International Financial Crises and the IMF: What the Historical Record Shows

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I. INTRODUCTION

In the three decades ending around 1980, serious crises implicating financial systems and sovereign creditworthiness were few.[2] Since then, however, crises have proliferated, along with international rescue efforts.[3] The Latin American debt crisis of the 1980s, centering on syndicated bank loans, engulfed a large number of Latin-American countries, most prominently Mexico, Argentina, Brazil, and extended to Asia, Africa, and Eastern Europe.[4] The Tequila crisis of 1994-95 affecting Mexico and Argentina was the first since the 1930s to center on international bond markets.[5] The Asian crisis in 1997-98, felt most violently in Thailand, Indonesia, South Korea and Philippines but with wider repercussions, brought to the fore other international financial contracts, including currency forwards and futures and interbank credits.[6] The crisis in Russia and succeeding events spanning the period 1998-2002 threatened financial stability in Brazil, Argentina, Uruguay, and Turkey. Finally, the experience of the most recent set of crisis countries – Ukraine, Hungary, Iceland, Latvia, Romania, Greece, and Ireland– highlights the close connections between financial and sovereign-credit risks.

Just as the incidence and nature of crises has changed, so has the nature of IMF rescue efforts.[7] The number of IMF programs has predictably shadowed the number of crises: up in the early 1980s, up again in the mid -1990s, up more modestly around 2000, and up again starting in 2008 (see Figure 1). IMF credit extended in billions of U.S. dollars shows a similar pattern superimposed on a rising trend. The most recent wave of crisis-related programs entails unusually large commitments of IMF financing by historical standards, reinforcing the picture (see Figure 2). While a substantial fraction of this funding has not been drawn at time of writing, it most likely will.[8] Note that IMF commitments since

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[1] The authors are with the International Monetary Fund, University of California, Berkeley, and International Monetary Fund, respectively. This paper was prepared for the NBER-Sloan project on the Global Financial Crisis. The views expressed are the authors' and do not necessarily represent the views of the IMF's management or Board of Directors. We thank Lee Bucheit and Kristen Forbes for helpful comments.

[2] For tabulations see Eichengreen and Bordo (2003). Other compendia like Reinhart and Rogoff (2008) show the same thing.

[3] Although both the crises and rescues have been clustered in time and, more often than not, displayed a prominent regional focus, as we describe below.

[4] See Kahler (1986).

[5] An introduction to which can be found in Cline (1995).

[6] The literature on the Asian financial crisis is immense. An early overview that shaped much of the subsequent literature is Goldstein (1998). An accessible introduction to subsequent controversies is Blustein (2003).

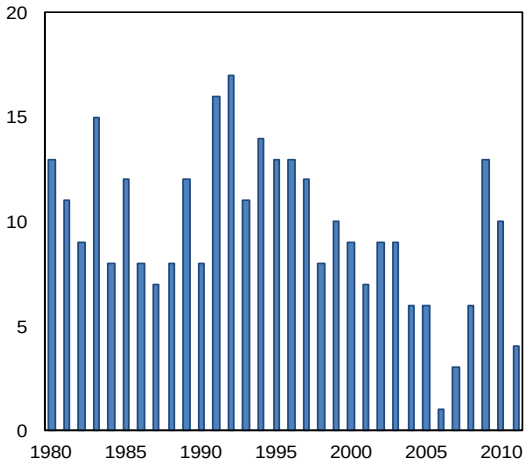
[7] A compendium of the IMF's own research on these trends is Mody and Rebucci (2006).

[8] Recent programs have also involved substantial amounts of other multilateral and bilateral assistance, reinforcing the picture. We provide new data on the latter below.

2009 include flexible credit lines to Mexico, Poland, and Colombia and a precautionary credit line to Macedonia, which are presumably less likely to be drawn.[9]

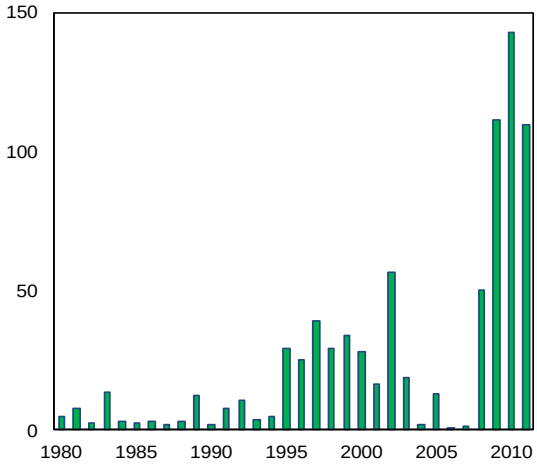
An extensive literature addresses the crisis problem and IMF response. One strand is organized around the question of why crises have grown more frequent and virulent.[10] Another asks whether the IMF programs adopted in response have helped with the restoration of macroeconomic stability or only aggravated output losses by requiring additional austerity of the supplicants but without restoring investor and consumer confidence. It asks whether the international policy response, even when it provides immediate relief, contributes to the growing incidence of crises by creating moral hazard.[11]

Figure 1: Number of IMF programs approved, 1980-2011 (March), by year



Source: IMF.

Figure 2: IMF credit approved, 1980 – 2011 (March)
In billions of U.S. dollars



Source: IMF.

The contentious nature of this literature reflects the difficulties these issues pose for policy and analysis. For analysis there is the problem, most clearly evident in econometric treatments, that both crises and IMF programs have been changing over time. The structural relationship that the econometrician is attempting to estimate is not stable, in other words. One can think of crises and rescues as locked in a process of coevolution – as two interdependent species each adapting to changes in the other.[12] A related problem is that many analyses attempting to determine how IMF programs affect the frequency, incidence and magnitude of crises fail to acknowledge that programs are not randomly assigned. And analyses that adopt clever econometric fixes--using the frequency with which a country votes

[9] A description of these new facilities is Goretti and Joshi (2010).
[10] See inter alia Bordo, Eichengreen, Klingebiel and Martinez Peria (2001).
[11] This last issue is especially contentious. The IMF's own review of the issues is Lane and Phillips (2000). Others would argue that these moral hazard concerns are overdone, observing that equity investors among others suffer massive losses in crises (see e.g. Mussa 2002).
[12] One is reminded of how biologists have turned to game theory to model the evolution of competing species.

with the United States in the UN General Assembly as an instrument for the likelihood of shareholder support for a program, for example—are less than convincing.[13]

Some would argue that crises and IMF programs are, in fact, not just coevolutionary but *codependent*: that they have developed a reactive pattern of coexistence and problem solving over time.[14] As countries have become more integrated into global financial markets, financial crises have become more virulent, and IMF programs have grown larger and more costly; and as programs have grown larger and more costly, crises have become more frequent and virulent. It can be argued that the availability of official finance from a combination of multilateral and national sources has rendered international investors more sanguine with the respect to the risks they assume. In turn this has permitted countries to put off necessary adjustments and rendered those adjustments more costly and difficult when they can no longer be resisted. While more effective design of crisis mitigation measures may be possible, the real payoff will come from heading off problems through more incisive and candid surveillance and ensuring that no party is entirely sheltered from the cost of a crisis by arranging for bail ins as well as bail outs.[15] Specifically, this means that where debts are unsustainable, more workable ways are needed for restructuring sovereign liabilities.

This issue of bail-ins versus bailouts will be familiar to aficionados of the crisis literature. Contributors have now been making the case for alternatives to bailouts more than 15 years.[16] Proposals for doing so range from abolishing the IMF in the extreme, to placing new restrictions on its lending, creating a statutory mechanism for sovereign debt structuring, and introducing restructuring-friendly collective action and representation clauses into debt contracts.[17] Still others would say that such institutional changes are unnecessary. It is already possible, they argue, to restructure problem debts under current arrangements. In this view, policy makers only need to better appreciate the case for this alternative.[18]

What is striking, given the long-standing nature of this debate, is how bail-ins remain the exception to the rule. In the most recent Europe-centered crisis, for instance, there was a clear reluctance on the part of the international policy community, European governments and EU officials alike to contemplate debt restructuring as an alternative to large-scale official lending.[19] Instead, unprecedentedly large amounts of official finance were extended for what could well turn out to be unprecedentedly long periods of time.[20] Evidently, either

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[13] We ourselves (Eichengreen and Mody) have committed this sin on at least one occasion: see Eichengreen, Gupta and Mody (2006).
[14] The phrase after the colon being the Merriam Webster definition of codependence.
[15] For a critique of IMF surveillance in the run up the most recent crisis, see the report of the Fund's Internal Evaluation Office (IEO 2011).
[16] An early statement, in a report to the G-10, was Eichengreen and Portes (1995). The definitive summary of the first generation of literature on this question was Roubini and Setser (2004).
[17] For examples see Hanke (2000), Meltzer Commission (2000), Krueger (2001) and Eichengreen (2003).
[18] This is essentially the conclusion of the Roubini and Setser volume cited above.
[19] Iceland was a special case to which we give further consideration below. It will be interesting to see whether this statement, which is true at the time of writing, remains true when this paper is eventually published.
[20] As we document below.

the policy changes needed to ensure a time-consistent commitment to bail-ins have been insufficiently ambitious, or else policy makers still fail to understand the argument.

In this paper we attempt once more to characterize the state of play and identify what is needed to address these problems, bringing new and not readily available data to bear. We do this as a way of providing a broader historical and institutional context for the other papers at this conference focusing on the 2007-9 crisis. In addition to indicators of economic performance in the crisis countries, we utilize a comprehensive data base on IMF programs spanning the last 30 years. Methodologically we rely on analytic narrative rather than econometrics.[21] Not only do the connections between financial circumstances and policy responses run both ways, but those connections are complex and evolve over time, as emphasized above. The Lucas Critique applies with a vengeance, in other words. And even true believers in econometric modeling will acknowledge that the first step toward a proper structural analysis is careful data construction and description.[22] Since the data and experience we consider cover an extended period, we are able to use historical events as predetermined variables that drive the dynamics of the system over time—that provide the identifying variation, if you will.

We start in Section 2 by using them to flesh out the picture of crisis incidence and multilateral response. We identify crisis dates on the basis of the behavior of foreign exchange rates and sovereign spreads. We then relate those crisis dates to the approval date and size of IMF programs. We provide some preliminary comparisons across episodes of causes, consequences and correlates as a way of introducing non-specialist readers to the lay of the land and reminding specialists of the terrain.

In Section 3 we consider Europe's crisis in more detail. Being the most recent of our five episodes, it is the least familiar and least fully digested. We are particularly interested in how this crisis differs from those which preceded it. We therefore contrast the evolution of the variables of interest with their average behavior in earlier crises.

Section 4 considers the official response, focusing on the size of official rescue packages. We marshal new data on co-financing to analyze changes in the shares of multilateral and bilateral contributions over time and to more accurately gauge the magnitude of total assistance. This paints a picture of official financial assistance packages as growing progressively larger over time. Additional data on debt restructuring, in Section 5, reinforces this picture in that it shows that while emergency lending has grown, restructuring remains rare. Whether this is a significant source of moral hazard, efficiency losses, and inadequate burden sharing cannot be answered on the basis of these kinds of cross-episode comparisons, but the presumption is there.

Given this presumption, we ask in Section 6 what can be done to rebalance the management of debt problems toward a better mix of emergency lending and restructuring. Building on the earlier literature on restructuring-friendly collective action clauses, we

[21] On analytic narrative as a research methodology see Bates et al. (1998) and Rodrik (2007).
[22] This paper may, in this sense, be thought of as the first stage in a larger research agenda.

propose the idea of "sovereign cocos," contingent debt securities with equity-like properties that automatically convert in the event of debt-sustainability problems. We argue that the incentives to restructure are not present once a crisis starts and hence should be built in *ex ante*. It can of course be said of this proposal, as with many proposals, that devil is in the details. We would be the first to acknowledge that we don't have all the details worked out. But we offer our thoughts here if only to provoke discussion.

II. CRISIS EPISODES

We distinguish five major clusters of crises: the Latin American and Eastern Europe debt crisis of the 1980s (what is sometimes called the commercial debt crisis in honor of the commercial banks that engaged in much of the international financial intermediation of the preceding period); the Tequila Crisis of the mid-1990s; the Asian financial crisis of 1997; the Russian crisis of 1998; and the crisis in emerging and advanced economies that erupted in the wake of the subprime mortgage debacle. In the case of the Tequila crisis we consider not just Mexico but also Argentina. In the case of what we refer to as the Russian crisis we consider not just Russia but also other countries that experienced sharp increases in currency volatility and sovereign spreads in the months and years following Russia's default: Argentina, Brazil, Uruguay and Turkey. In the case of the post-subprime crisis we consider not just Greece and Ireland but also Ukraine, Iceland, Hungary, Latvia and Romania.[23]

Analyzing the impact of crises and official responses requires us to pinpoint these events in time. We determine the timing of the five crises using data on currency market turbulence and sovereign spreads as follows. In the manner of Eichengreen, Rose and Wyplosz (1995), currency market turbulence is measured by a weighted average of the rate of change of the exchange rate change and the rate of change of reserves, where the two components are weighted by their respective standard deviations.[24] Values of the index at least three standard deviations above the mean are identified as crises. In addition, in the manner of Celasun, Debrun and Ostry (2006) we pinpoint crises on the basis of sovereign spreads; here spreads that are two standard deviations or more above the mean are identified as crises.

Table 1 shows the resulting crisis dates, the timing of the first IMF intervention, the number of IMF programs associated with the episode, and the cumulative IMF financial commitment.

[23] All of which satisfy our statistical criteria – see below. Data on Portugal and others will be added as they become available

[24] We also considered the rate of change of the reserve/GDP ratio in lieu of the rate of change of reserves; nothing of substance changes with this substitution.

Table 1: Timing and peak of crisis, and IMF programs

	Timing of crisis		Peak of crisis		IMF program	
	Currency crisis	Sovereign crisis	Currency pressure	Sovereign spread	Date (augmentation)	IMF commitment (percent of GDP)
Commercial debt crisis						
Mexico	Feb. 82	Aug.82	Dec. 82		Jan.83 – Dec.85 Nov.86 – Apr.88 May.89 – May.93	5.2
Argentina	Dec.83 Apr.89	Sep.82	Dec.83 Apr.89		Jan.83 – Jan.85 Aug.85 – Aug.89 Nov.89 – Nov.90	4.9
Brazil	Jan.90	Aug.82	Feb.90		Mar.83 – Feb.86 Aug.88 – Feb.90	3.2
Tequila crisis						
Mexico	Dec.94	Feb-95	Dec. 94	Mar.95	Feb.95 – Feb.97	5.5
Argentina		Feb-95	Mar.95	Feb.95	Mar.92 – Mar.96 (Apr.95) Apr.96 – Jan.98	2.5
Asian crisis						
Thailand	Jul.97	Jan-98	Jan. 98	Sep.98	Aug.97 – Jun.00	2.6
Indonesia	Dec.97		Jan. 98		Nov.97 – Aug.98 Aug.98 – Feb.00	4.8
Korea	Nov.97	Jan.98	Dec. 97	Sep.98	Dec.97 – Mar.98 Apr.98 – Dec.00	4.0
Philippines	Dec.97	Sep.98	Dec. 97	Sep.98	Jun.94 – Mar.98 (Jul.97) Apr.98 – Dec.00	3.8
Russian crisis and aftermath						
Russia	Aug.98	Sep.98	Sep.98	Mar.99	Mar.96 – Mar.99 (Jul-98) Jul.99 – Dec.00	7.2
Brazil	Jan.99	Jul.02	Jan.99	Oct.02	Dec.98 – Sep.01 (Dec.99) Sep.01 – Sep.02 Sep.02 – Mar.05 (Dec.03)	11.6
Argentina		Jul.02	May.02	Jul.02	Feb.98-Mar.00 Mar.00 – Jan.03 (Jan./Sep.01) Jan.03 – Aug.03 Sep.03 – Jan.06	20.9
Uruguay	Jul.02	Aug.02	Jul.02	Oct.02	Jun.97 – Mar.99 Mar.99 – Mar.00 May.00 – Mar.02 Apr.02 – Mar.05(Jun./Aug.02) Jun.05 – Dec.06	25.7
Turkey	Feb.01	Apr.01	Feb.01	Jul.01	Dec.99 – Feb.02(Jun./Aug.02) Feb.02 – Feb.05 May.05 – May.08	17.4
European crisis						
Ukraine		Dec.08	Oct.08	Mar.09	Nov.08 – Nov.10 Jul.10 – Dec.12	20.8
Hungary	Oct.08	Oct.08	Jan.09	Apr.09	Nov.08 – Oct.10	10.6
Iceland	Sep.08	Oct.08	Sep.08	Dec.08	Nov.08 – Aug.11	13.1
Latvia	Oct.08	Mar.09	Oct.08	Mar.09	Dec.08 – Dec.11	7.1
Romania		Nov.08	Jan.09	Feb.09	May.09 – May.11 Mar.11 – Mar.13	10.8
Greece	Oct.08	Apr.10	Oct.08	Dec.10	May.10 – May.13	13.2
Ireland		Aug.10	Jan.09	Nov.10	Dec.10 – Dec.13	14.5

Several differences across episodes are notable. The debt crisis of the 1980s displays an especially large increase in the exchange market pressure index, reflecting high rates of inflation in the crisis countries. Sovereign spreads, on the other hand, rose only modestly in that episode, since most of the debt in question took the form of borrowing from commercial bank syndicates.[25] Though weak economic conditions persisted for a number of years (again elaborated below), program financing was small compared to the other episodes.

Sovereign spreads then came to the fore in the Tequila crisis, when Mexican spreads rose by as much as 1,500 basis points. In both Mexico and Argentina, the crisis was resolved with a single program; program size was substantially larger than in the 1980s debt crisis. In contrast, private sector imbalances were the primary source of the Asian crisis, with sovereign spreads rising only with delay as worries developed that governments would socialize the losses of banks and large corporations. While there was considerable variance across the countries in the degree of market distress, the rise in the currency pressure and sovereign spreads was on average of the same order of magnitude as in the Tequila crisis. Once more, a single program was negotiated with each government. There was then a relatively quick recovery in each program country.

Exchange market pressure also rose sharply in the Russian crisis, albeit to a lesser extent than in the commercial debt crisis. In this episode, some afflicted countries negotiated multiple IMF programs, bringing cumulative average program size to the same order of magnitude as in the Asian crisis.

In the most recent crisis, finally, exchange market pressure has been no greater than in preceding crises on average. (In the case of the two euro zone economies Greece and Ireland, of course, this index has at best limited significance, since they are only small parts of the euro area economically and their difficulties have only limited impact on the euro exchange rate.) Spreads on sovereign bonds are also relatively modest compared to past crises. And yet programs are an order of magnitude larger. Some programs have already been extended, creating the likelihood of prolonged IMF presence in the crisis economies. Thus, the most recent episode stands out for the fact that while pressure was apparently no higher than in the past, program financing was substantially larger and, prospectively, longer lived.

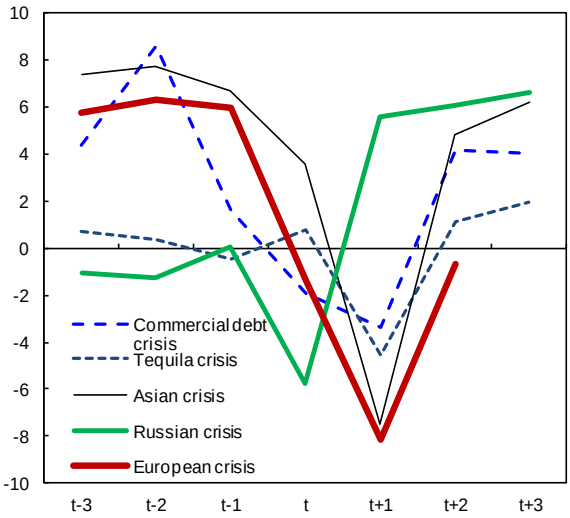
To understand why, we must delve further into the five episodes.[26] Economic preconditions clearly differed across them. In three episodes (the commercial debt, Asian, and current crises), GDP growth was unsustainably high before the crisis. But growth had begun to visibly decelerate before the crisis in the cases of the commercial debt and the Asian crises (Figure 3). The Tequila and Russian crises, in contrast, were preceded by slow growth, despite the exceptional measures taken in Mexico to sustain growth in 1994, a

[25] Which was only extensively securitized starting in 1989.

[26] There have been some similar comparisons before (see e.g. Reinhart, Goldstein and Kaminsky 2000, Sheng 2009 and Claessens et al. 2011 for illustrations of alternative approaches). Our analysis is differs in its focus on as many as five separate episodes and in the countries considered.

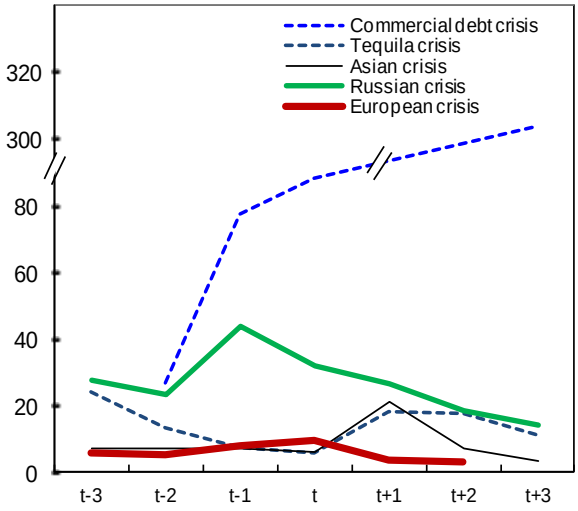
presidential election year.[27] More often than not, it would appear, weakening growth due to accumulated macroeconomic imbalances are precursors to crises. In the commercial debt crisis, the existence of imbalances was evident in the sharp acceleration in inflation during the run-up (Figure 4).[28] Of our subsequent crises, in contrast, significant inflation was evident only in the run-up to the Russian crisis, and even then it seemingly rang no warning bells.

Figure 3: Real GDP growth
(annual, in percent)



Source: World Economic Outlook.

Figure 4: Consumer price inflation
(annual , in percent)



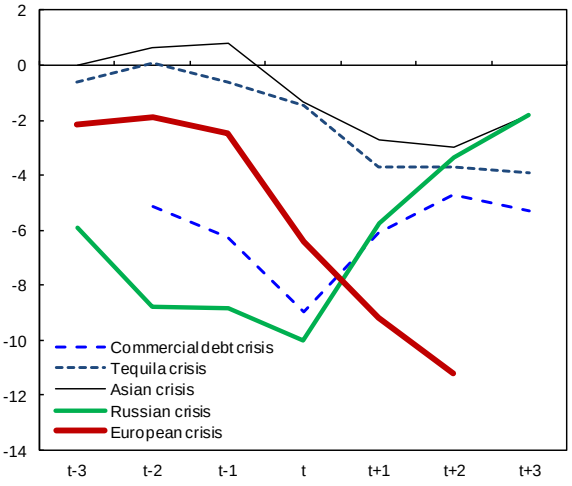
Source: International Financial Statistics.

The behavior of public debt and deficits also differs across episodes (Figure 5 and 6). Consistent with the contrasting behavior of inflation noted above, lax public finances played a major role in Latin America in the late 1970s and early 1980s and in the countries that experienced difficulties in the wake of Russia's late-1990s default. But the same was not true in Asia or Latin America in the 1990s. Some argue that Mexico in 1994 in fact had additional public spending hidden in the accounts of its development bank and that governments of the Asian crisis countries had significant implicit liabilities to banks and industrial conglomerates that were too big to fail that did not show up in the standard budgetary accounts.[29] But as a comparative statement – that public sector deficits were more of a problem in the run-up to the 1980s and Russian debt crises, while private sector deficits were more of a problem in the run-up to the Tequila and Asian crises – we would argue that the conclusion remains valid. Europe is an intermediate case: prior to the crisis, countries displayed small deficits, but a dramatic deterioration of budget balances followed the onset of the crisis.[30] Thus, as in East Asia or the Tequila crisis, neither inflation nor public finances indicated a coming crisis in Europe; we will have more to say about this below.

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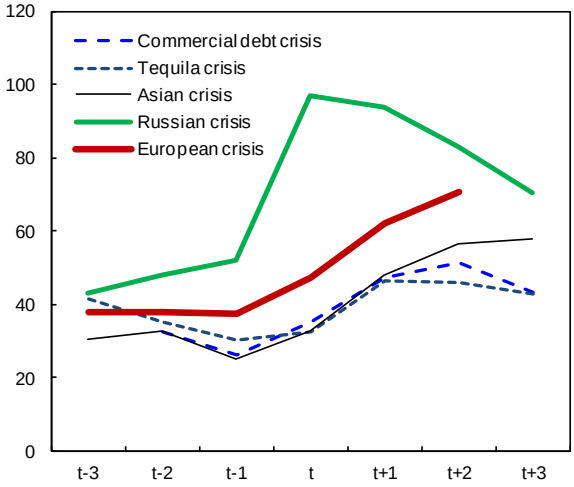
[27] As emphasized in Gil-Diaz (1998).
[28] t denotes the year of the currency or sovereign crisis, whichever occurs first.
[29] For discussion see GAO (1996).
[30] Greece is of course the exception to this rule, with large deficits before the fact (since revised upward).

Figure 5: General government balance
(in percent of GDP)



Source: World Economic Outlook.

Figure 6: General government gross debt
(in percent of GDP)



Source: FAD public debt database and World Economic Outlook.

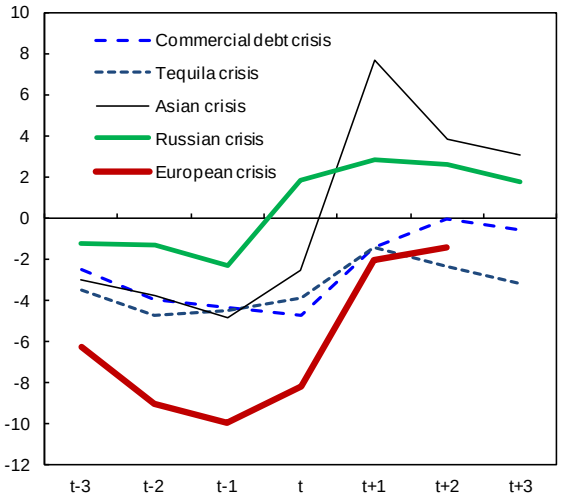
External positions also varied widely across episodes. Current account deficits in the run-up to the current crisis were unusually large, but sizeable deficits were also present in all instances except the Russian crisis (Figure 7). There is an apparent tendency for current accounts to strengthen already in the period immediately preceding the crisis, actually moving into surplus in the Asian and Russian cases. This presumably reflects the declining availability of private external finance and capital flight as problems began to become evident. There is also a tendency for real exchange rates to appreciate (it is tempting to say "to become overvalued") prior to crises and to collapse subsequently (Figure 8); the Russian and current crises stand out for the unusually early and late dates of their real rate collapses, respectively. Reserve coverage (measured in Figure 9 as a share of short-term debt) shows a tendency to decline in the run-up and to recover subsequently, with countries in the Russian crisis starting in a relatively secure position but seeing their coverage ratios then deteriorate particularly rapidly.

Leaving aside the Russian crisis, which saw a private capital outflow even before the event, the larger was the capital inflow prior to the crisis, the larger is the subsequent capital-flow reversal (Figure 10). This phenomenon is also the distinguishing characteristic of the current crisis, where private capital inflows reached unprecedented heights and then collapsed with special ferocity (see also Section 3 below).

In sum, crises come in different flavors. In some sense, the Asian and post-subprime crises seem to have been cut from the same cloth. Both involved mainly private- rather than public-sector imbalances. Both heavily implicated banking systems. Both involved large initial output drops. Both involved important roles for pegged exchange rates or their monetary-union equivalent. There, however, the similarities end, with the kind of fast

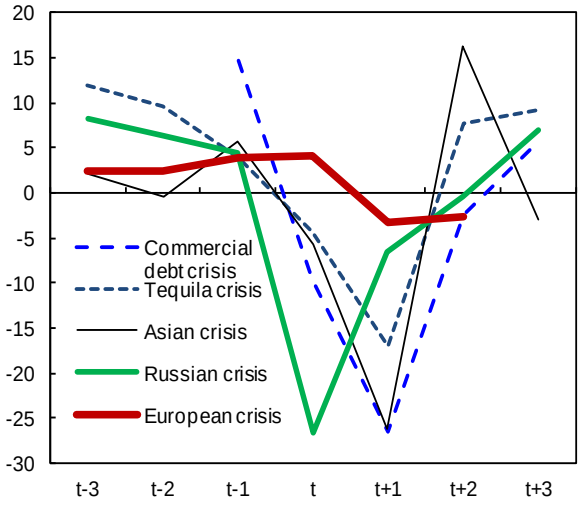
recovery that occurred in Asia not in the cards in Europe.[31] The Russian crisis of the late 1990s most closely resembles the debt crisis of the 1980s: weakness in domestic public finances was mirrored in inflationary trends, and both crises required large corrections of the real exchange rate. In contrast, the Tequila crisis stands alone.

Figure 7: Current account balance
(in percent of GDP)



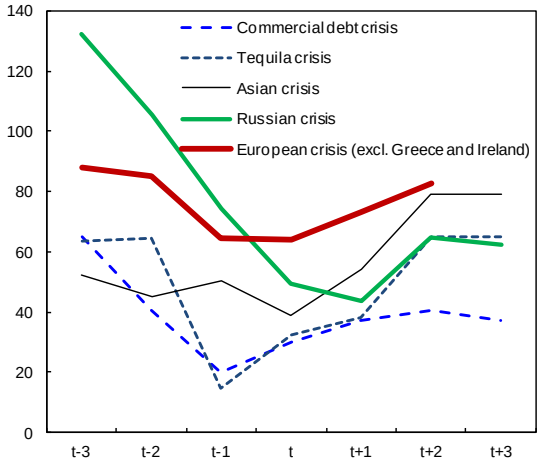
Source: World Economic Outlook.

Figure 8: Real exchange rate
(annual percentage change)



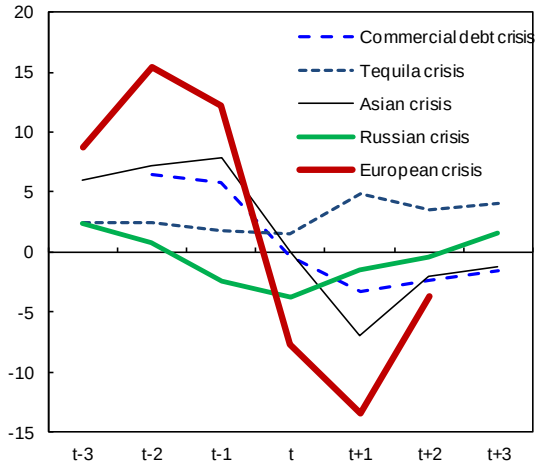
Source: IMF (Information Notice System).

Figure 9: International reserve coverage
(in percent of short-term debt)



Source: World Economic Outlook and International Financial

Figure 10: Private capital flows
(in percent of GDP)



Source: World Economic Outlook.

Finally, there is the fact that some of these crises were global in scope while others were not. For example, the Asian crisis occurred during a period of high growth in much of the rest of the world, while the post-subprime crisis occurred in a period when trade and

[31] Again, we suspect that the exchange rate regime has a lot to do with this, it having been possible to unpeg pegged exchange rates in the wake of the Asian crisis but members of the euro area having no such luck.

output were collapsing worldwide. Scope for recovering by, inter alia, depreciating one's currency and replacing domestic demand with external demand was, obviously, much greater in the former than the latter instance.

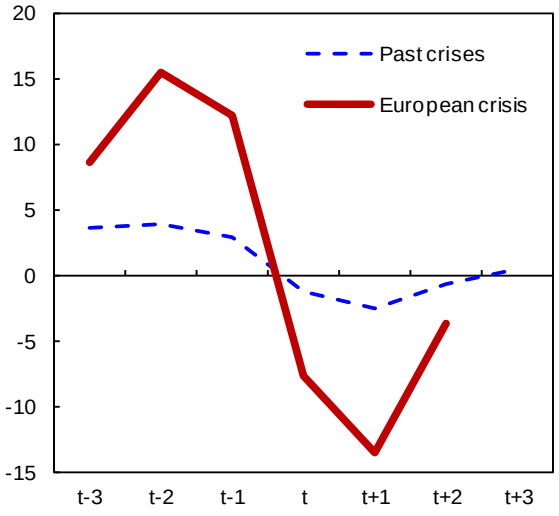
III. EUROPE UNDER THE MICROSCOPE

We now consider Europe's crisis in more detail. This being the most recent of our five episodes, it is the least familiar and least fully digested. We are particularly interested in how this crisis differs from those which preceded it. We therefore contrast the evolution of the variables of interest with their average behavior in the four earlier crises.

These comparisons suggest that Europe's crisis differs from its predecessors in important ways. To start, there was a larger "sudden stop" (reversal of private capital flows). This reflects the dramatic increase in capital flows within the euro area following the advent of the single currency, something pointed to already by Blanchard and Giavazzi (2002) among others, but also to the extraordinarily large capital inflows into countries like Latvia that had not yet adopted the euro but were part of the European Union. Reflecting the laws of physics, what rises to unusual heights then comes down with an unusually loud thud: exceptionally large inflows then give way to exceptionally large outflows (Figure 11).

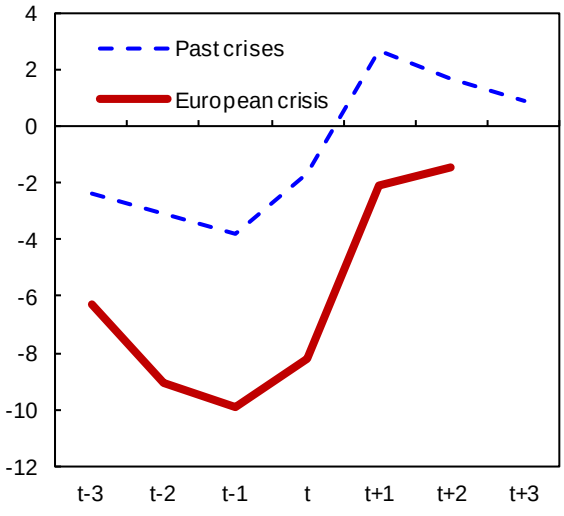
Another side of the same coin, as it were, is that larger pre-crisis current account deficits were followed by sharper post-crisis adjustments (Figure 12). Swings in the current account of this magnitude are unprecedented in our data, which helps to explain why the amount of emergency financial assistance provided was also unprecedented.

Figure 11: Private capital flows
(in percent of GDP)



Source: World Economic Outlook.

Figure 12: Current account balance
(in percent of GDP)

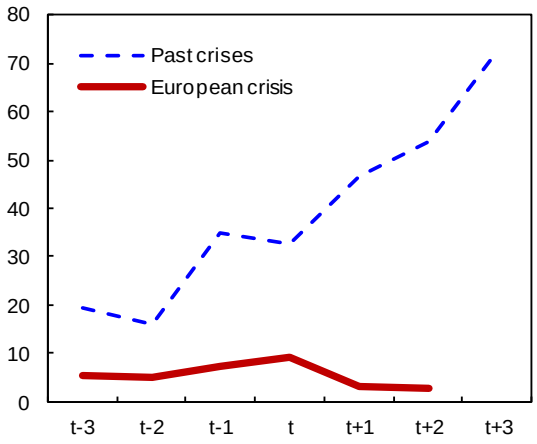


Source: World Economic Outlook.

As discussed in the previous section, this evidence of external imbalances was not matched by analogous evidence of internal imbalances of the sort that had been so prominent in earlier crisis episodes. Inflation was subdued by the standards of earlier crises (Figure 13), reflecting the disciplines of the single currency in the cases of Greece and Ireland and

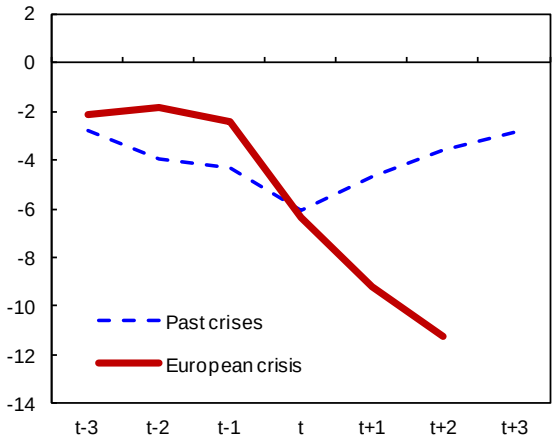
operation of a currency board in the case of Latvia. Government budgets were similarly closer to balance than had been the case prior to earlier crises (Figure 14), the exceptional case of Greece notwithstanding. These are not unrelated observations; it was of course this appearance of fiscal and monetary stability that allowed the now crisis countries to import capital to the extent they did. This, together with the presumption that monetary integration would all but guarantee catch-up growth, led to massive amounts of borrowing and lending by the private (primarily financial) sectors in the relatively-low- and relatively-high-income members of the euro area, respectively.[32]

Figure 13: Consumer price inflation
(annual, in percent)



Source: International Financial Statistics.

Figure 14: Government balance
(in percent of GDP)



Source: World Economic Outlook.

Internal imbalances in this most recent set of crises were heavily private- rather than public-sector centered, as noted. They had common roots in enormous credit booms in all the problem countries. From around 2002, consumer credit grew significantly faster in Ireland, Greece, Portugal, Spain, Italy and emerging European markets than in Germany, France and the other countries of the euro-area "core." Households borrowed from their banks, which in turn borrowed from banks elsewhere in Europe.[33] The result was massive capital flows from France, Germany and the other core countries to Ireland and Southern Europe.

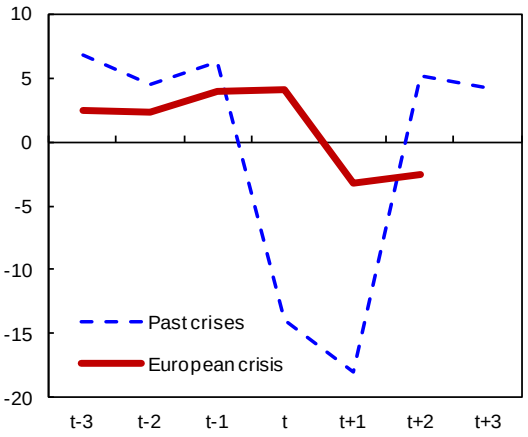
The different capital-importing countries put their borrowed funds to different uses. Portuguese households went on a consumption binge. Their Irish counterparts plowed the money into McMansions. In other countries the precise manner in which these excesses manifested themselves was again different. But the proximate cause – a foreign-capital-financed credit boom – was the same.

[32] For a critical ex post assessment of this process see Eichengreen (2010). Two earlier analyses that viewed these capital flows are relatively benign are Ahearne, Schmitz and von Hagen (2009) and Berger and Nitsch (2009).

[33] In other words, banks in the problem countries funded their loans not just by taking deposits from residents but in addition by borrowing on the interbank wholesale money market.

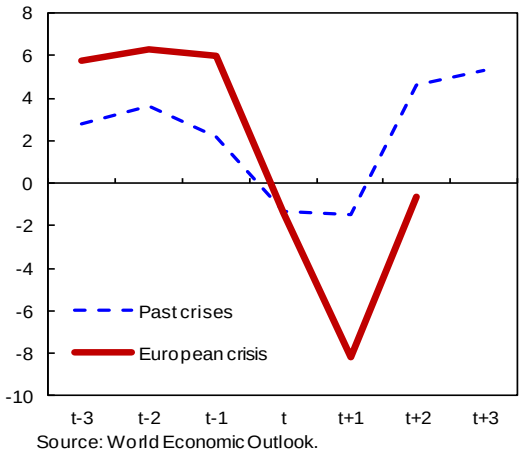
Inflation, rather than rising further with the outbreak of the crisis, then fell, reflecting the absence of an autonomous monetary policy (Iceland, Hungary and Romania notwithstanding) and consequent reliance on internal rather than external devaluation. Collapsing domestic balance sheets reinforced these deflationary tendencies. The difficulty of adjusting through internal devaluation is reflected in much more limited rates of real depreciation following the crisis (Figure 15). This greater difficulty of engineering a real depreciation meant, of course, that it was more difficult to substitute external for internal demand. In the current episode, then, less post-crisis adjustment has taken the form of prices as opposed to quantities. That is to say, the current crop of post-crisis recessions has been unusually severe by historical standards (Figure 16), and it is far from clear at the time of writing that the current crop has run its course.

Figure 15: Real effective exchange rate
(annual percentage change)



Source: IMF (Information Notice System).

Figure 16: Real GDP growth
(in percent, annual)



Source: World Economic Outlook.

As for whether recessions in the current cohort of crisis countries also prove to be unusually long, there is reason to suspect so, but only time will tell.

The evolution of general government debts in the run-up to the current European crisis is in line with earlier experience. However, the deterioration in budgets since the crisis has been more dramatic (Figure 14 above), reflecting the depth of recessions and, in Ireland, the ill-fated decision to guarantee the liabilities of the banking system.[34] This raises questions about the viability of the internal devaluation strategy in the absence of measures to write down the nominal value of debts. And this brings us debt restructuring as a supplement (or alternative) to emergency financial assistance, an issue that we consider in Section 5.

[34] And similarly the impact on the government budget in other countries of the need to use public funds to recapitalize the banking system.

IV. THE SIZE OF FINANCING PACKAGES

But first we analyze trends in program size. Since both the central tendency and overall size distribution are of interest, we club the Tequila crisis which led to only two programs together with the Asian crisis.[35]

The magnitude of financing can be measured per program or by the cumulative sum of the financing through repeated programs during the course of a crisis episode. In addition, cofinancing with the IMF by bilateral and multilateral creditors became increasingly important starting with the Tequila crisis. Hence, both IMF financing and the overall financing package are discussed below. The size of financing packages can be normalized in different ways. Under the IMF's internal governance structure, the official benchmark is the country's quota.[36] But since quotas have not always kept pace with global economic developments, we normalize program size by the country's nominal GDP.[37] Yet another alternative would be to deflate the dollar value of the program by an appropriate dollar price index. Fortunately, the alternative normalizations all lead to the same basic conclusion.

Following the commercial debt crisis, there was a discrete jump in the size of IMF programs, first during Tequila and Asian crises, and then again to yet higher levels in more recent crises (see Figure 17). Similarly, there is a steady increase in the median program size and a similar increase in the 75th percentile of the size distribution. The program with the largest financing also rose from the 1980s, but the largest ever program, at 19 percent of GDP, was that to Uruguay in the aftermath of the Russian crisis.[38] While peak size then came down in the European crisis to 15 percent of GDP for Ireland, this was still far above the 3 and 6 percent of GDP levels in the commercial debt and the Tequila/Asian crises. When cofinancing is included (as in Figure 18), per program size jumps rather more in the Tequila crisis, dips somewhat in the Russian crisis (though Uruguay boosts the largest program even in that episode), and then rises again in the European crisis.

The increasing magnitude of financing packages is clearest when cumulating multiple programs per episode (Figure 19) and considering overall financing (Figure 20). Financing packages rise sharply in size between the commercial debt and Tequila/Asian crises mainly because of extensive cofinancing. Aggregate financing jumps for the largest program in the

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[35] While, as discussed above, there are differences between the Tequila and Asian crises, for the purpose at hand—namely, the progression of program size—we would argue that they are part of the same evolutionary trend.

[36] "Quota subscriptions generate most of the IMF's financial resources. Each member is assigned a quota, based broadly on its relative size in the world economy. A member's quota determines its maximum financial commitment to the IMF, its voting power, and has a bearing on its access to IMF financing." http://www.imf.org/external/np/exr/facts/quotas.htm.

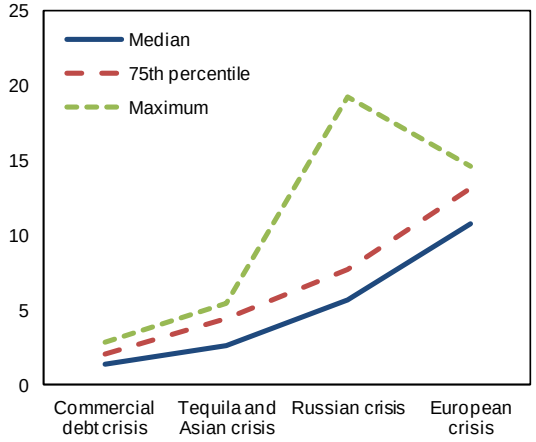
[37] Increases in quotas take place through regular and ad-hoc reviews. The 14th General Review of Quotas, once it becomes effective, will double quotas to catch up with global economic developments and realign quota shares to fast-growing emerging market and developing countries that have become underrepresented.

[38] The Uruguay program was augmented in June and August 2002, bringing it to 19 percent of GDP. The full amount was drawn.

episode in question, from about 10 percent of GDP in the commercial debt crisis to 20 percent of GDP for the largest program in the Tequila/Asian crisis (Mexico in 1995). The further increase during the Russian crisis reflects multiple programs (as in the commercial debt crisis), while the latest step up in program size in the European crisis arises from both larger IMF financing and the substantial co-financing. Over the entire period, the largest cumulative official financing package has grown by a factor of ten. The program at the 75th percentile has grown six-fold, and the median program in the European crisis is five times as large as the median in the commercial debt crisis.[39]

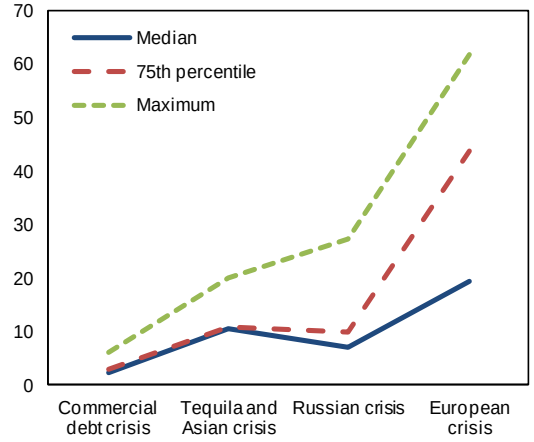
[39] If there are repeated programs in the European crisis, the observed increase would be even greater. Among the sample countries in the European crisis, only Ukraine and Romania have had successor programs so far. The programs for Iceland, Latvia, Greece, and Ireland are still active, while Hungary's program has expired.

Figure 17. IMF financing per program
(in percent of GDP)



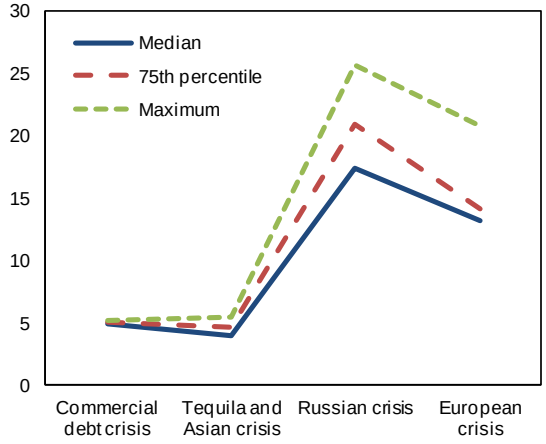
Source: IMF staff reports.

Figure 18. Official financing per program
(in percent of GDP)



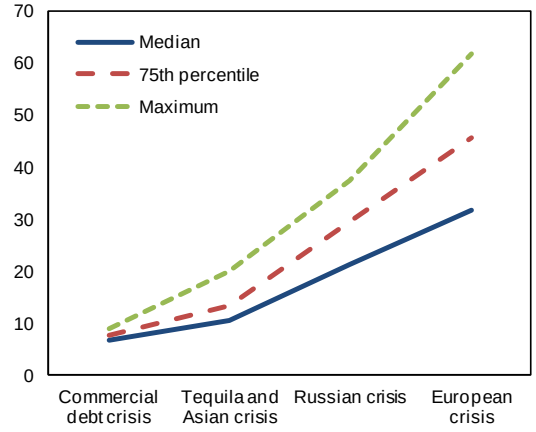
Source: IMF staff reports.

Figure 19. Cumulative IMF financing per country during crisis (in percent of GDP)



Source: IMF staff reports.

Figure 20. Cumulative official financing per country during crisis (in percent of GDP)

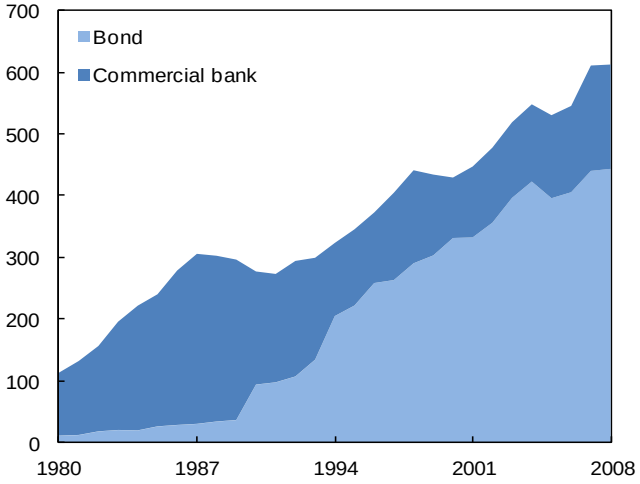


Source: IMF staff reports.

Note: Figures 17 and 18 depict averages for each crisis of IMF and total official financing per program, respectively. Figures 19 and 20 show the average cumulative IMF and total official fianncing, respectively, that were committed to countries during a crisis.

Not only was the Mexican program larger than its predecessors, but the shift toward larger scale official financing proved permanent (see Figure 22). In other words, the Mexican program inaugurated the new era of large financing packages. This reflected the dependence of sovereigns on bond rather than on bank financing and the anticipated difficulty of corralling bondholders to negotiate a restructuring (see Figure 21). It reflected fears of contagion – that other countries would be adversely affected if investors began to fear restructuring-related losses.

Figure 21. Sovereign external debt to private creditors, emerging market countries (in trillions of dollars)

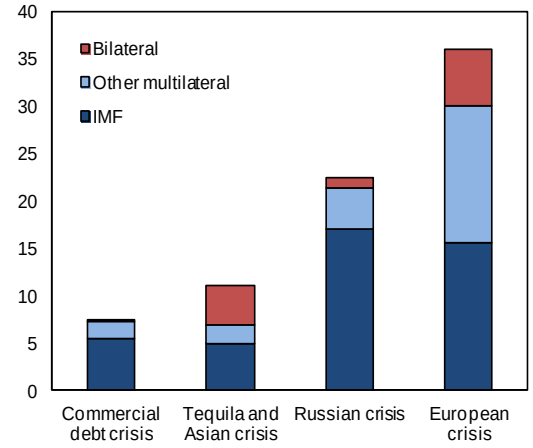


Source: Global Development Finance.

While the concern over the complications created by dispersed bondholders and the perceived risk of contagion carried over to subsequent crises, the same recourse to co-financing did not. In the Russian crisis and its aftermath, cofinancing was more modest, especially from bilateral sources, resulting in heavy reliance on the IMF (again see Figure 22). In Asia, in contrast, financing came from both multilateral and bilateral sources, including Japan, the U.S. and Europe. And in the European crisis, multilateral (mainly the European Union) and bilateral (individual European nations) financing were both large. Evidently, it mattered that there was no large bilateral creditor for whom Russia and the other countries caught up in its wake mattered as much as Mexico and Korea mattered for the U.S. or the Eastern European crisis countries mattered for Western Europe. But it would appear that the absence of a bilateral stakeholder mattered more for the source of official financing than its magnitude. In none of these cases, in other words, was the IMF obviously constrained financially.[40]

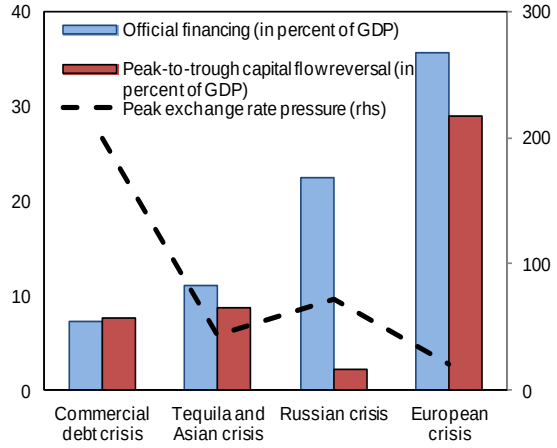
[40] Mexico (1995) was unprecedented in size. The original amount proposed in the staff report was $7.8 billion (300 percent of quota). But the day before the Board meeting, the US contribution was reduced from $40 billion in loan guarantees to US$20 billion. To keep the size of the financing package adequate, while not having yet the commitment by official creditors, Fund management asked the Board to increase the amount to $17.8 billion (688 percent of quota) minus the amounts that could be obtained from governments and central banks. Although there was resistance, mainly from Western Europe which saw the package as excessively large, it was approved. The next milestone was Korea (1997). A $55 billion financing package was put together, of which $20 billion from the Fund, $14 billion from other multilaterals and the rest from bilateral creditors. Access was record-large in percent of quota (1,938 percent) and the Board was unhappy (according to Boughton's forthcoming book on the 1990s, the meeting was "uncivil"). One argument in Korea's favor was that quota was very low compared to GDP, justifying exceptional circumstances. In 2002, the Fund put in place a policy for exceptional access (access beyond normal limits), including criteria on debt sustainability and strength of adjustment policies that need to be met in such cases. The policy has been modified but is still in place, though the criteria have been waived in several cases. The Fund naturally also assess the impact of loans on its lending capacity – the tripling of the Fund's lending capacity in April 2009 allowed it to respond more adequately to the large financing needs during the current crisis.

Figure 22. Cumulative IMF, other multilateral and bilateral financing (average, in percent of GDP)



Source: IMF staff reports.

Figure 23. Cumulative official financing, peak capital outflows and peak exchange market pressure (averages)



Source: IMF staff reports and World Economic Outlook.

The speed of the response and the large financing to support the Mexican program reflected the Fund's new view of itself as "crisis manager." Boughton (1997, p.3) notes that "... the Fund had helped countries through numerous crises, but its role in those cases was essentially similar to its noncrisis lending activities." However, the commercial debt crisis emphasized the systemic implications of this new wave of crises, starting with Mexico, encouraging the Fund to focus on containing the crisis per se, rather than simply facilitating stabilization and structural adjustment in the originating country and hopefully resolving its crisis in the course of doing so.

Does the increase in program size reflect the greater severity of crises? Two handed economists that we are, our answer would be "yes" and "no." The peak-to-trough capital flow reversal was larger in the Tequila/Asian crises than in the commercial debt crisis that preceded it (see Figure 23), but peak exchange market pressure was less. In the crises following Russia, capital outflows were, in fact, modest. While the peak exchange market pressure was greater than in the Tequila/Asian crises, it was again less than in the commercial debt crises. According to both metrics, then, the Russian crises were less severe than the commercial debt crisis, although the financing was considerably larger. The European crisis was characterized by a huge capital flow reversal but no exchange market pressure and very large financing, as we have seen.

It would appear, then, that the magnitude of the capital flow reversal has been the key determinant of the magnitude of official financing. If so, the rise in official financing over time primarily reflects the spread of financial globalization and, with it, the scope for capital flow reversals. By this metric, the Russian crises were something of an outlier, perhaps because fear of contagion was palpable in the wake of immediately preceding events in Asia. This suggests that, along with the financing needs arising from capital flow reversals, an underlying if difficult to measure perception of contagion has been the other driver of growing program size.

Regression results in Table 2 show that if all programs are pooled, capital flow reversals are the main determinant of program financing size, with little role for the exchange market pressure. When episode dummies are included, controlling for capital flow reversals and exchange market pressure program size does not rise between the commercial debt crisis and the Tequila/Asian crisis, but there was a jump in program size in the Russian episode and a further modest rise in the European crises. Within each episode, the extent of capital flow reversals continues to influence program size.[41]

We conclude that the rise in program size over time reflects both a rise in capital outflows and unaccounted broader systemic considerations, which are tempting to interpret in terms of contagion.

Table 2: Determinants of official financing in crisis

Variable		
Capital reversal, in percent of GDP	0.43 **	0.27
	[2.61]	[1.50]
Exchange market pressure index, peak	-0.05	-0.02
	[-1.26]	[-0.48]
Constant	18.45 ***	
	[4.11]	
Commercial debt crisis		9.59
		[0.97]
Tequila/Asian crisis dummy		9.54 *
		[1.88]
Russian crisis dummy		23.21***
		[4.09]
European crisis dummy		28.32 ***
		[4.23]
R-sq	0.38	0.62

Note: The columns report the coefficients in an Ordinary Least Square regression with cumulative official financing by country (in percent of GDP) during a crisis episode, as a dependent variable. t statistics are in brackets. *** represents significance at 1 percent, ** at 5 percent, and * at 10 percent levels.

[41] Albeit with a p-value of only 0.16.

V. EXPERIENCE WITH DEBT RESTRUCTURING

In parallel with the rise in program size there has been a shift in attitudes toward and the practice of debt restructuring.[42] Payment relief achieved by restructuring outstanding debt was seen a plausible alternative and important supplement to official financing in the commercial debt crisis, where as we have seen financing packages were small and restructuring negotiations, while not always brought to a quick conclusion, were ongoing. That emphasis on restructuring as an important option for dealing with borderline unsustainable debts then became weaker over time, as program sizes increased and the engagement of the official creditors in the restructuring process declined – although that emphasis and engagement were never entirely absent, and they were prominent in a few exceptional episodes.[43]

The commercial debt crisis eventually led private and official foreign creditors to extend substantial debt reductions. In 1982-83, Mexico, Argentina and Brazil re-negotiated their debts to their commercial bank creditors, although the resulting settlements were limited to a mix of new financing and rescheduling of principal in the short term. When it became clear that this was unlikely to be enough, governments and their creditors shifted in 1984 to negotiating to multi-year rescheduling arrangements with modest net present value (NPV) reductions designed not to do too much damage to bank balance sheets. As it became apparent once again that this would not be enough to jump-start growth and restore creditworthiness in the crisis countries, the Baker Plan was introduced in 1985, packaging together structural reforms with a putative commitment by the creditors to provide new financing.

Unfortunately, neither the resumption of growth nor significant new financing materialized. In 1987 Brazil responded with a unilateral debt moratorium, and it became increasingly clear that the commercial banks would have to take more losses. In 1987-8, Mexico, Argentina, Brazil negotiated new debt restructuring agreements, exchanging debt for exit bonds with lower face value and engaging in debt buy backs at depressed market prices. Finally, in 1989 the Brady Plan combined significant NPV reductions with collateralization of principal using US Treasury zero-coupon bonds and reserves placed in escrow account to pay interest payments, creating a template through which the debts of a range of problem countries were then restructured.

The IMF played an important role in the Brady deals. It set aside official financing for the credit enhancement needed to make the deals possible.[44] There was also a

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[42] See Tables 3 and 4 at the end for an overview of sovereign debt restructuring and other private sector involvement in Fund programs.

[43] Sturzenegger and Zettlemeyer (2007) review the evidence prior to the European crisis.

[44] Prior to the agreements with the commercial banks, the Fund negotiated programs that would, in addition to regular financing, set aside part of the loan to help the borrower restructure its commercial debt, and to augment the size of the arrangement for the same purpose once the borrower had reached a settlement with its commercial bank creditors. For Mexico, the Board approved in May 1989 a three-year extended arrangement for SDR 2.9 billion (240 percent of quota), including a set-aside equivalent to 30 percent of access for debt-reduction operations. The Board also expressed its willingness "to consider a possible request by Mexico for

(continued)

commitment to augment existing programs once the Brady deals became effective.[45] A further problem, that the Fund's policy of not lending into arrears created an asymmetry between the banks and borrowers in restructuring negotiations, was simultaneously removed, which helped to bring the banks to the negotiating table. Previously, the banks knew that official credit would not be available until arrears were cleared away. This effectively gave the banks a veto over IMF arrangements. In 1989 the Fund therefore decided to modify its policy to permit the approval of Fund programs ahead of agreement in principle with commercial banks. The policy on arrears was also modified to tolerate accumulation of arrears to commercial banks pending the negotiation of voluntary market restructuring agreement (the so-called lending-into-arrears policy).[46]

This approach involving a combination of official financing and NPV reduction changed in the Mexican crisis, which was met with massive and unprecedented official financing but no NPV reduction. Official financing was provided to support the amortization of the tesobonos (short-term sovereign obligations) and to help the commercial banks to meet their external obligations. The tesobonos had diverse ownership and lacked well defined legal and operational rules for restructuring. Given the scope for the tesobonos to roll off as they matured, it was considered impossible to coercively retain credit lines from foreign commercial banks, since doing so would imply different treatment of bondholders and banks. The approach proved successful in the end, helped in no small part by the fact that Mexico in 1994 had milder structural problems than in its previous crisis.

Similarly, there was no restructuring of sovereign debt to private creditors in the Asian crisis.[47] Commitments were obtained from international banks to keep open their credit lines to the private sector, but foreign creditors did not incur significant NPV losses from the restructuring of their claims.[48] Instead, large programs again provided the cover needed to deal with the problems that proved to be temporary in nature. The Fund again adopted a more arms-length relationship with the restructuring process compared to Brady-Plan days.

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augmentation of the arrangement for up to 40 percent of quota in the event that arrangements for the financing of Mexico's program provide for appropriate debt-service reduction and upon determination by the Fund that such arrangements are consistent with objectives of the program and with the guidelines on Fund support for debt and debt service reduction operations." For Argentina, the set-aside was 25 percent of access, and then possible augmentation of 30 percent of quota. Brazil initially had similar provisions in its 1992 program (25 percent of total access set aside), but the negotiations on the Brady deal with the banks was extended and the program went off track. Brazil therefore concluded its Brady agreement without having a Fund arrangement in place (the commercial banks waived the requirement of having a Fund program).

[45] The implication is that while the bait of additional financing helped bail in private creditors, absent that bail in, the size of official financing needed would have been even greater.

[46] This policy was extended from commercial banks to all private creditors in 1998. See IMF (1989) and IMF (1998).

[47] Indonesia rescheduled debt with Paris Club creditors during 1998-2000. A rescheduling of sovereign bond maturities occurred in 2000, during a successor program

[48] However, comprehensive strategies for bank and corporate restructuring were implemented under the Asian crisis programs.

That macroeconomic imbalances were greater in the Russian crisis and its aftermath meant that resolving them required more time, multiple programs, and greater recourse to debt restructuring. While creditors incurred NPV losses, the IMF maintained an arms-length posture toward restructuring negotiations, limiting itself to describing the requirements for debt sustainability as it saw them and emphasizing the voluntary nature of the debt exchanges.[49]

An exceptional case in the aftermath of the Russian crisis was Uruguay, which combined an unprecedented level of financing with a preemptive debt exchange. The Uruguay program started out large (at 6 percent of GDP) and was then was augmented twice in June-August 2002 amid major deposit outflows and reserve losses (as a result of which it reached 19 percent of GDP, an enormous number by IMF standards).

While the program did not call on Uruguay to restructure, it referred to "daunting challenges" to debt sustainability, the difficulties in meeting debt service obligations, and the need to engage in dialogue with market participants.[50] The Fund left the design of the exchange to the authorities and their advisers while providing assurances that financing gaps would be addressed. The resulting deal extended the average maturity of virtually all market debt by about five years while maintaining the low interest rates contracted when Uruguay had enjoyed investment grade ratings. A high participation on the part of creditors (93 percent) led this to be seen as a successful debt exchange. The exchange not only helped to reduce short-term financing needs but reduced the debt burden by about 5 percent of GDP. This combination of generous official financing and limited NPV reduction was successful in the sense that the debt/GDP ratio then fell quickly as growth resumed and the government ran substantial primary surpluses (averaging 3.4 per cent of GDP in 2003-7).

Why Uruguay is exceptional, in that resolving its crisis did involve debt restructuring, is an interesting question. One answer is that there was not much concern about contagion, reflecting the country's small size. Another is that the actual extent of the restructuring, in terms of NPV reduction, was very modest, and in this sense Uruguay is not a notable exception to the general trend we have been describing.

Private sector involvement in the current European crisis has been limited to foreign creditors' exposure to commercial banks. Only in Iceland and, to a much lesser extent, Ireland have foreign bank creditors had to accept haircuts on their bonds at the time of writing. Foreign parent banks have committed to rolling over their interbank credit lines and maintain capital adequacy in their subsidiaries in Eastern Europe, including in Hungary, Latvia, and Romania, through the European Bank Coordination Initiative. The European Bank Coordination Initiative (formerly the Vienna Initiative) created in 2009 helped ensure that foreign banks remain engaged and that overall commitments remain intact. The group brings together the IMF, the European Bank for Reconstruction and Development, the

[49] A few cases required official debt restructuring through the Paris Club and had an associated requirement of "comparability of treatment" to private creditors.

[50] The phrase in quotes is from the staff report for the Augmentation and the First Review of the Stand-By Arrangement (August 2002).

European Investment Bank, the World Bank Group, EU institutions (European Commission with the ECB as observer), home and host country central banks, regulatory and fiscal authorities as well as the largest western banking groups active in emerging Europe. This is very limited recourse to bank restructuring given the heavy indebtedness of the crisis countries.[51]

VI. A NEW APPROACH TO DEBT RESTRUCTURING

History – both recent European history and the history of our five international-debt-crisis episodes – thus suggests that policy makers are reluctant to contemplate debt restructuring. Restructuring even in a situation where there are serious questions about the sustainability of sovereign debts has up-front political and economic costs but deferred benefits. Politicians with finite political lives and higher discount rates than society as a whole may therefore be reluctant to contemplate it or at least put it off excessively. There is a reluctance to proceed in the hope that good news that removes the need may miraculously turn up. And to provide more opportunity for the miracles in question, there is the incentive to provide larger and larger amounts of emergency financial assistance for longer and longer periods.

In recognition of this fact, there have been a series of efforts to encourage institutional and contractual innovations designed to modestly tip the balance in the direction of earlier restructuring. Earlier schemes for an international-bankruptcy-court-type mechanism that determine the need for a restructuring and cram down terms culminated in Krueger's (2001) Sovereign Debt Restructuring Mechanism proposal.[52] Responding to international pressure, a number of emerging markets have added collective action clauses to their international bonds in an effort to signal that, if things went wrong, restructuring those debts would be easier (Gulati and Gelpern 2009). In response to the Southern European debt crisis, European leaders agreed that collective action clauses would be included in all new sovereign bonds starting in 2013. And they agreed that any emergency lending provided from that point by the EU's European Stability Mechanism (its proto-European Monetary Fund) would be preceded by a "rigorous debt sustainability analysis" that would make it harder to deny the existence of sustainability problems.[53]

We (more precisely, two of us – see Eichengreen, Kletzer and Mody 2001) are skeptics of the institutional approach. As we have argued elsewhere, it would be difficult for

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[51] We have two recent precedents of debt exchanges within Fund programs. In Jamaica, the February 2010 coercive debt exchange on domestic debt (including foreign-currency-denominated debt) was a prior action for the approval of the standby arrangement. A large amount of financing was provided upfront to finance a fund for the commercial banks holding the government debt. In Seychelles, the December 2008 program was based on a comprehensive restructuring of sovereign debt to private and official creditors. But these programs are small by today's standards (300 and 200 percent of quota, respectively) and the countries in question are not systemically significantly.

[52] The most comprehensive survey of proposals for an international bankruptcy-type mechanism is Rogoff and Zettelmeyer (2002).

[53] The quotation is from Eurogroup (2010).

either an IMF-linked entity or the ESM to make politically-difficult decisions any differently than the politicians themselves in the absence of strong-form political and operational independence of a sort that we think unlikely. And if political resistance to proceeding with a "potentially disruptive" restructuring is sufficiently strong, the addition of collective-action clauses will not be enough to tip the balance by itself. Politicians will find a way of taking extraordinary action to avoid having to invoke them.

For this reason, we suggest that future bond covenants should include provisions that trigger restructurings automatically. We propose the idea of "sovereign cocos," contingent debt securities that convert automatically in the event of debt-sustainability problems. The idea is that if adequate incentive to restructure is not present once a crisis starts, it should be built in *ex ante*.

The concept is taken from the debate over bank reform, where there is a similar problem of bail-ins and bail-outs. Because of the difficulty of putting banks through a bankruptcy-like procedure, which among other things will tends to create difficulties for bank counterparties, there is an incentive, analogous to that which arises in the context of sovereign debt, to provide a bailout and hope that good news will turn up rather than proceeding with the delicate process of bailing in the bondholders. Contingent convertible bonds (cocos) have been suggested as a solution to this problem. The bonds in question automatically convert to equity, both bailing in the bondholders and helping to recapitalize the bank, when its Tier 1 capital falls below a pre-specified limit.

There has been movement toward issuing these instruments. In 2010 Lloyds Banking Group Plc exchanged some of its subordinated bonds for enhanced capital notes that become equity if the lender's core Tier 1 ratio falls below 5 per cent of assets. Rabobank Groep NV sold senior notes that will be written down to a quarter of their face value if its capital ratio slips below 7 per cent.[54] Credit Suisse issued more than $2 billion of cocos in February 2011. At the time of writing other banks (the Bank of Cyprus, for example) have indicated that they intend to follow.

Extending this idea to the sovereign-debt domain, government bond contracts could provide that if a sovereign's debt/GDP ratio exceeds a specified threshold, there will be an automatic extension of maturities.[55] More ambitiously there could be an automatic reduction in principal and interest payments when the trigger is reached.

Objections to this idea are obvious – starting with whether sovereigns themselves would have an incentive to include such provisions in their bond contracts and whether, even if an international agreement was reached to mandate their inclusion, the incentive would be to place the threshold so high as to render it meaningless.

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[54] The experience with banks' cocos thus suggests that the threshold specified in the bond contract is specific to the issuer—and, indeed, if there are multiple issues, the threshold will likely be specific to the issue. We return to this below.

[55] One could also imagine making the trigger a function of the debt service/government revenue ratio, although the denominator is notoriously difficult to estimate reliably.

Concretely there is the objection that this kind of provision would increase sovereigns' borrowing costs, since investors would be wary of being bailed in and require compensation. In strong form, the argument would be that investors would be unwilling to hold such securities at any price. We would note, however, that while the same argument has been made about bank cocos, well-capitalized banks have not found it difficult to find willing buyers of such instruments. This is evident from the example of Credit Suisse in February 2011, when its issue of cocos was favorably priced and 11 times oversubscribed.[56]

Moreover, there is reason to think that borrowing costs would not rise across the board. They would only rise for sovereigns whose debts were within hailing distance of the trigger. Empirical work on collective-action clauses shows that their inclusion in bond covenants increases borrowing costs for risky sovereigns with potential sustainability problems and not for others far from the "strike price" (Eichengreen and Mody 2004). It seems plausible that the pattern would carry over.

Indeed that borrowing costs would rise for risky borrowers as the critical debt threshold was approached is by no means undesirable. Experience suggests that credit spreads do not always widen gradually as debt burdens grow; rather, investors tend to remain sanguine for extended periods before awakening abruptly to the existence of sustainability problems. If coco-like clauses serve to focus the attention of investors, adding them to bond covenants might enhance its regularity of market discipline.

Another objection to cocos is uncertainty about the trigger: in the case of commercial banks, regulators in different countries value Tier 1 capital in different ways, making it difficult for investors to assess when conversion might be triggered. There might be similar uncertainty about how to value and what to count as debt and about the level of GDP. To address these concerns, bond covenants could specify that the trigger would be based on debt statistics constructed by an independent party. Candidates would be rating agencies, Eurostat, and the IMF's *World Economic Outlook*, which publish such numbers as part of their normal reporting but are not parties to the agreement. To further reduce the risk of reporting manipulation, the agreement could specify the trigger as the higher or lower of two independent estimates. As with the Tier 1 capital ratio, sovereign debt ratios are updated only a few times a year. But the banks' use of the Tier 1 ratio suggests that this is not a problem.[57]

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[56] The rating agency Standard & Poor's estimates that banks will raise about a trillion dollars in contingent convertible bonds in the next 5 to 10 years.

[57] It will be noted that many of the same points arise in the context of GDP-indexed bonds: the possibility that GDP statistics might be manipulated, the difficulties of pricing, and the illiquidity of the IPO market. However, where in the case of GDP-indexed bonds it is presumably obvious in which direction a government would seek to manipulate the statistics – it would want to understate growth in order to reduce its debt burden – the direction in which an issuer of sovereign cocos would wish to manipulate the statistics is less clear. While understating GDP would get it a maturity extension, in practice governments actively seek to avoid having to restructure, and such governments would wish to overstate GDP.

For banks, the academic literature has also suggested an equity price as the trigger (Flannery, 2009). Two related concerns have been expressed about this idea. Bondholders may have an incentive to drive down the price to the threshold level and thereby gain preemptive access to the bank's stock at a "cheap" price (Sunderesan and Wang, 2010). Because of this possibility, there may be multiple equilibria in the stock price (Pennacchi et al 2010). For sovereign cocos, the corresponding trigger would be the sovereign bond spread (possibly over a risk-free rate). The spread is a measure of the risk of default, and the restructuring trigger could be a value of the spread above which a mandatory restructuring occurs. Concerns about manipulation would arise also in this case. Authorities could "talk up" the spread by irresponsible statements, especially as it nears the threshold. Equally, certain investors might seek to drive down the price of debt. Again, the risk would occur closer to the threshold where gains from such strategies are realistic. One (partial) solution to this problem might be for the contract to have a "cooling down" period, allowing the spread to persist above the threshold for some months before the trigger event is established.[58]

Then there is the danger of contagion if a government's cocos are triggered. There could be negative spillovers to banks and other institutional investors at home and abroad that hold the government bonds in question. There could be negative spillovers, both via the banking system and direct confidence channels, to bond markets in other countries.

Fair enough, one might say, but is there reason to think that the risks of contagion will be greater than under current contractual arrangements? Working in the other direction is the argument that if a predictable process of debt restructuring is in place, as in our proposal, the risk of contagion will also be lower since all parties will be forewarned of its imminence and will, therefore, have the time to prepare for it. Even in instances of sharp changes in market sentiment, triggering the default and restructuring, the market would have a well-defined probabilistic basis for anticipating the event in contrast to the current fuzziness on this matter that tends to create sharp swings in market sentiment.

A key issue will be setting the conversion trigger at a suitable level. The trigger needs to be placed high enough that it is unlikely to be reached as the result of a garden-variety recession but low enough that it kicks in when serious issues of debt sustainability arise. It is unlikely that the same debt-to-GDP ratio will be appropriate for different countries with different growth rates, real interest rates, and revenue-raising capacities. In other words, attempts to incorporate workable provisions of this sort into sovereign bond covenants would confront policy makers with all the same analytical problems of standard debt sustainability exercises – which is not to say that they should be relieved of trying to solve them. Moreover, there is no reason why the trigger could not be set at different levels in different countries. The Tier 1 capital threshold for bank cocos is set at different levels (see above). The thresholds for bondholder participation specified in collective action clauses differ across countries (Eichengreen 2003, Gulati and Gelpern 2009). The same

[58] Haldane (2011) considers these concerns about the consequences of market speculative behavior and suggests similar safeguards. He concludes, "So while CoCos are susceptible to market aberrations, these can in my view be managed."

could be true for sovereign cocos, in other words. Similarly, the specified degree of restructuring would be different—from maturity extension to outright write downs.

As in the case of collective action clauses, there is likely to be a first-mover problem. There will be fears by potential first movers of sending adverse signals about their creditworthiness. The first mover would pay a novelty and liquidity premium. This creates arguments for countries to move together and for an international organization to coordinate their actions. What better organization than the one that all too often finds itself on the hook for emergency assistance because of the difficulty of getting governments to swallow the restructuring pill?

Our proposal is consistent with other suggestions for relying more on contingent debt claims. Rogoff (2011), for instance, writes how "the lesson from the financial crisis is that we must become less reliant on crude, non-indexed debt." Most attempts for moving from principle to practice focus on GDP-indexed bonds. However, indexing the bond repayment directly to a debt statistic has many virtues. That's where the problem is centered. Measurement problems are easier for debt. Since debt is a stock, discrete jumps like those caused by banking crises have clearly identifiable sources. In contrast, GDP growth numbers are subject to serial revision. As a consequence, the risk of manipulating GDP growth is a serious one. As Rogoff (2011) experience, there may be a need for "strong independent fiscal councils to monitor government data claims."[59]

VII. CONCLUSION

Our review of the modern history of financial crises and their management highlights the heterogeneity of experience – to paraphrase *Anna Karenina*, every unhappy crisis episode is unhappy in its own way. But it has also revealed some common trends. There has been a tendency for the violence of financial reversals to grow, mirroring the progress of financial liberalization (such as it is) and growth of international capital movements. One consequence has been the financial requirements of international intervention have increased. This has strained the resources of multilateral and regional lenders. Whether it has been a serious source of moral hazard can be disputed. But what is indisputable is that it has not made the world a safer financial place.

Part of the problem, we have argued, is that there has been a reluctance to contemplate sovereign debt restructuring even when there is prima facie evidence that debts are not sustainable. Private lenders have an obvious interest in holding out for full payment, whether directly from the sovereign or indirectly through resources provided by international

[59] Moreover, in the case of GDP-indexed bonds it is presumably obvious in which direction a government would seek to manipulate the statistics – it would want to understate growth in order to reduce its debt burden – the direction in which an issuer of sovereign cocos would wish to manipulate the statistics is less clear. While understating GDP would reduce the net present value of debt, in practice governments actively seek to avoid having to restructure, and such governments would wish to overstate GDP.

financial institutions. National officials have an interest in putting off a difficult and politically embarrassing restructuring in the hope that good news might somehow turn up. Multilaterals find it hard to go against the wishes of those national officials and, being risk averse, fear restructuring as one of those "unknown unknowns."

We have suggested automating the restructuring decision as a way of countering this finance-rather-adjust bias. To that end, we propose adding sovereign cocos to future government bond issues, contractual provisions that will automatically lengthen maturities or reduce interest and amortization payments when a pre-specified debt/GDP ratio is reached. Adding such provisions to future bond issues would require solving a host of difficult technical issues. It would require solving coordination problems – getting governments to move together. But what, if not for this, are the multilateral financial institutions for?

Table 3: Private Sector Involvement and Debt Restructuring in IMF Programs

	Private Sector Involvement	Sovereign Debt 1/ Default 2/	Sovereign Debt 1/ Restructuring	IMF program
Commercial debt crisis				
Mexico	Repeated rescheduling of debt with commercial banks, combined with assurances to provide new money. Also concerted rollover of interbank credit lines. One of the first Brady agreements to be finalized, in 1990, leading to substantial debt reduction.	Aug.82	Eight restructuring agreements with commercial and Paris Club creditors during 1983-89, followed by a Brady deal in April 1990.	Jan.83 – Dec.85 Nov.86 – Apr.88 May.89 – May.93
Argentina	Bridge loan with private creditors to eliminate arrears, and unilateral rescheduling of domestic loans in 1982. Unsuccessful negotiations of rescheduling commercial loans during 1983-84, then agreement on official package combined with rescheduling/new money from commercial creditors in 1985, but new arrears appeared. Brady agreement in 1993, including down-payment of overdue amounts by Argentina.	Sep.82	Six restructuring agreements with commercial and Paris Club creditors during 1985-92, followed by a Brady deal in July 1993.	Jan.83 – Jan.85 Aug.85 – Aug.89 Nov.89 – Nov.90
Brazil	In 1983, agreement with commercial banks to rollover short-term financing into medium-term financing, and provide new money through syndicated loans. Delays in completing multi-year rescheduling agreements and unilateral stop in interest payments on bank debt in February 1987, followed by new restructuring agreements.	Jan.83	Nine restructuring agreements with commercial and Paris Club creditors during 1983-89, followed by a Brady deal in April 1994.	Mar.83 – Feb.86 Aug.88 – Feb.90

		Final Brady agreement in 1994, re-establishing orderly relations with creditors.					
Tequila crisis							
Mexico Argentina							Feb.95 – Feb.97 Mar.92 – Mar.96 Apr.96 – Jan.98
Asian crisis							
Thailand		Japanese banks gave informal assurances that credit lines to Thai banks would be maintained.					Aug.97 – Jun.00
Indonesia		Agreement in 1998 with foreign banks to reschedule interbank debt, and maintain trade credit to corporations.		Mar.99	Two Paris Club rescheduling agreements during 1998-2000. Rescheduling of sovereign bond principal payments in 1999-2000.		Nov.97 – Aug.98 Aug.98 – Feb.00
Korea		Agreement with foreign commercial banks to convert short-term of loans to Korean banks into longer-maturity sovereign-guaranteed bonds.					Dec.97 – Mar.98 Apr.98 – Dec.00
Philippines							Jun.94 – Mar.98 Apr.98 – Dec.00
Russian crisis and aftermath							
Russia		Restructuring of treasury bills, bonds, and commercial bank loans, with NPV reduction. Foreign investors' claims on Russian banks were settled in bilateral negotiations.		Aug.98	Three restructuring operations of debt with commercial creditors during 1997-2000, and a Paris Club rescheduling in 1999. Final London Club restructuring with commercial creditors in August 2000.		Mar.96 – Mar.99 Jul.99 – Dec.00
Brazil		Monitoring of foreign banks' credit lines to banks					Dec.98 – Sep.01 Sep.01 – Sep.02

		operating in Brazil and indications of commitments to maintain or rebuild exposures (1999). Joint statement of long-term commitment and intention to maintain exposure to banks operating in Brazil at meetings with leading banks in 2002.					Sep.02 – Mar.05
Argentina		The June 2001 megaswap increased the debt stock marginally, but the Phase 1 restructuring in November implied an NPV reduction. The 2005 global debt exchange led to a large NPV reduction. Repeated intervention in bank balance sheet led to losses for banks' creditors.		Nov.01	Two rounds of debt treatment in 2001, prior to default. In April 2005, a global bond exchange was offered. Rescheduling of official bilateral debt has not been completed.		Feb.98-Mar.00 Mar.00 – Jan.03 Jan.03 – Aug.03 Sep.03 – Jan.06
Uruguay		Sovereign debt exchange with NPV reduction in 2003. Creditors of commercial banks also haircut.		May.03	A single global bond exchange in May 2003.		Jun.97 – Mar.99 Mar.99 – Mar.00 May.00 – Mar.02 Apr.02 – Mar.05 Jun.05 – Dec.06
Turkey		General commitment in 2000 by foreign commercial banks to maintain exposure to Turkish banks, monitored weekly. Voluntary domestic debt swap to lengthen maturities in June 2001. Voluntary agreement in 2002 with foreign banks to maintain exposure to Turkish banks and companies.					Dec.99 – Feb.02 Feb.02 – Feb.05 May.05 – May.08
European crisis							
Ukraine							Nov.08 – Nov.10 Jul.10 – Dec.12
Hungary		Foreign banks agreed to maintain exposure to their subsidiaries in Hungary.					Nov.08 – Oct.10
Iceland		Losses imposed/agreed with					Nov.08 – Aug.11

		creditors of failed Icelandic banks.					
Latvia		Foreign banks agreed to maintain exposure to their subsidiaries in Latvia.					Dec.08 – Dec.11
Romania		Foreign banks agreed to maintain exposure to their subsidiaries in Romania.					May.09 – May.11
Greece							May.10 – May.13
Ireland		Haircuts on subordinated debt of government-guaranteed Irish banks.					Dec.10 – Dec.13

1/ Includes operations on sovereign bonds, commercial and official loans.
2/ A default is defined in the month in which the government misses its first payment beyond the grace period or there is a public announcement to restructure a sovereign debt instrument. Prior to 1995, default is based on IMF staff reports. From 1995 onward, the classification of sovereign default by credit rating agencies is applied, using the default month provided by at least two of the agencies.

Table 4: Haircuts in Sovereign Debt Restructurings with Commercial Creditors

	Debt Reduction in Net Present Value (in percent)	Operation	Public debt affected (in percent of GDP)
Commercial debt crisis			
Mexico	45	1988-89 restructuring, 1990 Brady agreement	21.3
Argentina	35	1992 restructuring, 1993 Brady agreement	12.3
Brazil	38	1992 restructuring, 1994 Brady agreement	7.8
Russian crisis and aftermath			
Russia	40-75	May 1999 Treasury Bill Restructuring	
	41-63	November 1999 Min-Fin 3 bonds	23.7
	40	August 2000 London Club Agreement	
Argentina	-2	June 2001 Megaswap	11.0
	35	November 2001 Phase I restructuring	19.0
	75	2005 Global Debt Exchange	59.7
Uruguay	20	May 2003 Debt Exchange	48.3

Source: IMF country documents and Sturzenegger and Zettlemeyer (2005).

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