Whither Financial Regulation?

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Introduction

When I took Econ 100 and Econ 5100, no one talked about fear, or greed, or hubris, or irrational exuberance. The closest were a few closet Keynesians who reminded us of "animal spirits."

For now, the focus has rightly been on crisis management. In this paper, I look more at medium-term policy responses. My thesis is that policy-makers and authorities need to pay attention to the more fundamental causes of this crisis in formulating responses. I also propose that the policy response should focus on better shoring up the dike between the fully regulated and less regulated or unregulated sectors, rather than on vast extensions of the regulatory system. I prefer market mechanisms to strengthen checks and balances in the system and to better relate rewards to outcomes.

My teachers did emphasize that fiat money was about confidence. Fiat money underpinned the growth and development of economies. Maintaining confidence in money—and, by extension, the banking system—was clearly a "good thing."

Financial intermediation is vital to economic well-being. It involves uncertainty and risk and requires confidence in banks and in the authorities who regulate them. That confidence has taken a "hit" recently and needs to be restored.

Paul Volcker observed in a widely reported and influential speech in April 2008 (Volcker 2008) that the "bright new financial system . . . has failed the test of the market . . . ." Yes. But why?

> It's only when the tide goes out that you discover who's been swimming naked.—*attributed to Warren Buffett*

Well, the tide went out with a vengeance.

Many talked about the "fact" that events were unprecedented and could not have been taken into account. One commentator noted that "the trouble with early warning is that it is early, and it is only a warning." Others, including the Bank of Canada (Bank of Canada

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2004; Carney 2008), noted that they had been discussing the possibility of repricing risk for some time. The words "fat tails of the distribution" were seen and heard in newspapers and boardrooms! Others correctly pointed out that the situation was not a "black swan."

Some had long wondered how banks and other financial services firms could earn nominal returns on equity in the 20 per cent range year in and year out when inflation was between 2 and 3 per cent. We now know a lot more about the answer to that question.

In this paper, I summarize what occurred, survey a number of recent views related to financial regulation (domestic and international), provide some retrospective assessment of how we are doing in Canada and internationally (always dangerous for a former participant), and provide some policy prescriptions.

It will be very important for reforms to be calibrated correctly—not only to reduce the incidence and severity of future crises—but to continue to have as many of the benefits to economies from the innovation and access to credit and financial services that the past innovation and deregulation brought.

I will deal for the most part with prudential and stability regulation, although I have a few observations on crisis management.

Background

What the public saw

House prices had soared in a number of countries (Chart 1). The growth in asset-backed securities had been enormous (Chart 2), and derivatives had been expanding. (See Chart 3 for an example of collateralized debt obligations—CDOs.) Signs of stress began in the U.S. subprime residential mortgage sector in 2007, but then spread.

In the early part of 2008, U.S. authorities induced an assisted takeover of Bear Stearns and dealt with the failure of Countrywide Financial and IndyMac. Over a period of several weeks in September 2008, U.S. authorities (i) refused a similar plan for Lehman Brothers (the fifth largest investment bank), which filed for Chapter 11 protection at the holding-company level; (ii) exercised moral suasion in encouraging Merrill Lynch to be bought by Bank of America; (iii) injected funds into a major insurer—American International Group (AIG)—and took it over in a managed wind-down structured not to be a formal liquidation; (iv) put two government-sponsored enterprises (GSEs)—Fannie Mae and Freddie Mac—into conservatorship; (v) used the Exchange Stabilization Fund to underwrite a temporary guarantee of mutual fund investments; and (vi) provided Federal Deposit Insurance Corporation (FDIC) open-bank assistance to Citibank's acquisition of parts of Wachovia ("good bank/bad bank") on grounds of systemic exception, that had to be signed off all the way to the President under rules put in place some years previously. That letter of intent was superseded a day later by a higher-price sale of the entire bank to Wells Fargo without FDIC assistance.

The U.S. Secretary of the Treasury joked at press conferences about working weekends. He and the rest of the U.S. authorities seemed to be working most weekends. The Federal Reserve (the "Fed") fast-tracked applications by Goldman Sachs and Morgan Stanley to become bank holding companies regulated by the Fed (and provided liquidity directly to their foreign subsidiaries). This would reduce their leverage and make it easier to acquire retail deposits.

Chart 1

Housing bubbles in various countries

The Economist's house-price indices

% change:

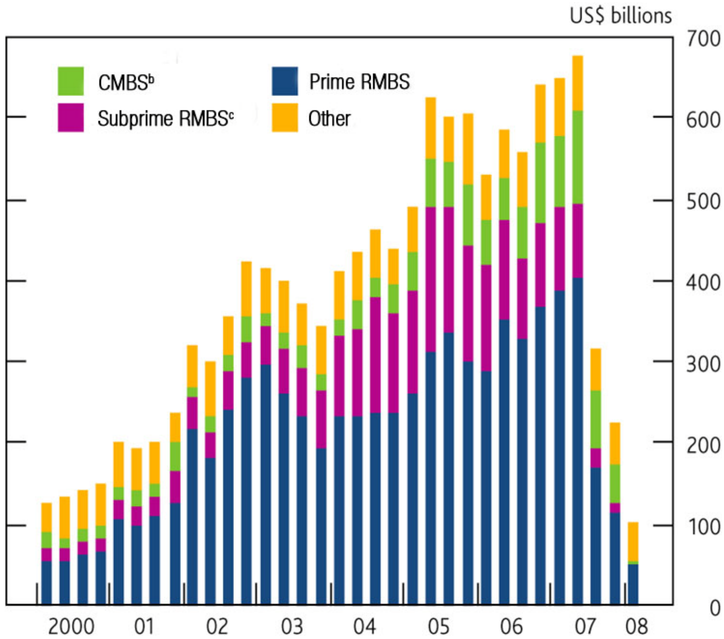
	on a year earlier		
	Q1 2005*	Q1 2004	1997–2005
South Africa	23.6	28.1	244
Hong Kong	19.0	17.4	-43
Spain	15.5	17.2	145
France	15.0	14.7	87
New Zealand	12.5	23.3	66
United States	12.5	8.4	73
Denmark	11.3	6.0	58
Sweden	10.0	7.7	84
China	9.8	7.7	na
Italy	9.7	10.8	69
Belgium	9.4	8.8	71
Ireland	6.5	13.2	192
Britain	5.5	16.9	154
Canada	5.2	5.7	47
Singapore	2.0	-1.5	na
Netherlands	1.9	5.5	76
Switzerland	1.0	3.4	12
Australia	0.4	17.9	114
Germany	-1.3†	-0.8‡	-0.2
Japan	-5.4	-6.4	-28

*Or latest †2004 average ‡2003 average

Sources: ABSA; Bulwien; ESRI; Japan Real Estate Institute; Nationwide; Nomisma; NVM; OFHEO; Quotable Value; Stadim; Swiss National Bank; government offices

Authorities in the United Kingdom dealt with HBOS (Halifax Bank of Scotland) and Bradford & Bingley, which was transferred in a good-bank/bad-bank transaction to Santander. This followed the widely publicized Northern Rock fiasco in September 2007, which ended with the bank's nationalization—the first since the 1840s. On the continent, Fortis Bank (nationalized by Belgium, Netherlands, and Luxembourg) became overstretched by its acquisition of ABN Amro. Fortis had received capital injection from each of the countries, but was subsequently taken over when those efforts failed to sustain confidence. French and Belgian authorities recapitalized Dexia. Germany arranged a rescue of Hypo Real Estate and then had to further assist it. Previously, well-publicized losses at UBS and Société Générale had exposed the limits of risk management (UBS 2008; Société Générale 2008). Icelandic banks came under severe pressure and were nationalized. Confusion and legal wrangling erupted about how depositors from various countries in Icelandic banks were affected. A number of countries hastily broadened deposit and/or creditor guarantees. Ireland announced a guarantee of all the deposits and almost all the debts of the six biggest banks, an action that threatened to attract funds from other European banks and cause problems elsewhere.

Chart 2
Global issuance of asset-backed securities[a]



a. Quarterly issuance. "Other" includes auto, credit card, and student loan asset-backed securities (ABS).

b. Commercial mortgage-backed securities (CMBS)

c. Residential mortgage-backed securities (RMBS)

Source: Dealogic

Authorities spoke of the systemic importance of these entities, their complexity, their links to other institutions, and worries that their outright failure would propagate risk. The real fear, I suspect, included undercutting already-fragile public and market confidence if the resolutions of these problems were not swift and decisive. In some cases, that led to paying out debt holders—something that the literature suggests creates serious moral hazard.

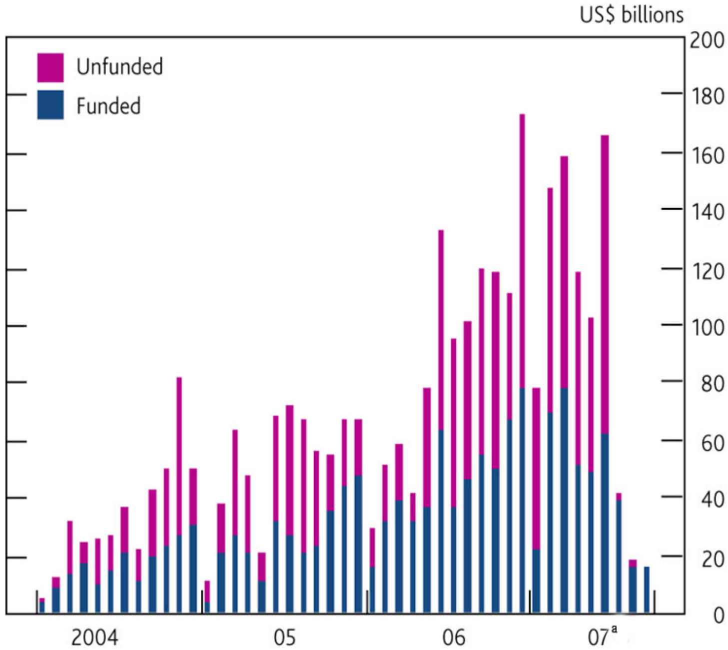
Major central banks have heavily used and expanded their lender-of-last-resort (LLR) facilities, including for collateral of less than high quality and to players not previously thought protected by the safety net. The sums involved appeared staggering. This also included entering into and using cross-border arrangements that built upon, but went well beyond, those put in place as preparation for earlier possible problems such as the Y2K scare.

In 2007, the asset-backed commercial paper (ABCP) market in Canada froze. Moral suasion by the authorities and private sector money were used to bring about a formal restructuring. Because of further market deterioration, the restructuring was finalized at the end of 2008 only after a partial, public sector backstop.

In many countries, various “off-balance-sheet vehicles” were brought back on balance sheet. Liquidity became a focus that it had not been for many years. There was little of it in key markets.

Chart 3

Global issuance of collateralized debt obligations



a. Unfunded data for September are not available.

Note: Funded CDOs refer to instruments backed by corporate bonds; unfunded CDOs refer to instruments backed by credit default swaps.

Source: JPMorgan Chase & Co.

Presidents and chancellors fretted about who had been first to suggest hedge fund regulation (and who had resisted), and presidential campaigns were being advised by former central bankers, who, in turn, were called on for solutions. In Canada, the crisis became an issue in the federal election.

Presidents and lawmakers were weighing in on accounting standards! Various bankers, insurance companies, and even senior politicians called for fair-value or mark-to-market (MTM) accounting to be suspended or replaced. Some believed that it had exacerbated the crisis by making it harder to determine a “fair” value. Others pointed out that suspension of the rules would lead to even more opacity and might further undercut confidence.

Meanwhile, market developments were truly amazing. Short-term funding seized up, and there were bouts of flights to quality, leading to short-term U.S. Treasury yields approaching zero. Bank confidence in counterparties eroded dramatically. The spread between interbank rates and risk-free rates—the TED spread, which is calculated as the difference between the 3-month Treasury bill interest rate and 3-month LIBOR—widened to levels rarely seen (Chart 4). It declined after the various large government interventions, but at the end of 2008 remained well above long-term normal levels and around historical highs at times of other crises. Costs of buying protection against default on various names soared (Chart 5). Markets maintained a virtual death watch on which institution was to come under pressure next. Participants talked of fear—and panic.

Chart 4

Impact on confidence in bank counterparties—TED spread

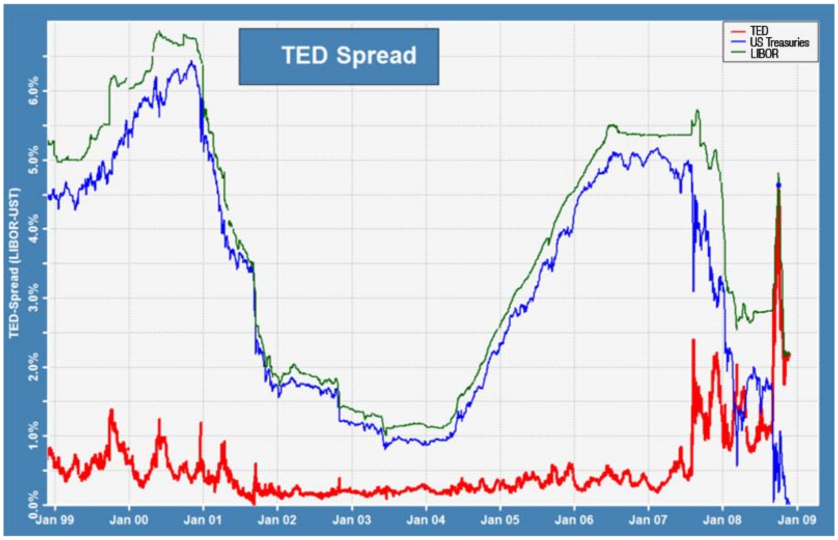
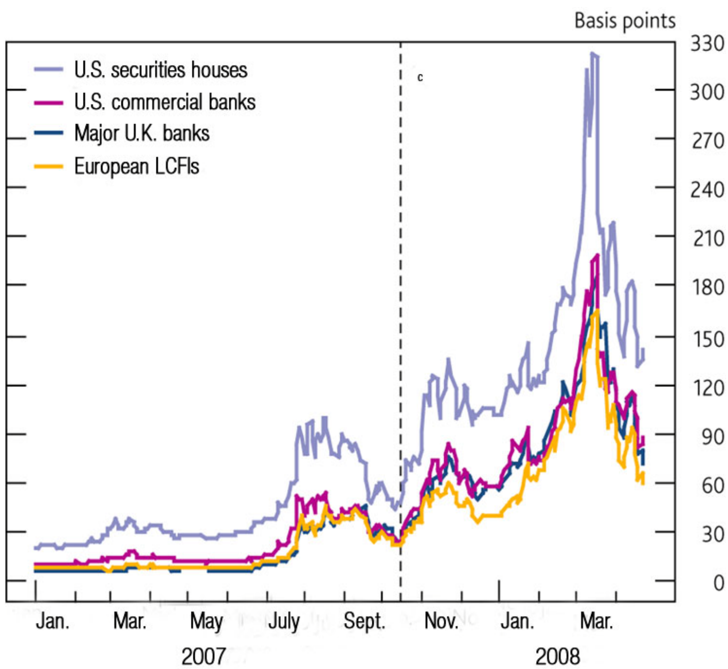


Chart 5

Major banks' and LCFIs' credit default swap premiums[a, b]



Note: LCFIs—large and complex financial institutions

a. Data to close of business on 22 April 2008

b. Asset-weighted average 5-year premiums

c. October 2007 Report

Sources: Markit Group Limited, Thomson Datastream, published accounts, and bank calculations

As additional piecemeal efforts to stem the credit contraction failed to make a dent in the problem, G-7 governments turned to more coordinated action based on several principles (see <http://www.treas.gov/press/releases/hp1195.htm>). They announced that they would:

(i) Use all available tools to support systemically important financial institutions and prevent their failure.

(ii) Take all necessary steps to unfreeze credit and money markets and ensure that banks and other financial institutions have broad access to liquidity and funding.

(iii) Ensure that our banks and other major financial intermediaries, as needed, can raise capital from public as well as private sources in sufficient amounts to re-establish confidence and permit them to continue lending to households and businesses.

(iv) Ensure that our respective national deposit insurance and guarantee programs are robust and consistent so that our retail depositors will continue to have confidence in the safety of their deposits.

(v) Take action, where appropriate, to restart the secondary markets for mortgages and other securitized assets. Accurate valuation and transparent disclosure of assets and consistent implementation of high-quality accounting standards are necessary.

The United Kingdom, followed by the United States and several European countries (but not Canada), injected public funds into major institutions. Some of the freeze in credit markets began to thaw.

There were other memorable moments. In July 2007, Charles ("Chuck") Prince III, then chief executive officer (CEO) of Citigroup, said to the *Financial Times*, "When the music stops, in terms of liquidity, things will be complicated. But as long as the music is playing, you've got to get up and dance. We're still dancing." He was no longer CEO by November of that year. In my view, the attitude behind this remark says a lot about incentives for market share and compensation. Other CEOs were fired or "retired" with hefty payouts.

Many pointed out that much of the crisis was not new if looked at in historical terms. However, there were some apparently new elements, such as structured products and the "originate-to-distribute" model. Some fretted that the Young Turks in suspenders and Gucci's had never seen a real downturn and had not taken that possibility into account in their trading. Senior regulators worried about lack of crisis experience in their own staff.

Of course, over the past decade, the public also saw much-reduced nominal returns on their investments. They definitely participated in a "search for yield" that sometimes took them, directly or indirectly, into complex products that later turned out to have risks they had not anticipated.

Why is all of this happening? What should be done to materially decrease the chances of some form of repeat occurrence? *Whither financial regulation?*

The international agenda

From the mid-1990s (and with the instigation of Canada at the 1995 G-7 summit in Halifax), world authorities believed they had strengthened global oversight and surveillance mechanisms. Core principles of banking, insurance, and securities supervision, and other standards and codes, were adopted more comprehensively. Leaders and their finance ministers called for the International Monetary Fund (IMF) to strengthen surveillance, including of major countries. The IMF, supported by the World Bank, introduced the Financial Sector Assistance Program (FSAP) and follow-ups. Financial sector focus was added to annual IMF Article IV consultations with member countries. The number of cross-border linkages between regulators and supervisors and central bankers rose materially.

International financial coordination

International coordination mechanisms were strengthened. In February 1999, the Financial Stability Forum (FSF) was created by G-7 ministers and governors. It brings together national authorities responsible for financial stability in significant international financial centres, namely, (i) treasuries, central banks, and supervisory agencies; (ii) sector-specific international groupings of regulators and supervisors engaged in developing standards and codes of good practice; (iii) international financial institutions charged with surveillance of domestic and international financial systems and monitoring and fostering implementation of standards; and (iv) committees of central bank experts concerned with market infrastructure and functioning.

The FSF's website—<http://www.fsforum.org/about/mandate.htm>—sets out the objectives. Its broad purpose is to "promote international financial stability, improve the functioning of financial markets and reduce the tendency for financial shocks to propagate from country to country, thus destabilizing the world economy."

The FSF's mandate is: "(i) to assess vulnerabilities affecting the international financial system; (ii) to identify and oversee action needed to address these; and (iii) to improve co-ordination and information exchange among the various authorities responsible for financial stability."

It was clear in the FSF mandate that it had no decision-making power—necessary changes are enacted by the relevant national and international financial authorities.

Many participants complained, however, about the proliferation of international meetings and, I suspect, secretly wondered about some of their utility.

Many, including the Bank of Canada, asked at these meetings where the risk had been transferred to. It might be hiding in the less-regulated parts of the system. It now appears that at least a good part of it was here all the time. Why didn't we undertake the analysis that would allow us to see that?

Do we have to conclude on prima facie evidence that these efforts to strengthen international rules and coordination were a failure? They were certainly not sufficient.

International regulatory developments

Basel II (BCBS 2006) was the biggest regulatory development affecting global banks. It was designed to replace the relatively blunt set of capital requirements of Basel I. Basel I was widely recognized as contributing to the moving of high-quality assets off balance sheet in various structures. This was because the market was implicitly assigning a much lower capital requirement than the regulators were if the assets were kept on balance sheet.

Basel II related *minimum* capital requirements more to risk, allowing major banks to use restricted variants of their own models to measure risk if they met stringent conditions. Basel II was expected to lower capital requirements for Tier 1 banks globally by 6 to 10 per cent (see <http://www.bis.org/bcbs/qis/qis5.htm>). Basel II, Pillar 2, also put forward an innovation in requiring banks to follow a much more structured process for relating their *actual* capital to their own risk tolerance, including more formalized requirements to consider a full range of risks and appropriate stress testing and impact of downturn conditions. That included a number of requirements, for example, regarding counter-party credit risk, that would have helped attenuate the impact of the crisis had they been fully implemented.

Basel II had just been implemented in a number of advanced economies at the beginning of 2008 (but not in the United States). So I believe that it is very hard to blame Basel II for the crisis. Indeed, delay in implementing Basel II in the United States made it harder to coordinate actions internationally that might have helped. I also believe that too much attention in Basel II implementation had been paid by banks and supervisors to the more mechanical calculation of minimum capital (Pillar 1) and too little to the more holistic and judgment-based Pillar 2.

Anecdotally, the implementation challenges of overlapping changes in major rules—Basel II, International Financial Reporting Standards, and Sarbanes-Oxley compliance—stretched resources in a number of banks and for their supervisors.

In some countries, such as those of the European Union (E.U.), regulation pertaining to insurance solvency had been modernized. That had already occurred in Canada in the early 1990s with comprehensive, risk-based capital regulation, formalized stress-testing requirements, and the risk- and reliance-based supervision framework. Comprehensive consolidated regulation and supervision of major insurers (including consolidated capital rules) were maintained after they demutualized. In Canada, the merger of the bank and insurance regulator in the Office of the Superintendent of Financial Institutions (OSFI) helped considerably. Some countries, including Canada, were starting to allow insurers to use models for capital calculation.

The United States was behind in this regard. For example, while the insurance companies in AIG were regulated by state insurers, there was no holding-company regulation until relatively recently. It was performed by the Office of Thrift Supervision (OTS), and the rules were considerably more circumscribed than would have applied to a bank holding company regulated by the Federal Reserve or an insurance conglomerate regulated by OSFI. The focus of OTS was on the extent to which the holding company could negatively affect the OTS-regulated thrift in the corporate group. Questions were also raised about the capacity of the OTS—this despite the fact that some of the main unregulated subsidiaries of the holding company were involved in financial products that came to be the source of the group's downfall (see Dinallo 2008).

As well, accounting standards in a number of countries moved to "fair value" for a wider range of financial instruments. There were fierce debates between setters of accounting standards and prudential regulators about the advisability of this. Some of the concerns of prudential regulators related to the issues that would arise in a crisis in valuing illiquid instruments and the worries about reliability, comparability, and transparency of mark-to-model valuation that was permissible under the rules (see BCBS 2002). At the same time, setters of accounting standards rightly pointed out that historical cost accounting was hardly perfect and that valuation of a lot of financial instruments was moving to markets in any event (see Turner 2008). If this was the way management increasingly managed the bank, then why shouldn't they account that way to shareholders?

Recent disputes about the appropriateness of fair value (or MTM) accounting often failed to note that a lot of assets involved in the crisis were held in the trading book, which had been on an MTM basis for many years. The move to extend fair value to a wider range of assets was in various stages of implementation, across countries, as the crisis hit.

Many fretted that the new accounting and capital rules were procyclical and that the financial sector had become an amplifier of shocks rather than a shock absorber. There was little hard evidence (and virtually none published) of how large this effect was likely to be. The Basel Committee adjusted its new rules to reduce this effect.

Domestic regulatory developments

Many countries, including Canada, had moved more to a risk-based regulation and supervision system with less emphasis on compliance monitoring. Several countries had introduced a formal requirement for supervisors to intervene early to get problems resolved. Over the previous decade and a half, many countries, including Canada, modernized banking regulation and insurance regulation and supervision. This often involved breaking down previous barriers between different types of financial institutions, merging and strengthening regulatory agencies, and adding to their powers and resources. The United States had broken down the barriers between commercial and investment banking and removed impediments to national banking. But it retained a "balkanized" regulatory structure with multiple regulators of banks, no consolidated regulation of investment banks, and insurance regulation at the state level. (See Davies and Green 2008 for a high-level summary.)

Countries such as Canada also reviewed their deposit-insurance regime and adopted various versions of prompt corrective-action accountabilities for supervisors to deal with the "will to act" problem. OSFI, the Bank of Canada, and the Department of Finance were major partners in this work. Certain mechanisms for crisis resolution were put in place to deal with problem financial institutions in various countries, although there was little harmonization of these.

Certain important problems for market stability related to bankruptcy were addressed (such as preserving netting and close-out of derivatives contracts), as was the establishment of a better legal foundation for the netting of offsetting contracts between counterparties, which can greatly reduce systemic risk. Other cross-border bankruptcy issues affecting banking and insurance were not fundamentally addressed—and the essential transatlantic differences in approach remained.[1]

1. North American bankruptcy law and practice are based more on ring-fencing domestic legal entities, while European law and practice are based more on pooling of all assets and liabilities in the worldwide group. North American practice also seems to have more experience with Chapter II/CCAA proceedings that involve temporary stays.

Over the past two decades, disclosure by financial institutions increased greatly, pushed by securities regulators and by market pressure. The bar for governance standards was raised significantly and material changes occurred in boardrooms.

Strides were made within Europe to move the single-market project forward as it affected financial services. Coordination of rule making increased considerably, as did supervisory coordination. Europe modernized capital rules for banks, investment banks, and insurers and ensured comprehensive consolidated supervision for all of the entities. Commentators noted that crisis management might be a challenge in Europe as cross-border arrangements for deposit insurance and LLR/ELA (emergency liquidity assistance) appeared untested in a crisis. They were the responsibility of national authorities, not of the European Central Bank (ECB).

Some very important "plumbing" matters were dealt with. Many jurisdictions, including Canada, acted to "risk-proof" systemic payment, clearing, and settlement systems so that they would withstand the failure of the largest participant without transmitting the shock to others in a way that would cause them to fail. (See Dingle 1998 for a description of this in Canada.)

Many regulatory developments in the past decade were not driven by concerns over systemic or macroprudential risk and possible crises, but by issues of competitiveness (see Dodge 2005). Canada had various bouts of considering the issue of whether to allow bank mergers or bank-insurance mergers. While focus on competitiveness seems misplaced now, it is important to the profitability and resiliency of a financial system. A key safeguard against the worst effects of crises is a profitable and diversified system. Having a loss that eats up one or two quarters or a year's earnings is a lot different than one that takes away a third of capital. Arguably, for example, the changes to break down barriers between pillars did lead to more diversified institutions, which was important in allowing several of them to withstand shocks to part of their business.

Overall, however, can we conclude that these efforts to improve regulation failed, or were insufficient? Or simply that things would have been much worse without them? Or is this largely a problem of inadequate rules and practices in one country—the United States—and for a few institutions elsewhere, that has been transmitted much more broadly because of the interconnectedness of institutions and markets, and crises management that did not get ahead of events soon enough?

Financial Regulation and Its Aims

Financial regulation has four components. How they are organized in a given country may vary. These components are embedded in a policy framework that is the responsibility of governments and legislatures and that can have a material impact on the prudential system and outcomes. This includes attitudes toward concentration, degree of regulation of product markets, access versus stability, tax and subsidy policies related to financial markets, and so on. The four components are as follows:

(i) A system of financial protection for depositors and/or other holders of liabilities in banks provided by or backed by the state. (Equivalent compensation arrangements for insurers and securities firms are usually not explicitly state supported.)

(ii) Prudential regulation and supervision, usually with an explicit mandate, rules, and tools designed to require holding of capital and supervise institutions to identify unacceptable risk-management practices, and to require necessary changes, with ultimate authority to close institutions. No one, except ex post in public inquiries or in the 10-second clip on the evening news, believes that prudential regulation can or should prevent all failures. There may or may not be explicit direction to prudential regulators to intervene early to deal with serious problems (which can have a big impact on perceived roles and behaviour). In the economic literature, prudential regulation is, of course, also seen as necessary because of the otherwise-too-great tendency for "bet the bank" behaviour by boards and managements in the face of depositor protection and other perceived or real safety nets.

(iii) A system of market regulation, including disclosure requirements and "know your client" rules. These often distinguish between sophisticated investors, where requirements are less, and others. These rules affect investor protection (the traditional mandate of securities commissions), but also how markets operate under stress. In some countries, they are bifurcated with similar products issued by different types of institution having different rules.

(iv) Implicit or explicit regulation of systemically important payment, clearing, and settlement systems, usually by the central bank, which may also be an operator of these systems.

The central bank's LLR facilities or ELA constitute an important part of the structure. In a number of countries, the central bank was created to perform this safety-net function, which is designed to provide funds to banks that are illiquid but still solvent.

Building blocks include accounting/auditing standards and contract and bankruptcy law. They affect how the system responds to various shocks. Tax laws and other subsidy policies can also have a huge effect—on both particular classes of assets or liabilities and on how banks operate and are funded and capitalized.

In a crisis, the ability of the various parts of the regulatory system to work effectively together matters a lot to success. The availability of tools and the will to use them effectively and in a timely way to resolve problem situations (including effective bankruptcy and/or conveyance tools) are also crucial to crisis management.

Cross-border aspects of regulation and crisis management are important. This is a real push-pull situation. Regulators need mutual reliance and co-operation to deal with global banking and insurance institutions. Lender of last resort is hard to operate only within your borders and with your currency, when you are dealing with banks from your country with material overseas operations in different time zones and different currencies. But national legislatures and the public will expect that the financial regulation system takes action to protect them and does not use "their money" to "bail out" others.

The different parts and functions of a regulatory system are highly interconnected. Changes to the fundamental elements of one part should not be made without considering the implications for the other parts. In addition, the response of the financial sector to regulation has to be assumed to be highly innovative. History is replete with regulatory arbitrage examples that added to risk.

There are also several trade-offs that any policy framework or regulatory structure needs to address. One is between innovation and stability. Another is between access to financial services and stability. Over the past twenty years, countries have chosen different points on that spectrum. One could argue, for example, that the United States had chosen policies that were more to the innovation/access end of the spectrum and less to the stability end than did Canada. No one choice is better than another. However, if one chooses policies that are more at the innovation/access end of the spectrum, then one has to expect more potential for problems related to stability and should invest more in preparedness and system resilience.

A key issue in any system of regulation and supervision is to define who is regulated and supervised. I will return to this later to examine the lessons learned about the choices that were made on how wide to cast the safety net and regulatory system in major countries, and whether this policy should be fundamentally changed.

What Does Theory Tell Us?

Finance is about confidence. The financial system turns short-term liabilities into longer-term assets. It intermediates between savers who wish to lend but cannot be expected to get information to efficiently assess the risk of those who borrow. Depositors, counterparties, and others are willing to deal with the system only if they trust the ability of institutions to meet their side of any bargain. Financial institutions are inherently leveraged and risky. There are classic agency problems and problems of asymmetric information.

Several theoretical frameworks can be applied in determining the causes of financial crises. They are not mutually exclusive. Trends in vogue of one theory or another affect policy choices and the actions of market participants. Currently, some are rightly questioning the emphasis that has been placed on the more rational approach.

Theories based on rationality

The first framework emphasizes that rationality drives financial markets. Exogenous events alter the perceptions of economic actors of future cash flows and risk tolerance and thus alter pricing and risk taking. With asymmetric information and opacity of financial instruments, market changes in response to exogenous events can be sudden and large. The impact of any given exogenous event depends on its size and on preconditions such as the existing capitalization of the system (see Bordo 2007; Bernanke 2008b; Calomaris 2008). It is not clear that this framework allows for major, persistent over- or underpricing of risk. Yet many market participants (and regulators) believe that such over- or underpricing does occur. Many believe that credit risk was seriously underpriced before the recent events.

Versions of this approach are inherent in the capital asset pricing model (CAPM), option pricing, risk-analysis models based on Black-Scholes, and so forth. These are the basis for the risk-measurement models of most banks and insurers and part of the Basel II system (but not all of that system). They are a key part of the tools used by ratings agencies to assign ratings and to advise market participants in the structuring of complex products.

In this "rational world," the distribution of outcomes is inherently knowable to a given approximation, and so can be priced, sliced and diced, and traded. If there are no traded markets, values can be estimated and accounted for on the basis of models.

While tails of the distribution of outcomes do exist, they are not normally "fat" and become so only because of exogenous events, as outlined above. This possibility can be handled in risk quantification and risk management, and by regulators, through adequate stress testing or scenario testing, or ad hoc model adjustments to supplement more "normal" risk-analysis models.

Unfortunately, too much of the focus in practice was on the "normal" risk-analysis models, not on adequate stress tests and scenarios built *into* (not artificially bolted *onto*) risk-measurement, management, and governance processes. In a number of institutions, those responsible for stress or scenario testing were seen as naysayers obstructing opportunities for profit making. It can be difficult to get those whose world view is based on rational expectations to take stress or scenario events seriously. The faith in the ability to deal with data deficiencies by approximation was misplaced for a number of markets. (See Senior Supervisors Group 2008; FSF 2008.)

Some commentators believed that compensation structures exacerbated this bias, a subject to which I will return.

Behavioural finance theories

Minsky (1986) and Kindleberger and Aliber (2005) developed a framework of booms and busts that is more behavioural. Behavioural finance theory has had a range of recent contributions; Celati (2004) presents a good summary of the issues. This theory has room for myopia, herd behaviour, and inconsistencies in preferences between various outcomes (e.g., fear of loss versus desire for gain). It harkens back to the Frank Knight (1921) distinction between risk (measurable and diversifiable and hedgeable) according to some reasonably accurate distribution of outcomes and "pure" uncertainty.

Over- and under-reaction are inherent *within* this system. But this system is not tidy theoretically. It has a lot of difficulty predicting *when* major corrections occur, for example. There were a number of "soothsayers" out there who had predicted the unwinding of the credit bubble, regularly, for many quarters (see Roubini 2008, for example).

Both frameworks emphasize that a breakdown of the price-discovery process, regardless of the trigger, exacerbated by lack of transparency, or lack of confidence of market participants in each other, is a major problem and is difficult to restart. Authorities have been grappling with this reality.

For all its lack of a certain rigour, I think that more belief in the behavioural framework would lead market participants, authorities, and regulators to focus more naturally on the factors that can create sustained under- or overpricing. Adherents of behavioural finance are not as surprised that booms and busts occur. They have less tendency to believe that, because these events are "fat tails" of what is usually a normal distribution, we couldn't have predicted them or managed for them. They are less likely to believe in analytic models without adding a *lot* of additional judgment.

Adherents of this behavioural view are also less likely to believe that serious crises can be avoided. They see them more as endemic. Consequently, they are more likely to focus on resiliency of the financial system. That means resiliency of financial institutions (such as their capital and provisions), resiliency of a financial system, and resiliency of crisis-management processes. Adherents tend to be more interested in determining which institutions might be systemic under various sets of conditions. What is systemic pertains—not only in terms of size but also of interconnectedness—to the presence in various markets, the extent of leverage, and operational interconnectedness.

Some have also pointed out that a kind of "fallacy of composition" may have been at work—systemic risk is not the sum of the risk of individual institutions. Behavioural finance thought tends to understand this inherently.

The behavioural literature has also spawned the concept of "black swans" (Taleb 2007). These are highly improbable, unpredictable events that carry a massive impact. After the fact, we may concoct explanations that make them appear less random and more predictable than they were. The credit crisis was not a pure black swan. Its occurrence was foreseen by many, even if its nature, timing, and severity were not. When I say that this event was not a black swan, I do not mean to downplay the shock that many market participants felt. By the same token, if we accept the view that the crisis was unforeseeable, we are not forced to grapple with lessons learned.

Other theoretical contributions

A number of partial frameworks point to specific microeconomic or macroeconomic determinants that contribute to the conditions that make financial crises potentially more likely or more severe. The most important of these are: (i) subsidies for risk taking that turn out to be excessive; (ii) agency problems; and (iii) macroeconomic imbalances that fail to adjust smoothly, owing to various rigidities.

In the case of recent events, the subsidies that matter were those for leverage in the housing market (tax policies in some countries, although not in Canada; GSEs in the United States; and subsidies for very-high-ratio mortgages in various countries and, briefly, in Canada). Again, the United States stands out as somewhat of an outlier in this respect. It has long had tax system deductions for mortgage interest, for example. These are, of course, policy decisions by legislatures, not regulatory issues.

Agency problems relate to asymmetric rewards for risk taking, with inadequate costs of the downside borne by the risk takers. I return to those below. A more recent suggestion cites agency problems in asset management that contributed to the underpricing of risk in complex instruments (Calomaris 2008). The point here is that many of the participants in the originate-to-distribute model (on the buy side, the sell side, and the ratings and structuring side) were operating with their remuneration based on the volume of transactions. That is not a recipe for adequate risk assessment and checks and balances.

Issues of macrofinancial imbalances have been well laid out (see Dodge 2006 and Dodge 2007c as examples). Of course, the big debate has been on the extent to which monetary policy and inflation targets were biased toward creating conditions that were conducive to asset bubbles. While I won't expand on that here, the issue matters a great deal to financial stability. No amount of specific bank regulation can stand against the wind if a financial system, an asset class, or a group of financial institutions is growing at a double-digit pace year after year, while the basic economy is growing much more slowly. I will, however, examine the related issue of whether aggregate macroprudential regulation could lean against that particular wind.

THE SOURCES OF THIS CRISIS—EARLY CONVENTIONAL WISDOM

Early diagnoses

So, what was going on? Clearly, there was exceedingly high growth in off-balance-sheet asset-backed securities and derivatives. Early diagnoses for market turmoil and the credit crunch blamed inadequate transparency in complex products and wrong incentives in the originate-to-distribute model of lending for a range of assets (most notably, mortgages). Credit risk had become tradable as never before and loan originators had little incentive to adequately assess risk as they were passing it on. Indeed, many of these structures had shared risk responsibilities among six or seven parties to the transaction, much different from the time when the originating bank retained all of the exposure.

Many of those seeking answers pointed to inadequate regulation of mortgage origination in the United States. This regulation had failed to rein in the abuses of both lenders and borrowers, which led to excessively bad underwriting of mortgage loans. Moreover, some of the lenders involved were not regulated as banks.

The trigger was seen as an exogenous realization that the losses in certain vintages of mortgages in the United States were likely to be materially larger than anticipated. (Charts 6 and 7 show delinquencies and vintages.) This occurred against a backdrop of tightening monetary conditions and greater uncertainty about growth prospects because of the commodity price boom, including the rise in the price of oil. Mortgage market bubbles in a number of other countries began to come under scrutiny.

Other events could also have been the trigger.

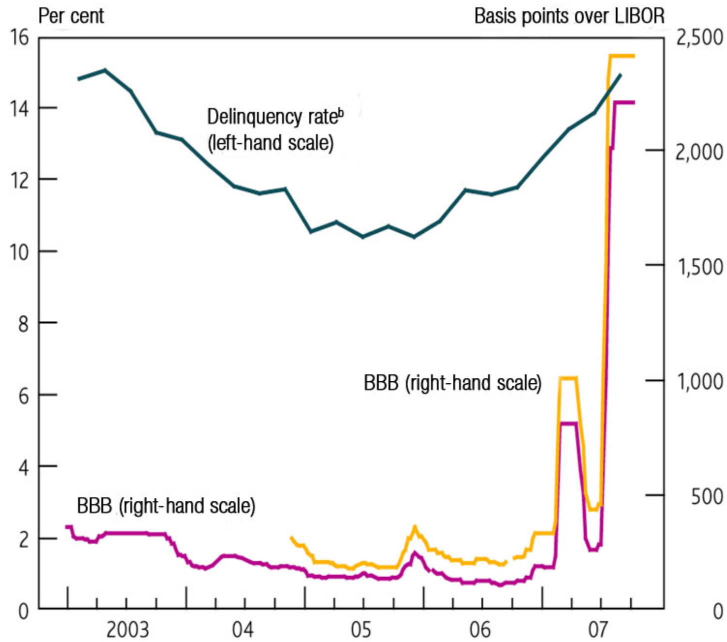
Inadequate risk management and risk governance, including the failure to recognize the importance of liquidity, and perhaps aided and abetted by skewed compensation, were cited as key ingredients. (See Dodge 2007, Carney 2008, and FSF 2008 for cogent examples of this type of analysis.) Some fretted about the exaggerating effects (or at least the opaque impact) of recent moves to fair-value accounting in a world of illiquidity and the procyclical effects of Basel II bank capital rules.

According to this view, once enough of the causes were triggered, events became self-reinforcing. It was very hard for the effects of the likely mortgage writedowns to be traced to those affected because of the opacity of the risk-transfer mechanisms and structured products. In some cases, investors would have had to understand multiple-layered "fund of funds" type holdings with thousands of underlying assets. Initially, anything with a "subprime" component was shunned; this then spread to anything with a mortgage component.

Confidence in structured products more broadly was undercut, and disorderly unwinding of positions and flights from risk and complexity to safety and simplicity occurred. There were unexpected risk concentrations such as in the monoline insurers of credit risk. In its report on credit risk transfer, the Joint Forum (2005)—formed under the aegis of the Basel Committee on Banking Supervision (BCBS), the International Organization of Securities Commissions (IOSCO), and the International Association of Insurance Supervisors (IAIS)—had identified this situation, and called on banks and supervisors to keep abreast of developments.

Chart 6

U.S. subprime mortgage delinquencies and home equity loan index spreads[a]



a. The home equity loan asset-backed security sector is an amalgam of subsectors related to different underlying mortgage products, including first lien subprime mortgage loans, closed-end second mortgage loans, so-called "high LTV (loan to value)" mortgage loans, and home equity lines of credit. This chart shows the higher-risk tranches of securities backed by such lending.

b. U.S. subprime residential mortgages 30+ days delinquency rate

Sources: Lehman Brothers, Mortgage Bankers Association, and Thomson Datastream

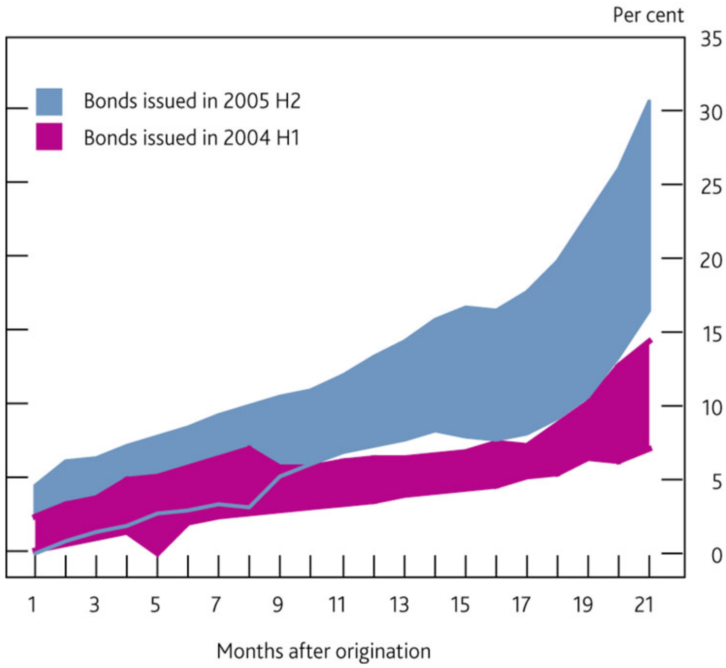
The banking system, faced with having to take more risk onto its balance sheet as some of the risk-transfer mechanisms were unwound and hit by MTM (and real) losses on a range of products, became less well capitalized. Bank default risk rose (see Chart 8). Efforts to raise capital occurred but were curtailed by falling stock prices as counterparty confidence was affected and by difficulty valuing the size of the hole, owing to complex products and inter–financial institution exposures. Lack of confidence in counterparties severely curtailed interbank lending. Short-term money markets and commercial paper markets were affected. Derivatives markets were disrupted. Meanwhile, the immediate cause of the problem—the retrenching of house prices in the United States, the United Kingdom, and other markets—had not found a bottom, making valuations of solvency difficult. These influences threatened real economic activity (although actions by authorities appeared to have provided some temporary cushion).

How authorities handled several failures may have contributed.

In response to the more systemic impacts, the U.S. government introduced a plan to allow it to buy and sell mortgage-related assets as a way of helping markets find a clearing price, based on hold-to-maturity values. This was modelled on the successful Resolution Trust Corporation experience, which was part of the cleanup of the U.S. savings and loan crisis of the 1980s. By temporarily removing certain assets from bank balance sheets through auctions, authorities hoped to help price discovery and make sure that the credit-granting process did not stagnate. Critics suggested that a more effective action would have been to acquire equity in some banks (see Wolf 2008, for example). The plan was amended in its passage through Congress to permit a wider range of intervention, including equity injections, although that was clearly not the initial preference of the U.S. authorities (see Paulson 2008). There was a subsequent coordinated cut in interest rates in major markets.

Chart 7

Range of delinquency rates on mortgages backing U.S. subprime securities[a, b]



a. 60+ days delinquent, including foreclosures

b. Range of five RMBS (on each date) issued by (the same) major issuers

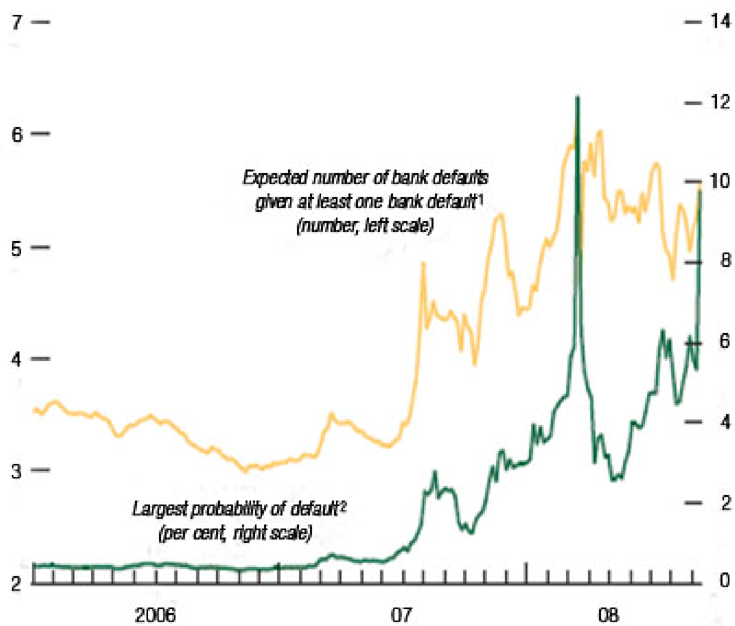
Sources: Bloomberg and bank calculations

After it became clear that interbank lending markets and short-term money markets were not materially freed up by these announcements, and in the face of calls for more coordinated action, the United Kingdom introduced a comprehensive plan for guarantees of interbank lending, temporary guarantees of bank liabilities, and equity injections. Others, including the United States, followed. Competitive pressures were likely a factor, since countries not taking action risked seeing flows of funds out of their banks to other markets. Canada put in place a backstop guarantee of bank wholesale funding, which was not expected to be used widely.

A number of commentators pointed out that major hedge funds and private equity groups had seemed to do better in response to the initial subprime debacle and were not the immediate cause of the crisis. In part, they surmised that this was due to their ability to avoid quarter-by-quarter earnings pressures. Inherently, however, these funds often had a lot of leverage and an asset-liability mismatch position like that of banks, and a number did "fail." Some bank-sponsored funds were supported, a few were cut loose, and others wound up into the bank. (The ability of hedge funds to withstand pressures and the validity of a number of the leveraged buyout and collateralized loan obligation deals they had pushed came under scrutiny, especially as the prospect of material slowdown in the real economy became more likely.) Speculation about overhang from possible asset sales of these funds was a factor in the downward pressure on asset prices.

Chart 8

Systemic bank default risk estimates



1. Among 15 selected large and complex financial institutions (LCFIs)
2. Measures the largest probability of default among the sampled LCFIs each day

Sources: Bloomberg and IMF staff estimates

The Fundamental Causes of the Crisis

Much of this interpretation of what happened is surely valid. But I think it is necessary to look at a few more fundamental causes and acknowledge their contribution. Some are starting to be recognized (see Draghi 2008). It will only be with hindsight that the relative contribution can be assessed, but these causes should be given prominence in the diagnosis. And if reforms don't address them, they will miss the mark.

Below, I will briefly examine each of the following: (i) the shadow banking system; (ii) macro conditions; (iii) excessive leverage; (iv) wholesale funding; (v) risk concentration; (vi) policy and regulatory failures; (vii) insufficient "plumbing"; (viii) moral hazard and system risk incentives; and (ix) governance failures.

The shadow banking system

The concept of the "shadow banking system" was coined by the asset-management firm PIMCO (Gross 2007) and popularized by others. It is a banking system in that it intermediates between providers of funds—savers—with short-term time horizons, and longer-term borrowers. So, like banks, it has to manage mismatch and liquidity risk. It also has a role in credit origination and distribution. Parts of the system are highly leveraged, and more so than banks, while other portions are funded largely with wholesale money.

The components of this shadow banking system in the United States included the non-bank mortgage lenders, funds and entities owned by broker-dealers, structured investment vehicles and conduits, private equity funds, hedge funds, and money market funds. It was a shadow system, because it was largely outside of the comprehensive, consolidated regulatory system with its capital requirements and limits on leverage. It often had lower disclosure requirements because, it was argued, its products were sold to sophisticated investors. And, in the United States, it initially had no access to LLR facilities or to deposit insurance. Banks were exposed to this system as lenders to it, as providers of liquidity backstops and, sometimes, as sponsors of similar vehicles, thus, with implied support through reputational risk. Other countries had only parts of this system—most notably, many countries did not have broker-dealers as lightly regulated as those in the United States. Hedge funds in the United Kingdom were already regulated as asset managers.

This system became severely strained. Some parts essentially collapsed and were folded into sponsoring banks, while others failed or will fail. Some parts are not too leveraged, are well managed, and will survive. Some parts converted to become banks to gain benefits from that status. How much did market participants or regulators understand of the extent of leverage and possible concentrations of exposure to this sector?

This system increased the transmission of financial weakness from markets to banks involved with it, and exacerbated the general lack of confidence in the market. In several countries, the crisis response was to extend the safety net to include some of this system. The obvious policy question is the future role of regulation in this sector.

Macro conditions

This has been the story of collapsing financial bubbles and debate on the role of proactive monetary/fiscal and regulatory policy in the face of the crisis. That certain global imbalances had not been dealt with was widely recognized; many had foreseen a disorderly unwinding of global imbalances (see Bank of Canada 2004; IMF 2006; BIS 2006; Dodge 2006).

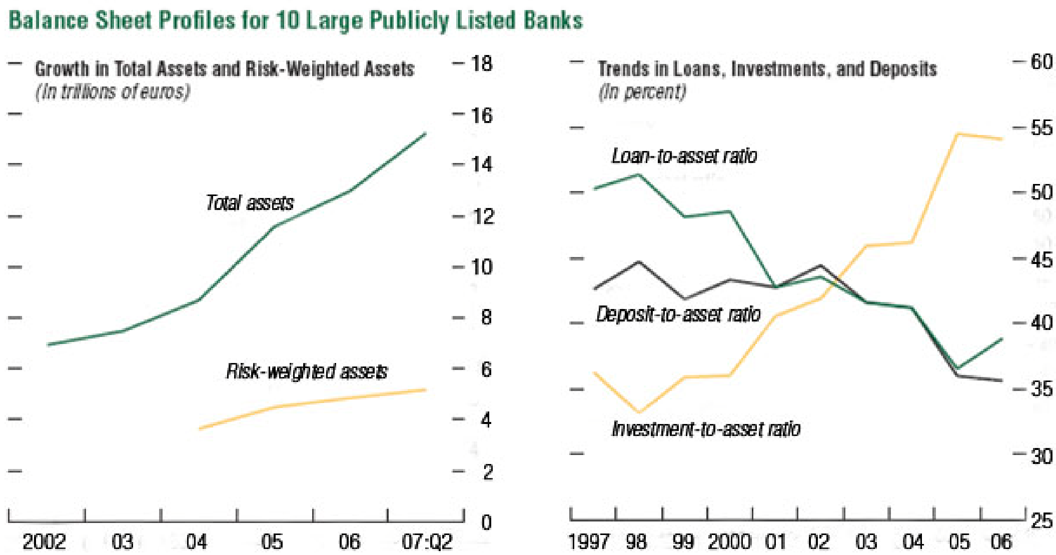
No one knew, however, just *when* that unravelling might occur; subsequently, there was the reluctance to cry wolf.

Many central banks, as well as the Bank for International Settlements (BIS), had examined the macroprudential issues at play. But writing financial stability reports doesn't really appear to be an adequate response. Some central bankers were steadfast in their refusal to lean against bubbles, arguing that they were difficult to spot and that monetary policy was an ineffective tool (Greenspan 2008).

I do not believe that the essence of the problem was lack of information about imbalances and bubbles. It was partly an unwillingness by some to confront tough choices about how to resolve the imbalances. It was also lack of effective, accepted instruments that can be used to counter bubbles. The response of the purist—to completely ignore asset bubbles in macroeconomic policy (monetary and fiscal)—is a mistake. However, even if monetary policy had been willing to lean against bubbles more, I doubt it would have been able to do much without damaging the rest of the economy. Monetary policy could not have pricked this bubble. Nevertheless, in trying to reduce the incidence and impact of crises in future, we must realize that every little bit will help and that monetary conditions, more generally, can help to attenuate bubbles.

Chart 9

Leverage indicators



Sources: Thomson Financial and IMF staff estimates

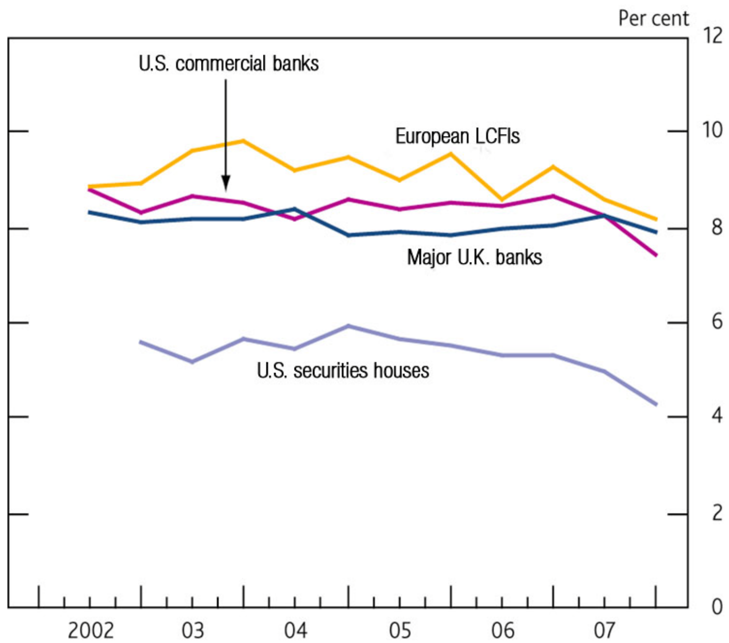
Excessive leverage

The financial system had experienced increased leverage. Overall, its assets to GDP had risen markedly. Even now, it is difficult to obtain regular macro measures of leverage, which perhaps says something about the importance that needs to be placed on it. Measures of on-balance-sheet leverage showed material increases (Chart 9). A look at the Tier 1 (core) capital ratios of major players in the United States, Europe, and the United Kingdom shows that the U.S. investment banks as a group were much more highly leveraged (Chart 10). Certain institutions were quite highly leveraged. Only the United States and Canada had leverage limits on commercial banks. In Canada, they apply to each bank overall and its subsidiaries, and therefore include the major investment banks, which are all owned by commercial banks. The shadow banking system and off-balance-sheet vehicles had highly leveraged parts. Leverage was multiplied by derivatives instruments, which often contain embedded leverage, and leverage was inherent in layered structures such as CDOs of CDOs (see Corrigan et al. 2008 for a good description).

The outstanding notional amount of credit default swaps (CDSs), which were part of an active traded market, exceeded by several multiples the value of the underlying reference assets. In a way, large notionals relative to underlying assets may not appear to matter when it is business as usual—if one side of the derivatives transaction "loses," the other side "gains" equivalently. But when the issue is whether one side will pay up, or whether major MTM losses in a class of derivatives will put pressure on the capital of an institution that holds a large amount of them, then the size of the notionals does matter. And, if leverage is coupled with more volatile wholesale funding, pressure can be much greater and more serious.

Chart 10

Tier 1 capital ratios[a, b, c]



a. Weighted by total assets

b. Capital ratios measured under Basel I except for U.S. securities houses; capital ratios for U.S. securities houses measured as ratio of tangible common equity to total assets adjusted for secured assets, segregated assets, derivatives liabilities, identifiable intangible assets, and goodwill

c. RBS data for end-2007 include ABN Amro

Sources: Bloomberg, published accounts, and Bank calculations

While I have not seen a definitive study, my impression from anecdotal evidence is that financial systems and individual banks that were more highly leveraged were the most vulnerable.

Wholesale funding

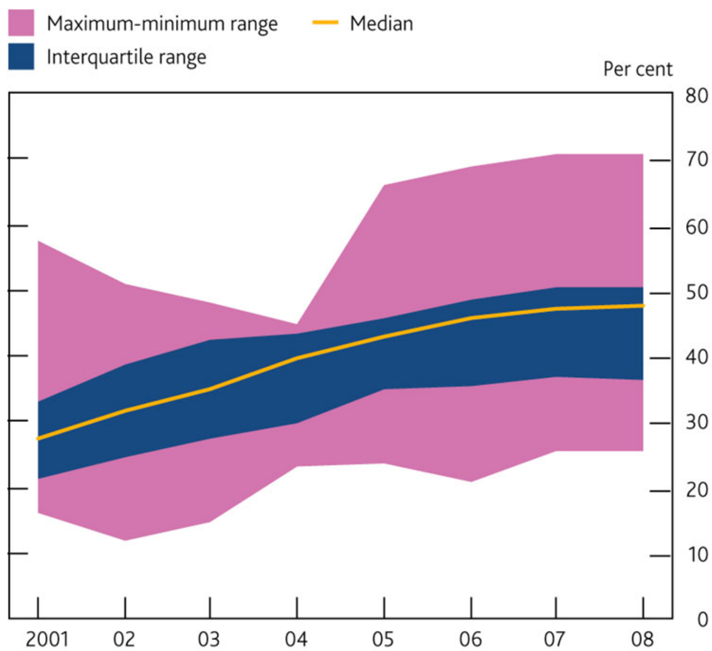
The perception of boundless liquidity that formed the basis of so many models and decisions was clearly an illusion. We knew that, but we also seem to have forgotten it. There is now a great focus on better management, regulation, and supervision of liquidity. Some argue that these changes will be exceedingly difficult, but I believe that some basics can take us a long way.

Many note that measuring liquidity risk in banks is problematic, and perhaps that is why it didn't receive as much attention as it should have. So much depends on responses by markets, bank customers, and the banks themselves. Of course, many pricing and risk models for traded instruments assumed boundless liquidity in markets—which history should have taught everyone is not what occurs in times of stress. Now, quantitative analysts—"quants"—are looking at things such as liquidity-adjusted value at risk.

But again, we shouldn't take our eyes off the basics. The reliance of certain banking systems on wholesale funding increased markedly. (See in Chart 11, for example, where, from 2001 to 2007, median wholesale funding for major banks rose from 30 per cent to 50 per cent of the total.) In various countries, certain individual banks were more reliant on wholesale funding than others. Investment banks and parts of the shadow banking system were much more dependent on wholesale funding. Many, but not all, Canadian banks were less dependent on wholesale funding than their international peers.

Chart 11

Major U.K. banks' wholesale funding as a percentage of total funding[a, b]



a. 2007 data are as at 2007H1.

b. Wholesale funding is defined as interbank deposits plus debt securities in issue. Total funding is wholesale funding plus customer deposits rates.

Banks that have been more dependent on wholesale funding have naturally experienced greater liquidity challenges—they suffered more.

I have never believed in institutions that are supposedly solvent but illiquid (except in cases of clear short-term operational difficulties, such as a major clearing technical problem that will be resolved within a very brief time). In times of trouble, illiquid institutions are very quickly insolvent, as well. And those who say that insurers can never have liquidity problems should learn the lessons we learned a number of years ago with Confederation Life.

There are also real lessons for LLR and ELA. I doubt that ELA is a viable policy tool—by itself—to resolve a problem institution. I am not aware of any institution that has received

LLR/ELA and returned to health on its own. ELA may be a useful, temporary bridge to a resolution (government-sponsored or not) that is advanced and certain to occur. Otherwise, I believe that recent experience supports my view.

Risk concentration

Historically, risk concentrations are usually implicated at individual institutions or in systemic problems. I think that was true in this case. Concentrations to certain mortgage markets, to the monoline insurers who had expanded to issue vast amounts of credit-derivatives protection, to other counterparties, to property in some economies, are all examples. Risk concentration, including sector concentration, is not well understood by some market participants and/or regulators. Trading-book concentrations are often less well analyzed, because it is assumed that they can be unwound or sold quickly! Nor is risk concentration always well analyzed using stresses or scenarios that include direct and indirect effects. An issue from this experience is whether rules governing concentration are stringent enough—and whether banks and their supervisors are sufficiently aware of the concentrations that do exist.

Policy and regulatory failures

Policy and regulatory failures were factors in this crisis. I believe that they occurred in certain countries and in international coordination. The degree of failure varied from country to country. In a number of cases, it was not the failure of the regulators but of the policy process, including legislatures, to deal in a timely way with known weaknesses in the system. The policy process also sets the tone for regulators, even though they are independent. The following are examples.

- It had been clear for a long time that the U.S. global investment banks were not regulated and supervised on a consolidated basis in the way that the commercial banks are. The U.S. regulatory reform legislation in the 1990s (the Gramm-Leach-Bliley Act, for example) had not dealt with this. The exposures of these institutions, therefore, were more opaque to regulators, and they could operate at much higher leverage (see Chart 10). The voluntary holding-company regulation by the Securities and Exchange Commission (SEC), included to deal with E.U. pressure, was not adequate (see SEC 2008). There had been multiple studies and proposals over the years about streamlining the U.S. oversight structure, but the actual changes implemented were not sufficient to enhance financial stability.

- Many securities regulators (including in Canada) are fundamentally regulators of market conduct, not prudential, solvency, or market stability regulators. In Canada, it was the Bank of Canada and a private sector group, led by a well-respected lawyer, who took the lead in the *non-bank* ABCP restructuring, with—in my view—a minor role for securities regulators in leading the effort. This was not a *bank* regulatory problem or a failure of *bank* regulation. If anyone should have been on top of this, it was securities regulators. They expressed “surprise” ex post at aspects of the issue, such as the extent of ABCP sales to individuals (IIROC 2008; *Globe and Mail* 2008). In Canada, we don’t have *one* national securities regulator that could be a partner for federal authorities in financial stability monitoring and crisis management. Successive federal ministers have pushed for changes but have met with considerable provincial resistance.

- Everyone knew that U.S. insurance regulation was bifurcated and weak in some places. Insurance-holding companies were not regulated, so there was no consolidated supervision or capital rules. The possibility of double leverage existed. And there appears to have been a patchwork of regulation of mortgage brokers. The Fed had been asked to do more to regulate mortgage origination and deceptive practices—in 1994, Congress had passed the Home Ownership and Equity Protection Act—which gave the Fed powers it had not exercised, and that is arguably not the best mandate to give a central bank. (See the Greenspan testimony of 23 October 2008: Committee on Oversight and Government Reform 2008.)

- There had long been evidence of very high leverage compared with core capital for some major European investment banks. Was this because of their need to compete with the U.S. bulge-bracket players? I believe this had come partly from their aggressively building up their trading book, which had lower capital charges than if the assets had been held in a banking book. Did E.U. regulators allow too much latitude?

- Many regulators were aware of the fact that models used by banks for mortgage defaults and losses were based on data that did not include a material downturn. Some acted in implementing Basel II to override bank capital estimates. But no one looked at the implications of this in a comprehensive way, and no one "connected the dots" to consider valuation of complex securities, rating agency ratings, structuring thresholds of off-balance-sheet structures, and so on.

- It is not clear that regulators understood the risks being assumed by a number of institutions and their models as well as they would have liked to. While I do not have specific evidence in this regard, this is a reasonable supposition, given that the banks and insurers themselves often expressed surprise at the risks that were revealed in their portfolios.

- Why did regulators worldwide not focus on liquidity as much as they should have? These issues are not new. Was there an implicit view that if serious liquidity issues arose, central banks would deal with them as they had before? Did Basel II get too much focus for too long? In some jurisdictions (not Canada), no or few new resources were added to implement Basel II. Was that part of the problem—since it reduced specialist resources available to consider other risks at systemically important institutions?

- Many noted that the GSEs in the United States were "a problem waiting to happen." There appears to have been a choice to promote more access to financial services rather than financial stability. The capital rules for GSEs were weak and there seems to have been inadequate effort by Congress to strengthen oversight and regulation. This is more an issue of policy than of regulation. Canada also flirted briefly with permitting very high loan-to-value-ratio mortgages—again, a policy issue, not a regulatory one.

- The U.S. policy-makers also made decisions about not regulating certain derivatives products. And the recent U.S. Treasury proposal for streamlining and enhancing the effectiveness of their regulatory structure was one of a long line of such proposals that had not been acted on.

- Some of the problems that were identified in the public reports on UBS and Société Générale were ones that a well-resourced prudential regulator would be expected to catch (UBS 2008; Société Générale 2008).

- The Northern Rock post-mortems (FSA 2008; Treasury Committee 2008) identified serious weaknesses in the Financial Services Authority (FSA) and Bank of England processes, raised issues regarding coordination during crises, and cast doubt on the adequacy of resources.

- I am amused by the recent talk about the derivatives business embedded within AIG being the main source of the problem and the reason for the systemic nature of the company that necessitated its assisted restructuring. Any who were involved in Canada with the failure of Confederation Life will recognize the tale (although we judged, rightly in that environment, that the failure of Confederation Life was not systemic even though it was the third largest insurance failure in the world to date and had a lot of messy cross-border complications). Repeating history!

- Not much action seems to have resulted from FSF/IMF discussion of vulnerabilities. Where was the focus on possibilities and the "will to act"? These discussions did not result in any consensus on the importance of vulnerabilities or on action at the international or national level. While meetings of all parties from a broad range of systemically important countries are beneficial, focusing on politically sensitive issues such as offshore financial centres or financial issues related to tax leakage leaves less time for real consensus building in the area of vulnerabilities. As well, discussion on vulnerabilities can't consist of simply waiting for dire warnings (of which I recall few, if any). It has to be about possibilities in the tails, with active monitoring and follow-up. Perhaps things moved too quickly. . . .

- Tolerance for regulatory arbitrage, or knowledge of arbitrage opportunities appears to have been too large. AIG, the insurer, wrote hundreds of billions of derivatives contracts with banks "for the purpose of providing them regulatory capital relief rather than risk mitigation, in exchange for a guaranteed fee to AIG" (AIG 2008, 120).

This is not an exhaustive list. And my intention is not to cast blame—no regulatory system will ever be perfect, and policy-makers have to make choices. But, without willingness to understand deficiencies, responses will be less effective.

The U.S. system seems particularly deficient and it must bear a lot of blame. I understand the ideas of regulatory competition and checks and balances among regulators and federal-provincial/state issues. And I am not in favour of super-regulators who regulate both prudential and market conduct issues. However, even taking those factors into account, the U.S. system seems particularly overdue for reform.

I return to this in my discussion of policy prescriptions.

Insufficient plumbing

By "plumbing" I mean the systems for clearing and settlement of cash and derivatives markets. This matters, since it reduces propagation of problems via markets and makes it easier to close/resolve one institution without affecting others. It can thus have an indirect impact on reducing moral hazard. Allowing netting of contracts in these systems also reduces risk.

Much of the direct large-value *payment* systems in major countries (including Canada) had been appropriately risk-proofed in the past decade. Central banks were overseers of these systems often as a result of legislation. But other markets were patchier.

A number of clearing and settlement issues were not dealt with fully. Recently, for example, the New York Fed has been spearheading an international effort to regularize clearing and settlement of CDS trades. All agree that this is overdue. If this had been in place, some commentators suspect that the failure of Lehman would have had fewer knock-on effects. In Canada, we still don't have all foreign exchange trades on the central collateralized, netted, counterparty system.

So why weren't more of these issues dealt with? Did authorities focus too much on payment systems, which are obviously a bedrock of systemic stability, and not enough on clearing and settlement systems?

Moral hazard and system risk incentives

One major issue is the extent to which actions by authorities over the previous two decades had contributed to moral hazard in the system. Authorities often acted to resolve problems at *individual* institutions in a way that was designed to reduce moral hazard. Shareholders were not bailed out and debt holders often took some "hit." Problems outside of the formally regulated sector (e.g., Long-Term Capital Management (LTCM), ABCP in Canada) did not have formal government financial involvement, although the Fed and the Bank of Canada did convene meetings of private sector agents and jawbone them into collective action. It must be said that there were not many failures of individual institutions, so the data set is small.

Perhaps more importantly, at a *system* level, market participants may have come to believe that authorities would deal with systemic problems by adjusting policy variables. There was definite evidence of action or willingness by authorities (the 1987 crash, the Asian and Russian crises, fallout from the dot-com bubble, LTCM, preparations for Y2K) to provide material liquidity to markets. These problems mostly resolved themselves or were resolved with limited damage and negligible contagion. It might have appeared to market participants that monetary and fiscal policy stances were adjusted in light of potentially systemic events. Could market participants have come to downplay the impact *through markets* that might result from a disorderly unwinding of the underpricing of credit? It is very hard to tell, but I think that has been a factor.

However, regulatory proposals based on presuming that we can materially reverse any sense of "too big to fail" are likely not realistic in the short term. When serious system instability comes up against moral-hazard worries, system stability wins, every time. Maybe that is a good thing. How far out of hand would the situation have become if we did not have institutions that were deemed to be systemically important and thus deserving of support? That doesn't mean that there can't be costs imposed on some participants in the method of resolving failures. And when systemically important institutions need assistance, there have to be serious consequences for those in charge, as generally there has been. But when financial markets are very skittish, it has proven hard to impose costs on debt holders. (That is why I have never been a big fan of requiring institutions to have a level of subordinated debt, as various academics have proposed (see Shadow Financial Regulatory Committee 2001)—and I believe other market indicators of creditworthiness can be monitored by supervisors.)

The recent crisis has reinforced the notion that the authorities will come to the rescue, and fairly broadly. Can and should anything more be done about that? I think markets will need real experience to change their view. Perhaps over the medium term, if we do undertake a sensible redesign of the regulatory system, and weather the next crisis better, moral-hazard problems will be reduced for the crisis after that.

Governance failures

Why did certain senior-management teams do well in identifying the problem early on and acting to minimize their exposure? Why did the incredible investment in risk technology and risk data not result in less exposure? Where was the judgment that sometimes existed that "if I don't understand it, we're not doing it"? What was the role of incentives within institutions from compensation structures?

Some have also recently argued that the compensation structures for investment funds, with fees based on a percentage of assets, led them to care less about accuracy of ratings as long as the fund investments in the search for yield were growing.

Some argued that the governance and incentive structure in ratings agencies was not up to the task that had been implicitly assigned in the financial and regulatory system.

Legislatures that had to provide public funds were certainly convinced that there were compensation issues that had to be curtailed and often built that into implementing legislation (although there was clearly a trade-off between this policy goal and the goal of having the measures work by being accepted by a range of banks). I will return to the policy issues flowing from this.

Risk-management practices are being enhanced across the board. I am not at all sure that a lot more guidance and rules are necessary in the area of risk management. I think the suggestions of the FSF report regarding enhanced guidance for liquidity management make sense. However, more clearly has to be done to embed enterprise-wide risk measurement and risk management, including a major role for *judgment*, in *cultures* of organizations. This can't be the sole role of the Chief Risk Officer acting as the ultimate gatekeeper. Culture cannot be legislated. I hope that the Pillar 2 process under Basel II can help push things in the correct direction. Risk management can't just be about the mechanics of models or stress tests. As well, regulators will need to tweak their approach to consider different indicia of the degree to which risk management is effective, and enhance their ability to assess its quality.

What about boards? There has been little questioning so far of "where were the directors?" The role of boards in risk governance has been enhanced in a number of institutions over the past decade, and more enhancements are likely from this experience. I do not have access to information that is detailed enough to determine that there were *systemic* governance failures at the board level across a range of institutions that would necessitate a system-wide response. There are some improvements in governance, such as separating the chair and chief executive officer roles, that have proceeded much farther in some countries (e.g., Canada and the United Kingdom) than they appear to have done in the United States. Litigation against various entities has started and that seems to be the best route to deal with any governance failures that did occur. Boards, too, will be wanting to "up their game" when it comes to oversight of risk issues, and they will be looking out for the indicia of an effective risk culture.

How Did We Do in Canada?

It can be argued that, compared with others, Canada has done well. We are not immune from global events, however, and major Canadian banks and insurers have suffered material losses, some more than others. The banking system has been considered one of the soundest in the world, in part due to good provisions and capital rules (often above those in the United States or Europe). Banks were holding well above the amounts required by OSFI to be considered "well capitalized." Banks with high-risk exposures acted early to shore up capital. We did not have as generalized an asset-price bubble. Nor did we have major gaps in consolidated regulation and supervision, as was the case in the United States. The size of our institutions meant that they were often not leading-edge players in the creation of complex products.

Various aspects of the operation of our mortgage market meant that it was less exposed to risks. These aspects included maximum loan-to-value ratios for bank lending without government guarantee, Canada Mortgage and Housing Corporation (CMHC) operations, and higher-risk lending practices by OSFI starting a number of years ago. At one point, CMHC began to guarantee mortgages with very low down payments, but this practice was pulled back. Moreover, losses there would have been covered by the government, and would not likely have been systemic.

Problems in the market definitely existed, however, as cracks in the non-bank ABCP market began to show. Was the lack of a national securities regulator a risk factor and a hindrance in dealing with this? In my opinion, issues relating to financial stability are not within the purview of Canadian securities commissions: that is not their area of expertise, nor their actual or perceived mandate. However, if Canada were to have a national securities commission, our system would be able to reach policy decisions more quickly and to focus on the securities side of crisis management and financial stability information and analysis.

Systemic frameworks contain gaps. And there are material deposit-taking entities outside the ambit of federal regulation. So, unless there are good links between their regulators and federal authorities, problems could arise.

Future Market Responses

There will be some legacies in markets from this crisis and how it was handled. There are likely to be, in a number of countries, more very large banks. That has implications for competition and concentration and for the next crisis. At the same time, the financial sector will represent a smaller part of GDP. Market practices will continue to become more conservative, simple, and transparent, at least for a time, until the next bubble conditions begin to take hold.

It is likely that the views of market participants in some countries of moral hazard will have been reinforced. Equity holders in institutions that have "failed" rightly lost all or most of their investment. The story of debt holders is more mixed. Few institutions were allowed to totally fail (as opposed to assisted/encouraged transactions of one form or another). And when they were allowed to fail, there may be a view that the authorities will look back on that as a mistake that contributed to the deterioration of public confidence.

The credibility of authorities in handling the crisis, and thus their credibility in the future will likely be judged as mixed. Their proactivity was good once action started, preparedness and foresight less so, and choice of instrument mixed. How they respond in the longer term to restore credibility will be important. The policy process to redesign the regulatory system will be an opportunity.

Regulatory Policy Implications: First Steps

Measures

The ultimate response to the crisis is going to be a combination of improved private sector standards and behaviours and more effective regulation. Use of market incentives balanced with regulation is always a challenge.

There are a range of policy prescriptions that have received considerable support internationally and that are partially implemented (see FSF 2008). They include:

- Changes to Basel market risk capital rules for complex structured credit products and additional capital charges for default and event risk, and for liquidity facilities to off-balance-sheet vehicles. Some of these were already under way before the crisis and are being accelerated.
- Additional supervisory guidance for the management of liquidity risk.
- Additional guidance in the area of stress testing.
- Additional disclosures (which are largely implemented by Canadian banks).
- Additional disclosures regarding application and convergence in accounting and valuation rules. Guidance on valuation when markets are no longer active. Recent guidance from the International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB)—adopted subsequently in Canada—fills this need on a stop-gap basis, but needs to be reviewed for suitability as a permanent measure.
- Implementing the revised IOSCO code on conduct for credit-rating agencies.
- Differentiating ratings on structured products from those on bonds.
- Putting in place a college of supervisors for each of the largest global financial institutions (see comments below).

- Regulators looking at the extent to which the mandated use of ratings has had negative effects, such as encouraging credit outsourcing, procyclical price movements, and discontinuities in markets.

Other matters are in progress, including strengthening the fundamentals of the CDS market in terms of clearing settlement and netting (Corrigan et al. 2008). Markets have also already put changes in place. A great deal of attention is focused on credit exposure. Demand for complex opaque securities has dried up. Market developments have forced institutions and regulators to recognize the importance of robust liquidity risk management. Certain products or structures will never be seen again.

Challenges in implementation

Challenges related to these measures should not be forgotten.

- In pursuing this agenda, we must not swing too far back to a mechanistic, rules-based compliance system. Judgment by financial institutions and regulators will continue to be the most important tool. And regulators who go to a more detailed, rules-based approach are likely to be fighting the last crisis, not the next one.

- Bank regulators (and banks) understand that they need to focus more on liquidity and on the real quality of risk management. That will require them to "up their game" with more, higher-quality resources to challenge and stress banks' positions. The cost of a high-quality regulatory regime is a lot lower than the cost of serious periodic crises. Having adequate resources means paying more for people and the willingness of regulators and policy-makers to see costs to governments and financial institutions rise. More than lip service needs to be paid to this.

- Banks and regulators need to focus more on concentrations in all parts of their operations. There may need to be more internal bank and regulatory limits on concentrations.

- Audit regulators (who are fairly new) must strengthen their *collective* oversight over the major global audit firms. Those firms increasingly set policy methodology and quality standards globally, while many of these regulators are operating nationally. Some of these regulators need to "up their game" to be able to assess the quality of audit of complex financial entities. Issues to reduce the potential for a failure of a major global audit player—which could have different kinds of systemic effects—need to be pursued. Limiting, but not eliminating, auditor liability is on the agenda in a number of jurisdictions and should be so in Canada. There are nascent ideas about how rules could be changed to allow capital to be injected into a major audit firm in the case of a problem. These also should be pursued.

Changes like those outlined in the FSF (2008) report are all well and good, and will help. For some, the devil is in the details. But are they enough? A lot of them were developed at the time when many thought the crisis was peaking—well before the events of September and October 2008. Should there be more fundamental regulatory improvements?

More Fundamental Policy Issues and Measures

I want to consider several more fundamental policy issues that arise from the analysis of causes described above.

Expectations of crises

Paul Volcker (2008) noted that evidence of the failure of the "bright new financial system" was the regularity of crises in the past twenty-five years, compared with the previous forty. As one interested in behavioural finance and in the views of Minsky, I think we have to accept that crises will occur. So, in addition to designing a better system that will reduce their incidence and severity, we must focus more on system resiliency and our readiness to deal effectively with crises, including our crisis-management capability. Some will say that the recent events are the best practice. Yes, but memories are notoriously short, and focusing on resiliency is likely to be short-lived once the situation begins to stabilize.

Part of any crisis is an element of surprise. So, focus on financial stability ought not to be only about identifying emerging risks and vulnerabilities, but also about assessing resilience.

In that regard, I commend Sir Colin McColl's (previously of MI5) Roskill Memorial Lecture (McColl 1999) on how to think about risks and events. He notes that scenario analysis, while useful and better than forecasting, was unlikely to have prevented the Falklands War or to have persuaded leaders to try and control the flow of capital to Southeast Asia in advance of the crises. He suggests analysis of opposing forces related to possible major outcomes (which may be balanced currently, so the likelihood of the event is small) with regular monitoring for changes in the balance of forces that change the likelihood.

Who is regulated and what does macro stability regulation mean?

I have noted that one of the most important decisions relates to who is regulated for safety and soundness. The issues of who is regulated and what macro stability regulation means are intertwined. There are some obvious points that are agreed on, such as comprehensive, consolidated regulation of banks, investment banks, and insurers (even though the United States did not follow this in all cases, and Canada does not for dealers not owned by banks).

The issue, then, is what about the so-called shadow banking system? One view, historically, to which I and a number of my colleagues subscribed, was that entities called "banks" were special by virtue of their access to the payment system and the position that they hold in public confidence. Part of this was associated with the name "bank." While others might offer products that were close to or economically identical to bank deposits and undertake intermediation, they didn't have the name or the implied cachet of stability and safety-net support. The idea of restricting the safety net to "narrow banks" that were only allowed to hold high-quality assets was rejected as being impractical and unnecessary—and perhaps unrealistic in thinking that systemic issues arising elsewhere would not be responded to. Recent behaviour by the authorities in many countries suggests to me that the genie of wider support is well out of the bottle.

This view also held that the regulatory costs of being a bank, such as capital requirements and supervision, were roughly balanced by the funding benefits of the explicit or implicit safety net (e.g., funding costs for unregulated bank holding companies without access to the safety net used to be roughly 100 bps more expensive than that of a bank subsidiary). So the issue of pushing intermediation and risk to unregulated players was not that serious a concern—if anything, the concern was from the perspective of the competitiveness of banks, not from the systemic risk that the other players were bringing to the system.

Under this model, authorities should draw the regulatory dike at the edge of the banking insurance and investment banking sector. This is also reinforced by the observation that many of the functions and markets in which these groups transact are similar, even if the entities differ. Several actions were taken to reinforce that dike. Reliance was placed on regulating banks' relations with the conduits, hedge funds, and off-balance-sheet vehicles, including ensuring that there was adequate capital to deal with eventualities.

Some of the assumptions of stress impact were clearly not severe enough. Nor were all the linkages between markets other entities and banks well understood. Some countries, notably, the United States, did not follow the model fully. But is that model of where to draw the line now obsolete? Do we need to identify other systemically important players and have some sort of prudential regulatory system in place?

Part of the consensus was that there were also a variety of entities who dealt with sophisticated investors and counterparties and, consequently, direct full safety and soundness regulation (and full market-conduct regulation) was not necessary (see Greenspan 2008).

While some railed against the lack of international consensus to regulate hedge funds directly (as opposed to reminding bank supervisors to make sure their prime broker banks were assessing risk appropriately), the proponents could provide little rationale for such a scheme. Even now, it is not clear that hedge funds were in any sense a cause of the problem, as opposed to being victims and part of the transmission mechanism once the problem was well under way.

It is clear that commercial banks and investment banks and insurers need comprehensive, consolidated prudential supervision and regulation by an effective and well-resourced supervisor. A number of advanced countries have some gaps in this that are likely not material (consider the credit union system and medium-sized dealers in Canada), but the obvious holes in the current system were mostly in the United States, not in Canada or Europe. It is very hard to judge, if that had been corrected in the United States several years ago, whether the crisis could have been more contained, albeit perhaps with important tweaks to the system of capital regulation—which I discuss below. In my view, it could have been.

Some have said that all who have access to safety-net facilities have to be regulated. I agree. This may be a new proposition for the United States but, in Canada, that would appear to be the case de facto—although there are probably a few systemically important provincial institutions. The same would already be true in much of Europe. There, the real issues are lack of clarity of cross-border arrangements in a crisis and the role of national authorities versus the role of the ECB.

I hope that the United States and others can distinguish between the temporary late-crisis extension of backstop facilities to mutual funds and the commercial paper market so that they do not have to be regulated fully. Then we can have a chance to manage the next crisis better and not extend the safety net to them again.

Going beyond regulation of banks, investment banks, and insurers is tricky. Should central banks or prudential regulators be given some formal macrofinancial stability remit over otherwise unregulated players, or at least the more systemically significant ones? At this point, I can imagine people asking what the criteria and powers are.

And if they are given that remit, is it one that they have a reasonable prospect of succeeding at? If not, their performance and credibility will suffer (see Bernanke 2008a). And one thing we should all have learned is that the credibility of central banks and regulators is exceedingly valuable when it comes to dealing with a crisis. At least as important, those with a macrofinancial stability remit have not distinguished themselves much in acting outside of their direct realm over the past few years—in making changes to reduce the likelihood or severity of problems outside the directly regulated sectors.

It is one thing to give central banks or regulators right of access to information from non-regulated players in order to better help them deal with a clear mandate with respect to the financial stability of the regulated sector. But should they have an explicit mandate for stability more broadly, a right for more information, but no power or mindset to push for changes outside of the regulated sector when they believe a serious problem is brewing? And it is not workable to just give central banks additional macroprudential powers only when a crisis is under way (see the 10 July 2008 Bernanke testimony before the Committee on Financial Services, U.S. House of Representatives at <http://www.federalreserve.gov/newsevents/testimony/bernanke20080710a.htm>).

And yet, no politician or, I suspect, central banker or regulator, wants to go through this again in their lifetime.

But then one answer has to be a much better shoring up of the dike between the regulated and unregulated players. I think this is essential even if a much lighter form of surveillance or very light regulation is extended more broadly. That process will also make it more credible that others can fail. Part of that shoring up may involve more risk-management practices (and perhaps rules) limiting exposure, or at least explicit monitoring of the exposures of individual banks to all kinds of unregulated entities on a gross and net basis. And changes in capital rules as outlined below constitute essential shoring up.

Shoring up a dike is not sufficient without the ability to see what is happening on the other side of it, to assess whether the dike is high enough. So, part of the response should be to require more information provided to regulators and central banks on what is occurring in the unregulated sector in aggregate and for specific larger players. Then relevant surveillance based on more realistic analysis and macro stress testing can be performed regularly.

That would involve a more direct relationship between the Bank of Canada and OSFI and major unregulated players. I understand that in the United Kingdom, for example, as hedge funds are already regulated as investment managers, the FSA has an effective relationship with them from a perspective of market surveillance. Part of that, as I note below, has to be ensuring that concentrations of exposures by regulated players to unregulated players are better measured and monitored (and perhaps regulated through limits), and that the mechanisms are sufficient for managing a failure of one or more unregulated players (including the unwinding) in a way that does not transmit systemically important risk to regulated players. Otherwise, drawing the line will not be credible.

If authorities have the ability to obtain information from unregulated entities, it has to be clear in legislation that this is with respect to their mandate for regulated entities, not so that they can act with respect to the unregulated players. Otherwise, authorities will be in an impossible position—with knowledge and expectation for action, but no authority to act.

That better shoring up of the dike may be doable. I think the LTCM experience of a number of years ago, in which the Fed used its offices to facilitate (but not financially) a workout, is an example of how this boundary can be managed even in a stressful circumstance (see Lowenstein 2000).

And I think that *macro-system* stress testing and scenario building—which some central banks and regulators have resisted—have to be much more frequent and realistic, and based on plausible stresses. Doing this only when the IMF FSAP team comes to call is not the right answer. Better information about the links between the regulated and unregulated sectors will be important if this is to be done well. Could major unregulated players be asked to participate in such stress analysis from a systemic perspective? This would take resources and commitment. Could we adopt the methodology of considering several low-probability events, analyze the balance of forces impinging on them, and monitor for changes in those forces, as McColl (1999) proposed?

Securities regulators have a *contributory* role to play here, as well, in collecting and analyzing information on trends in key markets. But, if I were the prudential regulator or the central bank, I would not rely solely on them for system surveillance. They do need to be part of the macro stress testing and have the capability to participate effectively. It is also likely that public-disclosure requirements for unregulated "wholesale" players will need to be enhanced.

Historically, I believe that some central banks have found it hard to develop and maintain real expertise in the financial stability area that can add value. For the purposes of their core monetary policy task, it is more important to think about, research, and forecast the central point of the distribution of economic outcomes. Financial stability and prudential regulation, on the other hand, are all about the tails of the distribution of outcomes. If central banks are, de facto, to play more of a role in macroprudential surveillance and monitoring, they will have to be staffed and organized appropriately to do so. And maintaining links with a wider range of systemically important non-bank market participants (who will not just be the biggest) requires the right kind of expertise, as well.

Strengthening the links between regulators and central banks is also key. This is a two-way street. Even in Canada, where I believe the links are good, the Bank of Canada could have, in my time, better understood from OSFI what is happening with individual institutions. And OSFI could have received better macro stress assessment from the Bank of Canada. That in-depth sharing does not undermine anyone's independence.

Central banks who are not supervisors should continue to work *through and with regulators*, to the maximum extent possible, to pool resources, knowledge, and skills. I think the Canadian experience in that regard has generally been exemplary, supported by a long line of previous governors and superintendents. They understood that regular senior-level engagement (not just in times of crisis); respect for one another's roles; high-quality, timely information sharing; and joint contribution to strategy development and execution were essential to effectiveness. The Financial Institutions Supervisory Committee (FISC), which was mandated by legislation in the mid-1980s after the failure of the western banks, works.

We did not need memoranda of understanding and protocols. The public post-mortems on recent failures in some other countries suggest that they could learn from our experience.

If we had a national securities regulator in Canada, the head of that organization should also be a member of FISC. There are potential conflicts of roles—disclosure versus secrecy during crises, for example—but I believe that the benefits, including co-operation and co-ordination in preparation and informally sharing information on what is occurring in markets from a financial stability perspective, outweigh those concerns. It wouldn't work with our current bifurcated securities regulatory structure. In lieu of this, Governor Dodge created separate ad hoc biannual meetings between federal authorities and the four main securities regulators. It was not as satisfactory a process and didn't really deal with surveillance or stability.

The alternative to shoring up the dike is a system of prudential regulation extended to a much wider range of players beyond investment banks and commercial banks and insurers. However, it is very hard to sort out in advance what the criteria for choosing how to extend the net should be. Some (e.g., Eatwell and Persaud 2008) have suggested that any entity above a certain size, leverage, and dependency on wholesale funding (an investment bank or commercial bank, for example) should face prudential regulation. I am skeptical that this can work in practice. And capriciousness in regulation based on "I know a systemic entity when I see it" is not desirable. Some may suggest the need to have backstop authority to designate entities that are systemically important, as well as equivalent activities with investment banks or other banks, subjecting them to some form of regulation. That should be explored, but I am not particularly hopeful that it is a fruitful avenue.

As well, extending bank-style regulation, along with the safety net, would be costly and likely to divert the attention of regulators from their main task. I am not convinced that a simple system of "light" regulation, say, a maximum leverage ratio for non-bank entities, is workable or likely to be effective. Nor am I convinced that what is systemic can be readily identified ex ante, so as to apply some more formal regulatory structure to it. However, enhanced disclosure requirements for the extended entities should be a part of the new system (see Corrigan et al. 2008). It used to be argued that this was pointless, since positions can change rapidly and positions were proprietary. Agreed, but even high-level information that is several months old can give markets and authorities some sense of areas for further investigation.

It is likely that pressures of competition and availability of capital and talent will lead to new entities being set up outside of the prudentially regulated sphere. Substantial players may well re-emerge that are essentially the same as the regulated entities. Should they be regulated? Some will say yes, and if they are systemically important, it is hard to disagree.

Revamping the U.S. regulatory structure

One hopes that this will remain a priority for the incoming U.S. administration. It is essential that the changes are not just cosmetic. Others have a huge stake in this being done well. It will be a serious mistake if the international focus on a "new Bretton Woods" (see Brown 2008) takes the pressure and focus away from the needed changes in the United States. And U.S. policy-makers must understand that they are behind others, not ahead of them, in this regard.

The recent Paulson plan (U.S. Treasury 2008) is an example of a sensible blueprint. Recommendations to modernize and eliminate duplication include eliminating the thrift charter (and the OTS), creating an optional federal charter for insurance, and unifying oversight for futures and securities.

The long-term recommendation was to create an entirely new regulatory structure consisting of a market stability regulator, one prudential regulator focusing on safety and soundness of firms with federal guarantees, and a business-conduct regulator with a focus on consumer protection. As market stability regulator, the Federal Reserve would have the responsibility and authority to gather appropriate information, disclose information, collaborate with the other regulators on rule writing, and take corrective actions when necessary to ensure overall financial market stability. To fulfill its responsibilities to gather information, the Federal Reserve would have the authority to join in examinations with the prudential and business-conduct regulators.

In my view, much of this should be dealt with as part of the immediate package.

As noted above, it will be essential to get the mandates and powers of these organizations right and not ask them to undertake what they are not well equipped to do.

Better relating compensation to results

While some worry about levels of compensation, I think that concern is misplaced. The more important criticisms are about inadequate alignment of compensation to risk and return—both on an ongoing basis and when senior managers are forced out after material problems. Loss of reputation by senior people who are part of failures is not that much of a disincentive.

In addition, the public is increasingly not going to accept that public funds are used to assist resolution of financial system problems, while senior managers receive material compensation. Some of this is "heat of the moment" reaction, but I think that reaction has staying power. Witness the Congressional bailout bill provisions regarding executive compensation, and conditions on compensation imposed on firms in other countries receiving assistance. This is the first time that governments have entered into this level of involvement in compensation decisions.

I would note, however, that some received "simple" wisdom that senior managers need to have equity stakes in the business to deal with the agency problem did not prove out in all cases. The leaders of Lehman and Bear Stearns, for example, are reported to have had much of their compensation tied up in their firm's stock, are believed by many commentators to have engaged in excessive risk taking, and lost considerable amounts along with the rest of the stakeholders of their firms. Maybe just not enough of their compensation was in this form. In some cases, the structure of compensation may be encouraging short-term behaviour that can exacerbate financial instability.

However, there is no easy answer. There is a lot of nervousness, and justifiably so, among policy-makers and regulators about stepping into this quagmire and ending up part of the management of these businesses. Removing the responsibility and accountability from boards might well backfire.

Some believe that the move over the past decade to greater transparency actually pushed up pay. Some blame the compensation consultants whose interest, they believe, is in everyone earning at the 75th percentile! Some call on boards to do better. Others point out that, unless there is collective action, any individual firm in its own best interest will not make its compensation so unattractive that it hurts its business relative to its competitors. Nor do we want to underpay for the talent needed.

I am aware of suggestions that regulators should have a look at whether compensation is driving highly risky behaviour. They can try, and I wish them luck. I doubt that regulators are likely to be able to challenge compensation practices effectively, except in the most obvious, egregious, outlier, circumstances. And many would argue that the issue here has not been just the outliers; it has been the "average" arrangements.

I believe that the Institute of International Finance (IIF) recommendations to banks for the desired outcome in this area make sense (IIF 2008). They are to:

- Base compensation on risk-adjusted performance, and align incentives with shareholder interests and long-term, firm-wide profitability.
- Ensure that compensation incentives do not induce risk taking in excess of the firm's risk appetite.
- Align payout with the timing of related risk-adjusted profit.
- Take into account realized performance for shareholders *over time* in determining severance pay.

Some firms have already adopted at least partial techniques, such as structuring a significant portion of incentive pay in the form of deferred or equity-related components, linking a more material portion of pay packages to the risk time horizon use of risk-adjusted compensation metrics, basing performance metrics more on relative performance than on absolute performance to net out, and making incentives for risk-takers as comparable as possible across firms' business groups.

In my experience, most directors want to do the "right" thing and are genuinely torn. How to ensure more of this behaviour? Marketplace incentives are now helping, but it is a bit after the fact! Could these be strengthened in lieu of turning to regulators? More complete disclosure, as well as fuller explanations of the rationale for compensation systems, are necessary. The new disclosure requirements of the Canadian Securities Administrators, which come into effect after 2008, are an excellent step in this regard. They will help the published ratings of "best and worst" in linking pay to performance.

I am intrigued by the proposal for "say on pay" by shareholders. Advisory shareholder resolutions have been possible in the United Kingdom and Australia for a few years. Similar proposals for Canada achieved around 40 per cent support in a number of shareholder votes in the last proxy season. I would not support mandatory shareholder resolutions re pay, as is the rule in a variety of countries. And it is clear that good boards are already consulting informally with institutional shareholders on their compensation practices, particularly the link between pay and performance. Many major public companies in Canada now permit voting for individual directors, not just for the whole slate. This gives the possibility of shareholders registering comments in how they vote. For example, they could withhold votes for members of the compensation committee. However, there is evidence in some jurisdictions that links between pay and performance can be strengthened by "say on pay" (see Ferri and Maber 2008).

There are good reasons for boards to believe that the responsibility for pay should be theirs and that they are in the best position to exercise it. I note that the Canadian Coalition for Good Governance (CCGG 2007) does not support say-on-pay advisory resolutions at this point. It wishes to see if more improvements occur in response to further disclosure and current informal discussion between firms and shareholders. "Say on pay" deserves further monitoring and consideration.

It is also essential for compensation committees and senior management to look well below the top five employees (which is the normal standard for securities disclosure) and the senior management team and include policy on severance. Committees need to be comfortable with the implications of the entity's compensation policy on risk taking. The idea of basing bonuses on longer-term results, for example, which is increasingly taking hold for senior people, has to be more prevalent much farther down in these organizations.

Last, should there be changes in bankruptcy law? We could consider changes in Chapter 11, the Companies' Creditors Arrangement Act, and similar provisions that would permit courts to recoup part of severance and perhaps some recent bonus remuneration from certain executives of "failed" entities over a defined previous period. Could the ability to refer such matters to a court be part of the power embedded in resolution legislation for authorities when they have to deal with a failed entity?

The role of accounting and disclosure

Much has been made by a number of commentators about the inappropriateness of "fair value" or MTM accounting for financial instruments. Many have also called for enhanced disclosure.

The criticism is that fair value exacerbates downturns, does not produce financial statement results based on real values, and causes uncertainty. Bank regulators, particularly from continental Europe, were worried about the financial stability effects starting a number of years ago. More recently, some firms have pushed for changes in the rule or its suspension, as have prominent politicians. The U.S. bailout bill gave the SEC authority to suspend and mandated an SEC study in ninety days. I recall a number of central bankers and regulators from other countries expressing concerns. Some of those were not on the principle but on the need for better standards for valuation of complex non-traded assets (like loans) and a plea for the rule not to curtail the ability of banks to do forward-looking provisioning.

Great care is needed in this area. In principle, the arguments in support of fair value, as opposed to historic cost or some other accounting method, are strong. Suspending the rule, or seriously weakening it, could easily lead to decreased confidence in financial reporting, which already affects confidence more generally.

However, I cannot believe that the proponents of this rule can be happy with its implementation, based on recent experience. I believe that implementation was rushed. The failure of international accounting and auditing standards setters to road test the rule a lot more, to issue detailed guidance for easily anticipated issues, and to take the lead in explaining its impact is not acceptable. Basing valuation of trillions of notionals on indices that in turn are based on a handful of actual trades, accepting indicative broker quotes, failing to set down detailed guidance for acceptable model valuations for Tier 3 assets where there is no observable market, and similar implementation issues, are all not good enough. Failure of the accounting and auditing standards setters to coordinate their efforts is also not desirable. The IASB and the International Auditing and Assurance Standards Board (IAASB) need to "up their game."

New rules should never again be introduced without a long testing and trial period and without adequate guidance and illustration and an extensive rollout explanatory process. The planned extension of fair-value measures and a more sensible accounting model globally to insurers (the model in Canada is already good in this regard) will present an opportunity to do better.

Accounting and auditing regulators need to issue *joint* guidance on fair value at an international level. (Note the recent stop-gap guidance issued by the FASB and the IASB and followed by Canada's Accounting Standards Board, AcSB.)

The current crisis illustrates that, in circumstances of stress, nothing with the bank's name on it or funded or backstopped by the bank is really off balance sheet. Rules about what conditions would allow something to be moved off balance sheet were tightened after the Enron catastrophe.

Stopping deconsolidation of these entities entirely would be simple and would reflect reality in a crisis. But it would put banks in a competitive disadvantage vis-à-vis their competitors. Accounting standards setters are reviewing further tightening of the rules. My sense is that this cannot be seen as a panacea, given the creativity in structures. Some of the changes already agreed on in capital rules will help (see Wellink 2008). Perhaps there should be at least some capital required for *all* such off-balance-sheet structures. Better building of the dike between the regulated and unregulated sector, including limiting aggregate exposure to these entities, and requiring banks to show they could handle the maximum stress capital and liquidity hit from repatriation of vehicles they are involved with, would go a long way to adding more discipline and resiliency.

As pointed out, the volume of disclosure by regulated institutions has increased enormously. It is less clear that these added "data" have actually resulted in a commensurate increase in "information." At the same time, complex products are being sold more and more to a broader range of investors, either directly or indirectly through various pooled-funds arrangements. Also, even supposedly sophisticated investors have claimed that they did not understand all of the features of the complex products they were buying.

Complex products will continue to exist, although for now in much reduced numbers. After suffering losses, investors of all sorts will want to look for ways to recoup their losses. However, the trends above suggest that we need a more fundamental re-examination of disclosure. Could more clarity around key risks, in one place, be part of financial-statement disclosure? Maybe in some areas of disclosure, less is more? Do we need more tiered formatting of disclosure—high-level statements backed up by more detail that not everyone would want or have to plow through? Could more focused requirements related to explanations of risks be put in place regarding disclosure obligations to both sophisticated and unsophisticated investors in "complex" products? Should the definitions of what constitutes a sophisticated investor be altered? Are disclosure obligations of various funds adequate? (See Corrigan et al. 2005 Report II recommendations.) And shouldn't similar products be treated in a similar manner?

I think disclosure merits a more fundamental re-think than some may be planning. Figuring out what is really useful to various groups of users is not an easy task. I am not aware that that has been a major part of developing disclosure regulation. Simply adding *more* is not necessarily the appropriate response.

Better capital regulation

Capital requirements are one of the most important parts of a prudential regulatory regime. Minimum and actual capital levels have huge impacts on the growth of the business, allocation between assets, profitability, and how business units and individuals are remunerated. Capital arbitrage has been a reason for growth of certain instruments that have turned out to have broader risk implications. More-than-adequate capital is key to resiliency in a crisis. While capital and liquidity are not perfect substitutes for each other, poorly capitalized institutions are more susceptible to liquidity problems.

I continue to support the rapid implementation of Basel II in economies with major financial systems. I don't believe the evidence supports the notion that Basel II is enough of a contributor to this crisis that it should be scrapped. I worry that any simpler alternative is likely to have similar perverse incentives as did Basel I. Basel II has flaws, but is a vast improvement on Basel I. I do, however, support material improvements in the Basel II framework and implementation.

I am concerned that too many emerging-market countries and too many banks, including some in developed markets, are trying to adopt the most advanced Basel II approaches, which they are not suited for. (The Committee made a mistake in labelling—who would ever want to be seen as less than advanced?)

I believe that Pillar 2 of Basel II was given inadequate attention by many. In my view, it is still not fully or adequately implemented in a number of countries that started implementing Basel II over a year ago. That is the part that deals with banks having adequate capital above the minimum, stress testing and capital to cover the results, capital for downturn conditions, risks not covered under Pillar 1—interest rate risk, counterparty credit risk, and so on—that were arguably not adequately handled during this crisis. Adequately implementing Pillar 2 in a way that is integrated into bank governance will take more effort, resources, and time by banks and supervisors. Better implementation of the principles-based part of Basel II (Pillar 2) would enhance financial stability. Pillar 2 is key to using capital to lean against bubbles and in dealing with over-the-cycle effects. This requires more effort in banks and supervisors.

The IMF program to assess implementation of Basel II should proceed expeditiously, properly resourced.

I know that the inadequacies in bank data and models around default and loss-rate assumption for mortgage portfolios in a variety of markets that had never seen a full cycle of loss data were well understood by supervisors and by banks. Certain countries took arbitrary action—such as overriding parameters across the board to raise capital on this portfolio. But the response was generally inadequate. (Although I believe that, at best, it would have mitigated the subsequent crisis.) International coordination and surveillance of action in such areas need to be enhanced. That will be easier when all major countries are on the same system. There may be a role for the IMF and FSF in this regard to identify areas that need attention, help build consensus, and monitor progress.

I believe that the level of capital debate resulting from the shift to Basel II was poorly framed. The final Quantitative Impact Studies (QIS) conducted in 2005 showed that the overall level of minimum required capital worldwide for Tier 1 banks under Basel II would be some 6.8 per cent lower than under Basel I. Canadian results were similar. It is likely that this reduction was less because of a variety of factors not included in the QIS results. Available evidence also suggests that the peak-to-trough variation in minimum capital requirements could be considerably higher than this, although inadequate reliable estimates of this are available. Basel II was raising capital requirements, on average, over a cycle. But very little discussion was taking place at senior levels internationally, based on analysis, but also a lot on judgment, about what target capital levels for systemically important banks ought to be.

I do, however, observe that banks that had high core capital ratios (Tier 1) before the crisis were better able to weather the storm. They often were better able to raise additional capital, as well. That is one of the reasons the Canadian system has performed reasonably well to date. I think that the systemic importance of a range of larger banks, and the de facto support they enjoy in a crisis, mean that it is reasonable to require them to have higher capital than they do now. Before designing countercyclical capital *rules*, regulators ought to decide that the de facto expectation of actual capital help by these banks is a lot higher than previously thought. In Canada, it is now 7 per cent, and 6 per cent in the United States. Banks normally hold above this. That may not be high enough, though. International consensus is necessary. And regulators could ensure that what counts as Tier 1 is of high quality.

Procyclicality in capital rules

I also believe that the procyclicality debate was unfortunately framed—including by some central banks who were legitimately worried. Capital requirements unrelated to risk will drive market responses that increase systemic risks. That is what happened under Basel I and is clearly not desirable. Relating capital requirements more closely to risk under Basel II will mitigate this problem (though not eliminate it). But that must imply that minimum capital for a bank will move up and down over a cycle, at least somewhat. Proposals to deal with procyclicality should not lose the Basel II benefits of better relating capital to risk.

Actual capital held by banks (based on their own assessment) may not move much over a cycle for a variety of reasons related to markets and institutions (in which case, the margin between actual and minimum will fluctuate). Banks have an incentive not to have to raise capital in the middle of a downturn and would naturally adjust their behaviour to reduce the chance of costly capital raising. They may not cut back lending. Rather, it could be a one-time adjustment, ensuring that their capital cushion above the minimum at the peak of a cycle is larger than it is currently, so they will still be adequately covered in a downturn. But if banks don't analyze cyclical impact and plan for it (as I believe many haven't), then surprises will occur and the short-term reaction to surprises is likely to be the cutting back of lending.

Banks' target levels of actual capital are influenced by rating agencies and position in the marketplace, not just by regulatory minimums. So proposals to deal with procyclicality, which have to be symmetrical, could actually make things worse, unless they also affect behaviours of these actors. For example, some proposals would have raised capital over the past few years and would now suggest lowering it in the face of the recession. But if changes in minimum capital don't translate into changes in banks' desired actual capital (for example, because banks perceive that they have to maintain capital to maintain their rating), then the measure is at best neutral and at worst may exacerbate the cycle.

However, Pillar 2 could be used more aggressively to help deal with excessive procyclicality. This would be working with market-based incentives rather than completely against them. The goal would be to make actual/desired capital less cyclical than minimum capital. This could involve more system-wide use of realistic stress tests (which change in severity over the cycle); having banks set internal targets for their actual capital at the top and bottom of the cycle, not just as an average; considering disclosure of these targets or the range of a bank's expected capital position; requiring banks to compute and update the cyclical sensitivity of their capital position; and pressing rating agencies to take account of banks' range of expected outcomes in their ratings, not just one point-in-time estimate. International coordination would be essential in implementation, including taking account of differences across jurisdictions and differences in cycles across countries. Banks that do not already do this could be encouraged to make sure that their capital is determined in part by using closer to through-the-cycle estimates for key parameters.

The Basel Committee on Banking Supervision (BCBS) did take significant action in response to criticisms to reduce the procyclical impact: (i) using through-the-cycle ratings; (ii) requiring Pillar 2 estimates of capital requirements under downturn conditions; and (iii) smoothing Basel II parameters. Other factors are being examined. I am not sure that much more can or should be done outside of the Basel II framework beyond the ideas noted above. It is not clear that all banks adequately appreciated the issue of procyclicality in their capital planning and had adjusted their desired capital levels before the crisis hit to produce their desired margin over likely cycles. Regulators should push for that.

I am leery of ad hoc, ex ante rules to be used to identify when to change capital provisions in relation to economic cycles. Macro policy has not been able to be based on such mechanistic rules. There are also likely to be differences across time and across jurisdictions that would not be picked up in such rules. Formulas can also be "gamed." In addition, searching for such rules may delay more sensible short-term measures that would help, such as those outlined above.

The issue of procyclicality is different from that of using capital rules to address asset bubbles. Recent suggestions from Goodhart (2008) and others support this notion. Some have pointed to the Spanish system of dynamic loan-loss provisioning as an example that might be adapted to capital calculation (although that is only looking forward a year). This is reminiscent of the William McChesney Martin adage about the role of authorities being to remove the punch bowl when the party is about to take off.

I have my doubts about an automatic ex ante system, in this case, as well, for the reasons outlined above. I also think that it would be hard to give central banks who are not supervisors the authority for such decisions as Goodhart suggests. That would take them into just the kind of judgments they are reluctant to make in calibrating monetary policy to supposed bubbles. And how would the supervisor react on being told to tell banks that their capital requirements were raised because the central bank told them so? Rapid asset growth is rarely uniform. So how would prudent banks react to an across-the-board measure? And what would be the confidence and signalling aspects of the decision by the authorities to invoke their countercyclical powers? Suppose that authorities got it wrong. Normally, the burden of proof has to be high. And regulators and rating agencies and counterparties are now in a symbiotic relationship vis-à-vis capital. Would rating agencies or counterparties ever let capital requirements fall?

Finally, some have suggested an automatic ex ante system basing capital requirements on asset growth (see Goodhart and Persaud 2008). This is likely to be a blunt tool. And it might also cause perverse effects as banks adjust their behaviour in the face of a non-risk-sensitive measure.

Groups of bank supervisors, supported by central banks and improved international coordination, should use Basel II, Pillar 2, to address *targeted* issues with capital add-ons or overrides of model parameters being used by banks for those markets that are unrealistic. That could be targeted action against specific, fast-growing asset classes where bubble conditions and likely loss experience are clearly not reflected in bank capital requirements.

For example, it ought to have been possible for ad hoc, yet justified, changes to be put in place, with lead time, to require additional capital against the mortgage book. Supervisors knew that the data were not there to support the low estimates of default and loss. Some did act in at least a partial way. However, since the United States at that point had not implemented Basel II and was in the middle of a delicate legislative process of doing so, it was difficult to have more effective action. In future, however, that ought to be possible. It will require stronger surveillance, more sharing of current experience, ideally a Basel Committee with broader membership from important markets who would need to be part of the solution, leadership, and more willingness to act. I believe an adequate base has been put in place to build on. There could be explicit consideration of this at least annually with appropriate reporting between Basel and the FSF.

Investment banks should be brought into a Basel-like system, where they are not already. Since so much of their assets are trading book and it is hard to model correlations between trading-book assets in a crisis, the Pillar 2 margin over minimum required capital ought perhaps to be higher.

And insurance capital rules will have to catch up in some jurisdictions to reduce arbitrage possibilities (that were part of the crisis problem) and recognize the investment banks and trading risk that are embedded in some insurers' operations (as was the case with AIG).

I have noted that leverage was part of the problem. I am well aware of the debates over requiring leverage ratios. Canada has a maximum leverage ratio, as does the United States for its commercial banks (but not for its investment banks). A number of European banks were reported to have very high leverage ratios. I commend the Canadian and U.S. approach to others. However, critics rightly point out that off-balance-sheet leverage is also an issue. For regulatory *monitoring* purposes, other leverage ratios that incorporate in some ways leverage in off-balance-sheet exposures should also be considered (see Corrigan et al. 2005 Report II, for examples).

Rating agencies

The business model and regulatory position of rating agencies should be adjusted (see Zelmer 2007 for a good summary). While many have called for reduced reliance on them by regulators, I doubt that a sea change in this can be achieved, beyond what will already be occurring in the marketplace. They have obvious conflicts inherent in their business model, but also the need to maintain their reputation.

Some reports suggested that revenues from structured products amounted to over 40 per cent of the total for the major rating agencies in 2006! The inappropriateness of the assumptions underlying ratings of structured products is well known and was in some quarters before the crisis.

I think the challenge is to increase their accountability and competition. I am less convinced that direct regulation would be as powerful as better market incentives. One important change would be to make them subject to civil legal actions for negligence in the rating process. Now they are offering an "opinion," not "advice." That would lead to bonding or their insurers being interested in the quality of their work. Moves such as those undertaken recently by New York to deal with conflicts between the structuring and rating processes should be repeated in other markets. I don't know whether it is possible to do more to have a framework that would promote less of an oligopoly.

International coordination

International groupings to promote financial stability have been found wanting. Reform of international institutions is well beyond the scope of this paper. But it should not be left out simply because it is difficult. Architecture redesign should be tested against the basic question of whether it would enhance *information* on what is happening and enhance *will to act*, both internationally for things that can only be done at that level and nationally for things that have to be done by individual jurisdictions.

There are some obvious needs. One is translating effective surveillance into action. The quality of the IMF macro surveillance product seems to be increasing. I am less sure at a micro surveillance level for individual countries. I think there should be more focus on certain basics that have consistently proved to be harbingers of problems, such as markets with leverage and fast asset growth. That will require adequate resourcing, which I doubt is currently in place. It will also require IMF senior management and the board to focus on these issues. Translating this into increased likelihood of action will also require better focused discussion at international forums, more requests for individual countries to use systemically important developments that are identified globally to stress their own financial system and report on the results, with better follow-up from the international financial organizations.

I believe that the IMF board, the Basel Committee, and the FSF all have different deficiencies and strengths in makeup and procedures. Could something be done that takes the best of each and clarifies their responsibilities?

One should also consider revising the Core Principles for Effective Banking Supervision (and the related core principles for insurance and securities) that are the essence of the IMF FSAPs to include the need for macro stress testing and effective crisis-resolution powers, plans, and capabilities (which countries could meet in a variety of ways). This should be a key part of IMF FSAP assessments.

FSAPs must be more substantial and more regular. The IMF should commit to a material-enhanced regular involvement in financial sector surveillance, based on the FSAP model.

To this end, material increase in high-quality resources, both financial and human, should be devoted to this task. When these assessments occur should no longer be optional for countries—the United States had never had an assessment! Article IV assessments, also using higher-quality financial resources regarding financial sector issues, should include more work on financial vulnerabilities and stresses. Countries should consider regular peer assessments. There are now a lot more examples to use, and it will be more difficult in future for national authorities to argue that these macrofinancial stress tests are meaningless. Assessments should provide for a confidential portion to promote greater effectiveness.

The formation of colleges of supervisors for major institutions has been seen to be part of the solution (see Brown 2008). The real issue is not having these, but what they are expected to do and what the powers of various home and host supervisors are. In my view, these work best when they are relatively small, when the home and host supervisor use them to obtain the judgment of one another on material risks that they should be focusing on, when they promote constructive challenge, when strategies for remedial action can be discussed and coordinated between home and host supervisors, and when home supervisors drive the process. These responsibilities are not really covered in the 1975 Basel Concordat, which set out home-host regulator responsibilities for internationally active banks.

Trust between home and host countries can't be legislated. Nor can effective challenge. However, the Basel Committee should consider revising the Concordat to explicitly cover colleges, which might better emphasize the role of home countries and host countries in contributing to an overall assessment of the bank, the possibility of coordination of action, and the importance of home countries in driving that process.

I also think that there is need for more technical informed discussion of financial stability issues internationally. Some will, no doubt, call for more international crisis simulation or international stress tests. Compiling lessons learned from the cross-border aspects of the recent crisis will be very important. One can't be particularly effective at this in biannual high-level meetings. Nor can such groups be expected to cover the fine judgments necessary, review specific vulnerabilities that may be quite technical, or arrange the necessary follow-up. Continuity is necessary. So is a link to those with the power to take action. I am not proposing a new group but rather that, whatever organization takes this on, it be supported by appropriate senior working-level and technical support.

I also believe that the effectiveness and credibility of the Basel Committee would be enhanced by its membership being extended to include other systemically important countries from Asia and Latin America. While some have rightly noted that the European contingent is rather large, I do not see a clear way to reduce it at this time. The Committee should focus more regularly on vulnerabilities and resiliency, not just on rules and guidance. It got away from this because of the press of Basel II. This should not supplant the FSF discussion. But by directly involving potentially detailed discussion between front-line supervisors, it could be more fruitful and might make the subsequent FSF discussion more focused. And if the Committee cannot reach consensus on a very important stability issue, such as the approach to liquidity regulation and supervision, then a way should be found to advance the issue to governors and heads of supervision.

The Basel Committee, IOSCO, and the IAIS could coordinate more directly on analyzing vulnerability issues that arise, including arbitrage between different entities based on differences in rules.

Systemic risk proofing of systems

There must be an unrelenting effort to complete the systemic risk proofing of the systems that support clearing and settlement and markets (and unwinding in time of crisis). I have already referred to initiatives related to the CDS market. Are there others? For example, in Canada, as I understand it, not all FX trades go through the central counterparty that was set up some years ago. The authorities responsible may have to be more directive to achieve results. And we should look at whether legal authority for central banks to oversee systemically important clearing and settlement systems (not just payment systems) needs to be expanded.

Some of the operation of these arrangements, including the unwinding procedures, has essentially been subcontracted to the International Swaps and Derivatives Association (ISDA). Regulators and central banks should examine the effectiveness of that experience and determine whether they need to establish more rules and protocols in this area.

Crisis Management

While crisis management is not the focus of this paper, I believe that there are a few principles that merit repeating. I believe that crises of one form or another are inevitable (although their incidence and severity can be reduced). Therefore, the task is to mitigate the impact of crises on the real economy. Authorities earn their pay and reputation on the basis of how they handle crises. Several principles underlie effective crisis management. There is plenty of evidence of these principles being followed—or not followed—during the recent past.

- Authorities and policy-makers must believe that crises can occur and that part of their job is to be as prepared as possible. Focus on the resilience of your system.
- Coordination between authorities matters a lot and has to be built up *before* a crisis, and the roles of each authority (regulator, central bank, and treasury) must be well understood.
- Act early.
- Think through beforehand what might be systemic—it's often not just large institutions, and it can be a lot smaller than you think.
- Be ready for the systemic implications—better to have a workable systemic solution ready if you need it than to appear to be overwhelmed by events.
- Confidence is about finality of measures and consistency of response.
- Effective communications are much more important during crises, are more sensitive, and are much more difficult—give them more attention than you would otherwise. Disclosure requirements make dealing with crises more demanding.

- Even when providing assistance, there are ways to impose consequences on those responsible.

- Figuring out how to phase out an assistance package, and how to craft conditions so that access is not universal if it doesn't need to be, are desirable but not easy to accomplish. When the focus is on preventing further erosions of confidence, it is important to remember that part of the medium-term solution sometimes requires shrinking the sector and sorting out the bad from the good.

Once a crisis reaches a certain stage, and certain measures such as blanket guarantees are being invoked, the issue of "competitive" impacts between countries arises. This was evident in the September–October 2008 period. The international coordination challenges to avoid the equivalent of a financial "trade war" are important. However, they are beyond the scope of this paper.

Other Matters

Countries must verify that they have the necessary legal ability and options to resolve problems at large, complex institutions. Canada reviewed this situation some years ago but should do so again, if it is not already happening. These reviews should be unflinching. I have always believed that a bank is either open or closed; it is not productively in limbo. Bridges to nowhere, including bridge banks to nowhere, are not useful tools for resolution. Any review must recall that in a systemic crisis, part of the job is to reduce capacity in the system and to achieve resolutions quickly and with finality. A typical CDO of a residential mortgage-backed security had thousands of underlying assets. Counterparty trades in various parts of a moderately complex bank's books will also number in the tens of thousands. In a crisis, there is insufficient time to assess all of this perfectly. Nor is it always possible to verify the interlinkages between institutions, the counterparties involved, and the markets in anything close to real time. That has implications for the kind of resolutions that are likely to be effective.

There should also be a concerted review of cross-border resolution approaches, if that is not already taking place. While there are undoubtedly insoluble differences in the approaches to liquidation in North America and Europe, it is possible that steps could be taken to minimize operational inconsistencies that can add uncertainty to markets in times of crisis.

Canada should move expeditiously to establish a national securities regulator. Even with this, OSFI should continue its safety and soundness oversight of bank-owned dealers. A national commission should have either the mandate and resources to perform a safety and soundness role for material non-bank-owned players or should outsource this role to OSFI.

Canada, and perhaps other countries as well, should increase resources devoted to the real-time enforcement of capital markets and financial fraud. Some of this can be preventive, if properly structured. This would involve both federal and provincial governments in civil and criminal investigations and prosecution. Too often, we look for a rule change when timely enforcement of existing statutes would do more to influence behaviours. And, too often, enforcement follows a major breakdown rather than dealing with the early symptoms. Credible examples of timely enforcement would go a long way to conditioning excesses in markets.

Conclusion

- The stresses in financial markets and on many major financial institutions have been unprecedented. Canada's regulatory and financial system fared well by international comparisons, but has not been immune.

- Issues of complexity, opacity of key markets, the originate-to-distribute model, and insufficient capital for certain off-balance-sheet and trading-book positions are all important causes. So is inadequate recognition of liquidity risk. Several challenges are related to implementing reforms in these areas, including ensuring adequate resources in regulators and ensuring that the focus in regulated institutions is on judgment and risk culture, not just on the mechanics of models and stress tests.

- A complete understanding of what happened must include macro conditions; excessive leverage (insufficient capital); excessive risk concentrations; policy and regulatory failure; inadequate will to act internationally on identified potential vulnerabilities; lack of clarity about what macro-stability mandates for authorities meant in practice; an outmoded regulatory structure in the United States; incomplete risk proofing of clearing and settlement systems; inadequate appreciation of the shadow banking system and the links between regulated banks, insurers, markets, and those unregulated players; and compensation systems that did not appropriately connect remuneration to results.

- We need to accept that a tendency to bubbles and busts is endemic to financial systems and prepare accordingly. I believe that their incidence and impact can be mitigated. That also means focusing not just on vulnerabilities but also on resiliency—of institutions, of the system, and of crisis response.

- While sensible proposals for improving the regulatory structure are emerging internationally (and that will require regulators and supervisors to "up their game"), I believe that a few, more fundamental issues must also be addressed. They include:

    - limiting the prudential regulatory system based on consolidated rules and capital and leverage requirements to banks, investment banks, and insurers (which will require major changes in the United States but not in Canada), but shoring up the dike by enhanced capital requirements; better rules for limiting and monitoring leverage; better assessment of arbitrage possibilities; power for authorities to obtain information on players in the unregulated sector to support better analysis, including regular *system* stress/scenario testing of the vulnerabilities of regulated entities; and clarifying the financial stability mandate of central banks. Clarity of mandate for central banks in macroprudential regulation is important.

    - the United States implementing more fundamental changes to its prudential regulatory system (not simply producing proposals) to reduce the number of regulators, clarify roles and responsibilities, and extend comprehensive consolidated supervision to all material investment banks and insurers. It will be a missed opportunity if debate about a new international architecture takes the focus away from needed changes in the United States.

- implementing Basel II where it has not yet been implemented, and using Pillar 2 much more aggressively to promote greater resiliency to shocks, including using (temporary) targeted Pillar 2 additional capital charges on a coordinated discretionary basis to lean against bubbles in selected financial markets where banks' analytics and experience supporting regular capital calculation are not based on adequate stress conditions; using Pillar 2 to deal further with procyclicality by requiring banks to estimate their over-the-cycle impacts on minimum capital and plan for their actual capital target over the cycle to minimize the need for capital raising or cutbacks in a downturn.
- beefing up IMF and FSAP surveillance efforts with adequate resources, doing FSAPs on a regular cycle that is not at the discretion of the country, extending the FSAP mandate to consider adequacy of stress testing, and preparedness for crisis resolution and Basel II implementation. Better link the results into international and domestic decision making in groups such as the Basel Committee and the FSF. Expand the membership of the Basel Committee to include major systemically important countries and make vulnerabilities and resiliency standing agenda items.
- permanent coordinated guidance on the use of fair values. Changes in the process of introducing such standards to increase the reliability, quality, and understanding of implementation by preparers and users of financial statements; further refining what entities can be considered off balance sheet and consider levying a capital charge against banks in relation to all such entities the bank is involved in.
- considering making rating agencies subject to civil lawsuits for negligence in the rating process.
- not expecting regulators to police compensation practices. Consider using enhanced market-based mechanisms to increase incentives for better linking pay to performance, such as permitting non-binding "say on pay" shareholder resolutions, and court ability to overturn bonus and severance arrangements based on the failure or resolution of a problem financial institution.
- the need to be rigorous and timely in ensuring that clearing and settlement systems for cash and derivatives products are in place, including potentially extending the formal responsibility of central banks in that regard.
- Canada being affected by several, but not all, of these changes. In addition, specific to Canada is the need for a national securities regulator as an effective partner and contributor to financial stability regulation (although this should continue to be led by existing federal authorities), and the need to further beef up civil and criminal investigation and prosecution in cases of capital markets wrongdoing.

This paper also comments on:

- why I do not support extension of the financial stability regulatory structure beyond banks, investment banks, and insurers. This paper considers the issues of substantially similar, systemically important players that may arise and considers possibilities about handling them.

- the need to for a more fundamental review of disclosure to increase its effectiveness.
- crisis-management principles and tools, including the limitation of ELA and bridge banks as tools to resolve problem financial institutions.
- the difficulty of ex ante, automatic regulatory rules designed to counter cycles or asset bubbles.

References

American International Group (AIG). 2008. Form 10-Q Quarter Ended 30 June 2008, Securities and Exchange Commission, Washington, 6 August.

Bank for International Settlements (BIS). 2006. *76th Annual Report*, 1 April 2005–31 March 2006.

Bank of Canada. 2004. "Developments and Trends." Bank of Canada *Financial System Review* (June).

Basel Committee on Banking Supervision (BCBS). 2002. "Comments on IASB Exposure Draft of Amendments to IAS 32 and IAS 39." Bank for International Settlements. October.

———. 2006. "International Convergence of Capital Measurement and Capital Standards, A Revised Framework Comprehensive Version." Bank for International Settlements. June.

Bernanke, B. S. 2008a. "Financial Regulation and Financial Stability." Speech at the Federal Deposit Insurance Corporation's Forum on Mortgage Lending for Low and Moderate Income Households, Arlington, Virginia, 8 July.

———. 2008b. "Reducing Systemic Risk." Speech at the Federal Reserve Bank of Kansas City's Annual Economic Symposium, Jackson Hole, Wyoming, 22 August.

Bordo, M. D. 2007. "The Crisis of 2007: Same Old Story, Only the Players Have Changed." Remarks prepared for the Federal Reserve Bank of Chicago and International Monetary Fund Conference on *Globalization and Systemic Risk*, September.

Brown, G. 2008. Speech on the global economy at the Reuters building, Prime Minister's Office, London, 13 October.

Calomaris, C. 2008. "The Subprime Turmoil: What's Old, What's New, and What's Next." Kansas City Federal Reserve Bank Symposium on *Maintaining Stability in a Changing Financial System*, Jackson Hole, Wyoming, 21–22 August.

Canadian Coalition for Good Governance (CCGG). 2007. "CCGG Position on 'Say on Pay'." 12 December.

Carney, M. 2008. "Addressing Financial Market Turbulence." Speech to the Toronto Board of Trade, Toronto, Ontario, 12 March.

Celati, L. 2004. *Dark Side of Risk Management: How People Frame Decisions in Financial Markets*. Financial Times/Pearson Education Limited.

Committee on Oversight and Government Reform. 2008. "Testimony of Alan Greenspan." 23 October. <http://oversight.house.gov/story.asp?ID=2256>.

Corrigan, G. et al. 2005. "Toward Greater Financial Stability: A Private Sector Perspective." Report of the Counterparty Risk Management Policy Group II, 27 July.

———. 2008. "Containing Systemic Risk: The Road to Reform." The Report of the Counterparty Risk Management Policy Group III, 6 August.

Davies, H. and D. Green. 2008. *Global Financial Regulation: The Essential Guide*. Cambridge: Polity.

Dinallo, E. 2008. "State Regulation Is Not to Blame for AIG." Letter to *Financial Times* (FT.com). 22 September.

Dingle, J. 1998. "The LVTS—Canada's Large-Value Transfer System." *Bank of Canada Review* (Autumn): 39–55.

Dodge, D. 2005. "Financial System Efficiency: Getting the Regulatory Framework Right." Speech to the Toronto CFA Society, Toronto, Ontario, 22 September.

———. 2006. "Global Imbalances: Why Worry? What to Do?" Speech to the New York Association for Business Economics, New York, New York, 29 March.

———. 2007a. "A Clear Case for Transparency." Speech to the Canada-U.K. Chamber of Commerce, London, United Kingdom, 12 September.

———. 2007b. "Credit Market Turbulence and Policy Challenges Ahead." Speech to the Institute of International Finance, Washington, D.C., 21 October.

———. 2007c. "Making Global Economic Institutions Work—What the World Needs Now." Speech to the Chicago Council on Global Affairs, Chicago, Illinois, 21 May.

Draghi, M. 2008. "The Current Crisis and Beyond." Speech to the Federal Reserve Bank of Kansas City Symposium, Jackson Hole, Wyoming, 22 August.

Eatwell, J. and A. Persaud. 2008. "A Practical Approach to the Regulation of Risk." *Financial Times*, 25 August.

Ferri, F. and D. A. Maber. 2008. "Say on Pay Vote and CEO Compensation: Evidence from the UK." Harvard Business School. September.

Financial Services Authority (FSA). 2008. "The Supervision of Northern Rock: A Lessons Learned Review." Report of the Internal Audit Division. March.

Financial Stability Forum (FSF). 2008. "Report of the Financial Stability Forum on Enhancing Market and Institution Resilience."

Globe and Mail. 2008 "Playing the Blame Game." 11 August.

Goodhart, C. A. E. 2008. "Central Banks' Function to Maintain Financial Stability: An Uncompleted Task." <http://www.resourceinvestor.com>.

Goodhart, C. and A. Persaud. 2008. "How to Avoid the Next Crash." *Financial Times*, 30 January.

Greenspan, A. 2008. *The Age of Turbulence: Adventures in a New World*. New York: Penguin.

Gross, B. 2007. "Beware Our Shadow Banking System." *Fortune*. 28 November.

Institute of International Finance (IIF). 2008. "Final Report of the IIF Committee on Market Best Practices: Principles of Conduct and Best Practice Recommendations." Washington, D.C. July.

International Monetary Fund (IMF). 2006. "Global Financial Stability Report: Market Developments and Issues." Washington, D.C. April.

———. 2008. Various working papers on the resolution of banking crises.

Investment Industry Regulatory Organization of Canada (IIROC). 2008. "Regulatory Study, Review and Recommendations concerning the manufacture and distribution by IIROC member firms of Third-Party Asset-Backed Commercial Paper in Canada." Toronto, Ontario. October.

Joint Forum (The). 2005. "Credit Risk Transfer." Bank for International Settlements. March.

Kindleberger, C. P. and R. Z. Aliber. 2005. *Manias, Panics and Crashes: A History of Financial Crises*. Hoboken, N.J.: Wiley.

Knight, F. H. 1921. *Risk, Uncertainty and Profit*. Boston: Houghton Mifflin Company.

Lowenstein, R. 2000. *When Genius Failed: The Rise and Fall of Long-Term Capital Management*. New York: Random House.

McColl, C. 1999. "Risks and Forecasts in World Affairs." 8th Roskill Memorial Lecture, Churchill College, Cambridge. 16 February.

Minsky, H. P. 1986. *Stabilizing an Unstable Economy*. New Haven: Yale University Press.

Paulson, H. 2008. "Paulson's Testimony to the House Financial Services Committee." 24 September.

Roubini, N. 2008. "The Rising Risk of a Systemic Financial Meltdown: The Twelve Steps to Financial Disaster." RGE Monitor; Nouriel Roubini's Global EconoMonitor, 5 February.

Securities and Exchange Commission (SEC) Office of Inspector General. 2008. "SEC's Oversight of Bear Stearns and Related Entities: The Consolidated Supervised Entity Program." Report No. 446–A.

Senior Supervisors Group. 2008. "Observations on Risk Management Practices during the Recent Market Turbulence." March.

Shadow Financial Regulatory Committee. 2001. "Statement of the Shadow Financial Regulatory Committee on Requiring Large Banks to Issue Subordinated Debt." February. Loyola University Chicago.

Société Générale. 2008. "Report of the Special Committee of the Board of Directors of Société Générale." 23 May.

Taleb, N. 2007. *The Black Swan: The Impact of the Highly Improbable*. New York: Random House.

Treasury Committee. 2008. "The Run on the Rock." Fifth Report of Session 2007–08. House of Commons. London. January.

Turner, L. 2008. "Banks Want to Shoot the Messenger Over Fair Value Rules." *Financial Times.* 2 October.

UBS. 2008. "Shareholder Report on UBS's Write-Downs." 18 April.

U.S. Treasury. 2008. "The Department of the Treasury Blueprint for a Modernized Financial Regulatory Structure." Washington, D.C. March.

Volcker, P. A. 2008. Remarks at a luncheon of the Economic Club of New York. 8 April.

Wellink, N. 2008. "Responding to Uncertainty." Speech to the International Conference of Banking Supervisors, 24 September.

Wolf, M. 2008. "Paulson's Plan Was Not a True Solution to the Crisis." *Financial Times* (FT.com). 23 September.

Zelmer, M. 2007. "Reforming the Credit-Rating Process." Bank of Canada *Financial System Review* (Spring): 51–70.