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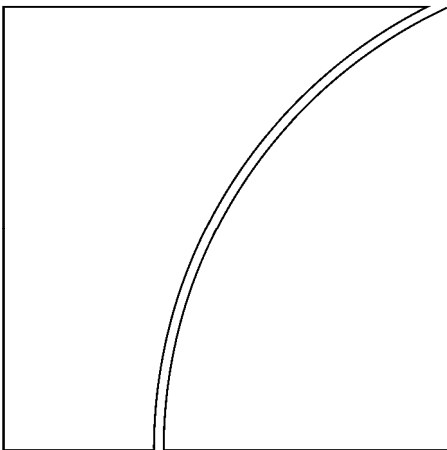
No 51

### Perspectives on inflation targeting, financial stability and the global crisis

Contributions to the BIS-sponsored sessions at the annual LACEA meetings in 2008 and 2009

Monetary and Economic Department

March 2010



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## Foreword

Since 2006, the Bank for International Settlements (BIS), through its Representative Office for the Americas, has sponsored sessions at the annual meetings of the Latin American and Caribbean Economic Association (LACEA). The BIS invites high level central bank officials and leading academics to these sessions to stimulate the exchange of views on issues relevant to the central banking community in the region.

In this *BIS Paper*, we are publishing selected presentations from the BIS-sponsored sessions at the two most recent LACEA annual gatherings: the November 2008 meeting, in Rio de Janeiro, and the October 2009 meeting, in Buenos Aires. The 2008 papers in this volume are by José de Gregorio, Governor of the Central Bank of Chile, and Guillermo Calvo, professor of economics at Columbia University; the 2009 presentations are by Vittorio Corbo, former Governor of the Central Bank of Chile, and Michael Dooley, professor of economics at the University of California, Santa Cruz.

This volume includes introductions by Már Gudmundsson, Deputy Head of the BIS Monetary and Economic Department (MED) when he chaired the 2008 session and now Governor of the Central Bank of Iceland; and by Philip Turner, Head of the BIS Secretariat Group when he chaired the 2009 session and now a Deputy Head of MED. The volume also contains a summary prepared by Camilo E Tovar, Senior Economist at the Americas Office, who organised and coordinated the sessions and edited the papers published here.

We at the BIS and its Representative Office for the Americas are convinced that forums of this kind help improve the quality of the debate on topics that are relevant to the central banking community and the economies of the region.

Gregor C Heinrich  
Chief Representative  
Office for the Americas



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## Perspectives on inflation targeting, financial stability and the global crisis

Camilo E Tovar<sup>1</sup>

This volume contains four papers presented at the BIS-sponsored sessions at the 2008 and 2009 annual meetings of LACEA. Written by leading central bankers and distinguished academics, they address the challenges confronted in recent years by central banks that practice inflation targeting (IT) and issues arising from the global crisis.

The first two papers were presented at the 2008 session, “Challenges to inflation targeting”, one by José de Gregorio (Governor of the Central Bank of Chile) and the other by Guillermo Calvo (professor of economics at Columbia University). Following those are papers from the 2009 session, “Central banks and the global crisis: lessons and challenges”, one by Vittorio Corbo (former Governor of the Central Bank of Chile) and the other by Michael Dooley (professor of economics at the University of California, Santa Cruz). The papers are preceded by the introductory remarks of the session chairs, Már Gudmundsson (2008) and Philip Turner (2009).

In his introduction to the 2008 session, “Challenges to inflation targeting”, **Már Gudmundsson** raises four issues for IT central banks. How should they deal with (i) relative price adjustments; (ii) financial globalisation and the role of the exchange rate; (iii) credit and asset price booms; and (iv) financial stability concerns? Insights on some of these questions were provided by the panelists.

In his contribution, **Jose de Gregorio** discusses three topics confronting central banks. The first is *price stability versus financial stability*. Following the Tinbergen principle, interest rate policy cannot deal with both macroeconomic stability and financial stability; additional instruments – such as financial regulation – are needed to deal with financial stability. Moreover, authorities must go beyond the usual coverage in inflation reports and monitor quantities (eg credit growth) as well as prices.

His second topic is *the challenge of relative price shocks*, such as the steep increases in commodity prices seen prior to the Lehman bankruptcy. Those increases were associated with spikes in inflation (generally above target) across the region in late 2007 and the first half of 2008 (see Graph 1). Had these shocks dissipated quickly, they could have been easily managed within an IT framework. However, they were quite persistent, threatening to contaminate inflation expectations. De Gregorio argues that it can be very costly to raise interest rates aggressively in response to such commodity price shocks, and the impact on inflation may be limited. The solution is to allow inflation to return to target on its own by maintaining a sufficiently long time horizon for the inflation target.

Finally, De Gregorio discusses *intervention in foreign exchange markets*. He notes that, although such intervention is sometimes necessary (eg to accumulate foreign reserves), flexible exchange rates can serve as a shock absorber, and they pose fewer risks than in the past because of a lower pass-through from the exchange rate to inflation.

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<sup>1</sup> Senior Economist, BIS Office for the Americas. I want to express my gratitude to LACEA organisers who facilitated the organisation of the BIS Sponsored sessions. In particular, I thank LACEA’s President Mauricio Cárdenas, and the Conference Chairs of the LACEA Annual Meetings in Rio de Janeiro and Buenos Aires, professors Aloisio Araujo and Andrés Neumeier, respectively..

**Guillermo Calvo** highlights some important issues in the provision of foreign currency liquidity during turbulent times: First, he notes that, while foreign reserve accumulation is needed in the absence of an effective global lender of last resort, it is hard to determine when foreign reserve holdings are adequate. For example, foreign reserve adequacy in 2007 appeared to be much higher in Asia than in Latin America according to the ratio of foreign reserves to short-term external debt, but it was roughly comparable in the two regions according to the ratio of foreign reserves to M2. He argues that the second indicator is preferable. Second, Calvo recognises the usefulness of facilities such as the International Monetary Fund's flexible credit line (FCL) and the Federal Reserve's foreign exchange swap lines but thinks that there are some issues, such as the fact that not many countries have access, and the relatively short duration of these facilities. Third, Calvo points out that drawing down foreign reserves must be done with care because it can trigger capital flight. Furthermore, foreign reserve use is more effective if it targets specific sectors of the economy, such as the export sector. Calvo concludes with the observation that the global crisis has shown the need to include credit in macroeconomic models. He also notes that treasury bills may be close substitutes for money, in which case foreign exchange market intervention may play an important role in adjusting liquidity.

In his introductory remarks for the 2009 session, "Central banks and the global crisis: lessons and challenges", **Philip Turner** outlines three possible perspectives on the policy lessons of the crisis. One is microeconomic – regulators did not provide an effective counterweight to market failures in the banking industry. A second is macroeconomic – an overly narrow focus on price stability led central banks to neglect financial stability. A third is macroprudential – not enough attention was paid to linkages between the macroeconomy and the financial system.

In addressing these issues, **Vittorio Corbo** looks at two central bank roles: financial crisis prevention and crisis management. With respect to *crisis prevention*, Corbo argues that monetary authorities have to move away from the "clean up after the bubble" paradigm to one in which monetary policy "leans against the wind". This may require a more discretionary and judgmental approach to asset prices. Furthermore, management of the policy interest rate is not enough for crisis prevention; central banks need to rely on other tools, including macroprudential policies (eg loan loss provisioning rules, capital standards and reserve requirements), procedures to deal with the failure of systemically important institutions, and intervention to avoid large misalignments of the exchange rate. Corbo sees macroprudential regulation as the best way to preserve financial stability by (i) reducing the incentives for increasing leverage during a boom and (ii) increasing the robustness of the system during a bust.

With respect to *crisis management*, central banks must contain the damage of crises and limit their impact on the real economy. In particular, it is necessary to calm markets, reduce uncertainty due to liquidity restrictions, and, if no resolution mechanisms exist, prevent the collapse of systemically important institutions that could induce further damage to the system, even if they are insolvent. To achieve these financial stability goals, central banks need to offer extensive liquidity support against good collateral, reduce the policy rate aggressively and rely on non-conventional policies. Increasing their cooperation with fiscal authorities would complete the policy response.

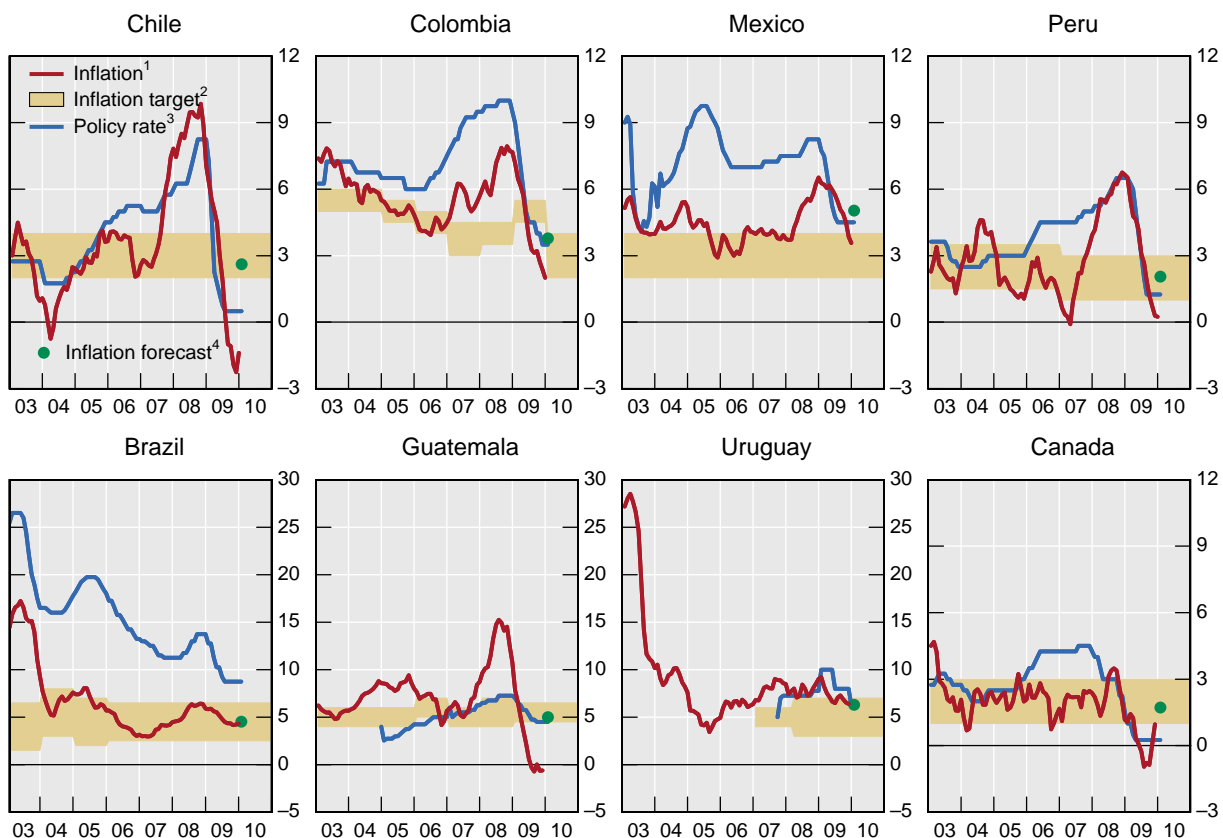
Finally, **Michael Dooley** argues that the monetary policy lessons being drawn from the crisis are wrong and that discussions in international forums about countercyclical prudential regulation are based on a misinterpretation of what caused the crisis. In Dooley's view, easy monetary policy in the United States had nothing to do with the crisis. In particular, notwithstanding global imbalances, there was no sudden stop in capital flows from emerging market economies (EMEs) to advanced countries, no spike in US real long-term interest rates and no collapse in the US dollar.



Dooley also argues that current regulatory proposals will do little because firms will find a way around regulations. Crises arise because profit motives and competition push leverage to unsustainable levels. There may be no set of regulations that can deal with the conflict between the profitability of leverage and the vulnerability of the system to leverage unless the system is pushed way beyond its efficient frontier. Therefore, he concludes, regulation is futile. What is needed is much stronger supervision. He identified three false assumptions that render supervision ineffectual: (i) private financial institutions care about the long-run value of the firm; (ii) markets impose self-discipline; (iii) private rating agencies are superior to government agencies in evaluating risk.

Dooley makes two other points. First, he argues that crises are costly because they involve the disappearance of collateral outside the insured system, so the role of the changing value of collateral in crises needs more attention. Second, he suggests that although foreign reserves did not hurt, they helped little in insulating EMEs because the cause of the crisis was a failure in supervision and regulation. Federal Reserve swap lines with EME central banks and the flexible credit line (FCL) of the International Monetary Fund, although useful, are also of little help in insulating economies from such crises.

Graph 1  
**Inflation and policy rates in inflation targeting countries**



<sup>1</sup> Annual change in consumer prices, in percent. <sup>2</sup> Targets announced, in terms of CPI. <sup>3</sup> Forecasts made in January 2010 for year-end 2010, Consensus Economics. <sup>4</sup> For Brazil, SELIC overnight rate. For Chile, monetary policy rate. For Colombia, expansion minimum intervention date. For Mexico, prior to 2008, bank funding rate; after 2008, reference rate. For Peru, interbank rate. For Guatemala, "tasa lider". For Uruguay, monetary policy rate. For Canada, overnight rate.

Sources: IMF; Datastream; Consensus Economics; national data.



**Part I:  
Challenges to inflation targeting**

BIS-sponsored session at the  
Latin American and Caribbean Economic Association (LACEA) Annual Meetings  
Rio de Janeiro, November 2008



# Challenges to inflation targeting: raising some issues<sup>1</sup>

Már Gudmundsson<sup>2</sup>

Prior to my appointment at the BIS in 2004 I was the Chief Economist of the Central Bank of Iceland. There I played a role in the 2001 adoption of the inflation targeting (IT) framework. At that time, I was a great fan of IT. However, experience has brought with it a better appreciation of the challenges that come with it. Iceland was the first country that I am aware of to suspend IT because of a financial crisis. Prior to that episode some countries had left IT, but they did so only to enter a monetary union. At the BIS, I took an attitude to IT that is similar to that of Winston Churchill's about democracy: "No one pretends democracy is perfect or all-wise ... indeed, it has been said that democracy is the worst form of Government except all those other forms that have been tried from time to time."

It is a fact that IT has been a great success story. New Zealand was the first country to adopt the framework, following the Bank of New Zealand Act of 1989. Since then, the IT group has grown to over twenty countries, among them several from Latin America. No country has to my knowledge regretted its adoption, although, as I noted, some left the group. The results have also been impressive in terms of the mean and the variability of inflation, without having a significant cost in terms of output volatility. Nonetheless, other countries have experienced similar developments, suggesting that, in some sense, this was driven by a benign environment, or good luck if you like. Despite such favourable conditions, it also seems to be the case that shocks to inflation have been less persistent among IT countries than among non-IT countries. But the goal of this session is not to discuss the success of IT. That story has been told over and over. Rather, we are here to discuss recent challenges that are putting IT to the test. Among those are the following:

- First, how should IT central banks react to persistent and potentially long-lasting changes in relative prices of oil and other commodities, as experienced in the recent past?
- Second, how does the ongoing process of financial globalisation complicate the conduct of monetary policy, especially in smaller countries? Related to this are the questions of how to deal with shrinkages in capital flows, the exchange rate, and the role, if any, of foreign exchange intervention in an IT framework.
- Third, in light of the potential medium-term damage to macroeconomic and price stability that can come from boom-bust cycles in credit growth and asset prices, how should those cycles be dealt with in an IT regime?
- Fourth, to what extent should financial stability concerns be factored into monetary policy decisions? Should there be more flexibility, longer horizons, leaning against the wind of asset price booms? Should there be a risk management approach in terms of financial disruptions – as generally spoken by Mishkin – or, should it be all of the above?

I am not here to provide any answers. To discuss the issues, we called a very distinguished group of panelists.

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<sup>1</sup> Presentation delivered at the LACEA Annual Meeting, Rio de Janeiro, November 2008.

<sup>2</sup> Governor, Central Bank of Iceland. At the time of the session, the author was Deputy Head of the Monetary and Economic Department at the BIS.



## Recent challenges of inflation targeting

Jose De Gregorio<sup>1</sup>

It is a pleasure to be once again at LACEA. The Bank for International Settlements (BIS) invited us to talk about the challenges of inflation targeting (IT). I will do so generally, with some references to the Chilean economy. My remarks will touch upon three issues that I believe are relevant today for managing monetary policy. First, price versus financial stability, which is related to Iceland's suspension of IT because of financial stability concerns. Second, the performance of IT – how well did it work before the Lehman Brothers bankruptcy, as inflation was going up because of commodity prices; and how will it work as inflation goes down. Finally, a very important issue for emerging markets, the exchange rate and how it fits into IT.

### Price versus Financial Stability

Most central banks have a dual objective. The Federal Reserve has a dual objective of maximum employment and stable prices, but most central banks have a role in both price and financial stability. Financial stability was for a long time rather ignored. Now it has become the main actor in monetary policy. There are issues regarding the definition of financial stability and the scope of central bank actions needed to support it. The definition is broad. From the point of view of a central bank, you care about systemic risk. In the case of Chile, we have to ensure the normal functioning of the payment system, both domestic and international, which implies that financial stability also involves concerns about balance of payments crises. This is very different from the concerns of agencies regulating the institutions in the financial system because they care about microregulation and supervision. That is a question I want to highlight here – whether microregulation should or should not be the responsibility of the central bank. In thinking about regulation, I prefer a system in which the central bank cares only about broad issues in the financial system – systemic risk and some broad regulation – while microregulation is left to some other agency.

The second issue regarding financial stability – the possible scope of central bank actions – has been discussed in the context of the current crisis: how should monetary policy react to asset price bubbles or more generally to financial instability? Here comes to mind the old and well-known *Tinbergen principle*, which says that we must have at least as many instruments as objectives. The conventional wisdom of the Greenspan era was to do nothing with asset price bubbles and to react following the collapse of a bubble by providing plenty of liquidity. Although it is very easy to say that this was wrong or that we should be careful about bubbles, there is some truth to that earlier belief. It is extremely difficult to identify a bubble. In hindsight we can say the bubble was there. But, in emerging markets particularly, it is difficult to identify an asset price bubble in real time because it is unclear whether exchange rates are overreacting or whether there is a non-fundamental force driving them.

Another issue regarding bubbles – and this is the subject of the most recent discussion – concerns monetary policy. There are two aspects to this issue. First, can you disinflate the bubble by raising interest rates, especially if the bubble is a component of prices that is

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<sup>1</sup> Governor, Central Bank of Chile.

based on non-fundamentals? To support this view we have to tell a story showing that we will be able to do so with a reasonable monetary policy. That is, I am certain that if you increase interest rates to 10% you can prick the bubble, but you also induce a collapse for the whole economy. So I am talking about the possibility of addressing bubbles with regular monetary policy. In this respect there is a debate. And, of course, John Taylor has an interesting simulation showing that tighter monetary policy in the United States could have prevented or ameliorated sharply increasing housing prices, although we do not know whether they would have been able to disinflate the bubble or to avoid the bubble.<sup>2</sup>

Second, dealing with financial stability through monetary policy has another problem – tighter monetary policy in the context of a weak financial system can undermine the financial system itself. That could be the story of late 2007 and the first half of 2008. Despite high inflation, there was always a lot of worry about raising interest rates in the United States because the financial system was extremely weak. Here is where the *Tinbergen principle* comes into play. Monetary policy and price stability can be handled with interest rates, but for financial stability we need something else.

In general, there is not that much to worry about in a well functioning system, but in order to prevent crises and excessive weakness we need to have some form of regulation and evaluation of financial vulnerabilities. This is one of the lessons of the recent crisis; there was weak or ambiguous regulation and weak evaluation, or no evaluation at all, of financial vulnerabilities. Many central banks, including the Central Bank Chile, followed the lead of the Bank of England, so starting some years ago we began issuing financial stability reports twice a year to look at the potential vulnerabilities and to give at least some warnings about weaknesses. The International Monetary Fund does this more broadly with its Global Financial Stability Report. Fundamental to assessing the resilience of the financial system is running stress tests, although we still need to develop better models for doing so. For example, in the United Kingdom the financial stability report identified some vulnerabilities, but it seems that the crisis has gone beyond what anyone was expecting, even regulators at central banks. So I think that, in addition to suggesting regulation to avoid financial crises, what we need is a clear view of how monetary policy is related to financial stability, of what that has to do with IT, and a way to assess vulnerabilities in the financial system.

In short, we have to pay more attention to financial stability. I used to have a discussion with my monetary policy friends about whether we should look at other things – not just inflation and interest rates but also look at monetary aggregates. But that was a discussion about price stability. The current discussion is about monetary aggregates and financial stability, and in that regard, it is much better to look at credit aggregates or broader measures of credit to monitor the sustainability of credit expansions. Combining credit and asset prices gives you a clear picture of whether systems are vulnerable or not. What we missed in this crisis – or I should say one of the things that we missed, because we missed many – was a huge increase in house prices and credit. So, there is a role for looking into quantities rather than just prices and, certainly, looking at credit aggregates helps.

## **IT performance before and after the Lehman bankruptcy**

The second point about IT – relevant to Chile, an emerging market – is the performance of IT before and after the Lehman bankruptcy. After that event, we realised that the recession was big, whereas before the Lehman bankruptcy, we were worrying about the inflation that had

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<sup>2</sup> J Taylor (2007): “Housing and monetary policy”, paper presented at the Jackson Hole Economic Symposium organised by the Federal Reserve Bank of Kansas City.



been building-up since mid-2007. The build-up was, in most emerging markets and particularly in Chile, an exogenous commodity price shock: increases in oil and food prices. In the case of Chile, oil price inflation was particularly important, because, aside from its effects on costs and on gas prices, it also affected electricity generation. Chile did not have gas because of the drastic reduction of imports from Argentina; and because of a drought, Chile had to move a lot of its energy generation to diesel. That was very expensive. So the oil price shock caused a huge increase in costs generally, as well as specifically in the price of electricity. The latter was an important component in the rapid increase of inflation in Chile, which reached 9.9% in October 2008. Now, inflation is coming down to the target of 3%. So for us, the build-up of inflation due to the exogenous shock was extremely significant.

Monetary policy has a huge challenge in adjusting to negative cost shocks. We can think of how to adjust to negative productivity shocks: we have to raise interest rates. But as you raise rates, an additional cost is added that further reduces economic activity. Thus, you have a cost shock together with the increasing interest rate imposed in order to contain inflation. If you do not contain inflation and interest rates have been increasing, then you end up with increasing inflation expectations. This is the beginning of the wage-price spiral, so it is much more difficult to reduce inflation if you let it go. An important discussion that we had at the central bank was whether we should lengthen the horizon for achieving the inflation target. Inflation targeting deals with supply shocks and cost shocks by means of the time horizon. All deviations from the target can be adjusted within the time horizon. In the Chilean case we have a 3% inflation target with a two-year horizon. Why do we have that horizon? The answer is because some supply shocks are transitory, so they can be left to die without increasing the interest rate, as they would otherwise be too costly to deal with. But if they become persistent, and they were persistent up to June/July this year, then this imposes a double cost on activity. But then, what can be done in that context? The answer is to have a longer time horizon that takes into account that monetary policy has lags and that reducing inflation has output costs that you want to spread through time.

What happened after September 2008? We realized that we were facing an unprecedented recession – in fact, not just a recession but a financial crisis. But that should bring a reduction in inflation, which is what we have seen. Currently, we have a positive cost shock – let us say positive because it's good: the decline in commodity prices. Most countries, including Chile, can thus now achieve their inflation target much more easily than before.

Just to tell you a little more about the case of Chile, in September 2008, before the Lehman bankruptcy, we at the central bank presented our monetary policy report, which said that we were going to continue raising interest rates – we had raised interest rates in the previous four months. We said that in the next three months we would raise interest rates at least 100 basis points to create enough slack capacity to bring down inflation and to avoid propagation. Then came the Lehman episode on September 15 and we realized that our assumptions about oil prices and foreign inflation were too high or too pessimistic from an inflationary point of view; the world economy would provide the reduction in aggregate demand that we had planned to achieve through monetary policy. So, after the Lehman bankruptcy, we presented another monetary policy report – updating it after just two months instead of the usual four – saying that perhaps we would maintain rates for a while, but we were not going to raise rates as we had been doing. As a result we will have, as has been seen everywhere in the world, countercyclical monetary policy. Given that the source of the inflation was demand, monetary policy easing with respect to what was planned two months ago is containing the slowdown and, at the same time, going with the reduction of inflation.

## Exchange rates

Finally, let me make some points about exchange rates, which are at the center of the debate. Exchange rates in an IT framework must be taken into account if they affect inflation. They do not affect inflation now as much as we were used to because the exchange rate pass-through to inflation is not as large as it was in the past. But exchange rates enter the IT framework in a very mechanical and simple way.

The first thing we have to realise is that there are rigidities around the world. So what we saw in the build-up of inflation for all countries – the commodity price shock – was an external shock. Of course, for the entire world this was not an external shock. If there had been a super central bank – if the BIS, for example, had been the central bank of the world – it would have raised interest rates before inflation happened. But in a decentralised world, how do we adjust to those shocks? With flexible exchange rates. Flexible exchange rates would have allowed exchange rate adjustments, and domestic inflation would have been contained. But what we had was the fear of an extreme appreciation, which led many countries to control interest rates to avoid that outcome. This is a problem that we had at the beginning of the adjustment; most countries, including Chile, at some point intervened, and I will talk about Chile later on. But what I think the recent experience shows is good news – I do not know if Guillermo Calvo agrees because we haven't talked about this with him – but it seems that we are getting rid of the fear of floating exchange rates, because the impressive depreciation in most developing countries is doing a large part of the adjustment. Especially in many countries that cannot run an expansionary fiscal policy, the exchange rate is doing the work and is the shock absorber. In the case of Chile – the extreme case, providing the minimum and the maximum readings on the Bloomberg screens – the minimum exchange rate in 2008 was 430 pesos per dollar and the maximum was 680 pesos per dollar. Nobody would have thought 10 years ago that a country would be willing to tolerate such a large depreciation without the huge fear of floating – mainly because the effect that this would have had, not just on banks but mostly on the corporate sector, through the currency mismatches. Despite some problems, we have seen that, all over Latin America, countries have been able to accommodate very large depreciations, and this is good news. Although the bad news is that all the gains that we have made on the inflation front are being somewhat dampened by this, I think that we will still see inflation coming down.

Sometimes a relative suspension of IT occurs when countries intervene in the foreign exchange market. We did it in March this year, and the move was intensely discussed. Since the exchange rate had appreciated sharply, we thought that there could be some sort of “bubble” or overreaction of the market – this was at the time of the Bear Stearns episode. At the same time, we had accumulated \$18 billion of reserves and also knew – especially from Guillermo Calvo's research on sudden stops when there are financial crises – that we needed to get ready for a sudden stop. We decided that if the crisis turned worse, we would accumulate 15% more of reserves. Thus, we went from \$16 billion to \$24 billion in six months. To make the accumulation consistent with the inflation target, we did it gradually, \$50 million a day. Initially we planned the accumulation period to last eight months; however, we shortened it to six months because we did well in terms of the profitability of reserves. Intervention was done mechanically in order to let the exchange rate float with that accumulation of reserves. Inflation worsened at the same time because of some unexpected propagation; but then came the Lehman collapse, so we stopped intervening. We are now – again in order to fulfil our objective of financial stability – providing liquidity in dollars and in pesos to the financial system to help it function normally. We have seen that it is currently functioning without problems, and not all the liquidity that is being provided is being demanded by the financial system.

The big issue for discussion, not just for Chile but everywhere in the world, is how the exchange rate and global imbalances will be adjusted. If the recession in developed countries is to be contained, part of the solution will have to come from replacing lost

domestic demand with foreign demand – and this at the global level. That means lower current account surpluses or more deficits in emerging markets and surpluses or a reduction in deficits in developed countries, especially in the United States. Now, in emerging markets we do not like to have current account deficits, so I think that is part of the challenge that the world will face. I think that, more than a challenge to IT, this has to do with the challenges to the international financial architecture. That question is beyond the scope of the topic for this session, so I will stop here.



## **Inflation targeting in hard times**

Guillermo Calvo<sup>1</sup>

Thank you very much for the invitation. There is not much time today to elaborate on these very large issues, and several of them have already been touched upon by José de Gregorio (in this volume). However, let me just say in response to what he said about having much less “fear of floating” – I agree with him: now there is a “fear of sinking”.

When I started to think about this presentation, I realised that I am at a great disadvantage compared with my colleagues on the panel because they look at reality everyday, they talk about it and it is very interesting. But I’m supposed to be an academic these days. So I have to make an effort to come up with something on which we can agree or disagree and that at least helps us understand what is going on from a more or less conceptual point of view. Not only in terms of specifics but more generally.

### **Reserve adequacy levels and lender of last resort**

The first point I am making here is related to what de Gregorio said: there are basically two major responsibilities for a central bank. It seems to me that there is a much stronger emphasis to price stability and, of course, each central bank will have its own ranking. But, financial stability issues eventually will fall on the central bank’s lap – whether central bankers want them or not.

With respect to financial stability, international reserves do play a role. In normal periods you can forget about them, but it seems to me that there was a lot of complacency in the North – thinking that we were going to live in normal periods for a long time. We even gave that thought a name: the “Great Moderation”. In the South, the Great Moderation started around 2003. When I went to conferences here, people talked about technical details of how to run inflation targeting (IT), leaving aside sudden stops and related issues. Obviously that is going to change in the future.

International reserves play a role because we do not have a global lender of last resort, and central banks sometimes have to take care of credit problems that go beyond national boundaries. That is, central banks have to give credit not only in domestic currency but also make sure there is enough international credit available. In normal times you do not worry, because markets are not segmented. But during hard times, like the present, the local currency and the international currency cannot be exchanged one for the other. This is evident – you see this in the market – even the European Central Bank (ECB) got a currency swap arrangement with the Federal Reserve to ensure that the ECB could have enough dollars. In this respect, you wonder, why did it happen if floating exchange rates are in place? This is a general point. A more specific issue, for which I do not have a very good answer, is that international reserves seem to be important. In fact, you see a lot of countries accumulating reserves. The question is then, what is the optimal level of reserves?

There is some literature on the question coming out nowadays. My experience, in a paper that we have been writing with Alejandro Izquierdo and Rudy Loo-Kung, is that in our models

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<sup>1</sup> Professor of economics, Columbia University.

the optimal level of reserves is very sensitive to certain things that are very difficult to assess. So when you change these things, estimates change radically. We have two popular measures of international reserves. Each gives very different answers. For example, if you look at the so-called Guidotti-Greenspan ratio – that of reserves to short-term external debt – in Asia, you conclude that Asia’s reserves have increased tremendously from 1994 to 2007. This is true even in Latin America (Table 1). But when you employ the other popular measure, the ratio of Reserves to M2 – which I feel is more reasonable for a central bank because M2 (or M3) represents the liabilities of the domestic banking system, which is something that the central bank is obviously concerned about – then you get a different picture. Under this ratio, Asia’s reserves were 32% on average, a rate not that different from Latin America’s. In fact, in this case Latin America is ahead of Asia. If you calculate the ratio for China, you find that it is about 35%. Thus, from the point of view of the central bank, I think the second ratio is more relevant. But you can see in these numbers how you can end up with very different conclusions.

Table 1  
Reserve adequacy<sup>1</sup>

Region	Reserves over Short-Term External Debt (Guidotti-Greenspan Ratio)		Reserves over M2	
	1994	2007	1994	2007
Asia <sup>2</sup>	2.52	6.28	0.19	0.32
Latin America <sup>3</sup>	2.00	3.50	0.40	0.44

<sup>1</sup> Simple averages. <sup>2</sup> China, India, Indonesia, Malaysia, the Philippines and Thailand. <sup>3</sup> Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Peru and Venezuela.

Source: Author’s calculations based on IMF, World Economic Outlook 2007.

## Credit lines and liquidity facilities

International reserves are not the only way for a central bank to ensure that there is enough liquidity in the system or to operate as lender of last resort without having to blow up the exchange rate. In that respect, what we have learned is that private credit lines are not very reliable. They dry up quickly during crises. Now we have this new facility by the International Monetary Fund (IMF) (the predecessor of the current Flexible Credit Line) which is very interesting and is just beginning to be developed. I think it is very imperfect at present, but I am sure they will change it over time to ensure that we have some short-term liquidity facility available. However, it is a facility that, in principle, expires after three months and is extended only if the examiners decide that the country deserves an extension. So even though it is a very fast-working facility – and that’s the idea of these liquidity facilities – the problem is that without conditionality, things in a certain sense become even more complicated than with standard conditionality loans from the IMF. The reason is that countries now do not know what kind of conditionality they are going to get after three months, and this is going to happen every three months for one year. And, in principle, that loan is not supposed to last for a year. So actually it is like future conditionality, unless you get lucky enough that in three months’ time or one year’s time your liquidity problems have faded away. But under the present circumstances, when everybody is saying that recovery may not take place in 2009, liquidity problems can continue for longer. These are issues that we need to discuss.

## How to spend reserves

The other issue is that once you have reserves or a credit line, how do you spend them? We have not spent enough time thinking about this, but there are certain forms of spending international reserves that could be counterproductive, and could even provoke capital flight. For example, a sharp decline in international reserves may lead people to take it as a signal that the central bank is in trouble, that the financial system is in trouble, and therefore that there is a financial crisis brewing. As a result, the use of international reserves could just help feed capital flight. Also, in the present circumstances, something worries me that I think we saw in the region in 1998 – the possibility of a global credit crunch. There are firms in Europe that are short of liquidity, short of credit, and they are looking around for new sources of liquidity. Then they come to Brazil, say, where the currency has depreciated tremendously, already 50%, so it is not a good idea to let the exchange rate go further. Thus, on the margin, the economy would be operating under virtually fixed exchange rates (as long as the devaluation pressures continue unabated). I am not saying that this is happening in Brazil or somewhere else – I picked this example because we have already seen a big depreciation there. Therefore, under those circumstances, there is the risk that a big firm, endowed with a large and credible collateral, especially compared to local potential bank clients, may be able to secure credits from local Brazilian banks in order to relieve an external liquidity crunch. This is equivalent to shorting the domestic currency and using the proceeds to buy foreign exchange. So, if the central bank is not careful, all of a sudden, the country may have its international reserves siphoned off to the rest of the world. Therefore, in some extreme cases, using international reserves may call for some kind of capital outflow control.

I also think effectiveness could be enhanced by using up the reserves to direct credit to certain sectors. That is what Brazil did in 2002, and I believe something in that direction is going on now. This is not an old-fashioned policy of picking winners and losers. Rather, it is a strategy to make sure that some large crucial sectors, like the export sector, have enough credit to avoid major disruption. These are, admittedly, heterodox solutions. But it so happens that it is when the market does not work that being heterodox makes sense. The public should also be aware of this. There is a tendency to brag about the accumulation of reserves, so when you use up the reserves people come to the conclusion that accumulating them is good, then decumulating them must be bad.

Maybe bringing the international financial institutions (IFIs) on board could be useful. We do not have many IFIs now that have a very strong reputation. I think it helps a lot that the Federal Reserve, for example, has given a currency swap with countries like Brazil and Mexico. That is very helpful. The problem is that those are only two countries, and I doubt that they would spread the goods around many other emerging market economies. These things are useful because you play on expectations a lot during financial turmoil.

## Implications for theory

Before I finish, let me make a general point about theory. I think it is important that we incorporate into theory some of these credit aspects. We have been going too much in the direction of models in which there is no credit market to speak of, there are no monetary aggregates – they can be ignored. The models, themselves – just to give an example – assume that a Treasury bill is a pure bond. In the simple models that we have, we assume that the bond on which the policy interest rate applies is essentially a pure bond. If you assume that, then there is a separation between interest policy and monetary aggregates altogether. But, if the bonds on which the central bank operates provide liquidity services, then it is no longer true that you do not care about the aggregates. And open market operations may not be able to change the relevant aggregate liquidity concept. So, this is a different world.

What we are living through now, especially in the North, is a situation in which there is not much difference between a Treasury bill and cash because the Treasury bill interest rate is virtually zero. So, in practice, there are two forms of cash. When you put it that way, just at that level, you have brought in liquid aggregates onto the radar. In that connection you can understand issues like intervening in the foreign exchange market as an attempt at changing the aggregate itself. Open market operations that involve exchanging domestic money for domestic bonds, or viceversa, may not be able to change liquidity very much. Foreign exchange intervention which changes the composition of domestic and foreign currency, could be more effective. I think that is important because, as de Gregorio mentioned (in this volume), even countries like Chile have resorted to foreign exchange intervention – and they are being very transparent about all that. So foreign exchange intervention is out there, it is being used all the time, especially under conditions of high volatility. We do not have a good theory, and the problem is that sometimes foreign exchange intervention is equated with abandoning inflation targeting. In my mind you are reinforcing inflation targeting with that, but I think more theoretical work on those issues is urgently needed.



**Part II:  
Central banks and the global crisis –  
lessons and challenges**

BIS-sponsored session

Latin American and Caribbean Economic Association (LACEA) Annual Meetings

Buenos Aires, October 2009



# Central banks and the financial crisis<sup>1</sup>

Philip Turner<sup>2</sup>

In this session, we asked two distinguished economists with extensive policy experience a very big question: how far were shortcomings of the policy frameworks of the major central banks responsible for the financial crisis? The many schools of thought on this question can, for convenience, be grouped under three headings: microeconomic; macroeconomic; and macroprudential. These big words convey a reassuring sense of neat categories; but in practice the linkages between them are many and complex.

## Microeconomic

The first school of thought emphasizes microeconomic failures: those responsible for banking supervision (not always central banks) were too *laissez-faire* in their attitude to financial innovation. This argument is well known. Banks made the securitisation of debts ever more complex so that their very opacity would induce buyers to overpay for the resultant products. This proved for a time very profitable. In other words, they deliberately exploited the *information asymmetries* that lie at the heart of the banking business. There was also a *classic agency* problem: traders took risky positions which earned them handsome bonuses but left banks holding large losses. Finally, there was *moral hazard* because banks were too big to fail.

None of these market failures – information asymmetry, agency problem and moral hazard – is new. Economists have been using these concepts in the study of the banking industry for years. Market failures mean that normal competitive forces cannot be counted on to produce a level of system-wide leverage consistent with stability. The first best policy response to this is more effective regulatory oversight. Only if this is not feasible could any second best argument be made for using monetary policy. Michael Dooley argues that better oversight should not be more intrusive regulation but rather more effective supervision. And effectiveness requires not only competent supervisors but also the political support for a strong enforcement process.

## Macroeconomic

The second school of thought is that central banks became too focused on their primary objective of price stability – and neglected financial stability. There are at least four versions of this thesis.

One version is that the very expansionary monetary policies of the Federal Reserve after 2001 fuelled an extraordinary appetite for risk in global financial markets. This led to the marked compression of market volatility, lower risk premia, asset price bubbles and so on that sowed the seeds of the current crisis. The obvious problem with this thesis is that there was no evidence in the recent cycle of any simple link between the policy rate and the usual

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<sup>1</sup> Revised version of a presentation delivered at the 2009 LACEA Annual Meeting held in Buenos Aires, Argentina, October 2009.

<sup>2</sup> Deputy Head, Monetary and Economic Department, BIS

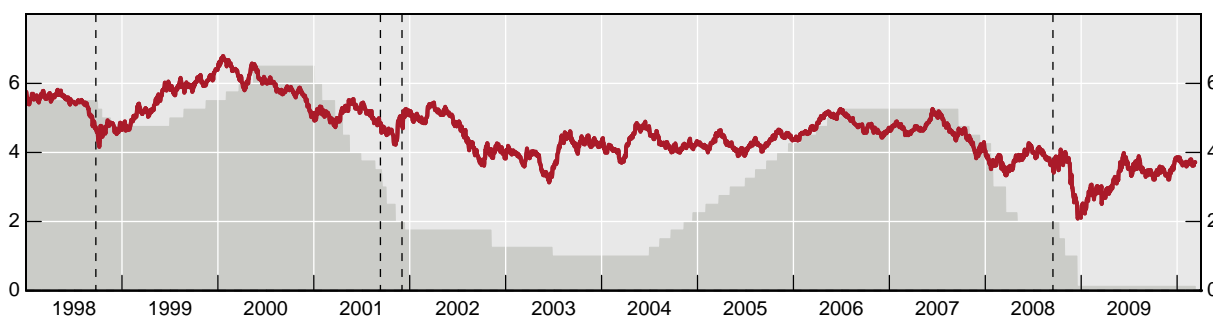
measures of volatility or risk appetite in financial markets.<sup>3</sup> Virtually all measures show that risk premia and volatility measures continued to fall after the Federal Reserve had concluded its tightening phase in June 2006, with the federal funds rate at 5¼%. Graph 2 shows that the simple aggregate measure of market volatility and risk spreads (green line) bears no relationship with the US policy rate (dark gray shading). (In some earlier cycles, by contrast, monetary tightening led to a decline in GDP – and of course recessions do lead to higher risk premia.)

Another problem with this explanation is that it is implausible to attribute a period of low real long-term rates that lasted several years to monetary policy. In any event, the US government bond yield did not rise as policy rates were increased from mid-2004 (red line). There was somewhat closer correlation in the 1999 to 2000 tightening episode – although movements in bond yields led, rather than lagged, the policy rate. The question of what determines the benchmark long rate is an important and unresolved question that is central to any explanation of movements in asset prices.

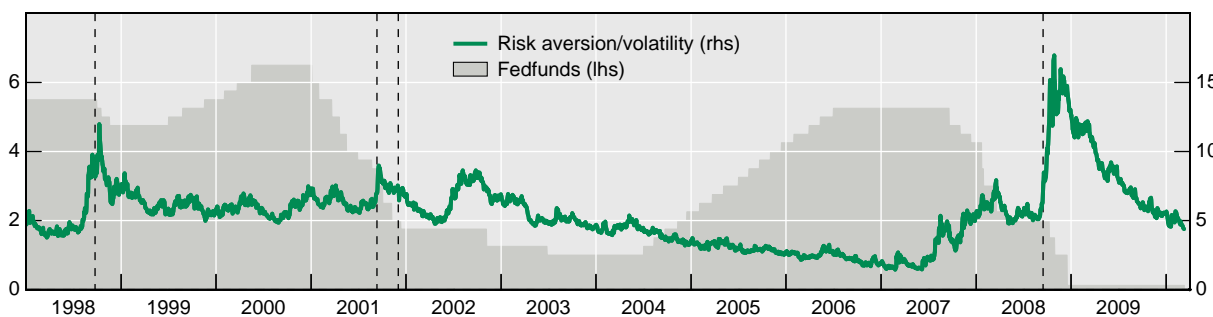
Graph 2  
Interest rates and risk aversion

In per cent

Ten-year US government bond yield<sup>1</sup>



Composite indicator of risk aversion/volatility renormalised as a credit spread<sup>2</sup>



The shaded area represents the target federal funds rate. The vertical dotted lines mark 23 September 1998 (the date of the bailout of Long Term Capital Management); 11 September 2001; 2 December 2001 (the Enron bankruptcy); and 15 September 2008 (the Lehman Brothers bankruptcy).

<sup>1</sup> In per cent. <sup>2</sup> Simple average of standardized scores of EMBI Global spread, US corporate high yield spread (Merrill Lynch US High Yield index), implied volatility of US equities (VIX index), implied volatility of US Treasury bonds (Merrill Lynch MOVE index) and implied volatility of G10 exchange rates (JPMorgan GVXF7 index); in percentage points. These components are shown separately in Graph A1.

Sources: Bloomberg; national data.

<sup>3</sup> Risk appetite is not of course directly measurable. Changes in price spreads in a specific market can equally well reflect changes in the underlying risk of the specific asset. A similar qualification applies to measures based on volatility. But an aggregate measure of risk premia/volatility in many different markets provides a reasonable proxy for present purposes. The individual components used in Graph 2 in any case moved in a broadly parallel way: see Graph A1.

A second version is that it was the too-smooth and too-well-announced nature of the path of policy rate increases (eg the famous “measured pace” from 2004) that caused the problem. Being too predictable in increasing rates allowed banks and others to leverage positions more safely than if sharper movements in rates – more closely corresponding to the irregular movements in macroeconomic prospects – had caught market participants by surprise. According to this view, the too-clear intimation by a central bank of the future path of policy interest rates encourages excessive leverage in interest rate and other risk exposures. The counterargument of course is that announcing a central bank’s intentions in advance could help anchor expectations – so that changes in market rates “do the work of the central bank”.

A third version of this thesis is that the actions of central banks over a long period had convinced markets that the central bank could prevent a collapse of financial asset prices. It had, some argue, given credence to the hope that better policies had reduced underlying macroeconomic volatility. This led banks and other investors, assuming that adverse tail risks had been eliminated by an activist central bank, to underprice risk.

A final version is the asymmetric reaction argument. The central bank willingly countenanced quite extreme asset price booms but then cut rates whenever prices fell sharply. According to this line of argument, it should have paid more attention to asset price increases. It is true that changes in asset prices (and other financial information) contain information that can correct shortcomings in conventional macroeconomic models. Yet this is much more likely to be the case during sharp downturns than during upturns. A generalised fall in asset prices – almost always sharper than the preceding rises – tightens budget constraints for a large number of debtors simultaneously. This forces spending cuts and leads banks to tighten credit supply quite quickly and in unison. And because the price volatility of financial assets rises in a falling market, market positions tend to be adjusted more abruptly than in a rising market. Declines in asset prices therefore have a stronger effect on the economy than do increases in asset prices. (This asymmetry of the effects of asset price changes may, some argue, itself justify pre-emptive action against asset prices increases.)<sup>4</sup>

The arguments against raising interest rates by more than warranted by inflation forecasts to curb local asset price increases are well known:

- If monetary policy tightening is less effective in curbing asset prices than it is in curbing aggregate demand, then there is a risk that instrument misassignment could lead to large output losses but only limited moderation of asset prices.
- In countries with a short record of monetary stability, an interest rate policy that is inconsistent with the desired path of the targeted inflation rate could undermine central bank credibility and unsettle inflationary expectations. With so much talk in the past year of both deflation and inflation, this aspect is not to be neglected.
- The considerations of domestic asset prices on the one hand and of the exchange rate on the other can indicate opposite movements in policy rates. Countering an asset price boom by raising short-term interest rates can, for instance, lead to currency appreciation, induce foreign purchases of short-term debt securities and in effect shorten the duration of external liabilities.

Even so, there may be cases when preventing *extreme* asset price movements would be desirable simply because of the destabilising feedback effects that would be generated.

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<sup>4</sup> A decade ago, my late colleague Palle Andersen showed in a careful econometric analysis that financial variables can account for errors in forecasts produced by standard macroeconomic variables in “bad” times (ie asset prices falling) but not during “good” times. See Palle Andersen “Forecast errors and financial developments”. *BIS Working Papers* No 61 (November 1997). Available at <http://www.bis.org/publ/work51.pdf>.

Michael Dooley rejects the argument that the monetary policy framework contributed to the crisis. Nor does Vittorio Corbo see IT-focused monetary policy as the major culprit. But Corbo nevertheless suggests how incorporating asset prices (and perhaps monetary and credit aggregates) into the monetary policy framework might help.

## **Macroprudential**

The third school of thought is that not enough attention was paid to macroeconomic/financial system linkages – and that “macroprudential” policies are needed to address these issues. The concept “macroprudential” is elusive.<sup>5</sup> The focus is not on an individual institution (which is the microprudential perspective) but on the whole system. The macroeconomy, the nature of the linkages between banks, the liquidity of markets in which banks operate and the aggregate pricing of risk are all relevant dimensions for a macroprudential orientation of policy. The aim is to ensure that the financial system operates so that the effect of a shock is damped, not amplified.

Market liquidity is central to this systemic perspective. Before the recent crisis, it was clear that banks and others took positions because they thought they could unwind them at will – on the (unwarranted) assumption that markets would always supply an unlimited amount of liquidity. “Liquidity” is of course a very nebulous concept. Michael Dooley argues in his paper that a central feature of the recent crisis was that the markets for many emerging market and other risk assets became illiquid because their value as collateral dropped sharply when the price volatility of these assets – which determines the “haircut” applied – rose. The key insight is that the value of collateral is endogenous in the system.

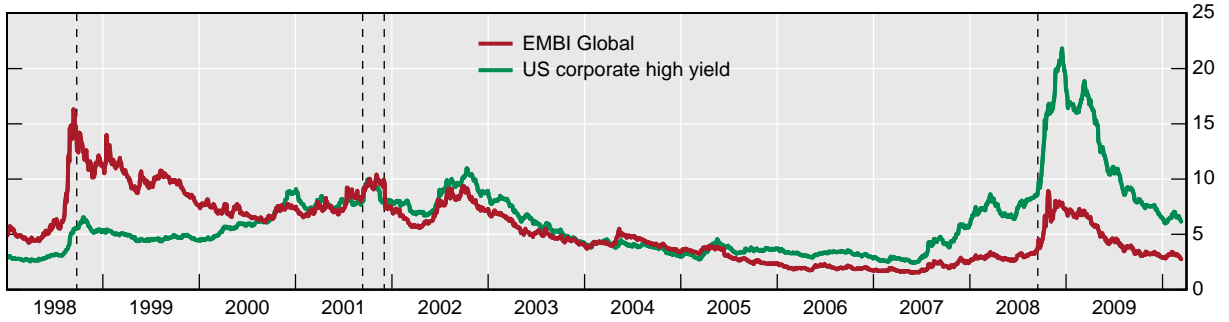
Vittorio Corbo says that macroprudential regulation is the approach best suited to maintain financial stability. He argues that macroprudential tools are better for this purpose than the monetary policy rate because they can be directed at particular distortions in the financial system. But he is under no illusions about the very real difficulties in putting this idea into practice: coordinating macroprudential and monetary policy; strengthening the accountability of the central bank for its actions; and resisting fierce political resistance to any tightening of credit terms for lending for “good” purposes, such as housing for low-income families.

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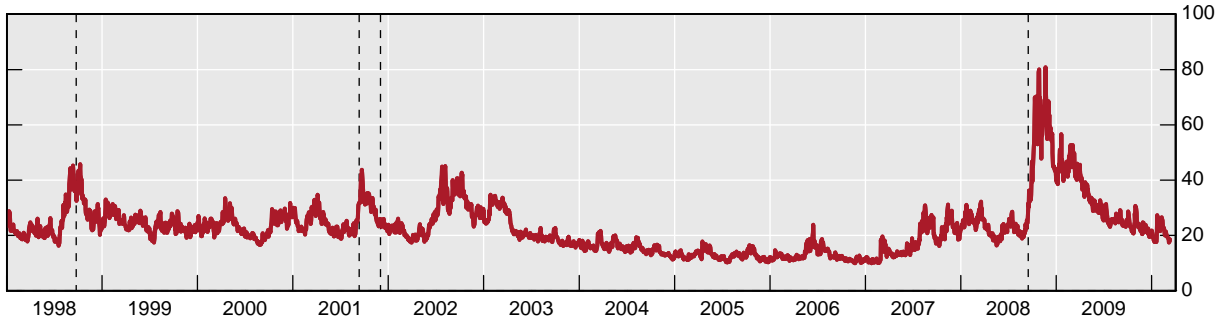
<sup>5</sup> For a history of the uses of this term, which began to be used in BIS meetings in 1979, see Piet Clement “The term ‘macroprudential’: origins and evolution”. *BIS Quarterly Review*, March 2010.

## Graph A1 Risk aversion/volatility

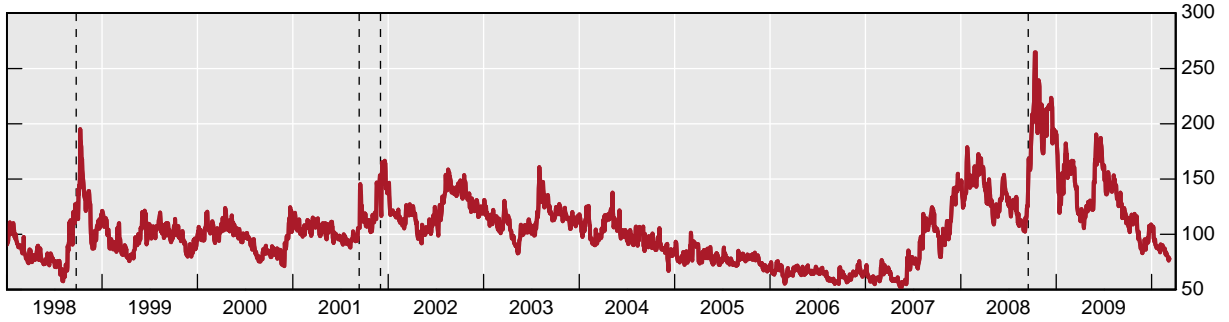
EMBI Global spread and US corporate high yield spread over US treasuries<sup>1</sup>



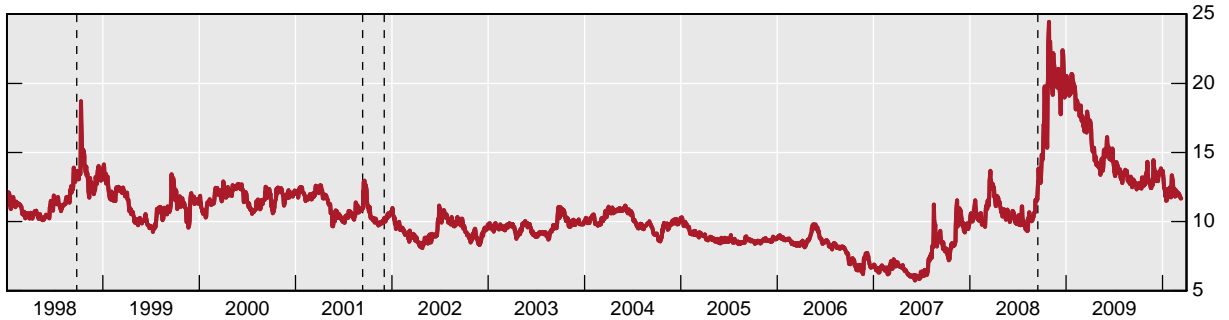
Implied volatility of US equities (VIX index)



Implied volatility of US Treasury bonds (Merrill Lynch MOVE index)



Implied volatility of G10 exchange rates (JPMorgan GVXF7 index)



The vertical dotted lines mark 23 September 1998 (the date of the bailout of Long Term Capital Management); 11 September 2001; 2 December 2001 (the Enron bankruptcy); and 15 September 2008 (the Lehman Brothers bankruptcy).

<sup>1</sup> In percentage points. <sup>2</sup> Merrill Lynch US High Yield index.

Sources: Bloomberg; national data.





## **Financial stability in a crisis: What is the role of the central bank?**

Vittorio Corbo<sup>1</sup>

Financial crises are costly and complex. Authorities have limited tools to deal with a crisis once it has broken out: there is little they can do other than attempt to limit the damage to the rest of the economy. This makes prevention as important as treatment. Central banks have traditionally focused on treating financial crises, but they also have an important role in helping to prevent them.

### **Preliminary: treatment and prevention**

The monetary policy rate is a blunt instrument that is not well-suited to resolve distortions in the financial system. But there is a growing consensus around the design and use of macroprudential tools, which are more flexible and can be targeted at the particular spots of the financial system that are creating distortions. Specifically, central banks could use cycle-adjusted capital requirement ratios, loan loss provision ratios and lending-to-asset-value ratios to discourage speculation in markets where a potential bubble is forming.

Central banks could also reduce systemic risk through improvements in the payment and security settlements systems and providing incentives for certain derivatives transactions to be settled in central counterparty institutions.

Another way in which central banks can help prevent financial crises is by designing procedures to deal with the failure of systemically important institutions. The ad hoc manner in which this issue was dealt with during this crisis exacerbated uncertainty and damage to the system. Ideally, central banks could establish resolution procedures analogous to those of the US Federal Deposit Insurance Corporation so that systemically important institutions cease being too big to fail.

Central banks could also reduce the probability of a crisis by designing intervention procedures to avoid large misalignments in the real exchange rate whose reversal could be too costly and affect the stability of the financial system.

Finally, central banks should work with financial institutions so that they issue contingent capital certificates. These are debt securities that would be converted into capital once a threshold is reached and so provide automatic recapitalization in the event of a crisis.

### **What are the financial stability objectives in a crisis?**

A central bank's main objective during a financial crisis is to contain the damage and limit the impact on the real economy. The first imperative is to restore calm in financial markets. Market panics create the equivalent of a financial heart attack by cutting off the flow of credit even to healthy institutions. This amplifies the damage in the financial system and is one of the main transmission channels through which a panic affects the real economy. Central

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<sup>1</sup> Centro de Estudios Públicos, Chile. The author was Governor of the Central Bank of Chile from 2003 to 2007.

banks must therefore reduce uncertainty, ensure that markets for short-term credit function properly, and prevent the collapse of financial institutions due to liquidity restrictions. As long as there are no resolution mechanisms to ensure that the financial system is not damaged by the failure of a systemically important institution, central banks should also prevent the collapse of these even if they are insolvent.

## **What are the appropriate central bank tools for financial stability in a crisis?**

The first measure that central banks use to achieve these objectives is to offer extensive liquidity support against good collateral at a penalty rate. This is part of a central bank's traditional role as a lender of last resort, as prescribed by Bagehot (1873). However, the offer of this support has been limited to banks. When non-bank intermediaries are important, as is the case in the US financial system, central banks should also lend to these institutions under the same conditions.

The second tool is the monetary policy rate. Authorities should reduce the policy rate aggressively in response to the projected decrease in aggregate demand so as to move the neutral level of the observed real policy rate closer to its new equilibrium value.

If the second tool is exhausted (the policy rate is close to the minimum), central banks should also consider non-conventional measures as a third, complementary tool. One such measure is making an explicit commitment to keep the policy rate at a low level for an extended period of time, thus reducing uncertainty and potentially reducing interest rates at greater maturities. The effectiveness of this measure depends on a central bank's credibility. If it is not enough, monetary authorities may also offer unlimited financing to the banking system (against appropriate collateral) at the policy rate at a longer maturity than is usual. Another non-conventional measure is direct intervention in financial markets: the outright purchase of financial instruments to affect the yield curve or stimulate a systemically important credit market.

When necessary, central banks may use flexibility as an additional tool. They may relax their collateral requirements and lend against a wider variety of instruments. They may also arrange cross-currency swaps with foreign central banks to provide liquidity denominated in foreign currency.

Finally, central banks may cooperate with fiscal authorities when a crisis calls for additional support in the form of government insurance or capital infusions.

## **What are the implications for monetary policy?**

The monetary policy framework will most likely expand to consider asset prices – and perhaps the growth of monetary aggregates and credit, as well – in some way. The high cost of the current crisis has highlighted the importance of preventing crises, and this suggests that monetary policy will shift from a “clean up after the bubble” stance towards a more active “lean against the wind” stance to deter the formation of asset price bubbles.

However, this will be anything but easy to implement in practice. There is a trade-off between responding aggressively and responding conservatively to potential bubbles. The former has a greater likelihood of preventing bubbles but may also cause instability and distortions in financial markets as a consequence of excessive intervention. It is also likely to garner considerable political ill will. Responding conservatively is less controversial, but it may allow a real bubble to grow and provoke a financial crisis. One should bear in mind that the

justification for a “clean up” policy stance was that bubbles are hard to identify. This observation has not become any less true; it is simply less important now that we have witnessed the potential consequences of not intervening.

As the details of the issue are important, the discussion has focused on how to include asset prices in the monetary policy framework. One possibility is to include the prices of financial assets and housing as separate arguments in the Taylor rule. Another method that has been discussed is including these prices in a broadened measure that would replace the consumer price index as the main measure of relevant inflation.

Given the complexity of financial markets, asset prices should be considered by central banks on a more discretionary and judgmental basis. Monetary policy is too blunt an instrument to control an asset price bubble. There may also be occasions in which the interests of price stability (reducing output gaps and leading inflation towards the target rate) and the interests of financial stability (controlling asset price bubbles and other distortions in the financial system) may be at odds – for instance, the case of a supply shock that creates a boom in asset prices but deflation in the prices of goods. Central banks cannot satisfy both objectives effectively with only one policy instrument. A second objective requires a second policy instrument. Furthermore, giving objectives to the central bank that go beyond price stability and financial stability most likely will end up reducing its effectiveness to achieve these two key objectives.

The instrument best suited to maintain financial stability is macroprudential regulation. It may be a straightforward instrument to wield when the central bank is also the main regulatory and supervisory authority for the financial system. But for the many instances in which that is not the case, macroprudential policy will have to be jointly implemented by the central bank and several other agencies. It will be crucial, then, to have explicit collaboration between all the relevant regulatory authorities and the central bank. Special attention must be paid to the institutional framework to ensure that they will have the incentives to do so.

Macroprudential regulation should have a dual purpose: reduce the incentives for financial institutions to increase leverage during a boom, and make the financial system more robust during a bust. It includes the use of procyclical capital requirements and loan provisions to moderate lending during a credit boom, placing larger requirements on systemic institutions to account for the incentive to become “too big to fail”, and increasing the risk weights attached to riskier lending during a boom.

Making use of these tools to “lean against the wind” will increase pressure on central banks. A pertinent example is the US boom in mortgage lending and housing prices that came before the current crisis. Before it proved to be unsustainable, the boom seemed to benefit everyone: low-income families could obtain easy financing terms, the construction industry saw increased activity, the financial system earned large revenues, and political authorities enjoyed a higher popularity. Attempts to intervene would likely have been met with fierce resistance.

Central banks’ institutional framework must be strengthened to ensure that they retain their autonomy. On the other hand, one cannot ignore the public’s desire for accountability. There is understandable opposition to the idea of a powerful institution – and the central bank surely is one – that is not accountable to political forces. Transparency and disclosure must be improved to satisfy the desire for accountability. If they are to retain their independence, central banks must earn the public’s good will.

With regard to the existing policy framework, the current crisis has not cast doubt on the use of inflation targeting (IT). Countries have been affected regardless of whether they had implemented inflation targeting. The United States, which was the epicentre of the crisis, does not use inflation targeting.

However, the crisis does leave some lessons for the implementation of IT policy. In the IT policy framework, the monetary authority should act when there is a steep decline in the

output gap ( $q - q^*$ ) and a decrease in expected inflation that puts the target in jeopardy. Given monetary policy's problematic ineffectiveness when the policy rate is near zero, this may require higher targets in the future.

In addition, central banks will also have to work on several other initiatives. They must prepare emergency response guidelines to deal with a crisis, both to reduce moral hazard and to diminish the influence of special interest groups. They must broaden their portfolio of policy instruments and the policy channels through which they inject liquidity during a crisis. They must cooperate with other supervisory agencies to ensure that there is adequate leadership to deal with emergencies. They must cooperate with their counterparts in other countries. And they must avoid creating implicit insurance for systemically important institutions and strengthen prefinanced deposit insurance.

## Central bank responses to financial crises

Michael Dooley<sup>1</sup>

I am going to start out by talking about the monetary policy lessons being drawn from the crisis that are just the wrong lessons. In fact, most of the discussion that is going on right now at the G20, including the need for countercyclical prudential regulation, is based on a misinterpretation of what caused the crisis. So I am going to first deal with two things widely cited as causes of the crisis – easy monetary policy in the United States and international imbalances – and I am going to argue that neither of them was related to the crisis in any direct or important way.

### Was easy monetary policy in the United States the cause of the crisis?

For monetary policy – and Philip Turner mentioned this in his introduction (in this volume) – the obvious observation is that easy monetary policy cannot depress real interest rates for seven years. There is no model that tells you that a continuously expansionary monetary policy for seven years does anything else but cause inflation. Real interest rates were low leading up to the crisis, but the cause cannot have been monetary policy.

The second observation is that easy monetary policy does not have an imaginary evil twin called liquidity. We hear a lot that the crisis was caused by excess liquidity sloshing around the system for seven years. But nobody has a very good idea of what that is or where it came from. It kind of reminds me of ether. Scientists decided that light was a wave that had to travel through something. But there was a vacuum out there and we would all freeze in the dark if there was not something to get the light from the sun to us. So scientists invented ether. Economists did not know what was going on before the crisis, so they invented liquidity.

The final thing, which is just so obvious to somebody in the financial markets, is that leverage is profitable at any level of interest rates. Low interest rates do not cause people to reach for a higher leverage. Leverage simply multiplies profits from spreads. Excessive leverage did make the system vulnerable, but the link between leverage and the level of interest rates is weak at best.

### International imbalances

At the G20 meeting that just concluded, the US position was that international imbalances were a big part of what led up to the crisis. Large net flows of credit from emerging markets – China, in particular – to the United States and other industrial countries can account for a low interest rate and expectations of future low real interest rates for a considerable time period. That is a perfectly sensible idea.

The associated sensible idea which gets a lot less attention is that equilibrium asset values will be high. If you have a lower real discount rate, and people expect it to continue for a very long time, asset prices are going to rise. It is in the denominator of every asset price that you can think of.

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<sup>1</sup> Professor of economics, University of California, Santa Cruz.

But the crisis that was predicted for that system was a stop in capital flows from emerging markets to the United States and to other industrial country markets. That predicted stop in net capital inflows was supposed to generate a spike in US real interest rates, a collapse in asset prices, a collapse in the dollar, and a crisis; but that did not happen. What I find quite astonishing is that even though the crisis that was predicted did not happen, the cure is still being touted as a proper policy response. This is not sensible.

## **Breaking down supervision and regulation and the need for improving supervision**

An alternative cause – which is on almost everyone’s mind but not given the enough emphasis – is a breakdown of supervision and regulation. As Vittorio Corbo said (in this volume), financial markets are the most controlled markets that we have in industrial countries. To understand why these markets failed we need to focus on a very old distinction between supervision and regulation.

Regulation is a set of rules that you impose on people. We love rule-based systems. They are consistent with the rule of law. We do not like interpretation nor do we like to give regulators a lot of latitude. Supervision is very different from regulation in that it requires people to interpret and enforce the rules.

Regulation is being improved, and tremendous energy is being devoted to setting up better rules. Vittorio Corbo (in this volume) went over several of them. I have read through lots of pages of proposed new rules. They are all kind of sensible things, but I do not think they are going to do any good, because the political economy of supervision has not changed sufficiently in my view.

I think we still have some of the assumptions that are behind ineffective supervision. The first is that private financial institutions care about the long-run value of the firm. Not true in any financial institutions I know anything about. Private financial institutions care about the next bonus payment, and after that they could not care less what the long-run value of the firm is.

The second assumption behind ineffective supervision is that the market will impose discipline over leverage. It just will not. Leverage, providing credit, is a very competitive and very profitable enterprise for the big institutions. If they offer even slightly different leverage ratios to their clients they will be out of business very quickly. There is tremendous pressure on financial institutions to provide credit to allow other people to take higher leverage ratios.

The last assumption – which is a real killer to me – is that private rating agencies are superior to the government agencies in evaluating risk. This sounded great, “let us marketise this rating environment”, but it clearly did not work. The incentives for the private rating agencies are not so good.

What are the problems with this? Some banks – a few banks in the world – will care about the long run, but most of the others will not. What is interesting to me is that a bank is a very stable industrial organization. The banks that do care about the long run, which is generally only one or two of them in each country – if you are lucky – actually did very well in the crisis. J.P. Morgan will come out of this crisis as a much more powerful bank than when it went in. But they do not have any interest in enforcing reasonable behaviour on the other banks; quite the contrary. If you are J.P. Morgan, you sit there on your cash and you love it when the other guys go out of business because you know you will be able to buy them for nothing when the crisis comes. So those banks will do well in a crisis, but they have no real incentive to make the system stable.

The second problem is that the regulatory capture of rating agencies is much worse than regulatory capture of government supervision agencies. We all know that there is a problem of regulatory capture in supervision of any entity in the private sector. But regulatory capture

among rating agencies is much worse. With the private rating institutions, direct payouts are encouraged, it is part of the structure. You pay the guy for his rating. At least with a government official you have to do it under the table, or take him out to lunch, or something like that – you cannot literally go into his office and write him a check. So clearly we need those government agencies rather than the private sector to do the risk analysis.

The other problem that I have not heard discussed at all – which I think was central to this crisis – is the idea that you can avoid regulation through good works. Remember, US subprime loans were a government programme. The lenders were doing good by extending home ownership to a whole class of people who before that were not able to qualify for loans. This initiative did not even come out of the private sector; it came from the US government's desire to do good in the world. One of the ways you do good is to subsidize credit to good causes. If you are a crook, that is what you will look for. How can I make myself look like somebody who is acting in the public interest and get around regulations? I think a strong supervisor, which we did not have in the United States because we legislated them away in the past 20 years, is a natural counterweight to this kind of political economy of relaxing regulation to do good.

## Why are crises so costly?

Given that the breakdown in supervision led to the problems, why is this such a costly thing? Why are these crises so costly? I think that the role of collateral is not emphasized enough. One way to make this point in a kind of dramatic fashion is that there are only two kinds of financial institutions in the world: one kind has access to the Federal Reserve, the ECB, the government bailouts and so on, and they actually get credit. Why? Because you think that if they do not pay you back, the government will. The other kind does not get credit – those institutions post collateral. That two-tier system works great in normal times. If I am a hedge fund, the amount of credit I get – every dollar of it – is “fully” collateralized. That means that the price of the asset that I pledge as collateral today can pay back the loan tomorrow. So as long as there is no big change in asset prices, that system works great.

In September 2008, collateral evaporated. What was the trigger point? Lehman Brothers, which arguably had access to the Federal Reserve, was cast out of the inner circle. It was cast out into the darkness, where it suddenly had to post collateral. If you look at the mechanics of the Lehman crisis, margin calls sunk Lehman. It was not a withdrawal of deposits or anything like that. Banks with cash – who were going to survive – demanded that Lehman post more collateral. Of course, they could not do so, and that was the crisis.

The insight here, which is not easily found in the academic literature, is that the value of collateral is endogenous to the system. In particular, it depends on the expected volatility of prices. If the expected volatility of prices goes up, the value of a put on an asset goes down, the derivative value goes down, and, from a macro point of view, collateral literally disappears. It was there yesterday, you get higher expected volatility today, and it is gone! In that case, everybody outside the trusted circle, including the sources of international trade credit, shut down. And here is the important point. This is an irresolvable conflict: *profit motives and competition push leverage to levels that are going to invite crisis. The crisis is going to be costly because it is going to involve an evaporation of collateral outside the insured system.*

## Reforming the system

How do we deal with this? Paul Volcker made a statement in the *Financial Times* in which he basically said it is hopeless. He said, forget all this. It was apparently in response to an

invitation to serve on yet another committee to reform the system and, Volker apparently said, reform is hopeless. I think what he meant by that, at least what I would mean by it, is that no set of regulations, no set of written rules can deal with this conflict between the profitability of leverage and the system's vulnerability to leverage unless those rules push the system far, far away from an efficient frontier. We actually did this in the United States after the Great Depression. We turned our financial system into a public utility – fixed deposit rates, no competition – a crummy system but very stable. As we moved away from that, it was not an immediate problem because we had a pretty effective system of supervision centred at the Federal Reserve. It was very proactive. That supervision mechanism was based on the idea that any regulatory system that you write down will immediately start to be chipped away, circumvented, in search of profit. That is our system. Once you write it down, the private sector goes to work that day and, since they generally have advance notice of what it is going to be, they have already figured it out. So this is not good or bad, this is a fact. Regulation is futile.

The proposed regulatory reforms are partial descriptions of what any sensible and motivated supervisor would do as a matter of course. With all due respect to Vittorio Corbo's presentation (in this volume), everything he said is fine, but it is exactly what any sensible supervision system would do anyway. Once you write it down, if you do not supervise, it does you no good. The problem is not knowing what to do after we see how the profit motive drives banks and financial intermediaries around the regulations. Once you write it down it is useless. They are not going to do what you are prohibiting, but they are going to do the next best thing to get around your regulation: to increase leverage, increase profits and make the system more and more vulnerable. You have to have a counterweight. That involves people who are well trained and motivated to see what the banks are doing and to tell them to stop it.

In a model of supervision I developed 20 years ago, I basically said that any activity that grows quickly or any asset that grows quickly on the balance sheet of regulated or insured institutions should be presumed to be dishonest. So you tell them to stop it. When they say "Why?", you say "I don't know yet, but I will soon let you know". You supervise now and figure it out later. If you try to figure it out now and supervise later you are going to be in trouble. So the problem is that ex ante we cannot imagine how they will do it. You just do not know how they are going to do it. In that sense it is a perfectly, rationally, unpredictable response. You do not know what form of political protection and public interest they will invoke to get away with it. Which senators are they going to buy to get away with it? Is it going to be housing? What is it? You do not know, so you had better supervise.

## **Did reserves insulate emerging market economies?**

Did reserves insulate emerging markets? No. OK, they didn't hurt. Borrowed reserves certainly didn't insulate them. Ask the people in eastern Europe whether reserves have helped them much. The answer is no. Did net foreign assets help? Yes – if you have less debt you are more insulated. That insulation comes from current account surpluses and that has done some countries lots of good. Fed swap lines and IMF flexible credit lines – somewhere in between. Again, it helps. But remember, the main reason emerging markets escaped this is that they had recent banking crises. This kept banks from getting into the asset market, which is where the problem was this time. And I guarantee you, in Mexico, if the banks had another year to get into this, they would have been into the asset-backed mortgage market just as heavy as anybody else. You should take no comfort at all about the ability of emerging market countries to avoid the next credit crisis if it is based on the failure of supervision and regulation in the industrial world.