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journal homepage: www.elsevier.com/locate/jieFinancial crises and the multilateral response: What the historical record shows[☆]Bergljot Barkbu^a, Barry Eichengreen^{b,c,*}, Ashoka Mody^d^a European Department, International Monetary Fund, 700 19th Street, NW Washington DC 20431, United States^b Department of Economics, University of California, Berkeley, 549 Evans Hall 3880, Berkeley, CA 94720-3880, United States^c NBER, United States^d Research Department, International Monetary Fund, 700 19th Street, NW Washington DC 20431, United States

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ABSTRACT

We provide a synoptic description of financial crises and the multilateral response over the course of the last four decades. We present both indicators of economic performance around crisis dates and a comprehensive description of multilateral rescue efforts. While emergency lending has grown, reliance on debt restructuring, broadly speaking, has declined. This leads us to ask what can be done to rebalance the management of debt problems toward a better mix of emergency lending and private sector burden sharing. In particular, we explore the idea of sovereign cocos, contingent debt securities that automatically reduce payment obligations in the event of debt-sustainability problems.

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1. Introduction

In the three decades ending in 1980, serious crises implicating financial systems and sovereign creditworthiness were few and far between. Since then, however, crises have proliferated. The debt crisis of the 1980s, centering on syndicated bank loans to governments, engulfed a large number of Latin American countries but extended also to Asia, Africa, and Eastern Europe. The Tequila Crisis in 1994–95 was the first since the 1930s to center on international bond markets. The Asian crisis of 1997–98 brought to the fore other international financial contracts, including currency forwards and futures and interbank credits, as well as external loans to the private sector. The crisis in Russia and succeeding events spanning the period 1998–2002 threatened financial stability in Brazil, Argentina, Ukraine, Uruguay, and Turkey. Most recently, the crisis in Europe highlights even more prominently the connections between financial-sector and sovereign-credit risks.

Just as the frequency and nature of crises have changed, so has the multilateral response. The number of IMF-supported programs has

been bunched: up in the early 1980s, up again in the mid-1990s, up around 2000, and up again starting in 2008 (see Fig. 1, left panel). New commitments of IMF credit show a similar pattern, superimposed on a rising trend (right hand panel of Fig. 1). Co-financing from other official sources has further augmented program financing commitments. IMF commitments since 2009 also include Flexible Credit Lines to Mexico, Poland, and Colombia, which are also substantial although not (yet) drawn, and a Precautionary Credit Line for Macedonia, which was partly drawn in March 2011.

One strand of literature asks why crises have grown more frequent (see e.g. Bordo et al., 2001). Another asks whether IMF programs have helped to restore macroeconomic stability or only aggravated output losses by requiring additional austerity of the borrower. Yet another asks whether the international policy response, even when providing immediate relief, contributes to the growing incidence of crises by creating moral hazard.

Analysis of these issues is not straightforward. Attempts to estimate the effects of IMF programs must confront the problem that both crises and programs have changed over time. The structural relationship that the investigator is seeking to estimate may not be stable, in other words. Moreover, analyses attempting to determine how IMF programs affect the frequency, incidence and magnitude of crises generally fail to acknowledge that programs are not randomly assigned.

Some would argue that crises and the multilateral response are codependent. As countries have become more integrated into global financial markets, financial crises have become more severe, causing

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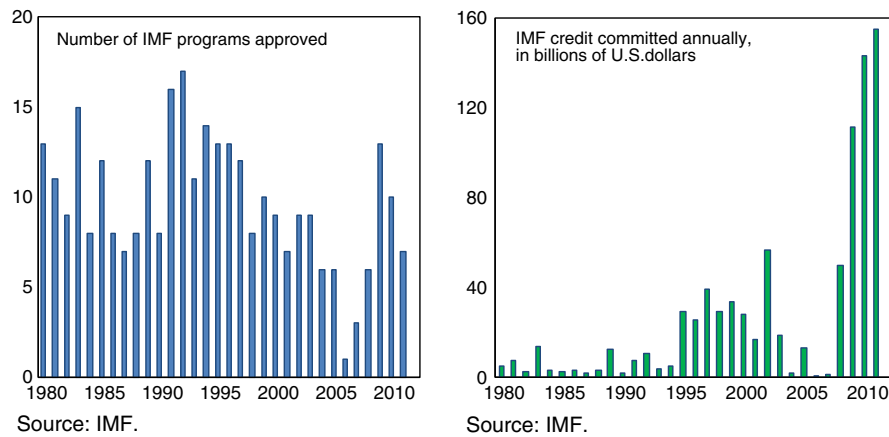


Fig. 1. IMF programs 1980–2011, emerging and advanced economies.

official financing to grow larger; and as programs have grown larger, this has caused crises to become more virulent. In this view, the availability of official finance from bilateral and multilateral sources has rendered investors more sanguine about the risks they assume. In turn this has permitted governments to postpone necessary adjustments, rendering the latter more costly and difficult. No one would question the desirability of more effective crisis prevention. At the same time, however, there would be considerable value to creating a more stable and predictable framework for crisis resolution.

In fact, commentators have been making the case for alternatives to emergency financial assistance for decades.¹ Proposals for doing so range from placing new restrictions on IMF lending to creating a statutory mechanism for sovereign debt restructuring and introducing restructuring-friendly collective action and representation clauses into sovereign bond covenants. Still others would say that such institutional and contractual changes are unnecessary. It is already possible, they argue, to restructure sovereign debts under current arrangements. In this view, policy makers only need to better appreciate the need.²

But there may also be other reasons, in addition to lack of understanding, why officials are reluctant to proceed with debt restructuring even in cases where, ultimately, it is unavoidable and where delay only increases eventual costs of adjustment. Bondholders who stand to take losses may effectively lobby against restructuring; their narrow interests may prevail over the broad social interest. Insofar as sovereign debt restructuring has up-front political and economic costs but deferred benefits, elected officials with finite political lives and higher discount rates than society as a whole may put it off excessively.

In this paper we revisit these questions. Along with indicators of economic performance in the run-up to each crisis and its aftermath, we describe major multilateral rescue efforts spanning the last 30 years. We employ analytic narrative rather than econometrics. Not only do the connections between financial circumstances and policy responses run both ways, but those connections evolve over time, as emphasized above. The Lucas Critique applies with a vengeance, in other words.

We start in Section 2 with an overview of crisis incidence and response, identifying crisis dates on the basis of the behavior of exchange rates and sovereign spreads. We provide comparisons of causes, consequences and correlates as a way of describing the lay of the land.

¹ An early statement, in a report to the G-10, was Eichengreen and Portes (1995). A summary of the first generation of literature on this question can be found in Roubini and Setser (2004).

² This is essentially the conclusion of the Roubini and Setser volume cited above.

Section 3 turns to the multilateral response. We marshal data on co-financing to analyze changes in multilateral and bilateral contributions over time and more accurately gauge the magnitude of assistance. The resulting picture is one of official financial assistance packages that are growing larger over time. Section 4 completes this picture by describing trends in debt restructuring.

In Section 5 we then explore a new approach to sovereign debt restructuring. Building on the literature on collective action clauses, we explore the idea of “sovereign cocos,” contingent debt securities that automatically reduce payment obligations in the event of debt-sustainability problems.

2. Crisis episodes

We distinguish five clusters of crises: the Latin American debt crisis of the 1980s; the Tequila Crisis of the mid-1990s; the Asian financial crisis of 1997–8; the Russian crisis of 1998 and the emerging market crises that occurred in its wake; and the crisis in Europe that erupted in the wake of the subprime mortgage debacle in the United States. Among the countries hit by the 1980s debt crisis, we look at Mexico, Chile, Argentina, Uruguay, Brazil and the Philippines. In the case of the Tequila we consider not just Mexico but also Argentina. In the case of Asia we include Thailand, Indonesia, South Korea and the Philippines, all of which had IMF-supported programs. 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, Ireland and Portugal but also Ukraine, Iceland, Hungary, Latvia and Romania; we consider more than just members of the euro area, in other words. We consider only countries that ultimately were in an IMF-supported program. Presumably, no program is also a multilateral response.³ In general, however, the more severe a crisis, the greater is the likelihood of a program.⁴

We identify crises using data on currency market turbulence and sovereign spreads. Following Eichengreen et al. (1995), currency

³ Thus, we put aside the 1992–3 EMS (European Monetary System) episode on the grounds that none of the affected countries faced the same crisis severity as the episodes we do study, and, as such, did not require official financing and none were forced to restructure their debts.

⁴ Any taxonomy of crises is controversial. A case in point is our grouping the Russian crisis with subsequent crises in Latin America and Turkey. While this is defensible on chronological grounds, it may be not as defensible analytically, as the Russian crisis is often seen as sui generis. Fortunately, most distinctions we highlight in this section carry over when we drop Russia from our fourth cluster.

Table 1
Timing and peak of crisis, and IMF-supported programs.

	Timing of crisis		Peak of crisis		IMF program	
	Currency crisis	Sovereign crisis	Currency pressure	Sovereign spread	Date (augmentation)	IMF commitment (percent of GDP)
<i>The 1980s debt crisis</i>						
Mexico	Feb. 82	Aug. 82	Dec. 82		Jan. 83–Dec. 85 Nov. 86–Apr. 88 May 89–May 93 (Jan. 90/May 92)	5.2
Chile	Jun. 82		Jul. 85		Jan. 83–Jan. 85 Aug. 85–Aug. 89 (Aug. 88) Nov. 89–Nov. 90	8.1
Argentina	Jul. 82 Apr. 89	Sep. 82	Dec. 83 Apr. 89		Jan. 83–Jan. 84 Dec. 84–Jun. 86 Jul. 87–Sep. 88 Nov. 89–Mar. 91	5.4
Uruguay	Nov. 82		Dec. 82		Jul. 91–Mar. 92 Apr. 83–Apr. 85 Sep. 85–Mar. 87 Dec. 90–Mar. 92 Jul. 92–Jun. 93	11.3
Brazil	Jan. 90	Aug. 82	Feb. 90		Mar. 83–Feb. 86 Aug. 88–Feb. 90 Jan. 92–Aug. 93	3.7
Philippines	Oct. 83		Jun. 84		Feb. 83–Feb. 84 Dec. 84–Jun. 86 Oct. 86–Aug. 88 May 89–Feb. 91 Feb. 91–Mar. 93 (Mar. 93)	6.1
<i>Tequila Crisis</i>						
Mexico	Dec. 94	Jan. 95	Dec. 94	Mar. 95	Feb. 95–Feb. 97	5.5
Argentina		Jan. 95	Mar. 95	Feb. 95	Mar. 92–Mar. 96 (Dec. 92/Apr. 95) Apr. 96–Jan. 98	2.5
<i>Asian crisis</i>						
Thailand	Jul. 97	Nov. 97	Jul. 97	Sep. 98	Aug. 97–Jun. 00 Nov. 97–Aug. 98 (Jul. 98) Aug. 98–Feb. 00 (Mar. 99)	2.6
Indonesia	Dec. 97		Jan. 98		Dec. 97–Dec. 00 Jun. 94–Mar. 98 (Jul. 97) Apr. 98–Dec. 00	4.8
Korea	Nov. 97	Dec. 97	Dec. 97	Sep. 98		4.0
Philippines	Dec. 97	Aug. 98	Dec. 97	Sep. 98		3.8
<i>Russian crisis and aftermath</i>						
Russia	Aug. 98	Sep. 98	Sep. 98	Mar. 99	Mar. 96–Mar. 99 (Jul. 98) Jul. 99–Dec. 00	7.2
Brazil	Jan. 99	Oct. 01	Jan. 99	Oct. 02	Dec. 98–Sep. 01 Sep. 01–Sep. 02 Sep. 02–Mar. 05 (Dec. 03)	11.6
Argentina		Dec. 01	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	Jul. 02	Jul. 02	Oct. 02	Apr. 02–Mar. 05 (Jun./Aug. 02) Jun. 05–Dec. 06	25.7
Turkey	Feb. 01	Dec. 00	Feb. 01	Jul. 01	Dec. 99–Feb. 02 (Dec. 00/May 01) Feb. 02–Feb. 05 May 05–May 08	17.4
<i>European crisis^a</i>						
Ukraine		Oct. 08	Oct. 08	Mar. 09	Nov. 08–Jul. 10 Jul. 10–Dec. 12	20.7
Hungary	Oct. 08	Oct. 08	Jan. 09	Apr. 09	Nov. 08–Oct. 10	10.7
Iceland	Sep. 08	Oct. 08	Sep. 08	Dec. 08	Nov. 08–Aug. 11	13.1
Latvia	Oct. 08	Oct. 08	Oct. 08	Mar. 09	Dec. 08–Dec. 11	7.1
Romania		Oct. 08	Jan. 09	Feb. 09	May 09–Mar. 11 Mar. 11–Mar. 13	13.3
Greece	Oct. 08	Apr. 10	Oct. 08	Jan. 12	May 10–May 13	13.2
Ireland	Oct. 08	Sep. 10	Jan. 09	Jul. 11	Dec. 10–Dec. 13	14.3
Portugal	Oct. 08	Sep. 10	Oct. 08	Jan. 12	May 11–May 14	15.7

^a The sovereign crisis indicators show that Greece continued to stay in a crisis mode and the most intense crisis was felt by this metric in March 2011. However, an application of this procedure that stops in June 2011 dates the crisis in April 2010, which was followed by a program in May of that year.

market turbulence is measured by a weighted average of the rate of change of the exchange rate and the rate of change of reserves, where the two components are weighted by their respective standard deviations. (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.) Values of the index at least three standard deviations above the mean are classified as crises. In addition, following Celasun et al. (2006) we also identify crises on the basis of sovereign

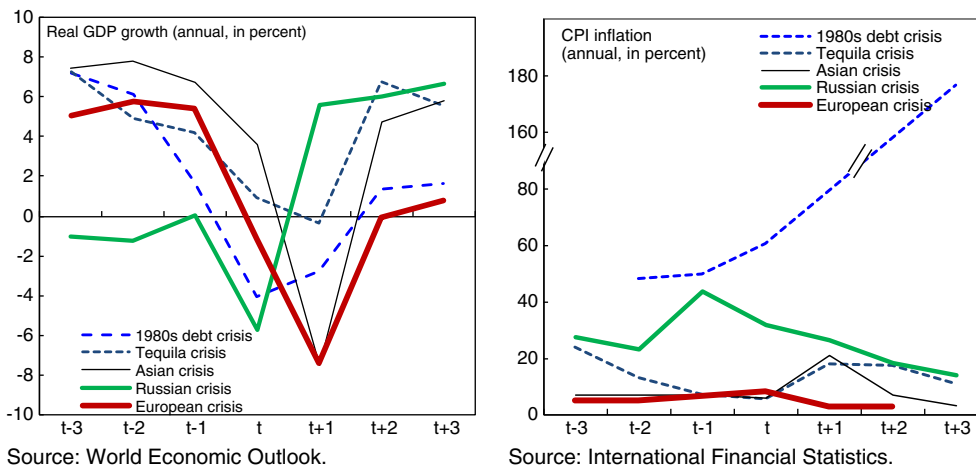


Fig. 2. Growth and inflation, unweighted averages by episode.

spreads. Periods when spreads are at least one standard deviation above the mean are identified as crises.⁵

Table 1 shows the resulting crisis dates, the timing of the first IMF intervention, the number of IMF-supported programs, and the cumulative IMF financial commitment. Several observations stand out. For example, the debt crisis of the 1980s displays an especially large increase in exchange market pressure, reflecting high rates of inflation in the crisis countries. Sovereign spreads, on the other hand, rose more modestly in that episode, in part because much of the debt in question was borrowing from commercial bank syndicates.

Risk premia on sovereign bonds came to the fore in the Tequila Crisis, when Mexican spreads rose by 1500 basis points. Mexico's crisis was resolved with a single program substantially larger than those of the 1980s. In contrast, private sector imbalances were the proximate source of the Asian crisis, with sovereign spreads rising only with worries that governments would be forced to socialize the losses of banks and large corporations.

Exchange market pressure then rose again in the Russian crisis. Some countries obtained multiple IMF-supported programs, raising cumulative average program financing size above the levels reached in prior crises.⁶

In four episodes (the 1980s, the Tequila, Asia, and Europe), GDP growth was generally high two to three years before the crisis. Growth then showed signs of decelerating in the run-up to the crisis in the 1980s, Tequila and Asian cases (Fig. 2, left panel). In the Russian case the problem was not that growth was decelerating but that it was low. Either way, it would appear that weakening growth due to accumulated macroeconomic imbalances is a precursor to crises. Europe stands out in that there was no indication of falling growth until the crisis struck.

In the 1980s and Russian debt crises, inflation accelerated during the run-up (Fig. 2, right panel). In the subsequent crises, inflation was less obviously a problem – though, as Europe reminds us, problems of international competitiveness can also arise in other ways.

The behavior of public debts and deficits also differs across episodes (Fig. 3). 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 experiencing

difficulties following Russia's default. But the same was not true in the Tequila or Asian crises. To be sure, Mexico in 1994 had public spending hidden in the accounts of its development bank, and governments of the Asian crisis countries had significant implicit liabilities to banks and industrial conglomerates that did not show up in governments' published accounts. But as a comparative statement the generalization remains valid: 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.

Generalizing about Europe's public finances is more difficult. With the exception of Greece, the state of the public finances did not obviously signal a looming crisis. Pre-crisis assessments showed low structural deficits because potential growth rates were deemed high and hence the estimated cyclical component of the deficit was not large. The dramatic deterioration of budget balances following the onset of the crisis then led to significant reassessment of the pre-crisis state of public finances. Potential growth rates during the pre-crisis period were revised downward. Key revenue sources – notably those related to real-estate transactions – were acknowledged to have been temporary. With benefit of hindsight it is now clear that consumption booms and housing bubbles contributed to the appearance of healthy public finances while hiding sizeable structural deficits. Together with failure to provision for implicit liabilities to the banking system, this meant that the strength of European budgets prior to 2008 was overstated. In addition, the general government deficit is also greatly affected by the 2010 budget deficit in Ireland, which due to banking sector outlays reached 32% of GDP. Fig. 3, lower left panel shows the euro area average correcting for the Irish bank support cost. This said, the public finances of the non-euro area crisis economies were better than those of their euro-area counterparts.

Current account deficits were unusually large in the run-up to Europe's crisis, reflecting external borrowing by the sovereign in Greece but also by banks and, more generally, by the private sector in Spain, Portugal and Ireland. But sizeable external deficits were also present in most of the other episodes (Fig. 4). Note also the tendency for current accounts to strengthen immediately before the crisis. This presumably reflects the declining availability of private external finance and capital flight as problems begin to become evident. There is also a tendency for real exchange rates to appreciate prior to crises and to collapse subsequently. Correspondingly, reserves as a share of short-term debt decline in the run-up and recover afterwards.

External imbalances were largest in the run-up to the recent European crisis. The presumption that monetary integration guaranteed stability and catch-up growth led to massive amounts of borrowing

⁵ Crises of sovereign spreads for Mexico, Argentina and Brazil are based on Edwards (1986) and Folkerts-Landau (1985). No sovereign spreads data are available for Chile, Uruguay, and the Philippines.

⁶ In the case of the three euro zone economies, of course, the index of exchange market pressure has limited significance, since they are small parts of the euro area economically and their difficulties have thus had only limited impact on the euro exchange rate. But sovereign bond spreads are high by any standard for Greece and are high everywhere, especially by the prior standards of the countries themselves.

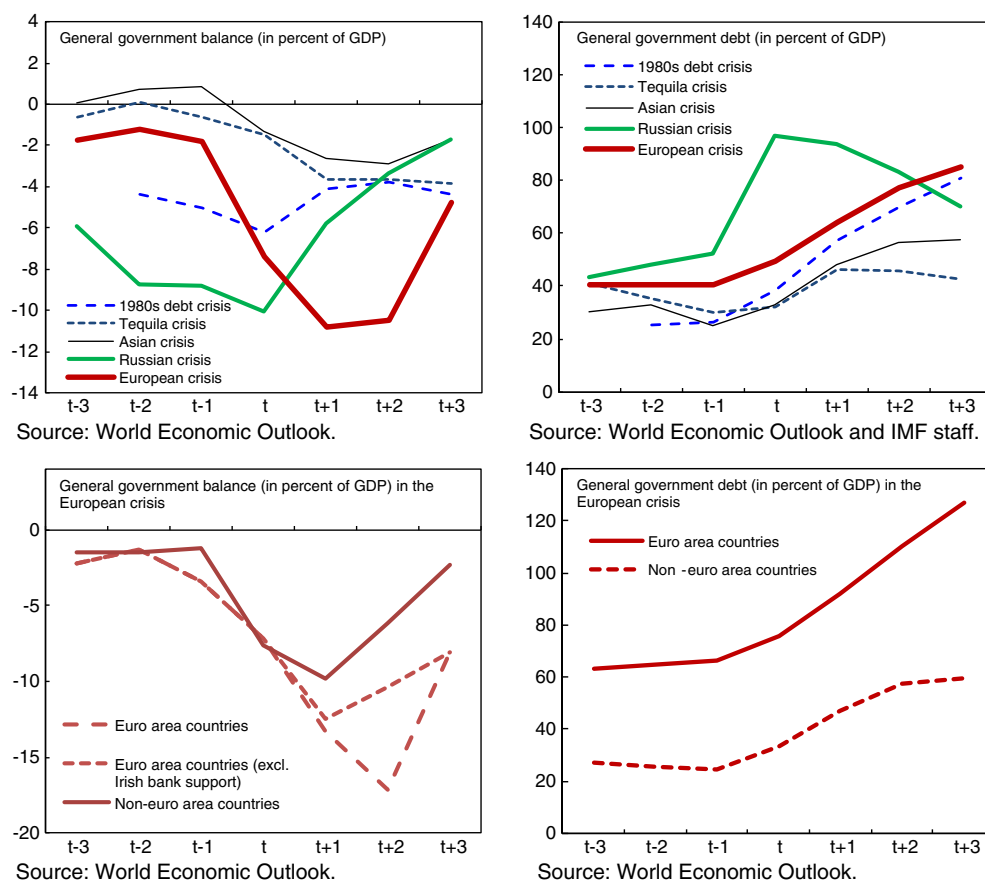


Fig. 3. Public finances, unweighted averages by episode.

and lending within Europe. As in other crises, external imbalances already began narrowing before the crisis, as problems became evident and the availability of private external finance declined. Yet, even in the year before the crisis, the average current account deficit in European crisis countries was 10% of GDP, matched by equivalent private capital inflows. In contrast, the extent of real exchange rate appreciation was no greater than prior to previous crises.

The larger the capital inflow prior to the crisis, the larger in general was the subsequent capital-flow reversal. European crisis countries enjoyed the largest pre-crisis inflows, they similarly experienced the largest reversal. Importantly, however, the accompanying decline in the real exchange rate during this crisis was significantly smaller and more gradual than in the other crises. Similarly, the fall in reserve ratios was relatively limited.

These comparisons point to important respects in which Europe's crisis is different. Pre-crisis inflation was relatively low, reflecting the disciplines of the single currency in Greece, Ireland and Portugal and of the peg in Latvia. The real exchange rate had gradually become overvalued but to a much lesser extent than may have been expected from the magnitude of foreign capital inflows. Government budgets were closer to balance than in earlier crises, Greece notwithstanding. These observations are not unrelated: the appearance of monetary and fiscal stability was what allowed the crisis countries to import capital in the amounts they did.

Foreign capital inflows into European economies facilitated the buildup of a very high degree of leverage. From around 2002, credit to both households and nonfinancial corporations grew significantly faster in Ireland, Greece, Portugal, and emerging European markets than in Germany and the other countries of the euro-area "core." The private sector borrowed from the banks, which in turn borrowed

from banks elsewhere in Europe.⁷ For Latvia and Romania, official EU funds following accession in 2004 contributed further to inflows. Despite rapid wage increases, household debt-to-income ratios rose in 2002–07 by more than five times in Latvia, by 270% in Hungary, by 180% in Ireland, and by 130% in Portugal. Housing prices rose dramatically in Greece, Ireland, Iceland, and Latvia. Equity prices continued to rise right up to the eve of the crisis, in contrast to the situation in Asia some ten years before, when they started falling well before the crisis.

The kind of fast recovery that followed the Asian crisis does not appear to be imminent in Europe. The European crisis economies require a precipitous fall in domestic demand to achieve the necessary deleveraging. Without the option of exchange rate depreciation, this adjustment must rely largely on internal devaluation.

Internal devaluation is not easy; the rate of real depreciation following the crisis has been limited, as noted above. In the current episode, then, less post-crisis adjustment has taken the form of prices as opposed to quantities. The greater difficulty of engineering a real depreciation has meant that it has been more difficult to substitute external for internal demand. The implication is that absent growth and with continued deflationary tendencies, public debt ratios are difficult to bring down. In this sense, the European crisis already resembles the more protracted 1980s and Russian crises. That is to say, the current crop of post-crisis recessions has been unusually severe by historical standards, and it is far from clear at the time of writing that they have run their course.

⁷ Banks in the problem countries thus funded their loans not just by taking deposits from residents but in addition by borrowing on the interbank wholesale money market, both from banks in other European countries and from banks outside Europe (see Ahearne et al., 2009).

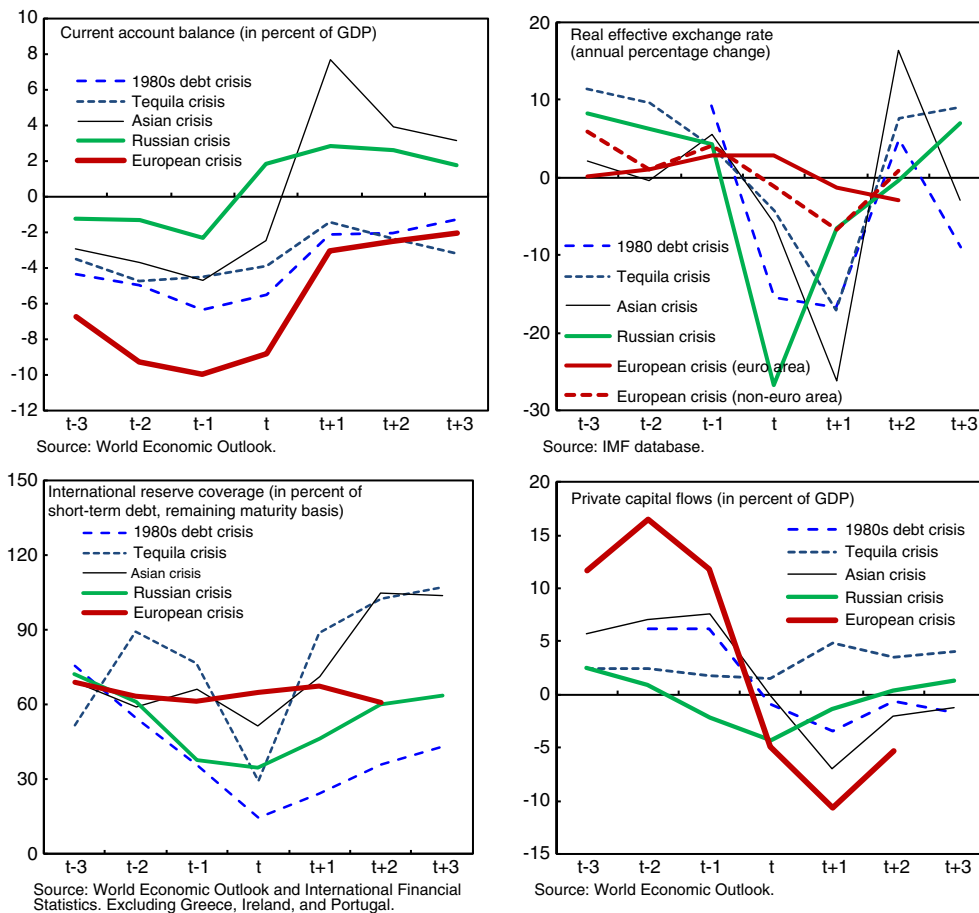


Fig. 4. External position, unweighted averages by episode.

3. The size of financing packages

We now analyze trends in program financing. Since we are interested not just in averages but also variations around them, we club the Tequila Crisis (which led to only two programs) together with the Asian crisis.⁸

The magnitude of financing can be measured per program or by the cumulative sum of the financing through repeated IMF programs in the course of a crisis episode. To the extent that IMF resources are limited and countries have responded by supplementing multilateral finance with bilateral loans, it is important to take into account both sources of support.⁹ Hence both IMF financing and the overall official financing are discussed below.

There is a steady increase in the median program size normalized by the country's nominal GDP (Fig. 5, upper left panel). The program for Uruguay in the aftermath of the Russian crisis, at 19% of GDP, was the largest ever. The peak program size in the European crisis at 16% of GDP for Portugal was much above the 6% of GDP average level in the 1980s and the Tequila/Asian crises. When official cofinancing is included (as in Fig. 5, upper right panel), the rise in program size over time is once again evident. This trend is clearest when cumulating multiple programs per country in each crisis episode (Fig. 5, lower left panel) and considering total official financing (Fig. 5, lower right

panel). Financing packages rise sharply in size between the 1980s and Tequila/Asian crises mainly because of extensive official cofinancing. Aggregate financing increases for the largest program from about 15% of GDP in the 1980s debt crisis to 20% of GDP in the Tequila/Asian crisis (Mexico in 1995). The further increase in the Russian crisis reflects multiple programs (as in the 1980s). The step up in program size in the European crisis arises from both larger IMF financing and substantial cofinancing. Over the entire period, the largest cumulative official financing package has grown four-fold.

The rapid response and large financing extended to Mexico in the 1980s reflected the Fund's new view of itself as "crisis manager" (Boughton, 2000, 2001). Officials were concerned with potential systemic implications of Latin American debt problems, leading the Fund to focus on containing the crisis rather than merely facilitating stabilization and structural adjustment.

Not only was the Mexican program larger than its predecessors, but the shift toward more official financing proved permanent, though with some variation over time in the extent of participation by bilateral and other multilateral lenders (Fig. 6, left panel). This reflected, in part, the new dependence of sovereigns on bond rather than bank financing (Fig. 7) and the difficulty of mobilizing bondholders to negotiate a restructuring. It also reflected fears that other countries would be adversely affected if investors began to fear restructuring-related losses.

Is the magnitude of program associated with the severity of crises? In the right panel of Fig. 6 we consider two measures of crisis severity: the capital flow reversal and exchange market pressure. Strikingly, the peak-to-trough capital flow reversal was lower in the Tequila/Asian crises than in the 1980s debt crisis (see Fig. 6, right panel). Peak exchange market pressure was, in fact, less. Yet

⁸ While, as discussed above, there are differences between the Tequila and Asian crises, for the purpose at hand – namely, the progression of program financing size – we would argue that they are part of the same evolutionary trend. That they occurred close together in time warrants treating them as a pair for present purposes.

⁹ Official financing does not include financing through debt rescheduling or restructuring.

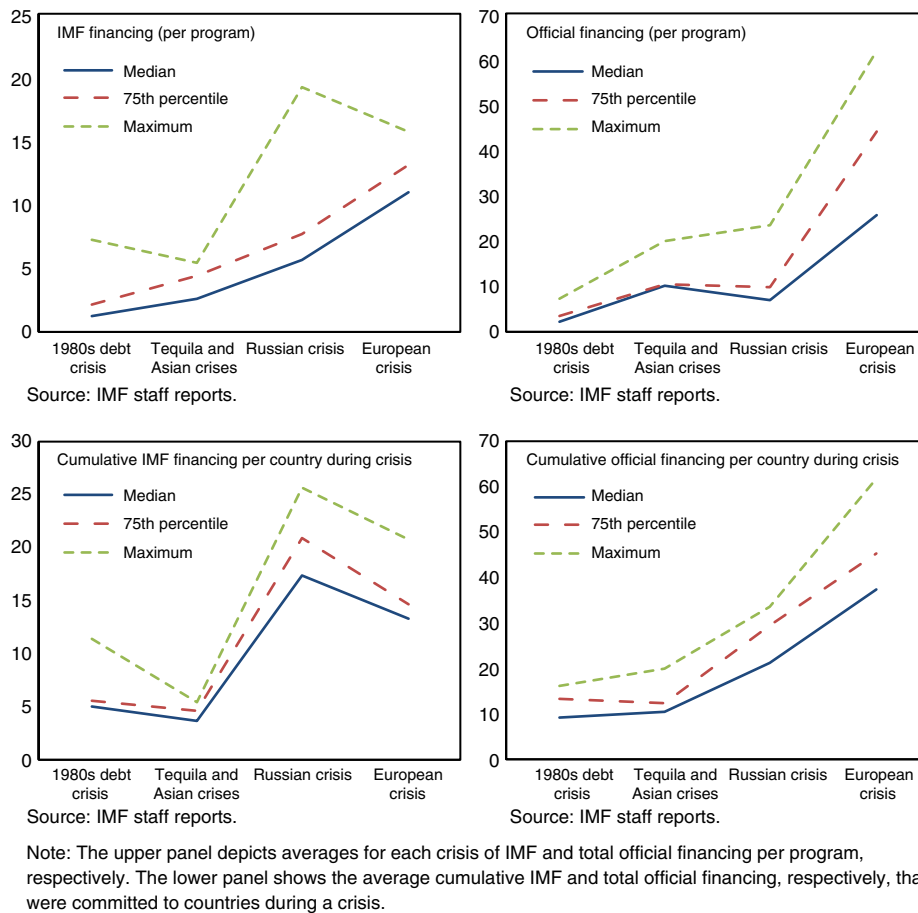


Fig. 5. IMF and total official financing (in percent of GDP).

aggregate official financing was greater. In the crises following Russia, capital outflows were modest. While peak exchange market pressure was greater than in the Tequila/Asian crises, it was again less than in the 1980s debt crisis. By both metrics, then, the Russian crisis was less severe than the 1980s debt crisis, although financing was larger. The European crisis was characterized by little exchange market pressure but a huge capital flow reversal and large financing, as we have seen.

It would appear that the size of the capital flow reversal has been a key correlate of the magnitude of official financing. In other words, the rise in official financing over time reflects the spread of financial globalization and, with it, the scope for capital flow reversals. In addition, that the Tequila/Asian crises were no more severe than the

1980s debt crisis and yet elicited more official financing suggests that the increase in financing packages also sought to preempt contagion, fears of which became more palpable over time.

These hypotheses can be tested using regression analysis, with total cumulative official financing as a share of GDP as the dependent variable. The results, in Table 2, confirm that when all programs are pooled capital flow reversals are the main factor associated with program financing size, with a limited role for exchange market pressure. When episode fixed effects are included, the capital reversal variable remains, which implies that even within each episode the extent of capital flow reversals influences program financing. The fixed effects suggest that program size fell between the 1980s debt crisis and the

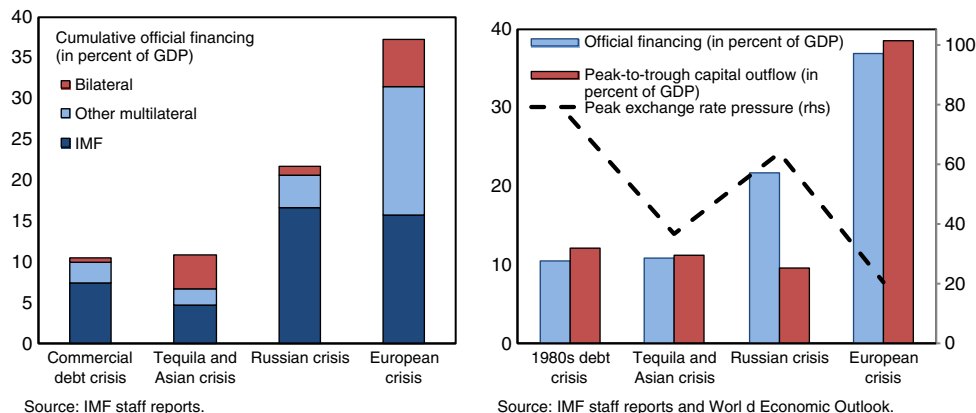


Fig. 6. Official financing (in percent of GDP), capital flows, and exchange rate pressure, unweighted averages by episode.

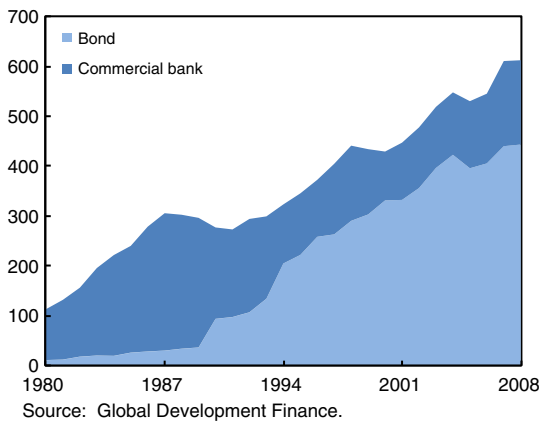


Fig. 7. Sovereign external debt to private creditors, emerging market countries (in trillions of dollars).

Tequila/Asian crises but that there was a big jump in program financing in the Russian episode and a further rise in the European crises. Thus, as we suggested above, other crisis-specific factors, including an increased perception of contagion risk, also influenced program size.

The conditions attached to IMF financial assistance are an important part of the official response insofar as the domestic adjustment required by these conditions can, in principle, substitute for program financing. The scope and use of macroeconomic targets have remained similar over time, although tailored to different exchange rate, monetary and fiscal policy regimes. The macroeconomic programs in the 1980s aimed at reducing budget deficits and public external debt, bringing down inflation by containing the growth of monetary aggregates, building reserves, and eliminating external payment arrears as part of the debt strategy. Mexico and Argentina had similar program targets during the Tequila Crisis. Macroeconomic programs in the Asian crisis focused on reconstituting net international reserves and adjusting fiscal policies. The programs for Brazil (in 1999) and Turkey (in 2006) incorporated “inflation consultation clauses” tailored to inflation targeting countries. Recent programs in Europe have emphasized fiscal targets, especially for euro area countries with no national monetary and exchange rate policies.

The only metric of trends in conditions related to structural reforms is their number. Structural reforms were rarely formal program

Table 2
Correlates of official financing.

Variable	Coefficients	Coefficients
Capital reversal, in percent of GDP	0.41*** [3.96]	0.26** [2.59]
Exchange market pressure index, peak	-0.04 [-1.48]	-0.02 [-0.80]
Constant	15.75*** [3.73]	
1980s debt crisis		10.17* [1.98]
Tequila/Asian crisis dummy		8.80** [2.16]
Russian crisis dummy		20.80*** [4.50]
European crisis dummy		27.03*** [5.32]
R-squared	0.50	0.71

Note: 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 dependent variable. t statistics are in brackets.

*** Represents significance at 1% level.
** Represents significance at 5% level.
* Represents significance at 10% level.

conditions during the 1980s and Tequila crises. They then became more of a focus as a result of the perceived structural deficiencies associated with the Asian crisis. The Asian programs incorporated a large number of structural conditions, initially focused on financial sector reform (Fig. 8). While these measures quickly developed into a broader reform agenda, they were not part of the program’s formal conditionality but rather were commitments by the authorities. Early programs in the Russian crisis cases had an even larger number of structural conditions. These were of three types: prior actions (that must be taken before any disbursement of funds), structural performance criteria (conditions that must be met to complete a review and authorize the disbursement of additional funds), and structural benchmarks (markers to assess implementation of important reforms during program reviews).

Structural conditionality evoked criticism for being intrusive, undermining national ownership, lacking priority, overwhelming implementation capacity, and being in areas outside the core expertise of the IMF. Initiatives were taken starting in 2000 to streamline conditionality while emphasizing ownership and macroeconomic relevance. Recent programs have therefore seen fewer structural conditions. Structural conditionality has focused on macroeconomically critical reforms to, inter alia, the financial sector, the fiscal balance, and monetary cum exchange rate policy. Implementation of structural policies is monitored in the context of program reviews rather than through the use of structural performance criteria, which have been discontinued in IMF-supported programs. While structural reforms continue to be integral to IMF programs, countries no longer need formal waivers if they fail to implement a structural reform by a particular date.

4. Sovereign debt restructuring

Table 3 provides an overview of sovereign debt restructuring in the episodes considered in this paper. (While there were also other forms of private-sector burden sharing, including losses to equity investors, even losses to workers in financial institutions, our focus here is on the debts of the sovereign.) All countries centrally involved in the 1980s debt crisis ultimately underwent debt restructuring. Payment relief was seen as an important supplement to official financing in this era when financing packages were relatively small. In contrast, the European crisis has seen only one restructuring as of the time of writing, in Greece. In the intervening episodes, there is a tendency for official financing to increase and emphasis on restructuring to fall.

There is unlikely to be a single explanation for this trend. It may be that there has been a growing incidence of crises of liquidity rather than solvency over time (where finance rather than restructuring is seen as appropriate for liquidity crises). In addition, restructuring may have become more difficult with the shift from bank to

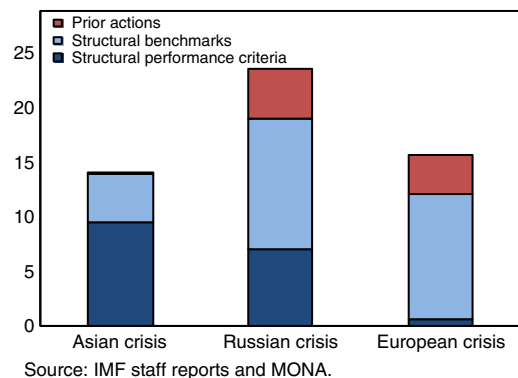


Fig. 8. Structural conditionality in IMF-supported programs Conditions per program year, unweighted average by episode.

Table 3

Private sector involvement and debt restructuring in IMF programs.

Sources: IMF staff reports, Boughton (2001), Das et al. (2011), Eurogroup (2010) and IMF (1993, 2006).

	Private sector involvement	Sovereign debt default or restructuring ^a		IMF program
		Date ^b	Restructuring	
<i>The 1980s debt crisis</i>				
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
Chile	In July 1983, Chile reached agreement with commercial banks on rescheduling principal payments and obtained commitments of new money. However, policies went off track and discussions on rescheduling in 1984 were unsuccessful. Voluntary market-based debt conversion during and buybacks of external debt under a debt-equity program 1985–90, and early reaccess to private capital markets in 1990.	Jan. 83	Seven restructuring agreements with commercial and Paris Club creditors during 1985–90.	Jan. 83–Jan. 85 Aug. 85–Aug. 89 Nov. 89–Nov. 90
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. 84 Dec. 84–Jun. 86 Jul. 87–Sep. 88 Nov. 89–Mar. 91 Jul. 91–Mar. 92 Mar. 92–Mar. 96
Uruguay	A first agreement was reached in July 1983 with commercial banks on rescheduling of current year maturities. A rollover was imposed and extended in 1984 while restructuring discussions were ongoing, followed by multi-year rescheduling agreements during 1985–89, contingent on Fund arrangement or enhanced surveillance. A Brady agreement was reached in 1991.	Mar. 83	Four restructuring agreements with commercial creditors during 1983–91.	Apr. 83–Apr. 85 Sep. 85–Mar. 87 Dec. 90–Mar. 92 Jul. 92–Jun. 93
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. Final Brady agreement in 1994, re-establishing orderly relations with creditors.	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 Jan. 92–Aug. 93
Philippines	Philippines requested a standstill on maturing debt in October 1983. A first agreement with commercial bank creditors was reached in May 1985, including rescheduling and new money, followed by multi-year rescheduling arrangements. An initial agreement was reached in 1989, followed by a final Brady agreement in 1992.	Oct. 83	Nine restructuring agreements with commercial and Paris Club creditors during 1984–94.	Feb. 83–Feb. 84 Dec. 84–Jun. 86 Oct. 86–Aug. 88 May 89–Feb. 91 Feb. 91–Mar. 93
<i>Tequila Crisis</i>				
Mexico				Feb. 95–Feb. 97
Argentina				Mar. 92–Mar. 96 Apr. 96–Jan. 98
<i>Asian crisis</i>				
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 loans to Korean banks into longer-maturity sovereign-guaranteed bonds.			Dec. 97–Dec. 00
Philippines				Jun. 94–Mar. 98 Apr. 98–Dec. 00
<i>Russian crisis and aftermath</i>				
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

(continued on next page)

Table 3 (continued)

	Private sector involvement	Sovereign debt default or restructuring ^a		IMF program
		Date ^b	Restructuring	
Brazil	Monitoring of foreign banks' credit lines to banks 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.			Dec. 98–Sep. 01 Sep. 01–Sep. 02 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.	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
<i>European crisis</i>				
Ukraine				Nov. 08–Nov. 10 Jul. 10–Dec. 12 Nov. 08–Oct. 10
Hungary	Foreign banks agreed to maintain exposure to their subsidiaries in Hungary.			Nov. 08–Aug. 11
Iceland	Losses imposed/agreed with creditors of failed Icelandic banks.			Dec. 08–Dec. 11
Latvia	Foreign banks agreed to maintain exposure to their subsidiaries in Latvia.			May. 09–May. 11
Romania	Foreign banks agreed to maintain exposure to their subsidiaries in Romania.			May. 10–May. 13
Greece	An initial framework for PSI was agreed at the July 2011 EU summit, based on a proposal by the IIF. However, concerns were raised that the targeted 21% NPV reduction was too generous to creditors. In October, EU leaders agreed on an enhanced official support package, based on more substantial PSI, targeting a face value haircut of 50%. Greece's debt restructuring discussions with creditors have not been completed as of Jan. 2012.			Dec. 10–Dec. 13
Ireland	Haircuts on subordinated debt of government-guaranteed Irish banks.			May 11–May 14
Portugal				

^a Includes operations on sovereign bonds, commercial and official loans.

^b The default date is defined as 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, the information refers to default or the initiation of debt restructuring negotiations 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, see Fitch (2011), Moody's (2008) and Standard and Poor's (2010).

securitized finance. Finally, officials may have grown increasingly concerned over time about contagion – that restructuring by one country might create expectations of restructuring by others.

4.1. The 1980s debt crisis

In 1982–83, crisis countries re-negotiated debts to their commercial bank creditors as a precondition for Fund financing, although the resulting settlements were limited to a mix of new financing and rescheduling of principal. When it became clear that this was not enough, governments and their creditors shifted in 1984 to negotiating multi-year rescheduling arrangements, although with little net present value reduction so as not to do too much damage to bank balance sheets. When it became apparent once again that this would not be enough to jump-start growth and restore creditworthiness, the Baker Plan was introduced in 1985, combining structural reforms with a putative commitment by the creditors to provide new financing.

But neither renewed growth nor significant new financing materialized. Brazil responded in 1987 with a unilateral debt moratorium, making it clear that the commercial banks would have to take more losses. In 1987–8, Mexico, Argentina, Brazil, Uruguay and the Philippines negotiated new debt restructuring agreements, exchanging debt for exit bonds with lower face value and buying back debt at depressed market prices.¹⁰ 1989 saw the advent of the Brady Plan, which combined significant NPV reduction with collateralization of principal using U.S. Treasury zero-coupon bonds and reserves placed in an escrow account to pay interest payments. This created a template according to which the debts of a range of problem countries were then restructured.

¹⁰ Chile relied on voluntary market-based debt conversion during 1985–89 and cash buy-backs of external debt during 1988–89, and in September 1990, is reported to be the first Latin American country to obtain a voluntary unsecured bank loan since 1982.

The IMF played an important role in the Brady deals. IMF financing was set aside for the debt reduction operations of the debtor countries. There was also a commitment to augment existing programs once the Brady deals became effective. The IMF's policy of not tolerating sovereign arrears was modified to help bring banks to the negotiating table. Previously, the banks knew that official credit would not be available until a strategy for dealing with arrears was agreed. This effectively gave them a veto over IMF arrangements. In 1989 the Fund therefore modified its arrears policy to permit Fund financing to lend into sovereign arrears to private external creditors if two conditions were met. First, prompt IMF support is considered essential for the successful implementation of the adjustment program. Second, the member country is pursuing appropriate policies and making a good faith effort to reach an agreement with its creditors. The new policy would then tolerate accumulation of arrears to commercial banks pending the negotiation of a voluntary market restructuring agreement.

Ultimately, then, the 1980s debt crisis led private and official foreign creditors to extend substantial debt reduction. IMF policy was important for bringing the banks to the bargaining table, while the fact that by the late 1980s they had already booked losses inclined them to accept a debt exchange with a net present value reduction.

4.2. The Tequila and Asian crises

In a departure from the previous approach combining official financing with NPV reduction, the Mexican crisis was met with unprecedented official financing but no NPV reduction. Official financing was provided to support amortization of short-term sovereign obligations (tesobonos) and to help the commercial banks meet their external obligations. The tesobonos were widely held and lacked well-defined legal and operational rules for restructuring. Given the scope for them to roll off as they matured, it was considered impossible to coercively retain credit lines from foreign commercial banks, since doing so would imply differential treatment of bondholders and banks.

There was no renegotiation of sovereign debt to private creditors in the Asian crisis.¹¹ Commitments were obtained from international banks to maintain their credit lines to the private sector, but foreign creditors did not incur significant NPV losses. One explanation offered for the limited extent of private sector participation was that most of these cases were crises of liquidity rather than solvency; financing packages were appropriate for dealing with problems of a temporary nature.¹²

4.3. The Russian crisis and its aftermath

Since macroeconomic imbalances were greater in the Russian crisis and its aftermath, resolving them required more time, multiple programs, and greater recourse to debt restructuring. While creditors incurred NPV losses, the IMF again maintained an arms-length posture toward restructuring negotiations.

An exceptional case was Uruguay, which combined an unprecedented level of financing with a voluntary debt exchange. The Uruguay program started out large (at 6% of GDP) and then was augmented twice in June–August 2002 amidst deposit outflows and reserve losses, ultimately reaching 19% 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, difficulties in meeting debt service obligations, and the need for dialog with market participants. 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 (93%) led to a successful debt exchange, which helped reduce short-term financing needs while reducing the debt burden by about a relatively modest 5% of GDP.

One explanation for why Uruguay was able to integrate debt restructuring into its crisis resolution plans is that there was not much concern about contagion from Uruguay, reflecting the country's small size. Another is that the actual extent of the restructuring, in terms of NPV reduction, was small. In this sense, and given the enormity of its official financing package, Uruguay is not a particular notable exception to the general trend toward finance relative to restructuring.

Another restructuring case in this period was Ukraine. Ukraine was pulled into the crisis partly by problems in neighboring Russia, which reduced market access at a time of large sovereign debt roll-overs. Following three rounds of selective restructuring of sovereign debt to private creditors in 1998 and 1999, Ukraine launched a comprehensive debt exchange offer in February 2000. In total, debt in the amount of 13% of GDP was restructured.¹³ Again, NPV reduction relative to GDP was not large, and fears of contagion were limited given the small size of the debt and the economy.

4.4. Europe¹⁴

Both private (bank and non-financial corporate) and public (sovereign) debts figure in the European crisis. At the time of writing, only in Iceland have foreign bank creditors had to accept haircuts on their bonds. Foreign parent banks have committed to rolling over their inter-bank credit lines and maintaining the capital of their subsidiaries in Eastern European countries such as Hungary, Latvia, and Romania through the European Bank Coordination Initiative (formerly the Vienna Initiative).

In the summer of 2011, the European Union agreed that financial assistance for the Greek government should be combined with private-sector involvement in the form of a commitment by foreign banks to roll over a portion of their holdings of Greek sovereign debt as it matured. More generally, it endorsed the idea that debt restructuring involving NPV reductions would be a part of any emergency financing program undertaken by their soon-to-be created European Stability Mechanism (ESM). In July an agreement was reached between the European Union, the IMF, and the Institute of International Finance (representing banks holding Greek debt) on a menu-based approach to restructuring the Greek sovereign's debt. The agreement envisaged a nominal 21% reduction in the net present value of the bonds, as noted above, to be achieved by the exchange of 90% of the government's outstanding bonds into three new securities. This agreement was then superseded in October by another that foresaw a 50% NPV reduction in Greek sovereign debt in private hands, again to be achieved through the voluntary exchange of

¹¹ Indonesia rescheduled debt with Paris Club creditors during 1998–2000. Another small rescheduling of Indonesian government bonds occurred in 2000 during a successor IMF program.

¹² Another significant difference from previous crises was that much of the Asian countries' debt to foreign creditors was owed by banks and non-financial corporations rather than sovereigns. There were thus many instances of bank and corporate debt restructurings in the Asian crisis cases.

¹³ In Pakistan, the restructuring of sovereign debt to private creditors took place as a requirement under the comparability of treatment clause for the January 1999 Paris Club rescheduling. Pakistan received later concessional terms from the Paris Club, substantially reducing the debt burden, but the impact of the private debt restructuring was limited, as it covered debt of only 1% of GDP.

¹⁴ Outside the European crisis, there are two recent precedents of debt exchanges within Fund programs. In Jamaica, the February 2010 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 IMF financing was provided upfront to finance a fund for financial institutions 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 relatively small by today's standards (300 and 200% of quota, respectively) and the countries in question are not systemically important.

outstanding bonds into new securities. At the time of writing, negotiations are ongoing.

At the end of 2011, European leaders then abandoned their commitment that private-sector burden sharing would be part of any subsequent emergency financing program provided by the ESM, reflecting fears that expectations of restructuring would destabilize the markets. Thus, whether the Greek case is a break with the broad trend away from substantial private-sector burden sharing remains to be seen. What is clear is that policy makers continue to resist and delay the decision to turn to sovereign debt restructuring – as they again did in this case.

5. A new approach to sovereign debt restructuring

The preceding review highlights instances where officials have been reluctant to restructure sovereign debts even where these have reached levels where there are serious doubts about their sustainability. Lobbying by bondholders who stand to take haircuts may prevent officials from moving. Insofar as sovereign debt restructuring has up-front political and economic costs but deferred benefits, elected officials with finite political lives and higher discount rates than society as a whole may put it off excessively.

One way of addressing this would be for future bond covenants to include provisions that trigger restructurings automatically. These would be “sovereign cocos,” contingent debt securities that automatically convert when pre-specified levels of indebtedness are breached. 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 debt, where there is a similar reluctance to restructure. Because of the difficulty of putting banks through a bankruptcy-like procedure, which among other things can 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 proceed with the delicate process of bailing in bondholders. Contingent convertible bonds (cocos) have been suggested as a solution to this problem. When Tier 1 capital falls below a pre-specified limit, these bonds automatically convert to equity, bailing in the bondholders and helping to recapitalize the bank.¹⁵

A number of banks have issued 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% 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%. Credit Suisse issued more than \$2 billion of cocos in February 2011. The Bank of Cyprus received subscriptions for more than \$1.2 billion of cocos in May.

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 reduction in principal and interest payments. One could also imagine making the trigger a function of the debt service/government revenue ratio, or of a convex combination of the two ratios.

Specific triggers could be tailored to country circumstances. As with collective action clauses (and bank cocos, for that matter), there is no reason why different countries with different characteristics should have to adopt a one-size-fits-all provision.

Activation of this contractual provision would not constitute a credit event that would trigger credit default swaps (CDS) written

¹⁵ This is similar in some respects to a proposal from Weber et al. (2011) that new euro-area bonds be required to include a contractual provision providing for a three-year maturity extension at the volition of the European Stability Mechanism when the latter provides an emergency loan for the government of a member state. The two differences from our proposal are that Weber et al. consider maturity extension only and that the provision would not be automatically when a pre-specified debt threshold was reached; rather, it would be at the volition of the ESM.

on the government debt instruments in question. The existence of large quantities of CDS in the market, together with uncertainty about precisely which financial institutions are responsible for issuing them, has fed the reluctance to proceed with restructuring (reluctance grounded in a fear of creating “an AIG-like event”). This specific obstacle to restructuring the obligations of a borderline-insolvent sovereign would be relaxed by the introduction of instruments with these provisions into the market.

Objections to the idea start with whether sovereigns 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. Then there is the objection that the 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. Note, however, that while the same argument has been made about bank cocos, adequately capitalized banks have not found it difficult to find willing buyers of such instruments.

Moreover, there is reason to think that borrowing costs would only rise for sovereigns 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).¹⁶ Intuition suggests that the pattern would carry over.

That borrowing costs would rise for risky borrowers as the trigger is approached is by no means undesirable. Experience suggests that credit spreads do not always widen gradually as debt burdens grow; rather, investors 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 the regularity of market discipline.

Another objection 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, the IMF, and the regional development banks, which publish such numbers as part of their normal reporting but are not parties to the agreement. To further reduce the risk of reporting bias, the agreement could specify the trigger as the higher or lower of two independent estimates.

As with the Tier 1 capital ratio, data on sovereign debt ratios are published by these entities only a few times a year. But the banks' use of Tier 1 ratios suggests that this is not a problem.¹⁷

For banks, the academic literature has also suggested an equity price as the trigger (Flannery, 2009). But bondholders may then have an incentive to drive down the price to the threshold level and

¹⁶ For other countries with low debts and impeccably good credit, where the provision can be seen simply as an insurance policy against exogenous risks (a Japan-like earthquake, for example), it can be argued, in parallel with the results for CACs, that they might end up able to borrow more. These responses should presumably be taken into account when setting trigger levels *ex ante* (see below).

¹⁷ 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. Our suggestions for addressing the problem of data manipulation might usefully be taken up by issuers of GDP-indexed bonds and sovereign cocos alike.

thereby gain preemptive access to the bank's stock at a "cheap" price (Sundaresan 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 over a proxy for the risk-free rate. The spread is then 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, large investors might seek to drive down the price of debt. Again, the risk would arise closer to the threshold where gains from such strategies are realistic. One solution to this problem might be for the contract to specify a "cooling off" period, by requiring the spread to persist above the threshold for some months before the trigger event is established.

A further objection is that triggering a government's sovereign cocos might prevent it from issuing new bonds with similar provisions to fund itself. Assuming that the government had been running large deficits, it would now be forced to dramatically compress public spending, precipitating a recession. But this problem of market access in the immediate aftermath of a restructuring holds for all restructurings, to a greater or lesser extent, whether the restructuring is automatic or discretionary. Limited amounts of official finance may thus be called for to help bridge the gap.

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

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, the risk of contagion will be less since all parties will be forewarned of its imminence and have time to prepare. Even in instances of sharp changes in market sentiment, triggering default and restructuring, the market would have a well-defined probabilistic basis for anticipating the event.

A key issue would be setting the conversion trigger. 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 to be breached 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). Thresholds for bondholder participation in collective action clauses differ across countries (Eichengreen and Mody, 2004; Gulati and Gelpern, 2009). The same could be true for sovereign cocos. Similarly, the specified degree of restructuring could differ across countries – 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 would 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 an argument for countries to move together through coordinated multilateral action.

6. Conclusion

Our review of the modern history of financial crises highlights the diversity of experience – to paraphrase *Anna Karenina*, every

unhappy crisis is unhappy in its own way. But it has also revealed common trends. The magnitude of financial reversals has tended to grow, mirroring the progress of financial liberalization and the growth of international capital flows. One consequence is that the financial requirements of international intervention have increased.

An explanation for this last trend is the absence of viable alternatives. Private lenders have an interest in holding out for full payment, whether directly from the sovereign or indirectly through resources provided by international financial institutions. National officials have an interest in pushing into the future a difficult and politically embarrassing restructuring. 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." Recognizing that restructuring is difficult, private investors have an incentive to lend at rates that are, in retrospect, too low. Larger capital inflows giving way to larger capital flow reversals implies the need for more official financing to limit the damage.

We have therefore explored the idea of automating the restructuring decision as a way of countering this bias. We discuss the possibility of adding to future government bond issues so-called sovereign cocos, contractual provisions that automatically lengthen maturities or reduce interest and amortization payments when a pre-specified debt/GDP ratio is reached. Automating the process preserves the integrity of the contract, which avoids the uncertainties involved in triggering CDS. It is predictable, and it can be priced.

Adding sovereign cocos to future bond issues will require solving difficult technical issues. It will also require solving coordination problems – getting governments to move together. But, equally, not addressing the occurrence of ever-larger crises due to ever larger inflows and subsequent large outflows of underpriced international capital is a story that cannot end well.

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