

Defining Systemic Risk Operationally

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One of the most feared events in banking is the cry of systemic risk. It matches the fear of a cry of “fire!” in a crowded theater or other gatherings. But unlike fire, the term systemic risk is not clearly defined. - George G. Kaufman and Kenneth E. Scott (2003)

For anyone interested in reducing government bailouts, a clear operational definition and measure of systemic risk for financial institutions is essential. Such a definition would set boundaries or limits on bailouts. If a particular financial firm’s failure did not satisfy the definition, then there would be no rationale for the government to bail out that firm or its creditors. A clear definition of systemic risk would also suggest alternatives to a bailout in certain cases. And if the definition was widely agreed to, then firms or their creditors could not arbitrarily cry “systemic risk” as a way to get government rescue funds. As George Shultz (2009) points out, based on his experience in government, frequently “the problem can be overestimated or can be reasonably contained.”

The more restrictive the definition and the more credibly it is adhered to by policy makers, the fewer bailouts we would see. Recognizing that bailouts are unavailable except in the most unlikely circumstances, firms and their creditors would have the incentive to adjust their behavior. But if, to the contrary, systemic risk is not clearly defined, then all such boundaries and incentives are blurred, systemic risk can be used to scare people and their government—just like the cry of fire—into bailouts, and the current bailout mentality continues or even grows.

Defining systemic risk operationally is not only essential for limiting bailouts, it is also essential for implementing most recent proposals for financial reform, including some of those in the chapters in this book. Some of the systemic regulator proposals require the Federal Reserve to identify firms that are systemically risky; these firms would then constitute a group, called Tier I financial holding companies in the U.S. Treasury (2009) proposal. Richard Herring’s (2009) wind-down proposal would apply only to systemically important financial firms. Some argue that the contingent convertible debt proposals described by Darrell Duffie (2009) should require a double trigger in which a regulatory declaration of systemic risk is needed as well as a drop of capital below a certain threshold at the institution in question. Thompson and Haubrick (2009) argue that we are better off placing firms in more than two bins, but a definition and measure of systemic risk is needed here too. As Kimberly Summe puts it in her paper, it is “imperative for policymakers to agree upon” a definition of systemic risk if such proposals are to be implemented.

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The purpose of this chapter is to review recent writings and research on systemic risk and assess whether the term is operational enough to be used as a guideline or criterion to determine whether the failure of a particular firm would create significant economic damage or to classify firms into a systemically important group in advance. Despite the frequent discussions in policy circles, I find that the term remains as vague and amorphous as it was six years ago when George Kaufman and Kenneth Scott published the paper in which the epigram to this chapter appears. By way of comparison, in order to implement monetary policy, whether with the help of a Taylor Rule or by some other means, one has to define and measure inflation and real GDP. While there are some questions and disagreements about how to define and measure these concepts operationally, they pale in comparison with questions and disagreements about how to define and measure systemic risk.

I begin with a brief overview of the concept of systemic risk as generally understood in the policy and financial economics literature, and then consider recent empirical research, case studies, and other attempts to define and measure the term more precisely. I then consider the policy implications and offer some suggestions about how to proceed.

1. The Concept of Systemic Risk

Any definition of systemic risk must be based on three considerations. The first is the *risk of a large triggering event*. The second is the *risk of financial propagation* of such an event through the financial sector by contagion or chain reaction. The third is the *macroeconomic risk* that the financial disruption will severely affect the whole economy.

Triggering Events

Triggering events can come from

- The public sector, as when the central bank suddenly contracts liquidity, perhaps after a previous sharp expansion of liquidity,
- An external shock, as when a natural disaster or terrorist attack destroys the payments system, or
- From the financial markets themselves, as when a large private financial firm fails.

Examples of triggering events prior to the current crisis are the default by the Russian government in 1998, which affected markets around the world, the default by the Argentine government in 2001, which had no such world-wide effect, and the 9/11 terrorist attacks which spread through the U.S. financial system, physically damaging financial firms.

In the current crisis there is considerable debate about the triggering event. In my view, a series of government actions and interventions are the most plausible triggering event, including a monetary policy that kept interest rates too low for too long and an *ad hoc* bailout policy that led to fear and panic. One of the reasons to end bailouts is to reduce the chance that government

will create such systemic events again. But others point to the failure of certain markets or private financial institutions, most commonly Lehman Brothers, as the main triggering event.

Financial Sector Propagation Mechanisms

Now consider the propagation risk from the original triggering event through the financial system. Experience suggests that it is useful to distinguish between two types of propagation risk.

The first type is where there is a *direct financial linkage* between firms which causes a failure of one institution to adversely affect other institutions in a chain reaction. The direct links can be through interbank loans (more generally inter-financial firm loans) and through derivative contracts. Interbank loans are part of the clearance and settlement system and thereby are part of the financial infrastructure. The Federal Reserve Board (2001) focused on the payments infrastructure when worrying about this type of risk writing that “systemic risk may occur if an institution participating on a private large dollar payments network were unable or unwilling to settle its net debt position. If such a settlement failure occurred, the institution’s creditors on the network might also be unable to settle their commitments. Serious repercussions could, as a result, spread to other participants in the private network, to other depository institutions not participating in the network, and to the nonfinancial economy generally.” It is important to note that in the present crisis, no major payment, clearing or settlement system failed.

The second type of propagation risk is where there is *no direct* financial connection between the firms. In this case a failing institution or some other the triggering event causes the balance sheets of a possibly large number of other financial institutions to be significantly impacted because they all have portfolios similar to the failing institution or because they have large exposures to securities that are impacted by the triggering event. The closer are the portfolios to those of other failed firms, the greater is the likelihood of losses and failure. This type of propagation, frequently called contagion, can be interpreted as a rational, rather than as a purely irrational or psychological, response to new information. But it can be magnified if uninformed investors follow more informed investors and if the suddenness of the event causes surprise and uncertainty.

This second type of financial propagation is sometimes characterized as a “run,” in which short term creditors and or depositors rush to withdraw their funds from the financial institutions they view as in trouble. As they withdraw their funds, the financial firms have to sell longer term possibly illiquid assets or collateral which then creates a liquidity problem which can become an insolvency problem. The problems are magnified if many firms sell at the same time creating fire sales, an issue studied in the context of the recent crisis by Diamond and Rajan (2009).

It is important to emphasize that contagion or chain reactions are not automatic, and they can be altered by changes in public policy. For example, as mentioned above, when Argentina defaulted on its debt in 2001, three years after the Russian default, there was no global contagion, even though the world economy was in worse shape in 2001 than in 1998. In my view

this was due to a change in policy by the major shareholders of the International Monetary Fund (IMF) which tried to clarify when a bailout would occur and when it would not.

In addition, interbank exposures can create incentives for interbank monitoring which will reduce the chain reaction effect. But if there is an expectation of a government bailout, then this will reduce the incentives to monitor and increase the likelihood of chain reaction effects. In other words, moral hazard considerations affect not only the risk at individual financial firms but also the risk of chain reactions or contagion between them. Rochet and Tirole (1996) have developed theoretical models of interbank lending in which moral hazard can play such a role.

Policy might also be able to reduce the risk in the payments infrastructure. Kahn and Roberds (1998) argue that the use of net settlement increases the probability of default in comparison with gross settlement. The tradeoff is that gross settlement requires the use of more reserves. But the cost of the higher risk is born by taxpayers and the bailouts because it increases the likelihood of damage from contagion and chain reaction. However, since interest can now be paid on bank reserves at the Fed, banks should care less about the extra reserves that are required in the gross settlement method.

The Macroeconomic Linkages

The traditional connections between such financial sector disturbances and the real economy are through changes in the supply of money, the supply of credit from banks and non-bank institutions, asset prices (including exchange rates), and interest rates.

A reduction in the supply of money is the classic connection and the one stressed by Friedman and Schwartz (1963) in their original work on the causes of the Great Depression. In that famous case, bank runs—rapid withdrawals of deposits from banks by individuals and other non-financial depositors, caused an increase in the ratio of cash to deposits, drastically shrunk the money supply, and thereby increased the severity of the Great Depression. Romer (1992) documents how the recovery from the Great Depression was largely due to a restoration of money.

The emphasis on the supply of credit from financial institutions has a long tradition dating back at least to the work in the 1950s and 1960s by Karl Brunner, Allan Meltzer, John Gurley, Edward Shaw, James Tobin and continuing into the 1990s by Ben Bernanke, Mark Gertler, and Simon Gilchrist. A reduction of the availability of bank credit would make it more difficult for firms to borrow, especially for those firms who could not finance their investment in plant and equipment internally. In an international context a reduction in the supply of credit would interfere with exporting and importing.

The interest rate (more generally the asset price) connection from the financial sector to the real economy has been more common in empirical models. This work ranges from the early large-scale econometric models to the international monetary models in the tradition of Mundell and Fleming to new Keynesian models with rational expectation. There has been much

empirical modeling of the linkages over the years and a useful symposium on the subject was sponsored by the *Journal of Economic Perspectives* in the Fall 1995 issue.

In my view the interest rate channel has been more successful empirically than the credit channel in part because good data on credit flows are difficult to find and because different types of credit are fungible. My view is based on my research using both approaches: the interest rate view in the model in Taylor (1995) and the credit view in proprietary research I did years ago at the consulting firm of Townsend Greenspan. For the most part interest rate connections are smoother and less abrupt than the credit connections.

There is a certain practical intuition held by many people in the financial sector that the credit linkages are more powerful than the interest rate or asset price linkages to the real sector, but there is little empirical evidence of this. For example, for many years the impact of a change in monetary policy was viewed as large because interest rate caps on deposits (Regulation Q) caused disintermediation (a reduction in bank credit) when interest rates rose and people withdrew funds from banks. However, when Regulation Q was removed this impact of interest rates on the real economy did not change much. The experience with Carter credit controls in 1980 provided more evidence of credit effects, but this was directly government induced.

In the recent crisis the reduction in credit flows has been viewed by many as more systemic than the interest rate changes because certain credit markets did freeze up, but there is still little empirical evidence supporting this view. There is no question that the real economy sharply contracted in the fourth quarter of 2008 and that the availability of credit dried up, but the cause and effect of the change in credit is very difficult to sort out. For example, Chauffour and Farole (2009) look into the supply of trade credit for exports and imports, and why it could have been vulnerable to financial disruption. But they are not able to resolve the econometric causality problem of whether a contraction of trade credit caused the worldwide collapse in exports or the reverse.

2. Measuring the Extent of Systemic Risk

Let me now examine recent work trying to measure or define the financial propagation mechanism more precisely.

Data sets on direct bilateral loans from one financial institution to another are unfortunately rare. In the case of money markets in the United States, Furfine (2003) has done some of the best work in this area. He created a data set of bilateral interconnections between banks making loans to each other in the overnight interbank federal funds market. He did this by matching send and receive messages in federal funds transactions. Using these data, he found that if there was a failure of the bank with the largest borrowing in this market it would cause some failures at other banks, but the total assets of these banks are less than 1 percent of total bank assets. If the loss rate was 5 percent, then no other banks would fail. The 5 percent loss rate was what was experienced in the 1984 Continental Illinois Bank failure according to Kaufman and Scott (2003). According to this evidence there is very little systemic risk coming from direct interconnectedness between banks.

In another study, Furfine (2006) used his data set to estimate the interconnection between non-banks and banks. He examined the nine banks that participated in the LTCM bailout. By looking at their borrowing in the overnight interbank market he found that in the days leading up to the LTCM rescue there was no evidence that other banks were restricting their lending or charging higher rates to these nine banks. In other words there was no sense in the markets that these banks were at risk from an LTCM failure. He also found a lowering of borrowing rates for large banking organization relative to smaller ones following the LTCM rescue, which is evidence of a perceived expansion of the too big to fail tendency from this event.

In more recent work, Ashcraft and Duffie (2007) created another interbank data set on the federal funds market using the matching methodology of Furfine (2003). Their main objective was to model which bank is likely to lend to each other bank and at what rate, based on variables such as the reserve balances of each bank relative to their normal reserve balances at various times during the day. This largely over the counter (OTC) market is thus useful for understanding counterparty trading behavior in OTC markets. Clearly it would be very useful to obtain and analyze bilateral counterparty data in other OTC markets.

One objection to the numbers reported by Furfine (2003) is that it does not include second round or third round reactions of banks to changes in the market. It would therefore be useful to see if Furfine's results hold up using the bank behavioral reactions estimated in the model of Ashcraft and Duffie (2007). These reactions could create a dynamic chain reaction effect that goes beyond the first round, which was the focus of Furfine.

Unfortunately, many of the other ways that people try to define systemic risk are much less quantitative. One frequently hears explanations of systemic risk using analogies with classic runs on bank deposits by individuals or non-financial business firms. We know bank runs on deposits can be systemic because deposits are used for economic transactions, as explained above. The deposits are part of the payments system. The reason we have deposit insurance is to prevent such runs. But to assess the systemic nature of a run on non-deposit short term debt, which is not used for transactions purposes, it is not enough to simply say "if you want to see why a run on short term debt is systemic just go see the movie *It's a Wonderful Life*." Rather one needs to explain and measure the impact of such a run on short term debt, and show why or why not it is like a run on a depository institution. For example, could it create a serious credit crunch that would impact consumers and businesses and how large would that crunch be?

Another approach to defining the systemic nature of financial propagation is to make physical analogies such as with the plumbing in a house. "The failure of this financial institution would clog the plumbing." Another analogy is mountain climbing. According to Kaufman and Scott (2003) former Governor Eddie George of the Bank of England would say that "direct financial exposures tie firms together like mountaineers: if one falls off the rock face others are pulled off too." Yet another analogy is falling dominoes. While certainly useful for some purposes, these stories do not provide a way to measure the systemic nature of the risk.

Several new ideas to define and measure systemic risk empirically have been proposed recently. However, most of them have purposes other than creating criteria to determine whether

the creditors of a financial institution should be bailed out or not, or whether a particular firm is systemically important. They are therefore not operational in the sense I use the term here. Rather the measures are useful for monitoring overall systemic risk in the financial system, a task which private investors must be concerned with and which the Fed and other agencies of government are already responsible and for which the Administration wants the Fed to take on more responsibility. This is the motivation for the measures proposed by Bhansali, Gingrich, and Longstaff (2008) and Huang, Zhou and Zhu (2009). The Bhansali et al measure uses information available in financial as well as nonfinancial sectors while Huang et. al. look at primarily financial sector credit default swap (CDS) and equity prices.

Such systemic risk measures would also be needed for macro-prudential regulation or for counter cyclical movements in regulatory instruments. For example, some argue that there is a need for countercyclical regulation which raises capital requirements in booms and loosens them in slumps. Adrian and Brunnermeier (2009) develop a measure which can be used for such purposes. It generalizes the concept of value at risk for an individual firm. They call the measure CoVar, and they show how it can be used to measure risk in the financial system as a whole. However, without more cross holdings data of the type Furfine (2003) has collected for interbank loans, it is not clear how this measure would help determine whether a bailout of a firm is warranted or not.

Qualified Financial Contracts in Bankruptcy

One of the arguments sometimes given in favor of a bailout rather than letting a firm go through bankruptcy proceedings is that the bankruptcy law gives exemptions from the automatic stays for derivatives and repos—so-called “qualified financial contracts.” Without the automatic stay, a bankruptcy would cause a run on the repos and fire sales of collateral underlying the derivatives and thereby cause systemic risk.

This is a complex area, but it illustrates the difficulties in defining or measuring risk in practice. Consider a simple example. Suppose there is a Credit Default Swap (CDS) which stipulates that Firm A will pay to Firm B if Firm C defaults on a bond. It is the counterparty relationship between Firm A and Firm B that we are interested in. Firm A will usually post collateral for part of the sum that must be paid in the event Firm C defaults on the bond. Now, suppose Firm A fails and goes into bankruptcy. If Firm B is in the money on the CDS, then Firm B can now demand the collateral on the CDS. Firm B can also be compensated for the replacement costs of the contract. While Firm B does not have to wait along with other creditors—because of the exemption of the automatic stay—the process still takes time. If there was no exemption to the stay, then Firm B would have to wait along with the unsecured creditors such as bond holders.

What is so bad about waiting longer? One concern is that prices of a replacement CDS or the collateral already pledged would change. If so, then the agreement could be to settle on the basis of prices at the time that the bankruptcy is declared. Some people, including Tom Jackson in his chapter in this book, have begun to ask why, if the exemption from the automatic stay is a problem, the qualified financial transactions exempt in the first place? One answer might be that

then the instrument would be less attractive. But that might be the cost of reducing systemic risk. In any case this example illustrates that in the process of delving into the reasons for the systemic risk one might find that there are good alternatives to the bailout in a particular circumstance. It also illustrates that there is considerable debate about the nature and extent of systemic risk.

Learning from the Recent Crises

The recent crisis shows how far away we are from defining and agreeing on systemic risk. Regarding the triggering event there is disagreement about whether it was the failure to bailout Lehman's creditors or actions by government itself. Regarding the macroeconomic impact there is disagreement about whether the restriction of credit brought about the sharp decline in production or the reverse as the panic itself caused firms to pull back.

Understanding the events surrounding the Lehman bankruptcy is particularly important. Many now argue that the cause of the panic in the fall of 2008 was the failure of the government to intervene and prevent the bankruptcy of Lehman. This view gives a rationale for continued bailouts and the expectation that any firm will be bailed out. Harvey Miller (2009), for example, testified to the House Judiciary Committee that "In the context of the Lehman experience, it appears beyond reasonable controversy that it is in the best interests of the country and the global financial system for the Treasury and the Federal Reserve to have the authority to utilize federal funds to avoid potential systemic failure." And he provides his reasons: "It is important to keep in mind that until the weekend of September 12-14, 2008 the belief that Lehman would be the subject of a bankruptcy was beyond comprehension. Lehman was the fourth largest investment bank in the United States. It reported consolidated assets of over \$600 billion and liabilities of almost that amount. It operated a massive, global business on a 24/7 basis. Through its highly developed network of subsidiaries and affiliates, and 25,000 employees, Lehman conducted hundreds of thousands of transactions each day at the speed of light and on a world-wide basis. It moved billions of dollars around the world for itself and its customers each and every day. If ever there was an institution that might have been deemed 'too big to fail,' Lehman was a prime candidate."

In contrast Peter Wallison (2009) testified to the Congressional Oversight Committee that "The Lehman example seems to demonstrate that even when a major institution fails at a time of profound market panic the actual systemic risks are minimal." In my view the problem was not simply the failure to bail out Lehman Brothers but rather the failure of the government to articulate a clear predictable strategy for lending and intervening into a financial sector. This strategy could have been put forth in the weeks after the Bear Stearns rescue, or even earlier, but was not. Instead market participants had to guess what the government would do. After Bear Stearns, many guessed that Lehman and its creditors would be bailed out. The lack of a strategy continued during the confusing rollout of the TARP plan, which, according to event studies in interbank and equity markets, was a more likely reason for the panic than the failure to intervene with Lehman.

Additional evidence is accumulating that confusing and unpredictable government interventions made things worse. There was noticeable movement of interest rate spreads in the interbank market and the bank debt market around the time of the seizure by the FDIC of Washington Mutual and its sale to JP Morgan Chase. This was followed quickly by a sharp drop in the price of Wachovia's bank debt, its aborted FDIC-driven acquisition by Citigroup, and its eventual acquisition by Wells Fargo. The acquisition of Merrill Lynch by Bank of America has also come under scrutiny. The Special Inspector General for TARP now reports that Timothy Geithner, who was president of the Federal Reserve Bank of New York, did not view the contagion or chain reaction to AIG's credit default swap counterparties as reason to bailout AIG. But to many this was the assumed reason that AIG's failure would have had a systemic effect. So was there systemic risk here or not? If so, what was it? The case is evidently not so clear.

3. Assessment

This brief review leads me to conclude that there is no clear operational definition and measure of systemic risk at this time. I am not alone in this assessment. The three main international institutions with responsibility for systemic risk—the International Monetary Fund, the Bank for International Settlements, and the Financial Stability Board—reached the same conclusion. Their report for G20 Finance Ministers and Governors (2009) finds that that current knowledge and understanding “limit the extent to which very precise guidance can be developed. Assessments of systemic importance will necessarily involve a high degree of judgment.” The problem, of course, is that judgments vary widely. A completely discretionary “I know it when I see it” approach is obviously not going to work to limit bailouts. Neither is relying on precedent as in “Let’s just assume the 19 financial institutions in Table 1 are the systemic ones because they were in the government’s stress test.” To some people, virtually everything is systemic. To others, it remains very rare.

Table 1. The 19 Financial Institutions in the 2009 Stress Test

1. JPMorgan Chase
2. Citigroup
3. Bank of America
4. Wells Fargo
5. Goldman Sachs
6. Morgan Stanley
7. MetLife
8. PNC Financial Services
9. U.S. Bancorp
10. Bank of New York Mellon
11. GMAC
12. SunTrust
13. State Street
14. Capital One Financial Corp.
15. BB&T
16. Regions Financial Corp.

17. American Express
18. Fifth Third Bancorp
19. KeyCorp

4. Policy Implications

There are three policy implications of my assessment that the term is still not well defined.

First, those reform proposals that rely on systemic risk to determine in advance whether a firm should be deemed systemically significant are not ready for prime time. They should be shelved until an operational definition is available. If we go ahead, we will make things worse by enshrining an inoperative concept. It is certainly inappropriate to pre-announce which firms are systemically risky. This would make it obvious which firms would be bailed out and cause huge moral hazard problems. Moreover, the determination of whether a firm was systemically risky is time and state dependent. That is, it depends on the state of the cycle and the state of interconnections with other firms.

Second, a major effort should be undertaken to define and measure systemic risk. Since a proper examination of the causes of the recent financial crisis is part of this effort, perhaps the task could be subsumed under the Financial Crisis Inquiry Commission. But this is a big task requiring much data collection, analysis and interpretation. In principle, we need to take what Furfine (2003) and Ashcraft and Duffie (2007) have done for the interbank market and apply it to the repo and derivative counterparties and any other link between financial firms. A large research effort should be devoted to the task of defining and measuring systemic risk.

Third, until the hard work of defining and measuring systemic risk is yielding results, policy makers have to find a framework for dealing with the bailout problem, recognizing these ambiguities. It may turn out that the reason why it is so difficult to define systemic risk is that it much rarer than many now believe. But in the meantime there is disagreement and we need to recognize this. In my view this requires creating a highly transparent and accountable framework to ensure that the systemic risk concept is not abused in practice and fosters a shift away from the bailout mentality that still exists today.

5. A Proposed Framework

There are three key elements of such a framework. First, using some set of *guidelines and criteria* its goal should be to find an alternative to bailout once a case of systemic risk arises. This will help government officials avoid a bailout. Because of the lack of an operational definition at this time, the guidelines and criteria could be based on the general concepts listed above, recognizing the imprecision and the various motivations people have to abuse the term. When and if the definitions and measures of systemic risk become operational, the guidelines and criteria would be tightened.

Second, for transparency and accountability, a report should be written about the case and made available to the public. The report would describe the rationale and justification for any bailout in detail referring explicitly to how the criteria and guidelines apply and why the alternative to bailout was not used. A preliminary version of the report would be required within two weeks of any action, with a final report six weeks later.

Third, to make this process workable, there should be a *set of credible alternatives to bailouts made available to all market participants*. As stated above the report should say why these alternatives were not used. As an example, one alternative would be Tom Jackson's Chapter 11F.

This definition would improve incentives to monitor risk. If such a framework was laid out after the bailout of Bear Stearns creditors and if the management of Lehman reasoned that their firm might go into bankruptcy, then they would have been much more prepared and the Lehman bankruptcy would have been less severe, or might never have occurred. The framework would create a virtuous circle where fewer firms would satisfy the definition causing more to monitor their risk. It would end the vicious circle of bankruptcy and systemic risk we have now.

Learning From the Success of another Framework

The framework I am proposing might be compared with the exceptional access framework the IMF instituted in 2003. Recall that the Mexican financial crisis in 1994-95 brought about unprecedented bailouts by the IMF and the U.S. Treasury of the holders of Mexican dollar-linked government bonds (called tesobonos) through large scale loans to Mexico to pay these creditors. So there are clear analogies between this intervention and the bailing out of the creditors of financial institutions now.

Almost immediately after the Mexican bailouts, many expressed concern about moral hazard. Expectations of similar bailouts could reduce due diligence on the part of investors and could also reduce incentives for emerging market countries to take steps to avoid circumstances that might lead to default. As a result of this moral hazard problem, as well as uncertainty about the nature of future policy actions, people worried that there could be more crises—more severe crises—in the future.

Reflecting these concerns, proposals were made to establish a new framework for limiting bailouts so that investors and borrowing countries would know the rules of the game. There were proposals by the British and the Canadians, for example, to put limits on access to large scale loans from the IMF, and to clarify the limits. These proposals were resisted during the 1990s by the United States and others. Doubts were expressed that any such limits could be adhered to. If limits were drawn there was no credible way that they would be followed. In addition, some were concerned about the loss of discretion that such limits would entail. Agreement on such a framework could not be reached.

Without such a framework interventions were erratic and emerging market crises got worse and continued for another eight years. There was the Asian financial crisis and the Asian contagion with Korea, Thailand, Indonesia, and Malaysia. There was the Russian crisis with global contagion to Brazil and Argentina and even the United States as the Fed had to cut the interest rates in response. The erratic nature of the interventions was very visible in the case of Russia. After several years of support, loans were suddenly pulled in August 1998. I believe that the lack of predictability was as much a problem as the moral hazard.

But eventually a solution to the impasse was found. The solution was to introduce an alternative to either default or bailout. The alternative was to add new clauses to the sovereign bonds—collective action clauses—which would allow for an orderly workout of sovereign debt problems between a country and its creditors. The existence of such an alternative made it credible for the official sector to say no. Thus any guidelines set in advance would be more credible. The collective action clause alternative is, of course, analogous with the Chapter 11F alternative in the proposal made by Tom Jackson.

And as soon as these clauses were put into the bonds, the IMF and its shareholders established a new exceptional access framework. The framework was much the same as the framework I am proposing here. And after the framework was in place, emerging markets moved into a new era of stability. Emerging market crises, which were so common during the years since the Mexican intervention, ended in 2002; looking back it is now clear that the terrible “eight year crisis” ended. And in this recent crisis, which emanated from the developed countries, the emerging market countries have rebounded remarkably well. We never can prove cause and effect beyond a shadow of a doubt in economics, but the new framework had a role in my view, both by clarifying the nature of future bailouts and encouraging emerging market countries to follow policies which reduced the chance of crisis greatly.

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