

This draft: January 14, 2008

**Is the 2007 U.S. Sub-Prime Financial Crisis So Different? An International  
Historical Comparison\***

Carmen M. Reinhart  
University of Maryland and the NBER

and

Kenneth S. Rogoff  
Harvard University and the NBER

\* REINHART: School of Public Policy and Department of Economics, 4105 Van Munching Hall, University of Maryland, College Park, Maryland 20742; email: [creinhar@umd.edu](mailto:creinhar@umd.edu); and ROGOFF: [Economics Department](#), Littauer Center, [Harvard University](#), Cambridge MA 02138-3001; email: [krogoff@harvard.edu](mailto:krogoff@harvard.edu). We would like to thank Vincent Reinhart and Alan Taylor for their helpful comments.

The first major financial crisis of the 21<sup>st</sup> century involves esoteric instruments, unaware regulators, and skittish investors. It also follows a well-trodden path laid down by centuries of financial folly. Is the “special” problem of sub-prime mortgages this time really different?

Our examination of the longer historical record, which is part of a larger effort on currency and debt crises, finds stunning qualitative and quantitative parallels across a number of standard financial crisis indicators. To name a few, the run-up in U.S. equity and housing prices that Graciela L. Kaminsky and Carmen M. Reinhart (1999) find to be the best leading indicators of crisis in countries experiencing large capital inflows closely tracks the average of the previous eighteen post World War II banking crises in industrial countries. So, too, does the inverted v-shape of real growth in the years prior to the crisis. Despite widespread concern about the effects on national debt of the early 2000s tax cuts, the run-up in U.S. public debt is actually somewhat below the average of other crisis episodes. In contrast, the pattern of United States current account deficits is markedly worse.

At this juncture, the book is still open on the how the current dislocations in the United States will play out. The precedent found in the aftermath of other episodes suggests that the strains can be quite severe, depending especially on the initial degree of trauma to the financial system (and to some extent, the policy response). The average drop in (real per capita) output growth is over 2 percent, and it typically takes two years to return to trend. For the five most catastrophic cases (which include episodes in Finland, Japan, Norway, Spain and Sweden), the drop in annual output growth from peak to trough is over 5 percent, and growth remained well below pre-crisis trend even after

three years. These more catastrophic cases, of course, mark the boundary that policymakers particularly want to avoid.

### **I. Post War Bank-Centered Financial Crises: The Data**

Our comparisons employ a small piece of a much larger and longer historical data set we have constructed (see Reinhart and Kenneth S. Rogoff, 2008.) The extended data set catalogues banking and financial crises around the entire world dating back to 1800 (in some cases earlier). In order to focus here on data most relevant to present U.S. situation, we do not consider the plethora of emerging market crises, nor industrialized country financial crises from the Great Depression or the 1800s. Nevertheless, even in the smaller sample considered in this paper, the refrain that “this time is different” syndrome has been repeated many times.

First come rationalizations. This time, many analysts argued, the huge run-up in U.S. housing prices was not at all a bubble, but rather justified by financial innovation (including to sub-prime mortgages), as well as by the steady inflow of capital from Asia and petroleum exporters. The huge run-up in equity prices was similarly argued to be sustainable thanks to a surge in U.S. productivity growth a fall in risk that accompanied the “Great Moderation” in macroeconomic volatility. As for the extraordinary string of outsized U.S. current account deficits, which at their peak accounted for more than two-thirds of all the world’s current account surpluses, many analysts argued that these, too, could be justified by new elements of the global economy. Thanks to a combination of a flexible economy and the innovation of the tech boom, the United States could be expected to enjoy superior productivity growth for decades, while superior American

know-how meant higher returns on physical and financial investment than foreigners could expect in the United States.

Next comes reality. Starting in the summer of 2007, the United States experienced a striking contraction in wealth, increase in risk spreads, and deterioration in credit market functioning. The 2007 United States sub-prime crisis, of course, has its roots in falling U.S. housing prices, which have in turn led to higher default levels particularly among less credit-worthy borrowers. The impact of these defaults on the financial sector has been greatly magnified due to the complex bundling of obligations that was thought to spread risk efficiently. Unfortunately, that innovation also made the resulting instruments extremely nontransparent and illiquid in the face of falling house prices.

As a benchmark for the 2007 U.S. sub-prime crisis, we draw on data from the eighteen bank-centered financial crises from the post-War period, as identified by Kaminsky and Reinhart (1999) and Gerard Caprio et. al. (2005):

These crisis episodes include:

*The Five Big Five Crises:* Spain (1977), Norway (1987), Finland (1991), Sweden (1991) and Japan (1992), where the starting year is in parenthesis.

*Other Banking and Financial Crises:* Australia (1989), Canada (1983), Denmark (1987), France (1994), Germany (1977), Greece (1991), Iceland (1985), and Italy (1990), and New Zealand (1987), United Kingdom (1974, 1991, 1995), and United States (1984).

The “Big Five” crises are all protracted large scale financial crises that are associated with major declines in economic performance for an extended period. Japan

(1992), of course, is the start of the “lost decade,” although the others all left deep marks as well.

The remaining rich country financial crises represent a broad range of lesser events. The 1984 U.S. crisis, for example, is the savings and loan crisis. In terms of fiscal costs (3.2 percent of GDP), it is just a notch below the “Big Five”<sup>1</sup>. Some of the other 13 crisis are relatively minor affairs, such as the 1995 Barings (investment) bank crisis in the United Kingdom or the 1994 Credit Lyonnaise bailout in France. Excluding these smaller crises would certainly not weaken our results, as the imbalances in the run-up were minor compared to the larger blowouts.

## II. Comparisons

We now proceed to a variety of simple comparisons between the 2007 U.S. crisis and previous episodes. Drawing on the standard literature on financial crises, we look at asset prices, real economic growth, and public debt. We begin in Figure 1 by comparing the run-up in housing prices. Period  $T$  represents the year of the onset of the financial crisis. By that convention, period  $T-4$  is four years prior to the crisis, and the graph in each case continues to  $T+3$ , except of course in the case of the U.S. 2007 crisis, which remains in the hands of the fates.<sup>2</sup> The chart confirms the case study literature, showing

---

<sup>1</sup> The fiscal costs of cleaning up after banking crises can be enormous. The fiscal cleanup from Sweden’s 1991 crisis was 6 percent of GDP and Norway’s 1987 crisis was 8 percent. Spain’s post-1977 cleanup cost over 16 percent of GDP. Estimates for Japan’s bill vary widely, with many in excess of 20 percent of GDP.

<sup>2</sup> For the United States, house prices are measured by the Case-Shiller index, described and provided in Robert Shiller (2005). The remaining house price data were made available by the Bank for International Settlements and are described in Gregory D. Sutton (2002).

the significant run-up in housing prices prior to a financial crisis. Notably, the run-up in housing prices in the United States exceeds that of the “Big Five” .

**Figure 1: Real Housing Prices and Banking Crises**

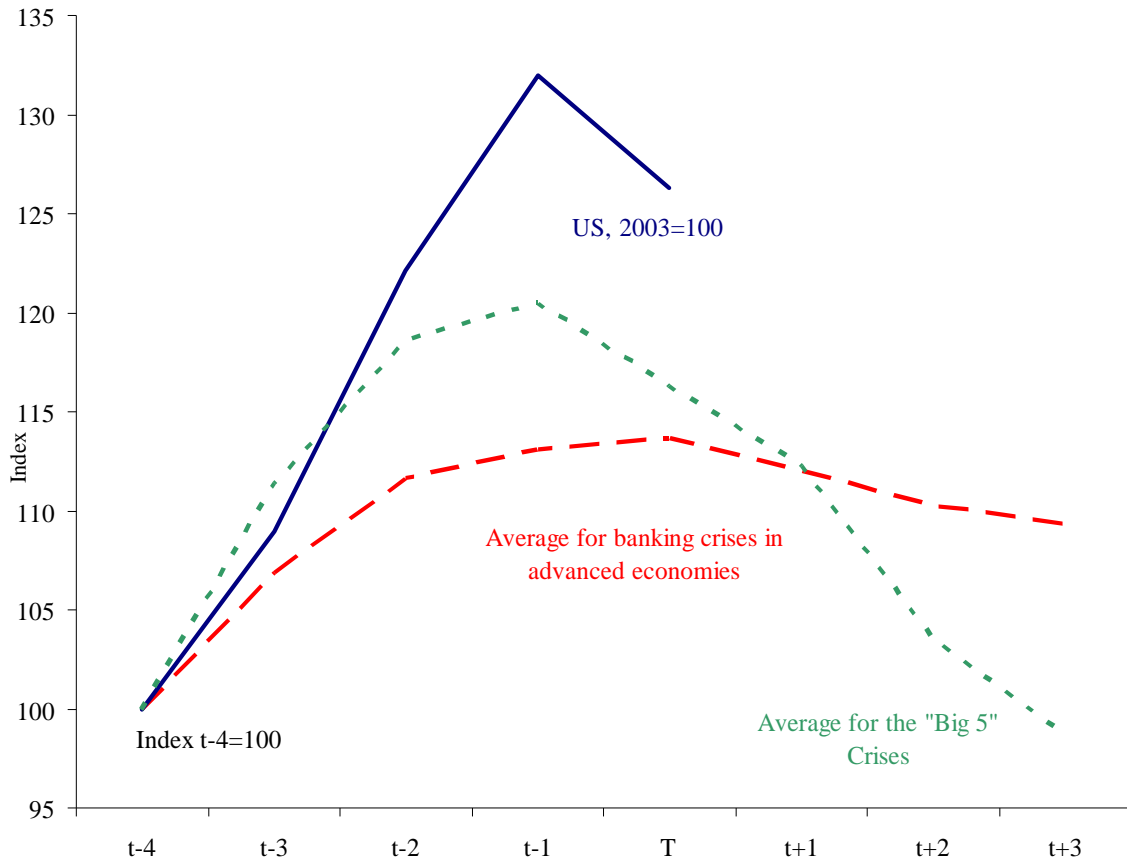
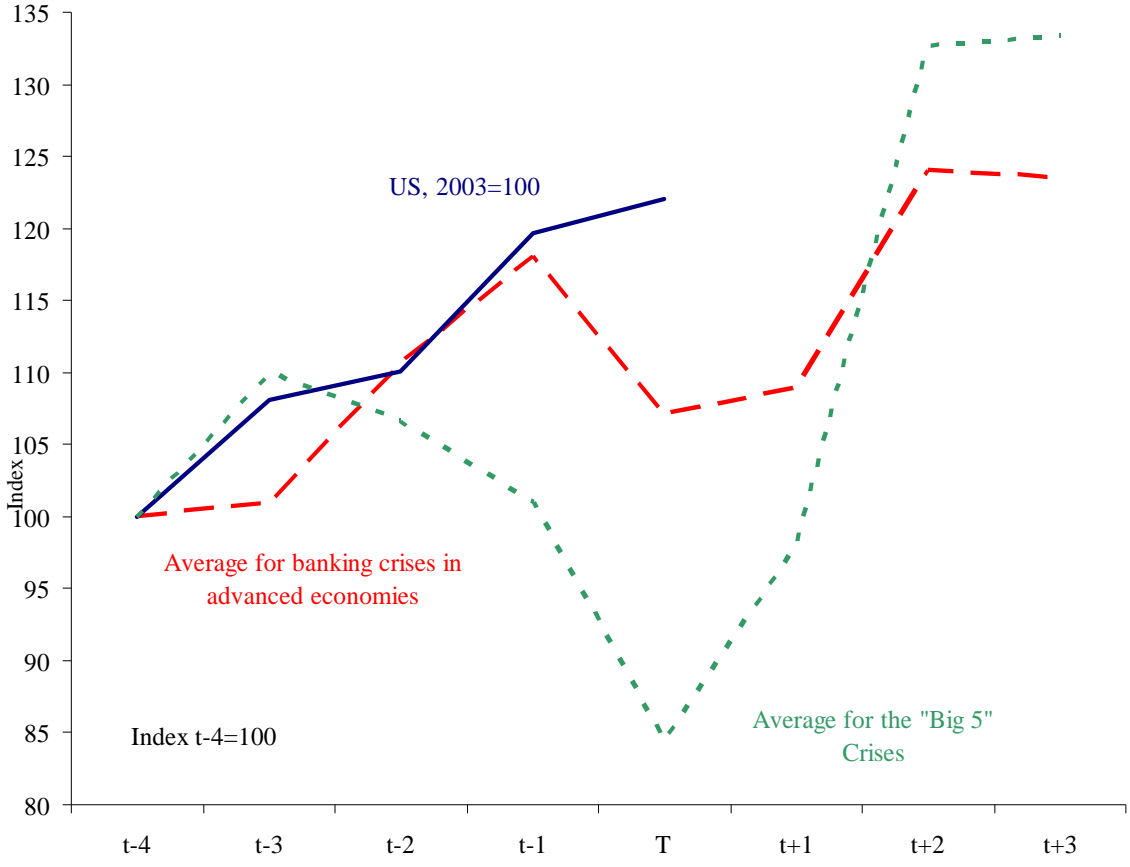


Figure 2 looks at real rates of growth in equity market price indices. (For the United States, the index is the S&P 500; Reinhart and Rogoff, 2008, provide the complete listing for foreign markets.)

Once again, the United States looks like the archetypical crisis country, only more so. The Big Five crisis countries tended to experience equity price falls earlier on than the U.S. has, perhaps because the U.S. Federal Reserve pumped in an extraordinary amount of stimulus in the early part of the most recent episode.

Figure 2: Real Equity Prices and Banking Crises



**Figure 3: Current Account Balance/GDP on the Eve of Banking Crises**

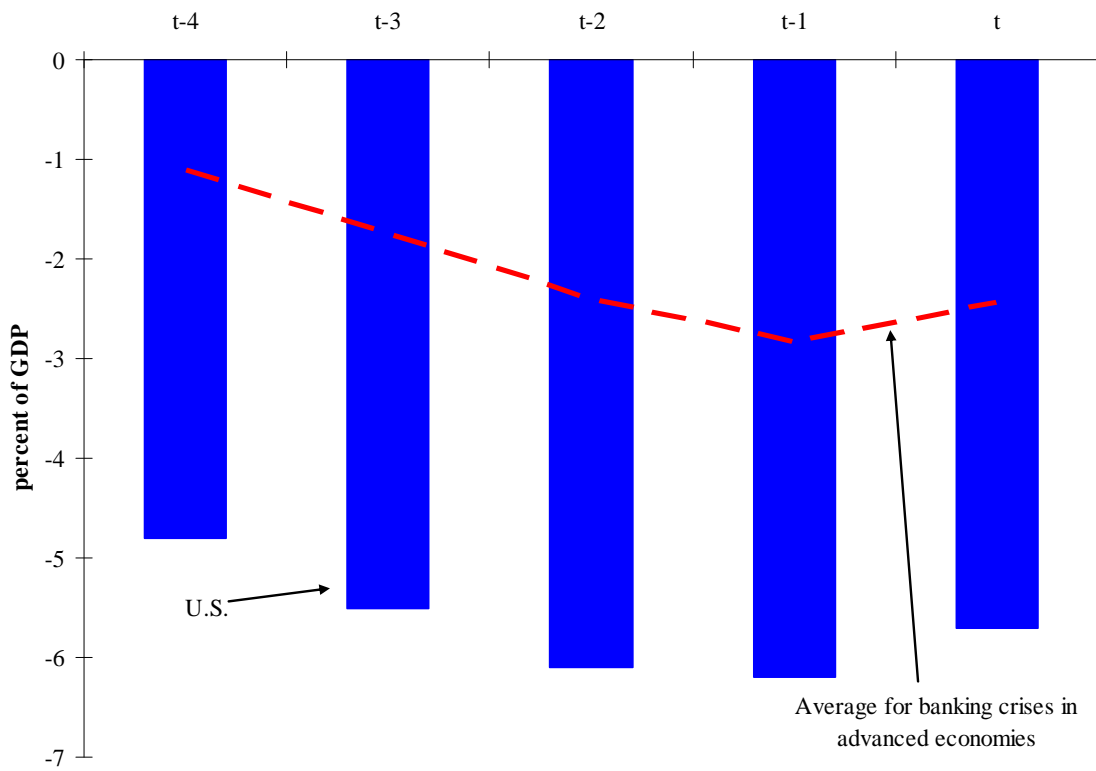


Figure 3 looks at the current account as a share of GDP. Again, the United States is on a typical trajectory, with capital inflows accelerating up to the eve of the crisis. Indeed, the U.S. deficits are more severe, reaching over six percent of GDP. As already mentioned, there is a large and growing literature that attempts to rationalize why the United States might be able to run a large sustained current account deficit without great risk of trauma. Whether the U.S. case is quite as different as this literature suggests remains to be seen.

Real per capita GDP growth in the run-up to debt crises is illustrated in Figure 4. The United States 2007 crisis follows the same inverted V shape that characterizes the earlier episodes. Growth momentum falls going into the typical crisis, and remains low

for two years after. In the more severe “Big Five” cases, however, the growth shock is considerably larger and more prolonged than for the average. Of course this implies that the growth effects are quite a bit less in the mildest cases, although the U.S. case has so many markers of larger problems that one cannot take too much comfort in this caveat.

**Figure 4: Real GDP Growth per Capita and Banking Crises (PPP basis)**

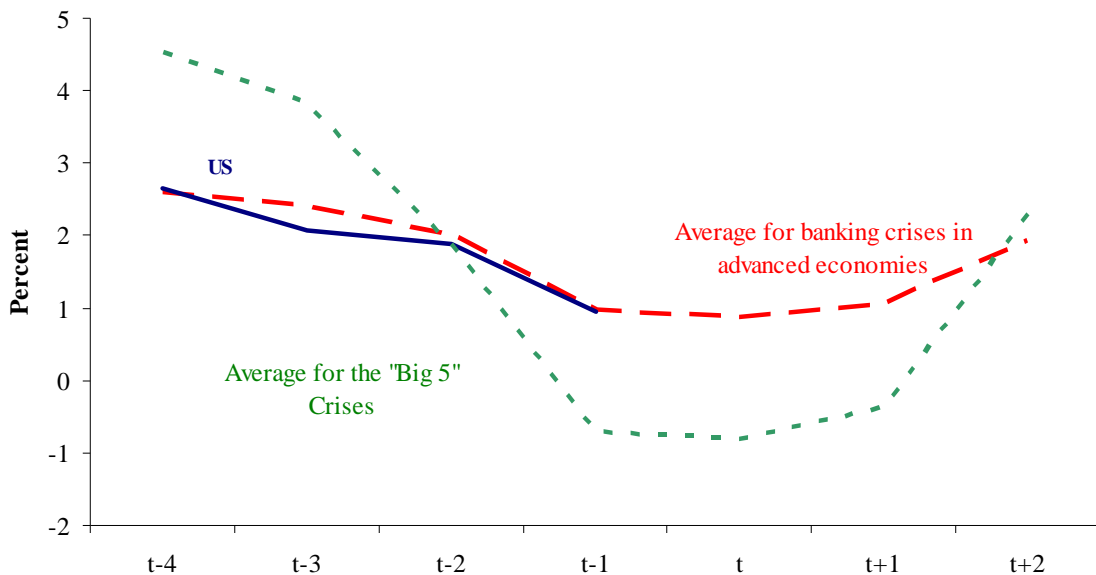
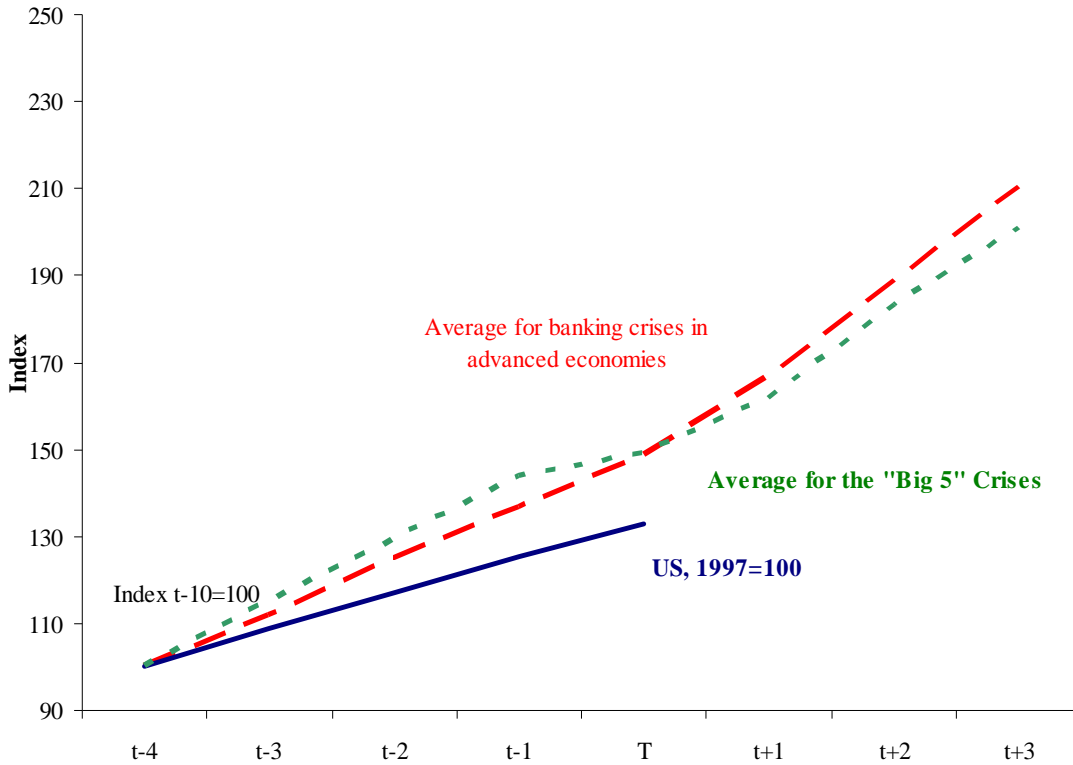


Figure 5 looks at public debt as a share of GDP. Rising public debt is a near universal precursor of other post-war crises, not least the 1984 U.S. crisis. It is notable that U.S. public debt rises much more slowly than it did in run-up to the Big Five crisis. However, if one were to incorporate the huge buildup in private U.S. debt into these measures, the comparisons would be notably less favorable.

The correlations in these graphs are not necessarily causal, but in combination nevertheless suggest that if the United States does not experience a significant and

**Figure 5: Public Debt and Banking Crises**



protracted growth slowdown, it should either be considered very lucky or even more “special” that most optimistic theories suggest. Indeed, given the severity of most crisis indicators in the run-up to its 2007 financial crisis, the United States should consider itself quite fortunate if its downturn ends up being a relatively short and mild one.

## Conclusions

Tolstoy famously begins his classic novel *Anna Karenina* with “Every happy family is alike, but every unhappy family is unhappy in their own way.” While each financial crisis no doubt is distinct, they also share striking similarities, in the run-up of asset prices, in debt accumulation, in growth patterns, and in current account deficits. The majority of historical crises are preceded by financial liberalization, as documented in Kaminsky and Reinhart (1999). While in the case of the United States, there has been no striking de jure liberalization, there certainly has been a de facto liberalization. New unregulated, or lightly regulated, financial entities have come to play a much larger role in the financial system, undoubtedly enhancing stability against some kinds of shocks, but possibly increasing vulnerabilities against others. Technological progress has plowed ahead, shaving the cost of transacting in financial markets and broadening the menu of instruments.

Perhaps the United States will prove a different kind of happy family. Despite many superficial similarities to a typical crisis country, it may yet suffer a growth lapse comparable only to the mildest cases. Perhaps this time will be different as so many argue. Nevertheless, the quantitative and qualitative parallels in run-ups to earlier post-war industrialized-country financial crises are worthy of note. Of course, inflation is lower and better anchored today worldwide, and this may prove an important mitigating factor. The United States does not suffer the handicap of a fixed exchange rate system. On the other hand, the apparent decline in U.S. productivity growth and in housing prices does not provide a particularly favorable backdrop for withstanding a credit contraction.

Another parallel deserves mention. During the 1970s, the U.S. banking system stood as an intermediary between oil-exporter surpluses and emerging market borrowers in Latin America and elsewhere. While much praised at the time, 1970s petro-dollar recycling ultimately led to the 1980s debt crisis, which in turn placed enormous strain on money center banks.<sup>3</sup> It is true that this time, a large volume of petro-dollars are again flowing into the United States, but many emerging markets have been running current account surpluses, lending rather than borrowing. Instead, a large chunk of money has effectively been recycled to a developing economy that exists within the United States' own borders. Over a trillion dollars was channeled into the sub-prime mortgage market, which is comprised of the poorest and least credit worth borrowers within the United States. The final claimant is different, but in many ways, the mechanism is the same.

Finally, we note that although this paper has concentrated on the United States, many of the same parallels hold for other countries that began experiencing housing price duress during the 2007, including Spain, the United Kingdom and Ireland. There can be similarities across unhappy families, too.

---

<sup>3</sup> See Rudi Dornbusch's concise assessment of the recycling of petrodollars in the third and fourth chapters of Dornbusch (1986).

## REFERENCES

**Caprio, Gerard and Daniela Klingebiel, Luc Laeven and Guillermo Noguera. 2005.**

“Banking Crisis Database.” In Patrick Honohan and Luc Laeven (eds.) *Systemic Financial Crises*. Cambridge: Cambridge University Press.

**Dornbusch, Rudiger.** 1986. *Dollars, Debts, and Deficits*. Cambridge, MA: MIT Press.

**Kaminsky, Graciela L. and Carmen M. Reinhart.** 1999. “The Twin Crises: The Causes of Banking and Balance of Payments Problems.” *American Economic Review* Vol. 89: 473-500.

**Reinhart, Carmen M. and Kenneth S. Rogoff.** *This Time is Different: Six Centuries of Financial Folly*. Forthcoming.

**Shiller, Robert.** 2005. *Irrational Exuberance* (Second Edition). Princeton, NJ: Princeton University Press.

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