
(annual percent changes)



Sources: Revenues are from Mitchell (2003a, b). For the numerous country-specific sources of prices see Reinhart and Rogoff (2008a).
Notes: Central government revenues deflated by consumer prices.

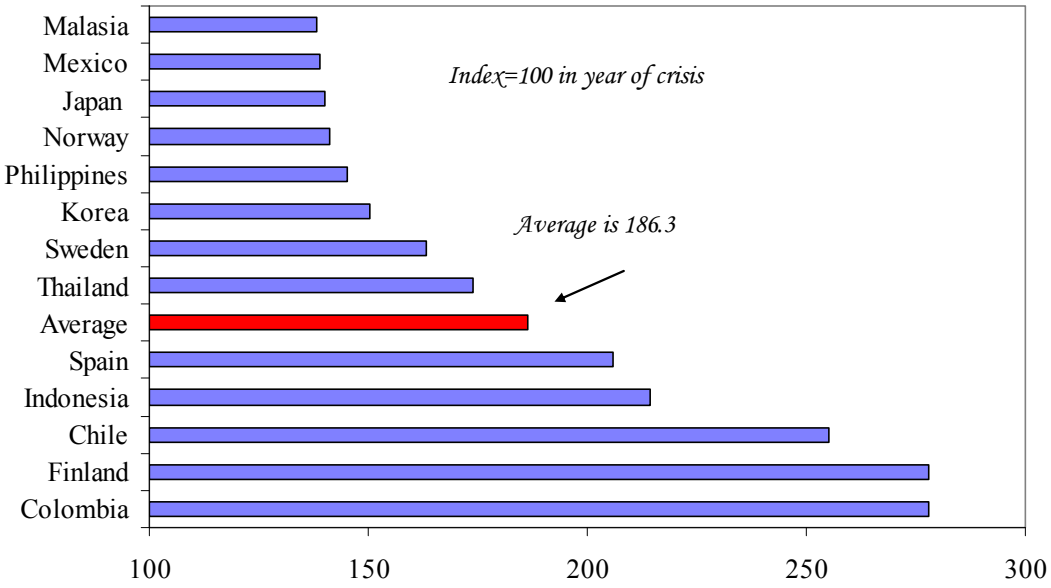
Government debt buildup in the aftermath of banking crises

To get a rough approximation of the impact of a crisis on government finances, we use the historical central government debt data compiled in Reinhart and Rogoff (2008c). It is important to note that this is a partial picture, since the general (not just central government) is affected by the crisis. Also, there is typically during these episodes a marked expansion in government-guaranteed debt, which does not show up in the central government figures.

With these caveats in mind, Figure 9 presents a summary of the evolution of debt in the aftermath of some of the major post-war crises in both advanced and emerging markets.

Figure 9

Cumulative increase in public debt in the three years following the banking crisis



Source: Reinhart and Rogoff (2008c).

Not surprisingly, taken together, the bailout of the banking sector, the shortfall in revenue, and the fiscal stimulus packages that have accompanied some of these crises imply widening fiscal deficits adding to the existing stock of government debt. What is perhaps surprising is how dramatic the rise in debt is. ***If the stock of debt is indexed to equal 100 at the time of the crisis (T), the average experience is one in which the real stock of debt rises to 186 three years after the crisis. That is to say, the real stock of debt nearly doubles.***[37] Such increases in government indebtedness are evident in emerging and advanced economies alike,

[37] Indeed, there are some important cases such as Japan where the accelerated debt build-up goes on for over a decade, so the three-year cutoff grossly understates the longer term consequences.

and extremely high in both. Arguably, the true legacy of banking crises is higher public indebtedness—far over and beyond the direct headline costs of big bailout packages.[38] (Obviously, as we noted earlier, the rise in public debt depends on a whole range of political and economic factors, including the effectiveness of the policy response and the severity of the initial real economic shock that produced the crisis. Nevertheless, the universality of the large debt rise is stunning.)

V. Concluding Remarks

Countries may "graduate" from serial default on sovereign debt and recurrent episodes of very high inflation, as the cases of France, Austria, Spain and others illustrate. History tells us, however, that graduation from recurrent banking and financial crises is much more elusive. And it should not have taken the 2007–2009 financial crisis to remind us. Out of the 66 countries in our sample, only Portugal, Austria, the Netherlands and Belgium had managed to escape from banking crises from 1945–2007. During 2008, however, even three of these four countries were among those engaged in massive bailouts as the current global financial crisis evolves.

Indeed, the wave of financial crises that began with the onset of the subprime crisis in the United States in 2007 has dispelled any prior notion among academics, market participants, or policymakers that acute financial crises are either a thing of the past or relegated to the "volatile" emerging markets. The "this time is different syndrome" has been alive and well in the United States, where it first took the form of a widespread belief that sharp productivity gains stemming from the information technology industry justified price–earning ratios in the equity market that

[38] We note that Figure 9 gives percentage change in debt, rather than debt to GDP, in order not to distort numbers by the large falls in GDP that sometimes accompany crises. However, the same basic message comes across looking at debt to GDP instead. Note that the calculations are based on total central government debt.

far exceeded any historical norm. [39] That delusion ended with the burst of the IT bubble in 2001. But the excesses quickly reemerged, morphing into a different shape in a different market. The securitization of subprime mortgages combined with a heavy appetite for these instruments from countries like Germany, Japan, and major emerging markets like China fueled perceptions that housing prices would continue to climb forever. "This time it was different" because there were new markets, new instruments, and new lenders. In particular, financial engineering was thought to have tamed risk by better tailoring exposures to investors' appetites. Derivatives contracts, meanwhile, offered all manner of hedging opportunities. We now know how that popular delusion ended.

Historical experience already shows that rich countries are not as "special" as some cheerleaders had been arguing, both when it comes to managing capital inflows and especially when it comes to banking crises. This paper has used an extensive new dataset that includes data on housing prices in some key emerging markets as well as revenue and domestic debt data that dates back almost a century for most countries and more for many. Surprisingly, not only is the frequency and duration of banking crises similar across developed countries and middle-income countries, so too are quantitative measures of both the run-up and the fall-out. Notably, the duration of real housing price declines following financial crises in both groups are often four years or more, while the magnitudes of the crash are comparable. One striking finding is the huge surge in debt most countries experience in the wake of a financial crisis, with real central government debt typically increasing by about 86 percent on average (in real terms) during the three years following the crisis.

[39] An important question is how rare banking crises, through sudden changes in market liquidity, might amplify the effects on asset prices analyzed by Barro (2009).

References

Agénor, Pierre-Richard, C. John McDermott, and Eswar Prasad, "Macroeconomic Fluctuations in Developing Countries: Some Stylized Facts," World Bank Economic Review, Vol. 14, May 2000, 251–285.

Barro, Robert, "Rare Disasters, Asset Prices and Welfare Costs," forthcoming *American Economic Review*, Volume 99, No. 1 (March 2009).

Barro, Robert J. and José Ursúa, "Macroeconomic Crises Since 1870," NBER Working Paper 13940, April 2008.

Bernanke, Ben, S. and Harold James, in Ben S. Bernanke, "The Gold Standard, Deflation, and Financial Crisis: An International Comparison," *Essays on the Great Depression*, Princeton: Princeton University Press, 2000.

Bernanke, Ben S. and James, Harold, "The Gold Standard, Deflation, and Financial Crisis in the Great Depression: An International Comparison," NBER Working Paper No. W3488, October 1990.

Bordo, Michael and Barry Eichengreen, 1999, "Is Our Current International Economic Environment Unusually Crisis Prone?" manuscript, Department of Economics, University of California, Berkeley, August.

Bordo, Michael, Barry Eichengreen, Daniela Klingebiel, and Maria Soledad Martínez-Pería, "Is the Crisis Problem Growing More Severe?" *Economic Policy* 16, April 2001, 51–82.

Bordo, Michael, and Olivier Jeanne, "Boom-Busts in Asset Prices, Economic Instability, and Monetary Policy," NBER Working Paper 8966, June 2002.

Bordo, Michael, and Christopher Meissner (2006). "The Role of Foreign Currency Debt in Financial Crises: 1880-1913 vs 1972-1997" Journal of Banking and Finance.

Bordo, Michael, Christopher Meissner and Angela Redish, "How Original Sin Was Overcome: The Evolution of External Debt Denominated in Domestic Currencies in the United States and the British Dominions," in Barry Eichengreen and Ricardo Hausmann (eds), *Other People's Money*, Chicago: University of Chicago Press, 2004.

Bordo, Michael, and Antu Panini Murshid, "Are Financial Crises Becoming More Contagious?" in Stijn Claessens and Kristin Forbes, (eds.), *International Financial Contagion*, Kluwer Academic Press, 2001, 367–403.

Calomiris, Charles and Gary Gorton, "The Origins of Banking Panics: Models, Facts, and Bank Regulation," in R. Glenn Hubbard, ed., *Financial Markets and Financial Crises,* Chicago: University of Chicago press for the NBER, 1991.

Cameron, Rondo E., *Banking in the Early Stages of Industrialization: A Study in Comparative Economic History*, New York: Oxford University Press, 1967

Camprubí Alcázar, Carlos, *Historia de los Bancos en el Peru, 1860--1879*, Lima, Peru, 1957.

Caprio, Gerald, Jr. and Klingebiel, Daniela, "Episodes of Systemic and Borderline Financial Crises," http://go.worldbank.org/5DYGICS7B0 (Dataset 1), January 2003.

Caprio, Gerald, Jr. and Klingebiel, Daniela, "Bank Insolvency: Bad Luck, Bad Policy, or Bad Banking?" in Boris Pleskovic and Joseph Stiglitz (eds.), *Annual World Bank Conference on Development Economics*, Washington, DC: The World Bank, 1996, 79–104.

Caprio, Gerard and Daniela Klingebiel, Luc Laeven and Guillermo Noguera, "Banking Crisis Database," In Patrick Honohan and Luc Laeven (eds.), *Systemic Financial Crises*, Cambridge: Cambridge University Press, 2005.

Ceron, Jose, and Javier Suarez, "Hot and Cold Housing Markets: International Evidence," CEMFI Working Paper 0603, January 2006.

Cheng, Linsun, *Banking in Modern China: Entrepreneurs, Professional Managers, and the Development of Chinese Banks, 1897–1937*, Cambridge: Cambridge University Press, 2003.

Conant, Charles A., *A History of Modern Banks of Issue,* 5th edition, New York: G.D. Putnam's Sons, 1915.

Conant, Charles A. and Marcus Nadler, in Charles A. Conant, *A History of Modern Banks of Issue,* New York: G.D. Putnam's Sons, 1927.

Correlates of War, http://correlatesofwar.org/

Della Paolera, Gerardo and Alan M. Taylor, *Straining at the Anchor: The Argentine Currency Board and the Search for Macroeconomic Stability, 1880–1935*, Chicago: University of Chicago Press, 2001.

Della Paolera, Gerardo and Alan M. Taylor, "Internal Versus External Convertibility and Emerging-Market Crises: Lessons from Argentine History," *Explorations in Economic History* 39 (October 2002): 357–89.

Della Paolera, Gerardo and Alan M. Taylor, "Internal Versus External Convertibility and Developing-Country Financial Crises: Lessons From The Argentine Bank Bailout of the 1930s," NBER Working Paper No. 7386 (October 1999).

Dell'Ariccia, Giovanni & Detragiache, Enrica & Rajan, Raghuram, 2008. "The Real Effect of Banking Crises," Journal of Financial Intermediation, Elsevier, vol. 17(1), pages 89-112, January.

Demirgüç-Kunt, Asli and Enrica Detragiache, "The Determinants of Banking Crises in Developing and Developed Countries," *IMF Staff Papers* Vol. 45 (1998), 81–109.

Demirgüç-Kunt, Asli and Enrica Detragiache, "Financial Liberalization and Financial Fragility," in Boris Pleskovic and Joseph Stiglitz (eds.) *Annual World Bank Conference on Development Economics 1998*, Washington, DC: World Bank, 1999.

Drees, Burkhard, and Ceyla Pazarbasioglu, *The Nordic Banking Crisis: Pitfalls in Financial Liberalization,* IMF Occasional Paper 161, Washington DC: International Monetary Fund, 1998.

Flath, David, *The Japanese Economy*, 2nd ed., Oxford: University Press, 2005.

Frydl, Edward J., "The Length and Cost of Banking Crises," IMF Working Paper WP/99/30, March 1999.

Gerdrup, Karsten R., "Three Episodes of Financial Fragility in Norway since the 1890s," BIS Working Paper No. 142, October 2003.

Gorton, Gary, "Banking Panics and Business Cycles," *Oxford Economic Papers*, 1988, 40, pp. 751–81.

International Monetary Fund, *Global Financial Stability Reports*, various issues.

International Monetary Fund, *International Financial Statistics,* various issues.

International Monetary Fund, *World Economic Outlook,* various issues.

Jácome, Luis, "Central Bank Involvement in Banking Crises in Latin America," IMF Working Paper WP/08/135, May 2008.

Jeanne, Olivier and Alexandra Guscina, 2006, "Government Debt in Emerging Market Countries: A New Data Set," IMF Working Paper No. 6/98, April.

Johnson, H. Clark, *Gold, France, and the Great Depression: 1919–1935,* Yale University Press, New Haven: 1998.

Jonung, L. and T. Hagberg, "How costly was the crisis?" Työväen Akatemia, Kauniainen; September 2002.

Kaminsky, Graciela L. and Carmen M. Reinhart, "The Twin Crises: The Causes of Banking and Balance of Payments Problems," *American Economic Review,* Vol. 89 No. 3, June 1999, 473–500.

Kaminsky, Graciela L. and Carmen M. Reinhart, and Carlo Vegh, "When It Rains It Pours: Procyclical Capital Flows and Macroeconomic Policies," *NBER Macro Annual 2004* (Kenneth Roggoff and Mark Gertler, editors), MIT Press, 2005.

Kindleberger, Charles P., *Manias, Panics and Crashes*: *A History of Financial Crises* (New York: Basic Books, 1989).

Kryzanowski, Lawrence and Gordon S. Roberts, "Perspectives on Canadian Bank Insolvency During the 1930s," *Journal of Money, Credit & Banking*, Vol. 31, No. 1, February 1999.

Lindert, Peter H. and Peter J. Morton, "How Sovereign Debt Has Worked," in Jeffrey Sachs, ed., *Developing Country Debt and Economic Performance,* Vol. 1, University of Chicago Press, 1989, 39–106.

MacDonald, James, *A Free Nation Deep in Debt: The Financial Roots of Democracy* (New York: Farrar, Straus, and Giroux, 2003).

Maddison, Angus, *Historical Statistics for the World Economy: 1–2003 AD*. (Paris: OECD, 2004). http://www.ggdc.net/maddison/

McElderry, Andrea Lee, *Shanghai Old-Style Banks 1800–1935: A Traditional Institution in a Changing Society*, Ann Arbor: Center for Chinese Studies, University of Michigan, 1976.

Mendoza, Enrique G. and Marco Terrones, "An Anatomy of Credit Booms: Evidence from the Macro Aggregates and Micro Data," NBER Working Paper 14049, May 2008.

Mitchell, Brian R., *International Historical Statistics: Africa, Asia, and Oceania, 1750–2000*, London: Palgrave MacMillan, 2003a.

Mitchell, Brian R., *International Historical Statistics: The Americas, 1750–2000*, London: Palgrave MacMillan, 2003b.

Nakamura, Leonard I. and Carlos E.J.M. Zarazaga, "Banking and Finance in Argentina in the Period 1900–35," June 2001, FRB Philadelphia Working Paper No. 01-7.

Neal, Larry, and Marc Weidenmier, "Crises in the Global Economy from Tulips to Today: Contagion and Consequences," in Michael D. Bordo, Alan M. Taylor, and Jeffrey G. Williamson (eds.), *Globalization in Historical Perspective*, Chicago: University of Chicago Press for the NBER, 2003.

Neely, Christopher, "The Profitability of U.S. Intervention in the Foreign Exchange Markets," *Journal of International Money and Finance* Vol. 14, (1995), 823–844.

Noel, Maurer, *The Power and the Money—The Mexican Financial System, 1876–1932*, Stanford: Stanford University Press, 2002.

Norges Bank, *The Norwegian Banking Crisis*, Occasional Paper No 33, Norges Bank, 2006.

Obstfeld, Maurice, and Alan M. Taylor, *Global Capital Markets: Integration, Crisis, and Growth*, Japan-U.S. Center Sanwa Monographs on International Financial Markets, Cambridge: Cambridge University Press, 2004.

Øksendal, Lars, "Re-Examining Norwegian Monetary Policy in the 1930s," manuscript, Department of Economics, Norwegian School of Economics and Business Administration, 2007.

Philippon, Thomas, "Why has the US Financial Sector Grown So Much? The Role of Corporate Finance," National Bureau of Economic Research Working Paper 13405, September 2007.

Purcell, John F. H., and Jeffrey A. Kaufman, *The Risks of Sovereign Lending: Lessons from History*, New York: Salomon Brothers, 1993.

Rajan, Raghuram, Enrica Detragiache and Giovanni Dell'Ariccia, "The Real Effect of Banking Crises," *Journal of Financial Intermediation* Vol. 17, 2008, 89–112.

Reinhart, Carmen M., "Default, Currency Crises, and Sovereign Credit Ratings," *World Bank Economic Review*, Vol. 16 No. 2, 2002, 151–170.

Reinhart, Carmen M., and Vincent R. Reinhart, "Capital Flow Bonanzas: An Encompassing View of the Past and Present," in Jeffrey Frankel and Francesco Giavazzi (eds.), *NBER International Seminar in Macroeconomics 2008*, Chicago: Chicago University Press for NBER, forthcoming.

Reinhart, Carmen M., Kenneth S. Rogoff, and Miguel A. Savastano, "Debt Intolerance," *Brookings Papers on Economic Activity,* Vol. 1, Spring 2003, 1–74.

Reinhart, Carmen M., and Kenneth S. Rogoff, "This Time Is Different: A Panoramic View of Eight Centuries of Financial Crises," NBER Working Paper 13882, March 2008a.

Reinhart, Carmen M., and Kenneth S. Rogoff, "Is the 2007 U.S. Subprime Crisis So Different? An International Historical Comparison," *American Economic Review,* Vol. 98 No. 2, May 2008b, 339–344.

Reinhart, Carmen M., and Kenneth S. Rogoff, "The Forgotten History of Domestic Debt," NBER Working Paper 13946, April 2008c.

Sanhueza, Gonzalo, "Chilean Banking Crisis of the 1980s: Solutions and Estimation of the Costs," Central Bank of Chile Working Paper 104, Santiago, Chile, 2001.

Shiller, Robert, *Irrational Exuberance*, Princeton, NJ: Princeton University Press, 2005.

Shin, Inseok and Joon-Ho Hahm, 1998, "The Korean Crisis: Causes and Resolution," Korea Development Institute, Working Paper, prepared for the KDI–EWC Conference on the Korean Crisis: Causes and Resolution, August 1998, Hawaii.

Sundararajan, Vasudevan, and Tomás Baliño, *Banking Crises: Cases and Issues* Washington DC: International Monetary Fund, 1991.

Suter, Christian, *Debt Cycles in the World-Economy: Foreign Loans, Financial Crises, and Debt Settlements*, 1820–1990, Boulder: Westview Press, 1992.

Sutton, Gregory D., "Explaining Changes in House Prices," *BIS Quarterly Review* (September 2002): 46–55.

Teichova, Alice, Ginette Kurgan-van Hentenryk, and Dieter Ziegler (eds), *Banking, Trade and Industry: Europe, America and Asia from the thirteenth to the twentieth century*, Cambridge University Press, 1997.

Temin, Peter, "The German Crisis of 1931: Evidence and Tradition," *Cliometrica: Journal of Historical Economics and Econometric History* 2(1), 2008, pp. 5–17.

Total Economy Database, http://www.conference-board.org/economics/database.cfm.

Vale, Bent, *The Norwegian Banking Crisis*, Occasional Paper No 33, Norges Bank, 2006.

Vogler R., "The Genesis of Swiss Banking Secrecy: Political and Economic Environment," *Financial History Review* 8(1), 2001, pp. 73–84.

Willis, Parker H., and B.H. Beckhart, eds., *Foreign Banking Systems*, (New York: Henry Holt and Company, Inc., 1929).

Young, Arthur Nichols, *China's Nation-building Effort, 1927–1937: The Financial and Economic Record*, Stanford: Stanford University, 1971.

Appendix I. Country sample, crisis definition and dates

In this section, we list the countries in the core sample (Table A1), and describe the criteria used in this study to date banking crises.

With regard to banking crises, our analysis stresses events. The main reason for following this approach has to do with the lack of long time-series data that would allow us to date banking or financial crises quantitatively along the lines of inflation or currency crashes. For example, the relative price of bank stocks (or financial institutions relative to the market) would be a logical indicator to examine. However, this is problematic, particularly for the earlier part of our sample as well as for developing countries (where many domestic banks do not have publicly traded equity).

If the beginning of a banking crisis is marked by bank runs and withdrawals, then changes in bank deposits could be used to date the crises. This indicator would have certainly done well in dating the numerous banking panics of the 1800s. Often, however, the banking problems do not arise from the liability side, but from a protracted deterioration in asset quality, be it from a collapse in real estate prices or increased bankruptcies in the nonfinancial sector. In this case, a large increase in bankruptcies or nonperforming loans could be used to mark the onset of the crisis. Indicators of business failures and nonperforming loans are also usually available only sporadically, if at all; the latter are also made less informative by the banks' desire to hide their problems for as long as possible.

Table A1. Countries, Regions, and World GDP

Country (An asterisk denotes no sovereign default or rescheduling history)	Year of Independence if after 1800	Share of World Real GDP 1990 International Geary–Khamis US dollars	
		1913	1990
Africa			
Algeria	1962	0.23	0.27
Angola	1975	0.00	0.03
Central Africa Republic	1960	0.00	0.01
Côte D'Ivoire	1960	0.00	0.06
Egypt	1831	0.40	0.53
Kenya	1963	0.00	0.10
Mauritius *	1968	0.00	0.03
Morocco	1956	0.13	0.24
Nigeria	1960	0.00	0.40
South Africa	1910	0.36	0.54
Tunisia	1957	0.06	0.10
Zambia	1964	0.00	0.02
Zimbabwe	1965	0.00	0.05
Asia			
China		8.80	7.70
Hong Kong *			
India	1947	7.47	4.05
Indonesia	1949	1.65	1.66
Japan		2.62	8.57
Korea *	1945	0.34	1.38
Malaysia *	1957	0.10	0.33
Myanmar	1948	0.31	0.11
Philippines	1947	0.34	0.53
Singapore *	1965	0.02	0.16
Taiwan *	1949	0.09	0.74
Thailand *		0.27	0.94
Europe			
Austria		0.86	0.48
Belgium *	1830	1.18	0.63
Denmark *		0.43	0.35
Finland *	1917	0.23	0.31
France		5.29	3.79
Germany		8.68	4.67
Greece	1829	0.32	0.37
Hungary	1918	0.60	0.25
Italy		3.49	3.42
Netherlands *		0.91	0.95
Norway *	1905	0.22	0.29
Poland	1918	1.70	0.72
Portugal		0.27	0.40
Romania	1878	0.80	0.30
Russia		8.50	4.25
Spain		1.52	1.75
Sweden		0.64	0.56
Turkey		0.67	1.13
United Kingdom *		8.22	3.49

Sources: *Correlates of War* (2007), Maddison (2004).

Notes: An asterisk denotes no sovereign external default or rescheduling history.

Table A1 (concluded) Countries, Regions, and World GDP

	Year of Independence if after 1800	Share of World Real GDP 1990 International Geary–Khamis US dollars	
		1913	1990
Latin America			
Argentina	1816	1.06	0.78
Bolivia	1825	0.00	0.05
Brazil	1822	0.70	2.74
Chile	1818	0.38	0.31
Colombia	1819	0.23	0.59
Costa Rica	1821	0.00	0.05
Dominican Republic	1845	0.00	0.06
Ecuador	1830	0.00	0.15
El Salvador	1821	0.00	0.04
Guatemala	1821	0.00	0.11
Honduras	1821	0.00	0.03
Mexico	1821	0.95	1.91
Nicaragua	1821	0.00	0.02
Panama	1903	0.00	0.04
Paraguay	1811	0.00	0.05
Peru	1821	0.16	0.24
Uruguay	1811	0.14	0.07
Venezuela	1830	0.12	0.59
North America			
Canada *	1867	1.28	1.94
United States *		18.93	21.41
Oceania			
Australia *	1901	0.91	1.07
New Zealand *	1907	0.21	0.17
	Total Sample-66 countries		
		93.04	89.24

Sources: *Correlates of War* (2007), Maddison (2004).

Given these data limitations, we mark a banking crisis by two types of events: (1) bank runs that lead to the closure, merging, or takeover by the public sector of one or more financial institutions (as in Venezuela in 1993 or Argentina in 2001); and (2) if there are no runs, the closure, merging, takeover, or large-scale government assistance of an important financial institution (or group of institutions) that marks the start of a string of similar outcomes for other financial institutions (as in Thailand 1996–97). We rely on existing studies of banking crises and on the financial press; according to these studies the fragility of the banking sector was widespread during these periods.

Many country-specific studies (such as Camprubi, 1957, for Peru; Cheng, 2003, McElderry, 1976, for China; and Noel, 2002, for Mexico) pick up banking crisis episodes not covered by the multicountry literature and contribute importantly to this chronology, but the main sources for cross-country dating of crises are as follows: For post-1970, the comprehensive and well-known study by Caprio and Klingebiel—which the authors updated through 2003—is authoritative, especially when it comes to classifying banking crises into systemic or more benign categories; Kaminsky and Reinhart (1999), and Jácome (2008) for Latin America round out the sources. For pre–World War II, Kindleberger (1989), Bordo et al. (2001), and Willis and Beckhart (1929) provide multicountry coverage on banking crises.

We relegate a summary discussion of the limitations of this event-based dating approach to Table A2, while the years in which the banking crises began are listed in Table A3—unfortunately, for many of the early episodes it is difficult to ascertain how long the crisis lasted.

Table A2. Defining Banking Crises by Events: A Summary

Type of Crisis	Definition and/or Criteria	Comments
Banking crisis Type I: systemic/severe Type II: financial distress/ milder	We mark a banking crisis by two types of events: (1) bank runs that lead to the closure, merging, or takeover by the public sector of one or more financial institutions; and (2) if there are no runs, the closure, merging, takeover, or large-scale government assistance of an important financial institution (or group of institutions) that marks the start of a string of similar outcomes for other financial institutions.	This approach to dating the beginning of a banking crisis is not without drawbacks. It could date a crisis too late, because the financial problems usually begin well before a bank is finally closed or merged; it could also date a crisis too early, because the worst part of a crisis may come later. Unlike the external debt crises (see below), which have well-defined closure dates, it is often difficult or impossible to accurately pinpoint the year in which a crisis ended.

Table A3. Banking Crises Dates and Capital Mobility: 1800–2007

High-Income		Middle Income		Low Income	
Country (ies)	BeginningYear	Country (ies)	BeginningYear	Country (ies)	BeginningYear
		Capital Mobility: Low-Moderate, 1800-1879			
France	1802				
France	1805				
UK	1810				
UK	1815				
Denmark	1813				
US	1818				
UK, US	1825				
US	1836				
Canada, UK	1837				
UK	1847				
Belgium	1848				
UK, US	1857			India	1863
Italy, UK	1866				
Austria, US	1873	Peru	1873		
		South Africa	1877		
		Capital Mobility: High, 1880-1914			
Germany	1880				
France	1882	Mexico	1883		
US	1884				
Denmark	1885				
Italy	1887				
France	1889				
Portugal, UK, US	1890	Argentina* Brazil, Chile, South Africa	1890		
Germany, Italy, Portugal	1891				
Australia	1893				
Netherlands, Sweden	1897				
Norway	1898	Chile	1899		
Finland	1900	Brazil	1900		
Germany, Japan	1901				
Denmark, France, Italy, Japan, Sweden, US	1907	Mexico	1907		
		Chile	1908		
		Mexico	1913	India	1913
Belgium, France*, Italy, Japan, Netherlands, Norway,* UK, US	1914	Argentina*, Brazil*	1914		
		Capital Mobility: Low, 1915-1919			
		Chile*	1915		

Table A3. Banking Crises Dates and Capital Mobility: 1800–2007 (continued)

High Income		Middle Income		Low Income	
Country (ies)	BeginningYear	Country (ies)	BeginningYear	Country (ies)	BeginningYear
		Capital Mobility: Moderate, 1920–1929			
Portugal*	1920	Mexico	1920		
Finland, Italy, Netherlands,* Norway*	1921			India	1921
Canada, Japan, Taiwan	1923	China	1923		
Austria	1924				
Belgium,* Germany*	1925	Brazil, Chile*	1926		
Japan, Taiwan	1927				
US*	1929	Brazil, Mexico*	1929	India	1929
		Capital Mobility: Low, 1930–1969			
France, Italy	1930				
Belgium, Finland, Germany*, Greece, Portugal* Spain,* Sweden*	1931	Argentina*, Brazil, China	1931		
Belgium*	1934	Argentina, China	1934		
Italy	1935	Brazil	1937		
Belgium,* Finland	1939				
				India	1947*
		Brazil	1963		
		Capital Mobility: Moderate, 1970–1979			
		Uruguay	1971		
UK	1974	Chile *	1976	Central African Republic	1976
Germany, **Israel, Spain**	1977	South Africa	1977		
		Venezuela	1978		

Table A3. Banking Crises Dates and Capital Mobility: 1800–2007 (continued)

High Income		Middle Income		Low Income	
Country (ies)	BeginningYear	Country (ies)	BeginningYear	Country (ies)	BeginningYear
		Capital Mobility: High, 1980-2007			
		Argentina,*	1980		
		Chile *			
		Ecuador,			
		Egypt,			
		Mexico,	1981		
		Philippines			
		Uruguay			
Hong Kong,	1982	**Colombia**,	1982	**Congo (Dem.**	1982
Singapore		Turkey		**Rep.), Ghana**	
Canada, Korea,	1983	**Morocco,**	1983	**Equatorial**	1983
Kuwait		**Peru,**		**Guinea, Niger**	
Taiwan		**Thailand**			
UK, US	1984			Mauritania	1984
		Argentina*	1985	**Guinea, Kenya**	1985
		Brazil,*			
		Malaysia*			
					1986
Denmark,	1987	**Bolivia,**	1987	**Bangladesh,**	1987
New Zealand,		**Cameroon,**		**Mali,**	
Norway		**Costa Rica,**		**Mozambique,**	
		Nicaragua		**Tanzania**	
		Lebanon,	1988	**Benin, Burkina**	1988
		Panama		**Faso, Central**	
				African	
				Republic, **Côte**	
				D'Ivoire,	
				Madagascar,	
				Nepal, Senegal	
Australia	1989	**Argentina, ***	1989		
		El Salvador,			
		South Africa,			
		Sri Lanka			
Italy	1990	**Algeria,**	1990	**Sierra Leone**	1990
		Brazil*, Egypt,			
		Romania			
Czech	1991	**Georgia,**	1991	**Djbouti,**	1991
Republic,		**Hungary,**		**Liberia,**	
Finland,		**Poland,**		**Sao Tome**	
Greece,		**Slovak**			
Sweden, UK		**Republic**			
Japan	1992	**Albania,**	1992	Angola, Chad,	1992
		Bosnia-		**China, Congo,**	
		Herzegovina,		**Kenya**, Nigeria	
		Estonia,			
		Indonesia			
Slovenia,		**Cape Verde**,	1993	**Guinea,**	1993
Macedonia		**Venezuela**		**Eritrea**, India,	
				Kyrgyz	
				Republic,	
				Togo	

Table A3. Banking Crises Dates and Capital Mobility: 1800–2007 (continued)

High Income		Middle Income		Low Income	
Country (ies)	BeginningYear	Country (ies)	BeginningYear	Country (ies)	BeginningYear
		Capital Mobility: High, 1980–2007			
France	1994	Armenia,	1994	Burundi,	1994
		Bolivia,		Congo (Rep.),	
		Bulgaria,		Uganda	
		Costa Rica,			
		Jamaica,			
		Latvia,			
		Mexico*,			
		Turkey			
UK	1995	Argentina,	1995	Guinea-Bissau,	1995
		Azerbaijan,		Zambia,	
		Brazil,		Zimbabwe	
		Cameroon,			
		Lithuania,			
		Paraguay,			
		Russia,			
		Swaziland,			
		Croatia,	1996	Myanmar	1996
		Ecuador,		Yemen	
		Thailand			
Taiwan	1997	Indonesia,	1997	Vietnam	1997
		Korea*,			
		Malaysia,			
		Mauritius,			
		Philippines,			
		Ukraine			
		Colombia*,	1998		
		Ecuador,			
		El Salvador			
		Russia			
		Bolivia,	1999		
		Honduras, Peru			
		Nicaragua	2000		
		Argentina*	2001		
		Guatemala			
		Paraguay	2002		
		Uruguay			
		Dominican	2003		
		Republic			
		Guatemala	2006		
US, UK	2007				

Note: An asterisk (*) denotes that the episode in question was associated with an output collapse as defined in Barro and Ursua (2008). However, many of the countries in our extended sample are not covered in Barro and Ursua (2008).

Table A4. Real House Prices

Country	Period covered	Source	Commentary
Argentina	1981–2007	Reporte Immobiliario	Average value of old apartments, Buenos Aires
Colombia	1997:Q1–2007:Q4	Departamento Administrativo Nacional de Estadistica	New housing price index, total 23 municipalities
Finland	1983:Q1–2008:Q1	Stat-Fin Online Service	Dwellings in old blocks of flats, Finland
	1970–2007	Bank of International Settlements	House price index, Finland
Hong Kong	1991:7–2008:2	Hong Kong University	Real estate index series, Hong Kong
Hungary	2000–2007	Otthon Centrum	Average price of old condominiums, Budapest
Iceland	2000:3–2008:4	Statistics Iceland	House price index, Iceland
Indonesia	1994:Q1–2008:Q1	Bank of Indonesia	Residential property price index, new houses, new developments, big cities
Ireland	1996:Q1–2008:Q1	ESRI/Permanent TSB	House prices, standardized, Ireland
Japan	1955:H1–2007:H2	Japan Real Estate Institute	Land prices, urban, residential index, Japan
Malaysia	2000:Q1–2007:Q4	Bank Negara	House price index, Malaysia
Norway	1970–2007	Bank of International Settlements	House price index, all dwellings, Norway
	1819–2007	Norges Bank	Housing prices, Norway
Philippines	1994:Q4–2007:Q4	Colliers International: Philippines	Prime 3-bedroom condominium, Makati Central Business District
South Korea	1986:1–2006:12	Kookmin Bank	Housing price index
	2007:Q1–2008:Q1	Kookmin Bank	Housing price index
Spain	1990:Q1–2008:Q1	Banco de España	House price index, appraised housing, Spain
	1970–2007	Bank of International Settlements	House price index, appraised housing, Spain
Thailand	1991:Q1–2007:Q	Bank of Thailand	House price index, single detached house
United Kingdom	1952:1–2008:4	Nationwide	Average house price UK
	1970–2007	Bank of International Settlements	House price index, UK
United States	1890–2007	Standard and Poors	Case–Shiller national price index, US
	1987:Q1–2008:Q2		

Table A5. Banking Crises: Historical Summaries			
Country	**Brief Summary**	**Year**	**Source**
Albania	After the July 1992 cleanup, 31% of "new" banking system loans were nonperforming. Some banks faced liquidity problems due to a logjam of interbank liabilities.	1992	Caprio and Klingebiel (2003)
Algeria	Circulation limits led to suspended specie payments. Lack of mortgage banking institutes led bank to secure loans based on real estate—many were foreclosed to escape loss.	August 1870	Reinhart and Rogoff (2008a); Conant (1915)
Algeria	Share of nonperforming loans in the banking system reached 50%.	1990–1992	Caprio and Klingebiel (2003)
Angola	Two state-owned commercial banks had insolvency problems.	1991–1996	Caprio and Klingebiel (2003)
Argentina	Suspension of National Bank of the Argentine Republic; high foreign debt, domestic credit, and imports led to reserve losses; peso fell 27% but the crisis was brief and had relatively little impact on industrial production.	January, 1885	Bordo and Eichengreen (1999); Conant (1915)
	Banks made extensive loans, and real estate prices rose dramatically with excess bank note issue. Land prices fell by 50%, and Bank of the Nation could not pay its dividend, leading to a run, and the peso fell 36% both years. In July 1890, every bank of issue was suspended—sent gold up 320%. In December 1890, the Bank of Argentine Nation replaced the old Bank of the Nation.	July 1890–1891	Bordo and Eichengreen (1999); Conant (1915)
	Bad harvests and European demands for liquidity due to the War led to bank runs, with private banks losing 45% of deposits in two years.	1914	Bordo and Eichengreen (1999); Conant (1915); Nakamura and Zarazaga (2001)
	End of gold standard with insolvent loans building.	1931	Bordo et al. (2001); della Paolera and Taylor (1999)
	Huge loans to government and nonperforming assets building for many years; finally all taken over by the new Central Bank.	1934	Bordo et al. (2001); della Paolera and Taylor (1999)
	The failure of a large private bank (Banco de Intercambio Regional) led to runs on three other banks. Eventually more than 70 institutions—16% of commercial bank assets and 35% of finance company assets—were liquidated or subjected to central bank intervention.	March, 1980–1982	Kaminsky and Reinhart (1999); Caprio and Klingebiel (2003); Bordo et al. (2001)
	In early May, the government closed a large bank, leading to large runs, which led the government to freeze dollar deposits on May 19.	May, 1985	Kaminsky and Reinhart (1999)
	Nonperforming assets accounted for 27% of aggregate portfolio and 37% of state banks' portfolios. Failed banks held 40% of financial system assets.	1989–1990	Caprio and Klingebiel (2003); Bordo et al. (2001)
	The Mexican devaluation led to a run on banks, which resulted in an 18% decline in deposits between December and March. Eight banks suspended and three banks collapsed. Through end of 1997, 63 of 205 banking institutions were closed or merged.	December, 1994–1996	Reinhart (2002); Caprio and Klingebiel (2003); Bordo et al. (2001)
	In March 2001, a bank run started due to lack of public confidence in government policy actions. In late November 2001, many banks were on the verge of collapsing and partial withdrawal restrictions were imposed (corralito) and fixed-term deposits (CDs) were reprogrammed to stop outflows from banks (corralon). In December 2002, the corralito was lifted. In January 2003, one bank was closed, three banks were nationalized, and many others were reduced in size.	March, 2001	Caprio and Klingebiel (2003); Jácome (2008)
Armenia	The Central Bank closed half the active banks; large banks continued to suffer from a high level of nonperforming loans. The savings bank was financially weak.	August, 1994–1996	Caprio and Klingebiel (2003)

Country	Brief Summary	Year	Source
Australia	Domestic lending boom showed the deteriorated quality of bank assets; land boom and unregulated banking system led to speculation. Closure of Mercantile Bank in Australia and Federal Bank of Australia meant British deposits ran off. Bank share prices fell heavily, banks retrenched and stopped long-term loans, and many closed. The depression of the 1890s followed.	January, 1893	Bordo and Eichengreen (1999); Conant (1915)
	Two large banks received capital from government to cover losses.	1989–1992	Caprio and Klingebiel (2003); Bordo et al. (2001);
Austria	Speculation in economy; Vienna Stock Exchange crash led 52 banks and 44 provincial banks to fail.	May, 1873–1874	Conant (1915)
Austria	Difficulties in major bank; liquidation began in June.	May, 1923	Bernanke and James (1990)
Austria	Second largest bank failed and merged with major bank.	November, 1929	Bernanke and James (1990)
Austria	Failure of Creditanstalt and run of foreign depositors.	May, 1931	Bernanke and James (1990)
Azerbaijan	Twelve private banks closed; three large state-owned banks deemed insolvent and one faced serious liquidity problems.	1995	Caprio and Klingebiel (2003)
Bangladesh	Four banks, accounting for 70% of credit, had 20% nonperforming loans. From the late 1980s, the entire private and public banking system was technically insolvent.	1987–1996	Caprio and Klingebiel (2003); Bordo et al. (2001)
Belarus	Many banks undercapitalized; forced mergers burdened some banks with poor loan portfolios.	1995	Caprio and Klingebiel (2003)
Belgium	Two rival banks: Bank of Belgium (created in 1835) and Société Générale. Fear of war led to credit contraction. Société tried to bankrupt the Bank of Belgium by redeeming large amounts of credit, weakening both. Runs on Bank of Belgium; did not suspend payment, but appealed to Treasury for assistance.	December, 1838–1839	Conant (1915)
	Bank of Belgium resigned its function of State depository to Société Générale; Société felt impact of crisis—abandoned all branches except Antwerp.	1842	Conant (1915)
	Société Générale suspended payments and lost right of issue after government demands for reform. National Bank of Belgium created.	February, 1848	Conant (1915)
	Public fear due to State decisions and burdens; but Bank of Belgium reassured people by continuing payments (raised discount rate and placed restrictions on acceptance of commercial paper)—great cost to commerce and bank.	July, 1870–1871	Conant (1915)
	Worldwide investors dumped assets and withdrew liquidity, pushing prices down and threatening financial institutions with failure. Stock exchanges around the world collapsed.	1914	Bordo et al. (2001)
	Consequence of systemic deflation led to a funding crisis.	1925–1926	Bordo et al. (2001); Johnson (1998)
	Rumors about imminent failure of Bank of Bruselles, the largest bank, led to withdrawals from all banks. Later, expectations of devaluations led to withdrawals of foreign deposits.	May, 1931	Bordo et al. (2001); Bernanke and James (1990)
	Failure of Banque Belge de Travail developed into general banking and exchange crisis.	1934	Bordo et al. (2001); Bernanke and James (1990)
		1939	Bordo et al. (2001)
Benin	All three commercial banks collapsed and 80% of banks' loan portfolios were nonperforming.	1988–1990	Caprio and Klingebiel (2003)
Bolivia	In October 1987, the central bank liquidated two of twelve state commercial banks; seven more reported large losses. In total, five banks were liquidated. Banking system nonperforming loans reached 30% in 1987 and 92% by mid-1988.	October, 1987–1988	Kaminsky and Reinhart (1999); Caprio and Klingebiel (2003)

Country	Brief Summary	Year	Source
	Two banks, with 11% of banking system assets, closed in 1994. In 1995, four of 15 domestic banks, with 30% of banking system assets, experienced liquidity problems and suffered a high level of nonperforming loans.	1994	Caprio and Klingebiel (2003)
	One small bank (with a market share of 4.5% of deposits) was intervened and resolved.	1999	Jácome (2008)
Bosnia & Herzegovina	Banking system suffered from a high level of nonperforming loans due to the breakup of the former Yugoslavia and the civil war.	1992–?	Caprio and Klingebiel (2003)
Botswana	Banks merged, liquidated, or recapitalized.	1994–1995	Caprio and Klingebiel (2003)
Brazil	Large government borrowing and currency speculation—the government continually issued more notes. National Bank of Brazil and Bank of US of Brazil merged into Bank of Republic of US of Brazil. The new bank retired the government's paper notes. Financial-sector turmoil led to decline in output.	December, 1890–1892	Bordo and Eichengreen (1999); Conant (1915)
	Civil War and currency depreciation. A loan from Rothschild's in London helped with an agreement on settling the loan.	1897–1898	Bordo and Eichengreen (1999); Conant (1915)
	Inelastic coffee exports could not respond to currency depreciation; concentrated industry, limited competition, and slowed recovery from deflation. Liquidity injection did not help—deposits ran off and loans recalled.	1900–1901	Bordo and Eichengreen (1999); Conant (1915)
		1914	Bordo et al. (2001)
		1923	Bordo et al. (2001)
		1926	
		1929	
		1963	Bordo et al. (2001)
	Three large banks (Comind, Maison Nave, and Auxiliar) were taken over by the government.	November, 1985	Kaminsky and Reinhart (1999)
	Deposits converted to bonds.	1990	Caprio and Klingebiel (2003); Bordo et al. (2001)
	In 1994, 17 small banks were liquidated, three private banks were intervened, and eight state banks placed under administration. The Central Bank intervened in or put under temporary administration 43 financial institutions, and banking system nonperforming loans reached 15% by the end of 1997. Private banks returned to profitability in 1998, but public banks did not begin to recover until 1999.	July, 1994–1996	Kaminsky and Reinhart (1999); Caprio and Klingebiel (2003); Bordo et al. (2001)
Brunei	Several financial firms and banks failed.	1986	Caprio and Klingebiel (2003)
Bulgaria	In 1995, about 75% of banking system loans were substandard. Banking system run in early 1996. The government stopped providing bailouts, prompting the closure of 19 banks accounting for 1/3 of sector assets. Surviving banks were recapitalized by 1997.	1995–1997	Caprio and Klingebiel (2003)
Burkina Faso	Banking system nonperforming loans estimated at 34%.	1988–1994	Caprio and Klingebiel (2003)
Burundi	Banking system nonperforming loans estimated at 25% in 1995 and one bank was liquidated.	1994	Caprio and Klingebiel (2003)
Cameroon	In 1989, banking system nonperforming loans reached 60–70%. Five commercial banks were closed and three restructured.	1987–1993	Caprio and Klingebiel (2003)
	At the end of 1996, nonperforming loans were 30% of total loans. Two banks were closed and three restructured.	1995–1998	Caprio and Klingebiel (2003)
Canada	Bank of Upper Canada and Gore Bank suspended specie payments; rebellion in Lower Canada led to suspension of payments.	November, 1838–1839	Conant (1915)
	Bank in Western Canada suspended payments, leading to financial panic. Bank of Upper Canada failed; rapid growth in Ontario—lost capital in land speculation in 1857; abandoned safe banking practices and made loans to lawyers, politicians, and gentry.	September, 1866	Conant (1915)

Country	Brief Summary	Year	Source
	Several bank failures; depression from 1874–1879.	September, 1873	Conant (1915)
	Ontario Bank failed due to speculation in NY stock market; shareholders lose entire investments.	October, 1906	Conant (1915)
	Current account deficit and a crop failure meant eastern banks were unwilling to ship funds west; banks raised loan rates, cut lending, and limited credit to farmers. Short but sharp recession; Canadian banks borrowed dominion notes and banks increased note issue.	January, 1908	Bordo and Eichengreen (1999); Conant (1915)
	Royal Bank acquired Bank of British Honduras and Bank of British Guiana.	1912	Conant (1915)
	Home Bank of Canada, with over 70 branches, failed due to bad loans.	1923	Bordo et al. (2001); Kryzanowski and Roberts (1999)
	Fifteen members of the Canadian Deposit Insurance Corporation, including two banks, failed.	1983–1985	Caprio and Klingebiel (2003); Bordo et al. (2001)
Cape Verde	At the end of 1995, commercial banks' nonperforming loans reached 30%.	1993	Caprio and Klingebiel (2003)
Central African Republic	Four banks were liquidated.	1976–1982	Caprio and Klingebiel (2003)
	The two largest banks, with 90% of assets, were restructured. Banking system nonperforming loans reached 40%.	1988–1999	Caprio and Klingebiel (2003)
Chad	Banking sector experienced solvency problems.	1980s	Caprio and Klingebiel (2003)
Chad	Private sector nonperforming loans reached 35%.	1992	Caprio and Klingebiel (2003)
	Bank currency system and gold standard completely wrecked by threat of war with Argentine Republic. On July 5th, growing exports of gold and Bank of Chile’s refusal to honor gold drafts led to a run on banks at Santiago and general suspicion of gold drafts. The government issued irredeemable paper money, constantly increasing the monetary supply for the next 10 years, leading to a period of inflation and overspeculation.	July, 1898	Bordo and Eichengreen (1999); Conant (1915)
	Four years of inflationary measures following a stock market crash; the peso fell 30% during the crisis, and the government loaned treasury notes to banks to prevent a financial sector crisis. Data concerning the ensuing recession are unavailable.	1907	Bordo and Eichengreen (1999); Conant (1915)
		1914	Bordo et al. (2001)
		1925	Bordo et al. (2001)
	Entire mortgage system insolvent.	1976	Caprio and Klingebiel (2003); Bordo et al. (2001)
	Three banks began to lose deposits; interventions began two months later. Interventions occurred in four banks and four nonbank financial institutions, accounting for 33% of outstanding loans. In 1983, there were seven more bank interventions and one financiera, accounting for 45% of financial system assets. By the end of 1983, 19% of loans were nonperforming.	September, 1981–1985	Kaminsky and Reinhart (1999); Caprio and Klingebiel (2003); Bordo et al. (2001)
China	Failure of a major silk-trading company in Shanghai led to the bankruptcies of many local banks.	1883	Cheng (2003)
China	Postwar depression led many banks to fail.	1923–1925	Young 1971
	Shanghai closed all Chinese banks for the duration of the war.	1931	Cheng (2003)
	Flight of silver led to huge economic downturn and financial crisis; the two major banks came under government control and were reorganized.	1934–1937	Cheng (2003)
	China's four large state-owned commercial banks, with 68% of banking system assets, were deemed insolvent. Banking system nonperforming loans were estimated at 50%.	1997–1999	Caprio and Klingebiel (2003)

Country	Brief Summary	Year	Source
Colombia	Banco Nacional became the first of six major banks and eight financial companies to be intervened, accounting for 25% of banking system assets.	July, 1982–1987	Kaminsky and Reinhart (1999); Caprio and Klingebiel (2003); Bordo et al. (2001)
	Many banks and financial institutions failed; capitalization ratios and liquidity decreased dramatically, and total assets of the financial industry contracted by over 20%.	April, 1998	Reinhart (2002); Jácome (2008)
Congo, Democratic Republic	Banking sector experienced solvency problems.	1980s	Caprio and Klingebiel (2003)
Congo, Democratic Republic	Four state-owned banks were insolvent; a fifth was recapitalized with private participation.	1991–1992	Caprio and Klingebiel (2003)
Congo, Democratic Republic	Nonperforming loans reached 75%. Two state-owned banks liquidated and two privatized. In 1997, 12 banks had serious financial difficulties.	1994–?	Caprio and Klingebiel (2003)
Congo, Republic of	Crisis began in 1992. In 2001–2002, two large banks were restructured and privatized. Remaining insolvent bank being liquidated.	1992–?	Caprio and Klingebiel (2003)
Costa Rica	In 1987, public banks accounting for 90% of banking system loans were in financial distress, with 32% of loans considered uncollectable.	1987	Caprio and Klingebiel (2003); Bordo et al. (2001)
	The third largest bank, Banco Anglo Costarricense, a state-owned institution with 17% of deposits was closed.	1994–1997	Caprio and Klingebiel (2003); Bordo et al. (2001); Jácome (2008)
Cote D'Ivoire	Four large banks (90% of banking system loans) were affected; three or four insolvent, six government banks closed.	1988–1991	Caprio and Klingebiel (2003); Bordo et al. (2001)
Croatia	Five banks, accounting for about half of banking system loans, were deemed insolvement and taken over by the Bank Rehabilitation Agency.	1996	Caprio and Klingebiel (2003)
Czechoslovakia	Withdrawal of foreign deposits sparked domestic withdrawals but no general banking panic.	July, 1931	Bernanke and James (1990)
Czech Republic	Several bank closings since 1993. In 1994–1995, 38% of banking system loans were nonperforming.	1991–?	Caprio and Klingebiel (2003)
Czech Republic		1994	
Denmark	Government declared it could not redeem Deposit Bank's Courant notes at original value—form of bankruptcy which diminished its public debt because notes were held by the people. New Royal Bank established; Courantbank, Specie Bank, and Deposit Bank abolished.	January, 1813	Conant (1915)
	Financial crisis led the National bank to assume central bank responsibilities through the 1860s.	1857	Jonung and Hagberg (2002)
	Industrial Bank diverted half its capital stock to cover losses; two provincial banks failed—led to lull in banking business.	1877	Conant (1915); Jonung and Hagberg (2002)
	National Bank intervened to provide support for commercial and savings banks.	1885	Jonung and Hagberg (2002)
	Important bank failure led to suspension of Freeholders' Bank and bank run on other institutions. The National Bank helped alleviate panic—took on five remaining banks and suspended banks' liabilities.	February, 1902	Conant (1915)
	Turbulence in the world markets and Germany and nonperforming assets led to decreased confidence. Consortium of five leading banks assisted and guaranteed the liabilities of weak banks, leading to a quick recovery.	1907	Bordo and Eichengreen (1999); Conant (1915); Jonung and Hagberg (2002)
		1914	Bordo et al. (2001)
	Banking crises lasted for many years due to reckless lending during the war and the international downswing in prices in the early 1920s.	1921	Bordo et al. (2001); Jonung and Hagberg (2002)
		1931	Bordo et al. (2001)
	Two small banks collapsed and shook the banking system leading to moves to curb bank lending. Cumulative losses over 1990–92 were 9% of loans; 40 of 60 problem banks were merged.	March, 1987–1992	Kaminsky and Reinhart (1999); Caprio and Klingebiel (2003); Bordo et al. (2001)

Country	Brief Summary	Year	Source
	Deep Faroese crisis.	1992	
Djibouti	Two of six commercial banks ceased operations and other banks experienced difficulties.	1991–1993	Caprio and Klingebiel (2003)
Dominican Republic	The third largest bank, with a market share of 7% of assets, was intervened.	1996	Jácome (2008)
	The 2003 banking crisis started with the intervention of the third largest bank—with a market share of 10%. Deposit withdrawals had already started by mid-2002, following allegations of fraud resulting from the discovery of hidden liabilities recorded in a "parallel bank." Immediately after, the crisis extended to two other institutions—with an additional 10% of market share—featuring similar inappropriate accounting practices.	2003	Jácome (2008)
Ecuador	Program exchanging domestic for foreign debt implemented to bail out banking system.	1981	Caprio and Klingebiel (2003); Bordo et al. (2001)
	A medium-sized bank, Banco de los Andes, with a market share of 6% of deposits, was intervened and then purchased by another private bank.	1994	Jácome (2008)
	Authorities intervened in several small financial institutions; by the end of 1995, 30 financial societies (sociedades financieras) and seven banks were receiving extensive liquidity support. In early 1996, the fifth largest commercial bank was intervened.	Late 1995–1997	Caprio and Klingebiel (2003); Bordo et al. (2001)
	60% of the banking system was intervened, taken over, or closed. Seven financial institutions, accounting for 25–30% of commercial banking assets, were closed in 1998–99. In March 1999, bank deposits were frozen for six months. By January 2000, 16 financial institutions, accounting for 65% of the assets, had either been closed (12) or taken over (four) by the governments. All deposits were unfrozen by March 2000.	April, 1998–1999	Caprio and Klingebiel (2003); Jácome (2008)
Egypt	Crisis due to credit abuse and issue of new securities.	March, 1907	Conant (1915)
Egypt	Run on Cairo and Alexandria branches of German banks.	July, 1931	Bernanke and James (1990)
	The government closed several large investment companies.	January, 1980–1981	Reinhart (2002); Caprio and Klingebiel (2003); Bordo et al. (2001)
	Four public banks were given capital assistance.	January, 1990–1995	Caprio and Klingebiel (2003); Reinhart (2002); Bordo et al. (2001)
El Salvador	Nine state-owned commercial banks had nonperforming loans averaging 37%.	1989	Caprio and Klingebiel (2003)
	After a sharp stop in economic growth in 1996 associated with a terms-of-trade deterioration (decline in coffee prices), the financial system got into stress from 1997 onwards. A small- to medium-sized institution (Banco Credisa), with a 5% market share, was closed.	1998	Jácome (2008)
Equatorial Guinea	Two of the country's largest banks were liquidated.	1983–1985	Caprio and Klingebiel (2003)
Eritrea	Most of the banking system insolvent.	1993	Caprio and Klingebiel (2003)
Estonia	Failure of two medium-sized banks; panic lasts until January.	November, 1930	Bernanke and James (1990)
Estonia	Waves of general bank runs.	September, 1931	Bernanke and James (1990)
Estonia	Insolvent banks accounted for 41% of financial system assets. Five banks' licenses were revoked and two major banks were merged and nationalized while two more merged and were converted to a loan recovery agency.	1992–1995	Caprio and Klingebiel (2003)
Estonia	The Social Bank, with 10% of financial system assets, failed.	1994	
Estonia	Three banks failed in 1998.	1998	Caprio and Klingebiel (2003)
Ethiopia	Government-owned bank restructured and nonperforming loans taken over.	1994–1995	Caprio and Klingebiel (2003)

Country	Brief Summary	Year	Source
Finland	Crisis in Russia and Balkans and export prices put the finance sector at risk. The Bank of Finland extended loans, extended note issues, but the growth rate of real GDP still fell by 4%.	1900	Bordo and Eichengreen (1999)
Finland	Fared better than other Nordic countries.	1921	Bordo et al. (2001); Jonung and Hagberg (2002)
Finland	Recession began in 1929; many banks were stuck with large losses, which led to bankruptcies; the Bank of Finland faciliated with loans and mergers.	1931	Bordo et al. (2001); Jonung and Hagberg (2002)
Finland	Financial stability was maintained and GDP growth did not suffer too much.	1939	Bordo et al. (2001); Jonung and Hagberg (2002)
Finland	A large bank (Skopbank) collapsed on September 19 and was intervened. Savings banks were badly affected; the government took control of three banks that together accounted for 31% of system deposits.	September, 1991–1994	Kaminsky and Reinhart (1999); Caprio and Klingebiel (2003); Bordo et al. (2001); Jonung and Hagberg (2002)
France	Bank of France: “serious crisis.”	1802	Conant (1915)
France	Bank of France: Debt of 68 m fr with only 0.782 m fr in specie; used commercial paper, government bonds, and credit to buy specie (Spain, Treasury); occurred after formation of third coalition against France during preparations for Austerlitz; victory at Austerlitz (Dec. 2, 1805) restored much confidence.	September, 1805–1806	Conant (1915)
France	Bankruptcies in Alsace.	December, 1827–1828	Conant (1915)
France	Severe runs on banks in Paris after Bank of Belgium failed.	December, 1838–1839	Conant (1915)
France	March 24, 1848: notes from Bank of France and departmental banks declared legal tender; necessity for uniform paper currency led to consolidation of local banks with Bank of France (April 27 and May 2).	February, 1848–1850	Conant (1915)
France	French panic after cotton speculation.	January, 1864	Conant (1915)
France	French crisis after failure of Credit Mobilier.	November, 1867–1868	Conant (1915)
France	Suspension of operations by branches of Bank of France. After surrender, Germany suspended Bank of Strasburg, and the Bank of Prussia replaced Bank of France in Alsace-Lorraine.	May, 1871	Conant (1915)
France	Speculation and financial innovation led to problems among banks; Bank of France extended loans to smaller banks and borrowed from the Bank of England to replenish reserves. Growth fell by 5% that year and failed to recover to previous trend for a long time.	February, 1882	Bordo and Eichengreen (1999); Conant (1915)
France	France financier's attempt to corner the copper market while the Comptoir d'Escompte discounted copper warrants; product limits broke down and copper prices fell so the Comptoir suffered heavy losses. The head committed suicide, leading to a run—sound assets could not satisfy liquidity demands. Comptoir appealed to Bank of France for help; growth fell by 14% during the crisis.	March, 1889	Bordo and Eichengreen (1999); Conant (1915)
France	French banking panic; depression in Bourse since beginning of Russo–Japanese War.	February, 1904	Conant (1915)
France	Trouble in the United States raised global demand for gold and money; majority of France's losses were in silver to its colonies. As a result, visible impact on GDP growth was mild.	1907	Bordo and Eichengreen (1999); Conant (1915)
France	Failure of two major banks; runs on provincial banks.	1930–1932	Bordo et al. (2001); Bernanke and James (1990)

Country	Brief Summary	Year	Source
France	Crédit Lyonnaise had serious solvency problems.	1994–1995	Caprio and Klingebiel (2003); Bordo et al. (2001)
Gabon	One bank temporarily closed in 1995.	1995	Caprio and Klingebiel (2003)
Gambia	In 1992, a government bank was restructured and privatized.	1985–1992	Caprio and Klingebiel (2003)
Georgia	Most large banks virtually insolvent. About 1/3 of banking system loans were nonperforming.	1991	Caprio and Klingebiel (2003)
Germany	Hamburg Bank: rescued by Austrian National Bank; restored confidence, dispelled crisis; repaid loan in six months.	1857	Conant (1915)
Germany	Triggered by Russia's crisis; stock prices in Berlin fell by 61%; hit mortgage banks first, but discount banks provided liquidity. Dresdner Creditanstalt, Bank of Leipzig, and Leipzig Bank failed. Modest slowdown in the rate of growth.	1901	Bordo and Eichengreen (1999); Conant (1915)
Germany	Twin crisis in which banks were recapitalized or their deposits guaranteed by the government. Bank runs exacerbated troubles building since mid-1930; many banks unable to make payments and there was a bank holiday.	1931	Bordo et al. (2001); Temin (2008); Bernanke and James (1990)
Germany	Giro institutions faced problems.	late 1970s	Caprio and Klingebiel (2003)
Ghana	7/11 banks insolvent; rural banking sector affected.	1982–1989	Caprio and Klingebiel (2003); Bordo et al. (2001)
Ghana	Nonperforming loans increased 11% to 27%; two state-owned banks were in bad shape and three others insolvent.	1997	Caprio and Klingebiel (2003); Bordo et al. (2001)
Greece		1931	Bordo et al. (2001)
Greece	Localized problems required significant injections of public funds.	1991–1995	Caprio and Klingebiel (2003); Reinhart (2002), Bordo et al. (2001)
Guatemala	Two small state-owned banks had a high level of nonperforming operations; closed in early 1990s.	1991	Caprio and Klingebiel (2003)
	Three small banks (Banco Empresarial, Promotor, and Metropolitano), with a market share of 7% of deposits, were intervened and later closed for not observing solvency requirements.	2001	Jácome (2008)
	The third largest bank, Bancafe (with 9% of deposits), was closed followed by another small bank, Banco del Comercio (with 1% of deposits), a few months later.	2006	Jácome (2008)
Guinea	Six banks (with 99% of system deposits) deemed insolvent.		Caprio and Klingebiel (2003)
Guinea	Two banks insolvent, one other had serious financial difficulties—45% of market total.	1993–1994	Caprio and Klingebiel (2003)
Guinea-Bissau	End of 1995, 45% of commerical banks' loan portfolios were nonperforming.	1995	Caprio and Klingebiel (2003)
Honduras	A small bank, Bancorp, with 3% of deposits, was closed in September 1999.	1999	Jácome (2008)
Honduras	A small bank, Banhcreser, with 3% of market share, was closed.	2001–2002	Jácome (2008)
	Two small banks, Banco Sogerin and Banco Capital were intervened and taken over by the deposit insurance institution.		Jácome (2008)
Hong Kong	Nine deposit-taking companies failed.	1982	Caprio and Klingebiel (2003); Bordo et al. (2001)
Hong Kong	Seven banks liquidated or taken over.	1983–1986	Caprio and Klingebiel (2003); Bordo et al. (2001)
Hong Kong	One large investment bank failed.	1998	Caprio and Klingebiel (2003)

Country	Brief Summary	Year	Source
Hungary	Run on Budapest banks; foreign withdrawals and bank holiday.	July, 1931	Bernanke and James (1990)
Hungary	By second half of 1993, eight banks (25% of financial system assets) were deemed insolvent.	1991–1995	Caprio and Klingebiel (2003)
Iceland	One of three state-owned banks became insolvent.	1985–1986	Caprio and Klingebiel (2003); Bordo et al. (2001)
Iceland	Government injected capital into state-owned commercial bank.	1993	Caprio and Klingebiel (2003); Bordo et al. (2001)
India	Central Bank of Western India went bankrupt in 1866.	1863	Reinhart and Rogoff (2008a)
India	Crop failures and excessive obligations to European banks; silver replaced much of the gold.	April, 1908	Conant (1915)
India	Nonperforming assets of 27 public banks estimated at 20% in 1995.	1993–1996	Caprio and Klingebiel (2003); Bordo et al. (2001)
Indonesia	A large bank (Bank Summa) collapsed and triggered runs on three smaller banks.	November, 1992	Kaminsky and Reinhart (1999)
Indonesia	Nonperforming assets accounted for 14% of banking system assets with more than 70% in state banks.	1994	Caprio and Klingebiel (2003); Bordo et al. (2001)
Indonesia	Through May 2002, Bank Indonesia had closed 70 banks and nationalized 13 out of 237. Nonperforming loans were 65–75% of total loans at the peak of the crisis and fell to about 12% in February 2002.	1997–?	Caprio and Klingebiel (2003)
Ireland	Run on most Irish banks; Agricultural Bank failed in November.	November, 1836–1837	Conant (1915)
Ireland	Tipperary Joint Stock Bank failed upon discovery that one director (John Sadlier) had systematically robbed the bank and falsified accounts.	February, 1856	Conant (1915)
Israel	Almost the entire banking sector was affected, representing 60% of stock market recapitalization. The stock exchange closed for 18 days and bank share prices fell more than 40%.	1977–1983	Caprio and Klingebiel (2003); Bordo et al. (2001)
Israel	Stocks of the four largest banks collapsed and were nationalized by the state.	October, 1983	Reinhart (2002)
Italy	National Bank suspended specie due to expectation of the Austro-Prussian War.	June, 1866–1868	Conant (1915)
Italy	Tiber Bank, Italian Mortgage Bank Society and Naples Building Association taken over by National Bank.	1889	Conant (1915)
Italy	Real estate boom and bust, bringing banks with it. Tariff war with France raised interest rates and helped to prick the land bubble. Growth slowed and did not pick up for five years.	1891	Bordo and Eichengreen (1999)
Italy	Government overhauled the banking system by merging several banks and authorized expansions of credit, triggering a currency crisis. The lira depreciated but the recessionary impact was mild.	January, 1893	Bordo and Eichengreen (1999); Conant (1915)
Italy	Financial speculation and mounting difficulties in New York, London, and Paris in 1906 put pressure on interest rates and pricked the financial bubble. Sharp drop in output followed.	1907	Bordo and Eichengreen (1999)
Italy	Savings banks on the verge of collapse; rescued by the three main issuing banks, which also supported industry during the war.	1914	Bordo et al. (2001); Teichova et al. (1997)
Italy	Third and fourth largest banks became insolvent, partly due to overtrading during and after the war.	1921	Bordo et al. (2001)
Italy	Withdrawals from largest banks; panic ensued until April when government reorganized many institutions and took over bad industrial assets.	December 1930–1931	Bordo et al. (2001); Bernanke and James (1990)
Italy	Agricultural bank closures, savings and commercial bank mergers to such an extent that the Italian banking system appeared completely reorganized.	1935	Bordo et al. (2001); Teichova et al. (1997)

Country	Brief Summary	Year	Source
Italy	Fifty-eight banks, with 11% of lending, merged with other institutions.	1990–1995	Caprio and Klingebiel (2003); Bordo et al. (2001)
Jamaica	A merchant banking group was closed.	1994–1997	Caprio and Klingebiel (2003); Bordo et al. (2001)
Jamaica	FINSAC, a government resolution agency, assisted five banks, five life insurance companies, two building societies, and nine merchant banks.	1995–2000	Caprio and Klingebiel (2003)
Japan	National Bank Act—banks forced to accept government's paper notes. Caused nine or ten banks to fail.	1872–1876	Conant (1915)
Japan	Deflationary measures depressed trade, and four national banks failed; five suspended, 10 consolidated.	1882–1885	Conant (1915)
Japan	Trade deficits and reserve losses; significant output losses—growth fell by 6% in one year.	1901	Bordo and Eichengreen (1999)
Japan	Tokyo stock market crash in early 1907 and global uncertainty; Bank of Japan intervened for some banks and let other banks fail. Recession was severe.	1907	Bordo and Eichengreen (1999)
Japan	Japan went off the gold standard; prospered from war boom.	1917	Bordo et al. (2001); Flath
Japan	Tokyo earthquake led to bad debts which shook the Bank of Tokyo and Chosen. Restructured with government aid.	September, 1923	Bernanke and James (1990)
Japan	Banking panic led to tighter regulation. Failure of Tokyo Watanabe bank led to runs and a wave of failures—15 banks unable to make payments. Government's unwillingness to bail out banks led to more uncertainty and other runs. Crisis resulted in bank consolidations.	April, 1927	Bordo et al. (2001); Bernanke and James (1990)
Japan	Banks suffered from sharp decline in stock market and real estate prices. In 1995, estimates of nonperforming loans were $469–1000 billion or 10–25% of GDP; at the end of 1998 they were estimated at $725 billion or 18% of GDP; and in 2002 were 35% of total loans. Seven banks were nationalized, 61 financial institutions closed, and 28 institutions merged.	1992–1997	Caprio and Klingebiel (2003); Bordo et al. (2001)
Jordan	Third largest bank failed.	August, 1989–1990	Caprio and Klingebiel (2003)
Kenya	15% of financial system liabilities faced liquidity and solvency problems.	1985–1989	Caprio and Klingebiel (2003)
Kenya	Intervention in two local banks.	1992	Caprio and Klingebiel (2003)
Kenya	Serious solvency problems with banks accounting for more than 30% of financial system assets.	1993–1995	Caprio and Klingebiel (2003)
Kenya	Nonperforming loans reached 19%.	1996	Caprio and Klingebiel (2003)
Korea	Financial deregulation led to an increase in the number of banks.	January, 1986	Reinhart (2002); Shin and Hahm (1998)
Korea	Through May 2002, five banks were forced to exit the market through a "purchase and assumption formula," and 303 financial institutions (215 were credit unions) shut down, and four banks were nationalized. Banking system nonperforming loans peaked between 30–40% and fell to about 3% by March 2002.	July, 1997	Reinhart (2002); Caprio and Klingebiel (2003); Bordo et al. (2001)
Kuwait	About 40% of loans were nonperforming by 1986.	1980s	Caprio and Klingebiel (2003)
Kyrgyz Republic	About 80–90% of banking system loans doubtful. Four small banks closed in 1995.	1990s	Caprio and Klingebiel (2003)
Lao People's Dem Republic	Some banks experienced problems.	Early 1990s	Caprio and Klingebiel (2003)
Latvia	Run on banks with German connections; two large banks hit especially hard.	July, 1931	Bernanke and James (1990)

Country	Brief Summary	Year	Source
Latvia	Between 1995–1999, 35 banks saw their license revoked, were closed, or ceased operations.	1995–?	Caprio and Klingebiel (2003)
Lebanon	Four banks became insolvent and eleven resorted to Central Bank lending.	1988–1990	Caprio and Klingebiel (2003)
Lesotho	One of four commercial banks had nonperforming loans.	1988	Caprio and Klingebiel (2003)
Liberia	7/11 banks not operational, accounting for 60% of bank assets.	1991–1995	Caprio and Klingebiel (2003)
Lithuania	In 1995, 12 small banks of 25 banks were liquidated; three private banks (29% of banking system deposits) failed, and three state-owned banks were deemed insolvent.	1995–1996	Caprio and Klingebiel (2003)
Macedonia	About 70% of banking system loans were nonperforming. The government took over banks' foreign debt and closed the second largest bank.	1993–1994	Caprio and Klingebiel (2003)
Madagascar	25% of bank loans deemed unrecoverable.	1988	Caprio and Klingebiel (2003)
Malaysia	Runs against some branches of a large domestic bank, following the collapse of a related bank in Hong Kong. Insolvent institutions accounted for 3% of financial system deposits; marginally recapitalized and possibly insolvent institutions accounted for another 4%.	July, 1985–1988	Kaminsky and Reinhart (1999); Caprio and Klingebiel (2003); Bordo et al. (2001)
Malaysia	Finance company sector was restructured, and finance institutions reduced from 39 to 10 through mergers. Two finance companies were taken over by the Central Bank, including the largest independent finance company. Two banks deemed insolvent—accounting for 14% of financial system assets—will be merged with other banks. Nonperforming loans peaked between 25–35% of banking system assets and fell to 10.8% by March 2002.	September, 1997	Reinhart (2002); Caprio and Klingebiel (2003); Bordo et al. (2001)
Mali	Nonperforming loans of largest bank reached 75%.	1987–1989	Caprio and Klingebiel (2003)
Mauritania	In 1984, five major banks had nonperforming assets from 45–70% of their portfolios.	1984–1993	Caprio and Klingebiel (2003)
Mauritius	Central Bank closed 2/12 commercial banks for fraud and irregularities.	1996	Caprio and Klingebiel (2003)
Mexico	Mexican government borrowed widely and then suspended payments (June 1885); foreign investments fell leading to a credit crisis, bank runs, and banks stopped lending. National Bank and Mercantile Bank merged into National Bank of Mexico (Banamex) in 1884 to meet government's demand for a loan.	February, 1884–1885	Conant (1915)
Mexico	National Bank absorbed Mexican Mercantile Bank, its main competitor.	1893	Conant (1915)
Mexico	Severe credit shortage from U.S. crash; banks could not collect debts; Mexican Central Bank and many state banks failed. Other banks survived with federal assistance or by merging. Failures caused many bankruptcies and prevented economic activity. Government cautioned against over-expansion of credit—first a circular (Feb.) warned against unsafe loans; restrictions imposed in June.	February, 1908	Conant (1915)
Mexico	Suspension of payments after a run on major banks.	July, 1931	Bernanke and James (1990)
Mexico	Capital flight; government responded by nationalizing the private banking system.	1981–1982	Bordo et al. (2001)
Mexico	Government took over banking system.	September, 1982–1991	Kaminsky and Reinhart (1999) & Caprio and Klingebiel (2003)
Mexico	Several financial institutions that held Ajustabonos were hurt by the rise in real interest rates in the second half of 1992.	October, 1992	Kaminsky and Reinhart (1999)

Country	Brief Summary	Year	Source
Mexico	In 1994, nine banks were intervened and 11 participated in the loan/purchase recapitalization program of 34 commercial banks. The nine banks accounted for 19% of financial system assets and were deemed insolvent. 1% of bank assets were owned by foreigner, and by 1998, 18% of bank assets were held by foreign banks.	1994–1997	Caprio and Klingebiel (2003); Bordo et al. (2001); Jácome (2008)
Morocco	Banking sector experienced problems.	Early 1980s	Caprio and Klingebiel (2003)
Mozambique	Main commercial bank experienced solvency problems—apparent after 1992.	1987–1995	Caprio and Klingebiel (2003)
Myanmar	Largest state-owned commercial bank reported to have large nonperforming loans.	1996–?	Caprio and Klingebiel (2003)
Nepal	In early 1988, the reported arrears of three banks, accounting for 95% of the financial system, averaged 29% of assets.	1988	Caprio and Klingebiel (2003)
Netherlands	Bank of Amsterdam closed by government decree; liquidation began in January and lasted a long time.	December, 1819–1829	Conant (1915)
Netherlands		1897	Bordo et al. (2001)
Netherlands	Temporary closure of the Amsterdam Exchange led to a sharp acceleration in the evolution of banking. Large commercial banks replaced older institutions, and many banks were taken over or replaced.	1914	Bordo et al. (2001); 'tHart et al. (1997)
Netherlands	Scores of banks failed and many others experienced serious problems. Banking crisis resulted in banks working more closely together and were characterized by more centralization. Banks financed industry more heavily after the war; after the crisis, industrial growth stalled.	1921	Bordo et al. (2001); 'tHart et al. (1997)
Netherlands		1939	Bordo et al. (2001)
New Zealand	One large state-owned bank, with 25% of banking assets, experienced solvency problems with high nonperforming loans.	1987–1990	Caprio and Klingebiel (2003); Bordo et al. (2001)
Nicaragua	Banking system nonperforming loans reached 50% in 1996.	Late 1980s–96	Caprio and Klingebiel (2003)
Nicaragua	Four out 11 banks, representing about 40% of deposits, were intervened and sold to other financial institutions.	2001–2002	Jácome (2008)
Niger	Mid-1980s, banking system nonperforming loans reached 50%. Four banks liquidated, three restructured in the late 80s; more restructuring in 2002.	1983–?	Caprio and Klingebiel (2003)
Nigeria	In 1993, insolvent banks had 20% of banking system assets and 22% of deposits. In 1995, almost half the banks reported being in financial distress.	1991–1995	Bordo et al. (2001); Caprio and Klingebiel (2003)
Nigeria	Distressed banks had 4% of banking system assets.	1997	Caprio and Klingebiel (2003); Bordo et al.
Norway	Real estate speculation; bubble burst when interest rates increased, and many banks failed. Bank of Norway stepped in and prevented spreading crisis.	May, 1899	Jonung and Hagberg (2002)
Norway	Due to reckless lending during the war and the global downswing in the early 1920s.	1921–1923	Bordo et al. (2001); Jonung and Hagberg (2002)
Norway	Norway abandoned the gold standard; the Norges Bank provided much support to smaller banks to prevent a systemic crisis. More successfully managed than the 1921 crisis.	1931	Bordo et al. (2001); Øksendal (2007)
Norway	Legislation introducing a tax on bank deposits led to many withdrawals.	1936	Bernanke and James (1990)
Norway	Two regional saving banks failed. The banks were eventually merged and bailed out. The Central Bank provided special loans to six banks suffering from the recession of 1985–86 and from problem real estate loans. The state took control of the three largest banks with 85% of banking system assets.	November, 1988–1993	Kaminsky and Reinhart (1999); Caprio and Klingebiel (2003); Bordo et al. (2001); Jonung and Hagberg (2002)

Country	Brief Summary	Year	Source
Panama	In 1988, the banking system had a nine-week banking holiday. The financial position of most state-owned and private commercial banks was weak and 15 banks ceased operations.	1988–1989	Caprio and Klingebiel (2003)
Papua New Guinea	85% of S&L associations ceased operations.	1989–?	Caprio and Klingebiel (2003)
Paraguay	Bank of Paraguay and River Plate Bank suspended payments; subject to severe run—gold **prices** increased 300% and **banks** eventually liquidated.	1890	Conant (1915)
Paraguay	The Government Superintendency intervened in most domestic private and public banks and a number of finance companies by the end of 1998, including the largest bank and savings & loan institution. By the end of 1999, banks were mostly foreign-owned, with over 80% of bank assets in foreign hands. All banks were deemed sound in 2000.	1995–1999	Caprio and Klingebiel (2003); Bordo et al. (2001); Jácome (2008)
Paraguay	Two banks, with about 10% of deposits, were intervened and closed in 1997. A medium-sized bank, with 6.5% of deposits, was closed in 1998.	1997–1998	Jácome (2008)
Paraguay	The third largest bank, with nearly 10% of deposits, was intervened and closed.	2001–2002	Caprio and Klingebiel (2003); Jácome (2008)
Peru	Gold coinage suspended and country on silver standard for 25 years.	December, 1872–1873	Conant (1915); Reinhart and Rogoff (2008a)
Peru	Two large banks failed. The rest of the system suffered from high nonperforming loans and financial disintermediation following the nationalization of the banking system in 1987.	April, 1983–1990	Kaminsky and Reinhart (1999); Caprio and Klingebiel (2003); Bordo et al. (2001)
Peru	Capital outflows triggered a domestic credit crunch, which unveiled solvency problems in a number of banks, including Banco Wiese, Banco Latino (16.7% and 3% market share, respectively), and other smaller financial institutions. Bank resolution was applied to two banks (summing nearly 21% of deposits). Instability also affected another six small banks (6.5% of deposits).	1999	Jácome (2008)
Philippines	Commercial paper market collapsed, triggering bank runs and failure of nonbank financial institutions and thrift banks. Problems in two public banks accounting for 50% of banking system assets, six private banks accounting for 12% of banking system assets, 32 thrifts accounting for 53% of thrift banking assets, and 128 rural banks.	January, 1981–1987	Kaminsky and Reinhart (1999); Caprio and Klingebiel (2003); Bordo et al. (2001)
Philippines	One commercial bank, seven of 88 thrifts, and 40 of 750 rural banks placed under receivership. Banking system nonperforming loans reached 12% by November 1998 and were expected to reach 20% in 1999.	July, 1997–1998	Reinhart (2002); Caprio and Klingebiel (2003)
Poland	Bank runs caused three large banks to stop payments; bank shakeout lasted until 1927.	July 1926–1927	Bernanke and James (1990)
Poland	Run on banks, especially those associated with Austrian Creditanstalt—spread of Austrian crisis.	June, 1931	Bernanke and James (1990)
Poland	In 1991, seven of nine treasury-owned commercial banks (90% of credit), the Bank for Food Economy, and the cooperative banking system experienced solvency problems.	1990s	Caprio and Klingebiel (2003)
Portugal	Bank of Lisbon suspended payments—consistently troubled career because tied with Portuguese government.	1828	Conant (1915)
Portugal	Bank of Lisbon lost all credit, could not redeem notes, reorganized into the Bank of Portugal.	May, 1846–1847	Conant (1915)
Portugal	Large budget deficits, the Baring crisis, and the Brazilian revolution led to currency depreciation. Reneged on some domestic debt and renegotiated foreign debt to reduce interest payments. Large impact on growth.	1891	Bordo and Eichengreen (1999); Conant (1915)
Portugal		1920	Bordo et al. (2001)
Portugal		1923	Bordo et al. (2001)
Portugal		1931–1932	Bordo et al. (2001)
Romania	Collapse of German-controlled banks and other banks; heavy runs on banks.	July, 1931	Bernanke and James (1990)

Country	Brief Summary	Year	Source
Romania	In 1998, nonperforming loans reached 25–30% in the six main state-owned banks.	1990	Caprio and Klingebiel (2003)
Russia	Bank of Russia closed in April; specie payments suspended and never resumed. A permanent treasury deficit meant several loans were necessary and there was a hopeless credit situation.	April, 1862–1863	Conant (1915)
Russia	Skopine community bank garnered deposits from all over the empire but kept low reserves; bubble burst in 1875 when it could not pay its deposits; limited communal banking henceforth.	1875	Reinhart and Rogoff (2008a); Conant (1915)
Russia	Joint-Stock commercial banks loaded with nonperforming assets; many small banks failed although large ones were protected by the state bank.	1896	Cameron (1967)
Russia	The interbank loan market stopped working due to concerns about connected lending in many new banks.	August, 1995	Caprio and Klingebiel (2003)
Russia	Nearly 720 banks, representing half of those in operation, were deemed insolvent. The banks accounted for 4% of sector assets and 32% of retail deposits. Eighteen banks, holding 40% of sector assets and 41% of household deposits, were in serious difficulties and needed rescue.	1998–1999	Caprio and Klingebiel (2003)
Rwanda	One well-connected bank closed.	1991	Caprio and Klingebiel (2003)
Santo Domingo	National Bank failed after unsuccessfully trying to adopt the gold standard; bank notes not accepted anywhere.	1894	Conant (1915)
Sao Tome and Principe	End of 1992, 90% of monobank's loans were nonperforming. In 1993, monobank liquidated and two new banks were licensed and took over most assets. In 1994, credit operations at one new bank suspended.	1980s–90s	Caprio and Klingebiel (2003)
Scotland	Western Bank Failure—brought on by reckless banking practices; bank made various bad loans to four firms—when discovered, the accounts were stopped and firms closed. There was a panic on the stock exchange; depositors withdraw their accounts and bank failed.	October, 1857–1858	Conant (1915)
Scotland	City of Glasgow Bank failure: falsification of books for three years, with loans to four firms; ruined shareholders, not creditors.	September, 1878–1880	Conant (1915)
Scotland	Bank of Scotland absorbed Caledonian Bank, and North of Scotland Bank absorbed Town & Country Bank.	March, 1908	Conant (1915)
Senegal	In 1988, 50% of loans were nonperforming. Six commercial banks and one development bank closed (20–30% of financial system assets).	1988–1991	Caprio and Klingebiel (2003); Bordo et al.
Sierra Leone	In 1995, 40–50% of banking system loans were nonperforming—undergoing bank recapitalization and restructuring.	1990	Caprio and Klingebiel (2003)
Singapore	Nonperforming loans rose to $200 million or 0.6% of GDP.	1982	Caprio and Klingebiel (2003); Bordo et al.
Slovakia	In 1997, unrecoverable loans were estimated at 101 billion crowns—about 31% of loans and 15% of GDP.	1991	Caprio and Klingebiel (2003)
Slovenia	Three banks (2/3 of banking system assets) were restructured.	1992–1994	Caprio and Klingebiel (2003)
South Africa	Trust Bank experienced problems.	December, 1977–1978	Caprio and Klingebiel (2003); Reinhart (2002); Bordo et al. (2001)
South Africa	Some banks experienced problems.	1989	Caprio and Klingebiel (2003)
Spain	During the Peninsular War, Spain was occupied by France, and Bank of St. Charles essentially dead since 1814; reorganized into Bank of St. Ferdinand in 1829.	1814–1817	Conant (1915)
Spain	Bank of St. Charles reorganized into Bank of Ferdinand.	July, 1829	Conant (1915)

Country	Brief Summary	Year	Source
Spain	Bank of Isabella II (created by government to punish Bank of Ferdinand in 1844) and Bank of Ferdinand consolidated into one, Bank of Ferdinand. Ferdinand bore Isabella's debts and was completely at the mercy of the State. In 1848, cash reserve of Bank decreasing, circulation increasing, government demanded more loans, victim of theft and embezzlement. Government reorganized the bank into Bank of Spain to resemble Bank of England.	February, 1846–1847	Conant (1915)
Spain		1920–1923	Bordo
Spain	Failure of two major banks.	1924–1925	Bordo et al. (2001); Bernanke and James (1990)
Spain	Avoided the worst of the Great Depression by staying off the gold standard; experienced runs, but Bank of Spain could lend freely as a lender of last resort.	1931	Bordo et al. (2001); Temin (2008)
Spain	Bank of Spain began rescuing a number of smaller banks. In 1978–83, 24 institutions were rescued, four were liquidated, four were merged, and 20 small and medium-sized banks were nationalized. These 52 banks of 110, representing 20% of banking system deposits, were experiencing solvency problems.	November, 1978–1985	Kaminsky and Reinhart (1999); Caprio and Klingebiel (2003); Bordo et al. (2001)
Sri Lanka	State-owned banks, comprising 70% of the banking system, estimated to have nonperforming loans of 35%.	1989–1993	Caprio and Klingebiel (2003)
Swaziland	Central Bank took over three other banks.		Caprio and Klingebiel (2003)
Sweden	Depreciation of gold led to Bullion Report (similar to Report on Irish Currency in 1804).	January, 1811	Conant (1915)
Sweden	Severe banking crises.	1876–1879	Jonung and Hagberg (2002)
Sweden	Jonung and Hagberg do not record a crisis.	1897	Bordo et al. (2001); Jonung and Hagberg (2002)
Sweden	Lending boom and decreasing confidence in stability of banking system led to bank runs. Reserves depreciated but Riksbank extended loans to national banks. Output negatively affected, but the economy recovered quickly.	1907	Bordo and Eichengreen (1999); Jonung and Hagberg (2002)
Sweden	One of severest banking crises in Swedish banking history; followed a steep recession.	1922–1923	Jonung and Hagberg (2002)
Sweden	Banks tied to the financier Ivar Kreuger suffered after his death; banks suffered large losses, but depositors were protected by the government and did not suffer from the failures.	1931–1932	Bordo et al. (2001); Jonung and Hagberg (2002)
Sweden	Swedish government rescued Nordbanken, the second largest bank. Nordbanken and Gota Bank, with 22% of banking system assets, were insolvent. Sparbanken Foresta, accounting for 24% of banking system assets, intervened. Five of the six largest banks, accounting for over 70% of banking system assets, experienced difficulties.	November, 1991–1994	Kaminsky and Reinhart (1999); Caprio and Klingebiel (2003); Bordo et al. (2001); Jonung and Hagberg (2002)
Switzerland	Switzerland could not obtain its supply of coin from France; bank clients rushed to redeem their notes for coin; bank cut down discounts and loans, led to an economic downturn.	July, 1870–1871	Conant (1915)
Switzerland	Wave of bank failures and consolidations.	1910–1913	Vogler (2001)
Switzerland	Swiss banks badly shaken by German banking crisis; total assets shrank and many banks restructured.	1931	Bordo et al. (2001); Vogler (2001)
Switzerland	Continued distress due to pressures from America and the Great Depression and the German banking crisis of 1931.	1933	Bordo et al. (2001); Vogler (2001)
Taiwan	Four trust companies and eleven corporations failed.	1983–1984	Caprio and Klingebiel (2003); Bordo et al. (2001)

Country	Brief Summary	Year	Source
Taiwan	Failure of Changua Fourth sparked runs on other credit unions.	July, 1995	Caprio and Klingebiel (2003); Bordo et al. (2001)
Taiwan	Banking system nonperforming loans estimated at 15% at the end of 1998.	1997–1998	Caprio and Klingebiel (2003); Bordo et al. (2001)
Tajikistan	One of largest banks insolvent, one small bank closed.	1996–	Caprio and Klingebiel (2003)
Tanzania	**In** 1987, main financial institutions had arrears amounting to half their portfolios. National Bank of Commerce, with 95% of banking system assets, became insolvent in 1990.	late 1980s–90s	Caprio and Klingebiel (2003)
Thailand	Following the stock market crash, one of the largest finance companies failed. The bailout of the financial sector began.	March, 1979	Kaminsky and Reinhart (1999)
Thailand	Large losses in a finance company led to runs and government intervention. Authorities intervene in 50 finance and security firms and five commercial banks, or about 25% of financial system assets; three commercial banks deemed insolvent (14% of commercial bank assets).	October, 1983–1987	Kaminsky and Reinhart (1999); Caprio and Klingebiel (2003); Bordo et al. (2001)
Thailand	As of May 2002, the Bank of Thailand shut down 59 of 91 financial companies (13% of financial system assets and 72% of finance company assets), one of 15 domestic banks, and nationalized four banks. A publicly owned assets management company held 29.7% of financial system assets as of March 2002. Nonperforming loans peaked at 33% of total loans and were reduced to 10.3% of total loans in February 2002.	May, 1996	Reinhart (2002); Caprio and Klingebiel (2003); Bordo et al. (2001)
Togo	Banking sector experienced solvency problems.	1993–1995	Caprio and Klingebiel (2003)
Trinidad & Tobago	Several financial institutions faced solvency problems and three government-owned banks merged.	1982–1993	Caprio and Klingebiel (2003)
Tunisia	Most commercial banks were undercapitalized.	1991–1995	Caprio and Klingebiel (2003)
Turkey	Runs on branches of German banks in wake of German crisis.	July, 1931	Bernanke and James (1990)
Turkey	Start of the war led to massive withdrawals and a run on banks, prompting the government to guarantee all deposits.	January, 1991	Kaminsky and Reinhart (1999)
Turkey	Three banks were merged with the state-owned Agriculture Bank and then liquidated; two large banks were restructured.	1982–1985	Caprio and Klingebiel (2003); Bordo et al. (2001)
Turkey	Three banks failed in April 1994.	April, 1994	Caprio and Klingebiel (2003); Bordo et al. (2001)
Turkey	Two banks closed and 19 banks have been taken over by the Savings Deposit Insurance Fund.	2000	Caprio and Klingebiel (2003)
Uganda	**During** 1994–98: half the banking system faced solvency problems. **During** 1998–2002: various banks recapitalized and privatized or closed.	1994	Caprio and Klingebiel (2003)
Ukraine	By 1997, 32 of 195 banks were being liquidated while 25 others were undergoing financial rehabilitation. Bad loans amounted to 50–65% of assets, even in some leading banks. In 1998, banks were further hit by the government's decision to restructure its debt.	1997–1998	Caprio and Klingebiel (2003)
United Kingdom	Mass speculation due to Napoleon’s Berlin Decree—many new country banks issued notes; excessive issue led to severe fall in London exchange; Treasury rescued banks on April 11, 1811.	January, 1811	Conant (1915)
United Kingdom	Good harvest and low prices led to speculation; general depression on property prices affected production industries. Eighty-nine country banks bankrupt; 300–500 ceased business, and there was an increased demand for Bank of England's notes.	Spring 1814–1817	Conant (1915)

Country	Brief Summary	Year	Source
United Kingdom	Speculation in real and imaginary investments financed by unregulated country banking caused a bubble in stocks and Latin American foreign sovereign debt; followed by a stockmarket crash, six London banks closed (including Henry Thornton's Bank), 60 country banks closed—panic in London.	April, 1825–1826	Conant (1915)
United Kingdom	Three banks failed (March 1837); Bank of England gave generous advances to other banks to prevent panic but still they drifted toward bankruptcy. Raised discount rate and borrowed from France and Germany.	March, 1837–1839	Conant (1915)
United Kingdom	The Irish Potato famine and railroad mania led to a steady drain on bullion; reduced resources led to a panic. Firms overextended into railroad endeavors and sugar plantations; firms began failing, which led to bank failures.	April, 1847–1848	Conant (1915)
United Kingdom	Discovery of Australian and Californian gold fields led to massive speculation and then collapse; paralyzed finances throughout world (spread from the United States to Europe, South America, and Far East). Most banks suspended; Bank of England the only source of discount.	August, 1857	Conant (1915)
United Kingdom	Bank Act of 1844 suspended to deal with panic—paid demands in gold. Joint Stock Discount company failed and various industries discounted.	May, 1866	Conant (1915)
United Kingdom	Provincial bank crisis: West of England & South Wales District Bank failed (Dec. 9) and City of Glasgow bank failure (Oct. 2) due to depressed confidence.	October, 1878	Conant (1915)
United Kingdom	House of Baring's portfolio was mostly in securities in Argentina and Uruguay. The Buenos Aires Water Supply & Drainage Company loan failed, but the Bank of England, assisted by the Bank of France and Russia, organized a rescue, which prevented Barings from failing. Short and mild recession followed.	November, 1890	Bordo and Eichengreen (1999); Conant (1915)
United Kingdom	"Secondary" banking crisis.	1974–1976	Caprio and Klingebiel (2003); Bordo et al. (2001)
United Kingdom	Johnson Matthey Bankers failure.	1984	Caprio and Klingebiel (2003)
United Kingdom	Bank of Credit & Commerce International failure.	1991	Caprio and Klingebiel (2003)
United Kingdom	Barings failure.	1995	Caprio and Klingebiel (2003)
United States	State banks suspended specie payments due to War of 1812—paralyzed Treasury's operations.	August, 1814	Conant (1915)
United States	Forty-six banks rendered insolvent due to demands for specie by Second Bank of the United States.	February, 1817–1819	Conant (1915)
United States	Preceded England's crisis; Bank of the United States and all other banks brought to the verge of suspension.	January, 1825	Conant (1915)
United States	Three banks failed (March 1837); Bank of England gave generous advances to other banks to prevent panic; failures began in New Orleans and NYC and spread to other cities' banks.	March, 1837–1838	Conant (1915)
United States	Second Bank of the United States liquidated; lenders repaid but shareholders lost all interest; 26 local banks failed.	March, 1841	Conant (1915)
United States	Discovery of Australian and Californian gold fields led to massive speculation and then collapse; paralyzed finances throughout world (spread from the United States to Europe, South America, and Far East). Most banks suspended; Bank of England the only source of discount.	August, 1857	Conant (1915)
United States	Government suspended specie payments—lasted until 1879; drove up price of gold (peaked in 1864) and all other retail items.	December, 1861	Conant (1915)
United States	U.S. panic due to the Civil War.	April, 1864	Conant (1915)
United States	Philadelphian banking firm Jay Cooke & Company failed, triggering a recession that lasted until 1877.	September, 1873	Conant (1915)

Country	Brief Summary	Year	Source
United States	Weak commodity prices and a series of brokerage firm failures led to bank runs and suspended payments, mostly in the NY region. The output effects were mild.	May, 1884	Bordo and Eichengreen (1999), Conant (1915)
United States	Monetary uncertainty and stock market crash led to bank runs. Political action to ameliorate the crisis; severe decline in output but the economy recovered quickly.	May, 1893	Bordo and Eichengreen (1999); Conant (1915)
United States	Global credit restrictions and domestic financial excesses, increasing number of state banks, and a rising ratio of deposits to cash reserves set the stage for a crisis. Real estate and stock speculations burst; crisis spread from NY nationwide. Growth rate fell by 9% per year. JP Morgan, the Bank of Montreal, and the Treasury of NY replenished liquidity.	March, 1907	Bordo and Eichengreen (1999); Conant (1915)
United States	NYSE closed until December in response to the War; however, a banking crisis was avoided by flooding the country with emergency currency to prevent hasty withdrawals.	July, 1914	Bordo et al. (2001)
United States	Great Depression: thousands of banks closed; failures correlated with particular Federal Reserve district. Bank of USA failed in December 1930; between August 1931 and January 1932, 1860 banks failed.	1929–1933	Bordo et al. (2001); Bernanke and James (1990)
United States	1400 S&L and 1300 bank failures.	1984–1991	Caprio and Klingebiel (2003); Bordo et al. (2001);
Uruguay	National Bank failed.	1893	Conant (1915)
Uruguay	Run on banks to redeem bank notes due to government decree to reduce the circulation of notes.	September, 1898	Conant (1915)
Uruguay	Banco Mercantil failed. A wave of bank mergers and bankruptcies developed, driven by high real interest rates.	March, 1971	Kaminsky and Reinhart (1999)
Uruguay	A large-scale run on banks came in the wake of the Argentine devaluation, which marked the end of the Argentine tablita. Affected institutions accounted for 30% of financial system assets; insolvent banks accounted for 20% of financial system deposits.	March, 1981–1984	Kaminsky and Reinhart (1999); Caprio and Klingebiel (2003); Bordo et al. (2001)
Uruguay	The Government-owned mortgage bank was recapitalized in December 2001. The banking system had 33% of its deposits withdrawn in the first seven months of 2002. In 2002, four banks were closed (33% of total bank assets), and fixed-term deposits (CDs) were restructured and their maturity extended.	2002	Caprio and Klingebiel (2003); Jácome (2008)
Venezuela	Notable bank failures in 1978, 1981, 1982, 1985, 1986	1978–1986	Caprio and Klingebiel (2003); Bordo et al. (2001);
Venezuela	Bank runs on Banco Latino, the country's second largest bank—closed in January 1994. Insolvent banks accounted for 35% of financial system deposits. Authorities intervened in 17 of 47 banks that held 50% of deposits and nationalized nine banks and closed seven more in 1994. The government intervened in five more banks in 1995.	October, 1993–1995	Kaminsky and Reinhart (1999); Caprio and Klingebiel (2003); Bordo et al. (2001); Jácome (2008)
Vietnam	Two of four large state-owned commercial banks (51% of banking system loans) deemed insolvent; the remaining two experience significant solvency problems. Several joint stock companies in severe financial distress. Banking system nonperforming loans reached 18% in late 1998.	1997–?	Caprio and Klingebiel (2003)
Yemen	Banks suffered from extensive nonperforming loans and heavy foreign currency exposure.	1996–	Caprio and Klingebiel (2003)
Zambia	Meridian Bank with 13% of commercial bank assets became insolvent.	1995	Caprio and Klingebiel (2003)
Zimbabwe	Two of five commercial banks have a high level of nonperforming loans.	1995	Caprio and Klingebiel (2003); Bordo et al. (2001)