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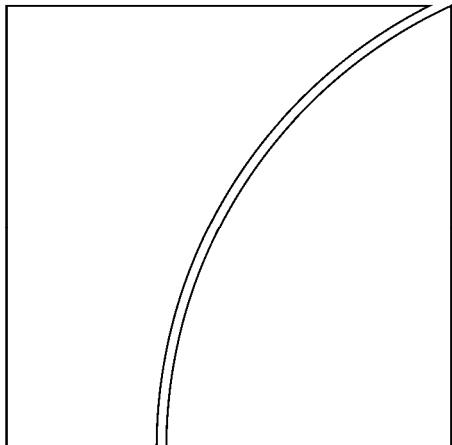
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Financial system and
macroeconomic resilience:
revisited

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25–26 June 2009

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Foreword

On 25–26 June 2009, the BIS held its Eighth Annual Conference on “Financial system and macroeconomic resilience: revisited” in Basel, Switzerland. The event brought together senior representatives of central banks and academic institutions who exchanged views on this topic. This volume contains the opening address of Stephen Cecchetti (Economic Adviser, BIS) and the contributions of the policy panel on “Lessons learned from the financial crisis”. The participants in the policy panel discussion, chaired by Jaime Caruana (General Manager, BIS), were William Dudley (Federal Reserve Bank of New York), Masaaki Shirakawa (Bank of Japan) and Nout Wellink (The Netherlands Bank). The papers presented at the conference and the discussants’ comments are released as BIS Working Papers 301 to 306.

Programme

Thursday 25 June

09.00	Opening remarks	Stephen Cecchetti (BIS)
09.15	Session 1: Towards market completeness?	
	Paper title:	The Failure Mechanics of Dealer Banks
	Chair:	Muhammad Al-Jasser (Saudi Arabian Monetary Agency)
	Author:	Darrell Duffie (Graduate School of Business, Stanford University)
	Discussants:	Martin Hellwig (Max Planck Institute for Research on Collective Goods) Philipp Hildebrand (Swiss National Bank)
10.30	Coffee break	
10.45	Session 2: Accounting and financial system behaviour	
	Paper title:	Accounting Alchemy
	Chair:	Miguel Fernández Ordóñez (Bank of Spain)
	Author:	Robert Verrecchia (Wharton School, University of Pennsylvania)
	Discussants:	Mary Barth (Graduate School of Business, Stanford University) Jean-Pierre Landau (Banque de France)
12.00	Lunch	
13.30	Session 3: Liquidity	
	Paper title:	Illiquidity and All Its Friends
	Chair:	Stanley Fischer (Bank of Israel)
	Author:	Jean Tirole (Institut d'Economie Industrielle)
	Discussant:	Franklin Allen (Wharton School, University of Pennsylvania)
14.45	Coffee break	
15.00	Session 4: The future of regulation	
	Paper title:	Financial Intermediation and the Post-Crisis Financial System
	Chair:	Lucas Papademos (European Central Bank)
	Author:	Hyun Shin (Princeton University)
	Discussants:	Donald Kohn (Federal Reserve Board) José Viñals (International Monetary Fund)
16.15	Coffee break	

Thursday 25 June (cont)

16.30	Session 5: Role of government in crisis management
	Paper title: Fear of fire sales and the credit freeze
	Chair: Guillermo Ortiz (Bank of Mexico)
	Presenting author: Raghuram Rajan (Graduate School of Business, University of Chicago)
	Discussants: Bengt Holmstrom (Massachusetts Institute of Technology) Jacob A Frenkel (Group of Thirty (G30))
19.00	Dinner

Friday 26 June

09.00	Session 6: Panel discussion: Lessons learned from the financial crisis
	Chair: Jaime Caruana (BIS)
	Panellists: William Dudley (Federal Reserve Bank of New York) Masaaki Shirakawa (Bank of Japan) Nout Wellink (De Nederlandsche Bank)
10.30	Coffee break
10.45	Session 7: Household decisions, financial sector and the macroeconomy
	Paper title: Household Decisions, Credit Markets and the Macroeconomy: Implications for the Design of Central Bank Models
	Chair: Duvvuri Subbarao (Reserve Bank of India)
	Author: John Muellbauer (Nuffield College, Oxford University)
	Discussant: Alan Bollard (Reserve Bank of New Zealand)

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Opening remarks

Stephen G Cecchetti

This year's conference is an update of the Sixth BIS Annual Conference held in Brunnen a little over two years ago, when the sessions and papers had titles like "Towards market completeness", "Accounting and financial system behaviour", "Financial intermediation through institutions or markets", "Risk transfer to households and macroeconomic resilience" and "Financial system: shock absorber or amplifier".

Many of the topics and authors are the same this year, so it is natural to look back and try to recall our thinking then as a basis for renewing our discussion now. Since I was not present in Brunnen for the 2007 conference, let me instead try to remember some of what I think was the consensus of the time on a number of general topics that were discussed there: market completeness; the relative merits of bank-based versus market-based finance; securitisation; and the policy framework that had been broadly adopted by many of the world's central banks. In doing this, I will be mixing some of the topics of the conference two years ago, as well as those discussed in the excellent papers that are coming today and tomorrow.

First, market completeness: What economist can argue against the creation of securities that help complete financial markets? Don't such innovations always improve efficiency?

Examples of improvements are easy to find. Once upon a time, payment streams and risks came bundled together. Bonds were sequences of coupons with principal payment at maturity, and the issuer could default on some fraction of those promises. Today, bonds are stripped so that coupons and principal can be purchased separately and the risk of default insured. And the risk of default can be sold off separately. More generally, financial engineers have made it possible to purchase or sell virtually any payment stream with any risk characteristics.

This ability to separate finance into its most fundamental pieces – the financial analogue to the particle physicist's protons, neutrons and electrons – has made it so that risk really does go to those who are most willing and able to bear it.

Next, we have bank-based versus market-based finance: Banks are okay, but markets are better.

Banks serve a variety of functions: they pool the resources of small savers and lend to large borrowers; they offer safekeeping and accounting services; they give customers access to the payment system; they supply liquidity services; they allow for risk-sharing; and they provide information services – the screening and monitoring of borrowers designed to overcome adverse selection and moral hazard arising from information asymmetries.

But in the same way subatomic finance breaks financial instruments into their most basic parts, why can't a traditional bank be split up with specialised institutions serving each of the functions? Surely the fact that GE makes jet engines doesn't make it a better financial service company or light bulb manufacturer. Why would a bank that provides access to the payment system and liquidity be better at screening potential borrowers than a specialist?

Furthermore, market-based systems should democratise finance, giving access to people who didn't have it before. Subprime mortgages – one of my favourite forms of market-based financing – allow people who would otherwise not be able to purchase homes to do so. Isn't this a good thing?

Not only did market-based finance give financial system access to a new class of people, it also made it easier for financial institutions to manage their risks. The fact that such a wide

class of assets could be bought and sold meant that adjustments were easy, cheap and fast. This made the financial system much more of a shock absorber than an amplifier. Or so we thought.

Third, there is securitisation: There are so many reasons to like securitisation. The easiest to see is that it removes the need for lenders to be in close physical proximity to borrowers. That is, someone wanting a mortgage need not seek out a local bank with local depositors to finance it. My parents' first mortgage in 1965 was from a local Californian savings and loan that originated and serviced the loan. The most recent mortgage that I obtained to purchase a home in Lexington, Massachusetts, in 2002 was through a mortgage broker. All I know is that the servicing was done by someone in New Jersey.

But my personal experience is not the best example of the benefits of securitisation. A better one came on 5 May 2005 when Standard & Poor's issued simultaneous announcements of the downgrading of Ford and GM, along with a press release that stated: "GM-Related Auto Loan, ABS Deals Unaffected by Corporate Downgrade." Two things made these asset-backed securities low-risk relative to the GM bonds: car loans are collateralised, and the overall default rates on large groups of auto loans are very predictable.

Finally, in addition to divorcing the physical location of the lender from that of the borrower, securitisation separates the origination of credit from the bearing of risk. Actors along the securitisation chain can make use of their comparative strengths in processing information or managing various types of risks. All of this should improve efficiency.

Remember, I'm recalling the thinking of two years ago!

Finally, there are policy frameworks: We really thought we had this figured out. Some form of inflation targeting was the solution – and the operational instrument was to be the interest rate. It was about refinements. Should we target inflation or the price level? What is the appropriate time horizon over which we should try to hit the target? Is it better to publish central banks' own interest rate path forecasts or not? These are not big questions.

I am convinced that, combined with the developments in the financial system I just mentioned, monetary policymakers' focus on inflation brought us the Great Moderation – the reduced volatility of real growth in the developed world that started in the mid-1980s. Monetary policy has become predictable – it is a source of stability where it had been a source of instability. And, faced with income volatility, individuals today can use the financial system to ensure that their consumption remains smooth. The results were amazing, and we smugly wrote papers debating the sources of the Great Moderation.

And looking at financial stability, safeguards were in place; central banks had emergency lending authority that saved us on 11 September 2001; deposit insurance protected depositors, so bank runs became a thing of the past; investor protections freed individuals from worrying about the security of their wealth; and there were regulators and supervisors to watch over individual institutions and keep their managers and owners from taking on too much risk.

What a difference two years makes. Since August 2007, the financial system has experienced a sequence of critical failures. What does this mean about the way we think about market completeness, bank-based vs market-based finance, securitisation and policy frameworks?

For subatomic finance, it is still hard to argue with the welfare benefits of market completeness. But the ability to sell risk easily and cheaply comes with the ability to accumulate risk in almost arbitrarily large amounts. Combined with compensation schemes in which money managers share the gains but not the losses of their investment strategies, this creates incentives to take on huge amounts of risk. Without risk, there is no reward; and without big risks, there are never big rewards.

The result is that small numbers of individuals have the potential to jeopardise the stability of the entire financial system. They do this not because they fail – the right to succeed in the capitalist system is the right to fail – but because of the knock-on effects they will have when they fail. It is the interconnectedness of the system that is the biggest challenge. And the more complex the system becomes, the bigger this risk becomes.

Even more fundamental is the fact that subatomic finance only delivers the promised gains – completing markets – so long as markets are efficient and liquid. They are not. Prices can deviate significantly and persistently from fundamentals because arbitrage fails, and there are times when it becomes impossible to buy or sell some financial instruments.

For bank- vs market-based systems of finance, we have learned that banks and markets are complements, not substitutes. Bank-based finance needs market-based finance, and vice versa. One does not operate without the other. Institutions depend on markets for revenue, risk management and funding. Markets depend on institutions for market-making, underwriting and credit. We should not think of one channel of intermediate as a spare tyre in the event that the other fails.

For securitisation, we see now that there are clear limits. There are problems with incentives and with information. Originators had incentives to economise on the quantity and quality of assets that were going into securitisation pools, and so they did. And information moves along the securitisation chain more like in Chinese whispers (or, as an American would say, the game of telephone) than as one would expect when billions of dollars or euros or pounds are involved. Add to this the difficulty associated with the pricing of infrequent events – the problem of tail events. And the fact that people seem to have underappreciated is that securitisation and tranching do not eliminate risk. They shift it around. The risk has to go somewhere.

Finally, for policy frameworks, we have some very hard thinking to do and the framework almost surely needs to be refined. But change does not mean forsaking central banks' price stability objectives, as it is not aimed at changing long-term targets or goals. Instead, it means expansion. For monetary policy, we need to think harder about integrating asset price and credit booms into the policy framework. And for financial stability, we need to create appropriate tools and institutional structures that allow us to identify and mitigate the systemic risks that naturally arise in the financial system.

Interpreting the causes of the great recession of 2008

Joseph E Stiglitz¹

The Great Recession of 2008 is both complex and simple. In some ways, beneath the complexity of CDS's, sub-prime mortgages, CDO's, and a host of new terms that have entered the lexicon is a run-of-the-mill credit cycle. As banks lent money freely on the basis of collateral, prices increased, allowing more and more lending. Real estate bubbles are a dime a dozen. Bubbles break, and when they break, they bring havoc in their wake. Perhaps the most unusual aspect of this bubble was the conviction of key policymakers (including two Chairmen of the Federal Reserve) that there was no bubble (perhaps a little froth), and the bald assertions (a) that one could not tell a bubble until it broke; (b) that the Fed didn't have the instruments to deflate the bubble, without doing untold damage to the economy; and (c) that it would be less expensive to clean up the mess after it broke than to take preventive action.

These assertions were made presumably on the basis of the "accepted" wisdom of the economic profession. Such views were reinforced by the belief in rational expectations and the belief that with rational expectations there couldn't be bubbles. Few would hold to these views today. But even before the crisis there was little basis for these beliefs. Brunnermeier (2001) had shown that one could have bubbles with rational expectations (so long as individuals' have different information).² Decades ago, economists had shown that there could be dynamics consistent with capital market equilibrium (rational expectations, with the no-arbitrage condition being satisfied across different assets) for *arbitrarily* far into the future, but not converging to the long run "steady state," so long as there were not futures markets extending *infinitely* far into the future.³ Such paths look very much like "bubbles." There has been, in addition, a large literature on rational herding.

Standard results on the stability of market equilibrium with rational expectations employed representative agent models with infinitely lived individuals (where the transversality condition replaced the necessity of having futures markets extending infinitely far into the future). But as soon as the assumption of infinitely lived individuals was dropped, there was no assurance of convergence; the economy could oscillate infinitely, neither converging nor diverging.⁴ Other models in the same vein emphasized the possibility of multiple rational expectations equilibria.⁵

These may seem theoretical niceties, but to the extent that the belief that markets were efficient, and that efficient markets precluded the possibility of a bubble, they gave confidence to the Fed's ignoring mounting evidence that there was a bubble and are thus much more than that.

From a more practical perspective, though one might not be *sure* that there was a bubble, surely a policy maker should ask the question if it is possible, or even likely. All decision making is made under uncertainty. Policymakers need to balance the risks: historical

¹ Lecture prepared for the Eighth BIS Annual Conference, Basel, 25–26 June 2009.

² Brunnermeier (2001)

³ See Hahn (1966) and Shell-Stiglitz (1967).

⁴ See, for instance, Stiglitz (1973, 2008).

⁵ See Cass and Shell (1983) and the large literature on "sunspot" equilibrium; see also Hoff and Stiglitz (2001).

experience should have been convincing that if there were a bubble, its breaking could have devastating consequences. There were a host of tell tale signals of a bubble – rapid expansion of credit, rising price-rental ratios, and rising ratios of say median prices to median income (which, adjusted for inflation, was stagnating or declining).⁶

Policymakers should have been concerned with the heavy dependence of the economy on real estate – both directly and through mortgage equity withdrawals. This meant that if there were a bubble, when it broke, the impact on the American economy could be devastating.

By the same token, the Fed should have been concerned about the models being used for risk assessment by rating agencies and investment banks, which formed a central part of the securitization process: they ignored the fact that there could be a bubble in many parts of the country and that an increase in the interest rate, say, could burst the bubble.

They should have been especially wary given the predatory lending that was pervasive – and which they did little about. It should have been clear (and was clear to many) that an increase in interest rates would make it impossible for many borrowers to service their debt and would make it impossible for many others to refinance their mortgage when balloon payments came due. This would force many houses onto the market, exacerbating downward pressures on prices: the bursting of the bubble could be particularly vicious.

In short, there were marked downside risks, which the Fed and other regulators should have taken into account. The notion that its only instrument was to increase the interest rate was a self-enforced constraint: just as in the 90s, it might have been able to dampen (“prick”) the tech bubble by an increase in margin requirements (and it was criticized for having failed to do so),⁷ the case for tightened regulation in mortgage lending was even more compelling. The advantage of such instruments is that they can be titrated: as evidence of the bubble mounted, as the risks grew, the regulations could have been tightened.

The risk, of course, was that with the economy so dependent on housing, even if interest rates remained relatively low, dampening the housing bubble would have stalled, or at least dampened, the economy. But if that were the case, it should have been all the more frightening for the Fed: it would mean that if the bubble broke, the likelihood was that the economy would go into a tailspin.

There are strong non-linearities: the economy has good buffers for absorbing small to mild shocks, but there are disproportionate costs to large shocks. Firms are forced into bankruptcy, with a large loss in organizational and institutional capital. The damage is not undone overnight. That is why the view that it would be easier to repair the damage after the bubble broke than to attempt to prick the bubble was, on the face of it, implausible. Long experience with the many, many crises that have marked the world in the era of deregulation shows that the aftereffects of crises last years, and the economies never fully regain the lost ground.

The experiences of the many other countries experiencing a debt-financed consumption boom should have been telling. America was borrowing large amounts from abroad, which one could think of, at the margin, as financing a tax cut for the rich, a war in Iraq, and a housing boom. If the housing boom was in fact a bubble, America would be left with a legacy of debt, but the seeming assets behind the debt would have diminished in value. At least in the aftermath of the tech bubble, there was a legacy of productive technology.

In short, the rationale underlying the Fed’s ignoring the bubble were indefensible. It might not have been able to maintain the economy at full employment, given other problems

⁶ See for instance World Bank (1997).

⁷ See, eg Chapter 3 of Stiglitz (2003).

confronting the economy – weaknesses in domestic aggregate demand resulting from the growing inequality and high oil prices, weaknesses in global aggregate demand arising from the growing inequality in most countries around the world and the increased demand for precautionary savings – through the build-up in reserves – following the mishandling of the East Asia and Latin American crises of the late 90s and early years of this decade. But it most likely could have avoided the extremes of the crisis of 2007/2008.

One other strand of thought may have given the Fed comfort in its seemingly mindless ignoring of the bubble: the widespread belief among central bankers in inflation targeting, the belief that low and stable inflation was necessary and almost sufficient for high and sustained economic growth. (America was lucky in facing low inflation, not so much because of wise monetary policy on its part but, at least in part, because China had been experiencing deflation; combined with its stable exchange rate, this meant that Americans faced stable prices for at least a wide range of consumer goods.) But history – and a growing body of economic literature – had shown that CPI price stability was neither necessary nor sufficient for sustained growth, and in particular, the bursting of bubbles – and especially real estate bubbles – could have devastating consequences. The ready flow of liquidity (justified because there were no inflationary pressures and because, without them, presumably aggregate demand would have been weak) supported the bubble.

When the bubble broke and brought havoc to the economic and financial system, Greenspan admitted that there had been a flaw in his economic model, which was the basis of his regulatory stance. He had had excessive faith in the incentives and ability of those in the financial sector to manage their risk. But in admitting that error, he also may have been admitting that he had failed to grasp the role of regulation. Managing one's own risk, from the perspective of maximizing the value of the enterprise, is what financial institutions are supposed to do. If that were all that there were to the matter, there would be no need for regulation, no need to substitute a regulator's risk judgments for that of the bank manager or the market.

There are two reasons for regulation.⁸ one is that there can be large externalities, or large effects of the action of one party on the well-being of others, effects that are not adequately reflected in the price system. When one bank goes bankrupt, it can have systemic effects. Bank managers have no incentives to incorporate these social costs; and they may have no ability to do so, since fully knowing these systemic effects requires knowledge of actions that are not fully revealed by prices being taken contemporaneously by other market participants. (The standard competitive model assumes that all the relevant information is conveyed by prices. With market imperfections, that is not the case.)

Thus, even if banks perfectly assessed their own risk, there would be no assurance that the system as a whole was stable. This is true even if there were no banks that were too big to fail, so long as they engaged in correlated behaviors. Did the regulators not understand this fundamental point? Did they not want to understand it? (These issues are of concern today; there is much talk about systemically significant institutions – though too little is being done about them – but almost no discussion of the risks of correlated behavior of large numbers of institutions whose correlated behavior is systemically important, even though each alone is not systemically important.)

The growing interdependence of financial institutions, brought on by derivative transactions, has only made matters worse. It appears that they had failed to engage in an adequate

⁸ There are actually several more, set forth clearly in the recent report of the Commission of Experts on Reforms of the International Monetary and Financial System (2009). These include maintaining competition (suppression of competition helps explain the development of an efficient electronics payment mechanism that modern technology would support) and ensuring access to credit.

network analysis of these interdependencies, even though research had pointed out their importance and the risk of bankruptcy cascades.⁹

A second reason for regulation is investor protection – preventing predatory lending and other abusive practices. In this crisis, the failure to curtail such practices contributed to the instability of the financial system: it was, in a sense, hoisted by its own petard.

Greenspan's admission of "error" reveals another deeper problem with the regulatory stance that he, and many other regulators, took: it was not *robust*. It was predicated on a particular behavioral model. If that model was wrong – as it proved to be – the economy could be exposed to great risks. A good "Bayesian" should recognize that our knowledge is limited, our models incomplete, and there is a risk that they might be wrong. Robust regulation should take into account that possibility and particularly focus on the worst consequences if that is the case. It should not be designed to protect the economic and financial system. By contrast, it was increasingly "fine tuned" to the assumption that financial markets were efficient and worked well.

Robust regulation should, in addition, recognize the limitations of regulation – that there will be circumvention of any set of regulations. Such circumvention is not a reason for abandoning regulation (as many had argued in favor of deregulation), but for building an overlay of checks and balances, regulations which enhance market discipline (through transparency regulations), strengthen appropriate incentives, restrict conflicts of interest, and restrain the opportunities to take advantage of these problems which will never be fully corrected, in particular, by restricting excessive risk taking and certain practices and products where potential social costs exceed the benefits.¹⁰

The same failure to understand the critical role of externalities and failures in the price system in regulation also led regulators and market participants to misjudge the nature of the innovations in the financial system. The fact that an innovation increased profits of a financial institution did not mean that it improved the efficiency or stability of the economy. Much of the innovation was directed at tax, accounting, and regulatory arbitrage. Some of it entailed new ways to exploit borrowers. To be sure, there were some innovations – like the development of the venture capital firms – which could be linked to increased productivity in the *real* economy. But it is hard both now, and before the crisis, to link many of the other innovations to sustained increases in the growth of the economy, where growth is properly measured.¹¹ Even if there were some short term *real* increases in growth, they have been overwhelmed by the costs. Evidence suggests that it will take years to catch up for the lost growth – that ten years or more from now, the economy will be operating at a lower level than it would have been had we not had the crisis. Hence, there is a heavy burden in showing that between 2002 and 2007 the increased real growth was sufficiently higher than it would have been without the financial innovations to offset the losses that have occurred as a result of the crisis.

⁹ See, for instance, Greenwald and Stiglitz (2003), chapter 7, and De Masi et al (2009). Data available on the Japanese banking system had, in fact, allowed an analysis of the interdependencies in that market. Corresponding data for other markets does not seem to be publicly available. It appears that the Fed and Treasury were taken aback even by the linkage between Lehman Brothers and money markets.

¹⁰ The theory of robust regulation is set forth in Stiglitz (2001) and Honahan and Stiglitz (2001).

¹¹ The issue of the appropriate measurement of GDP has been recently explored by an international Commission on the Measurement of Economic Performance and Social Progress (see <http://www.stiglitz-sen-fitoussi.fr/en/index.htm>). It is clear that the distortions to the economy associated with the bubble meant that during the years prior to the crisis, the GDP numbers provided an inaccurate picture of the economy's performance.

These arguments may seem obvious now, and to raise them now may raise the obvious criticism: this is looking at the world from 20/20 hindsight. But all of these points were raised by me and others well before the bubble broke.

Thought experiments in parsing out the blame

I began this talk focusing on the Fed, because of the focus of this group on Central Banks and their policies. Some critics¹² put the Fed's loose monetary policy at the center of the crisis. I want to argue here though that the question is far more complex. The list of those who and what contributed to the crisis (and the policies that contributed to the crisis) is long: global imbalances, rating agencies, investment banks, mortgage originators, mortgage brokers, CRA, Fannie Mae, foreign purchasers of securities, economists, moral hazard created by previous bank bailouts, deregulation, bankruptcy reform, tax law changes that encouraged leveraging, the reckless rescues. And within each of these categories, there are further debates: which regulatory failures were responsible – the repeal of Glass Steagall, the decision not to regulate derivatives, the SEC's 2004 decision to allow more leverage, the failure to force firms to expense stock options, or more broadly, the failure to deal with longstanding problems in corporate governance? The list is a long one, and almost surely each contributed either to the creation of the crisis or to making it worse.

Still, there is a well-defined conceptual question: is there a single “mistake” without which the crisis would not have occurred? A single action, which by itself, could account for the crisis? Or a combination of actions or mistake? In the hard sciences, we could conduct an experiment – try deregulation, but with a less loose monetary policy, and see if we have a crisis. In economics, we can't perform these experiments. We have to rely on thought experiments and historical experiences.

Two more preliminary remarks: in the heat of the moment, particular events become the focus of attention. In the Thai crisis, it was particular actions of the Central Bank in attempting to prevent the fall of the value of the Baht. In historical perspective, these events diminish in importance: it was the real estate bubble, and its breaking, which brought on the crisis. The actions of the Central Bank were designed to forestall the consequences; instead, when the nature of their action became apparent, it may have precipitated it. But the crisis would have occurred in any case, though perhaps a little later.

The second is that there are multiple levels of explanations. Interpreting an experience such as this crisis is like peeling an onion. Under each explanation, there is another. We need to explain, why were interest rates so low? Why did the financial sector do such a bad job of allocating capital and managing risk? If our answer is flawed incentive structures, we have to ask the deeper question: why were incentive structures designed to encourage such shortsighted and excessively risky behavior? Why did the rating agencies do such a bad job (once again) of doing their ratings? Each of these are long stories, with many details. In this brief talk, I want to pick up on a few of the more controversial themes and dispense with what I view as some of the “second order” explanations.

¹² See, for instance, Taylor (2009).

Low interest rates

From this perspective, low interest rates cannot and should not be blamed for the crisis. We have had low interest rates in a period with good regulation – the period after the war; we did not have a bubble. The low interest rates helped fuel the high economic growth. Had our financial markets channeled investments into more productive uses, the low interests rates could have been a boon to the economy. Low cost of capital should have been an advantage – that is the case in all of the standard growth models.

By the same token, some countries have had bubbles even with high (internal) interest rates – designed to sterilize an influx of capital. That was the case in East Asia. Evidently, low interest rates are neither necessary nor sufficient for a bubble.

Of course, sustaining a bubble for long does require a flow of liquidity, the availability of credit. But with the development of global capital markets, such a flow of liquidity can come either from domestic sources or from abroad. Many of our regulatory institutions focus on domestic banks. The domestic shadow banking system is less regulated, and, to a large extent, with open capital markets, there is reliance on foreign regulators for regulating foreign financial institutions – the risk of which has become all too evident since the collapse of the Icelandic institutions. A foreign supply of funds can finance a bubble – and has done so in several instances. The breaking of the bubble can have large domestic consequences, even when the financing of the bubble comes from outside.

The crisis that wasn't

This could have been the case in the United States. But it wasn't. Of course, there was considerable finance from outside. Securitization has facilitated this. So has the globalization of financial markets. But had this been the crux of the issue, America's banks would have been in far better shape. The massive bailouts would have been unnecessary. The brunt of the bursting of the bubble would be borne by the holders of the securities abroad and by foreign lenders.

Of course, large changes in asset prices would have had ramifications for the domestic market. The inability to continue to finance rampant consumption by mortgage equity withdrawals would have dampened consumption – as it has. But had American banks behaved well, had they assessed risk as they should have done, they would have been able to withstand the shock. They would have realized the risk of a collapse in housing prices and the resulting shock to aggregate demand and taken it into account. Of course, they might have assumed that the government would respond with countercyclical policies (based on historical experience), and an incompetent government might have failed to do so in an effective way. The result might be a downturn of longer duration than any reasonable lender might have expected, and then, even banks that did a reasonably good job in risk assessment would face difficulties – just as banks in the many developing countries where regulators were far better than those in the US are today facing problems.

The failure of America's financial markets

I put the failures in the financial markets front and center: the financial markets failed to allocate capital well. They mispriced and misjudged risk. Of course, they have done so repeatedly – which is why they have had to be bailed out repeatedly. It is remarkable that our regulators ignored this long historical experience – and the strong line of theory explaining why this is so. But they did.

If our financial markets had functioned well – as the “market fundamentalists” claimed unregulated/self-regulated markets would – then, of course, there would have been no need for regulation, and the regulatory failures would have been of no consequence.

In short, in this “thought experiment,” blame for the crisis must lie centrally with the financial markets. But given the long history of failure of financial markets, there is a “public failure” – the failure of the government to address the problem of market failure. Given the failures of the financial market, given the failure of the government to prevent the failures of the financial market, the low interest rates made matters worse, helping fuel the bubble. So, of course, did the ready supply of funds from abroad.

The Fed (and the US Treasury more generally) may have contributed to the crisis in another way: the infamous Greenspan and Bernanke puts provided assurance to the markets that, if they should run into problems, they would be bailed out with a flood of liquidity. Bad lending around the world had been rewarded by bailout after bailout. This led to moral hazard and contributed to a low price for risk. And, towards the end, the government (eg through the Federal Home Loan Banks), desperately trying to prevent the whole thing from unraveling before the election, added fuel to the fire that was already raging.¹³ So too, Fannie Mae and Freddie Mac (since 1968 privately owned corporations), envious of the profits and bonuses being made by their colleagues in others parts of the financial sector, joined the fray.

Shifting blame

Those that want to believe in the market have struggled to find someone else to whom blame can be shifted. One often heard candidates are government efforts to encourage lending to minorities and underserved communities through the Community Reinvestment Act (CRA) requirements and to increase home ownership through Fannie Mae and Freddie Mac. Default rates on CRA lending are actually lower than on other categories of lending, and CRA lending is just too small, in any case, to have accounted for the magnitude of the problem.¹⁴

Fannie Mae and Freddie Mac can, of course, be at most a part of the explanation: they cannot explain the AIG debacle, the single most expensive part of the financial mess, costing \$180 billion. That had to do with banks’ failure to assess counterparty risk – long recognized as the central issue in derivative transactions. Nor can it explain the difficulties that the banks got into in their holding of mortgages and other bad lending. If Fannie Mae and Freddie Mac were the central problem, the government would not have had to spend \$700 billion plus bailing out the rest of the financial system. The banks simply did a bad job in risk assessment. If Fannie Mae and Freddie Mac were contributing to a bubble (or if foreign lenders were doing so, or if low interest rates were doing so), then part of the banks’ responsibility in risk assessment was to realize this and to make sure that they were protected against the consequences. In short, no amount of finger pointing at Fannie Mae and Freddie Mac (or at the Fed for low interest rates, or at foreign suppliers of funds for inadequate risk assessment) can absolve the banks of their failures.

Moreover, the notion that the banks’ bad lending was the result of government pressures to increase home ownership is, on the face of it, absurd. The government had not introduced any incentives to the banking system. President Bush may have talked about the ownership

¹³ See Ferguson and Johnson (2009).

¹⁴ See Canner and Bhutta (2008) and Kroszner (2008).

society, but banks have never been moved towards corporate responsibility simply on the basis of a presidential speech.

Assessing Fannie Mae and Freddie Mac's contribution to the bubble is more complicated. Their focus was on "conforming loans," not on the subprime mortgages that were the source of so much of the problems. They did not originate the innovative concepts (like liar loans) that led to such problems. Mortgage originators like Countrywide, and the banks, were at the center of this lending. Fannie Mae and Freddie Mac got into the game late, but almost surely, their active involvement helped prolong and extend the bubble. To return to our "counterfactual thought experiment," if Fannie Mae and Freddie Mac had not joined the fray, it is conceivable that the bubble would have burst a little earlier, the damage done would have been a little less. They have some culpability, but it is limited.

But their culpability is not the result of government efforts to increase home ownership. There is always a home appropriate to an individual's income and circumstances. No one that I know who believed in the objectives of expanded home ownership thought that such a risky strategy made sense: in the end, home ownership was expanded slightly for a short period of time, and in the end, many of America's poor lost not only their home, but also their life savings. Indeed, consumer advocates tried to stop these predatory lending practices in many states but were beaten back by the banks and the mortgage originators.

It was the drive for short-run profits (fees) combined with the lack of regulation that resulted in bad lending practices that in turn resulted in loans beyond people's ability to pay. The irony is that, as such lending led to a bubble and home prices soared, the size of the homes that many acquired was little different from what it might have been had there been no bad-lending generated bubble.

Global imbalances

Some, such as Martin Wolf,¹⁵ put global imbalances at center stage. High savings in Asia, especially associated with reserve accumulations, helped drive down global interest rates. The massive imbalances – high U.S. deficits offset by large surpluses in a few countries – were not sustainable.

I agree that the global imbalances were unsustainable. This is especially so since the country that was borrowing the most – the U.S. – should have been saving for the impending retirement of the baby boomers. But the problems in the U.S. could have arisen without the global imbalances, and those problems broke out before the global imbalances were no longer sustainable. That is, the Fed continues to have some discretion in setting interest rates and determining credit availability. While global credit conditions do affect the U.S., they were not determinative. They might be the source of the next crisis, but they were not the source of this crisis.

One response to this critique of the global balance theory is that (at least traditionally) the Fed only controlled the short rate. The market determined the long. And even if the Fed had raised the short rate, the "savings glut" would have driven down the long rate (as it did, in what Greenspan referred to as the conundrum). And it is the long rate which (at least until recent years) is most relevant for the mortgage markets. But an increasing proportion of the mortgages during the bubble were based on the short rate, which the Fed did control; this crisis has shown that the Fed can intervene to affect the long rate as well (and it has done so occasionally in the past). Lowering interest rates across the board might, of course, have

¹⁵ See Wolf (2008).

lowered the dollar even more, but that would have been good for the American economy, faced as it was by weak aggregate demand – and the increased aggregate demand might have fortified regulators who would be worried that pricking the real estate bubble would bring about a recession. In short, low interest rates – whether the result of Fed action or a global savings glut – need not have led to the bubble, and if it had led to a bubble, need not have had the disastrous consequences for our banks, *if* they had engaged in good risk analysis and sound lending practices or *if* the regulators had prevented them from engaging in reckless behavior.

We have to explain, of course, the imbalances, and the irony is that the same mistakes – the repeated IMF/US Treasury bailouts – that gave rise to the moral hazard and contributed to the reckless lending also contributed to the high savings, as the developing countries did not want to ever again have to resort to the IMF. They had to rely on self-insurance – on reserves.

Purchasers of securities

A related line of “defense” of the financial sector and the Fed is to shift blame to buyers of American securities, and for some reason, it is especially foreign buyers that are blamed. (In one seminar, a prominent American academic blamed Chinese buyers. China may have been buying American agency bonds, but it was careful enough not to buy many of its toxic mortgages. Its judgment that the US government would stand behind the agency bonds proved correct.) If these had not created the demand for toxic mortgages, so the argument goes, the market would not have produced them. Like the argument blaming Fannie Mae and Freddie Mac, the buyers of the securities share some blame, but, again, if that was the whole story, then America would not have had the banking crisis that proved so costly.

Indeed, it was the belief that the financial system had distributed the risk widely, around the world, that gave comfort to the regulators that there was little risk to the bubble: if it broke, the effects would be minimal. Even a couple trillion dollars of losses is a small fraction of global wealth, easily absorbed. The problem was that a large part of the risk was not distributed but kept on the books of the banks. It appears as if the banks had, in fact, not distributed the risk in the way that they said, and the investors had not been quite as foolish as seemed at first glance – the securities they bought had been made more attractive by the fact that the banks had “enriched” them by holding on to some of the risk, putting it off balance sheet.

Moreover, this does not fully absolve the financial sector: there may have been fraudulent marketing.¹⁶ They sold as AAA products – with the seal of approval of the rating agencies – securities that clearly did not deserve that appellation. As I remark below, they may have defrauded themselves as well; but they claimed to be the global experts on risk and were rewarded accordingly. It is not surprising that others trusted them.

Net, it is not clear whether the foreign purchases made America’s plight better or worse. The counterfactual is again not clear. One view has it that America would have produced the same bubble: they were manufacturing toxic mortgages as fast as they could. The foreign demand may have driven down interest rates a little and increased the supply a little, and thus the size of the bubble may have increased a little. But the net benefit to the U.S. of offloading so much risk abroad more than offsets the slight increase in the size of the bubble.

¹⁶ The prevalence of fraudulent marketing practices was highlighted in a recent study at New York University. See Jones (2009).

The other view suggests that the increased demand for toxic mortgages increased the supply almost in tandem, and because accordingly the prices were elevated all the more, the price decline (with all of its consequences) was all the greater. I have not seen careful empirical work estimating the net effect, which depends in part on the response of monetary authorities as well. My own hunch is that net, America benefited from the foreign purchases.

That leaves two questions: why did the rating agencies perform so badly? And why did the buyers (both foreign and domestic) trust them so much?

This is, of course, not the first failure of the rating agencies. They performed abysmally in the last global crisis.¹⁷ There are two alternative explanations (as there are for many of the similar failures throughout the financial system): flawed incentives and incompetence. Clearly the incentives were awry. They were paid by those who rated them. They made money by consulting on how to get ratings higher. The resulting drive for “extracting” as much rating power out of a given set of securities contributed to the complexity of the securities and the difficulties of unwinding and valuation after the crisis struck. Competition made matters worse: there was a race to the bottom. With imperfect information, competition does not always have the desirable properties normally assumed. The system of grading contributed to information imperfections, because it made judgment of accuracy of ratings more difficult: there was not a simple forecast of the probability of default (or some other adverse outcome).

That having been said, one has to ask, would the rating agencies have done much better had they not had such perverse incentives? The investment banks’ risk judgments were equally flawed. But, of course, their incentives were even more flawed: they were (until they got caught short) among the big winners from the overrating.

The obvious flaws in the analysis of the investment banks and rating agencies are hard to excuse. Some of the risks I pointed out in the early stages of the securitization movement – the risks of underestimating correlations and the likelihood of price declines.¹⁸ Indeed, I called into question the intellectual foundations of securitization, concerns that have been increased in the intervening years and by the crisis itself. Securitization’s advantage is supposedly that it allows a more efficient distribution of risk through the global economy; its disadvantage is that it creates new asymmetries of information. With the creation of national and global banks and widely diversified ownership of the banking institutions themselves, the advantages of risk diversification were greatly reduced. In some areas, such as the issuance of bonds by large corporations, the information problems can be addressed, at least partially, by the large number of market analysts. But the information problems were never effectively addressed in the mortgage market: the originators realized that those who purchased the mortgages, those who repackaged them, those that rated the repackaged products, and the ultimate purchasers, none of these could or did do a good job at risk evaluation of the individual products, and this created a huge moral hazard problem. What we saw – the race to the bottom – is what economics predicted.

Securitization had another problem, which should have been evident from the greater difficulties in restructuring the East Asian debt compared to the Latin American debt: a reduced inability to restructure obligations, when debtors cannot repay. In the old fashioned lending, when a borrower got into trouble, the bank had the information which allowed it to make a judgment of whether this was just a temporary difficulty. Long term relationships and an incentive on the part of the lender to establish a reputation as a good lender meant that, on both sides, there were incentives for dealing with such problems efficiently and fairly. Securitization attenuated these incentives. Lack of trust (for good reason, noted below) in the

¹⁷ See, for instance, Ferri, Liu, and Stiglitz (1999).

¹⁸ See Stiglitz (1992).

servicers, who would manage such renegotiation, induced restrictions on restructuring. The patterns of lending opened up large opportunities for conflicts of interest, and this increased the likelihood of litigation – always a problem in a litigious society. In many of the problematic areas, borrowers had a second mortgage. Restructuring put into conflict the interests of holders of first and second mortgages. If there had been a single mortgage, it might make sense to write down the principal for a mortgage that was underwater by, say, 25%. The transaction costs of a foreclosure would result in even greater losses. But in the case of foreclosure, if there was a second mortgage holder, he would be wiped out, and the holder of the first would get the entire proceeds. Of course, the first mortgage holder would benefit if there were a write-down, and the second holder took the entire hit, for the likelihood of a foreclosure would then be greatly reduced. Into this morass, one more complexity was added: the service providers who were responsible for the renegotiation were often owned by the holders of the second mortgage, so they had an incentive to try to force the first mortgage holder to bear a share of the write down. Difficulties in restructuring meant, of course, that a larger fraction of homes would go into foreclosure.¹⁹

It is not evident why the ultimate purchasers trusted the rating agencies and investment banks – they are less likely to do so in the future, which is why it may be difficult to restart this part of the securities market. The government has stepped into the breach, claiming that it is doing so temporarily. It may be there longer, unless investors forget the lessons quickly. (The trust in the investment banks may seem especially peculiar, given the problems exposed earlier in the decade, in the follow up to the Enron scandal.²⁰ The conversion of many of these institutions away from partnerships may have also played a role in their seemingly shortsighted behavior.)

Some of the failures relate to intellectual inconsistencies that are hard to forgive: they used data only for a limited period, a data set in which there was no bubble and therefore no probability of a national price decline. They used default data from an era in which the mortgage products were markedly different: they believed that they were innovating, changing the world, and yet they used data from the past, as if the world hadn't changed. But it had – and for the worse. Why would one assume that the default probability for a liar loan was remotely similar to that of a conforming loan? It is not clear whether they adjusted default probabilities for the increase in loan to value ratios, but clearly they hadn't done it enough. And what would have been reasonable assumptions for mortgages that were clearly beyond the ability of the borrower to repay?

The rating agencies were, of course, empowered by the regulators. There was a delegation of responsibility both by regulators and by fund managers to the rating agencies. Investors trusted the rating agencies. They all believed that there was a free lunch and that one could obtain higher returns without more risk by the magic of financial engineering. What is marvelous about all of this is again the level of intellectual incoherence: how could one reconcile the beliefs that (i) prior to, say, 2000, markets were efficient (after all, the efficient markets hypothesis was not intended just to apply to the post-2000 world); but that (ii) they were engaged in financial engineering which so increased the efficiency of the market that they could extract huge amounts in bonuses and financial sector profits – so much so that the sector's profits constituted 40% of all corporate profits in 2007.

Part of the problem was the clear failure of risk analysis throughout the system. Bonuses were based on "performance," but performance was based on returns – not adjusted for risk.

¹⁹ There were other incentives not to restructure, such as accounting rules. Some of the ways that the bailouts were conducted also may have created incentives not to restructure. The Administration's own program did not provide any incentives for writing down principal, a major flaw in my judgment.

²⁰ See Stiglitz (2003).

Rewards were based on increasing beta, not alpha. Banks and their officers didn't understand the Modigliani-Miller theorem. They thought that increasing leverage meant that money was used more efficiently. Had these lawyers who were running many of the investment banks taken a basic course in economics, they would have been taught otherwise. They would have learned that though information economics and tax arbitrage circumscribed the domain of validity of the Modigliani-Miller theorem, it provided a deep insight into the limited gains from leverage and that bankruptcy costs (which Modigliani and Miller had ignored) provided a further important limitation.²¹

The irony was that in the attempt to use financial money more efficiently, real resources – what really matters – wound up being used less efficiently.

Explaining the failures of the financial sector

Explaining the failures of the financial sector entails the same ambiguity: to what extent should we blame faulty incentives, and to what extent is it incompetence (flawed models)? To be sure, the two reinforced each other. They had an incentive to use flawed models and not to see the flaws in the models they used, just as they had an incentive to engage in non-transparent complexity and predatory lending and to move risks off balance sheet. This increased fees, profits, and bonuses. Competition on standardized products might have driven profits to zero.

Clearly, the incentive structures within the financial sector were designed to encourage shortsightedness and excessive risk taking. As in other sectors, stock options encouraged creative (off balance) sheet accounting, but the incentives for circumventing financial regulation might have sufficed. What was distinctive about the financial sector in the era of modern financial engineering is that these perverse incentives could generate products with low probabilities of large losses accompanied by slightly higher than normal returns otherwise – so that one couldn't really ascertain whether the average return was sufficient to compensate for the risk until years later. In short, there was enormous scope for fooling themselves as well as others – including regulators.

The implications for regulatory design are potentially profound. It means that the regulators, like the market, have difficulty really ascertaining “fair market value.” Of course, what they should be focusing on are extreme outcomes – the possibilities of the bank not being able to make its commitments. (This, by the way, is one of the reasons that standard accounting procedures, focusing on the market value of liabilities as well as assets, are not appropriate for regulatory purposes. The fact that the market value of the liabilities goes down because of an increased probability of default should not provide comfort to the regulator that the bank is in a better position, though it might mean that the market value of the equity in the corporation increases. Indeed, a strategy that increases the losses in bad states and simultaneously increases the gains in good states – so that the expected value remains the same – would, from this perspective, look like a good move, as it is for shareholders; bankruptcy introduces “convexity” into the payoff function, implying that increased risk is a good thing for shareholders; but for the regulator, worried about the public fisc and the likelihood of a large pay-out for deposit insurance, such a strategy is distinctly a bad thing. Mark-to-market accounting of liabilities makes no sense, from the perspective of the regulator.)

²¹ See Stiglitz (1969).

It suggests that bank regulators should look askance at complex products. There should be no place for them in depository institutions backed by the government, implicitly or explicitly, whether they are part of the banking system or the shadow banking system. This does not necessarily mean that government should forbid such products. Transactions between consenting adults should be allowed, so long as they do not put others at risk. The point is that these risks should be put elsewhere in the system. The current arrangements, with for instance CDS's concentrated in the big banks, puts the tax payer at risk. More generally, any system which allows these products to be issued by institutions which are, effectively, underwritten by the government (because they are too big to fail or too intertwined to fail) is, in effect, subsidizing such institutions, distorting the economy, and creating an unlevel playing field. It leads to a destabilizing dynamic: the big institutions grow, not because they are more efficient but because they are implicitly subsidized.

The behavior of market participants is affected by a wide range of laws and regulations and how these are enforced. I have just described how the failure to enforce strong competition laws created distorted incentives, leading to excessive risk taking. Some believe that the passage in 2005 of the "Bankruptcy Abuse Prevention and Consumer Protection Act" contributed to reckless lending. Tax laws too provide incentives for excess leverage.

Explaining distorted incentives in the financial sector

Economists naturally prefer to emphasize the role of flawed incentives in explaining aberrant behavior. Too big to fail institutions obviously have distorted incentives – if they take risks and win, they reap the rewards; if they fail, the taxpayer picks up the tab. The Bush and Obama Administrations have introduced a new concept institutions that are too big to be resolved, so bondholders and shareholders are at least partially protected. I believe it is a spurious notion. The big banks had an incentive to stir fears that not bailing out bondholders and shareholders would generate such turmoil that there would be chaos and all would suffer. They succeeded. (It is, of course, impossible to ascertain whether those who actually argued this position truly believed it or were simply using it as an argument to extract the money they needed.)

In stirring such fears, the alleged consequences of Lehman Brothers' collapse are often cited. But blaming the mishandling of Lehman Brothers' bankruptcy for the subsequent freeze in credit markets is not persuasive. The real source of the problem was that the banks didn't know their own balance sheets and so knew that they couldn't know the balance sheets of other banks to whom they might lend. If Lehman had a role, it was that it increased the ambiguity about the nature of the government guarantee, ie the market had only been working because market participants had assumed there was a government guarantee; when that assumption was questioned, markets froze.

The events following Lehman Brothers' collapse and the subsequent problems with AIG did convey information, and that information too was unsettling. The information was that banks were in a more precarious shape than many had realized, that the financial institutions were more intertwined, and that they had made more errors in risk analysis (eg about counterparty risk) than many had thought. The problems with AIG brought home the importance of counterparty risk, and the intellectual incoherence of the banks – who had failed to net out positions. When asked why, they said it was because they could not imagine the failure of the counterparty, even though they were trading CDS's on the failure of these very same counterparties. When the government rushed to ask for \$700 billion in assistance, it too may

have conveyed a sense of an impending disaster.²² But the problems were deep and pervasive, as subsequent bailouts evidenced. The continuing fall in real estate prices and increase in foreclosures likely were little affected, and that meant so too were the mounting losses in the banks. There was a real basis for the lack of confidence.

Incentive structures inside the banks encouraged shortsighted behavior and excessive risk taking. In the end, it was clear that these incentive structures did not serve either shareholders or bondholders well, let alone the interests of the broader economy. But they may have served well the interests of those running the financial institutions. They were designed to allow them to keep large rewards, even if subsequently their investment decisions (for which they were supposedly being rewarded) proved disastrous. We need to ask why these reward structures became prevalent. Deficiencies in corporate governance are at least part of the answer. Sarbanes-Oxley was supposed to address these concerns, but it left open the problems posed by stock options and the incentives that they provide for deceptive accounting. While the problems posed arise in other industries, they are particularly serious in finance, where the opportunities for using financial engineering could be combined with creative accounting.

One might have hoped that investors would provide a check, reducing the market value of firms that had “distorted” incentive structures – just as one might have hoped that the purchasers of the mortgage-backed securities would have provided a check on bad mortgage originating practices. But in both cases they failed. This is partly attributable to the shortsighted behavior of many investors and their failure to understand risk. But if the experts on risk analysis in banks could not understand and analyze risk, what should we expect of the ordinary investor? Indeed, quite the contrary, one would expect that sophisticated risk managers would exploit the lack of understanding of risk by investors. They would know that investors might not appreciate that higher returns generated by higher leverage were associated with higher risk. (That is why they could get away with incentive structures that rewarded them not just for more “alpha” but also for more “beta”). Worse, if market participants did not fully understand risk, they might “punish” firms that did not engage in high leverage, because in the short term their performance would be poorer. Even if a CEO realized that increased leverage exposed the firm to a level of risk that he thought was excessive, his responsibility to maximize share value might induce him to take on high leverage. “Responsible” firms might not survive long enough to demonstrate the virtues of their alternative investment strategy.

These problems reflect the fact that in modern economies, there are a host of “agency” problems – people take actions on behalf of others, but the interests are seldom perfectly aligned. The separation of ownership and control was recognized long ago by Berle and Means (1932), but today, not only are there “agency” problems within corporations, but also with those who invest in the corporations (eg pension funds). When combined with the problems of pervasive externalities in financial markets, it means that private rewards are often not well aligned with social returns. This discrepancy gives rise to the need for regulation.

Concluding comments

We could continue the task of trying to drill deeper into the causes of the crisis. We could and should ask why we did not have the regulations and regulatory structures that would have protected against these problems, why the regulators didn’t use all the powers that they had,

²² See Cochrane and Zingales (2009).

why, within the diverse set of ideas within modern economics, certain ideas became fashionable, at least with policymakers, and others did not.

Seventy five years after the Great Depression, debates continue about the causes of that event and why it took so long for the economy to recover. This will surely be the case for the Great Recession. There is never a single “cause” of an event of such complexity. Fortunately for purposes of analysis, but unfortunately for the world, financial and economic crises have occurred frequently (except in the short period after World War II when we had effective regulations and regulatory institutions), and this wealth of experience allows us to supplement analytic thought experiments, contemplating what might have happened if only this or that policy had been pursued.

While I have placed the onus of responsibility for the failures on the financial system, to a large extent they were doing what actors in a market system are supposed to do: pursue their own self-interest. The major lesson of this crisis is that the pursuit of self-interest, particularly within the financial sector, may not lead to societal well-being, unless we set the rules of the games correctly. Fixing these “rules of the game” is the big task ahead.

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Lessons learned from the financial crisis

William C Dudley¹

In assessing the lessons of the past two years, I will focus on five broad themes that are interrelated:

- Interconnectedness of the financial system
- System dynamics – How does the system respond to shocks?
- Incentives – Can we improve outcomes by changing incentives?
- Transparency
- How should central banks respond to asset bubbles?

As always, my views are my own and may not necessarily reflect those of the FOMC or the Federal Reserve System.

1. Interconnectedness

This financial crisis has exposed how important the interconnections are among the banking system, capital markets, and payment and settlement systems. Focus on only one part of the financial system can obscure vulnerabilities that may prove very important. For example, the disruption of the securitization markets caused by the poor performance of highly-rated debt securities, led to significant problems for major financial institutions. Banks had to take assets back on their books; backstop lines of credit were triggered; and banks could no longer securitize loans, increasing the pressure on their balance sheets. This reduced credit availability, which increased the downward pressure on economic activity, which caused asset values to decline further, increasing the degree of stress in the financial system.

The high degree of interconnectedness across the financial system has a number of implications. First, supervision must not just be vertical – firm by firm, or region by region, but also horizontal – looking broadly across banks, securities firms, markets and geographies.

Second, this means that supervisory practices need to be revamped. They need to be coordinated and multi-disciplinary. I think the U.S. Treasury is right in proposing a systemic risk regulator as part of their regulatory reform plan. But, we shouldn't kid ourselves about how difficult this will be to execute. You will need a flexible and dynamic governance process to be able to identify the important elements of systemic risk, to elevate those concerns to the appropriate level and then to act on those concerns in a timely manner. It will take the right people, with the right skill sets, operating in a system with the right culture and legal framework. I don't believe creating this oversight process will be an easy task. Consider, for example, subprime lending. There were obvious excesses in terms of underwriting standards, product design and risk management. But addressing those issues during the boom would have required the supervisor to absorb attacks that reining in some of these practices would make it more difficult for some low- and moderate-income households to become homeowners for the first time.

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2. System dynamics

In thinking about interconnectedness, we also need to focus on system dynamics. By system dynamics, I mean how the different parts of the system interact. Do they interact in a way that dampens a shock or in a way that intensifies it? To the extent that the system has important reinforcing rather than dampening mechanisms, then it may need to be modified. That may require significant re-engineering.

Let me give you some examples of reinforcing and dampening mechanisms:

Capital. When firms have incentives to continue to pay dividends to show they are strong that is a reinforcing or amplifying mechanism. The paying of the dividends depletes capital, making the firms weaker. In contrast, when firms have incentives (or are forced) to cut dividends quickly to conserve capital, that is a dampening mechanism.

Foreign exchange. When the debts of a country held by foreigners are denominated predominantly in the home currency, currency depreciation reduces the net debt burden – the value of foreign assets climbs relative to the asset claims of foreigners. The US operates in a dampening regime in this respect. In contrast, when the debts of the home country are denominated in foreign currency, currency depreciation increases the net debt burden. Some of the Baltic countries are wrestling with this dilemma currently.

Some reinforcing mechanisms that we might want to engineer out of the financial system:

- Collateral tied to credit ratings. Credit downgrades lead to increased collateral calls which drains liquidity, leads to forced asset sales, further weakening the firm subject to the collateral calls. I don't have any great ideas on how to address this, but it is a problem that needs to be fixed.
- Collateral and haircuts. When volatility rises and that leads to increased haircuts, the result can be a vicious cycle of forced asset sales, higher volatility and still higher haircuts.
- Compensation tied to short-term revenue generation, rather than long-term profitability over the cycle. This causes risk-takers to take on too much risk because they are compensated on the upside. This extends the boom.

3. Incentives

Incentives may be very important in determining whether we have a system that is dampening rather than amplifying. I think bad outcomes are not just about bad luck, they are also about bad incentives. The problem with incentives may be due to faulty compensation schemes, poor risk management or the fact that participants do not bear the full costs of their actions.

One problem that we had in the U.S. banking system over the past year was a reluctance of banks to raise sufficient capital to be able to withstand bad states of nature. They didn't want to do this because this might unnecessarily dilute their shareholders. As a result, many banks did not hold sufficient capital and market participants knew this. This led to tighter financial and credit conditions, which made the bad state of the world more likely. This is an example of both bad incentives and an amplifying mechanism.

The Supervisory Capital Assessment Program (SCAP) exercise that we undertook in the United States leaned against this. By forcing all the banks to have sufficient capital to withstand a stress environment, we increased the likelihood that all the big banks would be able to survive a stress environment. This generated an improvement in confidence and a willingness of banks to engage with each other. This also made it easier for banks to be able

to tap the capital markets. The SCAP exercise made a bad state of the world outcome less likely, helping to create a virtuous circle rather than a vicious one. The SCAP exercise was conducted on an ad hoc basis. It probably would be much better to figure out how to do these types of exercises on a systematic basis. Such exercises may need to be hardwired into the oversight of the financial system.

Capital requirements are one area where I think we could adjust the rules in a way to improve incentives. For example, imagine that we mandated that banks had to hold more capital, but that the added capital could be in the form of a debt instrument that only converted into equity if the share price fell dramatically. What would this do? It would change management's incentives. Not only would management focus on generating higher stock prices, but they would also worry about risks that could cause share prices to fall sharply, resulting in dilution of their share holdings.

Debt convertible into equity on the downside would also be helpful in that it would be a dampening mechanism – equity capital would be automatically replenished, but only when this was needed.

4. Transparency

There were many areas where a lack of transparency contributed to a loss of confidence, which intensified the crisis. One particular area was the case of over-the-counter securities such as ABS, CMBS, RMBS and CDOs and their associated derivatives.

There was a lack of transparency in a number of different dimensions.

- A. Valuation. CDOs and other securitized obligations were complex and difficult to value. This reduced liquidity, pushed down prices and created increased uncertainty about the solvency of institutions holding these assets.
- B. Prices. The lack of pricing information led to a loss of confidence about accounting marks. Sometimes identical securities were valued differently at different financial institutions.
- C. Concentration of risk. Because there was no detailed reporting of exposures, market participants did not know much about the concentration of risk. This led to a reluctance to engage with counterparties, which, in turn, pushed up spreads and reduced liquidity further. The SCAP exercise was an example where increased transparency helped to generate a better outcome. We disclosed our stress test methodology and the results for each of the nineteen largest bank holding companies. This transparency increased confidence and made it easier for the banks to raise more capital.

5. Monetary policy and asset bubbles

In my opinion, this crisis should lead to a critical reevaluation of the view that central banks cannot identify or prevent asset bubbles, they can only clean up after asset bubbles burst.

As I wrote in 2006, this orthodoxy can be summarized by three propositions:

- 1. Asset bubbles are hard to identify.
- 2. Monetary policy is not well-suited to respond to bubbles.
- 3. Thus, the cost/benefit tradeoff of “leaning against the wind” against asset bubbles is unfavorable.

From these propositions, the two important policy implications directly follow:

1. The central bank should only take asset bubbles into consideration in the conduct of monetary policy to the extent that these asset bubbles affect the growth/inflation outlook.
2. The monetary authorities should be there to “clean-up” after bubbles burst, both to prevent systemic problems and undesired downward pressure on economic activity and/or inflation.

Relative to this, I would argue that:

1. Asset bubbles may not be that hard to identify – especially large ones. For example, the housing bubble in the United States had been identified by many by 2005, and the compressed nature of risk spreads and the increased leverage in the financial system was very well known going into 2007.
2. If one means by monetary policy the instrument of short-term interest rates, then I agree that monetary policy is not well-suited to deal with asset bubbles. But this suggests that it might be better for central bankers to examine the efficacy of other instruments in their toolbox, rather than simply ignoring the development of asset bubbles.
3. If existing tools are judged inadequate, then central banks should work on developing additional policy instruments.

Let's take the housing bubble as an example. Housing prices rose far faster than income. As a result, underwriting standards deteriorated. If regulators had forced mortgage originators to tighten up their standards or had forced the originators and securities issuers to keep “skin in the game”, I think the housing bubble might not have been so big.

I think that this crisis has demonstrated that the cost of waiting to clean up asset bubbles after they burst can be very high. That suggests we should explore how to respond earlier.

Harkening back to my earlier themes, I think we can respond in a number of ways:

- First, we can do a better job understanding interconnectedness. This means changing how we oversee and supervise financial intermediaries.
- Second, we can change the system so that it is more self-dampening.
- Third, we can improve incentives.
- Fourth, we can increase transparency.
- Fifth, we can develop additional policy instruments. For example, we might give a systemic risk regulator the authority to establish overall leverage limits or collateral and collateral haircut requirements across the system. This would give the financial authorities the ability to limit leverage and more directly influence risk premia and this might prove useful in limiting the size of future asset bubbles.

Some thoughts on incentives at micro and macro level for crisis prevention

Masaaki Shirakawa¹

Introduction

The current financial and economic crisis has posed wide-ranging challenges to policymakers and academics. Already, various proposals have been made for the reform of financial supervision and regulation. The traditional approach in this area is based on a microprudential perspective. From that perspective, financial system stability will be achieved by assembling sound financial institutions with adequate capital and liquidity positions as well as proper risk management.

That approach certainly plays an important role, but I am still uncertain whether the cumulative efforts in that approach will eventually ensure the financial system is shielded from a future crisis. In fact, the financial regulatory and supervisory framework has been reformulated from the microprudential viewpoint every time a financial crisis occurred.

In that respect, I will raise two questions. The first question is: "Has legally effective netting contributed to reducing the overall degree of risk in the financial system?" It is true that netting is effective in reducing counterparty risk. However, once the risk is reduced to a certain degree, a financial institution tends to take further risk. As a result, it is still not certain whether netting contributes to reducing aggregate risk.

The second question is: "Will a financial institution adopt a different business strategy, of not expanding its leverage, when again facing benign economic conditions, consisting of low inflation, high growth, and low interest rates?" Some financial institutions will surely adopt a conservative strategy, considering the lessons from the current crisis. But most will find it hard to resist pressures from equity holders to raise the returns on equity under severe competition.

Those examples seem to show the need for analyzing the incentives of financial institutions from the viewpoint of the macro as well as the micro level. Incentives for a financial institution are underpinned not only by the framework for financial regulation and supervision at a micro level but also importantly by the financial and economic environment at a macro level. At a micro level, "too big to fail" is the single most important issue. At a macro level, monetary policy is important. Today, I will mainly focus on monetary policy responses to a bubble. Then, I will briefly touch upon some issues concerning supervision and regulation.

Importance of the risk-taking channel

Before the current global financial crisis, the majority view about monetary policy responses to a bubble could be summarized in two points. First, before the bursting of a bubble, monetary policy should respond to asset price movements, whether driven by fundamentals or not, only to the degree that those movements have implications for future inflation and economic growth. Monetary policy should not go beyond that or should not venture into

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“extra operations,” by which I mean a policy decision to intentionally deviate from a monetary policy rule, like the Taylor rule. Second, in contrast to the bubble period, central banks should be proactive after the bursting of a bubble. Monetary policy should carry out “mop-up operations” aggressively responding to the adverse effects stemming from the bursting of a bubble. This line of argument is generally premised on the assumption that a bubble is very difficult to identify in real time, and that preemptive action by monetary policy alone is likely to require a large hike in interest rates, thus exerting a devastating adverse impact on economic activity.

In discussing monetary policy responses to a bubble, it matters a great deal how the transmission mechanism of monetary policy is understood. Recent monetary policy analysis, based on New Keynesian macroeconomics, explores optimal monetary policy to stabilize inflation and output. The declines in volatility of inflation and economic growth themselves certainly improve economic welfare, but the dynamics of the economy do not stop there. Once macroeconomic stability is achieved, another transmission channel outside the standard New Keynesian macroeconomics becomes crucial. This is often referred to as the “risk-taking channel” of monetary policy.

More precisely, risk perception and risk tolerance of economic agents change gradually but steadily under benign economic and financial conditions, thereby affecting their risk-taking behavior. This induces an expansion of credit and leverage at financial institutions, and results in the accumulation of financial imbalances behind the scenes. Such imbalances abruptly manifest themselves by some shock when they exceed the critical point. As a result, the financial system becomes unstable, and economic activity deteriorates significantly.

We see various forms of risk-taking channel. First, it appears as maturity mismatches. When interest rates are reduced, financial institutions expand maturity mismatches by short-term funding and long-term lending. This eases liquidity constraints in the non-financial private sector, thereby stimulating economic activity. Financial institutions also create maturity mismatches off-balance sheet, for example by investing in structured credit products through structured investment vehicles (SIVs). In addition, financial institutions generate maturity mismatches beyond national borders, as witnessed in the surge in cross-border lending during the credit boom preceding the current crisis.

Second, the risk-taking channel appears as an increase in asset prices. The availability of funds directly influences asset prices, and, more importantly, it also influences asset prices in an indirect way by influencing the market liquidity of particular assets. As the availability of funds improves and more investors participate in the markets, market transactions become easier in both sale and purchase, thus expanding market liquidity at an accelerated pace. The increases in asset prices and the expansion in market liquidity enhance the risk tolerance capacity of investors, thereby pushing asset prices further upward. Economic activity is consequently stimulated.

In addition, the two forms of risk-taking channel just mentioned interact with each other. The expansion of maturity mismatches, generally associated with the expansion of leverage, stimulates asset prices, and higher asset prices, in turn, facilitate the expansion of maturity mismatches and leverage.

Considering the risk-taking channel, it is crucially important to realize two points in formulating monetary policy. First, banks play an important role as a mediator in transmitting the effects of monetary policy. In this context, the behavior of banks influences the economy significantly, regardless of the share of the banking sector in financial intermediation. During a period of interest rate reduction, for example, expansions in maturity mismatches and increases in asset prices are observed on a bank’s balance sheet. When the cycle is moving upward under benign economic and financial conditions, the amplification process between maturity mismatches and asset prices takes place very gradually but steadily, and, in any case, the risks in the financial system are unlikely to manifest themselves. Once the cycle is reversed, however, the situation deteriorates suddenly. Maturity mismatches exaggerate the

shortage in funding liquidity. In addition, the sharp declines in asset prices result in losses, possibly inducing a shortage in capital, and a deterioration in market liquidity, thereby provoking a further shortage in funding liquidity due to margin calls and lowered collateral values. Those developments eventually hit banks' balance sheets.

Second, there exists an asymmetry between the upward and downward phases. While the upward phase proceeds gradually, the downward phase proceeds in an asymmetrically quick manner, since banks are forced to take immediate action to counter the shortage in funding liquidity. In addition, once confidence is lost, it takes a long time to restore. As market participants explain, the credit line can be cut off at once, but its reestablishment takes a much longer time.

Issues related to monetary policy

Mop-up operations

Given the understanding on the risk-taking channel I have discussed so far, what consequences will follow from asymmetric monetary policy responses before and after the bursting of a bubble? Suppose a central bank is considered to make a commitment to refrain from taking any monetary policy responses until the bubble bursts, the private agents will surely take action based on such unfounded expectations. That will accelerate maturity mismatches and asset price increases, thus further inflating the bubble and the adverse consequences of its bursting.

One of the basic messages from standard New Keynesian macroeconomics is that "the policy commitment is effective in stabilizing the economy, given the forward-looking behavior in the private sector." Standard New Keynesian macroeconomics does not incorporate the risk-taking channel, but its basic message suggests the importance of symmetric monetary policy responses to a bubble.

Extra operations

Then, what about extra operations against a bubble? I agree with the principle that monetary policy should respond to asset price movements, whether driven by fundamentals or not, only to the degree that those movements have implications for future inflation and economic growth. I should also say that the real issue here is how to understand the expression "only to the degree that asset price movements have implications for future inflation and economic growth" means in terms of implementing monetary policy.

The transmission dynamics of the risk-taking channel I have just mentioned differ significantly from those of the standard interest rate channel through housing investment and capital investment. The risk-taking channel produces asymmetric effects between the initial positive impact and the later negative impact. And, more importantly, it is also accompanied by considerable uncertainty about the timing of such negative impacts. Given this nature of the risk-taking channel, conventional macroeconomic models in a central bank's toolkit do not sufficiently incorporate the effects stemming from maturity mismatches and asset prices in the short term as well as in the longer term.

Policy challenges for central banks

In light of the previous discussion, I will raise some issues for discussion regarding the actions by central banks.

Monetary policy responses to a bubble

The first is monetary policy responses to a bubble. This issue is often debated simply as whether monetary policy should lean against the wind or excessive asset price increases. However, I believe that such a way of addressing the issue just confuses the discussion. No central banker believes that a bubble can or should be prevented by monetary policy alone.

A more proper way of addressing the issue would be “how should monetary policy be conducted in an environment in which all the symptoms of the economy except for inflation signal a need for policy tightening: asset prices are rising, credit and leverage are increasing, maturity mismatch is widening, and the economy is overheating, while only inflation remains low and stable?” My answer is that monetary policy responses are needed anyway, and it is just semantic whether to call them extra operations. I should hasten to add that the build-up of excesses, of course, cannot be contained by monetary policy alone, and needs to be addressed by a combination of policy measures. That leads me to the second issue, namely the role of policy measures other than monetary policy.

Two objectives and two instruments?

It is often argued that achieving the two objectives, price stability and financial system stability, requires two policy instruments. Active discussions are continuing regarding the need for developing prudential policy measures, including the countercyclical implementation of minimum capital adequacy requirements. I completely agree with the necessity of developing prudential policy measures. Having said that, I am wondering whether it is valid to employ the Tinbergen principle in this context.

The two objectives are not independent but closely connected with each other. It does appear that an intra-temporal trade-off exists between current price stability and current financial system stability. However, a real trade-off does exist in an inter-temporal direction between the current economic stability and the future economic stability. If that is the case, financial system stability and price stability are not independent objectives, but just differ in the time-horizon. I should say that central banks need one large toolkit to achieve one large policy objective, rather than needing two policy instruments for the two objectives.

Versatility of regulation

The third issue is regulatory and supervisory issues at a micro level. Among various issues for discussion, I will focus on the versatility of regulation to fit a variety of financial institutions. On the one hand, heterogeneity in financial institutions is quite important in enhancing the robustness of the financial system against shocks. On the other hand, one-size-fits-all treatments of heterogeneous financial institutions in designing prudential regulation, such as capital adequacy regulation and liquidity regulation, entail a risk of impairing the robustness of the financial system.

If regulatory capital is set at a level above economic capital, pressures on financial institutions from equity holders to earn sufficient profits become all the more intense. As financial history tells, too much as well as too little capital has caused problems. That is, excess capital is likely to induce a build-up of financial imbalances. If a risk measurement framework is inappropriate, and minimum capital requirements based on such a risk measurement framework are excessively high, that will produce perverse incentives for individual financial institutions, resulting in a trigger for macroeconomic instability.

Capital and liquidity positions for financial institutions depend crucially on their business model. The business model varies across countries, over time, and between institutions. The issue here is the ability of regulatory authorities to assess the business model. Given the differences in business models, redesigning capital adequacy regulations is an important challenge, along with the conduct of monetary policy.

Closing remarks

In closing, I ask myself what are the determinants of the amount of economy-wide risk-taking after all. There is no simple answer. Yet I believe both micro and macro approaches are needed for preventing a future crisis.

Remarks at the Eighth Annual BIS Conference

Nout Wellink¹

Introduction

We are facing a crisis of historic proportions. Numerous comparisons to earlier crisis episodes have been made, but it is safe to say that the global dimension and the negative spiral between the financial sector and the real economy are unprecedented. This raises many questions related to the causes and the policy cures. I will highlight some of them during my intervention, without pretending to have all the answers. First, I will discuss the resilience of the financial system. Next, I will raise some issues regarding macroprudential analysis. Third, I will touch upon the translation of analyses into policy actions and, finally, I will talk about several key policy initiatives, including those being pursued by the Basel Committee.

Where did we go wrong?

The financial system has proven to be less resilient than most of us assumed not too long ago. Until recently, it was common wisdom that the financial system had improved substantially over the past decades: financial services had become more accessible to broad categories of firms and households, the possibilities to spread and manage risks had increased, and the financial system was capable of absorbing shocks, including the burst of the dotcom bubble, the September 11 attacks and rising geopolitical tensions. In sum, it seemed that the financial system had become more efficient and stable, allowing more transactions at a higher speed. While I was a little sceptical about the birth of a new financial era at the time, I still believe that many of the improvements we saw are real. But somehow the system has turned out to be prone to large accidents, as the current crisis illustrates. This raises an important question: how was it possible for a system that seemed to have evolved for the better in so many ways to collapse, taking the real economy down with it? And, related to this, how could a problem in the relatively small US subprime market result in a global crisis?

We all know that a small snowball can create an avalanche of devastating proportions. But for this to happen, the snow on the slope of the hill has to be footloose at the outset. So the key question is: what characteristic of the financial system created the risk of such an avalanche? Part of the answer lies in the fact that financial markets have become increasingly interwoven. Currently, local financial markets hardly exist anymore. By implication, we have become less vulnerable to small shocks, but more to occasional large ones. We are now facing a global financial market in which the higher speed of transactions implies that not only gains, but also losses are transmitted fast and far, hardly hampered by time or distance. In addition to this interconnectedness, risks were vastly underpriced in the years before the crisis, creating avalanche-prone circumstances.

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The need for an improved toolkit

This experience has underscored that a financial system is more than the sum of its parts because of the interlinkages between financial institutions, contagion and reputation effects. By implication, we need a macroprudential approach, a framework that maps out how risks spread through the system, especially during episodes of systemic stress. Also, more attention should be paid to micro-macro linkages, which have become increasingly relevant in today's market-oriented financial system. Wrong incentives at the micro level have resulted in excessive risk-taking, such as the supply of subprime mortgages to households that cannot afford them. At the macro level, the size and distribution of such risks is blurred by complex financial instruments and risk transfer mechanisms.

One instrument to improve our insight into financial resilience is stress testing. These tests should play an increasingly important role in our overall assessment of financial stability. At my central bank, DNB, we have conducted macro stress tests on a regular basis in the context of its responsibility for prudential supervision and financial stability. An important question is how we should treat the results of these tests. We regard the tests as one of the instruments in our supervisory toolkit, and the outcomes are considered in conjunction with other supervisory assessments. Our main aim is to inform regular monitoring and to assess the financial sector's resilience to potential stress in the economy and the financial markets. A related question is whether the results of the stress tests should be published. I would argue that outcomes should generally be published on an aggregate level, for instance in financial stability reviews, as part of the overall financial stability assessment. In our specific case, we do not use uniform criteria to assess the stress test outcomes (e.g. capital targets), but apply a tailor-made approach instead. Therefore, we do not publish the individual firm stress test results. In my view these tools are an indispensable part of the overall macroprudential framework.

Translating analyses into policy actions

That being said about the need for further analyses, the bridge between risk identification and risk mitigation is still under construction, as somehow the warnings we did receive failed to make their way into policymaking. A key question is: how can we translate these analytical insights into better policymaking? This raises a host of complex issues.

In the first place, the development of early warning indicators and early warning exercises has risen to the top of the policy agenda. And rightfully so. However, in practice our early warning systems are generally late warning systems instead, only providing warnings when large imbalances have already been built up. In such circumstances it is difficult to find the right policy as most measures risk deepening the downturn. Related to this, how transparent can we be regarding imbalances and risks without creating a self-fulfilling prophecy? In other words, how do you communicate about risks without precipitating the crisis? We were confronted with these questions when the imbalances in Iceland became apparent. Warning about the instability of that country and its banks would undoubtedly have prompted a bank run.

Second, how can we ensure that policy adjustments are implemented on time? The IMF has extensive experience with policy recommendations that are not lived up to. How do we ensure that recommendations have more bite and that countries take more account of the cross-border effects of their policies?

And finally, how do we know whether we got the diagnosis right? This question is critical, as a biased diagnosis results in the prescription of the wrong medicine, which may worsen the illness, or even create a new one.

No regret policies

Notwithstanding the difficulties surrounding the identification of risks and the implementation of policy actions, there are remedies which I would call 'no regret policies'. These are policy measures that we are confident we should implement. Examples that speak for themselves are policies relating to more robust accounting and transparency standards, balanced remuneration schemes, more forward looking ratings, and more decisive crisis management instruments. The Basel Committee has also done extensive work on policy initiatives in this category. I will highlight two of them.

First, the crisis has reaffirmed that a strong capital base is critical to bank resilience and broader financial stability. We all agree that both the amount and the quality of regulatory capital should be increased. But not just yet. If we strive for higher capital requirements now, we risk accentuating the downturn. Thus, a key challenge is to build countercyclical buffers into capital frameworks and provisioning practices. This will help ensure that reserves are built up during periods of earnings growth, and that they can be drawn down during periods of stress. One approach to achieve this, which is being explored by the Basel Committee, is to complement strict minimum requirements that always hold with a long-term target capital level to be achieved in good times. Moving between the two levels introduces a countercyclical element. Such an adjustment mechanism can be readily designed in a way that is compatible with banks' own incentives, for instance by limiting dividends, share buy-backs and other distributions to shareowners as long as capital coverage is below the target level.

Second, of similar importance is a strong liquidity base. During this crisis, many banks have found themselves in a liquidity squeeze even though they had adequate capital levels. Therefore, liquidity needs to be managed in a more prudent manner. In this context, the Basel Committee has published *Principles of Sound Risk Management and Supervision*. Going forward, we should closely monitor the implementation of these principles. Benchmarks, tools and metrics to do this are currently under construction.

In conclusion

A last thought to conclude. It took us about 60 years to gain a true understanding of the causes and dynamics of the Great Depression. When it comes to this crisis, there is still a long way to go. Our insights into financial transmission mechanisms are partial at best. Although extreme times call for extreme measures, a crucial question is: how do we know whether our unconventional measures are the right ones? Unfortunately, the answer probably is that we do not know for certain. This means that we should be extra careful in implementing these measures. In practical terms: we should already be pondering our exit policies. In times of strain, policymaking is like tightrope walking. The Japanese crisis has taught us that delaying interventions can deepen a crisis. But we should not forget that excessive policies measures will likely do more harm than good, creating new vulnerabilities. In short, we need to strike a fine balance.

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